

Public Review Draft
Remedial Investigation Report

Port of Seattle North – Terminal 115
Seattle, Washington
Cleanup Site ID: 1229
Facility Site ID: 2177

for
**Washington State Department of Ecology
on Behalf of Port of Seattle**

July 26, 2024

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File No. 0303-112-00
July 26, 2024

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Note to Reviewers:

This Public Review Draft Remedial Investigation Report was prepared pursuant to Washington State Department of Ecology (Ecology) Agreed Order No. DE8099 (Agreed Order) to document the findings of the Remedial Investigation (RI) completed for the Port of Seattle (Port) North Terminal 115 Site (T115N or Site) located in Seattle, Washington. The environmental data presented in this report are compared to preliminary cleanup levels (PCULs) that were developed by Ecology for the Lower Duwamish Waterway (LDW), as presented in the “LDW PCUL Workbook” dated July 12, 2019. The PCULs are based on the technical approach outlined in Ecology’s policy memorandum (policy memorandum) regarding groundwater PCULs (Ecology 2016) and the methodology specified by Ecology’s white paper for upland sites along the LDW (Ecology 2018b). To identify the nature and extent of contamination and areas that will require cleanup action evaluation, the PCULs presented in this RI will be reevaluated, as appropriate, for the Feasibility Study (FS) based Ecology’s updates for determining PCULs at LDW sites with consideration of current and future land use assumptions, human and ecological receptors, complete exposure pathways, background and practical quantitation limits (PQLs) as allowed under Model Toxics Control Act (MTCA).

In accordance with Agreed Order No. DE8099 and following Ecology’s approval of this RI, the FS will be prepared to identify and screen applicable remedial technologies, develop and evaluate a range of remedial alternatives and to select a preferred alternative that meets the requirements of MTCA. The FS will be presented under a separate cover for public review as required by the Agreed Order. Preparation of the RI, FS and Cleanup Action Plan (CAP) will fulfill the requirements of the Agreed Order.

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Abbreviations and Acronyms

GENERAL

--	not analyzed
Agreed Order	Agreed Order No. DE-8099
AD	Native Alluvium
APS	Applied Professional Services, Inc.
ARAR	Applicable, Relevant and Appropriate Requirements
AST	above ground storage tank
AXYS	AXYS Analytical Services, Ltd.
bgs	below ground surface
bml	below the mudline
CAS	Chemical Abstracts Service
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CFR	Code of Federal Regulations
COC	contaminant of concern
COPC	contaminant of potential concern
CUL	LDW Target Sediment Concentration cleanup level
CSM	conceptual site model
CSBC	crushed surface base course
CSO	combined sewer outfall
DNR	Department of Natural Resources
DP	direct-push
Ecology	Washington State Department of Ecology
EIM	Environmental Information Management
ENSR	ENSR Consulting and Engineering
EPA	United States Environmental Protection Agency
ERM	Environmental Resources Management
FS	Feasibility Study
FD	Dredged Fill
FI	Initial Fill
FP	Pond Fill
FO	Operational Fill
GEI	GeoEngineers
Glacier NW	Glacier Northwest
Glacier Northwest	Glacier Northwest Inc.
Hg	mercury
HSA	hollow stem auger
IDW	inverse distance weighting
IG1, U85	Industrial General 1, Unlimited 85
J	estimated result
K	hydraulic conductivity

K _H	Henry's law constants
K _{OC}	soil organic carbon-water partitioning coefficient
Kaiser	Kaiser Cement & Gypsum Corporation
KCHD	King County Health Department
LAET	lowest apparent effects threshold
Landau	Landau Associates
LDW	Lower Duwamish Waterway
LDWG	Lower Duwamish Waterway Group
MHHW	mean higher high water
MLLW	mean lower low water
MOU	Memorandum of Understanding
MTCA	Model Toxics Control Act
n/a	not applicable
NAVD88	North American Vertical Datum 1988
NE	not established
NOAA	National Oceanic and Atmospheric Administration
Qob	Olympia beds
OnSite	OnSite Environmental, Inc.
OS	Native Organic Silt
PCUL	preliminary cleanup level
Port	Port of Seattle
PQL	practical quantitation limit
PSEP	Puget Sound Estuary Protocols
PVC	polyvinyl chloride
RAL	Remediation Action Level
RCP	reinforced concrete pipe
RCRA	Resource Conservation and Recovery Act
RCW	Revised Code of Washington
RI	remedial investigation
RI/FS	Remedial Investigation/Feasibility Study
RL	reporting limit
RM	River Mile
ROD	Record of Decision
ROW	Right-of-Way
SCO	Sediment Cleanup Objective
SCUM	Sediment Cleanup User's Manual
SHA	Site Hazard Assessment
Shaw	Shaw Environmental & Infrastructure
Site	North Terminal 115 Site
SKCDPH	Seattle-King County Department of Public Health
SMS	Sediment Management Standard
SPU	Seattle Public Utility
SW	southwest

SWPPP	Stormwater Pollution Prevention Plan
T115	Terminal 115
T115N	North Terminal 115
TCLP	toxicity characteristic leaching procedure
TEE	Terrestrial Ecological Evaluation
TEF	toxicity equivalency factor
TEQ	toxicity equivalency quotient
TOC	total organic carbon
TP	test pit
TSCA	Toxic Substances Control Act
U	analyte not detected above the reporting limit
USACE	United States Army Corps of Engineers
USGS	United States Geological Survey
UST	underground storage tank
WAC	Washington Administrative Code
WOE	weight of evidence
WRIA	Water Resource Inventory Area
WSDFW	Washington State Department of Fish and Wildlife
WSDOT	Washington State Department of Transportation

UNITS OF MEASURE

%	percent
°C	degrees Celsius
°F	degrees Fahrenheit
µg/L	microgram per liter
atm-m ³ /mol	atmospheres meter cubed per mol
cfs	cubic feet per second
cm	centimeter
ft	feet
ft/day	feet per day
ft/ft	foot/foot
mg/kg	milligram per kilogram
mg/L	milligram per liter
mm	millimeter
ng/kg	nanogram per kilogram
ng/L	nanogram per liter

CHEMICALS

cPAH	carcinogenic polycyclic aromatic hydrocarbons
HPAH	high molecular weigh PAH
LPAH	low molecular weight PAH
MPAH	medium molecular weight PAH
PAHs	polycyclic aromatic hydrocarbons
PCBs	polychlorinated biphenyls

TPH	total petroleum hydrocarbon
SVOCs	semi-volatile organic compounds
VOCs	volatile organic compounds

Executive Summary

This report describes the remedial investigation (RI) for the Port of Seattle (Port) North Terminal 115 Site (T115N or Site) located at 6000 West Marginal Way SW in Seattle, Washington. The RI was performed in compliance with Agreed Order No. DE-8099 (Agreed Order) between Port and the Washington State Department of Ecology (Ecology). The RI was completed using environmental investigation data for soil, groundwater and catch basin solids collected between 2009 and 2015 at T115N. Investigation activities were performed at T115N by the Port in general accordance with the Ecology-approved Remedial Investigation/Feasibility Study (RI/FS) Work Plan (GeoEngineers 2013).

SITE DESCRIPTION AND HISTORICAL LAND USE

The Site is contained within Tax Parcel No. 5367202505 and consists of a 3.2-acre upland property situated at the northwest corner of Terminal 115 (T115) within the western portion of the Lower Duwamish River Valley and Lower Duwamish Waterway between River Mile (RM) 1.5 and 1.6. T115N and adjacent properties are zoned for industrial use and are used for manufacturing, shipping terminals, warehouses, railways, water transportation and other industrial uses.

The Site was used for tin reclamation operations beginning in 1963. The facility recycled tin by dissolving the tin coating on waste metal in a solution containing caustic lye and separating the tin from solution via electrowinning. The recovered tin was subsequently cast into ingots. The spent solution containing sludge (black mud) generated by the operation was discharged into unlined, settling ponds constructed in the central and eastern portions of the T115N property. The black mud was recovered and sold for further tin recovery. In about 1978, the settling ponds were backfilled and were subsequently paved over. Tin reclamation operations ceased in 1998.

Currently, the Port leases the western portion of T115N to the Gene Summy Lumber Company for the distribution of untreated lumber and prior to June 2020, the eastern portion was leased to Unimacts Global, LLC, which received and distributed heavy equipment components. The driveway in the northern portion of T115N provides access to the Ports lease areas and serves as an access route for the containers and trucks leaving T115. The property includes an approximately 10,000 square foot warehouse constructed of concrete with concrete floors that was previously used for tin reclamation operations (former Process Building), an approximately 2,000 square foot modular office building and multiple sheds. The ground surface is paved with either asphalt or concrete except for portions of the Gene Summy Lumber Company lease area, which is covered with compacted gravel.

A 48-inch diameter storm drain line that outfalls into the Lower Duwamish Waterway (LDW) at the northeastern corner of T115 traverses the northern portion of T115N. The alignment of the 48-inch drain line corresponds to a historical drainage feature located on the northern portion of T115N on the boundary between T115N and the Glacier Northwest (Glacier NW) Site (Facility/Site Identification No. 23881883). The as-built drawing identifies that the drainage feature received drainage from the southern portion of the Glacier NW Site and West Marginal Way.

REMEDIAL INVESTIGATION

The LDW was designated a Superfund site by the United States Environmental Protection Agency (EPA) in 2001. Based on the results of the RI and subsequent Feasibility Study (FS) for the LDW, a Record of Decision (ROD) was issued that identified remedial actions required to address contaminants present in sediment. As the

lead agency for upland source control, Ecology required the Port to complete an RI to collect environmental data to define the nature and extent of contamination at T115N. Pursuant to Agreed Order DE-8099 and Model Toxics Control Act (MTCA; Chapter 173-340 Washington Administrative Code [WAC]), remedial investigation activities were performed by the Port to characterize Site conditions at T115N and to provide sufficient data to identify and evaluate cleanup alternatives. Remedial investigation activities included the following:

- **Soil Investigation** – Soil sampling was performed at 33 locations to collect samples representative of fill and native soil at T115N. Soil samples were screened in the field for evidence of contamination, including visual observations for contamination (i.e., staining, etc.), water sheen testing and organic vapor monitoring. Based on the field screening results and the chemical analytical results from previous investigations, selected soil samples were submitted for a combination of chemical analyses including polychlorinated biphenyls (PCBs), dioxins and furans, priority pollutant metals, barium, and tin, semi-volatile organic compounds (SVOCs), volatile organic compounds (VOCs) and petroleum hydrocarbons (gasoline-, diesel- and oil-range petroleum hydrocarbons). In addition, soil pH was also investigated because of its potential effect on contaminant fate and transport and remedy selection.
- **Groundwater Investigation** – Groundwater sampling was performed at 27 locations to collect samples representative of shallow and deep groundwater. Hydrogeologic testing, including hydraulic conductivity testing and a 72-hour tidal study, were also performed to characterize groundwater gradients and flow in the shallow and deep groundwater zones. Groundwater monitoring was completed on a quarterly basis for one year to evaluate seasonal variability in groundwater conditions. Groundwater samples were submitted for a combination of chemical analyses including total and dissolved priority pollutant metals, barium and tin, SVOCs, VOCs and petroleum hydrocarbons (gasoline-, diesel- and oil-range petroleum hydrocarbons). In addition to the Port's groundwater investigation at T115N, Ecology collected and analyzed groundwater samples from three wells at T115N for PCB Aroclors and congeners as part of a larger evaluation of PCBs in groundwater in the LDW (Leidos 2017) and collected and analyzed a groundwater sample for dioxins and furans from a monitoring well on the northeast corner of T115N in support of Ecology's evaluation of the Glacier NW Site. In addition, groundwater pH was evaluated because of its potential effect on contaminant fate and transport and remedy selection.
- **Stormwater System Investigation** – A stormwater system investigation was performed to evaluate whether the stormwater conveyance system was acting as a potential pathway for contaminant migration from T115N to the LDW. The stormwater system investigation consisted of completion of a video and land survey of the Port's stormwater conveyance system and collection of solids samples from selected catch basins for chemical analysis to evaluate the nature of contaminants within the stormwater conveyance system. Catch basin samples were submitted for chemical analyses including PCBs, dioxins and furans, priority pollutant metals, barium and tin, SVOCs, VOCs and petroleum hydrocarbons (gasoline-, diesel- and oil-range petroleum hydrocarbons).

The results of the soil, groundwater and catch basin solids investigations were used to identify the nature and extent of contamination at T115N.

NATURE AND EXTENT OF CONTAMINATION

The RI data for T115N were screened to identify Contaminants of Potential Concern (COPCs) using the technical approach outlined in Ecology's policy memorandum (policy memorandum) regarding groundwater PCULs (Ecology 2016) and the methodology specified by Ecology's white paper for upland sites along the

LDW (Ecology 2018b). The methodology specifies multiple criteria based on comparison of the detected concentrations and practical quantitation limits (PQLs) for each chemical to the preliminary cleanup levels (PCULs) developed for the LDW. The PCULs for soil and groundwater used for this RI are from Ecology's "LDW PCUL Workbook" dated July 12, 2019¹. COPCs identified in Site media and the nature and extent are summarized in the following sections.

Soil

The following constituents were identified as COPCs for soil at T115N based on the screening criteria set forth by Ecology:

- Total PCBs;
- Dioxins and furans;
- Metals (antimony, arsenic, barium, cadmium, chromium III/total, copper, lead, mercury, nickel, selenium, silver, thallium, tin, and zinc);
- Polycyclic aromatic hydrocarbon (PAH) compounds (acenaphthene, anthracene, benzo[a]anthracene, benzo[b]fluoranthene, benzo[k]fluoranthene, benzo[a]pyrene, chrysene, dibenzo[a,h]anthracene, dibenzofuran, fluoranthene, fluorene, indeno[1,2,3-c,d]pyrene, 1-methylnaphthalene, 2-methylnaphthalene, naphthalene, pyrene, and total carcinogenic polycyclic aromatic hydrocarbons [cPAHs]);
- SVOCs (aniline, bis[2-chloroethyl]ether, bis[2-ethylhexyl]phthalate, butyl benzyl phthalate, 3,3-dichlorobenzidine, 2,4-dichlorophenol, diethyl phthalate, 2,4-dimethylphenol, 2-methylphenol, n-nitrosodimethylamine, n-nitrosodiphenylamine, n-nitrosodi-n-propylamine, pentachlorophenol, phenol and 2,4,6-trichlorophenol);
- VOCs (benzene and chloroform); and,
- Petroleum hydrocarbons (gasoline-, diesel- and oil-range petroleum hydrocarbons).

COPCs were detected at concentrations greater than the PCULs in fill and native soil at the Site. The highest concentrations of COPCs in soil were generally detected in fill in the vicinity of the former settling pond area, in the material placed as backfill in the former settling ponds, in soil beneath and south of the former Process Building, and in the rail line right-of-way (ROW) on the western portion of the Site. COPC concentrations greater than the PCULs were also identified in fill southeast of the 1965 shoreline. Elevated pH values for soil were also measured in and adjacent to the former settling ponds area. With respect to arsenic, the highest concentrations were detected in soil in the northern and central portions of T115N adjacent to the area of historical wood treatment operations on the Glacier NW Site.

¹ PCULs for soil and groundwater were developed using several overriding assumptions: (1) exposure based on residential/unrestricted land use; (2) potential transport pathways are complete for individual constituents (e.g., soil to groundwater, groundwater to surface water and sediment, groundwater to indoor air); and (3) all potential exposure pathways are complete (e.g., terrestrial ecological exposure to upland soil). To identify the nature and extent of contamination and areas that will require cleanup action evaluation, the PCULs presented in this RI will be reevaluated, as appropriate, for the FS based Ecology's updates for determining PCULs at LDW sites with consideration of current and future land use assumptions, human and ecological receptors, complete exposure pathways, background and PQLs as allowed under MTCA.

Where the surface of T115N is paved, soil is not exposed to physical processes such as erosion and surface flow that could result in the transport of COPCs or direct exposure to adult workers at the Site. In unpaved portions of the Site, erosion and direct exposure are potential transport and exposure routes. Leaching of COPCs from soil and migration in groundwater are potential transport and exposure routes where COPCs are present at concentrations greater than the PCULs for protection of the soil to groundwater pathway and could cause exposure to aquatic organisms, humans and higher trophic level ecological receptors in surface water and sediment in the LDW.

Groundwater

The following constituents were identified as COPCs for groundwater at T115N based on the screening criteria set forth by Ecology:

- Total PCBs;
- Dioxins and furans;
- Metals (arsenic, barium, cadmium, chromium III/total, copper, lead, mercury, nickel silver, thallium, and zinc);
- PAH compounds (acenaphthene, anthracene, benzo[a]anthracene, benzo[b]fluoranthene, benzo[k]fluoranthene, benzo[a]pyrene, chrysene, dibenzo[a,h]anthracene, fluoranthene, fluorene, indeno[1,2,3-c,d]pyrene, 1-methylnaphthalene, naphthalene, pyrene, and total cPAHs);
- SVOCs (aniline, bis[2-chloroethyl]ether, bis[2-ethylhexyl]phthalate, butyl benzyl phthalate, 2,4-dichlorophenol, diethyl phthalate, 2,4-dimethylphenol, 2-methylphenol, n-nitrosodimethylamine, n-nitrosodiphenylamine, n-nitrosodi-n-propylamine, pentachlorophenol, phenol, and 2,4,6-trichlorophenol);
- VOCs (benzene and chloroform); and,
- Petroleum hydrocarbons (gasoline-, diesel- and oil-range hydrocarbons).

Multiple COPCs were detected at concentrations greater than the PCULs in shallow groundwater at the Site. In deep groundwater, COPCs were predominantly not detected or were detected at concentrations less than the PCULs with the exception of several metals (arsenic, copper and nickel) and cPAHs.

The detected concentrations greater than the PCULs for COPCs including barium, cadmium, chromium III/total, lead, silver, zinc, non-carcinogenic PAHs, all but three SVOCs, benzene, and gasoline-, diesel-, and oil-range petroleum hydrocarbons were limited to T115N and were not detected at concentrations greater than the PCULs in wells located on the northeastern portion of the Site adjacent to the 48-inch drain line (i.e., preferential flow pathway) and Glacier Bay. Relatively few COPCs were detected at concentrations greater than the PCULs in wells located on the northeastern portion of the Site adjacent to the 48-inch drain line and Glacier Bay. COPCs that were infrequently detected at concentrations greater than the PCULs in wells located on the northeastern portion of the Site adjacent to the 48-inch drain line and Glacier Bay include copper, nickel, cPAHs, bis(2-ethylhexyl)phthalate, 2,4-dichlorophenol, n-nitrosodi-n-propylamine, and chloroform.

Along the northeastern portion of T115N, arsenic was consistently detected in groundwater at concentrations greater than the PCUL. Although the presence of arsenic in groundwater at this location is predominantly attributed to historical wood treatment operations on the Glacier NW property, fill material

placed along the western bank of the LDW during property development cannot be definitively ruled out as a potential additional contributing factor to the observed PCUL exceedances in groundwater at the Site.

PCBs in groundwater greater than the PCUL were detected in samples at the T115N Site collected by Ecology as part of a greater LDW groundwater study (Leidos 2017). Based on the results of Ecology's PCB study, PCB congeners are ubiquitous in groundwater throughout the LDW and are likely the result of historical industrial activities throughout the area. PCBs were not historically used at T115N and were only detected in low concentrations in two soil samples of fill from the settling ponds area. Further, T115N is not believed to have or be a source of PCBs in groundwater.

Dioxin and furans were detected at a concentration greater than the PCUL in one groundwater sample collected by Ecology on the boundary between the Glacier NW Site and T115N. Dioxins and furans were detected in soil at the T115N Site at concentrations less than the natural background concentration for Washington State. As the dioxin and furan concentrations in soil at T115N are less than the natural background concentration in Washington State, soil at T115N is not a source of elevated concentrations of dioxins and furans in groundwater.

COPCs that are at concentrations greater than the PCULs in groundwater on the northeastern portion of T115N adjacent to the 48-inch drain line and Glacier Bay have the potential to be transported to surface water and sediment in the LDW. Transport to surface water and sediment in the LDW could result in the exposure of aquatic organisms, humans and higher trophic level ecological receptors to the COPCs from the T115N Site.

Catch Basin Solids

The stormwater system at the T115N Site is comprised of catch basins connected to stormwater lines that transport stormwater to the 48-inch diameter drain line that traverses the northern portion of the Site. An investigation of the stormwater system indicates that the stormwater pipes at the property are in good condition and are not likely a transport pathway for soil and groundwater contamination.

Catch basin solids were analyzed to evaluate the potential for contaminants in the catch basin solids at the Site to impact sediment in the LDW. Contaminants in catch basin solids at T115N that were detected at concentrations greater than the Target Sediment Concentrations developed for the LDW include the following:

- Total PCBs;
- Dioxins and furans;
- Metals (arsenic, copper, and zinc);
- PAHs including high molecular weight PAHs (HPAHs) and Total cPAHs; and,
- SVOCs (bis[2-ethylhexyl] phthalate, butyl benzyl phthalate, and 3 & 4 methylphenol).

The Port operates under a Phase I Municipal Stormwater Permit issued by Ecology (Permit No. WAR044701). To comply with the requirements of the permit, the Port requires T115N tenants to complete and maintain Stormwater Pollution Prevention Plans (SWPPPs) and implement measures to prevent and control the discharge of contaminated stormwater to surface water or groundwater within their operational area. In addition, the Port maintains the stormwater system for T115N, including the removal

of catch basin solids for permitted disposal on a periodic basis to control and limit the potential transport of COPCs contained in catch basin solids toward the LDW. Biannual inspections (winter and summer) of the catch basins are completed by the Port to identify whether removal of the captured solids is required. Catch basin solids removed from the stormwater system are transported from the Site for permitted disposal.

FEASIBILITY STUDY DEVELOPMENT

The nature and extent of contamination has been characterized in media at T115N in accordance with the RI/FS Work Plan using PCULs developed by Ecology for the Lower Duwamish Waterway (LDW), as presented in the “LDW PCUL Workbook” dated July 12, 2019. The PCULs are based on the technical approach outlined in Ecology’s policy memorandum (policy memorandum) regarding groundwater PCULs (Ecology 2016) and the methodology specified by Ecology’s white paper for upland sites along the LDW (Ecology 2018b). Based on the results of the RI, there is sufficient data to prepare the FS, and to identify and evaluate cleanup alternatives for contaminated media at the Site. To identify the nature and extent of contamination and areas that will require cleanup action evaluation, the PCULs presented in this RI will be reevaluated, as appropriate, for the FS based Ecology’s updates for determining PCULs at LDW sites with consideration of current and future land use assumptions, human and ecological receptors, complete exposure pathways, background and PQLs as allowed under MTCA.

In accordance with Agreed Order No. DE8099 and following Ecology’s approval of this RI, the FS will be prepared to identify and screen applicable remedial technologies, develop and evaluate a range of remedial alternatives and to select a preferred alternative that meets the requirements of MTCA. The FS will be presented under a separate cover for public review as required by the Agreed Order.

1.0 Introduction

This report presents the results of the remedial investigation (RI) completed for the Port of Seattle (Port) North Terminal 115 Site (T115N or Site) located at 6000 West Marginal Way SW in Seattle, Washington (Figure 1-1). The RI is being completed by the Port pursuant to the Washington State Department of Ecology (Ecology) Agreed Order DE-8099 (Agreed Order; Ecology 2011) and in accordance with the Washington State Model Toxics Control Act (MTCA) cleanup regulations (Chapter 173-340 Washington Administrative Code [WAC]). The T115N Site is listed in the Ecology Cleanup Site Database as Facility/Site Identification No. 2177 and Cleanup Site Identification No. 1229.

The T115N Site is located in the western half of the Lower Duwamish River Valley immediately southwest of Glacier Bay at River Mile (RM) 1.5 of the Lower Duwamish Waterway (LDW). The LDW has been designated as a Superfund site by the United States Environmental Protection Agency (EPA). EPA is the lead agency for the cleanup actions to address contaminated sediment in the LDW. Ecology is the lead agency for source control in the upland areas along the LDW and oversees investigations and cleanup of potential contaminant sources to the LDW. This RI presents the results of the investigation of the nature and extent of contamination at T115N and includes the data needed to identify and evaluate cleanup actions for the Site.

This RI has been prepared using environmental investigation data for soil, groundwater and catch basin solids collected between 2009 and 2015 from within the area of interest for the Site. Soil, groundwater and sediment data collected from the adjacent Glacier Northwest (Glacier NW) Site (Facility/Site Identification No. 23881883) and LDW areas near the Site are also used to support evaluations in this RI. Investigations have been completed at the Site by the Port in general accordance with the Ecology-approved Remedial Investigation/Feasibility Study (RI/FS) Work Plan (GeoEngineers 2013).

The purpose of this RI is to fill the data gaps identified in the RI/FS Work Plan to complete the characterization of contamination at the Site. Sampling and analyses were completed to evaluate the presence of polychlorinated biphenyls (PCBs), dioxins and furans, metals (priority pollutant metals, tin and barium), polycyclic aromatic hydrocarbons (PAHs), other semi-volatile organic compounds (SVOCs), volatile organic compounds (VOCs) and petroleum hydrocarbons. The results of the RI will be used as the basis of the Site Feasibility Study (FS) where cleanup action alternatives will be developed and evaluated, and a preferred cleanup alternative identified to address Site contamination in accordance with the MTCA (WAC 173340750).

This RI report is divided into eight sections that include the following:

- Section 1.0 (Introduction) provides a brief description of the purpose and organization of the RI report.
- Section 2.0 (Background Information) presents a description of T115N including location and legal description, layout, historical use and current operations, environmental setting, geologic and hydrogeologic setting, natural resources and current regulatory status.
- Section 3.0 (Site Characterization) presents a description of previous environmental studies completed at the Site and on adjacent property, a description of the investigation approach, methods and procedures used to investigate T115N as part of the RI.

- Section 4.0 (Cleanup Standards) describes the development of preliminary cleanup levels (PCULs) used to evaluate contaminant concentrations at T115N and identifies the Chemicals of Potential Concern (COPCs) for the Site based on comparison of contaminant concentrations to the PCULs².
- Section 5.0 (Remedial Investigation Results) presents the results of the RI and summarizes the nature and extent of COPCs.
- Section 6.0 (Contaminant Fate and Transport) presents the fate and transport of contaminants in soil and groundwater at T115N based on the fate and transport processes affecting the COPCs.
- Section 7.0 (Conceptual Site Model) presents the conceptual contaminant transport and exposure models for T115N.
- Section 8.0 (Conclusions) presents the media and areas requiring further evaluation in the FS and consideration of remedial alternatives based on sources of contamination related to Site operations, characterization of the nature and extent of contamination, contaminant transport and exposure pathways.
- Section 9.0 (References) presents the references used in preparing this report.

2.0 Background Information

This section presents background information on the Site including location, property description, current and anticipated future uses, environmental setting, geologic and hydrogeologic setting, natural resources and the regulatory framework to support the evaluation of the nature and extent of contamination.

2.1. SITE LOCATION AND PROPERTY DESCRIPTION

The Site is located within the City of Seattle, King County, Washington (Figure 1-1) at 6000 West Marginal Way SW in the northeast quadrant of Section 30, Township 24 North, and Range 4 East and has the coordinates of latitude N47° 32' 52.70" and longitude W122° 20' 37.84". The Site is situated on the northwest corner of the Port's Terminal 115 (T115) and shares common borders on the south and east sides. The Site is bordered on the north by property owned and operated by Glacier Northwest Inc. (Glacier NW Site) and is bordered on the west by the City of Seattle ROW for West Marginal Way Southwest (SW; Figure 2-1).

The Site is located on the western boundary of the Lower Duwamish River Valley and LDW between RM 1.5 and 1.6. Glacier Bay, an embayment within the LDW identified as a Tier 2 Source Control Area for the LDW cleanup action (Ecology 2007), is located approximately 60 feet northeast of the Site. The navigation

² The environmental data presented in this report are compared to PCULs were developed by Ecology for the Lower Duwamish Waterway (LDW), as presented in the "LDW PCUL Workbook" dated July 12, 2019. The PCULs are based on the technical approach outlined in Ecology's policy memorandum (policy memorandum) regarding groundwater PCULs (Ecology 2016) and the methodology specified by Ecology's white paper for upland sites along the LDW (Ecology 2018b). To identify the nature and extent of contamination and areas that will require cleanup action evaluation, the PCULs presented in this RI will be reevaluated, as appropriate, for the FS based Ecology's updates for determining PCULs at LDW sites with consideration of current and future land use assumptions, human and ecological receptors, complete exposure pathways, background and practical quantitation limits (PQLs) as allowed under Model Toxics Control Act (MTCA).

channel of the LDW is located approximately 530 feet to the east of the Site. The Glacier NW Site and parts of T115 lie between the Site and the LDW, including Glacier Bay.

T115N is situated in King County Parcel No. 5367202505. The legal description for T115N is the following:

- MCLAUGHLINS WATER FRONT ADD PARCEL "A" SEATTLE LOT BOUNDARY ADJUSTMENT NO 2207807 REC NO 20030211900004 WCH IS POR OF JOSEPH R MCLAUGHLINS WATERFRONT ADDITION TO THE CITY OF SEATTLE PLAT IN NE 1/4 LESS POR CONV TO WASH STATE D.O.T. AS DESC IN Q.C.D. UNDER REC NO 20051129002556 (DESCRIBED AS 'TRACT 1' AND 'TRACT 2') AND LESS POR CONV TO CITY OF SEATTLE AS DESC IN Q.C.D. UNDER REC NO 20051129002557 AND LESS POR CONV TO CITY OF SEATTLE AS DESC IN Q.C.D. UNDER REC NOS 20051129002558 AND 20051129002559 LESS PORS CONV TO STATE OF WASHINGTON AS DESC IN Q.C.D. UNDER REC NO 20051129002573.

2.2. PROPERTY DESCRIPTION

T115N is a 3.2-acre industrial property that includes structures and facilities that support the current industrial activities. Structures present at T115N currently include an approximately 10,000 square foot warehouse constructed of concrete with concrete floors that was a former tin reclamation process building (Process Building), an approximately 2,000 square foot modular office building and multiple sheds (Figure 2-1). As shown on Figures 2-2 and 2-3, the ground surface is generally paved with either asphalt or concrete except for an area on the western-most portion of T115N that is covered with compacted gravel and limited areas in the northern and western portions of T115N that are covered with vegetation.

On May 8, 2020, an evaluation of the paved surfaces at T115N was performed in general accordance with the Washington State Department of Transportation (WSDOT) Pavement Surface Condition Field Rating Manual for Asphalt Pavements (WSDOT 1999). The evaluation included identification of the pavement conditions including the following:

- Rutting and wear;
- Cracking (alligator, longitudinal, non-wheel path longitudinal, transverse and block);
- Raveling and aging;
- Flushing/bleeding;
- Patching; and,
- Pavement edge condition.

Where paved, the severity of the defects or distresses in the pavement surface were low to moderate with occasional longitudinal and transverse cracks observed in the asphalt driveway between West Marginal Way SW and T115 and occasional cracking in concrete paved surface in the eastern portion of the Site. In the western portion of the Site, the ground surface was originally paved with asphalt (asphalt present near the fence line and beneath the modular office building and sheds), however, the asphalt surface in this area has been severely distressed and now generally consists of compact gravel surface mixed with soil and wood debris (sawdust) as a result of industrial use. The current tenant of this area (Gene Summy Lumber Company) occasionally places crushed gravel to fill ruts and potholes as they develop. Based on a review of historical aerial photographs (discussed in the following section), the driveway between West Marginal Way SW and T115 was initially paved in the late 1970 (presumably following development of T115

in 1972) while the remainder of the property was paved in the late 1990s following the closure of tin reclamation operations.

An asphalt driveway along the northern portion of T115N provides access to T115N from West Marginal Way as well as the southern portion of the Glacier NW property and acts as the northern egress for T115. T115N is enclosed by chain link fencing except in the northwest corner at the West Marginal Way entrance to the Site.

2.3. PROPERTY DEVELOPMENT AND HISTORICAL SITE OPERATIONS

Dredging and filling in the area of T115N began in the early 1900s. At that time, the shoreline of the Duwamish River was situated within the eastern portion of what is currently T115N (Figure 2-4). Filling occurred on the property north of T115N (i.e., Glacier NW Site) in the 1930s. In the early 1960s, much of what comprises T115N today was created by the placement of fill material on the western bank of the LDW. The fill material was placed on the historical upland and shoreline and extended eastward into the LDW. In the 1970s, additional fill material was placed to the east and south of T115N to create the upland area that would become T115. By the end of the 1970s, major development to T115N and the surrounding area was complete, and the property has remained largely unchanged to the present. Note that historical industrial use of the Glacier NW property including mineralized-cell wood preserving, whetlerite and charcoal production, and other chemical manufacturing operations as discussed in Section 3.2 occurred upgradient of T115N for at least 30 years prior to the initial development of T115N. Historical photographs documenting changes to the T115N Property and surrounding area are presented on Figure 2-5.

Beginning in 1963, a facility was established at T115N that recycled tin by dissolving the tin coating on waste metal in a solution containing caustic lye and separating the tin from solution via electrowinning. The tin reclamation facility was operated by several companies between 1963 and 1998:

- M & T Chemicals from 1963 to 1978;
- Metals Recycling, Inc. from 1978 to 1991;
- MRI; a division of Proler Corporation from 1991 to 1997; and,
- Schnitzer Steel Industries from 1997 to 1998.

Final tin reclamation operations at T115N ceased in 1998 following closure by Schnitzer Steel Industries. During operation, the detinning process occurred in the central portion of T115N in the Process Building (Figure 2-6), which was equipped with two 16-ton cranes, a plating room, a boiler room, and an area where the caustic lye and metal materials were mixed. Storage and processing tanks for acids and bases such as sulfuric acid and sodium hydroxide or spent solutions were located north of the Process Building within above ground storage tanks (ASTs) located within a secondary concrete containment area. The number of storage and processing ASTs appears to have varied through time between about 13 to 16 tanks that ranged in size from 180 to 15,000 gallons. Additionally, a 1,100-gallon underground storage tank (UST) was located west of the Process Building that was used for storing heating oil (Figure 2-2). Waste sludge generated by the operation (black mud) was captured in the three unlined, settling ponds constructed in the central and eastern portions of T115N. These ponds were estimated to be approximately six feet deep and included dikes to contain the waste sludge in each of the individual ponds. Spent plating solution and black mud filtrate as well as water captured within the secondary containment area for the storage tanks

were reported to have been disposed of in the sanitary sewer. Stormwater runoff from the paved areas was reportedly collected in a sump that also discharged to the sanitary sewer (AET 1991).

Since at least 1972, a filter press was installed, and the black mud captured by the settling ponds was dewatered to form a semi-dry cake that was stockpiled at the eastern end of T115N. From 1972 to 1988, the stockpiled black mud filter cake was sold to businesses including “Tex Tin” in Texas and unknown location(s) in England (AET 1991). By 1978, the settling ponds were no longer used and were backfilled. After 1991, stockpiles of the recovered black mud filter cake were transported from T115N to a landfill for disposal. In 1998 detinning operations ceased.

While the primary Processing Building remains at T115N, other structures supporting the industrial operations including the storage tanks, storage tank containment area and settling ponds are no longer present. T115N has remained relatively unchanged since 1978 when the ponds were backfilled, and grading and paving activities were performed. T115N is currently owned by the Port, who purchased the property encompassing T115N in 1969.

2.4. CURRENT AND FUTURE LAND USE

T115N is in an industrialized corridor that surrounds the LDW. T115N and adjacent properties are zoned Industrial General 1, Unlimited 85 (IG1, U85). The surrounding area is characterized by manufacturing, shipping terminals, warehouses, railways, water transportation and other industrial uses.

Currently, the Port leases the western portion of T115N to the Gene Summy Lumber Company for the distribution of untreated lumber while the eastern portion is currently vacant. Prior to May 2020, Unimacts Global, LLC, which received and distributed heavy equipment components operated in this portion of the Site. The driveway in the northern portion of T115N provides access to the Port's lease areas and serves as access for the containers and trucks leaving T115 (Figure 2-1).

Although the specific future uses of T115N will depend on the operations of the Port's lessees, the anticipated future use of T115N and surrounding area is for industrial purposes.

2.5. ENVIRONMENTAL SETTING

2.5.1. Climate

The Site is generally located in the Puget Sound lowlands. The climate of the Puget Sound lowlands is characterized as “Pacific marine.” The prevailing winds move moist air inland from the Pacific Ocean, moderating both winter and summer temperatures. According to the Western Regional Climate Center (WRCC), monthly average winter temperatures (December through February) range from 40 to 43 degrees Fahrenheit (°F; 4 to 6 degrees Celsius [°C]) and monthly average summer temperatures (June through August) range from 60 to 65°F (16 to 18°C). The average monthly precipitation ranges from 0.8 to 6.0 inches. Precipitation predominantly falls between November and January (wet season), while typically less than 1-inch of rainfall occurs between July and August (dry season). Annual precipitation averages up to 38 inches per year (WRCC 2019). Winds in the Duwamish Valley, in which the Site is located, are typically from the south and southwest in the late fall, winter, and spring and from the north in the summer and early fall (PSCAA 2019). Annual monthly average wind speeds for the region range from seven to nine miles per hour.

2.5.2. Surface Water Bodies

The Site is located at the downstream end of the 566-square mile Green/Duwamish River watershed identified as Water Resource Inventory Area (WRIA) 9. The Green/Duwamish River watershed includes portions of the Cities of Seattle, Tukwila, SeaTac, Renton, Kent, Federal Way, Auburn, Black Diamond, and Enumclaw plus forested areas in unincorporated south central King County (Figure 2-7).

The Green River, which is the main freshwater source to the LDW, originates in the Cascade Mountains near Stampede Pass and flows from the Howard Hanson Dam at RM 65 and the Tacoma Headworks Dam at RM 61. Major tributaries to the Green River include Sunday Creek, Smay Creek, and the North Fork upstream of the Howard Hanson Dam and Newaukum Creek, Soos Creek, and Mill Creek downstream of the Howard Hanson Dam. In addition, the Black River discharges fresh water to the Duwamish River in Tukwila, several miles upstream of the LDW. Surface water runoff within the LDW area also contributes to flow within the LDW from sources such as storm drains, tributary creeks, and combined sewer outfalls (CSOs). However, these sources are minimal in comparison to the overall total discharge of the LDW. The average downstream flow rate for the Duwamish River as measured at the United States Geological Survey (USGS) Tukwila gaging station (No. 12113390) was 1,576 cubic feet per second (cfs) from 2013 to 2019 and ranged from an average of 373 cfs during the month of August to 2,688 cfs during the month of February.

The surface elevation of water within the LDW varies by up to approximately 11.1 feet as a result of tidal fluctuations based on water level measurements from the Seattle tide station (Station ID 9447130) located approximately 1.6 miles downriver from T115N. Mean higher high water (MHHW) in proximity to the Site is observed at an elevation of 8.68 feet referenced to the North American Vertical Datum 1988 (NAVD88). Mean lower low water (MLLW) in proximity to the Site is observed at an elevation of -2.42 feet NAVD88.

2.5.3. Site Topography

Elevations across T115N are referenced to the NAVD88 and generally range from approximately +18 feet NAVD88 (approximately +20 feet MLLW) on the western and southern portions of T115N to approximately +16 feet NAVD88 (approximately +18 feet MLLW) on the northeastern portion of T115N (Figure 2-2). At the shoreline northeast of T115N, the ground surface slopes down a relatively steep embankment toward Glacier Bay. West of T115N, the western valley wall slopes up from West Marginal Way. Local topography for T115N and the surrounding area is shown on Figure 2-8.

2.5.4. LDW Bathymetry

Numerous bathymetric surveys have been conducted in the LDW, but the most comprehensive survey was conducted in 2003 as part of the LDW RI (Windward and DEA 2004). The objective of the 2003 high-resolution, multibeam, bathymetric survey was to produce a bank-to-bank (where possible) bathymetric dataset for the LDW study area. The survey was conducted from RM 0.0 (the southern end of Harbor Island) to the bridge at S 102nd Street (RM 4.8). Bathymetry of the LDW east of the Site is shown on Figure 2-8. Northeast of the Site, the bathymetry of Glacier Bay ranges from an elevation of approximately +15 feet NAVD 88 (approximately +17 feet MLLW) at the top of the bank to an approximate elevation of approximately -15 feet NAVD88 (approximately -12.5 MLLW). Further offshore, the navigation channel in the LDW is maintained to an elevation of approximately -35 feet NAVD88 (approximately -32 feet MLLW) by the United States Army Corps of Engineers (USACE).

2.5.5. Stormwater Management

2.5.5.1. NORTH TERMINAL 115

Precipitation currently falling on the paved portions of T115N flows to 13 on-site catch basins and then through stormwater conveyances to a 48-inch diameter drain line (48-inch drain line) that traverses the northern portion of T115N between West Marginal Way and the LDW and discharges to the LDW at the northeastern corner of T115 (Outfall 2127). The drain line that traverses the northern portion of T115N is a component of Seattle Public Utility's (SPUs) Southwest (SW) Kenny Street storm drain basin and King County's CSO system. Catch basins at T115N are located on either side of the asphalt driveway, north and east of the former Process Building and along the western portion of T115N. Storm drain lines on T115N leading to the SPU SW Kenny Street storm drain/King County CSO range from 6 to 15 inches in diameter and are composed of polyvinyl chloride (PVC) or concrete. Stormwater collected from an area on the southeast portion of T115N passes through an oil-water separator prior to being conveyed to the SPU SW Kenny Street storm drain/King County CSO. The results of a detailed stormwater system survey completed for T115N as part of the RI are further described in Section 3.5. The general layout of the T115N stormwater system and surrounding stormwater systems are shown on Figure 2-9. Details of the SPU SW Kenny Street storm drain basin and King County CSO are further described in Section 2.5.5.2. Stormwater inspection records for T115N completed in April 2018 and December 2019 are presented in Appendix A.

In accordance with the Federal Clean Water Act, the Port operates under a Phase I Municipal Stormwater Permit (Permit No. WAR044701). To comply with the requirements of the permit, the Port requires T115N tenants to complete and maintain Stormwater Pollution Prevention Plans (SWPPPs), maintain and cleanout catch basin solids, and implement measures to prevent and control the discharge of contaminated stormwater to surface water or groundwater within their operational areas. Under the Ports Municipal Stormwater Permit, the Port maintains the stormwater system infrastructure for T115N, including the removal of catch basin solids for permitted disposal on a periodic basis to minimize the transport of catch basin solids to the LDW. Additionally, the Port requires T115N tenants to complete and maintain SWPPPs and implement measures to prevent and control the discharge of contaminated stormwater to surface water or groundwater within their operational areas. Currently, the Port conducts biannual inspections (winter and summer) of the catch basins to observe the condition of the stormwater system and identify whether removal of the captured solids is required. Following the City of Seattle stormwater code, catch basin solids are removed when 60 percent of the catch basin storage capacity is reached or when the level of the captured catch basin solids is less than six inches from the invert to the discharge pipe. Catch basin solids removed from the stormwater system are transported from the Site for permitted disposal.

Prior to placement of fill material and development of the T115N property in the 1960s, stormwater likely ran off as surface flow to the LDW. Between the initial development of the property in the 1960s and installation of the stormwater system in 1972, stormwater in the central and northern portions of the property likely ran as surface flow toward the drainage swale on the northern portion of the property (Figure 2-6) before discharging to the LDW. In the eastern portion of the property, stormwater flow may have discharged directly to the LDW down the shoreline embankment.

2.5.5.2. SW KENNY STREET STORM DRAIN AND CSO

As stated in Section 2.5.5.1, the drain line that traverses the northern portion of T115N between West Marginal Way and the LDW and discharges at Outfall 2127 (Figure 2-9) is a component of the SPU SW Kenny Street storm drain basin and King County's CSO system (Ecology 2011). The SW Kenny Street storm drain basin covers 155 acres and spans east-to-west from West Marginal Way SW/Glacier Bay to South

Seattle Community College/16th Avenue SW (approximately 0.25 mile west of T115N) and north-to-south from the southern end of Kellogg Island (approximately to 0.5 mile north of T115N) to SW Holly Street (approximately to 0.25 mile south of T115N). The CSO basin covers approximately 110 acres and spans east-to-west from the LDW to properties west of West Marginal Way SW and north-to-south from the northern boundary of T115N to just south of SW Michigan Street (approximately to 0.5 mile south of T115N). The CSO has been under King County authority since 1962. Land uses within the drainage basins include multiple industrial, commercial, park, and residential properties.

As-built drawings for the portion of the SPU SW Kenny Street storm drain/King County CSO that traverses T115N (Appendix B) indicate that the line was installed in 1972 and is constructed of reinforced concrete pipe (RCP) that is 48 inches in diameter. The drawings identify that the 48-inch drain line was installed in a trench that was constructed across the northern portion of T115N.

A description of the construction of the 48-inch drain line is provided in Section 2.6.2 (Site Geology).

2.5.5.3. GLACIER NORTHWEST

Stormwater at the Glacier NW Site is currently collected in a series of catch basins and is transferred to an infiltration swale located near the north central portion of the property. Excess stormwater collected in the swale is pumped to holding tanks for storage then returned to the swale for infiltration unless the stormwater flow exceeds the storage and infiltration capacity. When the stormwater flow exceeds the storage and infiltration capacity, the stormwater is discharged through an outfall to Glacier Bay. Details of the stormwater system currently in operation at the Glacier NW Site are presented in the Glacier NW Site RI.

Historically, stormwater at the Glacier NW property ran into ditches and discharged on the shoreline of the LDW. As shown on Figure 2-6, stormwater from a southern portion of the Glacier NW property ran into the drainage swale located on the northern portion of T115N prior to installation of the 48-inch drain line in 1972 (As-built drawings presented in Appendix B). In 1975, Kaiser Cement & Gypsum Corporation (Kaiser) operating at the Glacier NW Site installed a stormwater system in the southern portion of the property (Figure 2-9). The stormwater system was composed of five catch basins connected to a 15-inch-diameter concrete pipe. The concrete stormwater pipe was connected to the 48-inch drain line located on T115N. The stormwater system was abandoned in place in 1991 and not used by Glacier NW but remained connected to the 48-inch drain line until 2014. In 2014, the 15-inch stormwater line was excavated and plugged at several locations including near the southern boundary of the Glacier NW property. The stormwater pipe was plugged with concrete and covered to the top of the pipe with control density fill to seal the pipe and eliminate the pipe from being a preferential pathway for groundwater transport from the Glacier NW Site (ERM 2015).

2.5.6. Industrial Wastewater Discharge

Industrial wastewater was not generated at the Site prior to 1963, after which tin reclamation operations began. Following establishment of the detinning facility, industrial wastewater including spent plating solution and black mud filtrate as well as water captured within the AST secondary containment area was collected and discharged to the City's sanitary sewer. There are no records indicating that industrial wastewater generated by the detinning operations was directly discharged to the drainage swale that existed prior to 1972 or the 48-inch drain line after the line was installed in 1972.

2.6. GEOLOGIC SETTING

2.6.1. Regional Geology

The landscape of the Duwamish Valley has been influenced by historical glacial and fluvial processes as well as extensive human modification through the channelization of the Duwamish River and extensive filling activities along the river's shoreline. The regional stratigraphy of the Duwamish Valley at approximately RM 3.0 near the Site is depicted in the cross-section on Figure 2-10. As shown in this cross-section and described below, the three principal geologic assemblages within the greater Duwamish Valley that establish the hydrogeologic system, from oldest to youngest, are:

- Blakely Formation (bedrock), which includes marine sandstone, some conglomerate, and minor amounts of siltstone (Tb Unit).
- Glacial and non-glacial sedimentary units make up the plateau to the west of the Duwamish Valley and are exposed in west valley wall (Q(C)f, Q(B)c, Q(B)f, Q(A)c, Qtb, Qva, Qvt and Qvr Units).
- Undifferentiated quaternary alluvial deposits that make up the principal aquifer and groundwater pathway for the Duwamish basin (Qyal and Qoal Units).

Subsurface geologic unit nomenclature referenced in this document and in Figure 2-10 are described in the following table in order of increasing age.

GEOLOGIC NOMENCLATURE	DEFINITION
Qyal	Younger alluvium.
Qoal	Older alluvium.
Qvr	Recessional outwash deposits.
Qvt	Lodgment till, deposited by the melt-out of debris at the base of the glacier; composed of heterogeneous, compact sediment (glacial deposit).
Qva	Coarser outwash, deposited by streams derived from the advancing ice sheet, initiated by the Vashon Advance Outwash (approximately 15,000 years ago); primary shallow aquifer in the upland areas throughout the region.
Qtb	Transitional beds, formed as the ice first advanced and laminated silt and clay were deposited; unit is a regionally significant aquitard, allowing very little movement of groundwater.
Q(A)c	Coarse-grained deposits, presumably immediately underlying Olympia-age (approximately 17,000 to 40,000 years ago) deposits (correlation is speculative).
Q(B)f	Fine-grained deposits, immediately underlying the Q(A)c unit; speculative correlation would imply an age of at least 100,000 years old.
Q(B)c	Coarse-grained deposits, immediately underlying unit Q(B)f.
Q(C)f	Older undifferentiated, unconsolidated fine-grained deposits.
Qob	Olympia beds.
Tb	The Blakely Formation, which includes marine sandstone, some conglomerate, and minor amounts of siltstone (bedrock).

During the early part of the Pleistocene Epoch approximately 2,580,000 to 11,700 years ago, advancing ice sheets of the Puget Lobe carved out a northsouth trending trough in Tertiary bedrock (Tb Unit) along the alignment of the modern Duwamish River Valley. Infilling of the bedrock trough occurred during subsequent interglacial and glacial periods. The bedrock trough lies beneath the modern valley at depths approximately 200 feet below ground surface (bgs) in the southern portion of the valley near RM 3.0 to approximately 1,600 feet bgs in the northern portion of the valley near RM 0.1. The bedrock is also exposed on the east valley wall.

Overlying the Tertiary bedrock on the west valley wall are layers of older alluvium and undifferentiated fine-grain deposits (Q(C)f, Q(B)c, Q(B)f and Q(A)c) dating to at least 100,000 years old. Between about 60,000 and 15,000 years ago, the Olympia beds (Qob) were deposited in the region and consist primarily of non-glacial fine-grained sediments and ash and lahar deposits associated with volcanic eruptions that are generally oxidized and occasionally well-cemented with iron oxides (Borden and Troost 2001 and Troost et al. 2005). Due to subsequent glaciation, these deposits are discontinuous in the Duwamish River Valley.

During the early Vashon glaciation, which occurred approximately 15,000 years ago, lakes formed in the area when advancing ice blocked northward surface water drainage to the Strait of Juan de Fuca. Silts and clays known regionally as the Vashon transitional beds (Qtb; known locally as Lawton Clay in Seattle) were deposited in the lakes. After this time, the advancing ice sheet deposited glacial outwash (Qva) and glacial till (Qvt) in the area. A period of erosion followed, scouring the outwash (Qva) and till (Qvt) down to the silt and clay transitional beds (Qtb) followed by the deposition of recessional outwash deposits (Qvr) consisting of stratified sand and gravel in broad anastomosing outwash channels that carried south-draining glacial meltwater away from ice margin during ice retreat.

As the ice began to retreat approximately 5,700 years ago, the waters of Puget Sound extended up the Duwamish Valley as far south as Auburn, about 19 miles upstream of the present mouth of the LDW near Elliott Bay. At about the same time, the Osceola Mudflow descended from Mount Rainier depositing a massive layer of sediment in the Duwamish Valley with deposits reaching as far as the present-day Auburn/Kent (Booth and Herman 1998).

Fluvial processes associated with the White, Green, Black and Duwamish Rivers have deposited alluvial fill (Qoal and Qyal) within the Duwamish Valley on the post-glacial surface. The alluvial fill consists of layers of clay, fine silt and sand interspersed with coarser sands and gravels. As the rivers historically meandered within the valley, the existing alluvial fill deposits were continually intermixed with additional deposits through erosion and re-deposition (Booth and Herman 1998).

In the late 1800s and early 1900s, the river valley was extensively modified by filling and dredging. During this time period, the Duwamish River was channelized, and the adjacent properties were filled creating the LDW and uplands that have been utilized for industrial purposes.

2.6.2. Site Geology

The property comprising T115N was originally part of the Duwamish River estuary system. In the late 1800s and early 1900s, dredging and filling of the meandering Duwamish River and tidelands were conducted to create the straightened channel that is now known as the LDW. Between the early 1900s and late 1970s, a series of filling events occurred at the Site and in surrounding area for the purposes of raising the ground surface elevation to create additional land for industrial use.

As shown in the circa 1922 historical aerial photograph on Figure 2-4, the western shoreline (historical shoreline) of the Duwamish River was historically located in the central portion of T115N. Based on the landscape shown in the 1922 photograph, it is likely that an initial fill event occurred on the western portion of property that would become T115N prior to 1922. As shown in the photograph, the elevation of the western portion of T115N was above the level of surface water in the adjacent river and the property appears to be vegetated. Also visible is a berm that extends along the historical shoreline north of the property that would become the Glacier NW Site and the land behind the berm north of T115N was inundated with water. By 1936, as shown in the 1936 photograph on Figure 2-5, the area north of T115N was filled with dredged material (ERM 2015). Following the placement of fill materials on the Glacier NW property and prior to the initial placement of fill on the T115N property, historical operations including mineralize-cell wood treatment, charcoal and whetlerite manufacturing, and chemical manufacturing by Reichhold Chemicals Inc. (further discussed in Section 3.2.1) were being performed on the Glacier NW property.

In the early 1960s, fill material was placed on the existing upland surface on the western portion of T115N and east of the historical shoreline to extend the upland area eastward into the LDW, and by 1965, filling activities had essentially created the area comprising the current T115N, which was subsequently used for tin reclamation operations (SoundEarth 2011). T115N and the tin reclamation facility in 1967 is shown on Figures 2-5 and 2-6. Additional filling east and south of T115N was performed between the late 1960s and early 1970s to create land that is now T115. In 1972, the 48-inch drain line (described in Section 2.5.5.2) was installed between West Marginal Way and the LDW within a trench that was excavated along the northern portion of T115N. As-built drawings for the storm drain line (Appendix B) indicate that the trench measured approximately 20 feet wide at the top, 6 feet wide at the bottom, and approximately 17 feet deep. The trench was excavated in fill materials that were previously placed at the property. The bottom of the excavation was completed to an elevation ranging between an approximate elevation of 4.5 and 6 feet (NAVD88) within T115N, which is estimated to be the approximate elevation of the historical native ground surface based on borings completed as part the Site RI. Seattle class B fill (medium to coarse sand) was reportedly placed immediately around the new drain line. The remainder of the trench above the pipe backfill is noted as “fill” on as-built drawings of unknown composition or source.

The final placement of fill at T115N occurred in 1978 to infill the settling ponds, which were no longer in use at the Site. Based on a review of available tax and title documents, Port records and other investigation reports for T115N and the surrounding properties, the sources of fill material used at T115N to initially raise the ground surface and to later create additional upland area by extending the shoreline to the east and to fill the settling ponds were not identified.

2.7. HYDROGEOLOGIC SETTING

2.7.1. Regional Hydrogeology

Regional geology and stratigraphy provide the framework for the aquifer systems and influence the flow and transport of groundwater within the Duwamish Valley. In general, groundwater within the Duwamish Valley is unconfined at depths up to 10 feet bgs (Booth and Herman 1998). Regionally, the valley alluvium is a single, large aquifer system, which locally extends to up approximately 200 feet deep in the central portion of the valley and decreases in thickness toward the eastern and western margins of the valley (Figure 2-10).

Previous studies of the Duwamish Valley have divided the aquifer into shallow and deep groundwater zones (Windward 2010). The shallow zone is generally located within the fill and/or younger alluvium (Qyal), and the deep zone is generally located within the older alluvium (Qoal). In the shallow zone, groundwater is perched on top of silty (low permeable) layers that are predominantly associated with native river delta and floodplain deposits containing large amounts of organic material. Shallow groundwater may also be perched on silt and/or clay fill layers overlying more permeable sandy deposits. The separation of shallow and deep groundwater zones is based on the presence of low permeable layers (which locally act as an aquitard), the presence of localized upward groundwater gradients, and the occurrence of pockets of saline/brackish groundwater (Windward 2010). The silt layers are rarely continuous throughout the valley and often constrain local groundwater flow. The discontinuous nature of these silt layers allows for areas of hydraulic connection between the shallow and deeper groundwater zones.

The movement of groundwater in the valley is controlled regionally by the topography of the valley, with groundwater flowing from the uplands toward the LDW and down-valley toward Elliott Bay. Upland groundwater elevations are typically around 100 feet in elevation and valley groundwater elevations average around 10 feet in elevation, creating a significant hydraulic gradient from the uplands toward the LDW (Booth and Herman 1998).

Upland geologic units exposed along the walls of the Duwamish Valley likely contribute significant recharge to the valley aquifer in areas where more transmissive units are exposed. Outwash from advance, transitional and recessional deposits (Qva, Qvt and Qvr) exposed higher on the west valley wall (Figure 2-10) comprise a widely-utilized aquifer in the Puget Sound area. Where exposed, this unit likely contributes to groundwater recharge of the Duwamish Valley aquifer.

Groundwater gradients in the valley range between 0.002 feet per foot in the southern portion of the Duwamish Valley to 0.0008 feet per foot in northern portion of the Duwamish Valley (Windward 2010). Some portions of the aquifer are tidally influenced, causing groundwater levels to rise and fall in response to changing tides in the LDW. The tidal effect is generally more pronounced in the deep groundwater zone where the presence of silty layers creates semi-confined groundwater conditions. Tidally induced groundwater gradient reversals have been observed in the valley up to 400 feet from the LDW shoreline (Windward 2010).

2.7.2. Site Hydrogeology

T115N is located at the base of western Duwamish Valley wall, approximately 60 feet southwest of Glacier Bay and approximately 530 feet west of the present day LDW (Figure 2-1). Based on the results of the RI and previous environmental investigations (further discussed in Section 5.0), three hydrogeologic units are present that include the following:

- **Shallow Groundwater** – Unconfined shallow groundwater is locally perched on top of low permeable native organic silt and silt/clay rich fill layers west of the historical shoreline and is contained within fill soil encountered at depths ranging between 4 and 13 feet bgs. This shallow groundwater zone is also identified to be present on the Glacier NW Site to the north of T115N (ERM 2015).
- **Aquitard** – A low permeable unit (aquitard) consisting of native organic silt and clay, and clay fill separate shallow and deep groundwater west of the historical shoreline. The native organic silt layer extends north of T115N onto the Glacier NW Site (ERM 2015).

- **Deep Groundwater** – Deep groundwater is present within native LDW alluvial sand deposits measuring greater than 30 feet thick beneath the Site and is semi-confined west of the historical shoreline by the aquitard. This semi-confined deep groundwater zone is also present to the north of T115N on the Glacier NW Site (ERM 2015).

West of the historical shoreline, the shallow and deep groundwater zones are not hydraulically connected due to the presence of the aquitard. East of the historical shoreline where the aquitard is absent, shallow groundwater mixes with deep groundwater and forms a single groundwater unit.

Infiltration to the shallow aquifer occurs from precipitation falling onto the unpaved ground surfaces in the western portion of the Site and varies seasonally west of the historical shoreline, with observed spring (April 2014) elevations being higher than summer (September 2014) elevations by up to approximately 2.5 feet. Recharge to deep groundwater likely occurs in part from precipitation that falls onto advanced outwash deposits (Qva and Qvr) exposed higher up on the valley wall west of the Site and in part from groundwater moving down-valley. Based on the results of the RI, deep groundwater (semi-confined west of the historical shoreline and unconfined east of the historical shoreline) was observed to vary as a function of the change in tidal elevation in the LDW.

2.8. NATURAL RESOURCES

2.8.1. Terrestrial Habitat

In accordance with WAC 173-340-7491(1), the Site does not meet the criteria for a Terrestrial Ecological Evaluation (TEE) exclusion. For sites that do not qualify for a TEE exclusion, either a simplified TEE or a site-specific TEE must be conducted to determine if a threat to terrestrial ecological receptors exists or if the site can be removed from further ecological consideration during the RI and cleanup process.

WAC 173-340-7491 presents criteria for determining if a site-specific TEE or simplified TEE is required to evaluate the terrestrial habitat at the Site and surrounding areas, document the presence or absence of receptors or receptor habitats, rate the quality of habitat, and evaluate potential threats to terrestrial ecological receptors from exposure to contaminated soil having a potential to cause significant adverse effects. The following table presents the criteria for requiring a site-specific TEE and a description of conditions at the Site in response to the criteria.

SITE-SPECIFIC TERRESTRIAL ECOLOGICAL EVALUATION

SITE-SPECIFIC TEE CRITERIA	SITE CONDITION	CONCLUSION
WAC 173-340-7491(2)(a)(i) - The site is located on, or directly adjacent to, an area where management or land use plans will maintain or restore native or semi-native vegetation (e.g., green-belts, protected wetlands, forestlands, locally designated environmentally sensitive areas, open space areas managed for wildlife, and some parks or outdoor recreation areas).	The West Duwamish Greenbelt located west of the Site (Figure 2-11), is separated from T115N by West Marginal Way (classified as a principal arterial by WSDOT), active railroad tracks and fencing.	Because West Marginal Way, the railroad tracks and fencing provide a significant barrier between the Site and the West Duwamish Greenbelt, this condition is not met.

SITE-SPECIFIC TEE CRITERIA	SITE CONDITION	CONCLUSION
WAC 173-340-7491(2)(a)(ii) - The site is used by a threatened or endangered species; a wildlife species classified by the Washington State Department of Fish and Wildlife (WSDFW) as a "priority species" or "species of concern" under Title 77 of the Revised Code of Washington (RCW); or a plant species classified by the Washington State Department of Natural Resources (DNR) natural heritage program as "endangered," "threatened," or "sensitive" under Title 79 RCW. For plants, "used" means that a plant species grows at the site or has been found growing at the site. For animals, "used" means that individuals of a species have been observed to live, feed or breed at the site.	A review of WSDFW and DNR program websites indicated that the Site does not contain any priority species or species of concern; or plant species listed as endangered, threatened or sensitive in the vicinity of the Site.	Because the Site does not contain any priority species or species of concern; or plant species listed as endangered, threatened or sensitive in the vicinity of the Site, this criterion is not met.
WAC 173-340-7491(2)(a)(iii) - The site is located on a property that contains at least ten acres of native vegetation within 500 feet of the site, not including vegetation beyond the property boundaries.	The site contains less than 0.5 acres of vegetated land (Figure 2-11).	Because the Site contains less than 0.5 acres of vegetated land AND West Marginal Way, the railroad tracks and fencing provide a significant barrier between the Site and the West Duwamish Greenbelt, this criterion is not met.
WAC 173-340-7491(2)(a)(iv) - The department determines that the site may present a risk to significant wildlife populations.	The Site is surrounded by industrial properties and is separated from the nearest greenbelt by West Marginal Way (classified as a Principal Arterial), railroad tracks, adjacent industrial parcels, and fencing.	Because the Site and surrounding properties are zoned industrial and the future land use of the Site and surrounding area is not anticipated to change, this criterion is not met.

From the evaluation above, none of the site-specific criteria defined in WAC 173-340-7941 were met and as a result, a simplified TEE was completed in accordance with WAC 173-340-7490. The process for conducting a simplified TEE includes an evaluation of the extent of exposure, exposure pathways, and type of contaminants present in site media. To complete the simplified TEE, the Exposure Analysis Procedure (Exposure Scenario 2) was used because the total area of soil contamination at the Site exceeded 350 square feet. The results of the simplified TEE using Exposure Scenario 2 (outlined in Table 749-1, Appendix C) are summarized in the following table.

SIMPLIFIED TERRESTRIAL ECOLOGICAL EVALUATION – EXPOSURE SCENARIO 2 EVALUATION STEP	SITE ANALYSIS	SCORE
Line 1 - Estimate the area of contiguous (connected) undeveloped land on the site or within 500 feet of any area of the site to the nearest 1/2 acre (1/4 acre if the area is less than 0.5 acre).	Vegetated areas of the Site and adjacent to the Site comprise less than 1 acre (Figure 2-11). As previously noted, West Marginal Way, active railroad tracks and fencing provide a significant barrier between the Site and the greenbelt located west of the Site.	6
Line 2 - Is this an industrial or commercial property? If yes, enter a score of 3. If no, enter a score of 1.	The Site is zoned industrial.	3
Line 3 - Enter a score in the box to the right for the habitat quality of the site, using the following rating system. High=1, Intermediate=2, Low=3.	The habitat quality at the Site is low. A majority of the Site is covered with pavement, structures or working surfaces that do not provide suitable habitat.	3
Line 4 - Is the undeveloped land likely to attract wildlife? If yes, enter a score of 1 in the box to the right. If no, enter a score of 2.	Because of the current industrial land use and limited areas of vegetation, the Site is not likely to attract wildlife.	2
Line 5 - Are there any of the following soil contaminants present: Chlorinated dioxins/furans, PCB mixtures, DDT, DDE, DDD, aldrin, chlordane, dieldrin, endosulfan, endrin, heptachlor, benzene hexachloride, toxaphene, hexachlorobenzene, pentachlorophenol, pentachlorobenzene? If yes, enter a score of 1 in the box to the right. If no, enter a score of 4.	The Site contains one or more of the listed contaminants.	1
Line 6 - Add the numbers in the boxes on lines 2-5 and enter this number in the box to the right. If this number is larger than the number in the box on line 1, the simplified evaluation may be ended.	The score is larger than the score for Item 1. The results of the simplified TEE indicate that there is not a substantial threat of significant adverse effects to terrestrial ecological receptors from the Site.	9

From the simplified TEE completed in accordance with WAC 173-340-7490, the Site is unlikely to pose risks to terrestrial ecological receptors. A copy of the simplified TEE is presented in Appendix C.

2.8.2. Groundwater Potability

The following table summarizes Site conditions relative to the MTCA criteria specified in WAC 173-340-720(2) for non-potable water:

GROUNDWATER POTABILITY EVALUATION

GROUNDWATER POTABILITY CRITERIA	SITE CONDITION	CONCLUSION
WAC 173-340-720 (2)(a) - The ground water does not serve as a current source of drinking water.	No drinking water supply wells are present in the area of T115N based on review of Ecology's water well database (Ecology 2015). Drinking water is currently supplied by the City of Seattle. The sources of the City of Seattle's drinking water are the Cedar and Tolt River watersheds located east of Seattle (City of Seattle 2015).	Because drinking water wells are not present and drinking water is supplied to the Site and surrounding area by the City of Seattle, this condition is met.
WAC 173-340-720 (2)(c) - The department determines it is unlikely that hazardous substances will be transported from the contaminated ground water to ground water that is a current or potential future source of drinking water, as defined in (a) and (b) of this subsection [i.e., -720(2)], at concentrations which exceed ground water quality criteria published in Chapter 173-200 WAC.	Contaminated groundwater at T115N occurs in shallow groundwater. Shallow groundwater flows north/northeast toward the LDW and does not flow toward aquifers that may be a current or potential future source of drinking water.	Because groundwater flows north/northeast toward the LDW and does not flow toward aquifers that may be a current or potential future source of drinking water, this criterion is met.
WAC 173-340-720 (2)(d) - Even if ground water is classified as a potential future source of drinking water..., the department recognizes that there may be sites where there is an extremely low probability that the ground water will be used for that purpose because of the site's proximity to surface water that is not suitable as a domestic water supply. An example of this situation would be shallow ground waters in close proximity to marine waters such as on Harbor Island in Seattle. At such sites, the department may allow ground water to be classified as non-potable if each of the following conditions can be demonstrated. These determinations must be for reasons other than that the ground water or surface water has been contaminated by a release of a hazardous substance at the site		
WAC 173-340-720 (2)(d)(i) - There are known or projected points of entry of the ground water into the surface water.	Shallow and deep groundwater at T115N discharge into the LDW.	Because groundwater at T115N discharge into the LDW and the LDW is brackish at RM 1.4, this criterion is met.

GROUNDWATER POTABILITY CRITERIA	SITE CONDITION	CONCLUSION
WAC 173-340-720 (2)(d)(ii) - The surface water is not classified as a suitable domestic water supply source under Chapter 173-201A WAC.	The results of the hydrogeologic investigation showed that tidal fluctuations in the LDW affect groundwater elevations at the Site and that groundwater at the Site is connected to brackish water in the LDW. In addition, results of the hydrogeologic investigation showed that it is not practicable to utilize groundwater from T115N for domestic water supply due to the potential for drawing brackish water into the aquifer (i.e., saltwater intrusion).	Because the shallow and deep groundwater at the Site is affected by LDW tidal fluctuations and water in the LDW is brackish, and there is a potential to draw in brackish water from the LDW if groundwater from T115N was used for domestic water supply, this criterion is met.

From the evaluation above, conditions at the Site meet the MTCA criteria under 173-340-720 for non-potable water.

2.9. REGULATORY FRAMEWORK

In 2001, EPA designated the LDW a Superfund site under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) regulations. This 5-mile reach of the Duwamish River is flanked by industrial corridors that encompass T115N as well as many other industrial properties. The LDW was designated a Superfund Site based on the presence of contaminants in sediment at concentrations greater than risk-based screening levels.

In April 2002, EPA and Ecology signed an interagency Memorandum of Understanding (MOU), dividing federal and state work responsibilities for the cleanup actions being performed for the LDW Superfund Site (EPA and Ecology 2002). The MOU was revised in 2004 (EPA and Ecology 2004) to reflect ongoing work in the LDW. Under the agreement, EPA is the lead agency for the sediment investigation and remedial actions while Ecology is the lead agency for source control investigations and upland cleanup activities for the LDW Superfund Site.

An RI was completed for the LDW in 2010 (Windward 2010) and identified dioxins/furans, PCBs, PAHs and arsenic as the primary chemicals of concern for sediment in the LDW. The RI was based on data from multiple investigations, including a National Oceanic and Atmospheric Administration (NOAA) sediment characterization of the Duwamish River (NOAA 1998), an EPA Site Inspection (Weston 1999), the LDW Phase 2 RI (Windward 2005a, 2005b, 2007). Sample locations included in and around Glacier Bay and in the vicinity of T115.

An FS was completed for the LDW in 2012 (AECOM 2012) that evaluated multiple alternatives for cleanup of the LDW Site. A Record of Decision (ROD) selecting the cleanup actions for the LDW was based on the historic sampling and was published in 2014 (EPA 2014). The ROD identifies that dredging of contaminated sediment is the selected remedy for Glacier Bay and the portion of the LDW adjacent to Glacier Bay in response to the presence of dioxins/furans, PCBs, PAHs and arsenic at concentrations greater than the Remediation Action Levels (RALs) specified in the ROD. This may change based on design sampling activities.

As part of Ecology's initial source control efforts, 24 upland source control areas were identified for the LDW. The Glacier Bay Source Control Area was identified between RM 1.2 and 1.6 on the west side of the LDW. The primary properties of interest in the Glacier Bay Source Control Area identified by Ecology include, Alaska Marine Lines, Duwamish Shipyard, Inc. (Duwamish Shipyard), Glacier Northwest, Inc. , and the former MRI Corporation (i.e., T115N). Ecology developed the Lower Duwamish Waterway Source Control Action Plan for the Glacier Bay Source Control Area that identified potential contaminant sources and transport pathways and further investigations of the potential sources needed (Ecology 2007).

Contaminant sources and transport pathways associated with the Glacier Bay Source Control Area included direct discharges, stormwater runoff, groundwater discharges, bank erosion and spills from adjacent properties as well as atmospheric deposition. Actions identified in the plan for T115N included evaluation of groundwater transport of contaminants to Glacier Bay and consideration of whether remedial action was necessary to address potential groundwater contamination. Similar source control actions were identified for the Duwamish Shipyard and Glacier NW Sites (Ecology 2007). Ecology has entered into Agreed Orders for completion of RI and FSs for the Duwamish Shipyard, Glacier NW and T115N Sites.

3.0 Site Characterization

3.1. PREVIOUS ENVIRONMENTAL STUDIES AT T115N

Evaluation of the environmental conditions at the Site first began in 1987. Prior to the current RI investigations, four environmental evaluations were performed and included the following:

- 1987 Toxic Substances Control Act (TSCA) Site Inspection (Ecology 1987);
- 1991 Black Mud Waste Characterization (ENSR 1991);
- 1998 Site Hazard Assessment (Seattle-King County Department of Public Health [SKCDPH] 1998); and,
- 2009 Soil, Groundwater and Storm Drain Solids Investigation (Landau 2009).

Sampling locations from the previous evaluations of soil, groundwater and catch basin solids are shown on Figures 3-1 and 3-2. The previous investigation activities and their results are summarized in the following sections (Sections 3.1.1 through 3.1.4).

3.1.1. TSCA Inspection of Facility at T115N (1987)

In 1987, a TSCA inspection was conducted by Ecology to evaluate the potential use of PCB-containing equipment at T115N (Ecology 1987). As part of this inspection, available records, including annual reports, inventories and quarterly inspection records were reviewed by Ecology to evaluate the potential use of PCBs and PCB-containing equipment. In addition to the records review, above ground storage tanks used for the detinning operations as well as the secondary containment for the tanks were inspected. The inspection identified 13 bulk storage tanks that were behind a spill containment curb north of the Process Building (Figure 3-1). Eleven of the tanks were used to store caustic solutions, one tank was used to store sulfuric acid and one tank was used to neutralize the spent electrowinning solution. The largest of the tanks was observed to have a capacity of 1,300 cubic feet (9,724 gallons). Spent waste solution generated during facility operations and stormwater collected within the secondary containment curb for the storage tanks were noted to have been discharged to the King County Metro sewer under a permit at a rate not to exceed 4,300 gallons per day.

Ecology concluded from the Site inspection that because the facility did not handle PCBs, transformers or other PCB-containing equipment, that the Site was not subject to TSCA requirements. Ecology did express concern that the secondary containment curb may not have been adequate in the event of a release. As a result of the inspection, the secondary containment curb was raised to increase the spill containment capacity to 1,430 cubic feet. In addition, the driveway used to access the facility was re-graded to slope the surface to the west and paved to prevent potential spilled material from entering the LDW. A curb was also installed to the east of the driveway as a secondary measure to prevent potential spilled material from entering the LDW. Construction activities were completed during the summer of 1987. No identified spills or releases of stored solutions were noted by Ecology as part of their 1987 site inspection.

3.1.2. Black Mud Waste Disposal Characterization at T115N (1991)

A waste characterization study was conducted in 1991 by ENSR Consulting and Engineering (ENSR) for the MRI Corporation (ENSR 1991). The waste characterization study consisted of collecting representative samples of stockpiled black mud stored at T115N for waste disposal profiling. A total of six composite samples were submitted for chemical analysis of Resource Conservation and Recovery Act (RCRA) metals, tin and zinc using the toxicity characteristic leaching procedure (TCLP). In addition, the samples were also analyzed for corrosivity, reactivity, ignitability and pH.

Based on the sample results, low level concentrations of arsenic, barium, cadmium, chromium, lead, and zinc were detected in the stockpile samples. However, the detected concentrations were less than the maximum leaching concentrations based on 40 Code of Federal Regulations (CFR) Chapter 1, Part 261.24. As a result, ENSR concluded that the stockpiled black mud was not a designated dangerous waste and was acceptable for Subtitle D landfill disposal.

3.1.3. T115N Site Hazard Assessments (1998)

A Site Hazard Assessment (SHA) was performed in 1998 by the SKCDPH. The SHA consisted of collecting three shallow (up to 0.5 ft bgs) soil samples from the unpaved railroad spur area located on the western portion of the Site (MST-1 through MST-3, Figure 3-1) and submitting the samples for chemical analysis of RCRA metals, tin and zinc (SKCDPH 1998). The results of the investigation identified detected concentrations of barium, cadmium, chromium, lead, tin and zinc in two of the three soil samples submitted for chemical analysis.

As a result of the SKCDPH SHA, T115N was given a hazard rank of 5, where 1 represents the highest relative risk and 5 is representative of the lowest level of relative risk. The SHA was based on the groundwater exposure pathway and evaluation of tin and zinc. For the specific purposes of the SHA, groundwater in the area was not considered usable for drinking or irrigation purposes and the contaminants identified were not identified as a significant threat to public health.

Chemical analytical results from the 1998 SKCDPH SHA are presented in Table D-1 (Appendix D).

3.1.4. T115N Environmental Investigation Study (2009)

On behalf of the Port, Landau Associates (Landau) performed an investigation at T115N in 2009 (Landau 2009). Investigation activities included the completion of 11 direct-push (DP) explorations (DP-1 and MW-1 through MW-10, Figure 3-1) and installation of 10 monitoring wells (MW-1 through MW-10, Figure 3-2) to evaluate soil and groundwater conditions associated with historical uses at T115N and the

adjacent Glacier NW Site. Selected soil samples were analyzed for metals (priority pollutant metals and tin); SVOCs; PCBs; and gasoline-, diesel-, and/or oil-range petroleum hydrocarbons depending on field evidence of contamination (i.e., visual observations, monitoring of organic vapors and odor). Groundwater samples obtained from monitoring wells MW-1 through MW-10, DP boring DP-1 and monitoring wells GMW-25 through GMW-27 (installed by Glacier NW at the boundary between the Glacier NW and T115N) were analyzed for a combination of metals (total and dissolved priority pollutant metals, hexavalent chromium [chromium VI] and tin); SVOCs; VOCs; and gasoline-, diesel- and oil-range petroleum hydrocarbons.

The results of the soil investigation identified detectable concentrations of metals including arsenic, cadmium, chromium, copper, lead, mercury, nickel, tin and zinc; SVOCs including PAHs; and oil-range petroleum hydrocarbons in one or more soil samples collected from sample locations DP-1, MW-1, MW-3 and MW-5. PCBs were not detected in the soil samples submitted for chemical analysis.

The results of the groundwater investigation identified detectable concentrations of metals including antimony, arsenic, cadmium, chromium III/total, copper, lead, mercury, nickel, tin and zinc; VOCs (primarily acetone); SVOCs including PAHs; and oil-range petroleum hydrocarbons in one or more water samples. Because the groundwater results indicated that chromium VI is not present in groundwater and because of the high solubility of chromium VI, it was determined that the species of chromium at the Site is chromium III and therefore, soil samples were not analyzed for chromium VI.

In addition, stormwater solids were collected at one catch basin location (identified as CB-1, Figure 3-1) using Teflon containers placed just below the stormwater grate to capture stormwater and associated solids entering through the grate. The stormwater solids sample was analyzed for a combination of metals (antimony, arsenic, chromium, copper, lead, mercury, tin and zinc), SVOCs and PCBs. The results of the stormwater solids analysis identified detectable concentrations of metals including chromium, copper, lead, tin and zinc as well as PAHs. PCBs were not detected in the stormwater solids sample.

Chemical analytical results from the 2009 soil and groundwater investigation are presented in Tables D-1 and D-2 (Appendix D). The exploration logs for DP-1 and MW-1 through MW-10 completed as part of the investigation are presented in Appendix E.

3.2. GLACIER NW REMEDIAL INVESTIGATION

Previous investigation activities for the adjacent Glacier NW Site have been conducted since 1985 and include an RI of the property conducted between 2011 and 2012 under an Agreed Order with Ecology. The results of the investigations at Glacier NW Site are presented in the Draft Glacier NW RI Report (ERM 2015) and are summarized in the following sections (Sections 3.2.1 through 3.2.3).

3.2.1. Glacier NW Site Operations and Historical Land Use

The 18-acre Glacier NW property is located north and adjacent to T115N (Figure 2-1) at 5900 West Marginal Way SW, Seattle, Washington. The Glacier NW property is bordered on the west by the West Marginal Way SW roadway. The eastern portion of the property extends to the main channel of the LDW and includes Glacier Bay. The aquatic portion of the property in Glacier Bay is approximately 4.2 acres in size. The Glacier NW property has historically been used for a variety of industrial operations. The industrial operations and potential chemical releases that have occurred at the property have included the following:

- **Wood Preserving Operations:** Mineralized-Cell Wood Preserving Company used a solution containing arsenic, copper sulfate, zinc sulfate and other chemicals to treat logs between 1936 and 1939. Log treatment occurred on the southern portion of the property approximately 120 feet north of the T115N Site. The log treatment area is visible on the circa 1936 and circa 1940 aerial photographs presented on Figure 2-5. Transport of logs was via trucks and log rafts on the northern and eastern portions of the property. Treatment chemicals were reported to have leaked and drained onto the ground at the property as well as leached from treated logs into the LDW when logs were shipped via log rafts.
- **Charcoal and Whetlerite Manufacturing and Testing:** Carlisle Lumber Company, Crown Zellerbach Corporation and the Chemical Warfare Service, a division of the United States Department of the Army, manufactured and tested charcoal and activated carbon impregnated with copper, silver or chromium (i.e., whetlerite) at the property between 1940 and 1944. The manufacturing and testing processes were likely to have generated arsenic and dioxins/furans. Manufacturing and testing facilities were situated on the northern portion of the property, but disposal of wastes occurred at multiple locations across the property and in the LDW. According to the Glacier NW RI, disposal areas for charcoal, sawdust and/or briquettes were on the southern portion of the Glacier NW Site and a 100- cubic-foot tank (approximately 750 gallon) containing copper ammoniate was washed out once per month and the contents drained into the LDW (ERM 2015).
- **Chemical Manufacturing:** Reichhold Chemicals, Inc. produced resin glues, pentachlorophenol and sodium pentachlorophenate at the property between 1946 and 1961. Production of these products produced dioxins/furans. Manufacturing, testing and shipping activities occurred on the northern portion of the property. Waste was reportedly discharged to an unlined washwater impoundment, septic tank and the LDW. Ditches conveyed process water to the impoundment and stormwater to the LDW.
- **Facility Demolition and Redevelopment:** Kaiser used the property to build and operate a cement terminal between 1965 and 1968. The cement terminal operations area is visible on the circa 1967 aerial photograph presented on Figure 2-5. Kaiser reportedly demolished the existing buildings and conducted substantial earthwork in constructing the cement terminal including excavating and redistributing contaminated soil across the property. Kaiser reportedly enlarged the upland portion of the property by filling LDW, extending the southeast portion of the property. The source of the material used to fill along the shoreline is unknown but likely included some material from areas of the property where excavation and grading activities generated excess soil.
- **Cement Terminal:** The property has been operated as a cement terminal by Kaiser, Ash Grove Cement and Lone Star, which changed its name to Glacier Northwest sometime after 1991. Development of the property north of T115N is visible on circa 1980, 1998 and 2019 aerial photographs presented on Figure 2-5.

Glacier NW currently operates a bulk cement storage and distribution terminal at the property. The northern portion of the property is used to receive, store and distribute dry cement. Bulk cement is delivered to the property in ships. The cement is pneumatically conveyed from the ships to one of 19 storage silos. Fly ash is delivered by railcar and pneumatically conveyed from the rail cars into the storage silos. Cement is stored until it is loaded into trucks and rail cars for offsite delivery. A warehouse, fabrication shop, office, truck scale and a system designed to rinse cement off of the transport trucks are also present on the northern portion of the Glacier NW property. The southern portion of the property is currently used for vehicle, equipment material storage and maintenance (ERM 2015).

As a result of historical operations and the release of contaminants, the Glacier NW property is identified as a Cleanup Site by Ecology with the Cleanup Site ID 599. The Glacier NW Site is being investigated under an Agreed Order between Glacier NW, Reichhold Chemical and Ecology (Agreed Order No. DE 6000).

3.2.2. Glacier NW Upland Area Investigation

Multiple investigations have been performed in the Glacier NW upland area. In the vicinity of the T115N property boundary, up to 20 subsurface explorations (Figure 3-1) have been completed and nine monitoring wells have been installed (Figure 3-2) to evaluate soil and groundwater conditions relative to historical site operations and land use. Selected soil and groundwater samples were submitted for a combination of the following analyses:

- Metals (arsenic, cadmium, chromium III/total, chromium VI, copper, lead, mercury and zinc) by EPA Method 6000/7000 series.
- SVOCs by EPA Method 8270D/SIM.
- VOCs by EPA Method 8260.
- PCBs by EPA Method 8082.
- Diesel- and oil-range petroleum hydrocarbons by Method NWTPH-Dx.
- Dioxins and furans by EPA Method 8290.

The results of the upland investigation completed at Glacier NW have identified metals (arsenic, chromium [III/total], copper, nickel, and zinc), SVOCs (pentachlorophenol, 2,4,6-trichlorophenol, and hexachlorobenzene), PCBs, dioxins and furans, PAHs, VOCs (ethylbenzene and methylene chloride) and petroleum hydrocarbons (diesel and motor oil) as site-related COPCs for the Glacier NW Site (ERM 2015).

Soil and groundwater sample locations completed to investigate the Glacier NW Site in the vicinity of T115N property boundary are shown on Figures 3-1 and 3-2. Chemical analytical results for soil and groundwater samples collected from the Glacier NW Site in the vicinity of T115N property boundary are presented in Tables D-1 and D-2 (Appendix D). Exploration logs for soil and groundwater sample locations shown on Figures 3-1 and 3-2 are presented in Appendix E.

3.2.3. Glacier NW Marine Area Investigation

Surface and subsurface sediment samples were collected from within Glacier Bay and the LDW adjacent to the Glacier NW pier to characterize the nature and extent of sediment contamination as part of the Glacier NW RI. Surface sediment samples were collected from the top 10 centimeters (cm) and subsurface sediment samples were collected from the surface to 8 feet (244 cm) below the mudline using a core sampler.

Selected sediment samples were submitted for a combination of the following analyses:

- Metals (arsenic, cadmium, chromium III/total, copper, lead, mercury, silver and zinc), barium and tin by EPA Method 6010B/6020 and 7471A.
- SVOCs by EPA Method 8270D/SIM.
- PCBs by EPA Method 8082A.

- Dioxins and furans by EPA Method 1613B.
- Total organic carbon (TOC) by EPA Method 9060.
- Grain size analysis by Puget Sound Estuary Protocols (PSEP) or equivalent.

Sediment samples collected during the Glacier NW investigation were submitted to Analytical Resources Inc. (ARI) of Seattle, Washington, and AXYS Analytical Services, Ltd. (AXYS) of Sidney, BC, Canada for analysis (ERM 2015). Site-related COPCs identified in sediment within Glacier Bay include metals (arsenic, copper, and zinc), SVOCs (pentachlorophenol, hexachlorobenzene, benzyl alcohol, and benzyl butyl phthalate), PCBs, dioxins and furans and PAHs.

Sediment sample locations, the analysis performed at each sample location and a summary of sample results are presented in Appendix F.

3.3. LOWER DUWAMISH WATERWAY REMEDIAL INVESTIGATION

Surface and subsurface sediment samples were collected from within Glacier Bay and the LDW adjacent to the Glacier NW pier and were used to characterize the nature and extent of sediment contamination as part of the LDW RI. The sediment samples used as part of the LDW RI were from the following investigations:

- Site Inspection Report – Lower Duwamish River (Weston 1999).
- LDW Round 1 Remedial Investigation (Windward 2005a).
- LDW Round 2 Remedial Investigation (Windward 2005b).
- LDW Benthic Investigation (Windward 2009).
- LDW Subsurface Remedial Investigation (Windward 2007).
- LDW Dioxin/Furan Remedial Investigation (Windward 2010a).

As part of these studies, surface sediment samples were collected from the top 10 cm (i.e., 0 to 10 cm below the sediment surface) and subsurface sediment samples were collected from the surface to a depth up to 121 cm (4 feet) below the mudline (bml). Selected sediment samples were submitted for a combination of the following analyses:

- TOC by EPA Method 9060.
- Metals (aluminum, antimony, arsenic, barium, beryllium, cadmium, calcium, chromium III/total, cobalt, copper, iron, lead, magnesium, manganese, mercury, molybdenum, nickel, potassium, selenium, silver, sodium, tin, thallium, vanadium and zinc) by EPA Method 6010B/6020 and 7471A.
- SVOCs by EPA Method 8270D/SIM.
- VOCs by EPA Method 8260.
- Pesticides by EPA Method 8081.
- PCBs by EPA Method 8082A.
- Dioxins and furans by EPA Method 1613B/8290.
- Butyltins by Krone/8270SIM.

- Grain size by PSEP or equivalent.

Sediment samples were submitted to various laboratories for chemical analysis. Site-related COPCs identified in sediment within the LDW include PCBs, dioxin and furans, metals (arsenic and mercury) and carcinogenic polycyclic aromatic hydrocarbons (cPAHs).

Sediment sample locations within and adjacent to Glacier Bay and adjacent to Outfall 2127, which discharges to the LDW east of the Site, the analysis performed at each of the sample locations, and a summary of sample results for these sediment samples are presented in Appendix F.

3.4. T115N REMEDIAL INVESTIGATION

As required by the Agreed Order, RI field investigation activities were completed by the Port to further characterize soil and groundwater conditions and fill identified data gaps to define the nature and extent of contamination at the Site for the purpose of evaluating cleanup action alternatives in the FS. In addition, Ecology also required the Port to complete an evaluation of the stormwater conveyance system to determine whether it is a potential pathway for contaminant migration from T115N to the LDW. Furthermore, Ecology required the Port to review the sediment investigation results for Glacier Bay to identify whether T115N is a potential source to sediment impacts resulting from historical Site use.

The following is a summary of the data gaps identified in the RI/FS Work Plan and investigated as part of the RI:

- **Additional Fill Characterization** – Previous environmental studies identified fill at the Site extending from the surface to depths ranging from approximately 3 to 6 feet bgs in the western and central portion of the Site and to depths greater than approximately 15 feet bgs on the eastern portion of the Site. The source of this fill material is unknown. Although previous soil and groundwater sampling and analysis completed at the Site provided an initial characterization of fill material, additional characterization was required by Ecology to further characterize the fill material present at the Site.
- **Additional Characterization of the Former Settling Ponds** – Three settling ponds historically located in the eastern portion of the Site (Figure 2-6) were used to capture waste sludge during tin reclamation operations that were later backfilled with fill material from an unknown source. Although previous soil and groundwater sampling and analysis completed at the Site provided an initial characterization of former settling pond area, additional characterization was required by Ecology to further characterize soil and groundwater conditions in the vicinity of the former settling ponds as well as material used to backfill the ponds.
- **Characterization of Former Aboveground Storage Tank (AST) Area** – ASTs that were used to store process solutions and wastes were previously located in a containment area in the central portion of the Site (Figure 2-6). Stormwater falling on the containment area was collected in a sump and pumped to the sanitary sewer. Although previous soil and groundwater sampling and analysis completed at the Site provided an initial characterization of this area, additional characterization was required by Ecology to further characterize soil and groundwater conditions in the vicinity of the AST containment area to evaluate potential contamination related to past releases.
- **Characterization of Former Process Building Area** – The Process Building previously used for tin reclamation is located in the central portion of the Site (Figure 2-6). Because previous soil and groundwater sampling had not been performed to specifically evaluate historical activities associated

with the Process Building, characterization of this area was required by Ecology to further characterize soil and groundwater conditions in the vicinity of the Process Building to evaluate potential contamination related to past releases.

- **Investigation of Rail Line Area** – Two rail lines located in the western portion of the Site (Figure 2-2) were used to support historical tin reclamation operations. Although previous soil and groundwater sampling and analysis completed at the Site provided an initial characterization of this area, additional characterization was required by Ecology to further characterize soil and groundwater conditions in the vicinity of the rail lines.
- **Evaluation of a Former UST** – A heating oil UST was previously located west of the former Process Building (Figure 2-2). In February 1992, the UST was removed from the property and the area backfilled. During removal of the UST, visual observations did not identify pitting or penetration of the tank, or evidence of a release. However, petroleum odors were noted in soil removed from the excavation. Characterization of this area during previous environmental studies (i.e., MW-1 and DP-1; Figures 3-1 and 3-2) indicated the potential presence of petroleum hydrocarbons. Therefore, Ecology required additional characterization of this area to further evaluate soil and groundwater conditions to evaluate potential contamination related to past releases.
- **Characterization of Arsenic in Soil and Groundwater** – Arsenic was detected in soil and groundwater on the northern portion of the Site and southern portion of the adjacent Glacier NW site. Ecology required additional characterization to evaluate soil and groundwater conditions to further evaluate arsenic contamination related to potential off-site sources.
- **Stormwater Catch Basin Solids** – As part of Ecology's source control efforts for the LDW, Ecology required an investigation of the stormwater system at the Site to evaluate whether the stormwater conveyance system is a potential pathway for contaminant migration to the LDW.
- **Groundwater Gradients and Flow** – Previous environmental studies provided an initial characterization of groundwater conditions including shallow groundwater elevation and flow direction. However, Ecology required additional characterization of the groundwater system to evaluate 1) hydraulic conductivity and groundwater gradients, 2) potential influence by the 48-inch drain line on groundwater, 3) influence on groundwater resulting from tidal LDW fluctuations and river flow. In addition, Ecology required characterization to further evaluate the vertical extent of potential groundwater contamination.
- **Sediment** – Groundwater from the Site likely flows toward and discharges to Glacier Bay and the LDW. Stormwater from the Site also flows to the LDW. As a result, Ecology required that sediment conditions in Glacier Bay and the LDW be reviewed for potential impacts from historical T115N operations.

The investigation activities completed to meet the objectives of the Ecology-approved RI/FS Work Plan are summarized in the following sections (Sections 3.4.1 and 3.4.4).

3.4.1. Soil Investigation

The soil investigation was completed in general accordance with the Ecology-approved RI/FS Work Plan to characterize the stratigraphy at the Site and to define the nature and extent of contamination in soil, where present. To meet the objectives of the soil investigation, sampling activities were completed at a total of 33 locations representative of fill and native soil that may have been impacted by the historical T115N operations. The RI soil investigation locations are shown relative to the current and historical Site features

on Figure 3-3. Exploration locations were positioned to collect soil samples to address the specific investigation objectives of filling identified data gaps and to provide comprehensive coverage of the Site. Information from previous investigations (described above) and historical operations was used to support selection of the soil sample locations. Soil sampling and analysis completed as part of the RI is described in the following sections (Sections 3.4.1.1 and 3.4.1.2).

3.4.1.1. SOIL SAMPLE COLLECTION AND CHEMICAL ANALYSIS

The soil investigation consisted of collecting soil samples from 17 DP explorations (B-1 through B-17), three test pit (TP) explorations (TP-1 through TP-3) and 14 hollow stem auger (HSA) explorations (MW-2D, MW-4D, MW-10D, MW-19D and MW-11 through MW-20) between December 4, 2013 and January 10, 2014. Soil samples were screened in the field for evidence of contamination. Field screening consisted of visual observations for contamination (i.e., staining, etc.), water sheen testing and organic vapor monitoring. The procedures for soil sample collection, handling, field screening and transport to the laboratory as well as exploration logs detailing the materials encountered and field screening results are presented in Appendix G.

In general, samples with the greatest field screening evidence of contamination were selected for chemical analysis from each location. Samples with no evidence or less definitive evidence of contamination were retained for potential follow-up analysis. Soil samples were submitted for chemical analysis based on the results of previous investigations, presence of fill, and/or proximity to specific historical features (i.e., former storage tanks, settling ponds, etc.) as described in the RI/FS Work Plan. Selected soil samples were submitted for a combination of the following analyses:

- Priority pollutant metals (antimony, arsenic, beryllium, cadmium, chromium III/total, copper, mercury, nickel, lead, selenium, silver, thallium and zinc), barium and tin by EPA Method 6020A and 7471B.
- SVOCs by EPA Method 8270D/SIM.
- VOCs by EPA Method 8260C.
- PCBs by EPA Method 8082A.
- Gasoline-range petroleum hydrocarbons by Method NWTPH-Gx.
- Diesel- and oil-range petroleum hydrocarbons by Method NWTPH-Dx.
- Soil pH by SW 846-9045C.
- Dioxins and furans by EPA Method 8290.

Soil samples obtained during the RI were submitted to OnSite Environmental, Inc. (OnSite) of Redmond, Washington, an Ecology-certified laboratory, for chemical analysis. The methods and procedures for the collection, handling and transport of soil samples for laboratory analysis are presented in the RI/FS Work Plan. The investigation objectives for each sample location, samples that were collected from each location and the analyses performed on each sample are summarized in Table 3-1. The analytical results for soil samples collected as part of the RI are presented in Table D-1 (Appendix D) and discussed in Section 5.3.

3.4.1.2. DEVIATIONS FROM THE RI/FS WORK PLAN FOR SOIL SAMPLING AND ANALYSIS

The following deviations from the RI/FS Work Plan were noted during the soil field investigation:

- Exploration location B-9 could not be completed due to the presence of a concrete layer encountered at a depth of approximately 2 feet bgs. Based on the location and depth of the observed concrete layer, this was likely associated with the historical secondary containment curb used to contain process solutions for the detinning operations. With concurrence from Ecology, additional drilling at this location was not performed.

3.4.2. Groundwater Investigation

The groundwater investigation was completed in general accordance with the Ecology-approved RI/FS Work Plan to characterize groundwater flow characteristics and gradients at the Site and to define the nature and extent of contamination in groundwater, where present. To meet the objectives of the groundwater investigation, fourteen new monitoring wells (monitoring wells MW-11 through MW-20, MW-2D, MW-4D, MW-10D and MW-19D) were installed at the Site. The RI monitoring well locations are shown relative to the current and historical features on Figure 3-4. The RI monitoring wells were positioned to address data gaps identified in the RI/FS Work Plan and to provide comprehensive coverage of the Site. Information from previous investigations (described above) and historical operations was used to support selection of the groundwater sample locations. The procedures for monitoring well installation, well development, and survey and the monitoring well completion logs are presented in Appendix G.

Aquifer testing completed to evaluate groundwater flow and gradients at T115N is described in Section 3.4.2.1. Groundwater sampling and analyses are described in Section 3.4.2.2.

3.4.2.1. HYDROGEOLOGIC TESTING

Hydraulic conductivity testing and a 72-hour tidal study were performed in May 2014 prior to groundwater sample collection and analysis to characterize groundwater flow characteristics and gradients at T115N as follows:

- **Tidal Study** – To evaluate elevation changes in groundwater in the shallow groundwater relative to the change in water levels in the LDW, water level measurements were recorded over a 72-hour period in monitoring wells MW-7, MW-9, MW-10, MW-12 through MW-16, MW-18, MW-19 as well as GMW-26 and GMW-27 (Figure 3-4) and in an LDW stilling well installed on the T115 pier face using pressure transducers with data loggers. In addition, pressure transducers with data loggers were used to record water level measurements in monitoring wells MW-2D, MW-4D and MW-10D (Figure 3-4) to evaluate elevation changes in groundwater in the deep groundwater relative to the change in water levels in the LDW. The results of the tidal study were used, along with groundwater elevations measured during quarterly groundwater monitoring events, to estimate groundwater gradients at T115N. Specific procedures used to perform and evaluate the results of tidal influence on groundwater at the Site are presented in Appendix H. The results from tidal study completed as part of the RI are discussed in Sections 5.2. Based on the results of the tidal study and review of the materials encountered in the Site explorations, monitoring wells MW-2D, MW-4D, MW-10D and MW-19D screened within the native LDW alluvium were determined to be tidally influenced. Additionally, shallow monitoring wells MW-9 and GMW-27 situated near the Glacier Bay shoreline were determined to be tidally influenced.
- **Hydraulic Conductivity Testing** – In accordance with the RI/FS Work Plan, hydraulic conductivity was estimated by conducting slug tests in monitoring wells MW-4D, MW-11, MW-12, MW-13, MW-15, MW-16, and MW17 (Figure 3-4). Hydraulic conductivity was estimated by conducting rising- and falling-head slug tests at each of the monitoring well locations. During each slug test, groundwater levels in the well being tested were measured and recorded both manually and using a pressure transducer

with a data logger. The slug test groundwater level data were evaluated using spreadsheet software, and then plotted to identify the type of hydraulic response and to derive estimates of hydraulic conductivity in the vicinity of the wells tested. The specific procedures used to perform and evaluate the results of the hydraulic conductivity testing are presented in Appendix I. The results from hydraulic conductivity testing completed as part of the RI are discussed in Section 5.2.

3.4.2.2. GROUNDWATER SAMPLING AND ANALYSIS

Four rounds of groundwater monitoring were completed in accordance with the RI/FS Work Plan to characterize groundwater conditions at T115N. In accordance with the RI/FS Work Plan, groundwater samples were collected at least two weeks after well development and completion of the hydrogeologic testing activities discussed above. The groundwater monitoring events were completed on a quarterly basis. During each monitoring event, groundwater in monitoring wells affected by tidal fluctuation within the LDW (i.e., MW-2D, MW-4D, MW-9, MW-10D, MW-19D and GMW-27) were sampled on an ebb tide (i.e., outgoing) or near the effective low tide on the day of sampling. Groundwater sampling activities were completed as follows:

- **Round 1 Groundwater Monitoring Event** – Monitoring wells MW-3 through MW-5, MW-7 through MW-20, GMW-25 through GMW-27, MW-2D, MW-4D, MW-10D and MW-19D were sampled between June 9 and June 13, 2014. During the Round 1 monitoring event, monitoring wells MW-1, MW-2 and MW-6 were purged dry and did not sufficiently recover to obtain a groundwater sample for chemical analysis. In consultation with Ecology, GeoEngineers returned September 15 and September 16, 2014 to redevelop monitoring wells MW-1 through MW-10 to re-establish the hydraulic connection between the well screen and surrounding formation. Redevelopment activities were completed in accordance with the memorandum titled “Proposed Modifications to Ecology-Approved Groundwater Monitoring Approach – North Terminal 115 Site, Port of Seattle” dated August 12, 2014 (GeoEngineers 2014).
- **Round 2 Groundwater Monitoring Event** – Monitoring wells MW-4, MW-6 through MW-10, MW-12, MW-13, MW-15 through MW-20, GMW-25 through GMW-27, MW-2D, MW-4D, MW-10D and MW-19D were sampled between September 22 and September 26, 2014. During the Round 2 monitoring event, monitoring wells MW-1 through MW-3 and MW-5 were purged dry and did not recover sufficiently to obtain a water sample for chemical analysis. Additionally, measurable levels of groundwater were not present in monitoring well MW-14.
- **Round 3 Groundwater Monitoring Event** – Monitoring wells MW-2 through MW-20, GMW-25 through GMW-27, MW-2D, MW-4D, MW-10D and MW-19D were sampled between January 19 and January 22, 2015. During the Round 3 monitoring event, monitoring well MW-1 was purged dry and did not sufficiently recover to obtain a water sample for chemical analysis.
- **Round 4 Groundwater Monitoring Event** – Monitoring wells MW-3, MW-4, MW-6 through MW-20, GMW-25 through GMW-27, MW-2D, MW-4D, MW-10D and MW-19D were sampled between April 20 and April 23, 2015. During the Round 4 monitoring event, monitoring well MW-1, MW-2 and MW-5 were purged dry and did not recover sufficiently to obtain a water sample for chemical analysis.

Water samples collected during each groundwater monitoring event were submitted for chemical analysis of COPCs selected based on the results of previous investigations and/or proximity to historical features. Groundwater samples were submitted for a combination of the following analyses:

- Total and dissolved priority pollutant metals (antimony, arsenic, beryllium, cadmium, chromium III/total, copper, mercury, nickel, lead, selenium, silver, thallium and zinc), barium and tin by EPA Method 200.8 and 7470A.
- SVOCs by EPA Method 8270D/SIM.
- VOCs by EPA Method 8260C.
- Gasoline-range petroleum hydrocarbons by Method NWTPH-Gx.
- Diesel- and oil-range petroleum hydrocarbons by Method NWTPH-Dx.

In addition, selected groundwater samples were submitted for chemical analysis of TOC and/or diesel- and oil-range petroleum hydrocarbons with an acid silica gel cleanup following the first monitoring event to evaluate suspected organic interferences that could potentially create a high bias of the organic analysis. Groundwater samples were submitted to OnSite for chemical analysis. The methods and procedures for the collection, handling and transport of groundwater samples for laboratory analysis are presented in Appendix G. The investigation objective for each sample location, samples that were collected from each location and the analysis performed on samples from each location is summarized in Table 3-2. Groundwater sample results for this investigation are presented in Table D-2 (Appendix D) and discussed in Section 5.3.

3.4.2.3. GROUNDWATER SAMPLING FOR PCBS

Groundwater sampling activities were completed by Ecology in the LDW to gather PCB Congener and Aroclor data in support of Ecology's ongoing evaluation of the LDW Superfund Site. Groundwater samples were collected from 17 properties distributed within the LDW basin that are currently undergoing environmental investigations or cleanup including the T115N Site (Leidos 2017). Samples were collected from three Site groundwater monitoring wells (MW-3, MW-10, and MW-20) and submitted for the following analyses:

- PCB Aroclors by EPA Method 8082A.
- PCB Congeners by EPA Method 1668C.

Groundwater sample results for the Ecology study are presented in Table D-2 (Appendix D) and discussed in Section 5.3.

3.4.2.4. GROUNDWATER SAMPLING FOR DIOXINS AND FURANS

Groundwater sampling activities were completed by Ecology during the January 2015 groundwater monitoring event to gather dioxin and furan data in support of Ecology's evaluation of the Glacier NW Site. A groundwater sample was collected from monitoring well GMW-27 located at the southeast corner of the Glacier NW upland area and submitted for the following analyses:

- Dioxins and Furans by EPA Method 1613.

Groundwater sample results for this sampling event are presented in Table D-2 (Appendix D) and discussed in Sections 5.3.

3.4.2.5. DEVIATIONS FROM THE RI/FS WORK PLAN FOR GROUNDWATER SAMPLING AND ANALYSIS

The deviations from the RI/FS Work Plan, as described above included the following:

- During the Round 1 monitoring event, monitoring wells MW-1, MW-2 and MW-6 were purged dry and did not sufficiently recover to obtain a groundwater sample for chemical analysis.
- During the Round 2 monitoring event, monitoring wells MW-1 through MW-3 and MW-5 were purged dry and did not recover sufficiently to obtain a water sample for chemical analysis.
- During the Round 3 monitoring event, monitoring well MW-1 was purged dry and did not sufficiently recover to obtain a water sample for chemical analysis.
- During the Round 4 monitoring event, monitoring well MW-1, MW-2 and MW-5 were purged dry and did not recover sufficiently to obtain a water sample for chemical analysis.

Following each round of monitoring, Ecology was notified of the deviations from the RI/FS Work Plan. After Round 1, monitoring wells MW-1 through MW-10 were redeveloped to re-establish the hydraulic connection between the well screen and surrounding formation. However, limited recharge to the wells were still observed during subsequent monitoring events.

3.4.3. Stormwater System Investigation

The stormwater system investigation was performed to evaluate whether the stormwater conveyance system is a potential pathway for contaminant migration to the LDW. The stormwater system investigation consisted of completion of a survey of the stormwater conveyance network at the Site and collection of stormwater solids samples from catch basins for chemical analysis to evaluate the nature of contaminants within the stormwater conveyance system. The stormwater system survey and sampling activities are summarized in the following sections (Sections 3.4.3.1 and 3.4.3.3).

3.4.3.1. STORMWATER SYSTEM SURVEY

Applied Professional Service, Inc. (APS) conducted a video survey of the stormwater drain lines at the Site on October 29, 2013 to map their location and depth below ground surface. For the stormwater drain line survey, APS advanced a camera with a transmitter attached through each of the stormwater drain system lines at the Site. The transmitter allowed APS to identify the through-pipe location of the camera at the ground surface as well as to measure the depth of the camera below the ground surface. During the video survey, the location and depth of the stormwater lines were marked on the ground surface, which were later surveyed by Dowl HKM (land surveyor) on October 30, 2013 to document the as-built condition of the stormwater drain system. Note that APS identified the catch basins at the Site as CB-1 through CB-6. The actual catch basin IDs as well as the catch basin IDs used by APS are shown on Figure 3-5.

As part of the 2013 survey, evidence of damaged, cracked or leaking stormwater drain lines was not observed and the observed condition of the surveyed drain lines and lack of base flow observed within the drainage system suggested that the system was in good condition and is not likely a transport pathway for soil and groundwater contamination. However, accumulated deposits were identified in portions of the stormwater system at the Site and a complete video inspection of the stormwater system could not be performed. Supplemental surveys of the stormwater system performed by the Port in April 2018 and December 2019 following the removal of previously identified accumulated deposits confirmed that overall condition of the stormwater drainage system. The 2018/2019 stormwater system survey did however note cracks and/or breaks in the stormwater pipes connected to the 48-inch drain line at four locations within the driveway area in the northern portion of the Site (Figure 3-5). Although cracks and or breaks were identified, the locations of damaged portions of the stormwater pipes are located above the local

groundwater table. Based on the results of the groundwater investigation, groundwater is approximately 2 to 5 feet below the base of the stormwater drain lines.

Video imagery recorded by APS during the 2013 stormwater system survey is provided as Appendix J. In addition, survey records for the Port's 2018/2019 stormwater system survey are presented in Appendix A.

3.4.3.2. CATCH BASIN SOLIDS SAMPLING AND ANALYSIS

Samples of stormwater solids were collected from catch basins CB-313, CB-322, CB-323, CB-324, and CB-328 (Figure 3-5) to characterize solids present within the stormwater system. Catch basin samples were screened in the field for the presence of petroleum-related contamination. Field screening consisted of visual observations for the potential presence of contamination (i.e., staining, etc.), water sheen testing and organic vapor monitoring. Stormwater solids samples collected from the catch basins were submitted for a combination of the following analyses:

- Priority pollutant metals (antimony, arsenic, beryllium, cadmium, chromium III/total, copper, mercury, nickel, lead, selenium, silver thallium and zinc), barium and tin by EPA Method 6020A/7471B.
- SVOCs by EPA Method 8270D/SIM.
- VOCs by EPA Method 8260C.
- PCBs by EPA Method 8082A.
- Gasoline-range petroleum hydrocarbons by Method NWTPH-Gx.
- Diesel- and oil-range petroleum hydrocarbons by Method NWTPH-Dx.
- Dioxins and furans by EPA Method 8290.

Stormwater solids samples obtained during this investigation were submitted to OnSite for chemical analysis. The procedures for the collection, handling and transport of stormwater solids samples to the analytical laboratory are presented in Appendix G. The analysis performed on samples from each location is summarized in Table 3-3. Stormwater catch basin solid sample results for this investigation are presented in Table D-3 (Appendix D) and discussed in Section 5.3.

3.4.4. Deviations from the RI/FS Work Plan Storm System Investigation

The deviations from the RI/FS Work Plan for the Storm System investigation included the following:

- The connection between catch basin CB-6 and the oil/water separator could not be surveyed using video because a concrete cap prevented access to the suspected drain line at catch basin CB-6.
- Material composed of sand and gravel was identified in the stormwater drain line between the oil/water separator and catch basin CB-2. Due to the presence of the material near the tie-in from catch basin CB-1, the video camera could not be fully extended to catch basin CB-2.
- Catch basin CB-2 was capped with a steel plate and could not be accessed to survey of the drain line downgradient of this location.
- A drain line apparently draining west to east was identified upgradient of CB-322 running parallel to the asphalt driveway. Within this drain line, material consisting of sand and gravel with minimal fines and branches was identified and as a result, the video camera could not be extended past the section where the material was observed.

- A drain line connection apparently draining from east to west was identified approximately 10 feet north of CB-322. Because a catch basin was not identified upgradient of the connection and the angle of the connection between the two pipes did not allow access of the video equipment, further evaluation of this line was not possible.

As described above, portions of the stormwater system not accessible during the 2013 stormwater system survey were later surveyed by the Port in April 2018 and December 2019. Results of the 2013 and 2018/2019 stormwater system surveys are summarized on Figure 3-5.

3.4.5. Sediment Investigation

Sediment sampling and analysis was performed for the Glacier NW Site and for the LDW to evaluate the nature and extent of contamination in surface and subsurface sediment. As described in the Ecology-approved RI/FS Work Plan for the Site, the results of the sediment investigations performed as part of the Glacier NW RI and LDW RI were determined to be sufficient to evaluate potential sediment impacts from T115N operations. Several of the sediment sampling locations were positioned along the shoreline in the vicinity of the Site, near outfall locations and further offshore to provide comprehensive coverage within Glacier Bay adjacent to the Site.

3.5. ENVIRONMENTAL DATA USED FOR THE RI

The analytical results for data collected by GeoEngineers under the Ecology-approved RI/FS Work Plan to fulfill the requirements of the Agreed Order underwent data validation and were determined to be of acceptable quality for use in the RI/FS. Laboratory data reports for soil, groundwater and stormwater system investigation activities completed by GeoEngineers are presented in Appendix K. Validation reports for the data collected by GeoEngineers are presented in Appendix L.

Soil, groundwater and catch basin solids data from previous investigations of the Site and adjacent Glacier NW Site were also reviewed for technical quality for use as part of this RI. Environmental data, in which sample locations, sample depth, analytical methods and chemical analytical results could be verified were considered acceptable for use in the RI/FS. Chemical analytical data used for this RI are described in the following sections (Sections 3.5.1. through 3.5.4).

3.5.1. Soil Database Used in the RI

Soil data collected by GeoEngineers as part the RI, previous soil data collected by Landau in 2009 at T115N, and soil data collected as part of the SHA were submitted to the Environmental Information Management (EIM) database under Study ID AODE8099 and are used to characterize the nature and extent of contamination at T115N. In addition, soil data for the Glacier NW Site submitted to the EIM under Study ID FS23881883-RI for sample locations on and adjacent to the T115N property boundary are used to support characterization of the nature and extent of soil contamination at T115N. The soil database for this RI, comprised of data for T115N as well as soil data from Glacier NW sample locations on and adjacent to the T115N property boundary is presented in Table D-1 (Appendix D).

3.5.1.1. GROUNDWATER DATABASE USED IN THE RI

Groundwater data collected by GeoEngineers as part the RI and groundwater data collected by Landau in 2009 at T115N were submitted to the EIM under Study ID AODE8099 and are used to characterize the nature and extent of contamination at T115N. In addition, groundwater data for the Glacier NW Site submitted to the EIM under Study ID FS23881883-RI for sample locations on and adjacent to the T115N

property boundary are used to support characterization of the nature and extent of groundwater contamination at T115N. The groundwater database for this RI, comprised of data for T115N as well as groundwater data from Glacier NW sample locations on and adjacent to the T115N property boundary, is presented in Table D-2 (Appendix D).

3.5.1.2. CATCH BASIN SOLIDS DATABASE USED IN THE RI

Catch basin solids data collected by GeoEngineers as part the RI as well as catch basin solids data collected by Landau in 2009 were submitted to the EIM under Study ID AODE8099 are the catch basin solids database used for the RI. The catch basin solids database used for the RI is presented in Table D-3 (Appendix D).

3.5.1.3. SEDIMENT

Data evaluated to determine the potential sediment impacts from T115N operations include sediment collected as part of the Glacier NW Site RI submitted under EIM Study ID FS23881883-RI and sediment data collected in proximity to Glacier Bay and Outfall 2127 as part of the LDW RI submitted under the following EIM Study IDs:

- LODRIV98
- LDWAOC3
- LDWRRUN1
- LDWRRUN2
- LDWSedDioxin2010
- LDWRSubS2006

Sediment data evaluated as part of the RI to determine the potential impacts from T115N operations are presented in Tables F-2 and F-3 (Appendix F).

4.0 Cleanup Standards

Development of cleanup standards for the Site must include cleanup levels that are protective of human health and the environment; the point of compliance at which the cleanup levels must be met; and additional regulatory requirements, specified in applicable state and federal laws, that apply to the cleanup action because of the type of action and/or the location. The following sections describe the PCULs developed and points of compliance for the Site.

4.1. PRELIMINARY CLEANUP LEVELS

As part of its source control efforts for the LDW Superfund Site, Ecology developed PCULs for soil and groundwater for upland sites “that have environmental transport pathways to the LDW and may impact surface water, sediments, or organisms in the river.” The PCULs for upland sites were prepared following the technical approach outlined in an Ecology policy memorandum (policy memorandum) regarding groundwater PCULs for upland sites along the LDW (Ecology 2016). Ecology also prepared a white paper that provides background information and a recommended approach for using the PCULs (Ecology 2018a). The soil and groundwater PCULs, along with the multiple criteria that were considered in developing the PCULs for each media, are presented in separate summary tables within the “LDW PCUL Workbook,” which

has been updated periodically. Ecology's policy memorandum and white paper state that the LDW PCULs were developed consistent with the MTCA (173-340 WAC), the Sediment Management Standards (SMS; 173-204 WAC), Ecology guidance associated with these two regulations, and cleanup levels and RALs in EPA's record of decision (ROD) for the LDW (EPA 2014).

The soil and groundwater PCULs developed by Ecology for the LDW, presented in Ecology's "LDW PCUL Workbook" dated July 12, 2019, are used in this RI to screen data and identify media that may require a more detailed evaluation of the potential risks to human health and the environment (Ecology 2019a). The screening criteria were applied to the RI data using several assumptions as required by Ecology, including: (1) exposure based on residential/unrestricted land use; (2) potential transport pathways are complete for individual constituents (e.g., soil to groundwater, groundwater to surface water and sediment, groundwater to indoor air); and (3) all potential exposure pathways are complete (e.g., terrestrial ecological exposure to upland soil). As previously stated, the PCULs presented in this RI will be revised, as appropriate as part of the FS to define the nature and extent of contamination and identify areas requiring cleanup action.

The transport and exposure pathways used to develop the PCULs were adjusted for the Site based on feedback from Ecology. MTCA includes procedures for development of screening levels based on whether soil is present in the saturated zone or vadose zone (i.e., soil that is in the horizon above the saturated zone). Ecology required that soil PCULs for the Site be based on procedures for soil in the saturated zone because Ecology considers groundwater to be shallow at the Site and because vadose zone soil could become saturated in the future. Ecology also identified that the PCULs for groundwater should be based on groundwater being non-potable. However, Ecology did require that potable groundwater PCULs be used when non-potable groundwater PCULs were not available.

The Target Sediment Concentrations developed by Ecology (Ecology 2019a) are used to screen catch basin solids based for the purposes of evaluating the potential for contaminants in catch basin solids at the Site to impact sediment in the LDW. As with the soil and groundwater PCULs, screening levels for catch basin solids will be revised as part of the FS, as appropriate, to further evaluate the potential for contaminant migration from T115N to the LDW.

The following sections provide details on the development of the PCULs/Target Sediment Concentration screening levels for soil, groundwater and catch basin solids.

4.1.1. Preliminary Cleanup Levels for Soil

Ecology developed four sets of soil PCULs for upland sites based on vadose and saturated zone soils and potable and non-potable groundwater. Ecology has required the use of saturated zone PCULs for soil at the Site as stated in an email dated February 2, 2019. Also, as stated above, the soil PCULs used in this RI and discussed below include those derived for protection of non-potable groundwater.

Ecology developed PCULs for soil at upland sites based on the following transport and exposure pathways:

- Human health – direct contact (soil ingestion);
- Soil to groundwater transport pathway (based on saturated soil); including the protection of surface water via groundwater, and protection of sediment via groundwater transport pathways;
- Protection of sediment via bank erosion transport pathway; and,

■ Terrestrial ecological receptor exposure pathways.

The PCULs used to screen the soil data for the RI are presented in Table 4-1 and are the lowest risk-based values for the transport and exposure pathways listed above. In cases where the lowest risk-based value is less than natural background, the PCUL was adjusted, in accordance with MTCA requirements, up to the natural background value. The individual criteria used in development of the soil PCULs are further described below.

4.1.1.1. DEVELOPMENT OF DIRECT CONTACT SOIL PCULS FOR PROTECTION OF HUMAN HEALTH

Ecology developed direct contact soil PCULs based on unrestricted land use, which are used in this RI. PCULs for soil protection of human health were identified from MTCA standard Method B soil cleanup levels for unrestricted land use (WAC 173-340-740[3][b]). MTCA Method A soil cleanup levels for unrestricted land use are used for analytes without Method B soil cleanup levels, which included petroleum hydrocarbons and lead. Note that the Method B soil cleanup level for Total PCBs is based on applicable federal law (40 CFR 761.61).

Although PCULs are based on unrestricted land use, the Site lies within the industrialized corridor that surrounds the LDW. The Site and adjacent properties are zoned for industrial use (i.e., IG1, U85). The Site has historically and is currently used for industrial activities including tin reclamation, manufacturing, material storage and distribution, and to support marine shipping activities. The surrounding area is characterized by manufacturing, shipping terminals, warehouses, railways, water transportation and other industrial uses. The Site and surrounding properties are expected to be used for industrial activities into the future. Therefore, the Site meets the definition of an industrial property under MTCA (WAC 173-340-200) as it is zoned for industrial use and has been and is being used for industrial purposes. The Site also meets the requirements for use of industrial cleanup levels for soil as hazardous substances remaining at the property do not pose a threat to human health and the environment in non-industrial areas (WAC 173-340-745[iii]). The Site is surrounded by properties that are also zoned for industrial land use. Residential areas are not located in proximity to the Site. The location and use of the Site and land use in the surrounding area restricts access to the Site by the general public. However, the soil PCULs used in this RI are based on unrestricted land use as required by Ecology. Reevaluation of PCULs based on industrial land use will be performed to identify the nature and extent of contamination and areas requiring cleanup action during development of the FS.

4.1.1.2. DEVELOPMENT OF SOIL PCULS FOR PROTECTION OF GROUNDWATER

Ecology developed PCULs for the soil to groundwater transport pathway using the MTCA fixed parameter three-phase partitioning model (WAC 173-340-747[4]). Default assumptions provided in WAC 173-340-747(4)(b) (Equation 747-1 and Equation 747-2) for saturated zone soils and Ecology default model input parameter values (soil organic carbon-water partition coefficient [K_{oc}] Henry's Law constants) were used in the calculations.

Ecology developed soil PCULs based on two transport pathways, (1) protection of marine surface water via groundwater and (2) protection of sediment via groundwater. Screening levels for marine surface water were used in developing soil PCULs for protection of surface water via groundwater. Ecology developed soil PCULs for protection of sediment via groundwater using the LDW Target Sediment Concentrations described in Section 4.1.3.

4.1.1.3. DEVELOPMENT OF SOIL PCULS FOR PROTECTION OF IMPACTS TO SEDIMENT FROM BANK EROSION

Ecology developed soil PCULs based on the protection of sediment via bank erosion. The values that are used are the Target Sediment Concentrations, which are discussed in Section 4.1.3. However, the bank erosion transport pathway is not considered to be complete because the Site is not located adjacent to the LDW, and therefore, a soil bank is not present at the Site. Additionally, the surface of T115N is covered with asphalt or concrete pavement, compacted gravel and buildings that prevent erosion of soil and transport of eroded soil to the LDW. Reevaluation of PCULs based on the bank erosion transport pathway will be performed to identify the nature and extent of contamination and areas requiring cleanup action during development of the FS.

4.1.2. Preliminary Cleanup Levels for Groundwater

The groundwater PCULs used in this RI are based on the following transport and exposure pathways:

- Groundwater to marine surface water;
- Human Health - groundwater use for potable water (ingestion and inhalation) for contaminants where a non-potable water PCUL is not available;
- Groundwater to sediment; and,
- Vapor intrusion from contaminants in groundwater.

The PCULs used to screen the groundwater data in the RI presented in Table 4-2 are the lowest risk-based values for the transport and exposure pathways listed above. In the case of arsenic where the lowest risk-based values are less than natural background, the PCUL was adjusted, in accordance with MTCA requirements, up to the natural background value. The individual criteria used in development of the groundwater PCULs are further described below.

4.1.2.1. DEVELOPMENT OF GROUNDWATER PCULS FOR PROTECTION OF SURFACE WATER

Ecology used marine surface water quality criteria to develop the PCULs for the groundwater to the marine surface water pathway. Surface water in the LDW in proximity to the T115N Site is brackish and is not a domestic water supply.

The PCULs that were developed for the groundwater to marine surface water pathway are based on MTCA standard Method B surface water cleanup levels specified in WAC 173-340-730(3)(b). MTCA standard Method B surface water cleanup levels are required to be at least as stringent as applicable state and federal laws that include the following:

- Water Quality Standards for Surface Waters of the State of Washington. These marine surface water criteria for protection of aquatic life (acute and chronic exposures) and human health (fish consumption) are published in Chapter 173-201A WAC.
- EPA Federally Promulgated Human Health Criteria. These marine surface water criteria for protection of human health (consumption of organisms only) are published in 40 CFR 131.45 and Chapter 173-201A WAC.
- Federal National Recommended Water Quality Criteria. These marine surface water criteria for protection of aquatic life (acute and chronic exposures) and human health (fish consumption) are established under Section 304 of the Clean Water Act.

Ecology developed surface water quality criteria protective of aquatic life for selected chemicals where aquatic life criteria have not been established in the above references (Ecology 2016). The Ecology criteria were developed by consulting available screening levels, peer-reviewed literature, and EPA's EcoTox database and were considered in development of groundwater PCULs protective of surface water.

Additionally, as noted in WAC 173-340-730(3)(b)(iii), MTCA Method B standard formula values for surface water for protection of human health based on consumption of aquatic organisms (i.e., fish and shellfish) are used when sufficiently protective criteria have not been established under applicable state and federal laws. MTCA considers a criterion sufficiently protective for carcinogens if the excess cancer risk is not greater than 1×10^{-5} or the hazard quotient is not greater than 1 for non-carcinogens (Ecology 2005). State or federal criteria that are not sufficiently protective, based on the MTCA requirements, were adjusted (lowered) to be equivalent to a cancer risk of 1×10^{-5} or a hazard quotient of 1. Note that the fish consumption rate used to calculate the MTCA Method B standard formula values for surface water was adjusted to 97.5 grams per day and the fish diet fraction was adjusted to 1, to be consistent with the LDW ROD (EPA 2016).

4.1.2.2. DEVELOPMENT OF GROUNDWATER PCULS FOR PROTECTION OF SEDIMENT

Ecology developed PCULs for the groundwater to sediment transport pathway. The PCULs were calculated assuming equilibrium partitioning between sediment and groundwater in the sediment pore spaces and using a modified version of the MTCA three-phase model (Equations 747-1 and 747-2) that incorporated LDW-specific parameter values for organic carbon, porosity, and particle density (Ecology 2016). Ecology used the Target Sediment Concentrations presented in Ecology's "LDW PCUL Workbook" to develop the screening levels for the groundwater to sediment transport pathway (Ecology 2019a).

4.1.2.3. DEVELOPMENT OF GROUNDWATER SCREENING LEVELS FOR PROTECTION OF VAPOR INTRUSION

Ecology developed screening levels for the groundwater to indoor air pathway in consideration of the groundwater to vapor intrusion transport pathway based on unrestricted land use. However, as described in Section 4.1.1.1, the Site meets the definition of an industrial property under MTCA (WAC 173-340-200) as it is zoned for industrial use and has been and is being used for industrial purposes. Reevaluation of screening levels based on the groundwater to vapor intrusion for industrial land use will be performed to identify the nature and extent of contamination and areas requiring cleanup action during development of the FS.

4.1.3. Target Sediment Concentrations for Development of PCULs and Evaluation of Catch Basin Solids

Sediment screening levels, referred to by Ecology as Target Sediment Concentrations in Ecology's white paper (Ecology 2018a), are described here as they serve as the basis for derivation of groundwater and soil PCULs. The Target Sediment Concentrations are also used to evaluate the results for catch basin solids. Target Sediment Concentrations are the minimum sediment cleanup levels (CULs) in the LDW ROD (EPA 2014). Ecology also developed Target Sediment Concentrations for analytes without ROD CULs consistent with the SMS Sediment Cleanup Objectives (SCO). Additional considerations for the development of the Target Sediment Concentrations include the following:

- Sediment criteria based on the protection of benthic life for some analytes are expressed in terms of TOC normalized concentrations. For these analytes, Ecology set the Target Sediment Concentrations at

the lowest apparent effects threshold (LAET) values, which are expressed as dry weight, to calculate soil and groundwater criteria protective of sediment.

- Ecology considered sediment concentrations protective of human health in developing the Target Sediment Concentrations. The human health-based concentrations were calculated based on the exposure scenarios defined in the Lower Duwamish Waterway Group's (LDWG's) human health risk assessment (LDWG 2010), including beach play, clamming, and net fishing. Figure 6 from the LDW ROD shows portions of the LDW identified as a beach Play or potential clamming Areas (EPA 2014). Glacier Bay is identified as a potential clamming area; however, Glacier Bay and the LDW in proximity to the T115N Site are not identified as beach play areas.
- Ecology developed Target Sediment Concentrations for bioaccumulative analytes consistent with Chapter 9 of Ecology's Sediment Cleanup User's Manual (SCUM; Ecology 2019b). Chapter 9 of SCUM outlines two options for developing sediment CULs for bioaccumulative analytes. Ecology selected Option 1, which is the simpler approach, to develop Target Sediment Concentrations. Under Option 1, the sediment cleanup level, or Target Sediment Concentration in this case, is set at the higher of natural background and the PQL.

The Target Sediment Concentrations used to screen catch basin solids results for the purposes of evaluating the potential for contaminants in catch basin solids at the Site to impact sediment in the LDW are presented in Table 4-3.

4.2. POINTS OF COMPLIANCE

The following sections identify points of compliance for media that are present at the Site. Media present at the Site include soil, groundwater and soil vapor. The proposed points of compliance for T115N will be identified as part of the FS based on the range of remedial alternatives developed to address Site contamination.

4.2.1. Soil

Pursuant to WAC 173-340-740(6), the point of compliance is the point or points where the soil PCULs will be met. For soil cleanup levels based on the protection of groundwater, the point of compliance will be throughout the soil column (WAC 173-340-740[6][b]). For soil cleanup levels based on protection from vapors, the point of compliance will be throughout the soil column from the ground surface to the uppermost groundwater saturated zone (e.g., from the ground surface to the uppermost water table; WAC 173-340-740[6][c]). For soil cleanup levels based on human exposure via direct contact or other exposure pathways where contact with the soil is required to complete the pathway, the point of compliance will be throughout the soil column from the ground surface to 15 feet pursuant to WAC 173-340-740(6)(d) and WAC 173-340-7490(4)(b), which represents a reasonable estimate of the depth of soil that could be excavated and distributed at the soil surface as a result of development activities.

4.2.2. Groundwater

For groundwater, the point of compliance is the point or points where the groundwater PCULs must be met to comply with the cleanup standards. The standard point of compliance will be throughout the site from the uppermost level of the saturated zone extending vertically to the lowest depth that could potentially be affected by WAC 173-340-720(8)(b). A conditional point of compliance may be established if compliance with the PCUL cannot be met within a reasonable restoration time frame. Under this scenario, Ecology may

approve a conditional point of compliance that shall be as close as practicable to the source area and within the property boundary if it is demonstrated that all practicable methods of treatment are to be used as part of the cleanup. For contaminants extending off-property, an off-property conditional point of compliance may be established if the property is not adjacent to surface water. If contamination approaches a water body via other properties, then PCULs based on the protection of surface water are used and the affected property owners between the source of contamination and the surface water body must agree in writing to the use of the conditional point of compliance. Because the PCULs for groundwater are based on protection of surface water and protection of sediment via the groundwater transport pathway, a conditional point of compliance may be established at the point where groundwater discharges to surface water.

4.2.3. *Indoor Air*

The point of compliance for soil vapor is ambient air throughout the Site in accordance with WAC 173-340-750(6). A conditional point of compliance (i.e., occupied indoor spaces under a commercial use scenario) may be established that does not exceed the property boundary and does not pose a threat to human health or the environment.

4.3. IDENTIFICATION OF CONTAMINANTS OF POTENTIAL CONCERN

The RI data were screened to identify COPCs using a methodology specified by Ecology (Ecology 2018b). The methodology specifies multiple criteria based on comparison of the detected concentrations and practical quantitation limits (PQLs) for each chemical to the PCULs. The criteria specifically identify which chemicals can be eliminated from being selected as a COPC. The chemicals that are not eliminated are retained for further evaluation in the RI.

The COPCs identified based on the methodology specified by Ecology (Ecology 2018b) were submitted to Ecology for review prior to preparation of this RI (GeoEngineers 2019). Ecology provided comments on the COPCs that were submitted for the T115N Site. Ecology's comments were incorporated into the selection of COPCs. The list of COPCs presented in this RI were subsequently approved by Ecology (Ecology 2019c).

Based on the methodology specified by Ecology, a chemical is eliminated from being a COPC if one or more of the following comparisons is true:

- **Criterion 1** – There is no PCUL in Ecology's CLARC Database, which Ecology used as a source of PCULs for the LDW PCUL Workbooks.
- **Criterion 2** – The maximum reporting level (RL) and maximum detected concentration are less than the PCUL.
- **Criterion 3A** – The analyte was not detected with a maximum RL less than 10 times the PCUL.
- **Criterion 3B** – The analyte was not detected with an average RL less than 10 times the PCUL **and** less than 10 percent of the RLs are greater than 10 times the PCUL.
- **Criterion 3C** – The analyte was not detected with an average RL less than 2 times the RI/FS Work Plan target PQL.
- **Criterion 4A** – The frequency of detection is less than 5 percent, the maximum RL is less than or equal to 10 times the PCUL **and** the maximum detected concentration is less than or equal to 2 times the PCUL.

- **Criterion 4B** – The maximum detected concentration and maximum RL are less than 2 times the PCUL and less than or equal to 10 percent of the detected concentrations and RLs are greater than the PCUL.

Tables 4-4 through 4-6 present the comparison of the analytical results for each chemical in each media (i.e., soil, groundwater and catch basin solids) to the criteria provided above and identify whether an analyte is eliminated or is retained as a COPC. Table 4-7 presents a summary of the identified COPCs in each media. The nature and extent of the COPCs presented in Tables 4-4 through 4-6 and summarized in Table 4-7 are further evaluated in Section 5.0 (Remedial Investigation Results).

5.0 Remedial Investigation Results

The RI included collection of additional data to supplement the data collected as part of previous environmental studies (Section 3.1) and to fill data gaps identified in the RI/FS Work Plan. The additional data were obtained to characterize the geology, hydrogeology and the nature and extent of contamination at the Site and to provide adequate data to develop and evaluate cleanup action alternatives in the FS. As required by the Agreed Order, the RI included additional investigation of soil, groundwater and stormwater catch basin solids. The soil, groundwater and catch basin results are combined with the results of previous studies and the results of the environmental investigation of the adjacent Glacier NW Site to define the nature and extent of contamination utilizing PCULs and screening methodology required by Ecology for the Site as described in Section 4.0. In accordance with the RI/FS Work Plan, sediment data collected from Glacier Bay and LDW in proximity to the Site was reviewed to identify the contaminants that exceeded screening levels to evaluate the potential for sediment impacts from historical uses of T115N. Sediment sampling activities and an evaluation of the results are presented in Appendix F. The following sections present the stratigraphy, hydrogeology and the sampling and analysis results for soil, groundwater and catch basin solids.

5.1. STRATIGRAPHY

The stratigraphy at the T115N Site was characterized based on observations of materials encountered in explorations completed as part of the RI, information gathered during previous environmental studies at the Site and at adjacent properties (Sections 3.1 through 3.3) and review of information on the development of T115N and the surrounding area (Sections 2.3 and 2.6). The identified fill and native stratigraphic units are illustrated in geologic cross-section on Figures 5-1 through 5-3. The orientation of the geologic cross-sections is shown on Figure 3-3.

In general, the stratigraphy at T115N consists of fill layers of varying thicknesses overlying native organic silt (western portion of the Site) and native alluvial deposits. The stratigraphy at the Site provides the framework for the nature and extent of identified COPCs as they relate to potential contaminant sources and/or preferential migration pathways for Site and off-site contaminants. Descriptions of the stratigraphic units from oldest to newest are presented in the following sections (Sections 5.1.1 through 5.1.8). Descriptions of Site hydrogeology are discussed in Section 5.2 and COPC nature and extent based on stratigraphy and hydrogeology of the Site are discussed in Section 5.3

5.1.1. Native Lower Duwamish Waterway Alluvium

Native LDW alluvium consists of gray to black, well- to poorly-graded, fine to coarse sand with varying silt content. As shown on Figures 5-1 through 5-3, native LDW alluvium is present beneath the entire Site and

extends to the north, east and south of T115N beneath portions of Glacier NW and T115. The top of this unit is present at depths ranging approximately 15 and 20 feet bgs. As described in Section 2.6, fluvial processes associated with the White, Green, Black and Duwamish Rivers have deposited alluvial materials (Qoal and Qyal) within the Duwamish Valley on the post-glacial surface located up to 200 feet bgs. The native LDW alluvium is saturated and comprises the deep groundwater zone at the Site.

5.1.2. Native Organic Silt

The native organic silt has a low to medium plasticity and is brown in color. As shown on Figures 5-1 through 5-3, the organic silt layer ranges in thickness from approximately 1 to 5 feet and separates the shallow fill deposits from deeper LDW alluvium west of the historical shoreline at T115N and extends north beneath the 48-inch drain line onto the Glacier NW Site. The organic silt layer is truncated at the location of the historical shoreline (Figures 5-1 and 5-2) in the central/eastern portion of the Site. The native organic silt unit was not encountered at exploration locations MW-17 through MW-19D located east of the historical shoreline. The top of the organic silt is encountered at depth of approximately 4 feet bgs in the western portion of T115N and slopes down to a depth of approximately 16 feet bgs in the central/eastern portion of T115N. The organic silt is characteristic of a native floodplain/tidal deposit and was the exposed ground surface prior to area development beginning in the early 1900s.

5.1.3. Initial Fill

Prior to 1922, fill material from an unknown source(s) was used to raise the western portion of T115N above the elevation of surface water in the LDW, comprising the first fill event at T115N. The initial fill consists of a cohesive silt and silty fine to medium sand containing occasional organic debris (i.e., roots, branches, etc.) with colors ranging from brown to gray. As shown on Figures 5-1 through 5-3, the initial fill layer ranges in thickness from approximately 2 feet in the western portion of T115N up to 15 feet in the central/eastern portion of T115N.

5.1.4. Dredged Fill

Dredged Fill consists of gray to black, well- to poorly-graded, fine to medium sandy silt with a high organic content. As shown on Figure 5-3, the dredged fill is approximately 4 to 9 feet thick and overlies the organic silt layer in the northern portion of T115N and extends onto the Glacier NW Site. The lower portion of the dredged fill is typically saturated and comprises the majority of the shallow groundwater zone for the Glacier NW Site. As identified in the Glacier NW RI, the dredged fill originated from various dredging episodes of the LDW beginning as early as 1913 to straighten and deepen the waterway. By the late-1950s, much of the filling of the Glacier NW Site was complete (ERM 2015). Although dredged fill is present in the northern portion of T115N resulting from the filling of the Glacier NW Site, much of the fill placement at T115N did not occur until the 1960s (i.e., Operational Fill event described below).

5.1.5. Operational Fill

Operational fill placed at T115N during the 1960s (Figure 2-5), which is the fill layer upon which tin reclamation operations were established, consists of silty, fine to coarse sand, sandy silt or fine to coarse gravel with sand and/or silt that ranges in color from brown to black, green or gray. Thin layers (i.e., approximately 6 inches in thickness) of wood debris (“2 x 4 planks” or “untreated wood debris”) and/or concrete were identified in the operational fill at locations DP-1 at approximately 2 feet bgs, B-6 at approximately 2 feet bgs, MW-3 at approximately 10 feet bgs, MW-13 at approximately 10 feet bgs, and MW-15 at approximately 9 feet bgs (see exploration logs in Appendix G). Wood and/or concrete debris are

generally encountered at the contact between the initial fill placed at T115N and the operational fill placed for industrial land uses. As shown on Figures 5-1 through 5-3, west of the historical shoreline, the thickness of the operational fill layer varies from approximately 1.5 to 10 feet thick sloping west to east and south to north. East of the historical shoreline, the layer of operational fill varies in thickness from approximately 10 to 25 feet thick sloping from west to east.

5.1.6. Terminal Fill

Oblique photographs taken in the early 1960s show the filling of the Duwamish River south of T115N that connected Foss Island to the mainland (Figure 2-4). In 1969, large-scale filling of the area that would become T115 began. Prior to the filling, unsuitable sediment within the waterway and unwanted material that had accumulated on the banks of the river prior to development were reportedly removed. The filling process involved building a dike that extended east from T115N to the current LDW shoreline and then south along the LDW shoreline. The area behind the dike was then filled in sections. Filling of the area behind the dike was completed between 1971 and 1974 and consisted of the placement of approximately 1.1 million cubic yards of dredged material and other imported fill (Sound Earth 2011).

As shown on Figures 5-1 and 5-2, east of T115N, the terminal fill extends from the ground surface to the historical shoreline surface and ranges between 18 and 20 feet thick. Adjacent to T115N, the terminal fill consists of gray to black silt and fine to medium sand with silt and variable gravel content.

5.1.7. SPU Storm Drain Fill

As previously described (Sections 2.5.5.2 and 2.6.2), a 48-inch drain line was constructed in 1972 between West Marginal Way and the LDW along the northern portion of T115N within a trench that measured approximately 20 feet wide at the top, 6 feet wide at the bottom, and approximately 17 feet deep. Backfill placed around the 48-inch drain line in the trench is identified on the as-built drawing as City of Seattle Class B material, which consists of washed fine to medium sand (Appendix B). The remainder of the trench above the 48-inch drain line is noted as “fill” of unknown composition or source. Soil types encountered in explorations completed adjacent to the storm drain line alignment are generally characterized as a fine to coarse gravel with variable silt and sand content with color ranging from gray to brown.

5.1.8. Settling Pond Fill

The settling ponds used during historical tin reclamation operations were filled in the late 1970s. Fill placed in the settling ponds is generally characterized as a silt with occasional sand and gravel that ranges in color from gray to greenish gray and brown. Two of the three settling ponds historically used at T115N were approximately 35 feet long by 35 feet wide by approximately 8 to 9 feet deep and the third pond was approximately 75 feet long by 55 feet wide by approximately 11 feet deep (Figure 5-2). Debris encountered in fill material within the pond areas included occasional untreated wood debris, brick fragments, metal debris, charcoal, and flecks of green and white material of unknown origin.

5.2. HYDROGEOLOGY

5.2.1. 72-Hour Tidal Study

As described in Section 3.4.2.1, a 72-hour tidal study was performed as part of the RI to characterize groundwater flow characteristics. The results of the tidal study were evaluated to identify where tidal effects were observed in groundwater at the Site (i.e., fluctuations in groundwater levels as a result of tidal

elevation changes in the LDW). Where present, tidal fluctuations in groundwater levels in individual monitoring wells were analyzed to identify the following:

- The effect of tidal fluctuations on groundwater gradients;
- The length of time it took for the tidal effect observed at the LDW shoreline to reach an individual monitoring well location, which is identified as the time lag and presented in hours; and,
- The magnitude of the tidal influence on the groundwater level in a well relative to distance from the shoreline, which is identified as the stage ratio and presented as a percent (%).

The time lag (time between the change in river elevation and corresponding change in groundwater elevation) and stage ratio (amplitude of river elevation change compared to the amplitude of groundwater elevation change) were then used to calculate the diffusivity for the shallow and deep groundwater zones, which relates to transmissivity, storativity, and hydraulic conductivity that control the storage and flow of groundwater at the Site. This analytical method estimates “bulk” hydraulic parameters that provide an overall estimate for the groundwater zones where the testing is performed in contrast to the hydraulic parameters measured at individual monitoring well locations (e.g., slug tests) that provide hydraulic parameters for a specific location or portion of groundwater zone. Hydraulic conductivity testing is further discussed in Section 5.2.2.

The monitoring wells used in the tidal study as well as the mean groundwater elevation, calculated time lag and stage ratios are presented in Table 5-1. Response to tidal fluctuations observed in the LDW on monitoring wells installed in the shallow and deep groundwater zones are summarized in the following sections (Sections 5.2.1 through 5.2.3).

5.2.1.1. GROUNDWATER CHARACTERISTICS WEST OF THE HISTORICAL SHORELINE

Based on the results of the RI, the shallow groundwater zone west of the historical shoreline is perched on native organic silt and the low permeable silt and clay placed during the initial filling of T115N (Figure 5-4). The underlying deep groundwater zone is saturated and is locally confined by the layers of native organic silt and silt and clay fill, which act as an aquitard. Regionally, the deep groundwater zone is contained within the native LDW alluvial sand deposits that comprises the aquifer system for the Duwamish River Valley (Section 2.7.1).

Shallow Groundwater Zone

As indicated in Table 5-1 and shown on Figure 5-5 there is no discernible effect of the river stage height (i.e., water level in the LDW) on the groundwater level in shallow groundwater monitoring wells MW-10, MW-12 through MW-16 and GMW-26 as the groundwater level remained relatively unchanged throughout multiple tidal cycles that included up to approximately 15 feet of change in the water level in the LDW. For these wells, the calculated stage ratios were less than 3 percent³, except for monitoring well MW-15 located in the central portion of the Site, which had a calculated stage ratio of 5.3. However, the change in water elevation at this location was observed to be steadily increasing over the duration of the tidal study

³ A stage ratio less than 3 percent is considered negligible relative to the influence of tidal fluctuation.

(Figure 5-5) and did not show a cyclical variation corresponding to changes in LDW river height that would be expected if the change in the groundwater elevation was the result of tidal influence.

Although the stage ratio was less than 3 percent in monitoring wells MW-12, MW-14 and GMW-26, the similar time lags observed at these locations, which are up to 260 feet apart (within 7 minutes of each other) are likely attributable to the 48-inch drain line that is located in close proximity to the wells. The stormwater line and pipe backfill is likely acting as a conduit for water movement in the shallow aquifer during tidal exchanges. The tidal fluctuation in the LDW is likely propagating through the stormwater line and backfill and then to the shallow monitoring wells through the sandy soil, in which the wells are screened.

The results of the tidal study also show that the shallow groundwater zone west of the historical shoreline is hydraulically distinct from the deep groundwater zone. The native organic silt layer and the silt and clay fill layer are inhibiting communication between the shallow and deep groundwater zones west of the historical shoreline. As described in the following section, the deep groundwater zone at T115N is tidally influenced.

Deep Groundwater Zone

As indicated in Table 5-1 and shown on Figure 5-6, groundwater levels in the monitoring wells completed in the deep groundwater zone showed a direct hydraulic response to tidal fluctuations in the LDW. The tidal effect was observed in the deep groundwater zone to a distance of at least 440 feet inland from the LDW at deep monitoring well location MW-2D. Figure 5-6 presents a comparison of the water level in the LDW to the groundwater levels in wells screened in the deep groundwater zone. As shown in Figure 5-6, there is high degree of correlation between the river stage height and the groundwater level in the deep groundwater zone.

At the three deep groundwater monitoring wells that were monitored as part of the tidal study, the time lag ranged from approximately 1.3 hours for monitoring well MW-10D located approximately 70 feet from Glacier Bay to approximately 2.6 hours for monitoring well MW-2D located approximately 440 feet from Glacier Bay (Table 5-1). The stage ratios for the three deep groundwater wells monitored during the tidal study were generally similar, ranging between 26 percent for monitoring well MW-10D to 18 percent for monitoring well MW-2D. The 18 percent stage ratio observed at well MW-2D indicates the tidal influence in the deep groundwater zone likely extends inland beyond MW 2D. The relatively small difference in the stage ratios observed in the three deep groundwater monitoring wells (8 percent difference over a distance of 370 feet) suggests the soil deposits comprising the deep groundwater zone are relatively homogeneous.

The large distance of observed tidal effect in deep groundwater west of the historical shoreline supports the interpretation that the deep groundwater zone acts as a confined system in the area. The observations from the tidal study indicate that the confined system creates a conduit for a tidal “wave” of increased hydraulic head to propagate inland below the confining layers of native organic silt and silt and clay fill deposits during high tides.

5.2.1.2. GROUNDWATER CHARACTERISTICS EAST OF THE HISTORICAL SHORELINE

As shown on Figure 5-4, the layers of low permeable silt and clay fill and native organic silt deposits that separate the deep groundwater zone from the shallow perched groundwater are absent east of the historical shoreline resulting in a single unconfined groundwater zone. Where the confining layer or aquitard

is absent, shallow groundwater mixes with deep groundwater and is tidally influenced at locations MW-9 and GMW-27 based on the results of the tidal study (Figure 5-5).

The changes in the groundwater elevations in monitoring wells MW-9 and GMW-27 located east of the historical shoreline were observed to generally match the form of the river stage heights (Figure 5-5). The stage ratio for these monitoring wells ranged from approximately 16 percent at MW-9 located approximately 55 feet from Glacier Bay to 10 percent at GMW-27 located approximately 25 feet from Glacier Bay (Table 5-1). At monitoring well MW-7, there is no discernible effect of the river stage height on the groundwater level. This is likely due to heterogeneity in the fill material used to create land for T115.

Near the shoreline, the time lag in tidal response in monitoring wells GMW-27 and MW-9 ranged from approximately 3.1 hours to 3.8 hours, respectively.

5.2.2. Hydraulic Conductivity

Hydraulic conditions for the shallow perched and deep groundwater zones were evaluated using information from slug tests performed on selected monitoring wells as well as the results of the tidal study. The methodology and procedures for evaluating and calculating hydraulic conductivities based on slug tests are presented in Appendix I. The methodology and procedures for evaluating and calculating hydraulic conductivities based on the tidal study are presented in Appendix H.

5.2.2.1. HYDRAULIC CONDUCTIVITY FROM SLUG TEST RESULTS

Slug tests were performed on monitoring wells MW-4D, MW-11, MW-12, MW-13, MW-15, MW-16, and MW17 (Figure 3-4) to evaluate hydraulic conductivities in the shallow and deep groundwater zones at T115N. Hydraulic conductivity (K) values calculated from slug test data for the shallow groundwater zone ranged from approximately 0.18 feet per day (ft/day) to 3.2 ft/day with a geometric mean K value of 0.67 ft/day (a geometric mean is used to estimate the K value for the shallow aquifer because the calculated K values ranged by more than an order of magnitude). The K value calculated for the deep confined groundwater zone based on the results of slug testing on MW-4D is 75 ft/day. The K values calculated for the shallow groundwater zone based on slug test data are generally consistent with conductivity values observed for unconsolidated silt and silty sand. The wide range of K values calculated for the shallow unconfined groundwater zone likely reflects the heterogeneous nature fill material placed during property development (Section 5.1). The slug test data for the deep groundwater zone are generally consistent with values observed for sand aquifers, which is consistent with the native alluvium deposits for the Duwamish River Valley.

The values resulting from slug tests are considered estimates of the hydraulic conductivity at the test location or in a localized portion of the groundwater zone or aquifer where the test was performed due to the relatively limited radius of influence around the monitoring well that is generated during slug testing. The hydraulic conductivity values determined from slug tests are presented in Table 5-2.

5.2.2.2. HYDRAULIC CONDUCTIVITY FROM TIDAL STUDY RESULTS

Hydraulic conductivity values were also calculated from the tidal study data using diffusivity values calculated from both time lag and stage ratio. Hydraulic conductivity values calculated using tidal study results are considered bulk values for the groundwater zone because a large portion of the groundwater zone is monitored during the tidal study. The results of the tidal study can be considered an average for the portion of the groundwater zone monitored during the tidal study. Hydraulic conductivity values for the tidal study are presented in Table 5-2.

For the shallow perched groundwater zone, calculation of the hydraulic conductivity was inconclusive based on the results of the tidal study. Because of the variability of the fill materials comprising the shallow groundwater zone and the potential effects of the 48-inch drain line on shallow groundwater flow in the northern portion of T115N, the results of the conductivity calculations based on diffusivity were uncharacteristically high (440 ft/day using the stage ratio calculation method) in comparison to the observed fine-grained materials that generally comprise the shallow groundwater zone. The K value calculations for the shallow groundwater zone using the time lag method were also unrealistically high. Based on the stratigraphy and soil types encountered at T115N, the hydraulic conductivity values calculated for the shallow groundwater zone using the tidal study data do not represent a realistic estimate of hydraulic properties. Subsequently, the K values calculated for the shallow wells during slug tests (summarized above) represent a more realistic estimate of the hydraulic conductivity for the shallow unconfined groundwater zone.

Based on the observed tidal responses in the deep confined aquifer, the estimated bulk hydraulic conductivity is 111 feet/day, similar to the value calculated from slug test data for MW-4D (75 feet/day). The K value estimated for the deep groundwater zone based on the tidal study is consistent with conductivity values for unconsolidated sand deposits (Driscoll 1986).

5.2.2.3. GROUNDWATER VELOCITY

Groundwater velocity for the shallow groundwater zone could not be calculated using the tidal study results because the tidal study was inconclusive for the shallow groundwater zone. However, the groundwater velocity was estimated between well pairs MW-16 and MW-14 using K values calculated from the slug tests⁴. Based on this calculation, the average groundwater velocity between well pair MW-16 and MW-14 is estimated to be 0.34 feet per day.

The average groundwater velocity for the deep groundwater zone was calculated using the estimated bulk hydraulic conductivity of 111 ft/day, the estimated average groundwater gradient over the 72-hour tidal study of 0.00083 foot/foot (ft/ft), and an effective porosity of 32 percent, which is based on average literature values for the soil types identified at T115N. The estimated average groundwater velocity in the deep aquifer is 0.29 feet per day. Since the estimated value of 0.29 feet per day accounts for periods of slowed and reversed groundwater flow direction as observed during the 72-hour tidal study, the calculated velocity is considered an average, and velocity may be higher during low tide periods.

5.2.3. Horizontal Hydraulic Gradients and Flow Direction

Characterization of the groundwater gradients and flow directions at T115N is based on the results of the tidal study performed as part of the RI and on groundwater elevations measured during the quarterly monitoring events. An evaluation of groundwater elevations measured during quarterly monitoring was performed to evaluate seasonal (i.e., fall, winter, spring, and summer) variability on groundwater conditions including hydraulic gradients and flow direction. The tidal study was performed in May (transitional period between the wet and dry seasons) to evaluate the change in groundwater conditions (hydraulic gradients and flow direction) over several tide exchanges within the LDW and develop a time-averaged groundwater

⁴ Because MW-14 was not tested as part of the hydraulic conductivity study and the soil types are similar between monitoring well locations MW-14 and MW-12, the calculated hydraulic conductivity value for MW-12 was substituted for MW-14 in calculating groundwater velocity for the shallow groundwater zone.

flow gradient for the Site. In accordance with the RI/FS Work Plan, the tidal study was completed prior to the quarterly groundwater monitoring events so that sampling of tidal influenced wells would be performed at the effective low tide (low tide with lag time taken into consideration). The average groundwater elevation for each well location included in the tidal study was calculated by averaging the groundwater elevations measured over the 72-hour tidal study (see Appendix H for methodology). The average elevations for each well location were used to estimate the time-averaged groundwater flow direction and to calculate the average horizontal gradient in feet per foot between wells (i.e., feet of elevation change per horizontal foot). Time-averaged potentiometric surface maps identifying the locations monitored as part of the tidal study and depicting groundwater elevations and gradient directions in the shallow and deep groundwater zones during the tidal study are presented on Figures 5-7 and 5-8.

Figures 5-9 and 5-10 present “snapshot” groundwater elevations and gradient directions in the shallow and deep groundwater zones during each phase of the tide cycle (high, low, and mid-tides). The snapshot potentiometric maps for the phases of the tide cycle were generated using the groundwater levels measured during the 72-hour tidal study. In addition, maps depicting groundwater elevations during each of the four quarterly groundwater monitoring events are presented on Figures 5-11 through 5-18. The maps for the quarterly monitoring events were generated using the groundwater levels measured in each monitoring well immediately prior to purging and sampling the well. Because each sampling event was conducted over several days, the groundwater elevations shown on Figures 5-11 through 5-18 are not true snapshots of the shallow and deep groundwater elevations. However, since the groundwater elevations in shallow monitoring wells are largely unaffected by tidal fluctuations, Figures 5-11 through 5-14 provide a general indication of the shallow groundwater potentiometric surface and hydraulic gradient/flow direction during each of the four quarterly monitoring events. Because deep groundwater is continuously affected by tidal fluctuations in the LDW and the groundwater levels in the deep groundwater wells were measured at the effective low tide (low tide with lag time taken into consideration) over multiple days during each of the four quarterly monitoring events, only the deep groundwater elevations during quarterly monitoring are shown on Figures 5-15 through 5-18.

The following sections describe the groundwater gradients and flow directions in shallow and deep groundwater at T115N.

5.2.3.1. SHALLOW GROUNDWATER ZONE GRADIENT AND FLOW DIRECTION

The inferred average groundwater flow direction in the shallow groundwater zone during the tidal study was toward the north in the central portion of T115N and toward the northeast in the eastern portion of T115N (Figure 5-7). The inferred average groundwater flow direction in the area east of the historical shoreline where the confining layer or aquitard is absent between the shallow and deep groundwater zones was also toward the northeast. These inferred flow directions are based on the average groundwater elevations recorded in the shallow monitoring wells evaluated as part of the tidal study. From the tide cycle snapshots (Figure 5-9), the inferred flow direction for the shallow groundwater zone is toward the north in the central portion of T115N and toward the northeast in the eastern portion of T115N throughout the tide cycle. However, during the high and rising -tides, there is a localized flow reversal near the shoreline at monitoring wells MW-9 and GMW-27, which is oriented southwest toward the central portion of the Site. Based on the tidal study results, the localized flow reversal extends up to approximately 75 feet from the shoreline.

The estimated average horizontal groundwater gradient in the shallow groundwater zone in the central portion of T115N west of the historical shoreline was 0.059 ft/ft between MW-16 and MW-14. The

estimated average gradient in the eastern portion of T115N east of the historical shoreline was 0.058 ft/ft between MW-18 and MW-9.

The shallow groundwater potentiometric maps for each of the quarterly groundwater monitoring events (Figures 5-11 through 5-14) are more complex than the time-averaged map shown in Figure 5-7. The quarterly groundwater elevation data suggest that groundwater in the shallow aquifer is mounded in the vicinity of the former settling ponds throughout the year, and that groundwater flows radially away from this mounded area. In general, the groundwater mounding was most pronounced in June and September 2014 during the dry season and least pronounced in January 2015 during the wet season. The mounding may be caused by localized perched groundwater at shallow depth in the area of wells MW-15 and MW-16 and is likely a reflection the heterogeneous nature of the fill material placed during property development and fill material used to backfill the former settling ponds (Section 5.1). Although the shallow groundwater gradients and flow are observed to be more complex and circuitous based on water level elevations measured during the quarterly monitoring events, shallow groundwater still generally flows to the north and northeast toward the 48-inch drain line and Glacier Bay. In the southern portion of the Site (south of the former settling ponds), groundwater locally flows to the southeast and southwest before heading toward the 48-inch drain line and Glacier Bay.

Within the shallow groundwater zone west of the historical shoreline, measured groundwater elevations were observed to vary seasonally with the wet season (i.e., January 2015) elevations being higher than dry season (i.e., September 2014) elevations by up to approximately 2.5 feet although groundwater elevations at wells MW-5 and MW-15 in the vicinity of the former settling ponds were approximately 1 to 2.5 feet higher in the dry season than in the wet season.

The results of groundwater monitoring and tidal studies performed for the Glacier NW Site indicate that shallow groundwater flow in the southern portion of the Glacier NW Site is locally oriented toward the 48-inch drain line (ERM 2015). The curvature of water-table contours near the storm drain line shown on Figure 5-7 provides evidence for the movement of groundwater toward the storm drain line from both sides.

5.2.3.2. DEEP GROUNDWATER ZONE GRADIENT AND FLOW DIRECTION

The inferred average groundwater flow direction in the deep groundwater zone during the tidal study was toward the east-northeast (Figure 5-8). The inferred flow direction is based on the average groundwater elevations recorded in the deep groundwater monitoring wells monitored during the tidal study and the interpreted east to northeast average deep groundwater flow direction at the Glacier NW Site (ERM 2015). The estimated average horizontal groundwater gradient in the deep groundwater zone during the tidal study was 0.00083 ft/ft, which is significantly less than the estimated average gradients in the shallow groundwater zone.

From the tide cycle snapshots for the deep groundwater zone (Figure 5-10), the inferred flow direction for the deep groundwater zone is toward the northeast in the eastern portion of T115N throughout the tide cycle. However, during the high, there is a flow reversal that extends inland to at least 440 feet from the shoreline. During mid-tide (rising and falling) the flow reversal is less pronounced and extends inland up to approximately 100 feet from the shoreline.

The deep groundwater elevations for each of the quarterly groundwater monitoring events are shown on Figures 5-15 through 5-18 as requested by Ecology (Ecology 2018b). As previously discussed, the deep aquifer wells were sampled at the effective low tide (low tide with lag time taken into consideration) across

multiple days of sampling during each of the four quarterly monitoring events. Therefore, potentiometric groundwater surfaces and gradients were not prepared because the elevations shown on Figures 5-15 through 5-18 are not a snapshot of the deep groundwater gradients and only identify what the deep groundwater elevation was during sampling during each monitoring event. Because the potentiometric surface of the deep groundwater zone is subject to continuous tidal fluctuations in the LDW river height, seasonal variability within the deep groundwater zone could not be determined based on the measured groundwater levels during each monitoring event.

5.3. NATURE AND EXTENT OF CONTAMINATION

This section describes the nature and extent of contamination in soil, groundwater and catch basin solids at the Site. An evaluation of the nature and extent of contaminants in sediment in Glacier Bay and the LDW in proximity to T115N is presented in Appendix F. The nature and extent of contamination for the Site is based on the COPCs identified in media using the selection criteria specified by Ecology (described in Section 4.3). The COPCs identified for the Site are summarized in Table 4-7. Collectively, the COPCs encompass the lateral and vertical extent of Site contamination and the risk posed by contaminants to human health and the environment. COPCs also encompass cross-media impacts and provide a basis for developing the conceptual site model (CSM).

The results for soil, groundwater and catch basin solids are described in the following sections. Tables 5-3 through 5-5 present the results for COPCs in soil, groundwater and catch basin solids, respectively. The results for all field parameter measurements for soil, groundwater and catch basin solids and complete chemical analytical results compared to the PCULs are presented in Appendix D, Tables D-1 Through D-3. Note that the environmental soil data presented in this RI were compared to 2019 LDW PCUL Workbook screening criteria using the technical approach outlined in Ecology's policy memoranda regarding groundwater PCULs (Ecology 2016) and the methodology specified by Ecology's white paper for upland sites along the LDW (Ecology 2018b) as described in Section 4.0. Reevaluation of PCULs based on current and future land use assumptions, human and ecological receptors, complete exposure pathways, background and PQLs as allowed under MTCA will be performed to identify the nature and extent of contamination and areas requiring cleanup action during development of the FS.

5.3.1. Soil

The nature and extent of contamination in soil at the T115N Site was evaluated based on soil samples collected during the RI and previous environmental studies (Figures 3-1 and 3-3). Soil conditions at the Site are represented by up to a total of 143 samples (including duplicate samples) from 47 exploration locations completed to depths ranging from the ground surface to approximately 29 feet bgs. The majority of the borings were completed to depths of up to 20 feet bgs to evaluate initial, operational, dredged and settling pond fill conditions and the native organic silt layer. Four borings were advanced to depths between 25 and 29 feet bgs to evaluate deep native soil conditions representative of the LDW alluvium beneath the native organic silt layer west of the historical shoreline and deep fill soil conditions east of the historical shoreline. In addition, soil samples representative of dredge fill collected from 21 explorations located along the southern portion of the Glacier NW Site adjacent to the T115N Site were also reviewed to support the evaluation of the nature and extent of contamination and potential off-site sources of contamination. Specific details of the RI investigation activities and previous environmental studies for T115N and the Glacier NW Site are summarized in Section 3.0.

As discussed in Section 4.0, the following constituents were identified as COPCs for soil at T115N based on the criteria set forth by Ecology (Table 4-4):

- Total PCBs;
- Dioxins and furans;
- Metals (antimony, arsenic, barium, cadmium, chromium III/total, copper, lead, mercury, nickel, selenium, silver, thallium, tin, and zinc);
- PAH compounds (acenaphthene, anthracene, benzo[a]anthracene, benzo[b]fluoranthene, benzo[k]fluoranthene, benzo[a]pyrene, chrysene, dibenzo[a,h]anthracene, dibenzofuran, fluoranthene, fluorene, indeno[1,2,3-c,d]pyrene, 1-methylnaphthalene⁵, 2-methylnaphthalene, naphthalene, pyrene, and total cPAH toxic equivalency quotient [TEQ]);
- SVOCs (aniline⁵, bis[2-chloroethyl]ether⁵, bis[2-ethylhexyl]phthalate, butyl benzyl phthalate, 3,3-dichlorobenzidine, 2,4-dichlorophenol⁵, diethyl phthalate⁵, 2,4-dimethylphenol⁵, 2-methylphenol, n-nitrosodimethylamine⁵, n-nitrosodiphenylamine⁵, n-nitrosodi-n-propylamine⁵, pentachlorophenol, phenol and 2,4,6-trichlorophenol⁵);
- VOCs (benzene and chloroform⁵); and,
- Petroleum hydrocarbons (gasoline-, diesel⁵- and oil⁵-range petroleum hydrocarbons).

In addition to Site COPCs, the nature and extent of soil pH is also evaluated because of its potential implications to contaminant fate and transport and remedy selection. The analytical results for soil COPCs and pH in soil at the T115N Site are presented in Table 5-3. The distribution of soil COPCs and pH based on Site stratigraphy (Section 5.1) are presented on Figures M-2 through M-55. Figure M-1 provides a legend for interpretation of Figures M-2 through M-56. As previously discussed, the stratigraphy at the Site provides the framework for the nature and extent of COPCs as they relate to potential contaminant sources and/or preferential migration pathways for Site and off-site contaminants. The stratigraphic units evaluated at T115N during the RI from oldest to youngest include the following:

- Native LDW Alluvium (AD);
- Native Organic Silt (OS);
- Initial Fill (FI);
- Dredge Fill (FD);
- Operational Fill (FO); and,
- Settling Pond Fill (FP).

Sampling and analysis of fill material surrounding the 48-inch drain line was not performed to prevent damaging the 48-inch drain line. The nature and extent of contamination in soil at T115N based on Site stratigraphy is discussed further in the following sections.

⁵ Compound was identified as a groundwater COPC, therefore was retained as a soil COPC for further evaluation.

5.3.1.1. POLYCHLORINATED BIPHENYLS

Analyses for PCB Aroclors were performed on 22 soil samples collected at the Site (Table 4-4). The results for individual Aroclors were summed to provide the results for total PCBs, which are presented in Table 5-3 and shown on Figures M-2 in Appendix M. Figure M-2 presents the results for total PCBs in each of the soil samples collected, including the sample location, sample depth, stratigraphic unit, PCB concentration, and the concentration in comparison to the PCUL.

PCBs were only detected in soil at concentrations greater than the PCUL in material used to fill the settling ponds. Specifically, PCB Aroclors were detected in two samples from location B-13 at concentrations of 1.1 and 7.1 milligrams per kilogram (mg/kg; Table 5-3 and Figure M-2). The samples were representative of the fill material used to backfill the former settling ponds. At B-13, the settling pond fill extends from beneath the concrete paved surface to a depth of approximately 7.5 feet bgs. PCBs were not detected in the other soil samples representative of the initial fill, operational fill or dredged fill collected from locations across T115N. In addition, PCBs were not detected in the sample of native organic silt at location B-12.

Figure M-2 identifies that the total PCB concentrations in samples of the fill in the settling ponds were multiple orders of magnitude greater than the PCUL for total PCBs (0.0000022 mg/kg). In addition, Figure M-2 identifies that the PQLs for the samples of fill and native organic silt were also multiple orders of magnitude greater than the PCUL. The PQLs for PCB Aroclor analyses performed as part of the RI (Table 5-3) met the limits specified in the Ecology-approved RI/FS Work Plan (0.05 mg/kg; Table 4-1). The PQLs for soil samples collected as part of previous environmental studies (0.54 to 0.69 mg/kg) were slightly greater than the PQLs established in the RI/FS Work Plan.

Summary statistics for total PCBs in soil at the Site based on Site stratigraphy are presented in the following table.

PCB PROFILE IN SOIL

STRATIGRAPHIC UNIT	STRATIGRAPHIC SYMBOL	NUMBER OF SAMPLES ANALYZED	FREQUENCY OF DETECTION (%)	FREQUENCY OF EXCEEDANCE (%)		LOCATION AND DEPTH OF MAXIMUM DETECTED EXCEEDANCE
				NON-DETECTS	DETECTS	
Pond Fill	FP	2	100	n/a	100	B-13 (5-6 ft bgs)
Operational Fill	FO	10	0	100	n/a	n/a
Dredged Fill	FD	0	n/a	n/a	n/a	n/a
Initial Fill	FI	9	0	100	n/a	n/a
Native Organic Silt	OS	1	0	100	n/a	n/a
Native Alluvium	AD	0	n/a	n/a	n/a	n/a

Notes:

n/a = not available

ft = feet

bgs = below ground surface

5.3.1.2. DIOXINS AND FURANS

Analyses for dioxins and furans were performed on six samples of soil collected from the Site (Table 4-4). The results for individual dioxin and furan congeners were multiplied by toxicity equivalency factors (TEFs) and summed to provide the total dioxin and furan TEQ concentrations, which are presented in Table 5-3 and shown on Figure M-3 in Appendix M. Figure M-3 presents the results for total dioxins and furans (location, depth, stratigraphic unit, concentration, and concentration in comparison to the PCUL) in each soil sample collected at T115N.

Dioxins and furans were not detected in soil at concentrations exceeding the PCUL based on natural background. Specifically, the detected total dioxin and furan TEQ concentrations were less than the PCUL (5.2 nanograms per kilogram [ng/kg]) in samples representative of the operational fill and initial fill collected across the Site (Table 5-3 and Figure M-3). Figure M-3 also identifies that the total dioxin and furan TEQ concentrations were less than the PCUL. However, dioxins and furans were retained as a COPCs because these compounds are a contaminant of concern (COC) for the LDW and Glacier NW Site and the maximum detected concentration was greater than the simplified TEE screening level (3 ng/kg; Email from Ecology, May 20, 2019).

Summary statistics for total dioxin and furan TEQ concentrations in soil at T115N based on Site stratigraphy are presented in the following table.

DIOXIN AND FURAN TEQ PROFILE IN SOIL

STRATIGRAPHIC UNIT	STRATIGRAPHIC SYMBOL	NUMBER OF SAMPLES ANALYZED	FREQUENCY OF DETECTION (%)	FREQUENCY OF EXCEEDANCE (%)		LOCATION AND DEPTH OF MAXIMUM DETECTED EXCEEDANCE
				NON-DETECTS	DETECTS	
Pond Fill	FP	0	n/a	n/a	n/a	n/a
Operational Fill	FO	5	100	n/a	0	No Exceedance
Dredged Fill	FD	0	n/a	n/a	n/a	n/a
Initial Fill	FI	1	100	n/a	0	No Exceedance
Native Organic Silt	OS	0	n/a	n/a	n/a	n/a
Native Alluvium	AD	0	n/a	n/a	n/a	n/a

Notes:

n/a = not available

ft = feet

bgs = below ground surface

5.3.1.3. METALS

Analyses for metals were performed on up to 137 samples of soil collected from T115N (Table 4-4). The results for antimony, arsenic, barium, cadmium, chromium III/total, copper, lead, mercury, nickel, selenium, silver, thallium and zinc, which are the metals retained as COPCs for soil are presented in Table 53 and shown on Figures M-4 through M-17 in Appendix M. Figures M-4 through M-17 present the results (location, depth, stratigraphic unit, concentration, and concentration in comparison to the PCUL) for metals in each soil sample collected at T115N.

The results of soil analyses indicate that metals including antimony, cadmium, chromium III/total, lead, mercury, silver, and zinc are generally co-located with tin, the metal that was reclaimed as part of historical operations at the Site (Figures M-4, M-7, M-8, M-10, M-11, M-14 and M-17). These co-occurring metals are predominantly detected at concentrations greater than the PCULs in fill soil in and adjacent to the former settling ponds and east of the settling ponds area, in shallow fill soil adjacent to and beneath the former Process Building, and west of the former Process Building in the rail line ROWs. Specifically, antimony, cadmium, chromium III/total, lead, mercury, silver, tin and zinc are present in initial fill and operational fill at depths between 0.5 and 12 feet bgs and above the native organic silt layer on the western portion of the T115N Site. In, and adjacent to the settling ponds, these metals are present in pond fill, operational fill, and initial fill at depths between 1 and 18 feet bgs and in native organic silt at depths between 13 and 15 feet bgs. These metals were not detected at concentrations greater than the PCULs in the native alluvial deposits located below the organic silt layer on the western portion of the Site. These metals are also present greater than the PCUL in the operational fill on the eastern portion of the Site at depths between 2 and 6.5 feet bgs and likely represent localized releases during historical operations prior to the filling that created upland used for T115.

Figures M-4, M-7, M-8, M-10, M-11, M-14, M-16 and M-17 identify that the highest concentrations of antimony, cadmium, chromium III/total, lead, mercury, silver, tin, and zinc were detected in the settling ponds (B-11, B-13 B-15 and MW-16) and east of the settling ponds (MW-18). Figures M-7, M-8, M-10, M-11 and M-17 for cadmium, chromium III/total, lead, mercury, and zinc identify that there were relatively few detected concentrations of these metals at concentrations greater than the PCULs in soil samples collected from the northern portion of T115N adjacent to the property boundary between T115N Site and the Glacier NW Site.

Metals including copper, nickel, and selenium were detected at concentrations greater than the PCULs predominantly in the initial fill and operational fill above the native organic silt layer (Figures M-9, M-12, and M-13). The concentrations of copper, nickel, and selenium are relatively consistent across T115N. Specifically, copper and nickel were predominantly detected at concentrations greater than the PCULs in shallow soil samples at concentrations less than twice the PCULs (Figures M-9 and M-12). Selenium was predominantly detected greater than the PCUL in samples collected at greater depth and generally less than three times the PCUL (Figure M-13). The distribution (in fill) and relatively consistent concentrations of copper, nickel and selenium indicates that fill material is the likely source of these metals and that the concentrations of these metals are relatively consistent in fill across the Site.

The detected concentration of barium was greater than the PCUL in both fill and native soil throughout T115N (Figure M-6). The concentration of barium is relatively consistent across T115N ranging from approximately 20 to 140 mg/kg. Figure M-6 identifies that the highest concentrations were generally detected in initial fill on the western portion of the Site and in pond fill on eastern portion of the Site. The distribution (in fill and native soil) and relatively consistent concentrations of barium across the Site indicates that the barium may be present as the result of background concentrations in fill and native soil used at the Site.

In general, arsenic originating from operations on the Glacier NW Site is located in fill soil within the driveway area on the northern portion of the T115N Site in the vicinity of the historical drainage and 15-inch drain line and extends to the south along the interface between the native organic silt and initial fill layers. Low level concentrations of arsenic was also observed at various locations in the fill soil at the Site.

Specifically, the highest concentrations of arsenic (460 mg/kg) were detected at two locations (MW-14 and MW-4D) on the northern portion of T115N (Figure M-5). Arsenic was greater than the PCUL (7 mg/kg) in all samples collected from location MW-14 of dredge fill starting at 2 feet bgs and down to the native organic silt at 10 to 11 feet bgs. MW-14 is in the general area of a historical drainage and a stormwater drain line that extended from the southern portion of the Glacier NW Site (Figures 2-5 and 2-9) where wood treatment was performed between 1936 and 1939 using arsenic-based preservative (Section 3.2.1) prior to development of T115N for tin reclamation operations in the early 1960s. Arsenic was also greater than the PCUL in all samples collected from the dredge fill down to the native organic silt at locations GMW-26 on the boundary between the T115N Site and Glacier NW Site and GP-59 on the Glacier NW Site where arsenic was detected at 3,070 mg/kg in the native organic silt layer. At T115N, arsenic was detected greater than the PCUL in samples of the native organic silt layer from six locations (B-13, MW-16, MW-15, B-8, MW-12 and MW-11) across the Site and was either not detected or was detected at a concentration less than the PCUL in all samples collected from depths above the native organic silt layer. The locations where arsenic is only detected in the native organic silt layer at concentrations greater than the PCUL include B-13, MW-15 and MW-16 located in and adjacent to the settling ponds. Arsenic was detected greater than the PCUL in fill at the Site between 3 and 11.5 feet bgs at several additional locations (B-7, B-11, MW-3, and TP-2) at between 8.5 and 26 mg/kg and at location MW-17 from 2.5 to 6.5 feet bgs at 54 and 91 mg/kg. Figure M-5 identifies that higher concentrations were detected in soil on the northern portion of T115N and on the adjacent Glacier NW Site. A higher concentration of arsenic was also detected in a sample collected from 2.5 to 3.5 feet bgs from one location (MW-17) on the southeast portion of the Site. Isoconcentration maps prepared as part of the Glacier NW Site RI (Figures 5-1 and 5-2 in Appendix N) identify that the highest concentrations of arsenic in soil are in the vicinity of the former mineralized-cell wood treatment area.

Thallium was detected in two samples collected from 2.5 to 6.5 feet bgs from one location (MW-17) at concentrations greater than the PCUL (Figure M-15).

The PQLs for antimony, selenium, silver, and thallium were greater than the PCULs. The PQLs for antimony, selenium, silver, and thallium analyses performed as part of the RI (Table 5-3) met the limits identified in the Ecology approved RI/FS Work Plan (Table 4-1) in all but between one and five samples. The PQLs for antimony, selenium, silver, and thallium in soil samples collected from locations DP-1, MW-1, MW-3 and MW-5 (Table 5-3) performed as part of previous environmental studies were slightly greater than the PQLs established in the RI/FS Work Plan (Table 4-1). The PQLs for arsenic, mercury, selenium, and silver in the one sample collected from location MST-1, MST-2, and MST-3 (Table 5-3) performed as part of a previous environmental study were also greater than the PQLs established in the RI/FS Work Plan (Table 4-1). Figures M-13, and M-15 for selenium and thallium identify where the PQLs were higher in samples collected at locations sampled as part of previous environmental studies.

Summary statistics for metals in soil based on Site stratigraphy are presented in the following table.

METALS PROFILE IN SOIL

STRATIGRAPHIC UNIT	STRATIGRAPHIC SYMBOL	NUMBER OF SAMPLES ANALYZED	FREQUENCY OF DETECTION (%)	FREQUENCY OF EXCEEDANCE (%)		LOCATION AND DEPTH OF MAXIMUM DETECTED EXCEEDANCE	PRIMARY COPC
				NON-DETECTS	DETECTS		
Pond Fill	FP	7	67.4	62.9	79.5	B-13 (5-6 ft bgs)	Lead and Tin

STRATIGRAPHIC UNIT	STRATIGRAPHIC SYMBOL	NUMBER OF SAMPLES ANALYZED	FREQUENCY OF DETECTION (%)	FREQUENCY OF EXCEEDANCE (%)		LOCATION AND DEPTH OF MAXIMUM DETECTED EXCEEDANCE	PRIMARY COPC
				NON-DETECTS	DETECTS		
Operational Fill	FO	46 - 51	59.9	53.4	52.5	MW-18 (2-3 ft bgs)	Lead and Tin
Dredged Fill	FD	3 - 30	59.0	47.5	25.0	GP-59 (8.3-10 ft bgs)	Arsenic
Initial Fill	FI	37	56.8	50.0	39.2	MW4D (8-9 ft bgs)	Arsenic
Native Organic Silt	OS	14 - 21	58.8	54.7	29.9	GP-59 (10.3-11 ft bgs)	Arsenic
Native Alluvium	AD	4	57.1	57.1	20.0	MW-2D (26-27 ft bgs)	Barium

Notes:

ft = feet

bgs = below ground surface

5.3.1.4. NON-CARCINOGENIC POLYCYCLIC AROMATIC HYDROCARBONS

Analyses for non-carcinogenic PAHs were performed on 143 samples of soil collected from T115N (Table 4-4). The results for acenaphthene, anthracene, dibenzofuran, fluoranthene, fluorene, 1-methylnaphthalene, 2-methylnaphthalene, naphthalene, and pyrene, which are the non-carcinogenic PAHs retained as COPCs for soil, are presented in Table 5-3 and shown on Figures M-18, M-19, M-26, M-27, M-28, and M-30 through M-33 in Appendix M. Figures M-18, M-19, M-26, M-27, M-28, and M-30 through M-33 present the results (location, depth, stratigraphic unit, concentration, and concentration in comparison to the PCUL) for non-carcinogenic PAHs in each soil sample collected.

Non-carcinogenic PAHs including acenaphthene, anthracene, dibenzofuran, fluoranthene, fluorene, 2-methylnaphthalene, naphthalene, and pyrene were detected at concentrations greater than the PCULs at the Site in between two and 36 samples. The detected concentrations of non-carcinogenic PAHs are generally co-located except for naphthalene. In soil, 1-methylnaphthalene was not detected at a concentration greater than the PCUL but was retained as a COPC for soil as requested by Ecology as 1-methylnaphthalene was retained as a COPC for groundwater (Email from Ecology, May 20, 2019).

In general, the highest concentrations of non-carcinogenic PAHs were detected in the south-central portion of the Site beneath the former Process Building (B-8 and B-12 shown on Figures M-18, M-19, M-26, M-27, M-28, and M-30 through M-33). The next highest concentrations were detected at locations adjacent to the former Process Building (DP-1 and MW-3) and in and adjacent to the former settling ponds (B-13). In the south central portion of the T115N in and adjacent to the former Process Building, non-carcinogenic PAHs were detected at concentrations greater than the PCUL in initial fill and operational fill at locations DP-1, MW-1, MW-3, B-8 and B-12 from the ground surface to depths from 10 to 17 feet bgs and in the native organic silt layer at depths from 15 to 17 feet bgs at locations B-8 and B-12. In addition, naphthalene was detected at concentrations greater than the PCUL in operational fill at B-17 and MW-17 at depths from 2.5 to 8 feet bgs southeast of the former Process Building.

In, and adjacent to the former settling ponds at locations B-11, B-13, B-15, B-16, MW-4D, MW-5, MW-16 and MW-18, non-carcinogenic PAHs, excluding naphthalene, were detected at concentrations greater than the PCULs in the fill material used to backfill the former ponds and in initial fill and operational fill from the ground surface up to 11 feet bgs. At locations B-13 and MW-16, naphthalene was also detected at a concentration greater than the PCUL in the native organic silt layer at depths between 11.5 and 16 feet bgs (Figure M-32).

In the western portion of T115N, non-carcinogenic PAHs were detected at concentrations greater than the PCULs at B-1, B-2 and B-3 located along the rail line ROW in shallow initial fill and operational fill at depths from 1 to 4 feet bgs. Non-carcinogenic PAHs were also detected at concentrations greater than the PCULs at MW-11 in one sample collected from 3 to 4 feet bgs. Non-carcinogenic PAHs were either not detected with PQLs less than less than the PCULs or were detected at concentrations less than the PCULs in the other samples collected from MW-11.

On the southeastern portion of T115N near the 1965 shoreline, concentrations of acenaphthene, anthracene, fluoranthene, fluorene and naphthalene were detected at concentrations greater than the PCULs at MW-19D in the LDW alluvial deposits at a depth of 26 to 27 feet bgs (Figure M-18, M-19, M-27, M-28 and M-32). Non-carcinogenic PAHs were not detected in 3 samples collected from between 3 and 11 feet bgs at MW-19D.

Figures M-18, M-19, M-26 through M-28, M-30, M-31 and M-33 identify that the highest detected concentrations of non-carcinogenic PAHs, excluding naphthalene, were in the south central portion of T115N beneath the former Process Building (B-8 and B-12), adjacent to the former Process Building (DP-1 and MW-3) and in and adjacent to the former settling ponds (B-13). Figures M-18, M-19, M-26 through M-28, M-30, M-31 and M-33 also identify that non-carcinogenic PAHs, excluding naphthalene, are also present in soil on the northwest (MW-11) and southeast portions (MW-19D) of the Site.

Figure M-32 identifies that the highest detected concentrations of naphthalene in samples from T115N were also in the south-central portion of T115N beneath the former Process Building (B-8 and B-12), adjacent to the former Process Building (DP-1 and MW-3) and in and adjacent to the former settling ponds (B-13). Figure M-32 identifies that naphthalene is also present in soil at multiple additional locations on the northwest (B-3 and MW-11) and southeast portions (B-17, MW-17, and MW-19D) of the Site.

The PQLs were greater than the PCUL in multiple samples analyzed for naphthalene (Table 5-3 and Figure M-32). The PQLs for naphthalene analyses performed as part of the RI (Table 5-3) met the limits identified in the Ecology approved RI/FS Work Plan (0.0067 mg/kg; Table 4-1) in all but one sample collected from location B-2. The PQLs for soil samples collected from locations DP-1, MW-1, MW-3 and MW-5 performed as part of previous environmental studies (0.008 to 0.038 mg/kg) were greater than the PQLs established in the RI/FS Work Plan.

Summary statistics for non-carcinogenic PAHs in soil based on Site stratigraphy are presented in the following table.

NON-CARCINOGENIC PAH PROFILE IN SOIL

STRATIGRAPHIC UNIT	STRATIGRAPHIC SYMBOL	NUMBER OF SAMPLES ANALYZED	FREQUENCY OF DETECTION (%)	FREQUENCY OF EXCEEDANCE (%)		LOCATION AND DEPTH OF MAXIMUM DETECTED EXCEEDANCE	PRIMARY COPC
				NON-DETECTS	DETECTS		
Pond Fill	FP	7	66.2	0	35.3	B-13 (5-6 ft bgs)	Naphthalene
Operational Fill	FO	47	35.9	2.9	24.8	B-12 (9-10 ft bgs)	Naphthalene
Dredged Fill	FD	7	59.7	0	9.1	GP-59 (4.3-6.2 ft bgs)	Naphthalene
Initial Fill	FI	47	23.0	3.0	23.9	B-8 (10-11 ft bgs)	Naphthalene
Native Organic Silt	OS	20	22.3	2.4	24.1	B-8 (15-16 ft bgs)	Naphthalene
Native Alluvium	AD	7	23.2	1.3	32.5	MW-19D (26-27 ft bgs)	Naphthalene

Notes:

ft = feet

bgs = below ground surface

5.3.1.5. CARCINOGENIC POLYCYCLIC AROMATIC HYDROCARBONS

Analyses for cPAHs were performed on 141 samples of soil collected from T115N (Table 4-4). The results for benzo(a)anthracene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(a)pyrene, chrysene, dibenzo(a,h)anthracene and indeno(1,2,3-c,d)pyrene, which are the cPAHs retained as COPCs for soil, are presented in Table 5-3 and shown on Figures M-20 through M-25 and M-29 in Appendix M. The results for individual cPAHs were multiplied by TEFs and summed to provide the total cPAH TEQ concentrations, which are presented in Table 5-3 and shown on Figure M-34 in Appendix M.

Concentrations of cPAHs including benzo(a)anthracene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(a)pyrene, chrysene, dibenzo(a,h)anthracene and indeno(1,2,3-c,d)pyrene expressed as total cPAH TEQ were detected greater than the PCULs in soil samples collected from multiple locations at T115N. In general, the highest concentrations of cPAHs were observed in the vicinity of the former settling ponds and along the rail alignment west of the former Process Building. Individual cPAHs were generally detected at concentrations greater than the PCULs in the initial fill and operational fill at depths between 0.5 and 9 feet bgs west of the historical shoreline and in pond fill at depths between 1 and 9 feet bgs (Figures M-20 through M-25 and M-29). Individual cPAHs were also detected at concentrations greater than the PCULs in two samples of native organic silt collected from locations B-13 and MW-4D west of the historical shoreline at depths between 10 and 16 feet bgs. East of the historical shoreline, cPAH concentrations greater than the PCULs were generally detected at greater depth and were also detected in native LDW alluvium deposits at depths between 15 and 27 feet bgs. In general, the highest concentrations of individual cPAHs were detected adjacent to the former Process Building (DP-1), beneath the former Process Building (B-8), and in and adjacent to the former settling ponds (B-11, B-13 and MW-5). The highest detected concentrations were generally found in samples that were collected from between 0.5 and 8 feet bgs.

The total cPAH TEQ concentrations in soil at the Site ranged from 0.0051 to 0.51 mg/kg and are greater than the PCUL (0.000016 mg/kg). The highest total cPAH TEQ concentrations were detected adjacent to the former Process Building at location DP-1 in operational fill at 0.5 to 1 foot bgs, in and adjacent to the former settling ponds at B-11, B-13 and MW-5 in pond fill and operational fill at between 5 and 11 feet bgs, beneath the former Process Building at B-8 in operational fill at 4 to 5 feet bgs and on the western portion of T115N in the rail line ROW at B-2 in operational fill at between 1 to 2 feet bgs (Figure M-34). Figure M-34 further identifies the locations where the highest total cPAH TEQ concentrations were detected.

The PQLs were greater than the PCULs in each of the samples analyzed for cPAHs (Table 5-3 and Figures M-20 through M-34). The PQLs for cPAH analyses performed as part of the RI (Table 5-3) met the limits identified in the Ecology approved RI/FS Work Plan (0.0067 mg/kg) (Table 4-1) in all but 10 samples. Multiple cPAHs were detected in the 10 samples causing the PQLs to be raised for cPAHs that were not detected in the samples. The PQLs for soil samples collected from locations DP-1, MW-1, MW-3 and MW-5 performed as part of previous environmental studies (0.0082 to 0.0093 mg/kg) were slightly greater than the PQLs established in the RI/FS Work Plan.

Summary statistics for cPAH TEQ in soil based on Site stratigraphy are presented in the following table.

CARCINOGENIC PAH PROFILE IN SOIL

STRATIGRAPHIC UNIT	STRATIGRAPHIC SYMBOL	NUMBER OF SAMPLES ANALYZED	FREQUENCY OF DETECTION (%)	FREQUENCY OF EXCEEDANCE (%)		LOCATION AND DEPTH OF MAXIMUM DETECTED EXCEEDANCE
				NON-DETECTS	DETECTS	
Pond Fill	FP	7	85.7	100	100	B-13 (5-6 ft bgs)
Operational Fill	FO	46	45.7	100	100	DP-1 (0.5-1 ft bgs)
Dredged Fill	FD	7	85.7	100	100	MW-14 (2-3 ft bgs)
Initial Fill	FI	46	19.6	100	100	B-8 (4-5 ft bgs)
Native Organic Silt	OS	20	20	100	100	GP-59 (10.3-11 ft bgs)
Native Alluvium	AD	9	44.4	100	100	MW-17 (19-20 ft bgs)

Notes:

ft = feet

bgs = below ground surface

5.3.1.6. SEMI-VOLATILE ORGANIC COMPOUNDS

Analyses for SVOCs (other than PAHs) were performed on up to 143 samples of soil collected from T115N (Table 4-4). The results for aniline, bis(2-chloroethyl)ether, bis(2-ethylhexyl)phthalate, butyl benzyl phthalate, 3,3'-dichlorobenzidine, 2,4-dichlorophenol, diethyl phthalate, 2,4-dimethylphenol, 2-methylphenol (o-Cresol), n-nitrosodimethylamine, n-nitrosodiphenylamine, n-nitrosodi-n-propylamine, pentachlorophenol, phenol, and 2,4,6-trichlorophenol, which are the SVOCs retained as COPCs for soil are

presented in Table 5-3 and shown on Figures M-35 through M-49 in Appendix M. Figures M-35 through M-49 present the results (location, depth, stratigraphic unit, concentration, and concentration in comparison to the PCUL) for SVOCs in each soil sample collected at T115N.

SVOCs including, bis(2-ethylhexyl) phthalate, butyl benzyl phthalate, 3,3'-dichlorobenzidine, 2,4-dichlorophenol, 2,4-dimethylphenol, 2-methylphenol, pentachlorophenol, and phenol were detected at concentrations greater than the PCULs in soil at the Site. Concentrations of bis(2-ethylhexyl)phthalate appear to be widespread in the initial, operational and settling pond fill, and in the native organic silt layer at the Site. Butyl benzyl phthalate, 3,3'-dichlorobenzidine, 2,4-dimethylphenol, 2-methylphenol, and phenol were sporadically detected at concentrations greater than the PCULs in soil. Bis(2-chloroethyl)ether, 2,4-dichlorophenol, diethyl phthalate, n-nitrosodiphenylamine, n-nitrosodi-n-propylamine, and 2,4,6-trichlorophenol were only detected at concentrations exceeding the PCUL in the native alluvium at the northeast corner of T115N (Table 5-3 and Figures M-36, M-40, M-41, M-45, M-46 and M-49). Pentachlorophenol was only detected at concentrations exceeding the PCUL in the dredged fill at the southeast corner of the Glacier NW Site and shallow fill soil within the rail alignment southwest of T115N. SVOCs including aniline and n-nitrosodimethylamine were not detected in soil at the Site (Table 5-3 and Figures M-35 and M-44) while bis(2-chloroethyl)ether, 2,4-dichlorophenol, diethyl phthalate, nitrosodiphenylamine, n-nitrosodi-n-propylamine and 2,4,6-trichlorophenol met one or more of the COPC elimination criteria established by Ecology (Section 4.2 and Table 4-4). However, these compounds were identified as COPCs in groundwater and therefore, were retained as soil COPCs for further evaluation (Table 4-7).

Bis(2-ethylhexyl)phthalate was detected at concentrations ranging from 0.0084 to 0.55 mg/kg and greater than the PCUL (0.00018 mg/kg). Bis(2-ethylhexyl)phthalate was greater than the PCUL at multiple locations on the western portion of the Site in the initial fill and operational fill, in dredge fill at MW-14, and in pond fill at B-11 and MW-16 at depths ranging from 0.5 to approximately 12.5 feet bgs (Figure M-37). Bis(2-ethylhexyl) phthalate was also detected at concentrations greater than the PCUL in the native organic silt layer at B-3, MW-2D, MW-4D, MW-11, MW-20, MW-15 and MW-16 and native LDW alluvium underlying the native organic silt at MW-2D and MW-4D on the western portion of the Site, west of the historical shoreline. Bis(2-ethylhexyl)phthalate was detected at concentrations greater than the PCUL in operational fill and native LDW alluvium at depths ranging from 2.5 to 27 feet bgs on the eastern portion of the Site. Figure M-37 identifies that the highest concentrations of bis(2-ethylhexyl)phthalate were identified in samples collected from northern portion of the Site adjacent to the Glacier NW Site (MW-12, MW-13, and MW-14), adjacent to the former settling ponds (MW-4D, MW-15), adjacent to the former process building (B-7, B-10, and MW-3). On the western portion of T115N in the rail line ROW (DP-1, MW-20, TP-1, and B-2), and on the eastern portion of the Site (MW-17, MW-19D, and MW-18).

Butyl benzyl phthalate was detected at a concentration greater than the PCUL in only two samples of operational fill from two locations on the western portion of the Site (TP-1 and MW-2D) from 1 to 5.5 feet bgs and in the native alluvium at location MW-10D (Figure M-38). 3,3'-Dichlorobenzidine was detected at a concentration greater than the PCUL in five soil samples of pond fill collected from four locations (B-11, B-13, B-15, and MW-16) from 1 to 8 feet bgs and in the native alluvium at location MW-10D (Figure M-39). 2-Methylphenol and phenol were greater than the PCUL in three samples collected from the native organic silt layer or a sample of initial fill just above the organic silt layer from four locations (B-11, B-13, MW-15, and MW-16) and in the native alluvium at location MW-10D adjacent to the former settling ponds area at depths from 11.5 to 16 feet bgs (Figures M-43 and M-48). 2-Methylphenol and phenol were not detected

at concentrations greater than the PCUL in multiple samples collected from 1 to 10 feet bgs at the same five locations. At the southwest corner of T115N, pentachlorophenol was detected in one sample of operational fill at a concentration greater than the PCUL at location B-2 at a depth of 1 to 2 feet bgs (Figure M-47). On the south-central portion of the Site, 2,4-dimethylphenol was detected in two samples at a concentration greater than the PCUL in the operational fill and native organic silt at location B-12 at a depth of from 9 to 17 feet bgs and in the native alluvium at location MW-10D (Figure M-42).

The PQLs for bis(2-chloroethyl)ether, bis(2-ethylhexyl)phthalate, butyl benzyl phthalate, 3,3'-dichlorobenzidine, 2,4-dichlorophenol, diethyl phthalate, 2,4-dimethylphenol, 2-methylphenol (o-Cresol), n-nitrosodimethylamine, n-nitrosodiphenylamine, n-nitrosodi-n-propylamine, pentachlorophenol, and 2,4,6-trichlorophenol were greater than the PCULs. The PQLs for SVOC analyses performed as part of the RI (Table 5-3) met the limits identified in the Ecology approved RI/FS Work Plan (Table 4-1) in all but 10 samples. In most of the samples, one or more other SVOCs were detected causing the PQLs to be raised for SVOCs that were not detected. The PQLs for soil samples collected from locations DP-1, MW-1, MW-3 and MW-5 performed as part of previous environmental studies were also slightly greater than the PQLs established in the RI/FS Work Plan.

Summary statistics for SVOCs in soil based on Site stratigraphy are presented in the following table.

OTHER SVOCs PROFILE IN SOIL

STRATIGRAPHIC UNIT	STRATIGRAPHIC SYMBOL	NUMBER OF SAMPLES ANALYZED	FREQUENCY OF DETECTION (%)	FREQUENCY OF EXCEEDANCE (%)		LOCATION AND DEPTH OF MAXIMUM DETECTED EXCEEDANCE	PRIMARY COPC
				NON-DETECTS	DETECTS		
Pond Fill	FP	7	12.2	90.5	66.6	B-13 (5-6 ft bgs)	3,3'-Dichlorobenzidine
Operational Fill	FO	47	7.9	86.0	100	B-2 (1-2 ft bgs)	Pentachlorophenol
Dredged Fill	FD	13	13.6	77.6	83.3	GP-59 (2.3-8.9 ft bgs)	Pentachlorophenol
Initial Fill	FI	47	5.2	86.0	75.0	MW-3 (17-18 ft bgs)	Bis(2-Ethylhexyl) Phthalate
Native Organic Silt	OS	20	10.0	84.9	87.5	B-13 (15-16 ft bgs)	Phenol and 2-Methylphenol
Native Alluvium	AD	9	7.9	85.7	100	MW-19D (26-27 ft bgs)	Bis(2-Ethylhexyl) Phthalate

Notes:

ft = feet

bgs = below ground surface

5.3.1.7. VOLATILE ORGANIC COMPOUNDS

Analyses for VOCs were performed on 109 samples of soil collected from T115N (Table 4-4). The results for benzene and chloroform, which are the VOCs retained as COPCs for soil are presented in Table 5-3 and shown on Figures M-50 and M-51 in Appendix M. Figures M-50 and M-51 present the results for benzene and chloroform in each soil sample collected at the Site.

In general, elevated concentrations of benzene were detected in and around the former settling ponds and in scattered shallow soil locations east and west of the former Process Building. Chloroform was not detected in any soil samples at PQLs less than the PCUL (0.052 mg/kg; Figure M-51). However, chloroform was retained as a COPC for soil as requested by Ecology because chloroform was identified as a COPC for groundwater (Email from Ecology, May 20, 2019).

The detected concentrations of benzene range from 0.0011 to 0.024 mg/kg and are greater than the PCUL (0.00056 mg/kg) in 12 samples collected from six locations at depths from approximately 1 to 16 feet bgs (Table 5-3 and Figure M-50). The highest concentrations of benzene were detected in samples collected in and adjacent to the former settling ponds at location MW-4D at a depth of 2 to 3 feet bgs and at locations B-11 and B-13 at depths ranging between 5 to 8 feet bgs. At locations B-11 and B-13, the detected concentrations of benzene greater than the PCUL extend vertically from the pond fill down to the native organic silt layer. At location MW-4D, benzene was only detected in shallow operational fill soil. Benzene concentrations greater than the PCUL were also detected in pond fill at 3 to 4 feet bgs and initial fill from 7.5 to 8.5 feet bgs at MW-16 in the settling pond area and in operational fill at 2 to 3 feet bgs at MW-18 east of the former settling pond area. In addition, benzene was greater than the PCUL in operational fill at 1 to 2 feet bgs at MW-11 on the northwest portion of the Site. Figure M-50 identifies that the highest benzene concentrations in soil were detected in and adjacent to the former settling ponds. Benzene was not detected in any other soil samples collected at the Site. The PQLs for benzene in soil samples were greater than the PCUL (0.00056 mg/kg). The PQLs for benzene analyses performed as part of the RI (Table 5-3) met the limits identified in the Ecology approved RI/FS Work Plan (0.001 mg/kg; Table 4-1).

Because chloroform was not detected in soil at PQLs less than the PCUL, only summary statistics for benzene in soil based on Site stratigraphy are presented in the following table.

BENZENE PROFILE IN SOIL

STRATIGRAPHIC UNIT	STRATIGRAPHIC SYMBOL	NUMBER OF SAMPLES ANALYZED	FREQUENCY OF DETECTION (%)	FREQUENCY OF EXCEEDANCE (%)		LOCATION AND DEPTH OF MAXIMUM DETECTED EXCEEDANCE
				NON-DETECTS	DETECTS	
Pond Fill	FP	7	42.9	100	100	B-11 (7-8 ft bgs)
Operational Fill	FO	35	11.4	100	100	MW-4D (2-3 ft bgs)
Dredged Fill	FD	12	0	100	n/a	n/a
Initial Fill	FI	32	12.5	100	100	B-11 (9-10 ft bgs)
Native Organic Silt	OS	15	6.7	100	100	B-13 (15-16 ft bgs)
Native Alluvium	AD	8	0	100	n/a	n/a

Notes:

n/a = not available

ft = feet

bgs = below ground surface

5.3.1.8. PETROLEUM HYDROCARBONS

Analyses for petroleum hydrocarbons were performed on 58 samples of soil collected from T115N (Table 4-4). The results for gasoline-, diesel-, oil-range petroleum hydrocarbons, and total diesel- and oil-range petroleum hydrocarbons which are retained as COPCs for soil are presented in Table 5-3 and shown on Figures M-52 and M-53 in Appendix M. Figures M-52 and M-53 present the results for gasoline-range petroleum hydrocarbons and total diesel- and oil-range petroleum hydrocarbons in each soil sample collected at T115N.

Gasoline-range petroleum hydrocarbons were detected in one sample beneath the former Process Building at a concentration greater than the PCUL. Diesel- and oil-range petroleum hydrocarbons were only detected in shallow soil at one location east of the former settling ponds. Gasoline-, diesel- and oil-range petroleum hydrocarbons were retained as a COPC at the request of Ecology pending evaluation of whether there is a localized area of detections requiring additional characterization or because they are a groundwater COPC (Email from Ecology, May 20, 2019).

Gasoline-range hydrocarbons were detected at concentrations ranging from 6.2 to 57 mg/kg in four soil samples collected from two locations (B-8 and B-12) beneath the Former Process Building (Table 5-3 and Figure M-52). The gasoline-range hydrocarbon concentration was greater than the PCUL (30 mg/kg) in only one sample collected at location B-8 representative of the native organic silt layer at a depth of 15 to 16 feet bgs. Gasoline-range petroleum hydrocarbons in soil samples collected from depths ranging from 4 to 11 feet bgs beneath the former process building (B-8 and B-12) were detected at concentrations less than the PCUL or were not detected at PQLs less than the PCUL. Additionally, gasoline-range petroleum hydrocarbons were not detected at PQLs less than the PCUL in samples of the native organic silt layer collected from locations surrounding B-8 (B-7, B-12, and MW-20). Gasoline-range petroleum hydrocarbons were also not detected at PQLs less than the PCUL in the other soil samples collected from the Site. Figure M-52 identifies that the gasoline-range hydrocarbon concentrations were less than the PCUL in all but one sample from a location (B-8) beneath the former Process Building.

Total diesel- and oil-range petroleum hydrocarbons were detected at concentrations ranging from 32 to 2,630 mg/kg in 28 samples collected from 14 locations (Table 5-3 and Figure M-53). The highest total diesel- and oil-range hydrocarbon concentration was at location MW-18 in the operational fill at a depth up to 6 feet bgs. Other PCUL exceedances of total diesel- and oil-range petroleum hydrocarbons were observed at MW-20 in shallow fill (2 to 3 feet bgs) in the southwest portion of the Site and B-7 in shallow fill (3 to 4 feet bgs) beneath the former AST containment area. Total diesel- and oil-range petroleum hydrocarbons were also detected at concentrations less than the PCUL or not detected at PQLs less than the PCUL in all other soil samples collected from the Site.

The PQLs for gasoline-, diesel-, and oil-range petroleum hydrocarbons for analyses performed as part of the RI (Table 5-3) met the limits identified in the Ecology approved RI/FS Work Plan (Table 4-1).

Summary statistics for petroleum hydrocarbons in soil based on Site stratigraphy are presented in the following table.

PETROLEUM HYDROCARBON PROFILE IN SOIL

STRATIGRAPHIC UNIT	STRATIGRAPHIC SYMBOL	NUMBER OF SAMPLES ANALYZED	FREQUENCY OF DETECTION (%)	FREQUENCY OF EXCEEDANCE (%)		LOCATION AND DEPTH OF MAXIMUM DETECTED EXCEEDANCE	PRIMARY COPC
				NON-DETECTS	DETECTS		
Pond Fill	FP	0	n/a	n/a	n/a	n/a	n/a
Operational Fill	FO	22	33.3	0	7.9	MW-18 (2-3 ft bgs)	Total Diesel and Oil
Dredged Fill	FD	0	n/a	n/a	n/a	n/a	n/a
Initial Fill	FI	20	8.3	0	0	n/a	n/a
Native Organic Silt	OS	8	29.2	0	33.3	B-8 (15-16 ft bgs)	Gasoline
Native Alluvium	AD	4	50	n/a	n/a	n/a	n/a

Notes:

n/a = not available

ft = feet

bgs = below ground surface

5.3.1.9. SOIL PH

Analysis of pH were performed on 130 samples of soil collected from T115N. Soil pH was tested because of the potential effects on contaminant fate and transport and remedy selection. The results for soil pH are presented in Table 5-3 and shown on Figure M-54 in Appendix M. Figure M-54 presents the results for pH in each soil sample collected at T115N.

The highest pH (greater than 9) is located in the vicinity of the former settling ponds, in shallow soil beneath the former Process Building, and in shallow soil along the rail alignment. In soil, pH ranges from 5.6 to 12 with the highest pH values measured in and directly adjacent to the former settling ponds. At locations B-11, B-13, B-14, B-15, B-16, MW-15, and MW-16 (Figure M-54) that are in and adjacent to the former settling ponds area, pH ranged from approximately 10 to 12 in fill and native soil from 1 to 16 feet bgs. pH was also measured up to 11 in one or more samples at several additional locations around the former settling pond area at locations B-7, MW-10D and MW-17. In soil, pH greater than 9 was also measured in one more or samples collected from locations surrounding the locations in and adjacent to the former settling ponds area. The pH in soil samples collected from locations west of the former Process Building were between 6.7 and 9.1. Figure M-54 identifies that the range of pH in samples from the T115N Site and that higher pH (basic conditions) are present in soil in and adjacent to the former settling ponds at the Site.

5.3.2. Groundwater

The nature and extent of contamination in groundwater at the Site was evaluated based on water samples collected during the RI and previous environmental studies (Figures 3-2 and 3-4). Groundwater conditions for the Site are represented by 121 groundwater samples (including duplicates) collected from 27 monitoring wells during previous investigations performed at T115N in 2009 and quarterly monitoring performed between June 2014 and April 2015 (Section 5.2). In addition, the results of groundwater monitoring completed by Ecology in 2017 as part of a regional LDW study (Ecology 2017) were also used to characterize groundwater conditions. Twenty-two of the monitoring wells at the Site were completed above

the native organic silt layer (local confining layer) identified in the western portion of the Site to evaluate shallow groundwater conditions. Two deep monitoring wells (MW-2D and MW-4D) were completed below the native organic silt layer west of the historical shoreline and two deep monitoring wells (MW-10D and MW-19D) were completed beyond the eastern extent of native organic silt layer and historical shoreline to evaluate deep groundwater conditions. In addition, groundwater data collected from monitoring wells located along the southern portion of the Glacier NW Site adjacent to the T115N Site (GMW-3S, GMW-3D, GMW-18, GMW-20 and GMW-24) were reviewed to evaluate the nature and extent of contamination and potential off-site sources of contamination. Specific details of RI investigation activities and previous environmental investigations for the Site and the Glacier NW Site are summarized in Section 3.0.

As discussed in Section 4.0, the following constituents were identified as COPCs for groundwater for the Site based on criteria set forth by Ecology (Table 4-5):

- Total PCBs;
- Dioxins and furans;
- Metals (arsenic, barium, cadmium, chromium III/total, copper, lead, mercury, nickel silver, thallium, and zinc);
- PAH compounds (acenaphthene, anthracene, benzo[a]anthracene, benzo[b]fluoranthene, benzo[k]fluoranthene, benzo[a]pyrene, chrysene, dibenzo[a,h]anthracene, fluoranthene, fluorene, indeno[1,2,3-c,d]pyrene, 1-methylnaphthalene, naphthalene, pyrene, and total cPAH TEQ);
- SVOCs (aniline, bis[2-chloroethyl]ether, bis[2-ethylhexyl]phthalate, butyl benzyl phthalate, 2,4-dichlorophenol, diethyl phthalate, 2,4-dimethylphenol, 2-methylphenol, n-nitrosodimethylamine, n-nitrosodiphenylamine, n-nitrosodi-n-propylamine, pentachlorophenol, phenol, and 2,4,6-trichlorophenol);
- VOCs (benzene and chloroform); and,
- Petroleum hydrocarbons (gasoline-, diesel- and oil-range hydrocarbons).

In addition to Site COPCs, the nature and extent of groundwater pH is also evaluated because of its potential effects on contaminant fate and transport and remedy selection. As previously discussed, Site hydrogeology provides the framework for the nature and extent of COPCs as they relate to potential contaminant sources and/or preferential migration pathways for Site and off-site contaminants. Hydrogeologic zones evaluated during the RI include shallow and deep groundwater west of the historical shoreline and mixed groundwater east of the historical shoreline. Hydraulic gradients and flow direction for shallow groundwater is generally north/northeast toward the 48-inch drain line and Glacier Bay. Hydraulic gradients and flow direction for deep groundwater on average is northeast toward Glacier Bay and is tidally influenced. West of the historical shoreline, native organic silt and silt/clay fill soil prevent the vertical flow of water between the shallow and deep groundwater zones. The analytical results for groundwater COPCs and pH in groundwater are presented in Table 5-4. The distribution of COPCs and pH are presented on Figures M-55 through M-103. The nature and extent of contamination in groundwater is discussed further in the following sections.

5.3.2.1. POLYCHLORINATED BIPHENYLS

Analyses for PCB Aroclors and congeners were performed on three samples of groundwater collected from the Site (Table 4-5). The results for individual Aroclors were summed to provide the result for total PCBs based on Aroclors and the results for individual congeners were summed to provide the result for total PCBs

based on congeners. The results of total PCBs based on Aroclors and congeners are provided in Table 5-4 and presented on Figures M-55 and M-56 in Appendix M. Figure M-55 and M-56 present the results for total PCBs in each groundwater sample collected at T115N and the concentration in comparison to the PCUL.

PCBs were detected in groundwater samples collected by Ecology at the T115N Site at concentrations greater than the PCUL as part of a LDW groundwater study (Leidos 2017). However, historical uses of T115N did not include the use of PCB-containing equipment and, in soil, the only detected concentrations of PCBs were limited to the material used to fill the former settling ponds. As shown on Figure M-56, PCB congener concentrations decrease across the Site from the southwest corner to the northeast corner of T115N, which is an indication that detected concentrations in soil are not contributing to the detected concentrations in groundwater.

PCB Aroclor and congener analyses were performed on samples of shallow groundwater collected from monitoring wells MW-20, MW-3 and MW-10 at T115N as part of a 2017 Ecology Study (Leidos 2017). PCB Aroclors were not detected in the groundwater samples that were collected (Table 5-4 and Figure M-55). The PQLs (10 microgram per liter or $\mu\text{g/L}$) for the PCB Aroclor analyses were greater than the PCUL (0.000007 $\mu\text{g/L}$). Total PCBs based on congeners were detected in the groundwater samples at concentrations ranging between 0.0012 and 0.0046 $\mu\text{g/L}$. The highest concentration was detected at MW-20 located in the southwest portion of the Site while the lowest concentration was detected at MW-10 located in the northeast portion of the Site (Table 5-4 and Figure M-56). The total PCB concentrations based on congeners were greater than the PCUL.

Summary statistics for total PCB congeners detected in groundwater at T115N based on Site hydrogeologic units are presented in the following table.

PCB DISTRIBUTION IN GROUNDWATER

STRATIGRAPHIC UNIT	NUMBER OF SAMPLES ANALYZED	FREQUENCY OF DETECTION (%)	FREQUENCY OF EXCEEDANCE (%)		LOCATION OF MAXIMUM DETECTED EXCEEDANCE
			NON-DETECTS	DETECTS	
Shallow Groundwater West of Historical Shoreline	2	100	n/a	100	MW-20
Groundwater East of Historical Shoreline	1	100	n/a	100	MW-10
Deep Groundwater West of Historical Shoreline	0	n/a	n/a	n/a	n/a

Notes:

n/a = not available

5.3.2.2. DIOXINS AND FURANS

Analyses for dioxins and furans were performed on one sample of groundwater collected from the Site (Table 4-5). The results for individual dioxin and furan congeners were multiplied by TEFs and summed to provide the total dioxin and furan TEQ concentration, which is presented in Table 5-4 and shown on Figure M-57 in Appendix M. Figure M-57 presents the total dioxin and furan TEQ concentration in the groundwater sample collected at T115N in comparison to the PCUL.

Dioxin and furans were detected at a concentration greater than the PCUL in one groundwater sample collected by Ecology on the boundary between the Glacier NW Site and T115N during the January 2015 monitoring event. Dioxins and furans were detected in soil at the T115N Site as concentrations less than the natural background concentration for Washington State. As the dioxin and furan concentrations in soil at T115N are less than the natural background concentration in Washington State, soil at T115N is not expected to be the source of elevated concentrations of dioxins and furans in groundwater.

The detected total dioxin and furan TEQ concentration (0.000974 nanogram per liter [ng/L]) was greater than the PCUL (0.0000051 ng/L) in the sample collected from GMW-27 (Table 5-4 and Figure M-57). GMW-27 is located on the northeast portion of the Site and north of the 48-inch drain line adjacent to Glacier Bay. No other samples were collected for dioxin and furan analysis from the Site.

Summary statistics for total dioxin and furan TEQ concentrations in groundwater at T115N based on Site hydrogeologic units are presented in the following table.

DIOXIN AND FURAN DISTRIBUTION IN GROUNDWATER

STRATIGRAPHIC UNIT	NUMBER OF SAMPLES ANALYZED	FREQUENCY OF DETECTION (%)	FREQUENCY OF EXCEEDANCE (%)		LOCATION OF MAXIMUM DETECTED EXCEEDANCE
			NON-DETECTS	DETECTS	
Shallow Groundwater West of Historical Shoreline	0	n/a	n/a	n/a	n/a
Groundwater East of Historical Shoreline	1	100	n/a	100	GMW-27
Deep Groundwater West of Historical Shoreline	0	n/a	n/a	n/a	n/a

Notes:

n/a = not available

5.3.2.3. METALS

Analyses for total and dissolved metals were performed on 121 samples of groundwater collected from T115N (Table 4-5). The results for arsenic, barium, cadmium, chromium III/total, copper, lead, mercury, nickel, silver, thallium, and zinc, which are the metals retained as COPCs for groundwater, are presented in Table 5-4 and shown on Figures M-58 through M-68 in Appendix M. Figures M-58 through M-68 present the results for total and dissolved metals in each groundwater sample collected at T115N during each sampling event and include the concentrations in comparison to the PCULs.

Similar to the soil results, results of groundwater analyses indicate that metals including barium, cadmium, chromium III/total, lead, mercury, silver, and zinc are generally co-located in shallow groundwater in the vicinity of the former settling ponds and at location MW-7 located at the southeast corner of the 1965 shoreline at the Site (Figures M-59, M-60, M-61, M-63, M-64, M-66, and M-68). In shallow groundwater, the total and dissolved concentrations of barium, cadmium, chromium III/total, lead, mercury, silver, and zinc were greater than the PCULs during one or more monitoring events in and adjacent to the former settling ponds (MW-4, MW-5, MW-15, MW-16, MW-18, and MW-19). As shown in Figures M-59, M-60, M-61, M-63, M-66, and M-68, the locations in and adjacent to the former settling ponds where barium, cadmium, chromium III/total, lead, silver, and zinc were greater than the PCULs in shallow groundwater during one or more monitoring events are bounded by multiple locations with detected concentrations less than the PCULs or where these metals were not detected at PQLs less than the PCULs during monitoring

performed as part of the RI. Barium, cadmium, chromium III/total, lead, mercury, silver, and zinc were not detected at concentrations greater than the PCULs in deep groundwater at the Site. In addition, barium, cadmium, chromium III/total, lead, mercury, silver, and zinc were not detected in groundwater at concentrations greater than the PCULs during quarterly monitoring performed as part of the RI at monitoring wells located between T115N and the 48-inch drain line and Glacier Bay (MW-9, MW-10, MW-10D, GMW-26 and GMW-27; Figures M-59, M-60, M-62, M-63, M-64, M-66, and M-68). Figures M-59, M-60, M-61, M-63, M-64, M-66, and M-68 for dissolved barium, cadmium, chromium III/total, lead, silver, and zinc also identify that these metals were not detected in groundwater at concentrations greater than the PCULs during quarterly monitoring performed as part of the RI at monitoring wells located between T115N and the 48-inch drain line and Glacier Bay.

The total concentrations of chromium III/total, lead, and zinc were greater than the PCULs in one sample of shallow groundwater from one or more locations adjacent to the former processing building (MW-1, MW-6, and DP-1) and at MW-2 west of the former Process Building in 2009 during previous environmental studies but were not greater than the PCULs in the corresponding dissolved sample analyses (Figures M-61, M-63, and M-68). In addition, chromium III/total, lead, and zinc were not detected at concentrations greater than the PCULs during subsequent monitoring performed as part of the RI. Total and dissolved cadmium, chromium III/total, lead, and zinc were also detected at concentrations greater than the PCULs during two or more monitoring events at location MW-7 located east of the 1965 shoreline.

With respect to total and dissolved copper and nickel, the highest concentrations at the Site were generally observed in and adjacent to the former settling ponds (MW-4, MW-5, MW-15, MW-16, and MW-18; Figures M-62 and M-65) and were detected at concentrations greater than the PCULs in shallow groundwater during multiple monitoring events. Total and dissolved copper and nickel were also detected in shallow groundwater during multiple monitoring events at concentrations greater than the PCUL at MW-7 east of the historical shoreline. Total copper was detected during one or more monitoring events at a concentration greater than the PCUL, but dissolved copper was not detected greater than the PCUL during the same monitoring event at multiple locations around the Site (MW-2, MW-3, MW-4D, MW-8, MW-9, MW-11, MW-17, MW-19D, MW-20, and GMW-27). Figure M-62 identifies that dissolved copper was not detected in groundwater at concentrations greater than the PCUL during quarterly monitoring performed as part of the RI at monitoring wells located between T115N and the 48-inch drain line and Glacier Bay. Total and dissolved nickel was also detected during one or more monitoring events at a concentration greater than the PCUL at multiple other locations at the Site and at monitoring wells located between T115N and the 48-inch drain line and Glacier Bay (MW-2, MW-3, MW-6, MW-9, MW-12, MW-19, and GMW-27; Figure M-65).

With respect to total and dissolved arsenic, the highest concentrations are observed in shallow groundwater in the northern portion of the Site in the vicinity of the historical drainage and 15-inch drain line that was capped and plugged at the property boundary in 2014. The highest groundwater concentrations correspond to locations with the highest soil concentrations (Section 5.3.1.3). In addition, elevated concentrations of arsenic were detected in groundwater at MW-7 located at the southeast corner of the 1965 shoreline. Specifically, the detected concentrations of total arsenic in groundwater range from 3.6 to 7,800 µg/L and the dissolved arsenic concentrations range from 1.6 to 7,900 µg/L (Figure M-58). The highest detected concentrations of total and dissolved arsenic in groundwater and concentrations greater than the PCUL (8.0 µg/L) were detected at location MW-14 on the northern portion of T115N at the boundary between the Site and the Glacier NW Site. Monitoring well MW-14 is located in the area of a historical drainage from the

southern portion of the Glacier NW Site (Figure 2-9) where wood treatment using arsenic-based preservative was performed between 1936 and 1939 (Section 3.2.1) and where a 15-inch stormwater line that was plugged in 2014 enters T115N from the Glacier NW Site (Figure 2-9). The highest detected concentration in a groundwater sample from either site (Glacier NW Site or T115N) was at a location within the former wood treatment area (GMW-45 at 15,500 µg/L on August 26, 2014) on the Glacier NW Site approximately 200 feet north of the T115N Site (ERM 2015). Total and dissolved arsenic concentrations ranging from 3.6 to 2,770 µg/L were also detected in groundwater at locations GMW-3, GMW-3D, GMW-18, and GMW-20 located on the southern portion of the Glacier NW Site adjacent to the T115N (Figure M-58). Total and dissolved arsenic concentrations range from 3.5 to 23 µg/L on the southern boundary of T115N except at MW-7 where arsenic concentrations ranged from 280 to 1,100 µg/L. At monitoring well locations between T115N and adjacent to the 48-inch- drain line and Glacier Bay (i.e., MW-9, MW-10D, GMW-26 and GMW-27), total and dissolved arsenic concentrations were greater than the PCUL during multiple groundwater monitoring events and that the highest arsenic concentrations are present on the northern boundary of the T115N Site adjacent to the Glacier NW Site (MW-14 and MW-4), east of the historical shoreline (MW-5), and east of the 1965 shoreline (MW-7).

Total and dissolved concentrations of thallium were not detected in shallow or deep groundwater at T115N (Figure M-67).

The PQLs for total and dissolved cadmium, mercury, nickel, silver, and thallium analyses were greater than the PCULs in samples collected from several locations monitored during previous environmental studies performed in 2009 (DP-1, MW-1 through MW-9, and GMW-27) (Table 5-4 and Figures M-60, M-64, M-65, M-66, and M-67). The PQLs for cadmium, nickel, and silver were less than the PCULs during monitoring performed as part of the RI. The PQL for mercury (0.5 µg/L) and thallium (2.0 µg/L) were greater than the PCULs (0.025 µg/L and 0.062 µg/L, respectively) in all samples collected from the Site. The PQLs for mercury and thallium analyses performed as part of the RI (Table 5-3) met the limits identified in the Ecology approved RI/FS Work Plan (Table 4-1).

Summary statistics for metals in groundwater at T115N based on Site hydrogeologic units are presented in the following table.

METALS DISTRIBUTION IN GROUNDWATER

STRATIGRAPHIC UNIT	NUMBER OF SAMPLES ANALYZED	FREQUENCY OF DETECTION (%)	FREQUENCY OF EXCEEDANCE (%)		LOCATION OF MAXIMUM DETECTED EXCEEDANCE	PRIMARY COPC
			NON-DETECTS	DETECTS		
Shallow Groundwater West of Historical Shoreline	46 - 59	38.4	20.9	68.8	MW-14	Arsenic
Groundwater East of Historical Shoreline	37 - 42	38.6	23.7	55.6	MW-7	Arsenic
Deep Groundwater West of Historical Shoreline	20	29.5	18.6	18.9	MW-10D	Arsenic

Notes:

n/a = not available

5.3.2.4. NON-CARCINOGENIC POLYCYCLIC AROMATIC HYDROCARBONS

Analyses for non-carcinogenic PAHs, were performed on 121 samples of groundwater collected from T115N (Table 4-5). The results for acenaphthene, anthracene, fluoranthene, fluorene, 1-methylnaphthalene,

naphthalene, and pyrene, which are the non-carcinogenic PAHs retained as COPCs for groundwater, are presented in Table 5-4 and shown on Figures M-69, M-70, M-77, M-78 and M-80 through M-82 in Appendix M. Figures M-69, M-70, M-77, M-78 and M-80 through M-82 present the results for non-carcinogenic PAHs in each groundwater sample collected at T115N during each sampling event and include the concentrations in comparison to the PCULs.

In general, non-carcinogenic PAHs (excluding naphthalene) were detected in shallow groundwater greater than the PCUL in the central portion of the Site in the vicinity of the former Process Building and settling ponds during one or more monitoring events. Similar to other non-carcinogenic PAHs, the concentrations of naphthalene also exceeded the PCUL in shallow groundwater in the vicinity of the former Process Building and settling ponds. However, elevated concentrations of naphthalene were also detected at MW-7 located at the southeast corner of the 1965 shoreline.

Non-carcinogenic PAHs including acenaphthene, fluorene, and 1-methylnaphthalene were detected at concentrations greater than the PCULs in shallow groundwater at T115N in one or two samples collected from two locations (Table 5-4 and Figures M-69, M-78, and M-80). Naphthalene was detected at concentrations greater than the PCUL in shallow groundwater in 14 samples collected from five locations (Figure M-81). Anthracene, fluoranthene, and pyrene were not detected in groundwater at concentrations greater than the PCULs (Table 5-4 and Figures M-69, M-77, and M-82) but were retained as COPCs for groundwater as requested by Ecology pending further evaluation (Email from Ecology, May 20, 2019).

Acenaphthene and fluorene were each detected once at a concentration greater than the PCUL in shallow groundwater during a previous investigation in 2009 (November 2009). Acenaphthene was detected in shallow groundwater at MW-6 and fluorene was detected in shallow groundwater at MW-3. However, acenaphthene and fluorene were either not detected at PQLs less than the PCUL or were detected at concentrations less than the PCUL in groundwater collected during subsequent quarterly groundwater monitoring events performed as part of the RI (Table 5-4 and Figures M-69 and M-78). In Addition, acenaphthene and fluorene were not detected at concentrations greater than the PCULs in any other samples collected from T115N.

1-Methylnaphthalene was detected twice at concentrations greater than the PCUL in shallow groundwater at MW-6 during a previous investigation in 2009 and during a quarterly monitoring event in April 2015 performed as part of the RI. 1-Methylnaphthalene was either not detected at a PQL less than the PCUL or was detected at a concentration less than the PCUL in groundwater collected during two quarterly monitoring events (September 2014 and January 2015) between monitoring performed in 2009 and the quarterly monitoring event in April 2015 (Table 5-4 and Figure M-80). The detected concentration of 1-methylnaphthalene in April 2015 (2 µg/L) was slightly greater than the PCUL (1.5 µg/L). In Addition, 1-methylnaphthalene was not detected at concentrations greater than the PCUL in any other samples collected from T115N.

Naphthalene was detected at concentrations greater than the PCUL (1.4 µg/L) in shallow groundwater at locations MW-3, MW-6, MW-7, MW-16 and MW-18 (Table 5-4 and Figure M-81). Naphthalene was detected in one groundwater sample collected from locations MW-3 and MW-16 in and adjacent to the former setting ponds area. Naphthalene was detected at concentrations greater than the PCUL in between three and five groundwater samples collected from locations MW-6, MW-7 and MW-18. The highest naphthalene concentration (170 µg/L) was detected at MW-7.

Non-carcinogenic PAHs were either not detected at PQLs, less than the PCULs or were detected at concentrations less than the PCULs in the samples collected from deep groundwater.

Figures M-69, M-70, M-77, M-78 and M-80 through M-82 identify that non-carcinogenic PAHs, excluding naphthalene, are limited to the central portion of the T115N Site in and adjacent to the former settling ponds (MW-4, MW-5, and MW-16) and adjacent to the former Process Building (MW-3 and MW-6). Figures M-69, M-70, M-77, M-78 and M-80 through M-82 also identify that non-carcinogenic PAHs (excluding naphthalene) and naphthalene were not detected in groundwater at concentrations greater than the PCULs during quarterly monitoring performed as part of the RI at monitoring wells located between T115N and the 48-inch drain line and Glacier Bay (MW-9, MW-10, MW-10D, GMW-26 and GMW-27). Figure M-81 identifies that naphthalene is primarily limited to the area in and adjacent to the former settling ponds (MW-16 and MW-18) and adjacent to the former Process Building (MW-3 and MW-6) but is also located east of the historic shoreline (MW-7).

The PQLs were greater than the PCULs in several shallow groundwater samples analyzed for non-carcinogenic PAHs from locations MW-3, MW-4, MW-5 and MW-16 located in and adjacent to the former settling ponds area (Table 5-4 and Figures M-69, M-70, M-77, M-78 and M-80 through M-82). The samples with PQLs for non-carcinogenic PAH analyses greater than the PCULs included one sample each collected from locations MW-3, MW-4 and MW-5 during a previous environmental study performed in 2009 and one or two samples collected from locations MW-4, MW-5 and MW-16 performed as part of the RI.

Summary statistics for non-carcinogenic PAHs in groundwater at T115N based on Site hydrogeologic units are presented in the following table.

NON-CARCINOGENIC PAH DISTRIBUTION IN GROUNDWATER

STRATIGRAPHIC UNIT	NUMBER OF SAMPLES ANALYZED	FREQUENCY OF DETECTION (%)	FREQUENCY OF EXCEEDANCE (%)		LOCATION OF MAXIMUM DETECTED EXCEEDANCE	PRIMARY COPC
			NON-DETECTS	DETECTS		
Shallow Groundwater West of Historical Shoreline	59	9.4	7.2	15.8	MW-3	Naphthalene
Groundwater East of Historical Shoreline	42	12.8	2.8	7.7	MW-7	Naphthalene
Deep Groundwater West of Historical Shoreline	20	5	0	n/a	n/a	n/a

Notes:

n/a = not available

5.3.2.5. CARCINOGENIC POLYCYCLIC AROMATIC HYDROCARBONS

Analyses for cPAHs were performed on 121 samples of groundwater collected from T115N (Table 4-5). The results for benzo(a)anthracene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(a)pyrene, chrysene, dibenzo(a,h)anthracene and indeno(1,2,3-c,d)pyrene, which are the cPAHs retained as COPCs for groundwater, are presented in Table 5-4 and shown on Figures M-71 through M-76, M-79 and M-83 in Appendix M. The results for individual cPAHs were multiplied by TEFs and summed to provide the total cPAH TEQ concentrations, which are presented in Table 5-4 and shown on Figure M-83 in Appendix M. Figures M-71 through M-76, M-79 and M-82 present the results for cPAHs in each groundwater sample collected during each sampling event and include the concentrations in comparison to the PCULs.

Concentrations of cPAHs including benzo(a)anthracene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(a)pyrene, chrysene, dibenzo(a,h)anthracene and indeno(1,2,3-c,d)pyrene as well as total cPAH TEQ were detected greater than the PCULs in shallow groundwater samples at multiple locations at the Site during one or more monitoring events. In general, the highest detected concentrations of individual cPAHs were at locations adjacent to the former settling ponds (MW-4, MW-5, and MW-18), adjacent to the former Process Building (DP-1 and MW-3), and southeast of the 1965 shoreline (MW-7). Individual cPAHs were also detected at concentrations greater than the PCULs in deep groundwater during one monitoring event on the western portion of T115N (MW-2D) beneath the organic silt layer and on the eastern portion of T115N (MW-10D and MW-19D) adjacent to the historical and 1965 shorelines.

The total cPAH TEQ concentrations in groundwater at T115N ranged from 0.0081 to 0.995 µg/L and are greater than the PCUL (0.000016 µg/L) (Table 5.4 and Figure M-83). The highest total cPAH TEQ concentrations were detected adjacent to the former Process Building at location MW-3 (0.995 µg/L) and adjacent to the settling ponds at location MW-5 (0.978 µg/L) in 2009 during a monitoring event performed as part of a previous environmental study. The total cPAH TEQ concentrations at MW-3 and MW-5 were lower and ranging from 0.042 and 0.20 µg/L during monitoring events performed as part of the RI.

The total cPAH TEQ concentrations in groundwater were greater than the PCUL during two to four monitoring events at locations in and adjacent to the former settling ponds area (MW-4, MW-5, MW-16 and MW-18), adjacent to the former Process Building (MW-3), north of the AST containment area (MW-13) and east of the 1965 shoreline (MW-7). The total TEQ concentrations were greater than the PCUL only during one monitoring event at multiple other locations across the Site (Figure M-83) and the highest concentrations are present in and adjacent to the former settling ponds area, adjacent to the former Process Building, and east of the 1965 shoreline.

The PQLs for cPAHs were greater than the PCULs. The PQLs for cPAHs met the limits in the Ecology approved RI/FS Work Plan in more than 60 percent of the samples that were analyzed as part of the RI. The PQLs for cPAHs were greater than the PCULs in samples collected from three locations (MW-3, MW-4, and MW-5) as part of previous environmental studies (Table 5-4).

Summary statistics for total cPAH TEQ in shallow groundwater at T115N based on Site hydrogeologic units are presented in the following table.

CARCINOGENIC PAH DISTRIBUTION IN GROUNDWATER

STRATIGRAPHIC UNIT	NUMBER OF SAMPLES ANALYZED	FREQUENCY OF DETECTION (%)	FREQUENCY OF EXCEEDANCE (%)		LOCATION OF MAXIMUM DETECTED EXCEEDANCE
			NON-DETECTS	DETECTS	
Shallow Groundwater West of Historical Shoreline	59	30.4	100	100	MW-3
Groundwater East of Historical Shoreline	42	37.2	100	100	MW-5
Deep Groundwater West of Historical Shoreline	20	16.7	100	100	MW-10D

Notes:

n/a = not available

5.3.2.6. SEMI-VOLATILE ORGANIC COMPOUNDS

Analyses for SVOCs were performed on 121 samples of groundwater collected from T115N (Table 4-5). The results for aniline, bis(2-chloroethyl)ether, bis(2-ethylhexyl)phthalate, butyl benzyl phthalate, 2,4-dichlorophenol, diethyl phthalate, 2,4-dimethylphenol, 2-methylphenol (o-Cresol), n-nitrosodimethylamine, n-nitrosodiphenylamine, n-nitrosodi-n-propylamine, pentachlorophenol, phenol, and 2,4,6-trichlorophenol, which are the SVOCs retained as COPCs for groundwater, are presented in Table 5-4 and shown on Figures M-84 through M-97 in Appendix M. Figures M-84 through M-97 present the results for SVOCs in each groundwater sample collected at T115N during each sampling event and include the concentrations in comparison to the PCULs.

In general, SVOCs excluding bis(2-ethylhexyl)phthalate, 2,4-dimethylphenol and pentachlorophenol, either were not detected, detected at concentrations less than the PCUL, or infrequently detected in shallow groundwater at the Site. Concentrations of bis(2-ethylhexyl)phthalate, 2,4-dimethylphenol and pentachlorophenol exceeding groundwater PCULs were more frequent and generally located in the vicinity of the former Process Building and settling ponds.

SVOCs including, bis(2-ethylhexyl)phthalate, butyl benzyl phthalate, 2,4-dichlorophenol, diethyl phthalate, 2,4-dimethylphenol, 2-methylphenol (o-Cresol), n-nitrosodi-n-propylamine, pentachlorophenol, and 2,4,6-trichlorophenol were detected in at least one groundwater sample collected from the T115N Site at concentrations greater than the PCULs (Table 5-4 and Figures M-86 through M-91, M-94, M-95, and M-97). SVOCs including aniline, bis(2-chloroethyl)ether, n-nitrosodimethylamine, n-nitrosodiphenylamine, and phenol were not detected at concentrations greater than the PCULs in groundwater at T115N (Table 5-4 and Figures M-84, M-85, M-92, M-93 and M-96) but were retained as COPCs because they did not meet one or more of COPC elimination criteria established by Ecology or were retained at the request of Ecology for further evaluation (Section 4.3 and Table 4-4).

Bis(2-ethylhexyl)phthalate was detected in shallow groundwater at concentrations ranging from 0.14 to 13 µg/L and greater than the PCUL (0.046 µg/L) at nine locations (Figure M-86). The highest concentrations were detected at MW-18 and MW-16 located in and adjacent to the former settling ponds area and at DP-1 west of the former Process Building

Butyl benzyl phthalate, 2,4-dichlorophenol, and diethyl phthalate were each detected at a concentration greater than the PCULs in shallow groundwater collected during one monitoring event at one location. The detected concentration of butyl benzyl phthalate at location MW-18 (11 µg/L) was greater than the PCUL (0.013 µg/L) during a monitoring event in April 2015 (Figure M-87). The detected concentration of 2,4-dichlorophenol at location GMW-26 (16 µg/L) was greater than the PCUL (10 µg/L) during a monitoring event in June 2014 (Figure M-88) and the detected concentration of diethyl phthalate at location MW-3 (190 µg/L) was greater than the PCUL (93 µg/L) during a monitoring event in 2009 (Figure M-89) performed as part of a previous environmental study. 2,4-Dichlorophenol and diethyl phthalate were either not detected at PQLs less than the PCULs or were detected at concentrations less than the PCULs in all other groundwater samples collected from the Site.

2,4-dimethylphenol, 2-methylphenol, and 2,4,6-trichlorophenol were each detected in shallow groundwater from MW-4 during one or more monitoring events and in shallow groundwater during one monitoring event at one other location (Figures M-90, M-91, and M-97). 2,4-Dimethylphenol was detected at MW-4 during three monitoring events at concentrations ranging from 6.5 to 12 µg/L and greater than the PCUL (6.3 µg/L) and was detected once at MW-6 (11 µg/L) greater than the PCUL. 2-Methylphenol was detected

at MW-4 during five monitoring events at concentrations ranging from 77 to 120 µg/L and greater than the PCUL (27 µg/L) and was detected once at MW-5 (28 µg/L) greater than the PCUL. 2,4,6-Trichlorophenol was detected at MW-4 during one monitoring event at a concentration (1.2 µg/L) greater than the PCUL (0.28 µg/L) and was detected once at MW-16 (1.2 µg/L) greater than the PCUL. 2,4-Dimethylphenol and 2-methylphenol were either not detected at PQLs less than the PCULs or detected at concentrations less than the PCULs in all other groundwater samples collected from the Site.

N-nitrosodi-n-propylamine was detected at three locations (MW-2D, MW-9, and GMW-26) during one monitoring event (Figure M-94). The concentration of n-nitrosodi-n-propylamine ranged from 0.1 and 0.19 µg/L and greater than the PCUL (0.058 µg/L) at the three locations during the April 2015 monitoring event performed as part of the RI. N-nitrosodi-n-propylamine was the only SVOC detected at a concentration greater than the PCULs in deep groundwater (MW-2D).

Pentachlorophenol was detected at concentrations ranging from 0.69 to 12 µg/L and greater than the PCUL (0.002 µg/L) at MW-15 and MW-16 located in and adjacent to the former settling ponds area and at MW-10 located in the northeast portion of T115N (Figure M-95). Figure M-95 identifies that pentachlorophenol was not detected at a concentration greater than the PCUL in shallow and deep groundwater at other locations and that the highest concentrations (detect or non-detect) are present in and adjacent to the former settling ponds area, adjacent to the former Process Building, and east of the 1965 shoreline.

Aniline and phenol were either not detected at PQLs less than the PCUL or were detected at concentrations less than the PCULs (Figures M-84 and Figures M-96).

The PQLs for bis(2-chloroethyl)ether, bis(2-ethylhexyl)phthalate, butyl benzyl phthalate, n-nitrosodimethylamine, n-nitrosodiphenylamine, n-nitrosodi-n-propylamine, and pentachlorophenol were greater than the PCULs. The PQLs for these compounds met the limits in the Ecology approved RI/FS Work Plan in more than 50 percent of the samples that were analyzed as part of the RI. The PQLs for these compounds were greater than the PCULs in samples collected as part of previous environmental studies (Table 5-4).

Summary statistics for SVOCs in groundwater at T115N based on Site hydrogeologic units are presented in the following table.

SVOC DISTRIBUTION IN GROUNDWATER

STRATIGRAPHIC UNIT	NUMBER OF SAMPLES ANALYZED	FREQUENCY OF DETECTION (%)	FREQUENCY OF EXCEEDANCE (%)		LOCATION OF MAXIMUM DETECTED EXCEEDANCE	PRIMARY COPC
			NON-DETECTS	DETECTS		
Shallow Groundwater West of Historical Shoreline	59	8.4	41.1	50	MW-4	Bis (2-ethylhexyl) phthalate
Groundwater East of Historical Shoreline	42	6.9	47.1	38.6	MW-5	Butyl benzyl phthalate
Deep Groundwater West of Historical Shoreline	20	2.4	50.2	59.1	MW-10D	n-Nitrosodi-n-propylamine

Notes:

n/a = not available

5.3.2.7. VOLATILE ORGANIC COMPOUNDS

Analysis for VOCs were performed on 93 samples of groundwater collected from the Site (Table 4-5). The results for benzene and chloroform, which are the VOCs retained as COPCs, are presented in Table 5-4 and shown on Figures M-98 and M-99 in Appendix M. Figures M-98 and M-99 present the results for benzene and chloroform, respectively, in each groundwater sample collected during each sampling event and include the concentrations in comparison to the PCULs.

Similar to benzene in soil, PCUL exceedances in shallow groundwater are generally located in the vicinity of the former Processing Building and settling pond areas. Benzene was detected in shallow groundwater at concentrations ranging from 0.22 to 4.8 µg/L. The highest benzene concentrations that were greater than the PCUL (1.6 µg/L) were detected in and adjacent to the former settling ponds at MW-16 and MW-4 (Table 5-4 and Figure M-98). The benzene concentrations in groundwater samples collected at MW-16 during the four quarterly monitoring events performed as part of the RI were greater than the PCUL. The benzene concentration was also greater than the PCUL in the groundwater sample collected at MW-4 during a monitoring event performed in 2009 as part of a previous environmental study. Figure M-98 Shows that the locations with benzene concentrations in shallow groundwater greater than the PCUL (MW-16 and MW-4) are limited to the former settling ponds area. Benzene was not detected in deep groundwater at PQLs less than the PCUL.

Chloroform was not detected in soil at concentrations greater than the PCUL for the protection of groundwater as surface water. However, chloroform was detected in shallow groundwater at one location (MW-10) at concentrations (2.1 and 3.4 µg/L) greater than the PCUL (1.2 µg/L). Chloroform was detected at concentrations greater than the PCUL during two quarterly monitoring events (January and April 2015) performed as part of the RI. Chloroform was not detected at PQLs less than the PCUL in groundwater samples collected during quarterly monitoring events performed in June and September 2014 or during monitoring performed in 2009 as part of a previous environmental study (Figure M-99). Figure M-99 shows that the location with chloroform concentrations in shallow groundwater greater than the PCUL (MW-10) is limited to one location (MW-10). Chloroform was not detected in deep groundwater at PQLs less than the PCUL.

The PQLs for benzene and chloroform in groundwater samples were greater than the PCULs (1.6 and 1.2 µg/L, respectively) in nine samples collected from three locations (MW-3, MW-4, and MW-5) (Table 5-4 and Figures M-98 and M-99). The PQLs for all other benzene and chloroform analyses performed as part of the RI were less than the PCULs.

Summary statistics for VOCs (benzene and chloroform) in groundwater at T115N based on Site hydrogeologic unit are presented in the following table.

VOC DISTRIBUTION IN GROUNDWATER

STRATIGRAPHIC UNIT	NUMBER OF SAMPLES ANALYZED	FREQUENCY OF DETECTION (%)	FREQUENCY OF EXCEEDANCE (%)		LOCATION OF MAXIMUM DETECTED EXCEEDANCE	PRIMARY COPC
			NON-DETECTS	DETECTS		
Shallow Groundwater West of Historical Shoreline	40	100	n/a	100	MW-4	Chloroform
Groundwater East of Historical Shoreline	34	8.6	9.4	50	MW-10	Benzene

STRATIGRAPHIC UNIT	NUMBER OF SAMPLES ANALYZED	FREQUENCY OF DETECTION (%)	FREQUENCY OF EXCEEDANCE (%)		LOCATION OF MAXIMUM DETECTED EXCEEDANCE	PRIMARY COPC
			NON-DETECTS	DETECTS		
Deep Groundwater West of Historical Shoreline	19	0	n/a	n/a	n/a	n/a

Notes:

n/a = not available

5.3.2.8. PETROLEUM HYDROCARBONS

Analysis for gasoline-range petroleum hydrocarbons were performed on 53 samples and analysis for diesel- and oil-range petroleum hydrocarbons were performed on 70 samples of groundwater collected from the Site (Table 4-5). The results for gasoline-, diesel-, and oil-range petroleum hydrocarbons, which are retained as COPCs, are presented in Table 5-4 and shown on Figures M-100 and M-101 in Appendix M. Figures M-100 and M-101 present the results for gasoline-range petroleum hydrocarbons, and total diesel- and oil-range petroleum hydrocarbons in each groundwater sample collected during each sampling event and include the concentrations in comparison to the PCULs.

Gasoline-range hydrocarbons were retained as a COPC at the request of Ecology pending evaluation of whether there is a localized area of detections requiring additional characterization (Email from Ecology, May 20, 2019). In soil, gasoline-range petroleum hydrocarbons exceeded the PCUL at location MW-8 located beneath the former Process Building. However, in groundwater gasoline-range petroleum hydrocarbons either were not detected or were detected at concentration less than the PCUL. Gasoline-range petroleum hydrocarbons were detected at concentrations of 130 and 260 µg/L in a shallow groundwater sample from MW-5 and a sample from MW-18, respectively (Table 5-4 and Figure M-100). The gasoline-range petroleum hydrocarbon concentrations in groundwater from MW-5 and MW-18 were less than the PCUL (800 µg/L). Gasoline-range petroleum hydrocarbons were not detected at PQLs less than the PCUL in all other shallow and deep groundwater samples collected from the Site.

Total diesel- and oil-range petroleum hydrocarbon analyses were performed as part of the RI without and with using silica gel/acid wash cleanup prior to analysis. In soil, total diesel- and oil-range petroleum hydrocarbons either were not detected or were detected at concentrations less than the PCUL with the exception of shallow fill at location MW-18, MW-20 and B-7 located above the water table. However, in groundwater total diesel- and oil-range petroleum hydrocarbons were detected at concentrations ranging from 330 to 57,000 µg/L in samples collected from 15 locations analyzed without using silica gel/acid wash cleanup prior to analysis (Table 5-4 and Figure M-101). The highest concentrations without silica gel/acid wash cleanup prior to analysis and concentrations greater than the PCUL (500 µg/L) were detected in shallow groundwater adjacent to the former settling ponds area at MW-3, MW-4, and MW-5 and at MW-18. Total diesel- and oil-range petroleum hydrocarbon concentrations were also detected at concentrations greater than the PCUL without using silica gel/acid wash cleanup prior to analysis at several additional locations adjacent to the former settling ponds area (MW-13), on the eastern portion of the Site (MW-19 and MW-7) and on the western portion of the Site (DP-1 and MW-20).

Subsequent analyses for diesel- and oil-range petroleum hydrocarbons were performed on groundwater samples using silica gel/acid wash cleanup prior to analysis to evaluate the elevated concentrations detected in groundwater. At locations MW-3, MW-4, MW-18 and MW-20 samples were collected and analyzed for diesel- and oil-range petroleum hydrocarbons with and without using silica gel/acid wash cleanup between one and three quarterly monitoring events to provide a comparison of the results

(Table 5-4 and Figure M-101). The detected concentrations of total diesel- and oil-range petroleum hydrocarbon concentrations in the samples analyzed without using silica gel/acid wash cleanup ranged from 260 to 57,000 µg/L and included the highest concentrations detected in groundwater at the Site (57,000 µg/L at MW-4 and 33,000 µg/L at MW-18). Total diesel- and oil-range petroleum hydrocarbons either were not detected at PQLs less than the PCUL or were detected at concentrations less than the PCUL in each of the samples analyzed using silica gel/acid wash cleanup.

The results of the analyses for total diesel- and oil-range petroleum hydrocarbons using silica gel/acid wash cleanup identify that the detected concentrations of total diesel- and oil-range petroleum hydrocarbons analyses without using silica gel/acid wash cleanup are the result of organics other than petroleum hydrocarbons in groundwater. Analyses for TOC were also performed on the samples from MW-3, MW-18 and MW-20 that underwent analyses with and without using silica gel/acid wash cleanup (Table 5-4). The results from the TOC and diesel- and oil-range petroleum hydrocarbon analyses at each location are the following:

- At MW-20, TOC concentrations ranged from 4.3 to 7.3 mg/L in three samples and the diesel- and oil-range petroleum hydrocarbon concentrations ranged from 220 to 580 µg/L.
- At MW-3, TOC concentrations were 110 and 250 mg/L in two samples and the diesel- and oil-range petroleum hydrocarbon concentrations ranged from 2,000 to 5,500 µg/L.
- At MW-18, TOC concentrations ranged from 680 to 1,800 mg/L in six samples and the diesel- and oil-range petroleum hydrocarbon concentrations ranged from 5,700 to 18,000 µg/L.

The TOC concentrations in groundwater at MW-3, MW-18, and MW-20 correlate with diesel- and oil-range petroleum hydrocarbon concentrations from analyses performed without using silica gel/acid wash cleanup identifying that the concentrations detected by petroleum hydrocarbon analyses (without using silica gel/acid wash cleanup) are the result of interference by organic carbon present in groundwater. These results also generally correlate with high levels of soil and/or groundwater pH discussed in Section 5.3.2.9.

Summary statistics for petroleum hydrocarbons in groundwater at T115N based on Site hydrogeologic units are presented in the following table.

PETROLEUM HYDROCARBON DISTRIBUTION IN GROUNDWATER

STRATIGRAPHIC UNIT	NUMBER OF SAMPLES ANALYZED	FREQUENCY OF DETECTION (%)	FREQUENCY OF EXCEEDANCE (%)		LOCATION OF MAXIMUM DETECTED EXCEEDANCE	PRIMARY COPC
			NON-DETECTS	DETECTS		
Shallow Groundwater West of Historical Shoreline	18-26	26.9	n/a	73.1	MW-4	Total Diesel and Oil-Range
Groundwater East of Historical Shoreline	27-36	36.1	n/a	63.9	MW-18	Total Diesel and Oil-Range
Deep Groundwater West of Historical Shoreline	0-4	100	n/a	n/a	n/a	n/a

Notes:

n/a = not available

5.3.2.9. PH

Analysis of pH was performed on 150 samples of groundwater collected from T115N. The results for pH analyses are being evaluated because of the potential implications to contaminant fate and transport and remedy selection. The results for groundwater pH are presented in Table 5-4 and shown on Figure M-102 in Appendix M. Figure M-102 presents the results for pH in each groundwater sample collected.

The highest ranges of the pH (greater than 9) are located in the vicinity of the former settling ponds and at MW-7 located southeast of the 1965 shoreline. In groundwater, pH ranges from approximately 5.5 to 13.0 with the highest values measured in shallow groundwater in and adjacent to the former settling ponds and at a location east of the 1965 shoreline (Figure M-102). pH values greater than 9 were measured in shallow groundwater in and adjacent to the former settling ponds area at locations MW-5, MW-15, MW-16, and MW-18 and at MW-7 located east of the 1965 shoreline. pH values greater than 9 were not measured in deep groundwater. pH values were generally measured between 6.5 and 8.5 at locations around the former settling pond area. pH values were generally measured between 6 and 7.5 in groundwater at locations between from between T115N and the 48-inch drain line and Glacier Bay (MW-10, MW-10D, GMW-27, and MW-9).

5.3.3. Catch Basin Solids

Catch basin solids were collected and analyzed during the RI and a previous environmental study to evaluate the stormwater transport pathway at the Site. Catch basin solids concentrations are represented by analyses of seven samples (including a duplicate) collected from five catch basins located across the T115N Site (Figure 3-5). As discussed in Section 3.4, catch basin solids were analyzed for the purposes of evaluating the potential for contaminants in the catch basin solids at the Site to impact sediment in the LDW. Contaminants detected at concentrations greater than the Target Sediment Concentrations for the LDW are presented in Table 5-5. The results for all analyses performed on catch basin solids are presented in Appendix D. Contaminants in catch basin solids at T115N that were detected at concentrations greater than the Target Sediment Concentrations include the following:

- Total PCBs;
- Dioxins and furans;
- Metals (arsenic, copper and zinc);
- PAHs including high molecular weight PAHs (HPAHs) and Total cPAH TEQ; and,
- SVOCs (bis[2-ethylhexyl]phthalate, butyl benzyl phthalate, and 3 & 4 methylphenol).

The results of sediment sampling performed as part of the LDW RI, identify that PCBs, dioxins and furan, arsenic, mercury, cPAHs, and pentachlorophenol are present at concentrations greater than the Target Sediment Concentrations in proximity to Outfall 2127 for the 48-inch drain line (Table F-2, Appendix F). Other COPCs identified in the catch basin solids were not detected in LDW sediment at concentration greater than the Target Sediment Concentrations.

As described in Section 2.5.5.1, the Port operates under a Phase I Municipal Stormwater Permit issued by Ecology (Permit No. WAR044701). To comply with the requirements of the permit, the Port requires T115N tenants to complete and maintain SWPPPs and implement measures to prevent and control the discharge of contaminated stormwater to surface water or groundwater within their operational area. Under the Port's permit, the Port maintains the stormwater system for T115N, including the removal of catch basin solids

for permitted disposal on a periodic basis to control and prevent the transport of catch basin solids to the LDW. As previously discussed, the Port conducts biannual inspections (winter and summer) of the catch basins to observe the condition of the stormwater system and identify whether removal of the captured solids is required. Following the City of Seattle stormwater code, catch basin solids are removed when 60 percent of the catch basin storage capacity is reached, or when level of captured catch basin solids is less than 6 inches from the base of the effluent pipe opening. Catch basin solids removed from the stormwater system are transported from the Site for permitted disposal.

Contaminants with detected concentrations greater than the Target Sediment Concentrations are discussed in the following sections.

5.3.3.1. POLYCHLORINATED BIPHENYLS

Analysis for PCB Aroclors were performed on seven catch basin solids samples collected from the Site. The results for individual Aroclors were summed to provide the result for total PCB Aroclors, which are compared to the Target Sediment Concentrations in Table 5-5 and summarized on Figure 5-19.

Total PCB Aroclors were detected in the catch basin solids sample collected from CB-328 at a concentration (0.16 mg/kg) slightly greater than the Target Sediment Concentration (0.13 mg/kg). Catch basin CB-328 is located within the rail alignment on the western portion of the Site near the entrance to T115N. At the other catch basin solids sample locations, total PCBs were either not detected or were detected at or less than the Target Sediment Concentration in samples collected as part of the RI. The detection limit for total PCB Aroclors was greater than the Target Sediment Concentration in the sample collected during a previous environmental study performed in 2009 at sample location CB-323. However, total PCB Aroclors were not detected at PQLs less than the Target Sediment Concentration in two samples (including a duplicate) collected from CB-323 in 2014 as part of the RI.

5.3.3.2. DIOXINS AND FURANS

Analysis for dioxins and furans were performed on six samples of catch basin solids collected from the Site. The results for individual dioxin and furan congeners were multiplied by TEFs and summed to provide the total dioxin and furan TEQ concentrations, which are presented in Table 5-5 and summarized on Figure 5-19.

Total dioxin and furan TEQ concentrations were detected in catch basin solids samples at concentrations ranging from 10.58 to 67.55 ng/kg and greater than the Target Sediment Concentration (2 ng/kg). The highest total dioxin and furan TEQ concentration was detected in catch basin solids at CB-328 located within the rail alignment on the northwestern portion of the Site near the entrance to T115N. The second highest total dioxin and furan TEQ concentration (29.20 ng/kg) was detected in catch basin solids at CB-313 located on the northeast portion of the T115 Site adjacent to the Glacier NW property boundary.

5.3.3.3. METALS

Analysis for metals were performed on seven samples of catch basin solids collected from the Site. Metals including arsenic, copper, and zinc were detected at concentrations greater than the Target Sediment Concentrations and are presented in Table 5-5 and summarized on Figure 5-19. All other metals were not detected in catch basin solids at concentrations greater than the Target Sediment Concentrations (Table D-3, Appendix D).

Arsenic was detected in catch basin solids samples ranging from 3.5 to 25 mg/kg. The detected concentrations of arsenic were greater than the Target Sediment Concentration screening level (7 mg/kg) in four of the five catch basins sampled. The highest arsenic concentration was detected in catch basin CB-328 located within the rail alignment on the western portion of the Site near the entrance to T115N. The next highest concentration of arsenic was detected in catch basin CB-313 located on the northeast portion of the Site near the Glacier NW property boundary. The detection limit for arsenic was greater than the Target Sediment Concentration in the sample collected during a previous environmental study performed in 2009 at sample location CB-323. However, arsenic was detected at concentrations less than the Target Sediment Concentration in two samples (including a duplicate) collected from CB-323 in 2014 as part of the RI.

Copper was detected in the catch basin solids sample collected from CB-328 at a concentration (530 mg/kg) greater than the Target Sediment Concentration (390 mg/kg). Catch basin CB-328 is located within the rail alignment on the western portion of the Site near the entrance to T115N. At all other catch basin solids sample locations, copper was detected at a concentration less than the Target Sediment Concentration.

Zinc was detected in catch basin solids samples at concentrations ranging from 580 to 2,700 mg/kg and greater than the Target Sediment Concentration (410 mg/kg). The highest zinc concentration was detected in catch basin solids at CB-313 located on the northeast portion of the T115 Site adjacent to the Glacier NW property boundary. The second highest zinc concentrations (2,300 mg/kg) were detected in catch basin solids at CB-328 located within the rail alignment on the northwestern portion of the Site near the entrance to T115N and at CB-322 located on the eastern portion of the Site.

5.3.3.4. POLYCYCLIC AROMATIC HYDROCARBONS

Analysis for PAHs were performed on seven (samples of catch basin solids collected from the Site. The results for individual HPAHs were summed to provide the result for total HPAHs. The results for individual cPAHs were multiplied by TEFs and summed to provide the total cPAH TEQ concentrations. The results for individual HPAHs, total HPAHs, and the total cPAH TEQs are presented in Table 5-5. The results for total HPAHs and total cPAH TEQs are summarized on Figure 5-19. Low molecular weight PAHs (LPAHs) were not detected in catch basin solids at concentrations greater than the Target Sediment Concentrations (Table D-3, Appendix D).

HPAHs including benzo(a)anthracene, benzo(g,h,i)perylene, chrysene, dibenzo(a,h)anthracene, fluoranthene, and indeno(1,2,3-c,d)pyrene were detected in the catch basin solids sample collected from CB-313 at concentrations greater than the Target Sediment Concentrations (Table 5-5). The total HPAH concentration (15.58 mg/kg) was also greater than the Target Sediment Concentration (12 mg/kg) in the catch basin solids sample collected from CB-313. The individual HPAH concentrations and total HPAH concentrations were less than the Target Sediment Concentrations in all other catch basin solids samples collected from the T115N Site.

Total cPAH TEQ concentrations ranged from 0.04 to 1.6 mg/kg in catch basin solids samples and were greater than the Target Sediment Concentration (0.09 mg/kg). The highest total cPAH TEQ concentration was detected in a sample collected from CB-313 located near the Glacier NW property boundary. Substantially lower total cPAH TEQ concentrations were detected in samples collected from all other catch basins at the T115N Site.

5.3.3.5. SEMI-VOLATILE ORGANIC COMPOUNDS

Analysis for SVOCs were performed on seven samples of catch basin solids collected from the Site. SVOCs including bis(2-ethylhexyl)phthalate, butyl benzyl phthalate, and 3 & 4 methylphenol were detected at concentrations greater than the Target Sediment Concentrations and are presented in Table 5-5 and summarized on Figure 5-19. All other SVOCs were not detected in catch basin solids at concentrations greater than the Target Sediment Concentrations (Table D-3, Appendix D).

Bis(2-ethylhexyl)phthalate concentrations ranged from 2.5 to 48 mg/kg in catch basin solids samples and were greater than the Target Sediment Concentration (1.3 mg/kg) (Table 5-5). The highest total cPAH TEQ concentration was detected in a sample collected from CB-322 located on the eastern portion of the T115N Site (Figure 5-19). Butyl benzyl phthalate was detected in the catch basin solids samples collected from CB-313 and CB-328 at concentrations (1.4 and 5 mg/kg, respectively) greater than the Target Sediment Concentration (1.3 mg/kg) but were not detected at concentrations greater than the Target Sediment Concentrations in all other catch basin solids samples. 3 & 4 Methylphenol was detected in the catch basin solids samples collected from CB-333 and CB-324 at concentrations (1.1 and 1.4 mg/kg, respectively) greater than the Target Sediment Concentration (0.67 mg/kg) but were not detected at concentrations greater than the Target Sediment Concentrations in all other catch basin solids samples.

5.4. EVALUATION OF SITE COPCS

This section presents an evaluation of the COPCs identified for the T115N Site based on the results of the nature and extent of contamination for soil and groundwater presented in Sections 5.3.1 and 5.3.2. The following sections (Section 5.4.1 through 5.4.8) provide a summary of the nature and extent of contamination for COPCs in soil and groundwater and provides a weight of evidence (WOE) evaluation on whether the potential transport and exposure pathways and receptor(s) initially used for identification of the PCULs used to screen contaminants present at the Site and to identify COPCs for soil and groundwater that will require further evaluation as part of development of the FS. COPCs to be further evaluated as part of the FS are summarized on Table 4.7.

The spatial distribution of soil and groundwater for selected COPCs used to support the WOE evaluation is presented using inverse distance weighting (IDW) to characterize nature and extent of contamination at the Site. IDW includes use of a GIS application and interpolation methods with algorithms to interpret the influence of multiple neighboring points, their concentrations, and distances from one another to estimate the spatial distribution of a given parameter within the environment. IDW mapping of soil COPCs based on the WOE evaluation is presented on Figures 5-20 through 5-44. IDW mapping of groundwater COPCs based on the WOE evaluation is presented on Figures 5-45 through 5-67.

5.4.1. Polychlorinated Biphenyls

PCB Aroclors were detected in two soil samples collected from pond fill in the former settling ponds area (Section 5.3.1.1). PCB Aroclors were not detected in other samples of soil collected. The PQLs for soil samples were greater than the PCUL. However, the PQLs for PCB Aroclor analyses performed as part of the RI met the limits specified in the Ecology approved RI/FS Work Plan. The PQLs for soil samples collected as part of previous environmental studies were slightly greater than the PQLs established in the RI/FS Work Plan. Figure M-2 presents the results for total PCBs in soil in comparison to the PCUL. Figure 5-20 provides an isoconcentration map summarizing the total PCB results in soil in comparison to the PCUL.

PCB congeners were detected in groundwater at similar concentrations at monitoring wells MW-20, MW-3, and MW-10 during an Ecology groundwater study performed in March 2017 (Section 3.4.2.3; Leidos 2017). The total PCB concentrations in groundwater based on the congener analysis were greater than the PCUL, which is based on protection of surface water. Figures M-55 and M-56 present the results for total PCBs in groundwater in comparison to the PCUL. Figure 5-45 provides an isoconcentration map summarizing the total PCB results in groundwater based on congener analysis in comparison to the PCUL.

The total PCB concentrations detected in groundwater were similar to or lower than the total PCB concentrations detected in groundwater at Sites throughout the LDW corridor (Figure 5-68). As no tangible or circumstantial evidence (material use, operations, etc.) indicate that PCBs were used at the Site and that PCBs were only detected in a limited area of fill collected from the settling ponds area, a source for PCBs in groundwater was not identified at T115N. Additionally, PCB congeners were detected in all 44 groundwater samples collected from sites throughout the LDW as part of the study including upgradient groundwater monitoring locations. Based on the results of Ecology's PCB study, PCB congeners are ubiquitous in groundwater throughout the LDW. The WOE from the results of the RI indicates that PCBs in groundwater should be re-evaluated to determine whether PCBs should be considered a COC for the Site during development of the FS based on T115N not being a source of PCBs.

In catch basin solids, PCBs slightly exceeded the Target Sediment Concentration in catch basin CB-328 located adjacent to West Marginal Way. PCBs in catch basin solids at other sampling locations were either not detected or were detected at concentrations less than the Target Sediment Concentration. Although portions of the Site within the Gene Summy lease area are unpaved, PCBs were not detected in shallow fill soil in this area at PQLs less than the Target Sediment Concentration. The PCB results indicate that the T115N Site is not the source for PCBs in catch basin solids exceeding the Target Sediment Concentration.

5.4.2. Dioxins and Furans

The detected total dioxin and furan TEQ concentrations in soil samples collected from T115N were less than the PCUL (Section 5.3.1.2). The PCUL for soil is based on the natural background dioxin and furan soil concentration in Washington State (Ecology 2010). Dioxins and furans were retained as a COPC as requested by Ecology because the maximum concentration detected at T115N exceeded the simplified TEE screening level and because dioxins and furans are a COC for the LDW and Glacier NW Site (Email from Ecology, May 20, 2019). As described in Section 2.8.1, T115N is unlikely to pose risks to terrestrial ecological receptors. Figure M-3 presents the results for dioxins and furans in soil in comparison to the PCUL. Figure 5-21 provides an isoconcentration map summarizing the total dioxin and furan TEQ results in soil in comparison to the PCUL.

In groundwater, the total dioxin and furan TEQ concentration was greater than the PCUL in a sample collected by Ecology at GMW-27 located on the boundary between the T115N Site and Glacier NW Site (Section 5.3.2.2). The PCUL for dioxins and furans in groundwater is based on protection of surface water. As the dioxin and furan concentrations in soil at T115N are less than the natural background concentration in Washington State, soil at T115N is not expected to be the source of elevated concentrations of dioxins and furans in groundwater. Based on the results of the Glacier NW Site RI (ERM 2015), elevated concentrations of dioxins and furans were detected in multiple soil samples at locations upgradient of GMW-27 (Appendix N). Figure M-57 presents the results for dioxins and furans in groundwater in comparison to the PCUL. Figure 5-46 provides an isoconcentration map summarizing the total dioxin and furan result in groundwater in comparison to the PCUL. The WOE from the results of the RI indicates that dioxins and

furans in soil and groundwater should be re-evaluated to determine whether dioxins and furans should be considered a COC for the Site during development of the FS based on T115N not being a source of dioxins and furans.

In catch basin solids, dioxins and furans were detected at concentrations greater than the Target Sediment Concentrations at CB-313 and CB-322 through CB-324 located along the asphalt paved driveway in the northern portion of T115N and in CB-328 located adjacent to West Marginal Way. As noted in Section 5.3.3, the highest detected concentrations in the catch basin solids are at CB-313 located in the northeast portion of T115N adjacent to the Glacier NW property, in which dioxins and furans have been identified as a COC (figures presenting the nature and extent of dioxins and furans at the Glacier NW Site are presented in Appendix N) and at CB-328 located in the western portion of T115N adjacent to West Marginal Way. Dioxins and furans were detected in soil at T115N at concentrations ranging from approximately 0.5 to 3 ng/kg and less than the PCUL for soil based on natural background and approximately one to two orders of magnitude less than the concentrations detected in catch basin solids. The results for dioxins and furans indicate that the T115N Site is not the source for dioxins and furans in catch basin solids at concentrations exceeding the Target Sediment Concentration.

5.4.3. Metals

The results of soil analyses indicate that metals including antimony, cadmium, chromium, lead, mercury, silver, and zinc are generally co-located with tin, which was the metal being reclaimed as part of historical facility operations (Section 5.3.1.3). These metals are predominantly detected at concentrations greater than the PCULs in fill soil in and adjacent to the former settling ponds and east of the settling ponds area, in and adjacent to the former Process Building, and west of the former Process Building in the rail line rights-of-ways. The detected concentration of barium was greater than the PCUL in both fill and native soil throughout T115N and the distribution of barium (in fill and native soil) and relatively consistent concentrations of barium indicates that the barium is likely the result of background concentrations in fill and native soil. Figures M-4 through M-17 present the results for metals in soil in comparison to the PCULs. Figures 5-22 through 5-35 provide isoconcentration maps summarizing the results for metals in soil in comparison to the PCULs.

The results of groundwater analyses indicate that metals including barium, cadmium, chromium III/total, lead, mercury, silver, and zinc are generally co-located in shallow groundwater at the Site (Section 5.3.2.3). In shallow groundwater, the total and dissolved concentrations of barium, cadmium, chromium III/total, lead, mercury, silver, and zinc were greater than the PCULs during one or more monitoring events in and adjacent to the former settling ponds. Barium, cadmium, chromium III/total, lead, mercury, silver, and zinc were not detected at concentrations greater than the PCULs in deep groundwater at the Site. Figures M-58 through M-68 present the results for metals in groundwater in comparison to the PCULs. Figures 5-47 through 5-57 provide isoconcentration maps summarizing the dissolved metals results in groundwater in comparison to the PCULs.

Metals including copper, nickel, and selenium were detected at concentrations greater than the PCULs in fill at multiple locations across the Site. The concentrations of copper, nickel, and selenium are relatively consistent across T115N. The distribution (in fill) and relatively consistent concentrations of copper, nickel and selenium (Figures 5-27, 5-30 and 5-31) indicates that fill material is the likely source of these metals. Dissolved copper and nickel (Figures 5-51 and 5-54) were detected at concentrations greater than the PCULs in shallow groundwater during multiple monitoring events in and adjacent to the former settling

ponds. Dissolved nickel was also detected during one or more monitoring events at a concentration greater than the PCUL at multiple other locations around the Site.

The highest concentrations of arsenic were detected at two locations (MW-14 and MW-4D) on the northern portion of T115N (Section 5.3.1.3). MW-14 is in the area of a historical drainage from the southern portion of the Glacier NW Site (Figures 2-6 and 2-9) where wood treatment was performed between 1936 and 1939 using arsenic based preservative (Section 3.2.1). The location of elevated arsenic concentrations in soil (Figure 5-23 and Figures 5-1 and 5-2 in Appendix N) indicates that the source is predominantly attributed to the historical wood treating operations on the Glacier NW Site. Based on the distribution of arsenic in soil, it is assumed that groundwater containing elevated concentrations of arsenic (Figure 5-47) from the Glacier NW Site migrated southeast toward the LDW on to T115N prior to filling of the Site for tin reclamation operations and continued to migrate onto T115N prior to the installation of the 48-inch drain line, which resulted in the current groundwater flow pattern (Figures 5-7 and 5-8). Although the presence of arsenic in groundwater at this location is predominantly attributed to historical wood treatment operations on the Glacier NW property, fill material placed along the western bank of the LDW during property development cannot definitively be ruled out as a potential contributing factor to the observed PCUL exceedances in groundwater at the Site. Total and dissolved arsenic concentrations were detected in shallow groundwater at concentrations greater than the PCUL at multiple locations across T115N. However, the highest detected concentrations of total and dissolved arsenic in groundwater were at location MW-14 on the northern portion of T115N at the boundary between the T115N Site and the Glacier NW Site.

The PCULs for groundwater for barium, copper, lead, mercury, nickel, selenium, silver, and zinc are based on protection of surface water and the PCUL for cadmium is based on protection of sediment (Table 4-2). The PCUL for chromium III/total is based on protection of drinking water and, as discussed in Section 2.8.2, groundwater at the Site is non-potable. The results of the RI indicate that the extent of these metals is limited to the Site as multiple locations with barium, cadmium, mercury, silver, and zinc at concentrations less than the PCUL in groundwater are situated between the 48-inch drain line and Glacier Bay (Figures 5-48, 5-49, 5-53, 5-55, 5-57). Copper and lead were detected infrequently in groundwater and typically in total analyses and not dissolved analyses at locations in proximity to the 48-inch drain line and Glacier Bay (Figures 5-51 and 5-52).

The WOE from the results of the RI indicates that additional evaluation of antimony, barium, cadmium, copper, lead, mercury, nickel, selenium, silver, and zinc should be performed as part of the FS to evaluate the selection of these metals as contaminants of concern (COCs) for the Site based on a potential incomplete exposure pathway. Nickel was detected in groundwater at concentrations greater than the PCUL at locations in proximity to the 48-inch drain line and Glacier Bay. Nickel will be further evaluated as a potential COC during development of the FS for the Site. In addition, the PCUL for tin is based on the protection of TEE. However, as described in Section 2.8.1, the Site is unlikely to pose risks to terrestrial ecological receptors.

The PCUL for arsenic in groundwater is based on the background groundwater concentration in Washington State (Ecology 2018a). Arsenic was detected in shallow and deep groundwater at concentrations greater than the PCUL at locations across the Site and adjacent to Glacier Bay. Arsenic will be evaluated as a COC during development of the FS for the T115N Site.

In catch basin solids, concentrations of arsenic, copper and/or zinc were greater than the Target Sediment Concentration. Arsenic exceeded the Target Sediment Concentration in catch basins CB-313, CB-322,

CB-324, and CB-328; copper exceeded the Target Sediment Concentration in CB-328 only; and zinc exceeded the Target Sediment Concentration screening level in each of the catch basins sampled. However, only arsenic was identified as a COPC in sediment near Outfall 2127 (see Appendix F). As noted in Section 5.3.3, the highest detected concentrations of arsenic in the catch basin solids are at CB-313 located in the northeast portion of T115N adjacent to the Glacier NW property (figures presenting the nature and extent of arsenic at the Glacier NW Site are presented in Appendix N) and at CB-328 located in the western portion of T115N adjacent to West Marginal Way. Arsenic was detected at concentrations less than the Target Sediment Concentration in shallow soil at T115N in proximity to CB-328.

5.4.4. Non-Carcinogenic Polycyclic Aromatic Hydrocarbons

Non-carcinogenic PAHs including acenaphthene, anthracene, dibenzofuran, fluoranthene, fluorene, 2-methylnaphthalene, naphthalene, and pyrene were detected in two or more soil samples at concentrations greater than the PCULs at the Site (Section 5.3.1.4). 1-Methylnaphthalene was not detected in soil at a concentration greater than the PCUL but was retained as a COPC for soil as requested by Ecology as 1-methylnaphthalene was retained as a COPC for groundwater (Email from Ecology, May 20, 2019). Figures M-18, M-19, M26 through M-28, and M-30 through M-33 present the results for non-carcinogenic PAHs in soil in comparison to the PCUL. Figure 5-36 provides an isoconcentration map summarizing the results for all detected non-carcinogenic PAHs, excluding naphthalene, in soil in comparison to the PCULs. Figure 5-37 provides an isoconcentration map summarizing the naphthalene results in soil in comparison to the PCUL.

Non-carcinogenic PAHs including acenaphthene, fluorene, and 1-methylnaphthalene were detected at concentrations greater than the PCULs in shallow groundwater at T115N in one or two (1 or 2) samples collected from two locations (Section 5.3.2.4). Naphthalene was detected at concentrations greater than the PCUL in shallow groundwater in 14 samples collected from five locations. Anthracene, fluoranthene, and pyrene were not detected in groundwater at concentrations greater than the PCULs but were retained as COPCs for groundwater as requested by Ecology pending further evaluation (Email from Ecology, May 20, 2019). Figures M-69, M-70, M-77, M-78, and M-80 through M-82 present the results for non-carcinogenic PAHs in groundwater in comparison to the PCUL. Figure 5-58 provides an isoconcentration map summarizing the results for all detected non-carcinogenic PAHs, excluding naphthalene, in comparison to the PCULs. Figure 5-59 provides an isoconcentration map summarizing the naphthalene results in comparison to the PCUL.

Anthracene, fluoranthene, and pyrene were detected in multiple soil samples at concentrations greater than the PCULs. The PCULs for anthracene, fluoranthene, and pyrene are based on protection of sediment (Table 4-1), which includes the soil to groundwater to sediment pathway. As anthracene, fluoranthene, and pyrene were not detected in groundwater at concentrations greater than the PCULs for groundwater (also based on protection of sediment as presented in Table 4-2), the concentrations of anthracene, fluoranthene, and pyrene in soil are protective of the soil to groundwater to sediment pathway. The WOE from the results of the RI indicates that anthracene, fluoranthene, and pyrene should be re-evaluated and may not be considered a COC for the Site during development of the FS based on an empirical demonstration that soil concentrations are protective of the soil to groundwater to sediment pathway.

Acenaphthene and fluorene were also detected in multiple soil samples at concentrations greater than the PCULs. The PCULs for acenaphthene and fluorene, like anthracene, fluoranthene, and pyrene, are based on protection of sediment (Table 4-1), which includes the soil to groundwater to sediment pathway.

Acenaphthene and fluorene were only detected once in groundwater at concentrations greater than the PCULs for groundwater (also based on protection of sediment as presented in Table 4-2), in samples collected from locations MW-3 and MW-6 during a monitoring event performed in 2009 as part of a previous environmental study. Acenaphthene and fluorene were not detected at concentrations greater than the PCULs in subsequent samples collected from MW-3 and MW-6 during monitoring performed as part of the RI or in any other groundwater samples collected from the T115N Site. Based on the results of the RI, the concentrations of acenaphthene and fluorene in soil are protective of the soil to groundwater to sediment pathway. The WOE from the results of the RI indicates that acenaphthene and fluorene should be re-evaluated and may not be considered a COC for the T115N Site during development of the FS based on an empirical demonstration that soil concentrations are protective of the soil to groundwater to sediment pathway.

Dibenzofuran and 2-methylnaphthalene were detected at concentrations greater than the PCULs in one soil sample each collected from locations B-8 and B-12 located beneath the former Process Building. Dibenzofuran and 2-methylnaphthalene were not detected in any other soil samples collected from the T115N Site at concentrations greater than the PCULs. The PCULs for dibenzofuran and 2-methylnaphthalene are based on bank erosion (Table 4-1). Dibenzofuran and 2-methylnaphthalene were not identified as COPCs for groundwater. As the only two samples with dibenzofuran and 2-methylnaphthalene concentrations greater than the PCULs are located beneath the former Process Building and not subject to bank erosion, the WOE from the results of the RI indicates that dibenzofuran and 2-methylnaphthalene should be re-evaluated and may not be considered a COC for the Site during development of the FS based on an incomplete exposure pathway.

1-Methylnaphthalene was not detected in soil and was only detected in groundwater in two samples from location MW-6. The PCUL for 1-methylnaphthalene in groundwater is based on protection of drinking water (Table 4-2) and groundwater at T115N has been determined to be non-potable. The WOE from the results of the RI indicates that 1-methylnaphthalene should be re-evaluated and may not be considered a COC for the T115N Site during development of the FS based on reconsideration of the exposure route for the PCUL that is used as the cleanup level for 1-methylnaphthalene.

Naphthalene was detected in multiple samples of soil collected from across the T115N Site at concentrations greater than the PCUL (Figure 5-37). Naphthalene was detected in groundwater at concentrations greater than the PCULs at five locations (Figure 5-59). The PCULs for naphthalene for soil and groundwater are based on protection of surface water (Tables 4-1 and 4-2). Multiple locations with naphthalene at concentrations less than the PCUL are situated between the 48-inch drain line and Glacier Bay and the locations where naphthalene is present in groundwater at concentrations greater than the PCUL. The results of the RI indicate that the extent of naphthalene is limited to the T115N Site. The WOE from the results of the RI indicates that naphthalene should be re-evaluated and may not be considered a COC for the Site during development of the FS based on an incomplete exposure pathway.

Although non-carcinogenic PAHs including fluoranthene and HPAHs were detected at concentrations greater than the Target Sediment Concentrations in catch basin solids, fluoranthene and HPAHs were not detected at concentrations greater than the Target Sediment Concentrations in sediment in Glacier Bay or the LWD in proximity to Outfall 2127 (see Appendix F).

5.4.5. Carcinogenic Polycyclic Aromatic Hydrocarbons

Concentrations of cPAHs including benzo(a)anthracene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(a)pyrene, chrysene, dibenzo(a,h)anthracene and indeno(1,2,3-c,d)pyrene as well as total cPAH TEQ were detected greater than the PCULs in soil samples collected from multiple locations across the T115N Site (Section 5.3.1.5). The PQLs were greater than the PCULs in soil samples analyzed for cPAHs but the PQLs for cPAH analyses on soil performed as part of the RI met the limits identified in the Ecology approved RI/FS Work Plan in all but 10 samples. The PQLs for soil samples collected from four locations performed as part of previous environmental studies were slightly greater than the PQLs established in the RI/FS Work Plan. Figure M-34 presents the results for total cPAH TEQ in soil in comparison to the PCUL. Figure 5-38 provides an isoconcentration map summarizing the total cPAH TEQ results in comparison to the PCUL.

Concentrations of cPAHs including benzo(a)anthracene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(a)pyrene, chrysene, dibenzo(a,h)anthracene and indeno(1,2,3-c,d)pyrene as well as total cPAH TEQ were detected greater than the PCULs in shallow groundwater samples at multiple locations at T115N during one or more monitoring events (Section 5.3.2.5). The PQLs for cPAH analyses on groundwater samples were greater than the PCULs. The PQLs for cPAHs met the limits in the Ecology approved RI/FS Work Plan in more than 60 percent of the samples that were analyzed as part of the RI. The PQLs for cPAHs were greater than the PCULs in samples collected from three locations as part of previous environmental studies. Figure M-83 presents the results for total cPAH TEQ in groundwater in comparison to the PCUL. Figure 5-60 provides an isoconcentration map summarizing the results for cPAHs in comparison to the PCULs.

The PCULs for cPAHs in soil and groundwater are based on protection of surface water (Table 4-1 and 4-2). Detected concentrations of cPAHs in groundwater greater than the PCUL have occurred at locations that are situated between the 48-inch drain line and Glacier Bay. The WOE from the results of the RI indicates that cPAHs should be further evaluated as potential COCs for the Site during development of the FS.

In catch basin solids, the highest cPAH TEQ concentration was detected in catch basin CB 313 located near the Glacier NW property boundary and substantially lower concentrations of cPAHs were detected in the other catch basin solids samples. The cPAH TEQ concentration in shallow soil in the unpaved portion of the Site is less than the Target Sediment Concentration. The cPAH TEQ results indicate that the T115N Site is not a likely source for cPAH TEQ concentrations in catch basin solids exceeding the Target Sediment Concentration.

5.4.6. Semi-Volatile Organic Compounds

Aniline was identified as a COPC for groundwater and therefore, was retained as a COPC for soil for further evaluation. Aniline was not detected in soil at concentrations greater than the PCUL based on protection of bank erosion (Section 5.3.1.6, Table 4-1). In addition, aniline was not detected in groundwater at concentrations greater than the PCUL based on protection of drinking water (Section 5.3.2.6, Table 4-2). Aniline results for soil and groundwater are shown on Figures-M-35 and M-84, respectively. As shown on Figures M-35 and M-84, the PQLs for aniline for soil and groundwater were less than the PCULs. The WOE from the results of the RI indicates that aniline should be re-evaluated and would likely not be considered a COC for the T115N Site during development of the FS for the T115N based on aniline not being present at concentrations greater than the PCULs in soil and groundwater.

Bis(2-chloroethyl)ether was identified as a COPC for groundwater and therefore, was retained as a COPC for soil for further evaluation. Bis(2-chloroethyl)ether was detected in soil at location MW-10D within the native alluvium however, was not detected in groundwater with a PQL greater than the PCUL based on protection of surface water (Sections 5.3.1.6 and 5.3.2.6, Tables 4-1 and 4-2). Bis(2-chloroethyl)ether results for soil and groundwater are shown on Figures M-36 and M-85, respectively. As shown on Figure M-36, the PQLs for bis(2-chloroethyl)ether for soil analyses performed as part of the RI met the limits identified in the Ecology approved RI/FS Work Plan in all but 10 samples. As shown on Figure M-85, the PQLs for bis(2-chloroethyl)ether for groundwater analyses met the limits in the Ecology approved RI/FS Work Plan in more than 50 percent of the samples that were analyzed as part of the RI. The PQLs for soil and groundwater samples collected from multiple locations performed as part of previous environmental studies were greater than the PQLs established in the RI/FS Work Plan. The WOE from the results of the RI indicates that bis(2-chloroethyl)ether should be re-evaluated for the T115N Site during development of the FS for the Site based on consideration of the available PQL for groundwater, however, is not likely to be considered a COC for the T115N Site.

Bis(2-ethylhexyl)phthalate was detected in soil and groundwater across the Site at concentrations greater than the PCULs (Sections 5.3.1.6 and 5.3.2.6). The PCULs for bis(2-ethylhexyl)phthalate for soil and groundwater are based on protection of surface water (Tables 4-1 and 4-2). As shown on Figure M-37, the PQLs for bis(2-ethylhexyl)phthalate for soil analyses performed as part of the RI met the limits identified in the Ecology approved RI/FS Work Plan in all but 10 samples. As shown on Figure M-86, the PQLs for bis(2-ethylhexyl)phthalate for groundwater analyses met the limits in the Ecology approved RI/FS Work Plan in more than 50 percent of the samples that were analyzed as part of the RI. The PQLs for soil and groundwater samples collected from multiple locations performed as part of previous environmental studies were greater than the PQLs established in the RI/FS Work Plan. Figures 5-39 and 5-61 provide isoconcentration maps summarizing the results for bis(2-ethylhexyl)phthalate in soil and groundwater in comparison to the PCULs. The WOE from the results of the RI indicates that bis(2-ethylhexyl)phthalate should be further evaluated as potential COCs for the T115N Site during development of the FS.

Butyl benzyl phthalate was detected in three soil samples and one groundwater sample collected from the T115N Site at concentrations greater than the PCULs (Sections 5.3.1.6 and 5.3.2.6). The PCULs for butyl benzyl phthalate for soil and groundwater are based on protection of surface water (Tables 4-1 and 4-2). As shown on Figure M-38, the PQLs for butyl benzyl phthalate for soil analyses performed as part of the RI met the limits identified in the Ecology approved RI/FS Work Plan in all but 10 samples. As shown on Figure M-87, the PQLs for butyl benzyl phthalate for groundwater analyses met the limits in the Ecology approved RI/FS Work Plan in more than 50 percent of the samples that were analyzed as part of the RI. The PQLs for soil and groundwater samples collected from multiple locations performed as part of previous environmental studies were greater than the PQLs established in the RI/FS Work Plan. The WOE from the results of the RI indicates that butyl benzyl phthalate should be re-evaluated for the T115N Site during development of the FS for the T115N based on consideration of the available PQL for groundwater, however, is not likely to be considered a COC for the Site.

3,3'-Dichlorobenzidine was retained as a COPC for soil but was not retained as a COPC for groundwater. 3,3'-Dichlorobenzidine was detected in five soil samples collected from four locations in the former settling ponds at concentrations greater than the PCULs and was not detected (Section 5.3.1.6). The PCUL for 3,3'-dichlorobenzidine for soil is based on protection of surface water (Table 4-1). As shown on Figure M-39, the PQLs for 3,3'-dichlorobenzidine for soil analyses performed as part of the RI met the limits identified in the

Ecology approved RI/FS Work Plan in all but 10 samples. The PQLs for soil samples collected from multiple locations performed as part of previous environmental studies were greater than the PQLs established in the RI/FS Work Plan. The WOE from the results of the RI indicates that 3,3'-dichlorobenzidine should be re-evaluated and may not be considered a COC for the Site during development of the FS based on soil concentrations being protective of the soil to groundwater to surface water pathway.

2,4-Dichlorophenol was identified as a COPC for groundwater and therefore, was retained as a COPC for soil for further evaluation. As shown on Figure M-40, 2,4-dichlorophenol was not detected in soil at the T115N Site except for one sample collected from the native alluvium at MW-10D (Section 5.3.1.6). The PQLs for 2,4-dichlorophenol for soil analyses performed as part of the RI met the limits identified in the Ecology approved RI/FS Work Plan in all but 10 samples. The PQLs for soil samples collected from multiple locations performed as part of previous environmental studies were greater than the PQLs established in the RI/FS Work Plan. As shown on Figure M-88, 2,4-dichlorophenol was detected in only one groundwater sample at a concentration greater than the PCUL (Section 5.3.2.6). 2,4-dichlorophenol was detected at concentrations less than the PCUL or was not detected at PQLs less than the PCUL in all other groundwater samples collected from T115N. The PCULs for 2,4-dichlorophenol for soil and groundwater are based on protection of surface water (Tables 4-1 and 4-2). The WOE from the results of the RI indicates that 2,4-dichlorophenol should be re-evaluated and may not be considered a COC for the Site during development of the FS based on an empirical demonstration that soil concentrations are protective of the soil to groundwater to surface water pathway.

Diethyl phthalate was identified as a COPC for groundwater and therefore, was retained as a COPC for soil for further evaluation. As shown on Figure M-41, diethyl phthalate was detected in three soil samples at concentrations less than the PCUL and in one sample collected from the native alluvium at MW-10D greater than the PCUL (Section 5.3.1.6). The PQLs for diethyl phthalate for soil analyses performed as part of the RI met the limits identified in the Ecology approved RI/FS Work Plan in all but 10 samples. The PQLs for soil samples collected from multiple locations performed as part of previous environmental studies were greater than the PQLs established in the RI/FS Work Plan. As shown on Figure M-89, diethyl phthalate was detected in only one groundwater sample collected in 2009 as part of a previous environmental study at a concentration greater than the PCUL. Diethyl phthalate was detected at concentrations less than the PCUL or was not detected at PQLs less than the PCUL in all other groundwater samples collected as part of the RI. The PCULs for diethyl phthalate for soil and groundwater are based on protection of sediment (Tables 4-1 and 4-2). The WOE from the results of the RI indicates that diethyl phthalate should be re-evaluated and may not be considered a COC for the Site during development of the FS based on an empirical demonstration that soil concentrations are protective of the soil to groundwater to sediment pathway.

2,4-Dimethylphenol was identified as a COPC for groundwater and therefore, was retained as a COPC for soil for further evaluation. As shown on Figure M-42, 2,4-dimethylphenol was detected in three soil samples at concentrations greater than the PCUL (Section 5.3.1.6). The PQLs for 2,4-dimethylphenol for soil analyses performed as part of the RI met the limits identified in the Ecology approved RI/FS Work Plan in all but 10 samples. The PQLs for soil samples collected from multiple locations performed as part of previous environmental studies were greater than the PQLs established in the RI/FS Work Plan. As shown on Figure M-90, 2,4-dimethylphenol was detected in four groundwater samples collected from two locations adjacent to the former settling ponds and former Process Building at a concentration greater than the PCUL (Section 5.3.2.6). 2,4-Dimethylphenol was detected at concentrations less than the PCUL or was not

detected at PQLs less than the PCUL in all other groundwater samples collected as part of the RI. The PCUL for 2,4-dimethylphenol for soil is based on protection of surface water and the PCUL for groundwater is based on protection of sediment. The WOE from the results of the RI indicates that 2,4-dimethylphenol should be re-evaluated and may not be considered a COC for the T115N Site during development of the FS based on an empirical demonstration that soil and groundwater concentrations are protective of the soil to groundwater to surface water and sediment pathways.

As shown on Figure M-43, 2-methylphenol (o-cresol) was detected in three soil samples at concentrations greater than the PCUL (Section 5.3.1.6). The PQLs for 2-methylphenol for soil analyses performed as part of the RI met the limits identified in the Ecology approved RI/FS Work Plan in all but 10 samples. The PQLs for soil samples collected from multiple locations performed as part of previous environmental studies were greater than the PQLs established in the RI/FS Work Plan. As shown on Figure M-91, 2-methylphenol was detected in five groundwater samples collected from two locations adjacent to the former settling ponds at a concentration greater than the PCUL (Section 5.3.2.6). 2-Methylphenol was detected at concentrations less than the PCUL or was not detected at PQLs less than the PCUL in all other groundwater samples collected as part of the RI. The PCUL for 2-methylphenol for soil and groundwater are based on protection of sediment (Tables 4-1 and 4-2). The WOE from the results of the RI indicates that 2-methylphenol should be re-evaluated and may not be considered a COC for the Site during development of the FS based on an empirical demonstration that soil and groundwater concentrations are protective of the soil to groundwater to sediment pathway.

N-Nitrosodimethylamine was identified as a COPC for groundwater and therefore, was retained as a COPC for soil for further evaluation. As shown on Figures M-44 and M-92, n-nitrosodimethylamine was not detected in soil and groundwater at the T115N Site (Sections 5.3.1.6 and 5.3.2.6). The PQLs for n-nitrosodimethylamine for soil analyses performed as part of the RI were less than the PCUL in all but 10 samples. The PQLs for n-nitrosodimethylamine for groundwater analyses met the limits in the Ecology approved RI/FS Work Plan in more than 50 percent of the samples that were analyzed as part of the RI. The PQLs for soil and groundwater samples collected from multiple locations performed as part of previous environmental studies were greater than the PQLs established in the RI/FS Work Plan. The PCUL for n-nitrosodimethylamine for soil is based on bank erosion and the PCUL for groundwater is based on protection of surface water (Tables 4-1 and 4-2). The WOE from the results of the RI indicates that n-nitrosodimethylamine should be re-evaluated and may not be considered a COC for the Site during development of the FS based on an empirical demonstration that soil and groundwater concentrations are protective of bank erosion and groundwater is protective of the surface water pathway.

N-Nitrosodiphenylamine was identified as a COPC for groundwater and therefore, was retained as a COPC for soil for further evaluation. As shown on Figures M-45 and M-93, n-nitrosodiphenylamine was not detected in soil except for one sample collected from the native alluvium at MW-10D and groundwater at the T115N Site (Sections 5.3.1.6 and 5.3.2.6). The PQLs for n-nitrosodiphenylamine for soil analyses performed as part of the RI were less than the PCUL in all but 10 samples. The PQLs for n-nitrosodiphenylamine for groundwater analyses met the limits in the Ecology approved RI/FS Work Plan in more than 50 percent of the samples that were analyzed as part of the RI. The PQLs for soil and groundwater samples collected from multiple locations performed as part of previous environmental studies were greater than the PQLs established in the RI/FS Work Plan. The PCUL for n-nitrosodiphenylamine for soil and groundwater is based on protection of surface water (Tables 4-1 and 4-2). The WOE from the results of the RI indicates that n-nitrosodiphenylamine should be re-evaluated and

may not be considered a COC for the Site during development of the FS based on an empirical demonstration that soil and groundwater concentrations are protective of the surface water pathway.

N-Nitrosodi-n-propylamine was identified as a COPC for groundwater and therefore, was retained as a COPC for soil for further evaluation. As shown on Figures M-46 and M-94, n-nitrosodi-n-propylamine was not detected in soil at the T115N Site except for one sample collected from the native alluvium at MW-10D and was detected in three samples of groundwater collected from three locations (Sections 5.3.1.6 and 5.3.2.6). The PQLs for n-nitrosodi-n-propylamine for soil analyses performed as part of the RI were less than the PCUL in all but 10 samples. The PQLs for n-nitrosodi-n-propylamine for groundwater analyses met the limits in the Ecology approved RI/FS Work Plan in more than 50 percent of the samples that were analyzed as part of the RI. The PQLs for soil and groundwater samples collected from multiple locations performed as part of previous environmental studies were greater than the PQLs established in the RI/FS Work Plan. The PCUL for n-nitrosodi-n-propylamine for soil and groundwater are based on protection of surface water (Tables 4-1 and 4-2). The WOE from the results of the RI indicates that n-nitrosodi-n-propylamine should be re-evaluated for the Site during development of the FS for the T115N based on consideration of the available PQL for groundwater.

Pentachlorophenol was detected in one soil sample (Figure M-47) and was detected in five samples of groundwater collected from three locations (Figure M-95) at concentrations greater than the PCULs (Sections 5.3.1.6 and 5.3.2.6). The PQLs for pentachlorophenol for soil analyses performed as part of the RI were less than the PCUL in all but 10 samples. The PQLs for pentachlorophenol for groundwater analyses met the limits in the Ecology approved RI/FS Work Plan in more than 50 percent of the samples that were analyzed as part of the RI. The PQLs for soil and groundwater samples collected from multiple locations performed as part of previous environmental studies were greater than the PQLs established in the RI/FS Work Plan. The PCUL for pentachlorophenol for soil and groundwater are based on protection of surface water (Tables 4-1 and 4-2). Figures 5-40 and 5-62 provide isoconcentration maps summarizing the results for pentachlorophenol in soil and groundwater in comparison to the PCULs. The WOE from the results of the RI indicates that pentachlorophenol should be re-evaluated for the Site during development of the FS for the T115N based on consideration of the available PQL for groundwater.

Phenol was detected in three soil samples (Figure M-48) at concentrations greater than the PCUL (Section 5.3.1.6). The PQLs for phenol for soil analyses performed as part of the RI were less than the PCUL in all but 2 samples. Phenol was detected at concentrations less than the PCUL or was not detected at PQLs less than the PCUL in all groundwater samples (Figure M-96) collected from the T115N Site (Section 5.3.2.6). The PCUL for phenol for soil and groundwater is based on protection of sediment (Tables 4-1 and 4-2). The WOE from the results of the RI indicates that phenol should be re-evaluated and may not be considered a COC for the Site during development of the FS based on an empirical demonstration that soil and groundwater concentrations are protective of the soil to groundwater to sediment pathway.

2,4,6-Trichlorophenol was not detected in soil at the T115N Site except for one sample collected from the native alluvium at MW-10D (Figure M-49) and was detected in two samples of groundwater collected from two locations (Figure M-97) in and adjacent to the former settling ponds (Sections 5.3.1.6 and 5.3.2.6). The PQLs for 2,4,6-trichlorophenol for soil analyses performed as part of the RI were less than the PCUL in all but 10 samples. The PQLs for 2,4,6-trichlorophenol for groundwater analyses met the limits in the Ecology approved RI/FS Work Plan in more than 50 percent of the samples that were analyzed as part of the RI. The PQLs for soil and groundwater samples collected from multiple locations performed as part of

previous environmental studies were greater than the PQLs established in the RI/FS Work Plan. The PCUL for 2,4,6-trichlorophenol for soil and groundwater are based on protection of surface water (Tables 4-1 and 4-2). The WOE from the results of the RI indicates that 2,4,6-trichlorophenol should be re-evaluated and may not be considered a COC for the Site during development of the FS based on an empirical demonstration that soil and groundwater concentrations are protective of the surface water pathway.

In catch basin solids, bis(2-ethylhexyl)phthalate, butyl benzyl phthalate, and 3 & 4 methylphenol were detected at concentrations greater than the Target Sediment Concentrations. However, these compounds were not detected at concentrations greater than the Target Sediment Concentrations in sediment in the LDW in proximity to Outfall 2127.

5.4.7. Volatile Organic Compounds

Benzene was detected at concentrations greater than the PCUL in 11 soil samples at five locations (Figure M-50) in and adjacent to the former settling ponds and one sample collected from a location on the northwest portion of T115N (Section 5.3.1.7). Benzene was detected in shallow groundwater at concentrations greater than the PCUL at two locations (Figure M-98) in and adjacent to the former setting ponds (Section 5.3.2.7). The PCULs for benzene in soil and groundwater are based on protection of surface water (Tables 4-1 and 4-2). The groundwater monitoring results identify that groundwater with benzene at concentrations greater than the PCUL for protection of surface water are limited to the former settling pond area at T115N. Figures 5-41 and 5-63 provide isoconcentration maps summarizing the benzene results in soil and groundwater in comparison to the PCULs. The WOE from the results of the RI indicates that benzene should be re-evaluated and would likely not be considered a COC for the Site during development of the FS based on a potential incomplete exposure pathway.

Chloroform was retained as a COPC for soil as requested by Ecology because chloroform is a COPC for groundwater (Email from Ecology, May 20, 2019). As shown on Figure M-51, chloroform was not detected in any soil samples at PQLs less than the PCUL (Section 5.3.2.7). The PCUL for chloroform in soil is based on protection of surface water (Table 4-1). As shown on Figure M-99, chloroform was detected in shallow groundwater at one location (MW-10) at concentrations greater than the PCUL during two quarterly monitoring events (Section 5.3.2.7). The PCUL for chloroform in groundwater is based on protection of indoor air (Table 4-2). The groundwater monitoring results identify that groundwater with chloroform at concentrations greater than the PCUL for protection of indoor air is limited to one location at T115N that is located in the paved roadway that provides egress from T115 and no habitable buildings are present to create indoor air exposure. Figure 5-64 provides an isoconcentration map summarizing the chloroform results in groundwater in comparison to the PCUL. The WOE from the results of the RI indicates that chloroform should be re-evaluated and would likely not be considered a COC for the Site during development of the FS based on a potential incomplete exposure pathway.

VOCs either were not detected or were detected at concentrations less than the Target Sediment Concentrations in the catch basin solids samples.

5.4.8. Petroleum Hydrocarbons

Gasoline-range petroleum hydrocarbons were retained as a COPC at the request of Ecology pending evaluation of whether there is a localized area of detections requiring additional characterization (Email from Ecology, May 20, 2019). As shown on Figure M-52, the gasoline-range petroleum hydrocarbon concentration was greater than the PCUL in only one soil sample collected at location B-8 at a depth of 15

to 16 feet bgs (Section 5.3.1.8). As shown on Figure M-100, the gasoline-range petroleum hydrocarbon PCUL for soil is based on the presence of benzene (30 mg/kg). However, benzene was not detected in the soil sample collected from B-8. The detected gasoline-range petroleum hydrocarbon concentration is less than the MTCA Method A cleanup level for soil based on benzene not being present (100 mg/kg). Gasoline-range petroleum hydrocarbons were not detected at concentrations greater than the PCUL or were not detected at PQLs less than the PCUL in all shallow and deep groundwater samples collected from the Site (Section 5.3.2.8). Figures 5-42 and 5-65 provide isoconcentration maps summarizing the gasoline-range petroleum hydrocarbon results in soil and groundwater in comparison to the PCULs. The WOE from the results of the RI indicates that Gasoline-range petroleum hydrocarbons should be re-evaluated and would likely not be considered a COC for the Site during development of the FS based on a potential incomplete exposure pathway and reconsideration of the PCUL.

As shown on Figure M-53, the total diesel- and oil-range petroleum hydrocarbon concentration was greater than the PCUL in only three soil samples collected at a depth no greater than 6 feet bgs at locations B-7 and MW-18 (Section 5.3.1.8). The total diesel- and oil-range petroleum hydrocarbon PCUL for soil is based on protection of ecological receptors (260 mg/kg). Locations B-7 and MW-18 are in areas covered with concrete pavement and, as discussed in Section 2.8.1, the Site is unlikely to pose risks to terrestrial ecological receptors. Figure 5-43 provides an isoconcentration map summarizing the total diesel- and oil-range petroleum hydrocarbon results in soil in comparison to the PCUL.

In groundwater, diesel- and oil-range petroleum hydrocarbon analyses were performed on groundwater samples with and without using silica gel/acid wash cleanup prior to analysis (Section 5.3.2.8). Analyses for diesel- and oil-range petroleum hydrocarbons using silica gel/acid wash cleanup were subsequently performed to evaluate the elevated concentrations detected in groundwater and whether the result was due to naturally occurring organics at the Site (i.e., organic silt layer). When analyzing samples for diesel- and oil-range petroleum hydrocarbon using a silica gel/acid wash cleanup, the concentrations were less than the PCUL in each groundwater sample collected from the Site.

Analyses for TOC were also performed on the groundwater samples that underwent diesel- and oil-range petroleum hydrocarbon analyses with and without using silica gel/acid wash cleanup. The results of TOC and diesel- and oil-range petroleum hydrocarbon analyses identify that the TOC concentrations in groundwater correlate with diesel- and oil-range petroleum hydrocarbon concentrations from analyses performed without using silica gel/acid wash cleanup indicating that the concentrations detected by petroleum hydrocarbon analyses (without using silica gel/acid wash cleanup) are the result of interference by organic carbon present in groundwater.

The WOE from the results of the RI indicates that organic carbon concentrations in groundwater are the source of diesel- and oil-range petroleum hydrocarbon concentrations greater than the PCULs in groundwater without using silica gel/acid wash cleanup. Re-evaluation of the presence of diesel- and oil-range petroleum hydrocarbons in groundwater should be performed as part of the FS to evaluate the selection of diesel- and oil-range petroleum hydrocarbons as a COC for the Site based on a potential incomplete exposure pathway.

Although petroleum hydrocarbons were detected in catch basis solids, there are no Target Sediment Concentrations for petroleum hydrocarbons.

5.4.9. pH

In soil, pH ranges from 5.6 to 12. At multiple locations in and adjacent to the former settling ponds area, pH ranged from approximately 10 to 12 in fill and native soil (Figure M-54). pH was also measured up to 11 in one or more samples at several additional locations around the former settling pond area. Figure 5-44 provides an iso-concentration map summarizing the pH results in soil. As discussed in Section 6.2.1, the pH of soil and groundwater affects contaminant fate and transport, particularly for metals.

In groundwater, pH ranges from approximately 5.5 to 13.0. Values greater than 9 were measured in shallow groundwater in and adjacent to the former settling ponds area and at a location east of the 1965 shoreline (MW-7; Figure M-102). pH values greater than 9 were not measured in deep groundwater. pH values generally range between approximately 6 and 7 in groundwater between T115N and the Glacier NW Site and Glacier Bay. Figure 5-67 provides an iso-concentration map summarizing the pH results in groundwater.

The WOE from the results of the RI indicates that pH should be further evaluated as a COC for the Site during development of the FS.

6.0 Contaminant Fate and Transport

This section describes the fate and transport of contaminants at the T115N Site. For the purposes of this report, the term fate is defined as the eventual disposition of a contaminant in the environment either by destruction or long-term deposition. Transport is defined as the processes that move contaminants through the various media in the environment. The physical and chemical properties of source material(s) and the geochemical and environmental processes present at the Site ultimately control the fate and transport of contaminants at T115N.

The sources of contamination at the Site, environmental chemistry of the COPCs identified in Section 4.0, and transport mechanisms are discussed in the following sections to describe the fate and transport of contaminants at the Site.

6.1. IDENTIFICATION OF CONTAMINANTS BY SOURCE

The contaminant sources resulting from the development and historical operations at T115N and on adjacent properties that have been identified as potential contributors to contamination at the Site include the following:

- Deposition on the historical native surface prior to filling;
- Releases from the Glacier NW property prior to and following initial T115N development;
- Fill from undocumented sources;
- Tin reclamation operations;
- Atmospheric deposition, and,
- Drips, spills and releases from current/historical operations at the Site and surrounding area.

Potential contributors of COPC contamination at the Site are described in the following sections.

6.1.1. Deposition on Historical Native Surface

The Site is historically part of the LDW, which is a part of the larger Duwamish River estuary. The pre-development shoreline of the Duwamish River was historically located in the western portion of the current T115N property. At that time, the eastern portion of the property was submerged or tidally inundated by the estuarine waters of Duwamish River. At that time, the western portion of the T115N property was historically low-lying floodplain likely inundated by the estuarine waters of Duwamish River.

Commercial and industrial development and activities on LDW first began in the early 1900s. In 1913, the Commercial Waterway District No. 1 began dredging and re-channelizing the Duwamish River to allow navigation into the LDW to support commercial and industrial development. The dredging and re-channelization and filling of the adjacent properties allowed development of the adjacent properties for cargo handling and storage, ship and boat building and maintenance, aircraft manufacturing, wood treatment, concrete and chemical manufacturing and other industrial activities (Windward 2010b).

Commercial and industrial activities were occurring on the LDW prior to filling and development of the T115N property. Releases and discharges from historical commercial and industrial activities to the LDW caused contamination of sediment, soil and groundwater in and adjacent to the LDW that resulted in the LDW being designated a Superfund Site in 2001. Releases from historical commercial and industrial activities resulted in deposition of COPCs onto T115N property prior to filling and development.

COPCs for the Site that are potentially the result of historical deposition on the native surface include the following:

- Metals (arsenic, barium, chromium and selenium);
- Carcinogenic PAH compounds (expressed as total cPAH TEQ); and,
- SVOCs (bis[2-ethylhexyl]phthalate, 2-methylphenol, and phenol).

6.1.2. Releases from the Glacier Northwest Property

As described in Section 2.0, the Glacier NW property, located north and adjacent to T115N, has historically been used for industrial operations starting in the 1920s and prior to the placement of fill and development of T115N in the 1960s. The industrial operations and chemical releases that have resulted from the industrial operations at Glacier NW include the following:

- **Wood Preserving Operations (1936 to 1939):** A solution containing arsenic, copper sulfate, zinc sulfate and other “unnamed” chemicals was used to treat logs at the Glacier NW property between 1936 and 1939. Log treatment occurred on the southern portion of the property adjacent to the T115N property (Figure 2-5). Treatment chemicals leaked and drained onto and into the ground. Stormwater during wood treatment activities was reported to have either percolated into the ground or flowed overland toward the LDW (ERM 2015). Based on the results from investigations at T115N and Glacier NW, it appears that chemicals from wood preserving activities seeped into the soil and groundwater at T115N before fill was added there in the 1960s. The groundwater flow, documented in the Glacier NW study from 2015, suggests that contaminants like arsenic moved southeast towards the old LDW shoreline, affecting parts of T115N. This movement was influenced by drainage patterns and modifications due to historical tin reclamation and the installation of a 48-inch drain line. Detected concentrations of

arsenic in soil and groundwater based on the results of the Glacier NW Site RI (ERM 2015) are presented in Appendix N.

- **Charcoal and Whetlerite Manufacturing and Testing (1940 to 1944):** Manufacturing and testing of charcoal and activated carbon impregnated with copper, silver or chromium (i.e., whetlerite) was performed at the Glacier NW Site between 1940 and 1944. The manufacturing and testing processes also likely generated arsenic and dioxins and furans (ERM 2015). Manufacturing and testing facilities were on the northern portion of the property and included the use of various chemicals for testing. Spent carbon (i.e., gas chemical saturated carbon) from the testing was either dumped in portions of the Glacier NW Site, such as ditches or incinerated on site (ERM 2015). Disposal of other wastes generated by the manufacturing process was also reported to have occurred at multiple locations across the property including into the septic system and drainage ditches that discharged to the LDW (ERM 2015). Dioxin and furan contaminated soil was detected on the Glacier NW Site adjacent to the T115N Site as part of the Glacier NW Site RI (ERM 2015; Appendix N).
- **Chemical Manufacturing (1946 to 1961):** Resin glues, formaldehyde, pentachlorophenol and sodium pentachlorophenate were produced in the northern and central portions of the property between 1946 and 1961. Wastes were reportedly discharged to an unlined washwater impoundment, septic tank and the LDW. Ditches conveyed process water to the impoundment and stormwater to the LDW (ERM 2015). Pentachlorophenol is a known source of dioxins and furans. Dioxin and furan contaminated soil as well as pentachlorophenol contaminated soil and groundwater was detected on the Glacier NW Site adjacent to the T115N Site as part of the Glacier NW Site RI (ERM 2015; Appendix N).
- **Facility Demolition and Redevelopment (1965 to 1968):** A cement terminal was constructed and operated at the property between 1965 and 1968. During terminal construction, the existing buildings were demolished, and substantial earthwork was conducted. Aerial photographs from 1967 show piles of soil staged in the central and southeastern portions of the property that may be from the excavation to construct the terminal. The property has since operated as a cement terminal sometime after 1968 (ERM 2015).

Wood preserving operations (1935 to 1939), charcoal and whetlerite manufacturing and testing (1940 to 1944) and chemical manufacturing (1946 to 1961) all occurred on the Glacier NW Site prior to filling and development of the T115N Site in the early to mid-1960s. Additionally, all of these activities occurred prior to installation of the 48-inch drain line located between West Marginal Way and the LDW on the northern portion of the T115N property and filling for the Port's T115 property located south and west of the T115N property in the early 1970s. Contaminants identified as COPCs for the T115N Site that are potentially the result of historical Glacier NW operations include the following:

- Dioxins and furans;
- Metals (arsenic, chromium, copper, silver and zinc); and,
- Other SVOCs (e.g., pentachlorophenol).

6.1.3. Fill

Based on review of historical aerial photographs, the initial filling of the LDW shoreline in the vicinity of T115N Site began prior to 1922. As shown in the circa 1922 historical aerial photograph (Figure 2-4), the shoreline of the Duwamish River was historically located in the central portion of T115N and the landscape

shown is likely an initial fill event that occurred prior to 1922 to raise the western portion of the Site above the elevation of surface water in the LDW. Additional filling occurred in the early 1960s to extend the property from the historical shoreline to the approximate eastern extent of the current T115N property boundary. The additional filling was completed by 1963. The tin reclamation facility (i.e., former Process Building, above ground tanks, settling ponds and rail lines) was constructed by 1965 and are visible in the 1967 aerial photograph (Figure 2-6). Additional filling east and south of T115N was performed in the late 1960s and early 1970s to create land used for the larger T115 (Figure 2-5). In addition, as-built drawings for the 48-inch drain line, which traverses the northern portion of T115N (Appendix B), indicate that the line was installed in 1972 by excavating an approximate 17-foot deep trench followed by the placement of backfill in the pipe trench. A review of available records did not identify the sources of the fill material used at the Site for each of the fill events.

The fill at the Site includes the following based on explorations advanced as part of the RI:

- Initial fill placed prior to 1922 to raise the western portion of the Site above the elevation of surface water in the LDW that ranges in thickness from approximately 2 to 15 feet and contains occasional organic debris (i.e., roots, branches, etc.).
- Operational fill placed to facilitate tin reclamation operations is present from western boundary of T115N to the historical shoreline ranging in thickness from approximately 1.5 to 6 feet thick and contains thin layers of wood debris and/or concrete. East of the historical shoreline to the eastern boundary of T115N, operational fill ranging from approximately 10 to 20 feet thick containing occasional brick and untreated wood debris at various locations.
- Fill placed to backfill the settling ponds. Debris encountered in the fill material within the pond areas included occasional untreated wood debris, brick fragments, metal debris, and charcoal.
- Backfill placed around the 48-inch drain line within the trench excavated for the pipe installation is identified on the as-built drawing as City of Seattle Class B material, which consisted of washed fine to medium sand. The remainder of the trench above the 48-inch drain line backfill is noted as “fill” of unknown composition and source.

Contaminants identified as COPCs for the T115N Site that are potentially the result of fill placed on the Site include the following:

- PCBs;
- Dioxins and furans;
- Metals (arsenic, barium, chromium, copper, nickel, and selenium);
- Carcinogenic and non-carcinogenic PAHs; and,
- Other SVOCs (e.g., bis[2-ethylhexyl]phthalate, butyl benzyl phthalate, 3,3-dichlorobenzidine and phenol).

6.1.4. Tin Reclamation Operations

Tin reclamation operations began in 1963 at T115N and included recycling tin by dissolving the tin coating on waste metal in a solution containing caustic lye and separating the tin from solution via electrowinning. Electricity was used to reduce the tin salt in the solution to tin metal that was subsequently cast into ingots.

The detinning process occurred in the former Process Building (Figure 2-6). The former Process Building was equipped with two 16-ton cranes, a plating room, a boiler room, and an area where the caustic lye and metal materials were mixed. A rail line also serviced the former Process Building.

The spent solution containing sludge (black mud) generated by the operation was discharged into the unlined, settling ponds constructed in the central and eastern portions of the T115N property. The black mud was recovered and sold for further tin recovery. Since at least 1972, a filter press was installed, and the black mud captured by the settling ponds was dewatered to a semi-dry cake and stockpiled at the eastern end of T115N prior to sale. Since at least 1972, the remaining black mud was reported to have been removed from the ponds and sold for further tin reclamation.

Since at least 1978, the settling ponds were backfilled and were subsequently paved over. From 1972 to 1988, the stockpiled black mud was sold to off-site sources. After 1988, the black mud was no longer sold and was instead stockpiled on the Site until 1991. In 1991, the stockpiles of mud were removed and disposed of at an off-site landfill.

Contaminants identified as COPCs for the T115N Site that are potentially the result of tin reclamation include the following:

- Metals (antimony, cadmium, chromium, lead, mercury, silver, tin, and zinc);
- Non-carcinogenic PAHs (acenaphthene, anthracene, fluoranthene, fluorene, 2-methylnaphthalene, naphthalene, and pyrene);
- cPAHs;
- VOCs (benzene); and,
- Petroleum hydrocarbons (e.g., gasoline, diesel, and oil).

In addition to Site COPCs, the basic pH in soil and groundwater is the result of tin reclamation operations at the Site with the highest pH values measured in and adjacent to the former settling ponds.

6.1.5. Atmospheric Deposition

Gases and particulates may have been released to the atmosphere from current and historical combustion (e.g., vehicle emissions, burning, etc.) and/or industrial operations and may contain concentrations of PCBs, dioxin and furans, metals, PAHs, and/or other contaminants. Contaminants present in the atmosphere may have been deposited by settling of particulates or precipitation directly to waterbodies or land surfaces throughout the LDW and surrounding area. Secondary transport mechanisms of atmospheric deposition include stormwater runoff from land, roads, rooftops, and parking lots into catch basins and/or resuspension into the atmosphere by wind. The results of a LDW bulk atmospheric deposition study (King County 2013) found that atmospheric disposition of contaminants including PCBs, dioxin and furans, metals (arsenic, cadmium, copper, lead, nickel, and vanadium), and PAHs is occurring throughout the LDW and surrounding area.

6.1.6. Drips, Spills and Releases from Current/Historical Operations at the Site and Surrounding Area

Commercial and industrial activities at the Site since the late 1990s have included untreated wood storage and commercial sales, storage and distribution of fencing products, and storage and distribution of heavy equipment. Historically, the Site was used for tin reclamation operations. Industrial activities at the Site since the early 1960s may have resulted in the release of contamination through drips and spills from rail cars, the use of vehicles and/or other machinery at the Site, and storage of equipment including localized releases of petroleum hydrocarbons. Releases to the ground surface in unpaved areas have the potential to migrate through the soil column while releases to paved portions of the Site would be transported by surface flow to the stormwater catch basins. Additionally, off-site releases to unpaved areas or surface runoff have the potential to leach and infiltrate to groundwater/surface water and contaminants contained in groundwater/surface water from off-site sources may have migrated onto the T115N property. This may account for COPCs detected in groundwater at concentrations exceeding the PCULs with no apparent source from Site (i.e., detected concentrations of COPCs in soil either are not detected or are detected at concentrations less than the PCUL), including PCBs, dioxins and furans, metals, SVOCs, VOCs and petroleum hydrocarbons.

6.2. ENVIRONMENTAL CHEMISTRY OF COPCS

The following sections present the environmental chemistry for the identified COPCs and Site conditions as the basis for describing the fate of COPCs at the Site.

6.2.1. Polychlorinated Biphenyls

An important property of PCBs is their general inertness and persistence in the environment. PCBs resist both acids and alkalis and have thermal stability. This made PCBs useful in a wide variety of applications, including dielectric fluids in transformers and capacitors, heat transfer fluids, and lubricants. In general, PCBs are relatively insoluble in water and their solubility decreases with increased chlorination. PCBs are freely soluble in nonpolar organic solvents (e.g., hexane) and biological lipids (EPA 1980).

PCBs are considered to be persistent as a result of limited degradation in the environment. PCBs are expected to be relatively immobile in soil and are not easily transported via groundwater or surface water unless they are attached to particulates that are entrained in the water.

6.2.2. Dioxins and Furans

Chlorinated dioxins exist as colorless solids or crystals in a pure state. Dioxins and furans are considered persistent because they are hydrophobic, highly lipophilic, and biodegrade very slowly. Due to the low water solubility and low vapor pressure, dioxins and furans do not easily migrate in groundwater or surface water as dissolved molecules and do not easily evaporate into the atmosphere from soil and other solid matrices. As a result, dioxins and furans are expected to be relatively immobile in soil and are not easily transported via groundwater or surface water unless they are attached to particulates that are entrained in the water.

6.2.3. Metals

6.2.3.1. ANTIMONY

Antimony is naturally occurring, persistent and displays four oxidation states in the environment that include -3, 0, +3, and +5. The most common and stable oxidation states of antimony in aqueous solutions are Sb(III) and Sb(V). The oxidized form of antimony, Sb(V), is expected to be the more stable form in the

environment. However, Sb(III) is formed under certain environmental conditions (Mitsunobu et al. 2006). In the soil, the antimony oxidation state and environmental reactions are largely dependent on the pH, redox conditions, and concentrations of co-occurring reduction agents and oxidants in the system (Wilson et al. 2010).

Antimony is sometimes referred to as a metalloid, indicating that it displays both metallic and nonmetallic characteristics (Li 2011). Antimony can be retained in the soil primarily through adsorption. Antimony can sorb onto clay minerals, or onto oxides and hydroxides in the soil. Sb(III) sorbs more strongly to manganese (III) oxyhydroxide (MnOOH) than to aluminum hydroxide (Al(OH)_3) or iron(III) oxide-hydroxide (FeOOH) (Wilson et al. 2010). Similar to arsenic, antimony is capable of dissolution in pH ranges from 2.0 to 11.0 under suitable physical and chemical conditions. It is most soluble at both high (basic) pH and low (acidic) pH conditions and less soluble at a neutral pH.

6.2.3.2. ARSENIC

Arsenic is naturally occurring, persistent, and exists in the environment in four oxidation states that include +3 (arsenite), +5 (arsenate), 0 (arsenic metal) and -3 (arsine). The two most common oxidation states are +3 and +5. The mobility of arsenic in the environment depends strongly on the pH and redox conditions and can change oxidation states in response to environmental redox conditions. However, the change is generally slow. In the environment, arsenic bonds with a wide variety of other elements, producing inorganic and organic compounds with a range of mobilities.

Arsenic is capable of dissolution in pH ranges from 2.0 to 11.0 under suitable physical and chemical conditions. It is most soluble at both high (basic) pH and low (acidic) pH conditions and less soluble at a neutral pH. Arsenic is also mobile under both oxidizing and reducing conditions. Arsenic transport could be characterized as cycling between sorbed and aqueous phases due to environmental changes that affect pH, redox, concentrations of other chemicals present in the water, and biologic activity (Panagiotaras and Nikolopoulos 2015).

6.2.3.3. BARIUM

Barium is naturally occurring and readily oxidizes in air and is reactive in water creating hydrogen gas. Because of its high reactivity, barium does not exist as a metal in the environment; it exists in a combined state with other elements. Barium compounds, including barium acetate, barium chloride, barium cyanide, barium hydroxide, and barium oxide, are very soluble in water. Barium carbonate and sulfate are poorly soluble in water and slowly decomposes forming barium hydroxide and barium hydrosulfide. The solubility of barium compounds increases with decreasing pH (IPCS 1991).

6.2.3.4. CADMIUM

Cadmium is naturally occurring, persistent and is expected to partition primarily to soil (80 to 90%) when released to the environment. Although particulate and vapor cadmium may be released to the air, the net flux to soil will be positive as cadmium will eventually deposit onto soils (Morrow 2001; Wilber et al. 1992). In soils, pH, oxidation-reduction reactions, and formation of complexes are important factors affecting the mobility of cadmium (Bermond and Bourgeois 1992; Herrero and Martin 1993). Cadmium can participate in exchange reactions on the negatively charged surface of clay minerals. In acid soils, the reaction is reversible. However, adsorption increases with pH and may become irreversible (Herrero and Martin 1993). Cadmium also may precipitate as insoluble cadmium compounds, or form complexes or chelates by interaction with organic matter. These compounds are formed with increased pH.

Cadmium is more mobile in aquatic environments than most other heavy metals (e.g., lead). Cadmium concentration in water is inversely related to the pH and the concentration of organic material in the water (EPA 1979). Because cadmium exists only in the +2 oxidation state in water, aqueous cadmium is not strongly influenced by the oxidizing or reducing potential of the water. However, under reducing conditions, cadmium may form cadmium sulfide, which is poorly soluble and tends to precipitate (EPA 1983c; McComish and Ong 1988).

6.2.3.5. CHROMIUM

Chromium is naturally occurring, and persistent in the environment. The mobility of chromium in soil is dependent upon the speciation of chromium, which is a function of redox potential and the pH of the soil. In most soil, chromium will be present in the chromium +3 (III) oxidation state. Under reducing conditions, chromium III is present and has low solubility and low reactivity resulting in low mobility in the environment. Under oxidizing conditions, chromium +6 (VI) may be present in soil. Mobility studies have found that chromium forms insoluble complexes resulting in little leaching from the soil (ATSDR 2017). However, similar to arsenic, chromium is soluble under high pH conditions, while less soluble at a neutral pH (SRNL 2011).

6.2.3.6. COPPER

Copper is naturally occurring and persistent in the environment. In general, copper's migration in soil is determined by multiple physical and chemical interactions of copper with soil components. Copper will adsorb onto organic matter, carbonate minerals, clay minerals or hydrous iron and manganese oxides. Sandy soils with low pH have the greatest potential for leaching. Although much of copper is bound to inorganic and organic matrices in soil, there is the potential for release of copper into porewater in soil depending on extractability of the copper and soil conditions including pH (ASTDR 2017).

In general, the mobility of copper increases as pH decreases (SRNL 2011). A laboratory study showed that between 55 and 85 percent of copper bound to sand was remobilized as a result of a decrease in the pH from 9 to 4. At a pH above 5, absorption of copper from porewater onto soil components is a significant process, whereas at a pH below 5, copper largely remains in porewater and is mobile in soil (ATSDR 2017).

6.2.3.7. LEAD

Lead is naturally occurring and persistent in the environment. Lead bonds with a wide variety of other elements producing inorganic and organic compounds. Lead exists in the environment in three oxidation states that include +4 (tetravalent lead), +2 (divalent lead) and 0 (elemental lead). Of these, the +2 oxidation state is most common. Unlike arsenic, lead is unlikely to change oxidation states in response to typical environmental redox conditions.

Lead is considered to have low to very low solubility or to be insoluble. Materials onto/into which lead sorbs (adsorb/absorb) include soil and organic matter. Aluminum, iron, and manganese oxides and hydroxides are examples of materials that are widely distributed in soils onto which lead readily sorbs.

In general, the solubility of lead increases with a decrease in pH. Lead is considered to have low solubility at a pH of 8, becomes more soluble as the pH decreases to 5, and the solubility substantially increases between pH 5 and 3.3 (ASTDR 2017).

6.2.3.8. MERCURY

Mercury is naturally occurring, persistent and is distributed throughout the environment by both natural and anthropogenic processes. Mercury has three valence states. The specific state and form, in which the compound is found in an environmental medium is dependent upon a number of factors, including the redox potential and pH of the medium. The most reduced form is metallic or elemental mercury, which is a liquid at ambient temperatures, but readily vaporizes. In soil and water, mercury can exist in the mercuric (Hg^{+2}) and mercurous (Hg^{+1}) states as a number of complex ions with varying water solubilities. Mercuric mercury, present as complexes and chelates with ligands, is probably the predominant form of mercury present in water.

The transport and partitioning of mercury in water and soil is influenced by a particular form of the compound. However, the dominant process controlling the distribution of mercury compounds in the environment appears to be the sorption of nonvolatile forms to soil particulates (Bryan and Langston 1992). The sorption process has been found to be related to the organic matter content of the soil where mercury is strongly sorbed to humic materials and sesquioxides in soil at a pH higher than 4 (Blume and Brummer 1991) and to the surface layer of peat (Lodenius and Autio 1989). The most common organic form of mercury, methylmercury, is soluble, mobile, and quickly enters the food chain.

6.2.3.9. NICKEL

Nickel is naturally occurring and persistent in the environment. Nickel exists in several oxidation states, of which +2 is the most common. Nickel is generally, strongly adsorbed by soil, although to a lesser degree than lead, copper and zinc. There are many factors that affect the extent to which nickel is adsorbed by soil, so the adsorption of nickel by soil is site specific. Amorphous oxides of iron and manganese and to a lesser extent clay minerals, are the most important adsorbents in soil (ASTDR 2017).

The solubility of nickel increases as pH decreases, causing it to become more mobile. Most nickel compounds are relatively soluble at pH values less than 6.5 and relatively insoluble at high pH conditions.

6.2.3.10. SELENIUM

Selenium is naturally occurring, persistent, and is ubiquitous in the environment, being released from both natural and anthropogenic sources. The principal release of selenium into the environment as a consequence of human activity results from the combustion of coal. Selenium is stable in four valence states (-2, 0, +4, and +6) and forms chemical compounds similar to those of sulfur. The heavy metal selenides (-2) are insoluble in water, as is elemental selenium. The inorganic alkali selenites (+4) and selenates (+6) are soluble in water (Weast 1988). Conditions such as pH, oxidation-reduction potential, and the presence of metal oxides affect the partitioning of the various compounds of selenium in the environment. Under acidic conditions, selenite can be rapidly reduced to elemental selenium by mild reducing agents such as ascorbic acid or sulfur dioxide (NAS 1980). Selenate can be converted to selenite or elemental selenium in aquatic systems, but this reaction is slow relative to other transformations. Once formed, elemental selenium is stable over a wide range of pH values and a range of mildly oxidizing to reducing conditions. The formation of various metal selenides is favored by acidic and reducing conditions (NAS 1976), as found in organic-rich sediments.

6.2.3.11. SILVER

Silver is naturally occurring, rare element that exists in four oxidation states in the environment including 0, +1, +2, and +3. The 0 and +1 forms are much more common than the +2 and +3 forms. Silver occurs primarily as sulfides, in association with iron (pyrite), lead (galena), tellurides, and with gold. Silver is found

in surface waters in various forms including as the monovalent ion (e.g., sulfide, bicarbonate, or sulfate salts), as part of more complex ions with chlorides and sulfates and adsorbed onto particulate matter.

The transport and partitioning of silver in water is influenced by the particular form of the compound. Under oxidizing conditions, the primary silver compounds are bromides, chlorides, and iodides, while under reducing conditions the free metal and silver sulfide dominate (Lindsay and Sadiq 1979). In soil, mobility is affected by drainage as silver tends to be removed from well-drained soils, the oxidation-reduction potential and pH, which determine the reactivity of iron and manganese complexes, which tend to immobilize silver, and the presence of organic matter, which complexes with silver and reduces its mobility (Boyle 1968).

6.2.3.12. THALLIUM

Thallium is a naturally occurring element that is found primarily as the monovalent ion (Tl^+). Thallium exists in the environment mainly combined with other elements (primarily oxygen, sulfur, and halogens) in inorganic compounds. Compounds of thallium may be soluble in water but tend to be sorbed to soils and sediments (Frantz and Carlson 1987). Thallium is quite stable in the environment, since it is neither transformed nor biodegraded and bioconcentrates in aquatic plants, invertebrates, and fish (Barrows et al. 1978; Zitko and Carson 1975).

6.2.3.13. TIN

Tin is naturally occurring, persistent, and generally exists in two oxidation states in the environment including divalent +2 (stannous) and tetravalent +4 (stannic). Divalent tin is the dominant form in reduced water and will readily precipitate as a sulfide (S_nS) or as a hydroxide ($S_n(OH)_2$) in alkaline water. Tin is generally considered to be relatively immobile in the environment (ASTDR 2017).

6.2.3.14. ZINC

Zinc is naturally occurring, persistent, and occurs in the environment mainly in the +2 oxidation state. Zinc sorbs strongly onto soil particles. The mobility of zinc in soil depends on multiple factors including pH and redox potential. Precipitation of soluble zinc compounds appears to be significant under reducing conditions. Studies on zinc mobility have shown increased solubility as pH decreases and that as pH increases zinc adsorption increases, decreasing the amount of zinc in solution (ASTDR 2017).

6.2.4. Polycyclic Aromatic Hydrocarbons

PAHs are considered ubiquitous in the environment and can be formed from either natural or manmade combustion sources and are a class of organic compounds that consist solely of carbon and hydrogen atoms in aromatic ring structures. PAHs are grouped into low and high molecular weight classes. In general, chemicals within each class have similar environmental fates:

- Low molecular weight PAHs (LPAHs) are composed of less than four aromatic rings and include naphthalene, acenaphthylene, acenaphthene, fluorene, phenanthrene and anthracene.
- Medium molecular weight PAHs (MPAHs) are composed of three to four aromatic rings and include fluoranthene and pyrene.
- High molecular weight PAHs (HPAHs) composed of four or more aromatic rings and include benzo(a)anthracene, chrysene, benzo(b,k)fluoranthene, benzo[a]pyrene, dibenz(a,h)anthracene and ideno(1,2,3-c,d)pyrene.

PAHs are hydrophobic and do not readily dissolve in water or volatilize to the atmosphere with the exception of naphthalene. The chemical stability, low water solubility, and high sorption capacity of PAHs contribute greatly to their persistence in the environment. HPAHs are generally less water soluble, have lower vapor pressures and Henry's constants, and partition more readily into organic matter than LPAHs. Naphthalene can be categorized as a VOC due to its high volatility relative to other PAHs. Naphthalene, while being a PAH, behaves more like a lighter petroleum hydrocarbon compound, with higher solubility and mobility (lower K_{oc}) than the other PAHs. In addition, naphthalene readily degrades aerobically and would be expected to attenuate as a result of biodegradation at a faster rate than the heavier, more complex PAHs.

Anthropogenic sources of PAHs vary widely, including petroleum fuel spills, coal- and gas-fired power plants, and industrial operations and are present in a range of environments, often proximate to past or current industrial operations. The fate and transport of PAHs in the environment is controlled by PAH hydrophobicity, rates of dissolution, physicochemical properties of the soil, and the source phase. PAH compounds tend to be removed from the water column by binding to suspended particles or solids, by being accumulated by or sorbed onto biota and to a lesser degree, by volatilization to the atmosphere. The transport of PAHs from water to the atmosphere via volatilization will depend on the Henry's law constants (K_H). LPAHs have Henry's law constants in the range of 10^{-3} to 10^{-5} atmospheres meter cubed per mol ($\text{atm}\cdot\text{m}^3/\text{mol}$), MPAHs have constants in the 10^{-6} $\text{atm}\cdot\text{m}^3/\text{mol}$ range, and HPAHs have values in the range of 10^{-5} to 10^{-8} $\text{atm}\cdot\text{m}^3/\text{mol}$. Compounds with values ranging from 10^{-3} to 10^{-5} are associated with volatilization, while compounds with values less than 10^{-5} volatilize from water only to a limited extent (Lyman et al. 1982). Sorption of PAHs to soil increases with increasing organic carbon content and with increasing surface area of the sorbent particles.

6.2.5. Semi-Volatile Organic Compounds

Many SVOCs are high production volume chemicals used in plastics, detergents, furniture, building material components, and other household and consumer products, making them ubiquitous in the environment. The term "semi-volatile compounds" refers to organic compounds that possess Henry's law constants (H) in the range of 10^{-5} to 3×10^{-7} $\text{atm}\cdot\text{m}^3/\text{mol}$ and demonstrate higher boiling points, usually greater than that of water with correspondingly low vapor pressure from 10^{-14} to 10^{-4} atm. SVOCs are a subgroup of VOCs that tend to have a higher molecular weight and higher boiling point temperature than other VOCs. Compounds considered to be SVOCs have boiling points ranging from approximately 240-260 to 380-400°C. They are present partly as gaseous airborne chemicals and partly as chemicals adsorbed onto soil particles. SVOCs tend to have relatively low solubility and mobility in water. Biodegradation is expected to occur under aerobic conditions. Sorption and biodegradation are likely to be competing processes with the dominant fate being site-specific.

6.2.6. Volatile Organic Compounds

6.2.6.1. BENZENE

Benzene is considered to be highly volatile, having a vapor pressure of 95.2 millimeters (mm) mercury (Hg) at 25°C. The high volatility is the predominant chemical property in the partitioning and environmental transport of benzene. Benzene is soluble in water with a solubility of 1,780 mg/L at 25°C and the Henry's law constant for benzene indicates that benzene readily partitions to air from water. The measured soil partitioning coefficients ($K_{oc} = 62$ L/kg) for benzene indicates that benzene readily partitions from soil to water.

6.2.6.2. CHLOROFORM

Chloroform is both a synthetic and naturally occurring compound although anthropogenic sources are responsible for most of the chloroform in the environment. Chloroform volatilizes readily from soil and surface water and undergoes degradation in air to produce phosgene, dichloromethane, formyl chloride, carbon monoxide, carbon dioxide, and hydrogen chloride. Its half-life in air ranges from 55 to 620 days (WHO 2004). Biodegradation in water and soil is slow. Chloroform does not significantly bioaccumulate in aquatic organisms.

6.2.7. *Petroleum Hydrocarbons*

Gasoline is a mixture of relatively volatile hydrocarbons, including normal and branched chain alkanes, cycloalkanes, alkenes, and aromatics, that vary widely in their physical and chemical properties. Upon release to the environment, gasoline is not transported as a mixture; rather, the various components of the mixture selectively partition to the atmosphere, soil, or water according to their individual physical and chemical properties. Gasoline released to surface soils will differentially partition by volatilization, dissolution, or adsorption of individual constituents according to their physical and chemical properties. Gasoline exists in soil in four states: 1) as a free-moving liquid, 2) adsorbed onto soil particulates, 3) dissolved in groundwater, and/or 4) as a vapor. Components of gasoline that are not volatilized or sorbed onto non-colloidal soil particulates will migrate downward through the unsaturated zone by gravity or leaching to the water table. Liquid gasoline, as a result of its lower kinematic viscosity, is expected to move through the unsaturated zone of the soil at a velocity 2 to 3 times that of water. The amount of liquid product that reaches the water table is dependent upon the amount of product released and site-specific soil and hydrogeological conditions.

The transport and dispersion of diesel and heavy oil petroleum hydrocarbons are dependent on the water solubility and volatility of the aliphatic and aromatic hydrocarbon fractions of the diesel and oil. Lower molecular weight hydrocarbons such as n-alkanes may volatilize relatively quickly from both water and soil, while larger aliphatics (greater than nine carbon chain length) may be sorbed to organic particles in water or soil. Aromatic hydrocarbons will be dissolved in the aqueous phase in both soil and water and may undergo some volatilization. Liquid diesel and heavy oils, as a result of their higher kinematic viscosity, are expected to move through the unsaturated zone of the soil at a slower velocity as compared to gasoline. Similar to gasoline, the amount of liquid product that reaches the water table is dependent upon the amount of product released and site-specific soil and hydrogeological conditions.

Petroleum hydrocarbons in the unsaturated zone may be solubilized by downward moving water or fluctuating elevations of groundwater and may serve as a source of contamination through leaching of solubilized components for long periods of time. Water-soluble components will dissolve in groundwater, whereas insoluble components will float as a separate phase on top of the water table. Water-soluble compounds, such as benzene, toluene, and xylene, show a greater potential for transport in groundwater than insoluble forms.

Overall, mass reduction of petroleum hydrocarbons occurs naturally through biodegradation. Biodegradation of petroleum is most efficient under aerobic conditions. Biodegradation of petroleum also results in reducing conditions as the available oxygen in the substrate is consumed during aerobic biodegradation. Anaerobic biodegradation of petroleum also occurs, but it is a slower process than aerobic biodegradation.

6.2.1. pH

In solution, pH is the measure of the hydrogen ion concentration on a scale of 0 to 14 with values between 0 to less than 7 being acidic and values greater than 7 to 14 being basic or alkaline. A pH value of 7 is considered neutral (neither acidic nor basic). The pH of soil in Western Washington is generally acidic (less than 7) as a result of rainfall leaching of the alkaline elements in soil. The pH of groundwater generally ranges from 6.5 and 8.5. The pH of soil and groundwater affects contaminant fate and transport, particularly for metals.

6.3. ENVIRONMENTAL TRANSPORT

This section presents the potential transport mechanisms for the identified COPCs and conditions at the Site. Potential ecological receptors and exposure pathways based on COPC transport pathways are further discussed as part of the CSM (Section 7.0).

6.3.1. Soil

As discussed in Section 6.1, multiple sources have historically contributed to the fate of COPCs in soil at the T115N Site. Specific historical sources include deposition on the historical native surface, historical operations on the adjacent Glacier NW Site, fill from unknown sources and tin reclamation at the Site. Placement of fill on the historical native surface to create the T115N property and construction of the tin reclamation facility was completed by 1965. Backfilling of the settling ponds was completed by 1978. Following backfilling of the settling ponds, the majority of the T115N property was paved with asphalt and concrete (Figure 2-2).

Where asphalt and concrete pavement is present, soil is not exposed to physical mechanisms that can cause soil transport. The southwestern portion of the Site is not paved but is covered in compact gravel in areas where the asphalt is no longer continuous or ballast where rail lines are present on the Site. In unpaved areas, physical mechanisms including human activities, wind and water have the potential to transport COPCs present in soil at the ground surface. In addition, human activities (i.e., excavation) that remove paved surfaces or penetrate surface soil on the T115N Site can also expose soil containing COPCs to physical transport mechanisms.

6.3.2. Groundwater

Chemical properties described in Section 6.2 affect the solubility and mobility of COPCs in groundwater. Advection by stormwater infiltration or groundwater flow is the primary process for transporting COPCs in solution. To a lesser degree, dispersion, diffusion and mixing also affect COPC transport in solution. Dispersion is a transport process that results from COPCs traveling along flow pathways of differing velocities in groundwater on a micro-scale. Diffusion results from COPCs moving from areas of higher concentrations to areas of lower concentrations. Mixing is the process of two or more water sources interacting with one another. Each of these physical processes do not reduce the overall contaminant mass but can affect the distribution of the contaminant mass in groundwater including the redistribution of COPCs within the soil column or potential transport and discharge of COPCs to surface water and/or sediment in the LDW. Groundwater transport mechanisms identified for the Site are described further in the following sections.

6.3.2.1. INFILTRATION AND LEACHING

Infiltration of precipitation and leaching of COPCs in unpaved portions of the Site can transport COPCs contained within the soil column. COPCs that are soluble may enter solution and remain in solution until reaching groundwater or may be sorbed to soil in other portions of the soil column. As described above, the Site is predominantly covered in asphalt and concrete pavement that prevent the infiltration of stormwater through the soil column. Infiltration of precipitation and leaching of COPCs is a potential transport mechanism on the southwestern portion of Site where asphalt or concrete pavement is not present or is not continuous.

6.3.2.2. SHALLOW GROUNDWATER SOLUTE TRANSPORT

Solute transport in the shallow unconfined groundwater zone is governed by the environmental chemistry of the COPCs described above and hydrogeological properties of the groundwater zones including hydraulic conductivity, groundwater velocity, gradient and tidal influence. As described in Section 5.2 the average groundwater flow direction in shallow groundwater was measured to be to the north and northeast as shown on Figure 5-7 with an estimated velocity of approximately 0.34 ft/day. Results of the tidal study indicate that the current groundwater flow in the shallow groundwater zone is influenced by the presence of the 48-inch drain line that traverses the northern portion of the T115N Site. During the T115N tidal study, tidal influence was measured almost simultaneously (within 7 minutes of each other) in three shallow monitoring wells (GMW-26, MW-14, and MW-12) located adjacent to the 48-inch drain line approximately 250 feet apart and up to 350 feet from Glacier Bay. Note that, although there was tidal influence, the magnitude of tidal influence at these locations was small and less than 3 percent. The tidal influence measured in these wells is most likely attributed to the City of Seattle Class B material (washed fine to medium sand) placed as pipe bedding around the 48-inch drain line during installation or hydrostatic pressure outward from the concrete pipe joints during periods of high tide. The average groundwater flow gradients and tidal influence indicate that the 48-inch drain line and/or sand pipe bedding is acting as a preferential flow pathway for shallow groundwater.

6.3.2.3. SOLUTE DIFFUSION ACROSS THE AQUITARD

As stated above, diffusion results from a contaminant moving from an area of higher concentration to an area of lower concentration. During the groundwater investigation, concentrations of dissolved arsenic ranging from 1,400 to 1,700 µg/L were detected in the shallow groundwater zone at MW-4 (location of highest detection). In deep groundwater at MW-4D, arsenic was detected at concentrations up to 8.4 µg/L and exceeding the SL beneath the aquitard in the deep aquifer. It is possible that diffusion may be occurring through the aquitard between the shallow and deep groundwater zones in the north central portion of the Site where the highest concentrations of arsenic were detected. However, it is more likely that arsenic in deep groundwater migrated from the Glacier NW Site. Based on results of the Glacier NW Site RI, the highest concentrations of arsenic in shallow groundwater were detected in the vicinity of the former wood treatment area. Arsenic concentrations greater than the PCUL were also detected in deep groundwater at this location. In the Glacier NW RI, it was concluded that diffusion was the mechanism for the downward migration of arsenic through the aquitard layer at this location.

At the well pair MW-2 and MW-2D, low level PCUL exceedances of arsenic were identified in shallow groundwater, however, arsenic does not exceed the PCUL in deep groundwater at this location. This pattern of detections provides evidence that the range of detected concentrations in shallow groundwater in the western portion of the T115N Site are not at sufficient levels to diffuse across the aquitard and impact the underlying deep groundwater unit.

6.3.2.4. DEEP GROUNDWATER SOLUTE TRANSPORT

Similar to the shallow groundwater zone, solute transport in deep confined groundwater zone is governed by the environmental chemistry of COPCs described above and hydrogeologic properties including hydraulic conductivity, groundwater velocity, gradient and tidal influence. As described in Section 5.2 the average groundwater flow direction in deep groundwater was measured to be to the east and northeast as shown on Figure 5-10 with an estimated velocity of approximately 0.29 feet per day. Results of the tidal study indicate that there is a direct hydraulic response in the deep groundwater zone to tidal fluctuations in the LDW. The tidal effect was observed on groundwater in the deep groundwater zone to a distance of approximately 440 feet inland from the LDW at deep monitoring well location MW-2D. Based on the tidal study, there is an observed reversal in gradient and likely flow in deep groundwater during flood tide events. With the exception of arsenic, only cPAHs have been infrequently detected at concentrations greater than the PCULs in deep groundwater at monitoring well MW-10D located adjacent to the 48-inch drain line (preferential flow pathway).

6.3.2.5. GROUNDWATER MIXING ZONE SOLUTE TRANSPORT

Based on the results of the RI, the native organic silt layer separating the shallow and deep groundwater zones in the central and western portions of property is not present east of the historical shoreline. At this location, groundwater from the shallow and deep groundwater zones mix as a result of advection as well as tidal influence causing groundwater elevation changes. Within this mixing zone, shallow and deep groundwater east of the historical shoreline becomes comingled prior to traveling to the northeast toward the 48-inch drain line and LDW. As stated above, with the exception of arsenic, only a few COPCs have been infrequently detected at concentrations greater than the PCULs in shallow and deep groundwater at monitoring wells GMW-26, MW-10, GMW-27, and MW9 located adjacent to the 48-inch drain line (preferential flow pathway) and MW-8 located east of the historical shoreline and downgradient of the former settling pond area.

6.3.3. *Catch Basin Solids*

The stormwater system at the T115N Site is comprised of catch basins connected to stormwater lines that transport stormwater to the 48-inch drain line that traverses the northern portion of the Site. A 15-inch diameter storm drain line from the southern portion of the Glacier NW Site also discharged to the 48-inch drain line until 2014. The 48-inch drain line discharges to the LDW at the northeast corner of T115. Although COPCs were detected in catch basin solids at concentrations exceeding the Target Sediment Concentrations, the function of the catch basin system is to capture solid particulates (catch basin solids) from stormwater runoff over asphalt, concrete and/or gravel surfaces at the property prior to being discharged to the LDW.

As previously described, the Port operates under a Phase I Municipal Stormwater Permit issued by Ecology (Permit No. WAR044701). To comply with the requirements of the permit, the Port requires T115N tenants to complete and maintain SWPPPs and implement measures to prevent and control the discharge of contaminated stormwater to surface water or groundwater within their operational area. Under the Port's permit, the stormwater system is maintained at T115N, including the removal of catch basin solids for permitted disposal on a periodic basis to control and prevent the transport of catch basin solids to the LDW. The regular removal of catch basin solids limits the potential transport of the solids to sediment in the LDW.

6.3.4. Volatilization of Organic Compounds

In general, VOCs in soil and groundwater, will partition to the gaseous phase. VOCs with greater aqueous solubility (e.g., benzene) show a relatively greater tendency to remain in solution. Additionally, the effectiveness of volatilization to the atmosphere decreases with depth in the soil column. A Tier 1 evaluation of the environmental data for the T115N Site identifies benzene and chloroform as COPCs with the potential for vapor intrusion (VI) based on a comparison of the groundwater data relative to the 2019 LDW workbook screening values for the protection of VI. However, Ecology's Guidance for Evaluating Vapor Intrusion in Washington State (Ecology 2022) states that Ecology generally considers benzene concentrations less than three times the MTCA Method A soil cleanup level for unrestricted land use to not be significant, provided that only a limited contaminant mass is contained within soil body. In the soil at T115N, the maximum detected concentration of benzene is 0.022 mg/kg which is below the MTCA Method A soil cleanup level for unrestricted land use of 0.03 mg/kg. In groundwater, benzene only exceeds the VI screening level of 2.4 ug/L in groundwater at MW-16. However, MW-16 is located more than 80 feet from the nearest corner of the former Process Building in which indoor air may be impacted, which is well beyond the 30-foot horizontal separation distance identified in Ecology's implementation memorandum making the potential for VI unlikely. With respect to chloroform, Screening level exceedances were not identified in soil and only one exceedance of the VI screening level was observed more than 170 feet from the nearest corner of the former Process Building making the potential for VI unlikely. Note that the VI screening level for both benzene and chloroform assumes unrestricted land use, however, the current and anticipated future land use of the Site is industrial, further limiting the potential for adverse site worker exposure.

The potential for VI should be reevaluated during development of the FS based on current and future land use assumptions and complete exposure pathways. Based on the results for the RI, VI would likely not be considered a complete exposure pathway requiring remedial action evaluation.

7.0 Conceptual Site Model

This section presents the CSM for the T115N Site. The CSM identifies suspected sources of contamination, types of contaminants, contaminated Site media, potential exposure pathways, and receptors. The CSM provides the basis for evaluating the contamination from specific sources and transport pathways and identifies exposure pathways that pose a potential risk to receptors. The CSM for the T115N Site is graphically depicted in Figures 7-1 and 7-2. Figure 7-1 shows potential sources of contamination and transport pathways. Figure 7-2 shows the potential exposure pathways and receptors.

The following sections summarize the Site geology and hydrogeology that serves as the basis for the identified transport pathways and presents the sources of contamination, transport and exposure pathways, and receptors.

7.1. SITE GEOLOGY

As described in Section 2.6, the property comprising T115N lies within the Duwamish River Valley. In the early 1900s, the Duwamish River valley was extensively modified by filling and dredging to support development and marine commerce. In the early 1900s, the pre-development shoreline of the Duwamish River was situated within the western portion of what is currently T115N. Initial filling at the T115N Site occurred prior to the early 1920s to raise the ground surface on the western portion of the Site above the elevation of surface water in the LDW. Filling also occurred north of T115N (i.e., Glacier NW Site) in the 1930s using dredged material from the LDW to raise the ground surface above the elevation of surface

water in the LDW. In the early 1960s, much of what comprises T115N today was created by filling to facilitate tin reclamation operations and included the placement of additional fill material over the initial fill west of the historical shoreline and placement of fill to extend the T115N Site east into the LDW. In the 1970s, additional fill material was placed east and south of T115N to create upland terminal space for T115, to fill the settling ponds, and to backfill the 48-inch drain line trench traversing the northern portion of the Site.

The stratigraphy at T115N (Section 5.1) generally consists of fill of varying thicknesses overlying native organic silt and LDW alluvial deposits and is shown in cross-sections on Figures 5-1 through 5-3.

Fill at T115N includes the following:

- Initial and operational fill from the western boundary of T115N to the historical shoreline that varies in thickness from approximately 1.5 to 15 feet thick.
- Operational fill from the historical shoreline to the eastern boundary of T115N that varies in thickness from approximately 10 to 20 feet thick.
- Backfill placed in the former settling ponds.
- Backfill placed around the 48-inch drain line in the pipe trench (washed fine to medium sand) and above the pipe backfill.

Native deposits at T115N include the following:

- A layer of organic silt with low permeability ranging in thickness from approximately 1 to 5 feet that separates the fill deposits from the underlying LDW alluvial deposits west of the historical shoreline. The organic silt layer extends north beneath the 48-inch drain line and is present on the Glacier NW Site (ERM 2013).
- Beneath the organic silt layer on the western and central portion of T115N and the fill on the eastern portion of T115N are alluvial deposits that extend east beneath the LDW as well as north beneath the Glacier NW Site (ERM 2015).

7.2. SITE HYDROGEOLOGY

As described in Section 2.7, T115N is located at the base of western Duwamish River Valley plateau, approximately 60 feet southwest of Glacier Bay and approximately 530 feet west of the present day LDW (Figure 2-1). Three hydrogeologic units are present west of the historical shoreline as shown on Figure 5-4 that include the following:

- Unconfined shallow groundwater is locally perched on top of low permeable native organic silt and silt/clay fill west of the historical shoreline and is encountered at depths ranging between 4 and 13 feet bgs. Shallow groundwater is also identified on the Glacier NW Site to the north of T115N (ERM 2015).
- A low permeable unit (aquitard) consisting of native organic silt and clay and clay fill separate shallow and deep groundwater west of the historical shoreline. The native organic silt layer extends north of T115N onto the Glacier NW Site (ERM 2015).

- Deep groundwater is present within the native LDW alluvial sand deposits beneath the Site and is semi-confined west of the historical shoreline by the aquitard. Semi-confined deep groundwater is also present to the north of T115N on the Glacier NW Site (ERM 2015).

West of the historical shoreline, shallow and deep groundwater are not hydraulically connected due to the presence of the aquitard. East of the historical shoreline where the aquitard is absent, shallow groundwater mixes with deep groundwater and forms a single groundwater unit.

Shallow groundwater varies seasonally with an average groundwater velocity of 0.34 ft/day and a flow gradient that is oriented north toward the 48-inch drain line and northeast toward Glacier Bay. Deep groundwater fluctuates as a function of water level changes in the LDW resulting from tidal fluctuation. The average deep groundwater velocity is estimated to be 0.29 ft/day with a flow gradient oriented to the northeast toward Glacier Bay. During LDW tidal exchanges, groundwater west of the historical shoreline shows a localized reversal in groundwater gradient extending at least 440 feet inland. Groundwater at monitoring wells MW-9 and GMW-27 within the mixing zone located near the Glacier Bay shoreline is also tidally influenced and shows a localized reversal in groundwater gradient extending approximately 75 feet inland.

Recharge to the shallow groundwater zone occurs from precipitation infiltrating through unpaved areas in the upland. Recharge to the deep groundwater zone is in part from precipitation that falls onto advanced outwash deposits (Qva and Qvr; Figure 2-10) exposed higher up on the valley wall west of the Site and in part from groundwater moving down-valley.

7.3.SOURCES OF CONTAMINATION

As described in Section 6.1, the primary sources of contamination at T115N include the following:

- Deposition on the historical native surface prior to the filling of T115N;
- Releases from the Glacier NW property;
- Fill from undocumented sources;
- Tin reclamation operations;
- Atmospheric deposition; and,
- Drips, spills and releases from current/historical operations at the Site and surrounding area.

Secondary sources include Site media (soil and groundwater) that contain concentrations of COPCs greater than the PCULs. Tertiary sources include catch basin solids and groundwater discharging to surface water and/or sediment. COPCs identified in Site media at concentrations greater than the PCULs are presented in Table 4-7 and shown on Figures M-2 through M-101 (Appendix M). As discussed in Section 5.4, the COPCs will be further evaluated as part of the FS based on complete transport and exposure pathways discussed in the following sections (Sections 7.4 and 7.5).

7.4. TRANSPORT PATHWAYS

Soil, groundwater, and catch basins solids transport pathways are identified in this section and illustrated on Figure 7-1. The transport pathways applicable to each media are presented in the following sections (Sections 7.4.1 through 7.4.3) to support the CSM for the Site.

7.4.1. Soil

Potential transport pathways for COPCs in soil include the following:

- Transport of COPCs in soil from unpaved areas via wind erosion;
- Transport of COPCs in soil from unpaved areas via surface flow;
- Transport of COPCs from soil via volatilization; and,
- Transport of COPCs from soil to groundwater via leaching.

7.4.2. Groundwater

Potential transport pathways for COPCs in groundwater include the following:

- Transport of COPCs from groundwater via volatilization;
- Transport of COPCs in shallow groundwater to the 48-inch drain line and transport via the drain line in pipe backfill or localized discontinuities (ex. pipe joints, cracks, or breaks) in the drain line;
- Transport of COPCs via groundwater to surface water in the LDW; and,
- Transport of COPCs via groundwater to sediment in Glacier Bay.

7.4.3. Catch Basin Solids

Catch basin solids contain COPCs at concentrations greater than the Target Sediment Concentrations as described in Section 5.3.3. COPCs in catch basin solids are the result of wind and/or water erosion of soil from unpaved portions of T115N and unpaved portions of the Glacier NW Site adjacent to the T115N Site and the collection of particulates from atmospheric deposition and/or drips, spills and releases on paved surfaces at the Site and surrounding area.

As previously described, the Port implements measures to prevent and control the discharge of contaminated stormwater and to maintain the stormwater system for T115N including the removal of catch basin solids for permitted disposal on a periodic basis to control and prevent the transport of catch basin solids to the LDW. As previously described, the Port conducts biannual inspections (winter and summer) of the catch basins to observe the condition of the stormwater system and identify whether removal of the captured solids is required following the City of Seattle stormwater code. Catch basin solids removed from the stormwater system are transported from the Site for permitted disposal. The removal of catch basin solids limits potential transport of solids to the LDW.

7.5. EXPOSURE PATHWAYS AND RECEPTORS

This section describes the potential exposure pathways and receptors at T115N. Figure 7-2 presents the conceptual site exposure model for T115N and graphically depicts the potential exposure pathways and receptors. The following sections further describe the potential exposure pathways and receptors for Site media.

7.5.1. Soil

The human and ecological receptors for soil presented in this RI are based on the exposure scenarios specified in Ecology's white paper (Ecology 2019a) as required by Ecology. The exposure scenarios are based on unrestricted land use as described in Section 4.1.1.

The exposure pathways and receptors evaluated for soil by the RI as required by Ecology include the following:

- **Residents** – Evaluated based on protection of human health from direct contact (incidental ingestion) with contaminated soil.
- **Biota, plants and wildlife** – Evaluated based on protection of terrestrial receptors from exposure to contaminated soil via direct contact (incidental ingestion and dermal contact).
- **Aquatic organisms and higher trophic level ecological receptors** – Evaluated based on the protection of aquatic organisms and higher trophic level ecological receptors from exposure via the soil to groundwater to surface water and sediment pathway and bank erosion (incidental ingestion and dermal contact).

The potential exposure pathways for soil for human and ecological receptors are ultimately selected based on consideration of the current and future use of the Site, which is for industrial purposes as described in Section 2.4. In addition, a simplified TEE and the resulting exposure analysis (Section 2.8.1) conducted for the T115N Site determined that the Site is unlikely to pose risks to terrestrial ecological receptors. Lastly, the Glacier Bay shoreline is armored with rip rap and therefore, bank erosion of contaminated soil and exposure to sediment impacted by bank erosion is not a complete exposure pathway. However, erosion of soil may occur in portions of the Site that are unpaved and be transported by stormwater toward the LDW, if not captured by the catch basins.

Soil PCULs will be re-evaluated during development of the FS based on exposure pathways for current and future land use including protection from incidental ingestion by industrial adult workers and exposure of individuals, aquatic organisms and higher trophic level ecological receptors via the soil to groundwater to surface water and sediment pathway identify the nature and extent of contamination and areas requiring cleanup action evaluation.

7.5.2. Groundwater

The human and ecological receptors for groundwater presented in this RI are based on the exposure scenarios specified in the Ecology's white paper (Ecology 2019a) as required by Ecology. The potential exposure pathways for groundwater were developed in consideration of the highest beneficial use of groundwater. The highest beneficial use for groundwater at T115N is as marine surface water in the LDW because groundwater at the Site is non-potable as described in Section 2.8.2. However, Ecology also required use of the groundwater as drinking water exposure pathway for COPCs, for which surface water PCULs are not established.

The potential exposure pathways and receptors evaluated for groundwater as required by Ecology include the following:

- **Individuals in contact with groundwater** – Evaluated based on protection of human health from ingestion as drinking water and incidental ingestion or dermal contact with non-potable groundwater.
- **Individuals where groundwater discharges to sediment in the LDW** – Evaluated based on protection of human health from direct contact (incidental ingestion or dermal contact) with sediment.
- **Marine aquatic organisms where groundwater discharges to surface water and sediment in the LDW** – Evaluated based on protection of marine aquatic organisms from direct contact with sediment or surface water.
- **Individuals and higher trophic level ecological receptors consuming aquatic organisms in the LDW** – Evaluated based on protection of human health and ecological receptors from consumption of marine aquatic organisms exposed to sediment or surface water where groundwater discharges to sediment or surface water in the LDW.
- **Individuals where groundwater volatilizes to indoor air** – Evaluated based on protection of human health via inhalation.

The potential exposure pathways for groundwater for human and ecological receptors are ultimately selected based on consideration of the current and future use of the Site and the highest beneficial use of groundwater. As described in Section 2.8.2, groundwater at the Site is not a potable source of drinking water, and therefore the highest beneficial use of groundwater is as marine surface water. In addition, because the current and future Site use is for industrial purposes as described in Section 2.4, the exposure pathway for protection of human health for industrial adult workers only includes incidental ingestion and dermal contact with non-potable groundwater and inhalation of indoor air.

Groundwater PCULs will be re-evaluated during development of the FS based on exposure pathways for current and future land use including protection from incidental ingestion or dermal contact with non-potable groundwater and inhalation by industrial adult workers and protection from incidental ingestion and dermal contact by aquatic organisms and higher trophic level ecological receptors exposed to sediment and/or surface water within Glacier Bay and the LDW identify the nature and extent of contamination and areas requiring cleanup action evaluation.

7.5.3. Catch Basin Solids

The Port implements measures to prevent catch basin solids from being transported to sediment in the LDW including the removal of catch basin solids on a periodic basis for offsite disposal. As previously described, the Port conducts biannual inspections (winter and summer) of the catch basins to observe the condition of the stormwater system and identify whether removal of the captured solids is required following the City of Seattle stormwater code. The removal of catch basin solids eliminates transport of the removed solids to the LDW.

The exposure pathways and receptors for catch basin solids as required by Ecology include the following:

- **Individuals where catch basin solids discharge to sediment in the LDW** – Evaluated based on protection of human health from direct contact (incidental ingestion or dermal contact) with sediment if catch basin solids discharge to sediment in the LDW.

- **Marine aquatic organisms where catch basin solids discharge to sediment in the LDW** – Evaluated based on protection of marine aquatic organisms from direct contact with sediment if catch basin solids discharge to sediment in the LDW.
- **Individuals and Higher trophic level ecological receptors consuming aquatic organisms in the LDW** – Evaluated based on protection of human health and ecological receptors from consumption of marine aquatic organisms exposed to sediment if catch basin solids discharges to sediment in the LDW.

The Port will continue to implement measures to prevent catch basin solids from being transported to sediment in the LDW including the removal of catch basin solids on a periodic basis for offsite disposal. The potential for erosion and the transport of contaminated solids to the LDW will be further evaluated during development of the FS to determine whether additional cleanup action evaluation is required.

8.0 Conclusions

8.1. REMEDIAL INVESTIGATION

Pursuant to the Ecology Agreed Order DE-8099 and MTCA (Chapter 173-340 WAC), an RI was performed by the Port to characterize Site conditions at T115N located at 6000 West Marginal Way SW in Seattle, Washington. Environmental data was collected in accordance with the Ecology-approved RI/FS Work Plan to supplement existing data collected as part of previous Site investigations, fill data gaps identified in the RI/FS Work Plan, characterize the nature and extent of contamination, and provide sufficient data to identify and evaluate cleanup action alternatives in the FS. The RI for T115N included the following:

- **Soil Investigation:** Soil sampling was performed at 33 locations to characterize the stratigraphy at the Site and to define the nature and extent of contamination in soil. Exploration locations were positioned to collect soil samples representative of fill and native soil to provide comprehensive coverage of the Site and to fill identified data gaps. Soil samples collected during the RI were screened in the field for evidence of contamination, including visual observations of contamination (i.e., staining, etc.), water sheen testing and organic vapor monitoring. Based on the field screening results and the chemical analytical results from previous investigations, selected soil samples were submitted to an Ecology-accredited laboratory for a combination of chemical analyses including PCBs; dioxins and furans; priority pollutant metals, barium, and tin; SVOCs; VOCs; and petroleum hydrocarbons (gasoline-, diesel- and oil-range petroleum hydrocarbons).
- **Groundwater Investigation:** Hydrogeologic testing including hydraulic conductivity testing and a 72-hour tidal study were performed to characterize groundwater gradients and flow in shallow and deep groundwater at the Site. Groundwater sampling was then performed at 27 locations on a quarterly basis for one year to evaluate seasonal variability in groundwater conditions and characterize the nature and extent of contamination in shallow and deep groundwater. Groundwater samples collected during the RI were submitted to an Ecology-accredited laboratory for a combination of chemical analyses including total and dissolved priority pollutant metals, barium and tin; SVOCs; VOCs; and petroleum hydrocarbons (gasoline-, diesel- and oil-range petroleum hydrocarbons). In addition to the groundwater sampling performed by the Port at T115N, Ecology collected and analyzed groundwater samples from three wells (MW-3, MW-10 and MW-20) at T115N for PCB Aroclors and Congeners as part of a larger evaluation of PCBs in groundwater in the LDW (Leidos 2017) and collected and analyzed

a groundwater sample from one location (GMW-27) for dioxins and furans during one quarterly groundwater monitoring event.

- **Stormwater System Investigation:** A stormwater system investigation was performed to evaluate whether the stormwater conveyance system is acting as a potential pathway for contaminant migration from T115N to the LDW. The stormwater system investigation consisted of completion of a video and land survey of the Port's stormwater conveyance system and collection of solids samples from selected catch basins for chemical analysis to evaluate contaminants within the stormwater conveyance system. Catch basin solids samples were submitted to an Ecology-accredited laboratory for chemical analyses including PCBs; dioxins and furans; priority pollutant metals, barium and tin; SVOCs; VOCs; and petroleum hydrocarbons (gasoline-, diesel- and oil-range petroleum hydrocarbons).

The results from the soil, groundwater and catch basin solids investigations were used to characterize the Site stratigraphy and hydrogeologic conditions; identify Site COPCs based on protection of human health and ecological receptors for unrestricted land use and protection of marine aquatic organisms and higher trophic level ecological receptors in the LDW as requested by Ecology; and define the nature and extent of COPCs at T115N.

8.2. NATURE AND EXTENT OF CONTAMINATION

From the results of the RI, COPCs were selected for Site media using the methodology specified by Ecology (Ecology 2018b) that included the comparison of the detected concentrations and PQLs for each chemical to soil and groundwater PCULs developed by Ecology for upland sites “that have environmental transport pathways to the LDW and may impact surface water, sediments, or organisms in the river.” In addition, the results for catch basin solids were compared to Target Sediment Concentrations developed for the LDW to evaluate whether contaminants identified as COCs for sediment in the LDW were present in catch basin solids at concentrations greater than the Target Sediment Concentrations. The screening methodology requested by Ecology was used to specifically identify which chemicals could be eliminated from being selected as a COPC. The chemicals that were not eliminated were retained for further evaluation in the RI.

COPCs identified for soil, groundwater and catch basin solids are summarized in Table 4-7. The chemical analytical results and the distribution of COPCs in soil, groundwater and catch basin solids are presented in Sections 5-1 through 5-3. COPCs at the Site are the result of historical development and operations at T115N and on adjacent properties beginning in the early 1900s and include deposition on the historical native surface prior to filling, releases from the Glacier NW Site, the filling of T115N with soil from undocumented sources, tin reclamation operations, and atmospheric deposition. COPCs in catch basin solids are the result of wind and/or water erosion of soil from unpaved portions of T115N and unpaved portions of the Glacier NW Site adjacent to the T115N Site and the collection of particulates from atmospheric deposition and/or drips, spills and releases on paved surfaces at the Site and surrounding area.

The results for COPCs identified in soil, groundwater, and catch basin solids based on Ecology's screening methodology assuming unrestricted land use, protection of terrestrial ecological receptors, protection of sediment and surface water via groundwater, protection of groundwater as a potable drinking water source in the absence of surface water screening criteria, and Target Sediment Concentrations for the LDW are summarized in the following Sections (Sections 8.2.1 through 8.2.3).

8.2.1. Soil

In soil, the following were identified as COPCs at the T115N Site based on the criteria set forth by Ecology (Table 4-4):

- PCBs;
- Dioxins and furans;
- Metals (antimony, arsenic, barium, cadmium, chromium III/total, copper, lead, mercury, nickel, selenium, silver, thallium, tin and zinc);
- PAH compounds (acenaphthene, anthracene, benzo[a]anthracene, benzo[b]fluoranthene, benzo[k]fluoranthene, benzo[a]pyrene, chrysene, dibenzo[a,h]anthracene, dibenzofuran, fluoranthene, fluorene, indeno[1,2,3-c,d]pyrene, 1-methylnaphthalene, 2-methylnaphthalene, naphthalene, pyrene, and total cPAH TEQ);
- SVOCs (aniline, bis[2-chloroethyl] ether, bis [2-ethylhexyl]phthalate, butyl benzyl phthalate, 3,3'-dichlorobenzidine, 2,4-dichlorophenol, diethyl phthalate, 2,4-dimethylphenol, 2-methylphenol, n-nitrosodimethylamine, n-nitrosodiphenylamine, n-nitrosodi-n-propylamine, pentachlorophenol, phenol and 2,4,6-trichlorophenol);
- VOCs (benzene and chloroform); and,
- Petroleum hydrocarbons (gasoline-, diesel- and oil-range).

COPCs were detected at concentrations greater than the PCULs in fill and native soil at the Site. The highest concentrations of COPCs in soil were generally detected in fill in the vicinity of the former settling pond area, in the material placed as backfill in the former settling ponds, in soil beneath and south of the former Process Building, and in the rail line rights-of-ways on the western portion of from the ground surface to depths ranging between approximately 10 to 18 feet bgs. In addition, COPC concentrations greater than the PCULs were also identified in fill southeast of the 1965 shoreline. Elevated pH values for soil were also measured in and adjacent to the former settling ponds area. With respect to arsenic, the highest concentrations were detected in soil in the northern and central portions of T115N adjacent to the area of historical wood treatment operations on the Glacier NW Site and the location of a historical drainage from the southern portion of the Glacier NW Site and the abandoned 15-inch drain line that historically drained to the 48-inch diameter drain line from southern portion of the Glacier NW Site.

Where the surface of T115N is paved, soil is not exposed to physical processes such as erosion and surface flow that could result in the transport of COPCs or direct exposure to adult workers at the Site. In unpaved portions of the Site, erosion and direct exposure are potential transport and exposure routes. Leaching of COPCs from soil and migration in groundwater are potential transport and exposure routes where COPCs are present at concentrations greater than the PCULs for protection of the soil to groundwater pathway and could cause exposure to aquatic organisms, humans and higher trophic level ecological receptors in surface water and sediment in the LDW.

8.2.2. Groundwater

In groundwater, the following were identified as COPCs at the T115N Site based on the criteria set forth by Ecology (Table 4-5):

- PCBs;
- Dioxins and furans;
- Metals (arsenic, barium, cadmium, chromium III/total, copper, lead, mercury, nickel, silver, thallium, and zinc);
- PAH compounds (acenaphthene, anthracene, benzo[a]anthracene, benzo[b]fluoranthene, benzo[k]fluoranthene, benzo[a]pyrene, chrysene, dibenzo[a,h]anthracene, fluoranthene, fluorene, indeno[1,2,3-c,d]pyrene, 1-methylnaphthalene, naphthalene, pyrene, and total cPAH TEQ);
- SVOCs (aniline, bis[2-chloroethyl]ether, bis[2-ethylhexyl]phthalate, butyl benzyl phthalate, 2,4-dichlorophenol, diethyl phthalate, 2,4-dimethylphenol, 2-methylphenol, n-nitrosodimethylamine, n-nitrosodiphenylamine, n-nitrosodi-n-propylamine, pentachlorophenol, phenol and 2,4,6-trichlorophenol);
- VOCs (benzene and chloroform); and,
- Petroleum hydrocarbons (gasoline-, diesel- and oil-range petroleum hydrocarbons).

Multiple COPCs were detected at concentrations greater than the PCULs in shallow groundwater at the Site. In deep groundwater, COPCs were predominantly not detected or were detected at concentrations less than the PCULs with the exception of several metals (arsenic, copper and nickel) and cPAHs.

In groundwater, the transport of COPCs is governed by the environmental chemistry of the specific COPCs and the physical properties of the groundwater zone including hydraulic conductivity, gradient and tidal influence. The results of hydrogeologic testing indicate that groundwater flow in the shallow groundwater zone is to the north/northeast and is influenced by the presence of the 48-inch drain line that traverses the northern portion of the T115N property. The influence of the 48-inch drain line is most likely attributed to the pipe bedding placed around the 48-inch drain line during installation, which was identified to be washed fine to medium sand, which is likely acting as a preferential flow pathway for shallow groundwater. Deep groundwater west of the historical shoreline is affected by tidal fluctuations in the LDW that causes a reversal in flow gradient during periods of low tide. However, the average groundwater flow in the deep groundwater zone is to the northeast toward Glacier Bay. East of the historical shoreline where the native organic silt layer is absent, shallow and deep groundwater mixes before flowing to the northeast toward the 48-inch drain line and Glacier Bay.

The detected concentrations greater than the PCULs for COPCs including barium, cadmium, chromium III/total, lead, silver, zinc, non-carcinogenic PAHs, all but three SVOCs, benzene, and gasoline-, diesel-, and oil-range petroleum hydrocarbons were limited to T115N and were not detected at concentrations greater than the PCULs in wells located on the northeastern portion of the Site adjacent to the 48-inch drain line (i.e., preferential flow pathway) and Glacier Bay. Relatively few COPCs were detected at concentrations greater than the PCULs in wells located on the northeastern portion of the Site adjacent to the 48-inch drain line and Glacier Bay. COPCs that were infrequently detected at concentrations greater than the PCULs in wells located on the northeastern portion of the Site adjacent to the 48-inch drain line and Glacier Bay include copper, nickel, cPAHs, bis(2-ethylhexyl)phthalate, 2,4-dichlorophenol, n-nitrosodi-n-propylamine, and chloroform. PCBs in groundwater greater than the PCUL were detected in samples at the T115N Site collected by Ecology as part of a greater LDW groundwater study (Leidos 2017). PCB congeners were detected in all 44 groundwater samples collected from sites throughout the LDW as part of the study including upgradient groundwater monitoring locations. Based on the results of Ecology's PCB study, PCB

congeners are ubiquitous in groundwater throughout the LDW and are likely the result of historical industrial activities throughout the area. PCBs were not historically used at T115N and were only detected in low concentrations in two soil samples of fill from the settling ponds area. Further, T115N is not believed to have or be a source of PCBs in groundwater.

Dioxin and furans were detected at a concentration greater than the PCUL in one groundwater sample collected by Ecology on the boundary between the Glacier NW Site and T115N. Dioxins and furans were detected in soil at the T115N Site at concentrations less than the natural background concentration for Washington State. As the dioxin and furan concentrations in soil at T115N are less than the natural background concentration in Washington State, soil at T115N is not a source of elevated concentrations of dioxins and furans in groundwater.

Along the northeastern portion of T115N, arsenic was consistently detected in groundwater at concentrations greater than the PCUL. The presence of arsenic in groundwater is predominantly attributed to historical wood treatment operations on the Glacier NW property. However, fill soil on T115N cannot definitively be ruled out as a contributing source to the observed groundwater contamination.

Analyses for diesel- and oil-range petroleum hydrocarbons using silica gel/acid wash cleanup were performed to evaluate elevated concentrations detected in groundwater and whether the results were due to naturally occurring organics at the Site (i.e., organic silt layer). The results for analyses of TOC in groundwater correlate with diesel- and oil-range petroleum hydrocarbon concentrations in analyses performed without using silica gel/acid wash cleanup indicating that the concentrations detected by petroleum hydrocarbon analyses without using silica gel/acid wash cleanup are the result of interference by organic carbon present in groundwater.

As discussed in Section 5.4.3, results of soil analyses indicate that metals including cadmium, chromium, copper, lead, mercury, silver, and zinc are generally co-located with tin, which was the metal being reclaimed as part of historical facility operations (Section 5.3.1.3). Other contaminants detected in groundwater at T115N including cPAHs, bis[2-ethylhexyl]phthalate, n-nitrosodi-n-propylamine, pentachlorophenol, 2,4,6-trichlorophenol, chloroform may be the results of historical activities and deposition prior to filling of the T115N property, imported fill used on the property from unknown sources or other unknown sources. COPCs that are at concentrations greater than the PCULs in groundwater in the north and northeastern portions of T115N adjacent to the 48-inch drain line and Glacier Bay have the potential to be transported to surface water and sediment in the LDW. Transport to surface water and sediment in the LDW could result in the exposure of aquatic organisms, humans and higher trophic level ecological receptors to the COPCs from the T115N Site.

8.2.3. Catch Basin Solids

The stormwater system at the T115N Site is comprised of catch basins connected to stormwater lines that transport stormwater to the 48-inch drain line that traverses the northern portion of the Site and discharges to the LDW at the northeast corner of T115. Video surveys of the T115N stormwater system indicate that the network of stormwater pipes at T115N are generally in good condition and that the pipes are located above the groundwater table. A stormwater system survey in 2018/2019 by the Port did note cracks and/or breaks in the stormwater pipes connected to the 48-inch drain line at four locations within the driveway area in the northern portion of the Site (Figure 3-5). The locations of damaged portions of the stormwater pipes are located above the groundwater table.

Chemical analysis of catch basin solids detected the following COPCs at concentrations greater than the Target Sediment Concentrations:

- Total PCBs;
- Dioxins and furans;
- Metals (arsenic, copper and zinc);
- PAHs including HPAHs and Total cPAH TEQ; and,
- SVOCs (bis(2-ethylhexyl)phthalate, butyl benzyl phthalate, and 3 & 4 methylphenol).

Solid particulates containing COPCs from water and wind erosion and/or atmospheric deposition carried by stormwater runoff are captured by the system of catch basins at T115N. The function of the catch basin system is to remove the solid particulates from the stormwater prior to being discharged to the LDW. The Port implements measures to prevent catch basin solids from being transported to sediment in the LDW including the removal of catch basin solids on a periodic basis for offsite disposal. The removal of catch basin solids limits potential for transport of the solids to the LDW.

8.3. FEASIBILITY STUDY DEVELOPMENT

The nature and extent of contamination in media at T115N has been characterized in accordance with the RI/FS Work Plan using screening levels and exposure pathways required by Ecology for the LDW. Based on the results of the RI, there is sufficient data to prepare the FS, and to identify and evaluate cleanup alternatives for contaminated media at the Site. Note that the environmental soil data presented in this RI were compared to 2019 LDW PCUL Workbook screening criteria using the technical approach outlined in Ecology's policy memoranda regarding groundwater PCULs (Ecology 2016) and the methodology specified by Ecology's white paper for upland sites along the LDW (Ecology 2018b) as described in Section 4.0. Re-evaluation of PCULs based on current and future land use assumptions, human and ecological receptors, complete exposure pathways, background and PQLs as allowed under MTCA will be performed to identify the nature and extent of contamination and areas requiring cleanup action during development of the FS.

In accordance with Agreed Order No. DE8099 and following Ecology's approval of this RI, the FS will be prepared to identify and screen applicable remedial technologies, develop and evaluate a range of remedial alternatives and to select a preferred alternative that meets the requirements of MTCA. The FS will be presented under a separate cover for public review as required by the Agreed Order. Preparation of the RI, FS and Cleanup Action Plan (CAP) will fulfill the requirements of the Agreed Order.

9.0 Limitations

We have prepared this document for use by the Port of Seattle for the T115N Site. Within the limitations of scope, schedule and budget, our services have been executed in accordance with generally accepted environmental science practices in this area at the time this report was prepared. No warranty or other conditions, express or implied, should be understood.

10.0 References

- Agency for Toxic Substances and Disease Registry (ATSDR 2019), <http://www.atsdr.cdc.gov>, accessed April 23, 2020.
- Booth, D.B., and L. Herman, (Booth and Herman 1998). "Duwamish Basin Groundwater Pathways Conceptual Model Report," City of Seattle, Office of Economic Development.
- Borden, Richard K., and Kathy G. Troost, (Borden and Troost 2001). "Late Pleistocene stratigraphy in the south central Puget Lowland, Pierce County, Washington," Washington State Dept. of Natural Resources.
- Bouwer, H. and Rice, R.C. (Bouwer and Rice 1976), "A Slug Test for Determining Hydraulic Conductivity of Unconfined Aquifers with Completely or Partially Penetrating Wells," Water Resources Research, 12(3), 423-428.
- Bouwer, H. (1989), "The Bouwer and Rice Slug Test – An Update," Ground Water, Volume 27, Number 3. Pages 304-309.
- Butler Jr., J.J., (Butler 1998), "The Design, Performance, and Analysis of Slug Tests," CRC Press, Boca Raton, FL. 252 p.
- Butler, Jr. J.J., and Garnett, E.J., (Butler and Garnett 2000), "Simple procedures for analysis of slug tests in formations of high hydraulic conductivity using spreadsheet and scientific graphics software," Kansas Geological Survey Open-File Rept. 2000-40.
- Environmental Protection Agency (EPA 2014), "Record of Decision, Lower Duwamish Waterway Superfund Site," November 2014.
- Environmental Protection Agency (EPA 2016), "Partial Approval/Partial Disapproval of Washington's Human Health Water Quality Criteria and Implementation Tools," letter from D.D. Opalski, Director, Office of Water and Watersheds, EPA to M. Bellon, Director, Ecology. November 15, 2016.
- Environmental Resources Management (ERM 2013), "July 2013 Tidal Study Results Summary, 5900 West Marginal Way SW, Seattle, Washington," September 30, 2013.
- Environmental Resources Management (ERM 2015), "Draft Remedial Investigation Report, 5900 West Marginal Way Site, Seattle, Washington," May 2015.
- Ferris, J.G. (Ferris 1951), "Cyclic Fluctuations of Water Levels as a Basis for Determining Aquifer Transmissibility," International Union of Geodesy and Geophysics Association, Science Hydrology Assembly, Publication 33, Brussels V.2:148-155.
- GeoEngineers Inc. (GeoEngineers 2019), "Memorandum: Port of Seattle North Terminal 115, Updated Preliminary Cleanup Levels and Initial Chemicals of Potential Concern," April 9, 2019.
- GeoEngineers Inc. (GeoEngineers 2013), "Work Plan, Remedial Investigation/Feasibility Study, Port of Seattle North Terminal 115," May 9, 2013.

King County (2013), “Lower Duwamish Waterway Source Control: Bulk Atmospheric Deposition Study Final-Data Report,” December 2013.

Leidos (2017), “Lower Duwamish Waterway, Groundwater Sampling for PCB Congeners and Aroclors, Data Report,” July 2017.

Neville, C. J. (Neville 2011), “Critical Thinking in Aquifer Test Interpretation,” Short Course Presented in Conjunction with the 8th Washington Hydrogeology Symposium, Tacoma, Washington, April 28, 2011.

Panagiotaras and Nikolopoulos (2015), “Arsenic Occurrence and Fate in the Environment; A Geochemical Perspective,” *Journal of Earth Science and Climate Change* 6:269. doi: 10.4172/2157-7617.1000269, February 15, 2015.

Puget Sound Clean Air Agency (PSCAA 2019), “Wind rose (wind speed/direction calculator),” accessed December 2019, available from: <http://www.pscleanair.org/airq/windrose/default.aspx>.

Mitsunobu S, Harada T, Takahashi Y. (Mitsunobu 2006), “Comparison of antimony behavior with that of arsenic under various soil redox conditions,” *Environmental Science and Technology*, Volume 40, pages 7270-7276.

Savannah River National Laboratory (SRNL 2011), “The Scenarios Approach to Attenuation-Based Remedies for Inorganic and Radionuclide Contaminants,” prepared for the U.S. Department of Energy, Publication No. SRNL-STI-2011-00459, April 4, 2011.

Serfes, M.E. (Serfes 1991), “Determining the Mean Hydraulic Gradient of Groundwater affected by Tidal Fluctuations,” *Ground Water* 29 (4): 549-555.

SoundEarth (2011), “Terminal 115 Environmental Conditions,” April 6, 2011.

Streltsova, T.D. (Steltsova 1974), “Method of additional seepage resistances – Theory and Applications,” *J. Hydr. Div., ASCE*, 100(8), 1119–1131.

Troost, K.G., Booth, D.B., Wisher, A.P., and Shimel, S.A. (Troost et al 2005), “The Geologic Map of Seattle, a Progress Report,” U.S. Geological Survey Open-File Report 2005-1252, scale 1:24,000, December 9, 2005.

Washington State Department of Ecology (Ecology 2022), “Guidance for Evaluating Vapor Intrusion in Washington State, Investigation and Remedial Action,” Publication No. 09-09-047, revised March 2022.

Washington State Department of Ecology (Ecology 2019a), “Lower Duwamish Waterway, Preliminary Cleanup Level Workbook, Supplemental Information,” July 2019.

Washington State Department of Ecology (Ecology 2019b), “Sediment Cleanup Users Manual, Guidance for Implementing the Cleanup Provisions of the Sediment Management Standards, Chapter 173-204 WAC,” Publication No. 12-09-057, revised December 2019.

Washington State Department of Ecology (Ecology 2019c), “Ecology Email Correspondence – Maureen Sanchez to Iain Wingard, RE: Revised COPC Tables,” November 21, 2019.

Washington State Department of Ecology (Ecology 2018a) “Lower Duwamish Waterway, Preliminary Cleanup Level Workbook, Supplemental Information,” December 2018.

Washington State Department of Ecology (Ecology 2018b), “Ecology Comments on the Remedial Investigation Report, Port of Seattle North Terminal 115 Site, 6000 West Marginal Way SW, Seattle, Washington, Ecology Agreed Order No. DE-8099, dated October 16, 2017 for: Port of Seattle, December 6, 2018.

Washington State Department of Ecology (Ecology 2016), “Groundwater Cleanup Levels for Upland Sites Along the Lower Duwamish Waterway,” memorandum from Pete Kmet, Senior Engineer, Policy and Technical Support Unit, Ecology to Jeff Johnston, Manager, Information and Policy Section, Toxics Cleanup Program, Ecology. Revised March 1, 2016.

Washington State Department of Ecology (Ecology 2011), “Lower Duwamish Waterway RM 1.6 to 2.1 West (Terminal 115), Source Control Plan,” Ecology Publication 11-09-132, October 2011.

Washington State Department of Ecology (Ecology 2007), “Lower Duwamish Waterway Source Control Action Plan for Glacier Bay Source Control Area,” Publication 07-09-005, November 2007.

Washington State Department of Ecology (Ecology 1994), “Natural Background Soil Metals Concentrations in Washington State,” Publication No. 94-15, October 1994.

Western Regional Climate Center (WRCC 2019), “Seattle Tacoma WSCMO AP, Washington (457473): Period of record monthly climate survey, 1945 to 2016: General climate summary tables: temperature,” accessed December 2019, available from: <http://www.wrcc.dri.edu/cgi-bin/cliMAIN.pl?wa7473>.

Weston, Roy F. (Weston 1999), “Site Inspection Report, Lower Duwamish River (RK 2.5 to 11.5), Seattle, Washington,” prepared for the United States Environmental Protection Agency, Region 10., April 1999.

Wilson SC, Lockwood PV, Ashley PM, (Wilson et al. 2010), “The chemistry and behaviour of antimony in the soil environment with comparisons to arsenic: A critical review”, Environmental Pollution, Volume 158, Pages 1169-1181.

Windward Environmental, LLC (Windward 2010a), “Lower Duwamish Waterway Remedial Investigation Report: Lower Duwamish Waterway Group,” July 9, 2010.

Windward Environmental, LLC (Windward 2010b), “Lower Duwamish Waterway Remedial Investigation, Technical Memorandum: 2009/2010 Surface Sediment Sampling Results for Dioxins and Furans and Other Chemicals,” Lower Duwamish Waterway Group,” July 19, 2010.

Windward Environmental, LLC (Windward 2009), “Lower Duwamish Waterway Remedial Investigation, Data Report: Chemical Analysis of Fish, Crab, and Clam Tissue Samples and Co-Located Sediment Samples Collected in 2007,” Lower Duwamish Waterway Group,” January 29, 2007.

Windward Environmental, LLC (Windward 2007), “Lower Duwamish Waterway Remedial Investigation, Data Report: Subsurface Sediment Sampling for Chemical Analysis,” Lower Duwamish Waterway Group,” January 29, 2007.

Windward Environmental, LLC (Windward 2005a), “Lower Duwamish Waterway Remedial Investigation, Data Report: Round 1 Surface Sediment Sampling for Chemical Analysis and Toxicity Testing,” Lower Duwamish Waterway Group,” October 21, 2005.

Windward Environmental, LLC (Windward 2005b), “Lower Duwamish Waterway Remedial Investigation, Data Report: Round 2 Surface Sediment Sampling for Chemical Analysis and Toxicity Testing,” Lower Duwamish Waterway Group,” October 21, 2005.

Windward and David Evens and Associates (Windward and DEA 2004), “Lower Duwamish Waterway Remedial Investigation. Bathymetric Survey,” prepared for Lower Duwamish Waterway Group, February 6, 2004.

Van Der Kamp, G. (Van Der Kamp 1976), “Determining Aquifer Transmissivity by Means of Well Response Tests: The Underdamped Case,” Water Resources Research 12, No. 1:71-77.

Tables

Table 3-1
Remedial Investigation Soil Sample Collection and Analysis
Port of Seattle - North Terminal 115
Seattle, Washington

Sample Location ¹	Sample Identification	Sample Date	Sample Depth (feet)	Characterization Objectives for Investigation Location							Soil Investigation Total Depth (feet)	Soil Sample Analysis						
				Fill	Former Ponds	Former ASTs	Process Building	Rail Lines	Former UST	Arsenic in Soil		Soil pH (SW 846 - 9045C)	PCBs (EPA 8082A)	Dioxins/Furans (EPA 1613/8290)	Metals (EPA 6000/7000)	SVOCs (EPA 8270D/SIM)	VOCs (EPA 8260C)	TPH (NWTPH-Gx, Dx)
TP-1	TP01-1-2	12/04/13	1-2	■				■			5	X	X		X	X	X	X
	TP01-3-4	12/04/13	3-4									X	X		X	X	X	X
TP-2	TP02-1-2	12/04/13	1-2	■				■	■		8	X	X		X	X	X	X
	TP02-3-4	12/04/13	3-4	■				■	■			X	X			X	X	X
	TP02-4-5	12/04/13	4-5					■	■			X	X		X	X	X	X
	TP02-7-8	12/04/13	7-8					■	■			X	X		X	X	X	X
TP-3	TP03-0-1	12/04/13	0-1	■				■	■		6	X	X		X	X	X	X
	TP03-2-3	12/04/13	2-3	■				■	■			X	X			X	X	X
	TP03-2-3Dup	12/04/13	2-3	■				■	■			X	X			X	X	X
	TP03-4-5	12/04/13	4-5					■	■			X	X		X	X	X	X
B-1	B1-2-3	01/06/14	2-3	■				■			6	X			X	X		
	B1-4-5	01/06/14	4-5	■				■				X			X	X		
B-2	B2-1-2	01/06/14	1-2	■				■			7	X			X	X		
	B2-3-4	01/06/14	3-4					■				X			X	X		
	B2-3-4Dup	01/06/14	3-4					■				X			X	X		
B-3	B3-3-4	01/06/14	3-4	■				■			7	X			X	X		
	B3-5-6	01/06/14	5-6					■				X			X	X		
B-4	B4-1-2	01/06/14	1-2	■				■			15	X	X			X	X	
	B4-4-5	01/06/14	4-5					■				X			X	X	X	
	B4-6-7	01/06/14	6-7					■				X			X	X	X	
	B4-10-11	01/06/14	10-11					■				X			X	X	X	
B-5	B5-1-2	01/09/14	1-2	■			■		■		15	X	X		X	X	X	X
	B5-6-7	01/09/14	6-7				■		■			X			X	X	X	X
	B5-10-11	01/09/14	10-11				■		■			X			X	X	X	X
	B5-10-11Dup	01/09/14	10-11				■		■			X			X	X	X	X
	B5-13-14	01/09/14	13-14				■		■			X			X	X	X	X
B-6	B6-2-3	01/08/14	2-3	■		■	■		■		20	X			X	X	X	X
	B6-4-5	01/08/14	4-5			■	■		■			X	X		X	X	X	X
	B6-10-11	01/08/14	10-11			■	■		■			X			X	X	X	X
	B6-17-18	01/08/14	17-18			■	■		■			X				X	X	X
B-7	B7-3-4	01/10/14	3-4	■		■	■		■		20	X			X	X	X	X
	B7-5-6	01/10/14	5-6	■		■	■		■			X			X	X	X	X
	B7-10-11	01/10/14	10-11			■	■		■			X			X	X	X	X
	B7-16-17	01/10/14	16-17			■	■		■			X				X	X	X
B-8	B8-4-5	01/10/14	4-5	■		■	■		■		19	X			X	X	X	X
	B8-10-11	01/10/14	10-11			■	■		■			X			X	X	X	X
	B8-15-16	01/10/14	15-16			■	■		■			X			X	X	X	X
B-10	B10-2-3	01/09/14	2-3	■	■	■					17	X			X	X		
	B10-6-7	01/09/14	6-7	■	■	■						X			X	X		
	B10-10-11	01/09/14	10-11		■	■						X			X	X		
	B10-16-17	01/09/14	16-17		■	■						X				X		
B-11	B11-3-4	01/07/14	3-4	■	■						20	X			X	X	X	
	B11-7-8	01/07/14	7-8	■	■							X			X	X	X	
	B11-9-10	01/07/14	9-10	■	■							X			X	X	X	
	B11-14-15	01/07/14	14-15		■							X				X	X	
B-12	B12-7-8	01/10/14	7-8	■		■	■				17	X	X		X	X	X	X
	B12-9-10	01/10/14	9-10			■	■					X			X	X	X	X
	B12-16-17	01/10/14	16-17			■	■					X	X		X	X	X	X
B-13	B13-1-2	01/07/14	1-2	■	■						20	X			X	X	X	
	B13-2-3	01/07/14	2-3	■	■							X	X					
	B13-5-6	01/07/14	5-6	■	■							X	X		X	X	X	
	B13-6-7	01/07/14	6-7	■	■							X			X	X	X	
	B13-9-10	01/07/14	9-10		■							X			X	X	X	
	B13-15-16	01/07/14	15-16		■							X			X	X	X	
B-14	B14-2-3	01/08/14	2-3	■	■		■				17	X			X	X		
	B14-7-8	01/08/14	7-8	■	■		■					X			X	X		
	B14-11-12	01/08/14	11-12	■	■		■					X			X	X		
	B14-15-16	01/08/14	15-16		■		■					X				X		
B-15	B15-2-3	01/08/14	2-3	■	■					■	21	X			X	X	X	
	B15-6-7	01/08/14	6-7	■	■					■		X			X	X	X	
	B15-6-7Dup	01/08/14	6-7	■	■					■		X			X	X	X	
	B15-9-10	01/08/14	9-10		■					■		X			X	X	X	
	B15-17-18	01/08/14	17-18		■					■		X				X	X	
B-16	B16-2-3	01/07/14	2-3	■	■						23	X			X	X	X	X
	B16-2-3Dup	01/07/14	2-3	■	■							X			X	X	X	X
	B16-6-7	01/07/14	6-7	■	■							X			X	X	X	X
	B16-10-11	01/07/14	10-11	■	■							X			X	X	X	X
	B16-17-18	01/07/14	17-18		■							X				X	X	X

Table 3-1
Remedial Investigation Soil Sample Collection and Analysis
Port of Seattle - North Terminal 115
Seattle, Washington

Sample Location ¹	Sample Identification	Sample Date	Sample Depth (feet)	Characterization Objectives for Investigation Location							Soil Investigation Total Depth (feet)	Soil Sample Analysis						
				Fill	Former Ponds	Former ASTs	Process Building	Rail Lines	Former UST	Arsenic in Soil		Soil pH (SW 846 - 9045C)	PCBs (EPA 8082A)	Dioxins/Furans (EPA 1613/8290)	Metals (EPA 6000/7000)	SVOCs (EPA 8270D/SIM)	VOCs (EPA 8260C)	TPH (NWTPH-Gx, Dx)
B-17	B17-4-5	01/09/14	4-5	■			■				22	X			X	X	X	
	B17-8-9	01/09/14	8-9	■			■					X			X	X	X	
	B17-8-9Dup	01/09/14	8-9	■			■					X			X	X	X	
	B17-19-20	01/09/14	19-20				■					X			X	X	X	
MW-1	MW-1-(4-5)	10/29/09	4-5	■			■	■			16				X	X		X
	MW-1-(7-8)	10/29/09	7-8	■			■	■							X	X		X
	MW-1-(11-12)	10/29/09	11-12				■	■							X	X		X
MW-2D	MW2D-0.5-1.5	12/17/13	0.5-1.5	■				■	■		30	X			X	X	X	X
	MW2D-4.5-5.5	12/17/13	4.5-5.5	■				■	■			X			X	X	X	X
	MW2D-5.5-6.5	12/17/13	5.5-6.5					■	■			X				X	X	X
	MW2D-11.5-12.5	12/17/13	11.5-12.5					■	■			X				X	X	X
	MW2D-13.5-14.5	12/17/13	13.5-14.5					■	■			X			X	X	X	X
	MW2D-26-27	12/17/13	26-27					■	■			X			X	X	X	X
MW-3	MW-3-(6.5-7)	10/29/09	6.5-7	■	■		■				22				X	X		
	MW-3-(10.5-11.5)	10/29/09	10.5-11.5		■		■								X	X		
	MW-3-(17-18)	10/29/09	17-18		■		■								X	X		
MW-4D	MW4D-2-3	12/19/13	2-3	■	■	■					31	X			X	X	X	
	MW4D-7-8	12/19/13	7-8	■	■	■						X				X	X	
	MW4D-8-9	12/19/13	8-9		■	■						X			X	X	X	
	MW4D-8-9Dup	12/19/13	8-9		■	■						X			X	X	X	
	MW4D-10-11	12/19/13	10-11		■	■						X			X	X	X	
	MW4D-24-25	12/19/13	24-25		■	■						X			X	X	X	
MW-5	MW-5-(4-5)	10/29/09	4-5	■	■		■				18				X	X		
	MW-5-(10-11)	10/29/09	10-11	■	■		■								X	X		
	MW-5-(17-18)	10/29/09	17-18		■		■								X	X		
MW-10	MW-10-(3-8)	10/30/09	3-8	■							12				X			
	MW-10-(10-12)	10/30/09	10-12	■											X			
MW-10D	MW10D-2-3	12/30/13	2-3	■	■						35	X	X	X	X	X	X	
	MW10D-6.5-7.5	12/30/13	6.5-7.5	■	■							X			X	X	X	
	MW10D-17-18	12/30/13	17-18		■							X				X	X	
	MW10D-23-24	12/30/13	23-24		■							X			X	X	X	
	MW10D-28-29	12/30/13	28-29		■							X				X	X	
MW-11	MW11-1-2	12/16/13	1-2	■				■	■	■	15	X		X	X	X	X	
	MW11-3-4	12/16/13	3-4					■	■	■		X			X	X	X	
	MW11-9-10	12/16/13	9-10					■	■	■		X				X	X	
	MW11-13-14	12/16/13	13-14					■	■	■		X			X	X	X	
	MW11-13-14Dup	12/16/13	13-14					■	■	■		X			X	X	X	
MW-12	MW12-4-5	12/30/13	4-5	■						■	13	X			X	X		
	MW12-8-9	12/30/13	8-9	■						■		X			X	X		
	MW12-8-9Dup	12/30/13	8-9	■						■		X			X	X		
	MW12-11-12	12/30/13	11-12							■		X			X	X		
MW-13	MW13-1-2	12/18/13	1-2	■	■	■	■			■	14	X			X	X	X	
	MW13-5-6	12/18/13	5-6	■	■	■	■			■		X	X	X	X	X	X	
	MW13-7-8	12/18/13	7-8		■	■	■			■		X			X	X	X	
	MW13-9-10	12/18/13	9-10		■	■	■			■		X			X	X	X	
	MW13-11-12	12/18/13	11-12		■	■	■			■		X				X	X	
MW-14	MW14-2-3	12/18/13	2-3	■						■	13	X			X	X	X	
	MW14-5-6	12/18/13	5-6	■						■		X			X	X	X	
	MW14-7-8	12/18/13	7-8	■						■		X			X	X	X	
	MW14-10-11	12/18/13	10-11							■		X			X	X	X	
MW-15	MW15-3-4	12/27/13	3-4	■	■	■	■				14	X		X	X	X		
	MW15-7-8	12/27/13	7-8		■	■	■					X		X	X	X		
	MW15-13-14	12/27/13	13-14		■	■	■					X			X	X		
MW-16	MW16-3-4	12/27/13	3-4	■	■	■	■				13.5	X			X	X	X	
	MW16-5-6	12/27/13	5-6	■	■	■	■					X			X	X	X	
	MW16-7.5-8.5	12/27/13	7.5-8.5	■	■	■	■					X			X	X	X	
	MW16-11.5-12.5	12/27/13	11.5-12.5		■	■	■					X			X	X	X	
	MW16-11.5-12.5Dup	12/27/13	11.5-12.5		■	■	■					X			X	X	X	
MW-17	MW17-2.5-3.5	12/26/13	2.5-3.5	■	■						22	X			X	X	X	X
	MW17-5.5-6.5	12/26/13	5.5-6.5	■	■							X			X	X	X	X
	MW17-7.5-8.5	12/26/13	7.5-8.5	■	■							X			X	X	X	X
	MW17-19-20	12/26/13	19-20		■							X				X	X	X
MW-18	MW18-2-3	12/18/13	2-3	■	■					■	20	X			X	X	X	X
	MW18-5-6	12/18/13	5-6	■	■					■		X			X	X	X	X
	MW18-10-11	12/18/13	10-11	■	■					■		X			X	X	X	X
	MW18-18-19	12/18/13	18-19		■					■		X				X	X	X

Table 3-1
Remedial Investigation Soil Sample Collection and Analysis
Port of Seattle - North Terminal 115
Seattle, Washington

Sample Location ¹	Sample Identification	Sample Date	Sample Depth (feet)	Characterization Objectives for Investigation Location							Soil Investigation Total Depth (feet)	Soil Sample Analysis						
				Fill	Former Ponds	Former ASTs	Process Building	Rail Lines	Former UST	Arsenic in Soil		Soil pH (SW 846 - 9045C)	PCBs (EPA 8082A)	Dioxins/Furans (EPA 1613/8290)	Metals (EPA 6000/7000)	SVOCs (EPA 8270D/SIM)	VOCs (EPA 8260C)	TPH (NWTPH-Gx, Dx)
MW-19D	MW19D-3-4	12/26/13	3-4	■	■						32.5	X		X	X	X	X	X
	MW19D-3-4Dup	12/26/13	3-4	■								X			X	X	X	X
	MW19D-7-8	12/26/13	7-8	■								X			X	X	X	X
	MW19D-10-11	12/26/13	10-11	■								X				X	X	X
	MW19D-26-27	12/26/13	26-27									X			X	X	X	X
MW-20	MW20-2-3	12/26/13	2-3	■				■			15	X			X	X	X	X
	MW20-4-5	12/26/13	4-5					■				X			X	X	X	X
	MW20-9-10	12/26/13	9-10					■				X				X	X	X
	MW20-13-14	12/26/13	13-14					■				X			X	X	X	X

Notes:

¹ Soil sample locations are shown on Figure 3-3.

² Characterization of the fill material included the sampleable portion (i.e., the minus 3/4-inch fraction) of railroad ballast, where encountered.

³ Samples were collected across the water table observed at the time of drilling.

EPA = Environmental Protection Agency

PCB = Polychlorinated Biphenyls

SVOC = Semi-Volatile Organic Compounds

VOC = Volatile Organic Compounds

TPH = Total Petroleum Hydrocarbons

Table 3-2
Remedial Investigation Groundwater Sample Collection and Analysis
Port of Seattle - North Terminal 115
Seattle, Washington

Sample Location ¹	Groundwater Monitoring Event	Characterization Objectives for Investigation Location								Target Groundwater Aquifer	Groundwater Sample Analyses					
		Fill	Former Ponds	Former ASTs	Process Building	Rail Lines	Former UST	Arsenic in Groundwater	Investigate Vertical Extent		TOC (EPA SM5310B)	Total Metals (EPA 200.8/7470)	Dissolved Metals (EPA 200.8/7470)	SVOCs (EPA 8270D/SIM)	VOCs (EPA 8260C)	TPH (NWTPH-Gx, Dx)
MW-1	Jun-14									Unconfined Aquifer		1.2	1.2	1.2	1.2	1.2
	Sep-14	■			■	■	■	■				1.2	1.2	1.2	1.2	1.2
	Jan-15											1.2	1.2	1.2	1.2	1.2
	Apr-15											1.2	1.2	1.2	1.2	1.2
MW-2	Jun-14									Unconfined Aquifer		1.2	1.2	1.2	1.2	1.2
	Sep-14	■				■	■	■				1.2	1.2	1.2	1.2	1.2
	Jan-15										X	X	X	X	X	X
	Apr-15											1.2	1.2	1.2	1.2	1.2
MW-3	Jun-14									Unconfined Aquifer		X	X	X	X	X
	Sep-14	■	■	■	■		■	■				1.2	1.2	1.2	1.2	1.2
	Jan-15										X	X	X	X	X	X
	Apr-15										X	X	X	X	X	X
MW-4	Jun-14									Unconfined Aquifer		X	X	X	X	
	Sep-14	■	■					■				X	X	X	X	X
	Jan-15										X	X	X	X	X	X
	Apr-15										X	X	X	X	X	X
MW-4D	Jun-14									Confined Aquifer		X	X	X	X	
	Sep-14											X	X	X	X	
	Jan-15							■	■			X	X	X	X	
	Apr-15											X	X	X	X	
MW-5	Jun-14									Unconfined Aquifer		X	X	X	X	X
	Sep-14	■	■					■				1.2	1.2	1.2	1.2	1.2
	Jan-15										X	X	X	X	X	X
	Apr-15											1.2	1.2	1.2	1.2	1.2
MW-6	Jun-14									Unconfined Aquifer		1.2	1.2	1.2	1.2	1.2
	Sep-14	■	■		■			■				X	X	X	X	X
	Jan-15											X	X	X	X	X
	Apr-15											X	X	X	X	X
MW-7	Jun-14									Unconfined Aquifer		X	X	X	X	X
	Sep-14	■	■					■			X	X	X	X	X	X
	Jan-15										X	X	X	X	X	X
	Apr-15										X	X	X	X	X	X
MW-8	Jun-14									Unconfined Aquifer		X	X	X	X	
	Sep-14	■	■					■				X	X	X	X	X
	Jan-15											X	X	X	X	X
	Apr-15											X	X	X	X	X
MW-9	Jun-14									Unconfined Aquifer		X	X	X		
	Sep-14	■	■					■			X	X	X	X		X
	Jan-15										X	X	X	X		
	Apr-15										X	X	X	X		X
MW-10	Jun-14									Unconfined Aquifer		X	X	X	X	
	Sep-14	■	■					■				X	X	X	X	X
	Jan-15											X	X	X	X	X
	Apr-15											X	X	X	X	X
MW-10D	Jun-14									Confined Aquifer		X	X	X	X	
	Sep-14	■						■	■			X	X	X	X	X
	Jan-15											X	X	X	X	X
	Apr-15											X	X	X	X	X
MW-11	Jun-14									Unconfined Aquifer		X	X	X		
	Sep-14	■				■		■			1.2	1.2	1.2	1.2		
	Jan-15										X	X	X	X		
	Apr-15										X	X	X	X		
MW-12	Jun-14									Unconfined Aquifer		X	X	X		
	Sep-14	■						■				X	X	X		X
	Jan-15											X	X	X		X
	Apr-15											X	X	X		X
MW-13	Jun-14									Unconfined Aquifer		X	X	X	X	X
	Sep-14	■	■	■	■			■				X	X	X	X	X
	Jan-15											X	X	X	X	X
	Apr-15											X	X	X	X	X
MW-14	Jun-14									Unconfined Aquifer		X	X	X	X	
	Sep-14	■						■				1.2	1.2	1.2	1.2	1.2
	Jan-15										X	X	X	X	X	X
	Apr-15										X	X	X	X	X	X
MW-15	Jun-14									Unconfined Aquifer		X	X	X	X	
	Sep-14	■	■	■	■							X	X	X	X	
	Jan-15										X	X	X	X	X	
	Apr-15										X	X	X	X	X	

Table 3-2
Remedial Investigation Groundwater Sample Collection and Analysis
Port of Seattle - North Terminal 115
Seattle, Washington

Sample Location ¹	Groundwater Monitoring Event	Characterization Objectives for Investigation Location								Target Groundwater Aquifer	Groundwater Sample Analyses					
		Fill	Former Ponds	Former ASTs	Process Building	Rail Lines	Former UST	Arsenic in Groundwater	Investigate Vertical Extent		TOC (EPA SM5310B)	Total Metals (EPA 200.8/7470)	Dissolved Metals (EPA 200.8/7470)	SVOCs (EPA 8270D/SIM)	VOCs (EPA 8260C)	TPH (NWTPH-Gx, Dx)
MW-16	Jun-14	■	■	■	■					Unconfined Aquifer		X	X	X	X	
	Sep-14											X	X	X	X	
	Jan-15											X	X	X	X	
	Apr-15											X	X	X	X	
MW-17	Jun-14	■	■							Unconfined Aquifer		X	X	X	X	X
	Sep-14											X	X	X	X	X
	Jan-15											X	X	X	X	X
	Apr-15											X	X	X	X	X
MW-18	Jun-14	■	■					■		Unconfined Aquifer		X	X	X		X
	Sep-14										X	X	X	X		X
	Jan-15										X	X	X	X		X
	Apr-15										X	X	X	X		X
MW-19	Jun-14	■	■							Unconfined Aquifer		X	X	X		X
	Sep-14											X	X	X		X
	Jan-15											X	X	X		X
	Apr-15											X	X	X		X
MW-19D	Jun-14	■	■		■				■	Confined Aquifer		X	X	X		
	Sep-14											X	X	X	X	X
	Jan-15											X	X	X	X	X
	Apr-15											X	X	X	X	X
MW-20	Jun-14	■				■				Unconfined Aquifer		X	X	X		X
	Sep-14										X	X	X	X		X
	Jan-15										X	X	X	X		X
	Apr-15										X	X	X	X		X
MW-2D	Jun-14								■	Confined Aquifer		X	X	X	X	
	Sep-14											X	X	X	X	
	Jan-15											X	X	X	X	
	Apr-15											X	X	X	X	
GMW-25	Jun-14	■						■		Unconfined Aquifer		X	X	X		
	Sep-14											X	X	X		
	Jan-15											X	X	X		
	Apr-15											X	X	X		
GMW-26	Jun-14	■						■		Unconfined Aquifer		X	X	X		
	Sep-14											X	X	X		
	Jan-15											X	X	X		
	Apr-15											X	X	X		
GMW-27	Jun-14	■						■		Unconfined Aquifer		X	X	X		
	Sep-14											X	X	X		
	Jan-15											X	X	X		
	Apr-15											X	X	X		

Notes:

- ¹ Groundwater sample locations are shown on Figure 3-4.
- ² Monitoring well was purged dry during the sampling event and did not recover to a sufficient level to obtain a water sample for chemical analysis.
- = Planned groundwater sample not obtained for chemical analysis (see footnote 2)
- EPA = Environmental Protection Agency
- PCB = Polychlorinated Biphenyls
- SVOC = Semi-Volatile Organic Compounds
- VOC = Volatile Organic Compounds
- TPH = Total Petroleum Hydrocarbons
- TOC = Total Organic Carbon

Table 3-3**Remedial Investigation Catch Basin Solids Sample Collection and Analysis**

Port of Seattle - North Terminal 115

Seattle, Washington

Sample Location ¹	Stormwater Catch Basin Solids Analyses					
	PCBs (EPA 8082A)	Dioxins/Furans (EPA 1613/8290)	Metals (EPA 6000/7000)	SVOCs (EPA 8270D/SIM)	VOCs (EPA 8260C)	TPH (NWTPH-Gx, Dx)
CB-313	X	X	X	X	X	X
CB-322	X	X	X	X	X	X
CB-323	X	X	X	X	X	X
CB-324	X	X	X	X	X	X
CB-328	X	X	X	X	X	X

Notes:¹ Stormwater catch basin solids sample locations are shown on Figure 3-5.

EPA = Environmental Protection Agency

PCB = Polychlorinated Biphenyls

SVOC = Semi-Volatile Organic Compounds

VOC = Volatile Organic Compounds

TPH = Total Petroleum Hydrocarbons

Table 4-1

Preliminary Cleanup Levels for Soil

Port of Seattle - North Terminal 115

Seattle, Washington

Analyte	CAS Number	LDW Preliminary Cleanup Level ¹ (Saturated Soil, Non-Potable Groundwater)		Basis for Preliminary Cleanup Level							Practical Quantitation Limit ² (PQL) (mg/kg)	
		Scientific Notation (mg/kg)	Decimal Notation (mg/kg)	Direct Contact	Drinking Water	Surface Water	Sediment	Bank Erosion	TEE	Natural Background		
Polychlorinated Biphenyls (PCBs)												
PCB-Aroclor 1016	12674-11-2	NE	NE								0.05	
PCB-Aroclor 1221	11104-28-2	NE	NE								0.05	
PCB-Aroclor 1232	11141-16-5	NE	NE								0.05	
PCB-Aroclor 1242	53469-21-9	NE	NE								0.05	
PCB-Aroclor 1248	12672-29-6	NE	NE								0.05	
PCB-Aroclor 1254	11097-69-1	NE	NE								0.05	
PCB-Aroclor 1260	11096-82-5	NE	NE								0.05	
Total PCBs (Aroclors or Congeners)	n/a	2.2E-06	0.0000022			■					0.05	
Dioxins and Furans												
Total Dioxin/Furan TEQ	n/a	5.2E-06	0.0000052							■	0.000011	
Metals												
Antimony	7440-36-0	4.1E+00	4.1			■					5	
Arsenic	7440-38-2	7.0E+00	7.0							■	0.5	
Barium	7440-39-3	8.3E+00	8.3			■					2	
Beryllium	7440-41-7	3.5E+00	3.5				■				0.5	
Cadmium	7440-43-9	1.0E+00	1.0							■	0.2	
Chromium III / Total	7440-47-3	4.8E+01	48							■	0.5	
Chromium VI	18540-29-9	1.8E+01	18		■						0.5	
Copper	7440-50-8	3.6E+01	36							■	0.2	
Lead	7439-92-1	5.0E+01	50						■		0.5	
Mercury	7439-97-6	7.0E-02	0.070							■	0.05	
Nickel	7440-02-0	4.8E+01	48							■	0.5	
Selenium	7782-49-2	3.0E-01	0.30						■		0.5	
Silver	7440-22-4	1.6E-02	0.016			■					0.5	
Thallium	7440-28-0	4.4E-03	0.0044			■					0.25	
Tin	7440-31-5	5.0E+01	50						■		1.0	
Zinc	7440-66-6	8.5E+01	85							■	2.5	
Semi-Volatile Organic Compounds (SVOCs) - Polycyclic Aromatic Hydrocarbons (PAHs)												
Acenaphthene	83-32-9	2.8E-02	0.028				■				0.0067	
Acenaphthylene	208-96-8	1.3E+00	1.3					■			0.0067	
Anthracene	20-12-7	5.1E-02	0.051			■					0.0067	
Benzo(a)anthracene	56-55-3	5.7E-05	0.000057			■					0.0067	
Benzo(b)fluoranthene	205-99-2	2.0E-04	0.00020			■					0.0067	
Benzo(k)fluoranthene	207-08-9	2.0E-03	0.0020			■					0.0067	
Total benzofluoranthenes	n/a	3.2E+00	3.2					■			0.0067	
Benzo(g,h,i)perylene	191-24-2	6.7E-01	0.67					■			0.0067	
Benzo(a)pyrene	50-32-8	1.6E-05	0.000016			■					0.0067	
Chrysene	218-01-9	6.4E-03	0.0064			■					0.0067	
Dibenzo(a,h)anthracene	53-70-3	2.9E-05	0.000029			■					0.0067	
Dibenzofuran	132-64-9	5.4E-01	0.54					■			0.017	
Fluoranthene	206-44-0	9.0E-02	0.090				■				0.0067	
Fluorene	86-73-7	2.9E-02	0.029				■				0.0067	
Indeno(1,2,3-c,d)pyrene	193-39-5	5.6E-04	0.00056			■					0.0067	
1-Methylnaphthalene	90-12-0	2.9E+01	29					■			0.0067	
2-Methylnaphthalene	91-57-6	6.7E-01	0.67					■			0.0067	
Naphthalene	91-20-3	2.1E-03	0.0021			■					0.0067	
Phenanthrene	85-01-8	1.5E+00	1.5					■			0.0067	
Pyrene	129-00-0	1.4E-01	0.14				■				0.0067	
Total cPAH TEQ	n/a	1.6E-05	0.000016			■					0.010	
Other SVOCs												
Aniline	62-53-3	1.5E+02	150					■			0.085	
Benzidine	92-87-5	3.7E-03	0.0037					■			0.017	
Benzoic acid	65-85-0	1.7E-01	0.17				■				0.085	
Benzyl alcohol	100-51-6	5.7E-02	0.057					■			0.017	
Bis(2-chloroethoxy)methane	111-91-1	NE	NE								0.017	
Bis(2-chloroethyl)ether	111-44-4	2.2E-05	0.000022			■					0.017	
Bis(2-chloroisopropyl)ether	39638-32-9	3.2E+03	3,200	■							0.017	
Bis(2-ethylhexyl)phthalate	117-81-7	5.1E-03	0.0051			■					0.017	
4-Bromophenyl phenyl ether	101-55-3	NE	NE								0.017	
Butyl benzyl phthalate	85-68-7	1.8E-04	0.00018			■					0.017	
Carbazole	86-74-8	NE	NE								0.017	
4-Chloroaniline	106-47-8	8.1E-01	0.81				■				0.017	
4-Chloro-3-methylphenol	59-50-7	NE	NE								0.017	
2-Chloronaphthalene	91-58-7	6.4E+03	6,400	■							0.017	
2-Chlorophenol	95-57-8	1.1E-02	0.011			■					0.017	
4-Chlorophenyl phenyl ether	7005-72-3	NE	NE								0.017	
Decane	124-18-5	NE	NE								0.017	
Dibutyl phthalate	84-74-2	1.5E-02	0.015			■					0.017	
2,3-Dichloroaniline	608-27-5	NE	NE								0.017	

Table 4-1 Preliminary Cleanup Levels for Soil Port of Seattle - North Terminal 115 Seattle, Washington											
Analyte	CAS Number	LDW Preliminary Cleanup Level ¹ (Saturated Soil, Non-Potable Groundwater)		Basis for Preliminary Cleanup Level							Practical Quantitation Limit ² (PQL) (mg/kg)
		Scientific Notation (mg/kg)	Decimal Notation (mg/kg)	Direct Contact	Drinking Water	Surface Water	Sediment	Bank Erosion	TEE	Natural Background	
1,2-Dichlorobenzene (o-Dichlorobenzene)	95-50-1	3.1E-03	0.0031				■				0.001
1,3-Dichlorobenzene (m-Dichlorobenzene)	541-73-1	NE	NE								0.001
1,4-Dichlorobenzene (p-Dichlorobenzene)	106-46-7	8.1E-03	0.0081				■				0.001
3,3'-Dichlorobenzidine	91-94-1	3.3E-06	0.0000033			■					0.017
2,4-Dichlorophenol	120-83-2	4.3E-03	0.0043			■					0.017
Bis(2-ethylhexyl)ester	103-23-1	7.1E+02	710					■			0.017
Diethyl phthalate	84-66-2	3.4E-02	0.034				■				0.085
Dimethyl phthalate	131-11-3	7.1E-02	0.071					■			0.017
2,4-Dimethylphenol	105-67-9	3.1E-03	0.0031			■					0.017
1,2-Dinitrobenzene	528-29-0	8.0E+00	8.0	■							0.017
1,3-Dinitrobenzene	99-65-0	8.0E+00	8.0	■							0.085
1,4-Dinitrobenzene	100-25-4	8.0E+00	8.0	■							0.017
4,6-Dinitro-2-methylphenol	543-52-1	NE	NE								0.085
2,4-Dinitrophenol	51-28-5	2.9E-02	0.029			■					0.085
2,4-Dinitrotoluene	121-14-2	6.9E-05	0.000069			■					0.017
2,6-Dinitrotoluene	606-20-2	1.1E-01	0.11				■				0.017
Di-n-octyl phthalate	117-84-0	3.3E-01	0.33				■				0.017
1,2-Diphenylhydrazine	122-66-7	1.1E+00	1.1					■			0.017
Hexachlorobenzene	118-74-1	4.0E-07	0.0000004			■					0.017
Hexachlorobutadiene	87-68-3	5.4E-04	0.00054			■					0.005
Hexachlorocyclopentadiene	77-47-4	2.0E-01	0.20			■					0.017
Hexachloroethane	67-72-1	4.1E-05	0.000041			■					0.017
Isophorone	78-59-1	3.7E-02	0.037			■					0.017
o-Cresol (2-Methylphenol)	95-48-7	1.0E-02	0.010				■				0.017
m-Cresol (3-Methylphenol)	108-39-4	4.0E+03	4,000	■							0.017
p-Cresol (4-Methylphenol)	106-44-5	6.7E-01	0.67					■			0.017
2-Nitroaniline	88-74-4	8.0E+02	800	■							0.017
3-Nitroaniline	99-09-2	NE	NE								0.017
4-Nitroaniline	100-01-6	NE	NE								0.017
Nitrobenzene	98-95-3	4.1E-02	0.041			■					0.017
2-Nitrophenol	88-75-5	NE	NE								0.017
4-Nitrophenol (p-Nitrophenol)	100-02-7	7.0E+00	7.0						■		0.017
n-Nitrosodimethylamine	62-75-9	1.7E-02	0.017					■			0.017
n-Nitrosodiphenylamine (as Diphenylamine)	86-30-6	1.1E-03	0.0011			■					0.017
n-Nitrosodi-n-propylamine	621-64-7	1.8E-05	0.000018			■					0.017
n-Octadecane	593-45-3	NE	NE								0.017
Pentachlorophenol	87-86-5	1.8E-06	0.0000018			■					0.083
Phenol	108-95-2	1.2E-01	0.12				■				0.017
Pyridine	110-86-1	8.0E+01	80	■							0.017
2,3,4,6-Tetrachlorophenol	58-90-2	4.9E+02	490				■				0.017
2,3,5,6-Tetrachlorophenol	935-95-5	NE	NE								0.017
1,2,4-Trichlorobenzene	120-82-1	7.2E-05	0.000072			■					0.001
2,4,5-Trichlorophenol	95-95-4	1.1E+00	1.1			■					0.017
2,4,6-Trichlorophenol	88-06-2	1.9E-04	0.00019			■					0.017
Volatile Organic Compounds (VOCs)											
Acetone	67-64-1	7.2E+04	72000	■							0.005
Benzene	71-43-2	5.6E-04	0.00056			■					0.001
Bromobenzene	108-86-1	6.4E+02	640	■							0.001
Bromochloromethane	74-97-5	NE	NE								0.001
Bromoform (Tribromomethane)	75-25-2	5.0E-03	0.0050			■					0.001
Bromomethane	74-83-9	7.9E-02	0.079			■					0.001
n-Butylbenzene	104-51-8	4.0E+03	4,000	■							0.001
sec-Butylbenzene	135-98-8	8.0E+03	8,000	■							0.001
tert-Butylbenzene	98-06-6	8.0E+03	8,000	■							0.001
Carbon disulfide	75-15-0	8.0E+03	8,000	■							0.001
Carbon tetrachloride	56-23-5	1.5E-04	0.00015			■					0.001
Chlorobenzene	108-90-7	1.0E-01	0.10			■					0.001
Chloroethane	75-00-3	NE	NE								0.005
2-Chloroethyl vinyl ether	110-75-8	NE	NE								0.005
Chloroform	67-66-3	5.2E-02	0.052			■					0.001
Chloromethane	74-87-3	NE	NE								0.005
2-Chlorotoluene	95-49-8	1.6E+03	1,600	■							0.001
4-Chlorotoluene	106-43-4	NE	NE								0.001
Dibromochloromethane	124-48-1	7.7E-04	0.00077			■					0.001
1,2-Dibromo-3-chloropropane	96-12-8	1.3E+00	1.3	■							0.005
Dibromomethane	74-95-3	8.0E+02	800	■							0.001
Bromodichloromethane (Dichlorobromomethane)	75-27-4	9.6E-04	0.00096			■					0.001

Table 4-1

Preliminary Cleanup Levels for Soil

Port of Seattle - North Terminal 115

Seattle, Washington

Analyte	CAS Number	LDW Preliminary Cleanup Level ¹ (Saturated Soil, Non-Potable Groundwater)		Basis for Preliminary Cleanup Level							Practical Quantitation Limit ² (PQL) (mg/kg)
		Scientific Notation (mg/kg)	Decimal Notation (mg/kg)	Direct Contact	Drinking Water	Surface Water	Sediment	Bank Erosion	TEE	Natural Background	
Dichlorodifluoromethane (CFC-12)	75-71-8	1.6E+04	16,000	■							0.001
1,1-Dichloroethane	75-34-3	1.8E+02	180	■							0.001
1,2-Dichloroethane (EDC)	107-06-2	2.4E-02	0.024			■					0.001
1,1-Dichloroethene	75-35-4	1.4E+00	1.4			■					0.001
cis-1,2-Dichloroethene	156-59-2	1.6E+02	160	■							0.001
trans-1,2-Dichloroethene	156-60-5	3.2E-01	0.32			■					0.001
1,2-Dichloropropane	78-87-5	1.0E-03	0.0010			■					0.001
1,3-Dichloropropane	142-28-9	NE	NE								0.001
2,2-Dichloropropane	594-20-7	NE	NE								0.001
1,1-Dichloropropene	563-58-6	NE	NE								0.001
cis-1,3-Dichloropropene	10061-01-5	6.3E-04	0.00063			■					0.001
trans-1,3-Dichloropropene	10061-02-6	6.3E-04	0.00063			■					0.001
Ethylbenzene	100-41-4	1.5E-02	0.015			■					0.001
1,2-Dibromoethane (EDB)	106-93-4	5.0E-01	0.50	■							0.001
2-Hexanone	591-78-6	4.0E+02	400	■							0.005
Isopropylbenzene (Cumene)	98-82-8	8.0E+03	8,000	■							0.001
p-Isopropyltoluene	99-87-6	NE	NE								0.001
2-Butanone (MEK)	78-93-3	4.8E+04	48,000	■							0.005
Methyl Iodide (Iodomethane)	74-88-4	NE	NE								0.005
4-Methyl-2-pentanone (Methyl isobutyl ketone)	108-10-1	6.4E+03	6,400	■							0.005
Methyl tert-butyl ether (MTBE)	1634-04-4	5.6E+02	560	■							0.001
Methylene chloride	75-09-2	3.0E-02	0.030			■					0.005
n-Propylbenzene	103-65-1	8.0E+03	8,000	■							0.001
Styrene	100-42-5	3.0E+02	300						■		0.001
1,1,1,2-Tetrachloroethane	630-20-6	3.8E+01	38	■							0.001
1,1,2,2-Tetrachloroethane	79-34-5	1.1E-04	0.00011			■					0.001
Tetrachloroethene	127-18-4	1.6E-03	0.0016			■					0.001
Toluene	108-88-3	5.5E-02	0.055			■					0.005
1,2,3-Trichlorobenzene	87-61-6	2.0E+01	20						■		0.001
1,1,1-Trichloroethane	71-55-6	2.1E+01	21			■					0.001
1,1,2-Trichloroethane	79-00-5	3.3E-04	0.00033			■					0.001
Trichloroethene	79-01-6	2.7E-04	0.00027			■					0.001
Trichlorofluoromethane (CFC-11)	75-69-4	2.4E+04	24,000	■							0.001
1,2,3-Trichloropropane	96-18-4	3.3E-02	0.033	■							0.001
1,2,4-Trimethylbenzene	95-63-6	8.0E+02	800	■							0.001
1,3,5-Trimethylbenzene	108-67-8	8.0E+02	800	■							0.001
Vinyl acetate	108-05-4	8.0E+04	80,000	■							0.005
Vinyl chloride	75-01-4	5.5E-05	0.000055			■					0.001
Xylene, m-	108-38-3	1.6E+04	16,000	■							0.002
Xylene, p-	106-42-3	1.6E+04	16,000	■							0.002
Xylene, o-	95-47-6	1.6E+04	16,000	■							0.001
Petroleum Hydrocarbons											
Gasoline-range hydrocarbons w/benzene	n/a	3.0E+01	30	■							5
Diesel-range hydrocarbons	n/a	2.6E+02	260						■		25
Oil-range hydrocarbons	n/a	2.0E+03	2,000	■							50
Total diesel- and oil-range hydrocarbons	n/a	2.6E+02	260						■		50

Notes:

^a Most stringent soil Preliminary Cleanup Level (PCUL) for saturated zone soil and non-potable groundwater. Obtained from Ecology's "LDW PCUL Workbook - Soil Summary" dated July 2019. Screening value for most stringent potable groundwater used when non-potable groundwater PCUL available.

^c PQL from the North Terminal 115 (T115N) Remedial Investigation/Feasibility Study Work Plan (GeoEngineers 2012) and is the lowest available value from OnSite Environmental, Inc. of Redmond, Washington.

Direct Contact = Most stringent cancer/noncancer MTCA Method B soil cleanup level adjusted for ARARs

Drinking Water = Protection of groundwater.

Surface Water - Protection of surface water via groundwater (saturated soil)

Sediment - Protection of sediment via groundwater (saturated soil)

Bank Erosion - Protect sediment via bank erosion, minimum Record of Decision (ROD) cleanup level and lower tier Sediment Management Standard (SMS)

TEE - Most stringent MTCA Table 749-3 for plants, soil biota and wildlife (unrestricted land use)

Natural Background - Puget Sound Natural Background (Ecology 1994)

CAS = Chemical Abstracts Service

ARAR = Applicable, Relevant and Appropriate Requirements

cPAH = carcinogenic Polycyclic Aromatic Hydrocarbon

LDW = Lower Duwamish Waterway

mg/kg = milligram per kilogram

n/a = Not Available

NE = Not Established

PCUL = Preliminary Cleanup Level

PQL = practical quantitation limit

TEQ = toxic equivalence quotient

Table 4-2
Preliminary Cleanup Levels for Groundwater
Port of Seattle - North Terminal 115
Seattle, Washington

Analyte	CAS Number	LDW Preliminary Cleanup Level ¹ (Non-Potable Groundwater)		Basis for Preliminary Cleanup Level					Practical Quantitation Limit ² (PQL) (µg/L)
		Scientific Notation (µg/L)	Decimal Notation (µg/L)	Drinking Water	Surface Water	Sediment	Indoor Air	Natural Background	
Polychlorinated Biphenyls (PCBs)									
PCB-Aroclor 1016	12674-11-2	NE	NE						0.02
PCB-Aroclor 1221	11104-28-2	NE	NE						0.02
PCB-Aroclor 1232	11141-16-5	NE	NE						0.02
PCB-Aroclor 1242	53469-21-9	NE	NE						0.02
PCB-Aroclor 1248	12672-29-6	NE	NE						0.02
PCB-Aroclor 1254	11097-69-1	NE	NE						0.02
PCB-Aroclor 1260	11096-82-5	NE	NE						0.02
Total PCBs (Aroclors or Congeners)	n/a	7.0E-06	0.0000070		■				0.02/0.000010
Dioxins and Furans									
Total Dioxin/Furan TEQ	n/a	5.1E-09	0.0000000051		■				0.000002
Metals									
Antimony	7440-36-0	9.0E+01	90		■				5.5
Arsenic	7440-38-2	8.0E+00	8.0					■	3.3
Barium	7440-39-3	2.0E+02	200		■				5.0
Beryllium	7440-41-7	4.4E+00	4.4			■			10
Cadmium	7440-43-9	1.2E+00	1.2			■			0.2
Chromium III / Total	7440-47-3	2.7E+01	27		■				2.0
Chromium VI	18540-29-9	5.0E+01	50		■				50
Copper	7440-50-8	3.1E+00	3.1		■				2.0
Lead	7439-92-1	8.1E+00	8.1		■				1.0
Mercury	7439-97-6	2.5E-02	0.025		■				0.5
Nickel	7440-02-0	8.2E+00	8.2		■				2.0
Selenium	7782-49-2	7.1E+01	71		■				6.0
Silver	7440-22-4	1.9E+00	1.9		■				1.0
Thallium	7440-28-0	6.2E-02	0.062		■				2.0
Tin	7440-31-5	9.6E+03	9,600	■					5.0
Zinc	7440-66-6	8.1E+01	81		■				56
Semi-Volatile Organic Compounds (SVOCs) - Polycyclic Aromatic Hydrocarbons (PAHs)									
Acenaphthene	83-32-9	5.3E+00	5.3			■			0.1
Acenaphthylene	208-96-8	NE	NE						0.1
Anthracene	20-12-7	2.1E+00	2.1			■			0.1
Benzo(a)anthracene	6-55-3	1.6E-04	0.00016		■				0.01
Benzo(b)fluoranthene	205-99-2	1.6E-04	0.00016		■				0.01
Benzo(k)fluoranthene	207-08-9	1.6E-03	0.0016		■				0.01
Total benzofluoranthenes	n/a	NE	NE						0.01
Benzo(g,h,i)perylene	191-24-2	NE	NE						0.01
Benzo(a)pyrene	50-32-8	1.6E-05	0.000016		■				0.01
Chrysene	218-01-9	1.6E-02	0.016		■				0.01
Dibenzo(a,h)anthracene	53-70-3	1.6E-05	0.000016		■				0.01
Dibenzofuran	132-64-9	1.6E+01	16	■					0.1
Fluoranthene	206-44-0	1.8E+00	1.8			■			0.1
Fluorene	86-73-7	3.7E+00	3.7			■			0.1
Indeno(1,2,3-c,d)pyrene	193-39-5	1.6E-04	0.00016		■				0.01
1-Methylnaphthalene	90-12-0	1.5E+00	1.5	■					0.1
2-Methylnaphthalene	91-57-6	3.2E+01	32	■					0.1
Naphthalene	91-20-3	1.4E+00	1.4		■				0.1
Phenanthrene	85-01-8	NE	NE						0.1
Pyrene	129-00-0	2.0E+00	2.0			■			0.1
Total cPAH TEQ	n/a	1.6E-05	0.000016		■				0.02
Other SVOCs									
Aniline	62-53-3	7.7E+00	7.7	■					0.1
Benzidine	92-87-5	2.3E-05	0.000023		■				0.1
Benzoic acid	65-85-0	5.9E+02	590			■			0.5
Benzyl alcohol	100-51-6	8.0E+02	800	■					0.1
Bis(2-chloroethoxy)methane	111-91-1	NE	NE						0.1
Bis(2-chloroethyl)ether	111-44-4	6.0E-02	0.060		■				0.1
Bis(2-chloroisopropyl)ether	39638-32-9	9.0E+02	900		■				0.1
Bis(2-ethylhexyl)phthalate	117-81-7	4.6E-02	0.046		■				0.1
4-Bromophenyl phenyl ether	101-55-3	NE	NE						0.1
Butyl benzyl phthalate	85-68-7	1.3E-02	0.013		■				0.1
Carbazole	86-74-8	NE	NE						0.1
4-Chloroaniline	106-47-8	2.3E+03	2300			■			0.1
4-Chloro-3-methylphenol	59-50-7	3.6E+01	36		■				0.1
2-Chloronaphthalene	91-58-7	1.0E+02	100		■				0.1
2-Chlorophenol	95-57-8	1.7E+01	17		■				0.1
4-Chlorophenyl phenyl ether	7005-72-3	NE	NE						0.1
Decane	124-18-5	NE	NE						2
Dibutyl phthalate	84-74-2	8.0E+00	8.0		■				0.1
2,3-Dichloroaniline	608-27-5	NE	NE						0.1

Table 4-2
Preliminary Cleanup Levels for Groundwater
Port of Seattle - North Terminal 115
Seattle, Washington

Analyte	CAS Number	LDW Preliminary Cleanup Level ¹ (Non-Potable Groundwater)		Basis for Preliminary Cleanup Level					Practical Quantitation Limit ² (PQL) (µg/L)
		Scientific Notation (µg/L)	Decimal Notation (µg/L)	Drinking Water	Surface Water	Sediment	Indoor Air	Natural Background	
1,2-Dichlorobenzene (o-Dichlorobenzene)	95-50-1	4.6E+00	4.6			■			0.1
1,3-Dichlorobenzene (m-Dichlorobenzene)	541-73-1	2.0E+00	2.0		■				0.1
1,4-Dichlorobenzene (p-Dichlorobenzene)	106-46-7	4.9E+00	4.9				■		0.1
3,3'-Dichlorobenzidine	91-94-1	3.3E-03	0.0033		■				0.1
2,4-Dichlorophenol	120-83-2	1.0E+01	10		■				0.1
Bis(2-ethylhexyl)ester	103-23-1	4.0E+02	400	■					0.1
Diethyl phthalate	84-66-2	9.3E+01	93			■			0.1
Dimethyl phthalate	131-11-3	6.0E+02	600		■				0.1
2,4-Dimethylphenol	105-67-9	6.3E+00	6.3			■			0.1
1,2-Dinitrobenzene	528-29-0	1.6E+00	1.6	■					0.1
1,3-Dinitrobenzene	99-65-0	1.6E+00	1.6	■					0.1
1,4-Dinitrobenzene	100-25-4	1.6E+00	1.6	■					0.1
4,6-Dinitro-2-methylphenol	543-52-1	7.0E+00	7.0		■				0.5
2,4-Dinitrophenol	51-28-5	1.0E+02	100		■				1.0
2,4-Dinitrotoluene	121-14-2	1.8E-01	0.18		■				0.1
2,6-Dinitrotoluene	606-20-2	3.0E+02	300			■			0.1
Di-n-octyl phthalate	117-84-0	3.9E-03	0.0039			■			0.1
1,2-Diphenylhydrazine	122-66-7	2.0E-02	0.020		■				0.1
Hexachlorobenzene	118-74-1	5.0E-06	0.0000050		■				0.1
Hexachlorobutadiene	87-68-3	1.0E-02	0.01		■				0.1
Hexachlorocyclopentadiene	77-47-4	1.0E+00	1.0		■				0.1
Hexachloroethane	67-72-1	2.0E-02	0.020		■				0.1
Isophorone	78-59-1	1.1E+02	110		■				0.1
o-Cresol (2-Methylphenol)	95-48-7	2.7E+01	27			■			0.1
m-Cresol (3-Methylphenol)	108-39-4	4.0E+02	400	■					0.1
p-Cresol (4-Methylphenol)	106-44-5	8.0E+02	800	■					0.1
2-Nitroaniline	88-74-4	1.6E+02	160	■					0.1
3-Nitroaniline	99-09-2	NE	NE						0.1
4-Nitroaniline	100-01-6	NE	NE						0.1
Nitrobenzene	98-95-3	1.0E+02	100		■				0.1
2-Nitrophenol	88-75-5	NE	NE						0.1
4-Nitrophenol (p-Nitrophenol)	100-02-7	NE	NE						0.1
n-Nitrosodimethylamine	62-75-9	3.4E-01	0.34		■				0.1
n-Nitrosodiphenylamine (as Diphenylamine)	86-30-6	6.9E-01	0.69		■				0.1
n-Nitrosodi-n-propylamine	621-64-7	5.8E-02	0.058		■				0.1
n-Octadecane	593-45-3	NE	NE						0.1
Pentachlorophenol	87-86-5	2.0E-03	0.0020		■				0.5
Phenol	108-95-2	3.7E+02	370			■			0.1
Pyridine	110-86-1	8.0E+00	8.0	■					0.1
2,3,4,6-Tetrachlorophenol	58-90-2	4.8E+02	480	■					0.1
2,3,5,6-Tetrachlorophenol	935-95-5	NE	NE						0.1
1,2,4-Trichlorobenzene	120-82-1	3.7E-02	0.037		■				0.1
2,4,5-Trichlorophenol	95-95-4	6.0E+02	600		■				0.1
2,4,6-Trichlorophenol	88-06-2	2.8E-01	0.28		■				0.1
Volatile Organic Compounds (VOCs)									
Acetone	67-64-1	7.2E+03	7,200	■					5
Benzene	71-43-2	1.6E+00	1.6		■				0.2
Bromobenzene	108-86-1	6.4E+01	64	■					0.2
Bromochloromethane	74-97-5	NE	NE						0.2
Bromoform (Tribromomethane)	75-25-2	1.2E+01	12		■				1
Bromomethane	74-83-9	1.3E+01	13				■		0.2
n-Butylbenzene	104-51-8	4.0E+02	400	■					0.2
sec-Butylbenzene	135-98-8	8.0E+02	800	■					0.2
tert-Butylbenzene	98-06-6	8.0E+02	800	■					0.2
Carbon disulfide	75-15-0	4.0E+02	400				■		0.2
Carbon tetrachloride	56-23-5	3.5E-01	0.35		■				0.2
Chlorobenzene	108-90-7	2.0E+02	200		■				0.2
Chloroethane	75-00-3	1.9E+04	19,000				■		1
2-Chloroethyl vinyl ether	110-75-8	NE	NE						1
Chloroform	67-66-3	1.2E+00	1.2				■		0.2
Chloromethane	74-87-3	1.5E+02	150				■		1
2-Chlorotoluene	95-49-8	1.6E+02	160	■					0.2
4-Chlorotoluene	106-43-4	NE	NE						0.2
Dibromochloromethane	124-48-1	2.2E+00	2.2		■				0.2
1,2-Dibromo-3-chloropropane	96-12-8	2.0E-01	0.20	■					1
Dibromomethane	74-95-3	8.0E+01	80	■					0.2

Table 4-2
Preliminary Cleanup Levels for Groundwater
Port of Seattle - North Terminal 115
Seattle, Washington

Analyte	CAS Number	LDW Preliminary Cleanup Level ¹ (Non-Potable Groundwater)		Basis for Preliminary Cleanup Level					Practical Quantitation Limit ² (PQL) (µg/L)
		Scientific Notation (µg/L)	Decimal Notation (µg/L)	Drinking Water	Surface Water	Sediment	Indoor Air	Natural Background	
Bromodichloromethane (Dichlorobromomethane)	75-27-4	1.8E+00	1.8		■				0.2
Dichlorodifluoromethane (CFC-12)	75-71-8	5.6E+00	5.6				■		0.2
1,1-Dichloroethane	75-34-3	1.1E+01	11				■		0.2
1,2-Dichloroethane (EDC)	107-06-2	4.2E+00	4.2				■		0.2
1,1-Dichloroethene	75-35-4	1.3E+02	130				■		0.2
cis-1,2-Dichloroethene	156-59-0	1.6E+01	16	■					0.2
trans-1,2-Dichloroethene	156-60-5	1.0E+03	1,000		■				0.2
1,2-Dichloropropane	78-87-5	3.1E+00	3.1		■				0.2
1,3-Dichloropropane	142-28-9	NE	NE						0.2
2,2-Dichloropropane	594-20-7	NE	NE						0.2
1,1-Dichloropropene	563-58-6	NE	NE						0.2
cis-1,3-Dichloropropene	10061-01-5	2.0E+00	2.0		■				0.2
trans-1,3-Dichloropropene	10061-02-6	2.0E+00	2.0		■				0.2
Ethylbenzene	100-41-4	3.1E+01	31		■				0.2
1,2-Dibromoethane (EDB)	106-93-4	2.7E-01	0.27				■		0.2
2-Hexanone	591-78-6	4.0E+01	40	■					2
Isopropylbenzene (Cumene)	98-82-8	8.0E+02	800	■					0.2
p-Isopropyltoluene	99-87-6	NE	NE						0.2
2-Butanone (MEK)	78-93-3	1.7E+06	1,700,000				■		5
Methyl Iodide (Iodomethane)	74-88-4	NE	NE						1
4-Methyl-2-pentanone (Methyl isobutyl ketone)	108-10-1	4.7E+05	470,000				■		2
Methyl tert-butyl ether (MTBE)	1634-04-4	6.0E+02	600				■		0.2
Methylene chloride	75-09-2	1.0E+02	100		■				1
n-Propylbenzene	103-65-1	8.0E+02	800	■					0.2
Styrene	100-42-5	8.2E+03	8,200				■		0.2
1,1,1,2-Tetrachloroethane	630-20-6	7.4E+00	7.4		■				0.2
1,1,2,2-Tetrachloroethane	79-34-5	3.0E-01	0.30		■				0.2
Tetrachloroethene	127-18-4	2.9E+00	2.9		■				0.2
Toluene	108-88-3	1.3E+02	130		■				1
1,2,3-Trichlorobenzene	87-61-6	NE	NE						0.2
1,1,1-Trichloroethane	71-55-6	5.5E+03	5,500				■		0.2
1,1,2-Trichloroethane	79-00-5	9.0E-01	0.90		■				0.2
Trichloroethene	79-01-6	7.0E-01	0.70		■				0.2
Trichlorofluoromethane (CFC-11)	75-69-4	1.2E+02	120				■		0.2
1,2,3-Trichloropropane	96-18-4	1.5E-03	0.0015	■					0.2
1,2,4-Trimethylbenzene	95-63-6	2.4E+02	240				■		0.2
1,3,5-Trimethylbenzene	108-67-8	8.0E+01	80	■					0.2
Vinyl acetate	108-05-4	7.8E+03	7,800				■		2
Vinyl chloride	75-01-4	1.8E-01	0.18		■				0.2
Xylene, m-	108-38-3	3.0E+02	300				■		0.4
Xylene, p-	106-42-3	2.9E+02	290				■		0.4
Xylene, o-	95-47-6	4.3E+02	430				■		0.2
Petroleum Hydrocarbons									
Gasoline-range hydrocarbons w/benzene	n/a	8.0E+02	800	■					100
Diesel-range hydrocarbons	n/a	5.0E+02	500	■					250
Oil-range hydrocarbons	n/a	5.0E+02	500	■					400
Total diesel- and oil-range hydrocarbons	n/a	5.0E+02	500	■					400

Notes:

¹ Most stringent groundwater Preliminary Cleanup Level (PCUL) for non-potable groundwater. Obtained from Ecology's "LDW PCUL Workbook - Soil Summary" dated July 2019. Screening value for most stringent potable groundwater used when non-potable groundwater PCUL available.

² PQL from the North Terminal 115 (T115N) Remedial Investigation/Feasibility Study Work Plan (GeoEngineers 2012) and is the lowest available value from OnSite Environmental, Inc. of Redmond, Washington except for dioxins/furans. The PQL for total dioxins/furans TEQ was calculated using reporting limits for individual congeners obtained from samples collected at T115N by Ecology.

Drinking Water = Protection of groundwater.

Surface Water = Protection of surface water via groundwater

Sediment = Protection of sediment via groundwater

Indoor Air = MTCA Method B and C groundwater cleanup level for protection of indoor air (vapor intrusion)

Natural Background = Puget Sound Natural Background (Ecology 1994)

µg/L = microgram per liter

CAS = Chemical Abstracts Service

cPAH = carcinogenic Polycyclic Aromatic Hydrocarbon

LDW = Lower Duwamish Waterway

n/a = not available

NE = not established

PCUL = Preliminary Cleanup Level

PQL = practical quantitation limit

TEQ = toxic equivalence quotient

Table 4-3
Screening Levels for Catch Basin Solids
Port of Seattle - North Terminal 115
Seattle, Washington

Analyte	CAS Number	Lower Duwamish Waterway Screening Level ¹ (Target Sediment Concentration)		Practical Quantitation Limit ² (PQL) (mg/kg)
		Scientific Notation (mg/kg)	Decimal Notation (mg/kg)	
Polychlorinated Biphenyls (PCBs)				
PCB-Aroclor 1016	12674-11-2	NE	NE	0.05
PCB-Aroclor 1221	11104-28-2	NE	NE	0.05
PCB-Aroclor 1232	11141-16-5	NE	NE	0.05
PCB-Aroclor 1242	53469-21-9	NE	NE	0.05
PCB-Aroclor 1248	12672-29-6	NE	NE	0.05
PCB-Aroclor 1254	11097-69-1	NE	NE	0.05
PCB-Aroclor 1260	11096-82-5	NE	NE	0.05
Total PCBs Aroclor	1336-36-3	1.3E-01	0.13	0.05
Total PCBs Congeners	n/a	2.0E-03	0.0020	0.000002
Dioxin-Like PCBs Congeners	n/a	7.0E-07	0.0000007	0.000002
Dioxins and Furans				
Total Dioxins/Furans TEQ	7440-38-2	2.0E-06	0.0000020	0.000011
Metals				
Antimony	7440-36-0	8.8E+01	88	5
Arsenic	7440-38-2	7.0E+00	7.0	0.5
Barium	7440-39-3	4.4E+04	44,000	2
Beryllium	7440-41-7	4.4E+02	440	0.5
Cadmium	7440-43-9	5.1E+00	5.1	0.2
Chromium III / Total	7440-47-3	2.6E+02	260	0.5
Chromium VI	18540-29-9	NE	NE	0.5
Copper	7440-50-8	3.9E+02	390	0.2
Lead	7439-92-1	4.5E+02	450	0.5
Mercury	7439-97-6	4.1E-01	0.41	0.05
Nickel	7440-02-0	4.4E+03	4,400	0.5
Selenium	7782-49-2	1.1E+03	1,100	0.5
Silver	7440-22-4	6.1E+00	6.1	0.5
Thallium	7440-28-0	2.2E+00	2.2	0.25
Tin	7440-31-5	1.3E+05	130,000	1.0
Zinc	7440-66-6	4.1E+02	410	2.5
Semi-Volatile Organic Compounds (SVOCs) - Polycyclic Aromatic Hydrocarbons (PAHs)				
Acenaphthene	83-32-9	5.0E-01	0.50	0.0067
Acenaphthylene	208-96-8	1.3E+00	1.3	0.0067
Anthracene	20-12-7	9.6E-01	0.96	0.0067
Benzo(a)anthracene	6-55-3	1.3E+00	1.3	0.0067
Benzo(b)fluoranthene	205-99-2	3.2E+00	3.2	0.0067
Benzo(k)fluoranthene	207-08-9	6.7E-01	0.67	0.0067
Total benzofluoranthenes	n/a	1.6E+00	1.6	0.0067
Benzo(ghi)perylene	191-24-2	1.4E+00	1.4	0.0067
Benzo(a)pyrene	50-32-8	2.3E-01	0.23	0.0067
Chrysene	218-01-9	5.4E-01	0.54	0.0067
Dibenzo(a,h)anthracene	53-70-3	1.7E+00	1.7	0.0067
Dibenzofuran	132-64-9	5.4E-01	0.54	0.017
Fluoranthene	206-44-0	6.0E-01	0.60	0.0067
Fluorene	86-73-7	2.9E+01	29	0.0067
Indeno(1,2,3-c,d)pyrene	193-39-5	6.7E-01	0.67	0.0067
1-Methylnaphthalene	90-12-0	2.1E+00	2.1	0.0067
2-Methylnaphthalene	91-57-6	1.5E+00	1.5	0.0067
Naphthalene	91-20-3	2.6E+00	2.6	0.0067
Phenanthrene	85-01-8	5.2E+00	5.2	0.0067
Pyrene	129-00-0	1.2E+01	12	0.0067
Total LPAHs ³	n/a	5.2E+00	5.2	0.0067
Total HPAHs ⁴	n/a	1.2E+01	12	0.0067
Total cPAH TEQ	n/a	9.0E-02	0.090	0.010
Other SVOCs				
Aniline	62-53-3	1.5E+02	150	0.085
Benzidine	92-87-5	3.7E-03	0.0037	0.017
Benzoic acid	65-85-0	6.5E-01	0.65	0.085
Benzyl alcohol	100-51-6	5.7E-02	0.057	0.017
Bis(2-chloroethoxy)methane	111-91-1	NE	NE	0.017
Bis(2-chloroethyl)ether	111-44-4	7.8E-01	0.78	0.017
Bis(2-chloroisopropyl)ether	39638-32-9	6.8E+03	6,800	0.017
Bis(2-ethylhexyl)phthalate	117-81-7	1.3E+00	1.3	0.017
4-Bromophenyl phenyl ether	101-55-3	NE	NE	0.017
Butyl benzyl phthalate	85-68-7	6.3E-02	0.063	0.017
Carbazole	86-74-8	NE	NE	0.017
4-Chloroaniline	106-47-8	4.3E+00	4.3	0.017
4-Chloro-3-methylphenol	59-50-7	NE	NE	0.017
2-Chloronaphthalene	91-58-7	1.4E+04	14,000	0.017
2-Chlorophenol	95-57-8	8.4E+02	840	0.017
4-Chlorophenyl phenyl ether	7005-72-3	NE	NE	0.017
Decane	124-18-5	NE	NE	0.017
Dibutyl phthalate	84-74-2	1.4E+00	1.4	0.017
2,3-Dichloroaniline	608-27-5	NE	NE	0.017
1,2-Dichlorobenzene (o-Dichlorobenzene)	95-50-1	3.5E-02	0.035	0.001
1,3-Dichlorobenzene (m-Dichlorobenzene)	541-73-1	NE	NE	0.001
1,4-Dichlorobenzene (p-Dichlorobenzene)	106-46-7	1.1E-01	0.11	0.001
3,3'-Dichlorobenzidine	91-94-1	1.9E+00	1.9	0.017
2,4-Dichlorophenol	120-83-2	5.1E+02	510	0.017

Table 4-3
Screening Levels for Catch Basin Solids
Port of Seattle - North Terminal 115
Seattle, Washington

Analyte	CAS Number	Lower Duwamish Waterway Screening Level ¹ (Target Sediment Concentration)		Practical Quantitation Limit ² (PQL) (mg/kg)
		Scientific Notation (mg/kg)	Decimal Notation (mg/kg)	
Bis(2-ethylhexyl)ester	103-23-1	7.1E+02	710	0.017
Diethyl phthalate	84-66-2	2.0E-01	0.20	0.085
Dimethyl phthalate	131-11-3	7.1E-02	0.071	0.017
2,4-Dimethylphenol	105-67-9	2.9E-02	0.029	0.017
1,2-Dinitrobenzene	528-29-0	1.7E+01	17	0.017
1,3-Dinitrobenzene	99-65-0	1.7E+01	17	0.085
1,4-Dinitrobenzene	100-25-4	1.7E+01	17	0.017
4,6-Dinitro-2-methylphenol	543-52-1	NE	NE	0.085
2,4-Dinitrophenol	51-28-5	3.4E+02	340	0.085
2,4-Dinitrotoluene	121-14-2	2.8E+00	2.8	0.017
2,6-Dinitrotoluene	606-20-2	5.7E-01	0.57	0.017
Di-n-octyl phthalate	117-84-0	6.2E+00	6.2	0.017
1,2-Diphenylhydrazine	122-66-7	1.1E+00	1.1	0.017
Hexachlorobenzene	118-74-1	1.0E-03	0.001	0.017
Hexachlorobutadiene	87-68-3	1.1E-02	0.011	0.005
Hexachlorocyclopentadiene	77-47-4	1.0E+03	1,000	0.017
Hexachloroethane	67-72-1	2.1E+01	21	0.017
Isophorone	78-59-1	9.0E+02	900	0.017
o-Cresol (2-Methylphenol)	95-48-7	6.3E-02	0.063	0.017
m-Cresol (3-Methylphenol)	108-39-4	8.5E+03	8,500	0.017
p-Cresol (4-Methylphenol)	106-44-5	6.7E-01	0.67	0.017
2-Nitroaniline	88-74-4	1.7E+03	1700	0.017
3-Nitroaniline	99-09-2	NE	NE	0.017
4-Nitroaniline	100-01-6	NE	NE	0.017
Nitrobenzene	98-95-3	3.4E+02	340	0.017
2-Nitrophenol	88-75-5	NE	NE	0.017
4-Nitrophenol (p-Nitrophenol)	100-02-7	NE	NE	0.017
n-Nitrosodimethylamine	62-75-9	1.7E-02	0.017	0.017
n-Nitrosodiphenylamine (as Diphenylamine)	86-30-6	2.8E-02	0.028	0.017
n-Nitrosodi-n-propylamine	621-64-7	1.2E-01	0.12	0.017
n-Octadecane	593-45-3	NE	NE	0.017
Pentachlorophenol	87-86-5	3.6E-01	0.36	0.083
Phenol	108-95-2	4.2E-01	0.42	0.017
Pyridine	110-86-1	1.7E+02	170	0.017
2,3,4,6-Tetrachlorophenol	58-90-2	5.1E+03	5,100	0.017
2,3,5,6-Tetrachlorophenol	935-95-5	NE	NE	0.017
1,2,4-Trichlorobenzene	120-82-1	3.1E-02	0.031	0.001
2,4,5-Trichlorophenol	95-95-4	1.7E+04	17,000	0.017
2,4,6-Trichlorophenol	88-06-2	7.8E+01	78	0.017
Volatile Organic Compounds (VOCs)				
Acetone	67-64-1	NE	NE	0.005
Benzene	71-43-2	NE	NE	0.001
Bromobenzene	108-86-1	NE	NE	0.001
Bromochloromethane	74-97-5	NE	NE	0.001
Bromoform (Tribromomethane)	75-25-2	NE	NE	0.001
Bromomethane	74-83-9	NE	NE	0.001
n-Butylbenzene	104-51-8	NE	NE	0.001
sec-Butylbenzene	135-98-8	NE	NE	0.001
tert-Butylbenzene	98-06-6	NE	NE	0.001
Carbon disulfide	75-15-0	NE	NE	0.001
Carbon tetrachloride	56-23-5	NE	NE	0.001
Chlorobenzene	108-90-7	NE	NE	0.001
Chloroethane	75-00-3	NE	NE	0.005
2-Chloroethyl vinyl ether	110-75-8	NE	NE	0.005
Chloroform	67-66-3	NE	NE	0.001
Chloromethane	74-87-3	NE	NE	0.005
2-Chlorotoluene	95-49-8	NE	NE	0.001
4-Chlorotoluene	106-43-4	NE	NE	0.001
Dibromochloromethane	124-48-1	NE	NE	0.001
1,2-Dibromo-3-chloropropane	96-12-8	NE	NE	0.005
Dibromomethane	74-95-3	NE	NE	0.001
Bromodichloromethane (Dichlorobromomethane)	75-27-4	NE	NE	0.001
Dichlorodifluoromethane (CFC-12)	75-71-8	NE	NE	0.001
1,1-Dichloroethane	107-06-2	NE	NE	0.001
1,2-Dichloroethane (EDC)	75-34-3	NE	NE	0.001
1,1-Dichloroethene	75-35-4	NE	NE	0.001
cis-1,2-Dichloroethene	156-59-0	NE	NE	0.001
trans-1,2-Dichloroethene	156-60-5	NE	NE	0.001
1,2-Dichloropropane	78-87-5	NE	NE	0.001
1,3-Dichloropropane	142-28-9	NE	NE	0.001
2,2-Dichloropropane	594-20-7	NE	NE	0.001
1,1-Dichloropropene	563-58-6	NE	NE	0.001
cis-1,3-Dichloropropene	10061-01-5	NE	NE	0.001
trans-1,3-Dichloropropene	10061-02-6	NE	NE	0.001
Ethylbenzene	100-41-4	NE	NE	0.001
1,2-Dibromoethane (EDB)	106-93-4	NE	NE	0.001
2-Hexanone	591-78-6	NE	NE	0.005
Isopropylbenzene (Cumene)	98-82-8	NE	NE	0.001
p-Isopropyltoluene	99-87-6	NE	NE	0.001

Table 4-3
Screening Levels for Catch Basin Solids
Port of Seattle - North Terminal 115
Seattle, Washington

Analyte	CAS Number	Lower Duwamish Waterway Screening Level ¹ (Target Sediment Concentration)		Practical Quantitation Limit ² (PQL) (mg/kg)
		Scientific Notation (mg/kg)	Decimal Notation (mg/kg)	
2-Butanone (MEK)	78-93-3	NE	NE	0.005
Methyl Iodide (Iodomethane)	74-88-4	NE	NE	0.005
4-Methyl-2-pentanone (Methyl isobutyl ketone)	108-10-1	NE	NE	0.005
Methyl tert-butyl ether (MTBE)	1634-04-4	NE	NE	0.001
Methylene chloride	75-09-2	NE	NE	0.005
n-Propylbenzene	103-65-1	NE	NE	0.001
Styrene	100-42-5	NE	NE	0.001
1,1,1,2-Tetrachloroethane	630-20-6	NE	NE	0.001
1,1,2,2-Tetrachloroethane	79-34-5	NE	NE	0.001
Tetrachloroethene	127-18-4	NE	NE	0.001
Toluene	108-88-3	NE	NE	0.005
1,2,3-Trichlorobenzene	87-61-6	NE	NE	0.001
1,1,1-Trichloroethane	71-55-6	NE	NE	0.001
1,1,2-Trichloroethane	79-00-5	NE	NE	0.001
Trichloroethene	79-01-6	NE	NE	0.001
Trichlorofluoromethane (CFC-11)	75-69-4	NE	NE	0.001
1,2,3-Trichloropropane	96-18-4	NE	NE	0.001
1,2,4-Trimethylbenzene	95-63-6	NE	NE	0.001
1,3,5-Trimethylbenzene	108-67-8	NE	NE	0.001
Vinyl acetate	108-05-4	NE	NE	0.005
Vinyl chloride	75-01-4	NE	NE	0.001
Xylene, m-	108-38-3	NE	NE	0.002
Xylene, p-	106-42-3	NE	NE	0.002
Xylene, o-	95-47-6	NE	NE	0.001
Petroleum Hydrocarbons				
Gasoline-range hydrocarbons w/benzene	n/a	NE	NE	5
Diesel-range hydrocarbons	n/a	NE	NE	25
Oil-range hydrocarbons	n/a	NE	NE	50
Total diesel- and oil-range hydrocarbons	n/a	NE	NE	50

Notes:

¹ Target sediment concentrations. Obtained from Ecology's "LDW PCUL Workbook - Sediment Summary" dated July 2019.

² PQL from the North Terminal 115 (T115N) Remedial Investigation/Feasibility Study Work Plan (GeoEngineers 2012) and is the lowest available value from OnSite Environmental, Inc. of Redmond, Washington.

³ Total LPAHs are the total of naphthalene, acenaphthylene, acenaphthene, fluorene, phenanthrene and anthracene; 2-methylnaphthalene is not included in the sum of LPAHs.

⁴ Total HPAHs are the total of fluoranthene, pyrene, benzo(a)anthracene, chrysene, benzo(a)fluoranthene, benzo(a)pyrene, indeno(1,2,3-c-d)pyrene, dibenzo(a,h)anthracene and benzo(g,h,i)perylene.

CAS = Chemical Abstracts Service

cPAH = carcinogenic polycyclic aromatic hydrocarbon

HPAH = high molecular weight polycyclic aromatic hydrocarbons

LDW = Lower Duwamish Waterway

LPAH = low molecular weight polycyclic aromatic hydrocarbons

mg/kg = milligram per kilogram based on dry weight

n/a = not available

NE = not established

PCUL = Preliminary Cleanup Level

PQL = practical quantitation limit

SMS = Sediment Management Standard

TEQ = toxic equivalence quotient

Table 4-4
Soil Contaminants of Potential Concern
Port of Seattle - North Terminal 115
Seattle, Washington

Analyte	Analytical Method	Units	Frequency of Detection			Practical Quantitation Limit ¹ (PQL)		Preliminary Cleanup Level ² (PCUL)			Laboratory Reporting Limits (RL)			Detected Concentrations			Comparisons to PCUL		Comparisons to 10x PCUL		Contaminants of Potential Concern (COPC) Selection Criteria ³							COPC Evaluation ⁴
			Total Number of Samples	Number of Detections	Frequency of Detection (Percent)	PQL	2X PQL	PCUL	2X PCUL	10X PCUL	Minimum	Average	Maximum	Minimum	Average	Maximum	Number of Detects and RLs > PCUL	Percentage of Detects and RLs > PCUL	Number of RLs > 10x PCUL	Percentage of RLs > 10x PCUL	1	2	3A	3B	3C	4A	4B	
Polychlorinated Biphenyls (PCBs)																												
Total PCB Aroclors	EPA 8082	mg/kg	22	2	9.1	0.05	0.05	0.0000022	0.0000044	0.000022	0.027	0.049	0.069	1.1	4.1	7.1	22	100	20	90.9	No	No	No	No	No	No	No	COPC ⁵
Dioxins and Furans																												
Total dioxin/furan TEQ (ND=0)	EPA 1613	ng/kg	6	6	100	11	22	5.2	10	52	AD	AD	AD	0.025	1.5	3.2	0	0	AD	AD	No	Yes	No	No	No	No	Yes	COPC ⁶
Total dioxin/furan TEQ (ND=0.5RL)	EPA 1613	ng/kg	6	6	100	11	22	5.2	10	52	AD	AD	AD	0.26	1.7	3.4	0	0	AD	AD	No	Yes	No	No	No	No	Yes	COPC ⁶
Metals																												
Antimony	EPA 6000/7000	mg/kg	123	8	6.5	5.0	10	4.1	8.2	41	5.0	5.3	16	0.25	10	20	121	98.4	0	0	No	No	No	No	No	No	No	COPC
Arsenic	EPA 6000/7000	mg/kg	137	105	76.6	0.50	1.0	7.0	14	70	0.50	5.4	16	0.50	25	460	35	25.5	0	0	No	No	No	No	No	No	No	COPC
Barium	EPA 6000/7000	mg/kg	112	112	100	2.0	4.0	8.3	17	83	AD	AD	AD	7.3	60	140	111	99.1	AD	AD	No	No	No	No	No	No	No	COPC
Beryllium	EPA 6000/7000	mg/kg	123	2	1.6	0.50	1.0	3.5	7.0	35	0.50	0.51	0.69	0.19	0.20	0.21	0	0	0	0	No	Yes	No	No	No	Yes	Yes	Eliminated as a COPC
Cadmium	EPA 6000/7000	mg/kg	126	29	23	0.20	0.40	1.0	2.0	10	0.10	0.25	0.69	0.16	1.6	9.1	8	6.3	0	0	No	No	No	No	No	No	No	COPC
Chromium III / Total	EPA 6000/7000	mg/kg	126	126	100	0.50	1.0	48	96	480	AD	AD	AD	5.2	67	2,200	36	28.6	AD	AD	No	No	No	No	No	No	No	COPC
Chromium VI	EPA 6000/7000	mg/kg	0	n/a	n/a	0.50	1.0	18	32	180	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	Eliminated as a COPC ⁷	
Copper	EPA 6000/7000	mg/kg	123	123	100	0.20	0.40	36	72	360	AD	AD	AD	8.7	39	620	33	26.8	AD	AD	No	No	No	No	No	No	No	COPC
Lead	EPA 6000/7000	mg/kg	126	126	100	0.50	1.0	50	100	500	AD	AD	AD	0.98	880	49,000	24	19	AD	AD	No	No	No	No	No	No	No	COPC
Mercury	EPA 6000/7000	mg/kg	126	25	19.8	0.050	0.10	0.070	0.14	0.70	0.050	0.058	0.29	0.022	0.087	0.30	14	11.1	0	0	No	No	No	No	No	No	No	COPC
Nickel	EPA 6000/7000	mg/kg	123	123	100	0.50	1.0	48	96	480	AD	AD	AD	7.4	38	120	34	27.6	AD	AD	No	No	No	No	No	No	No	COPC
Selenium	EPA 6000/7000	mg/kg	126	17	13.5	0.50	1.0	0.30	0.60	3.0	0.50	2.2	14	0.50	0.77	1.5	126	100	18	14.3	No	No	No	No	No	No	No	COPC
Silver	EPA 6000/7000	mg/kg	126	4	3.2	0.50	1.0	0.016	0.032	0.16	0.10	0.53	3.0	0.72	1.5	3.2	126	100	120	95.2	No	No	No	No	No	No	No	COPC
Thallium	EPA 6000/7000	mg/kg	121	2	1.7	0.25	0.50	0.0044	0.0088	0.044	0.25	0.88	6.9	0.32	0.40	0.47	121	100	119	98.3	No	No	No	No	No	No	No	COPC
Tin	EPA 6000/7000	mg/kg	124	101	81.5	1.0	2.0	50	100	500	0.99	1.0	1.3	1.2	2,600	62,000	51	41.1	0	0	No	No	No	No	No	No	No	COPC
Zinc	EPA 6000/7000	mg/kg	124	124	100	2.5	5.0	85	170	850	AD	AD	AD	14	533	33,000	24	19.4	AD	AD	No	No	No	No	No	No	No	COPC
Semi-Volatile Organic Compounds (SVOCs) - Polycyclic Aromatic Hydrocarbons (PAHs)																												
Acenaphthene	EPA 8270/SIM	mg/kg	143	39	27.3	0.0067	0.013	0.028	0.056	0.28	0.0067	0.0073	0.025	0.0076	0.24	3.2	17	11.9	0	0	No	No	No	No	No	No	No	COPC
Acenaphthylene	EPA 8270/SIM	mg/kg	143	10	7	0.0067	0.013	1.3	2.6	13	0.0023	0.0081	0.064	0.0038	0.027	0.092	0	0	0	0	No	Yes	No	No	No	No	Yes	Eliminated as a COPC
Anthracene	EPA 8270/SIM	mg/kg	143	35	24.5	0.0067	0.013	0.051	0.10	0.51	0.0067	0.0071	0.025	0.0073	0.078	0.68	13	9.1	0	0	No	No	No	No	No	No	No	COPC
Benzo(a)anthracene	EPA 8270/SIM	mg/kg	141	39	27.7	0.0067	0.013	0.000057	0.00011	0.00057	0.0067	0.0072	0.025	0.0070	0.062	0.41	141	100	102	72.3	No	No	No	No	No	No	No	COPC
Benzo(b)fluoranthene	EPA 8270/SIM	mg/kg	141	31	22	0.0067	0.013	0.00020	0.00040	0.0020	0.0067	0.0077	0.026	0.0068	0.072	0.74	141	100	110	78	No	No	No	No	No	No	No	COPC
Benzo(k)fluoranthene	EPA 8270/SIM	mg/kg	141	15	10.6	0.0067	0.013	0.0020	0.0040	0.020	0.0067	0.0081	0.061	0.0071	0.051	0.19	141	100	7	5	No	No	No	No	No	No	No	COPC
Benzo(g,h,i)perylene	EPA 8270/SIM	mg/kg	143	21	14.7	0.0067	0.013	0.67	1.3	6.7	0.0067	0.0082	0.064	0.0068	0.039	0.19	0	0	0	0	No	Yes	No	No	No	No	Yes	Eliminated as a COPC
Benzo(a)pyrene	EPA 8270/SIM	mg/kg	141	32	22.7	0.0067	0.013	0.000016	0.000032	0.00016	0.0067	0.0077	0.026	0.0069	0.051	0.35	141	100	109	77.3	No	No	No	No	No	No	No	COPC
Chrysene	EPA 8270/SIM	mg/kg	141	43	30.5	0.0067	0.013	0.0064	0.013	0.064	0.0067	0.0068	0.0093	0.0072	0.066	0.69	141	100	0	0	No	No	No	No	No	No	No	COPC
Dibenzo(a,h)anthracene	EPA 8270/SIM	mg/kg	141	4	2.8	0.0067	0.013	0.000029	0.000058	0.00029	0.0067	0.0089	0.064	0.0071	0.023	0.055	141	100	137	97.2	No	No	No	No	No	No	No	COPC
Dibenzofuran	EPA 8270/SIM	mg/kg	143	17	11.9	0.017	0.034	0.54	1.1	5.4	0.017	0.022	0.15	0.017	0.32	1.5	2	1.4	0	0	No	No	No	No	No	No	No	COPC
Fluoranthene	EPA 8270/SIM	mg/kg	143	62	43.4	0.0067	0.013	0.090	0.18	0.90	0.0067	0.0070	0.025	0.0069	0.16	1.9	14	9.8	0	0	No	No	No	No	No	No	No	COPC
Fluorene	EPA 8270/SIM	mg/kg	143	37	25.9	0.0067	0.013	0.029	0.058	0.29	0.0067	0.0073	0.025	0.0067	0.19	1.7	17	11.9	0	0	No	No	No	No	No	No	No	COPC
Indeno(1,2,3-c,d)pyrene	EPA 8270/SIM	mg/kg	141	15	10.6	0.0067	0.013	0.00056	0.0011	0.0056	0.0067	0.0085	0.064	0.0069	0.035	0.15	141	100	126	89.4	No	No	No	No	No	No	No	COPC
1-Methylnaphthalene	EPA 8270/SIM	mg/kg	143	29	20.3	0.0067	0.013	29	58	290	0.0067	0.0074	0.038	0.0075	0.17	3.0	0	0	0	0	No	Yes	No	No	No	No	Yes	Eliminated as a COPC
2-Methylnaphthalene	EPA 8270/SIM	mg/kg	143	33	23.1	0.0067	0.013	0.67	1.3	6.7	0.0067	0.0074	0.038	0.0067	0.30	5.9	2	1.4	0	0	No	No	No	No	No	No	No	COPC
Naphthalene	EPA 8270/SIM	mg/kg	143	73	29	0.0067	0.013	0.0021	0.0042	0.021	0.0010	0.0049	0.038	0.0010	0.76	29	169	67.1	3	1.2	No	No	No	No	No	No	No	COPC
Phenanthrene	EPA 8270/SIM	mg/kg	143	63	44.1	0.0067	0.013	1.5	3.0	15	0.0067	0.0072	0.025	0.0069	0.24	2.5	2	1.4	0	0	No	No	No	No	No	No	Yes	Eliminated as a COPC
Pyrene	EPA 8270/SIM	mg/kg	143	73	51	0.0067	0.013	0.14	0.28	1.4	0.0067	0.0071	0.025	0.0072	0.12	2.4	11	7.7	0	0	No	No	No	No	No	No	No	COPC
Total cPAH TEQ (ND=0)	EPA 8270/SIM	mg/kg	141	46	32.6	0.010																						

Table 4-4
Soil Contaminants of Potential Concern
Port of Seattle - North Terminal 115
Seattle, Washington

Analyte	Analytical Method	Units	Frequency of Detection			Practical Quantitation Limit ¹ (PQL)		Preliminary Cleanup Level ² (PCUL)			Laboratory Reporting Limits (RL)			Detected Concentrations			Comparisons to PCUL		Comparisons to 10x PCUL		Contaminants of Potential Concern (COPC) Selection Criteria ³							COPC Evaluation ⁴
			Total Number of Samples	Number of Detections	Frequency of Detection (Percent)	PQL	2X PQL	PCUL	2X PCUL	10X PCUL	Minimum	Average	Maximum	Minimum	Average	Maximum	Number of Detects and RLs > PCUL	Percentage of Detects and RLs > PCUL	Number of RLs > 10x PCUL	Percentage of RLs > 10x PCUL	1	2	3A	3B	3C	4A	4B	
4-Chloro-3-methylphenol	EPA 8270	mg/kg	143	0	0	0.017	0.034	PCUL NE	PCUL NE	PCUL NE	0.017	0.025	0.19	All ND	All ND	All ND	PCUL NE	PCUL NE	PCUL NE	PCUL NE	Yes	n/a	n/a	n/a	n/a	n/a	n/a	Eliminated as a COPC
2-Chloronaphthalene	EPA 8270	mg/kg	143	0	0	0.017	0.034	6,400	12,800	64,000	0.017	0.025	0.19	All ND	All ND	All ND	0	0	0	0	No	Yes	Yes	Yes	Yes	No	No	Eliminated as a COPC
2-Chlorophenol	EPA 8270	mg/kg	143	1	0.7	0.017	0.034	0.011	0.022	0.11	0.017	0.025	0.19	0.027	0.027	0.027	143	100	5	3.5	No	No	No	No	No	No	Eliminated as a COPC ⁵	
4-Chlorophenyl-phenylether	EPA 8270	mg/kg	143	0	0	0.017	0.034	PCUL NE	PCUL NE	PCUL NE	0.017	0.025	0.19	All ND	All ND	All ND	PCUL NE	PCUL NE	PCUL NE	PCUL NE	Yes	n/a	n/a	n/a	n/a	n/a	n/a	Eliminated as a COPC
Decane	EPA 8270	mg/kg	130	0	0	0.017	0.034	PCUL NE	PCUL NE	PCUL NE	0.017	0.021	0.16	All ND	All ND	All ND	PCUL NE	PCUL NE	PCUL NE	PCUL NE	Yes	n/a	n/a	n/a	n/a	n/a	n/a	Eliminated as a COPC
Dibutyl phthalate	EPA 8270	mg/kg	143	2	1.4	0.017	0.034	0.015	0.030	0.15	0.017	0.025	0.19	0.013	0.016	0.019	142	99.3	3	2.1	No	No	No	No	No	No	Eliminated as a COPC ⁵	
2,3-Dichloroaniline	EPA 8270	mg/kg	143	0	0	0.017	0.034	PCUL NE	PCUL NE	PCUL NE	0.017	0.025	0.19	All ND	All ND	All ND	PCUL NE	PCUL NE	PCUL NE	PCUL NE	Yes	n/a	n/a	n/a	n/a	n/a	n/a	Eliminated as a COPC
1,2-Dichlorobenzene (o-Dichlorobenzene)	EPA 8260 +EPA8270	mg/kg	252	1	0.4	0.0010	0.0020	0.0031	0.0062	0.031	0.0010	0.015	0.19	0.0017	0.0017	0.0017	143	56.7	18	7.1	No	No	No	No	No	No	Eliminated as a COPC ⁸	
	EPA 8260	mg/kg	109	1	0.4	0.0010	0.0020	0.0031	0.0062	0.031	0.0010	0.001	0.00	0.0017	0.0017	0.0017	0	0	0	0	No	Yes	No	No	No	Yes	Yes	Eliminated as a COPC
1,2-Dichlorobenzene (o-Dichlorobenzene)	EPA 8270	mg/kg	143	0	0.4	0.0170	0.0340	0.0031	0.0062	0.031	0.0170	0.025	0.19	All ND	All ND	All ND	143	100	18	12.6	No	No	No	No	No	No	Eliminated as a COPC ⁸	
1,3-Dichlorobenzene (m-Dichlorobenzene)	EPA 8260 +EPA8270	mg/kg	252	3	1.2	0.0010	0.0020	PCUL NE	PCUL NE	PCUL NE	0.0010	0.015	0.19	0.0028	0.0035	0.0045	PCUL NE	PCUL NE	PCUL NE	PCUL NE	Yes	n/a	n/a	n/a	n/a	n/a	n/a	Eliminated as a COPC
1,3-Dichlorobenzene (m-Dichlorobenzene)	EPA 8260	mg/kg	109	3	1.2	0.0010	0.0020	PCUL NE	PCUL NE	PCUL NE	0.0010	0.001	0.00	0.0028	0.0035	0.0045	PCUL NE	PCUL NE	PCUL NE	PCUL NE	Yes	n/a	n/a	n/a	n/a	n/a	n/a	Eliminated as a COPC
	EPA 8270	mg/kg	143	0	1.2	0.0170	0.0340	PCUL NE	PCUL NE	PCUL NE	0.0170	0.025	0.19	All ND	All ND	All ND	PCUL NE	PCUL NE	PCUL NE	PCUL NE	Yes	n/a	n/a	n/a	n/a	n/a	n/a	Eliminated as a COPC
1,4-Dichlorobenzene (p-Dichlorobenzene)	EPA 8260 +EPA8270	mg/kg	252	0	0	0.0010	0.0020	0.0081	0.016	0.081	0.0010	0.015	0.19	All ND	All ND	All ND	143	56.7	6	2.4	No	No	No	Yes	No	No	No	Eliminated as a COPC
1,4-Dichlorobenzene (p-Dichlorobenzene)	EPA 8260	mg/kg	109	0	0	0.0010	0.0020	0.0081	0.016	0.081	0.0010	0.001	0.00	All ND	All ND	All ND	0	0	0	0	No	Yes	Yes	Yes	Yes	No	No	Eliminated as a COPC
	EPA 8270	mg/kg	143	0	0	0.0170	0.0340	0.0081	0.016	0.081	0.0170	0.025	0.19	All ND	All ND	All ND	143	100	6	4.2	No	No	No	Yes	No	No	No	Eliminated as a COPC
3,3'-Dichlorobenzidine	EPA 8270	mg/kg	143	5	3.5	0.017	0.034	0.0000033	0.0000066	0.000033	0.017	0.078	1.9	0.026	0.28	0.82	143	100	138	96.5	No	No	No	No	No	No	No	COPC
2,4-Dichlorophenol	EPA 8270	mg/kg	143	0	0	0.017	0.034	0.0043	0.0086	0.043	0.017	0.032	0.70	All ND	All ND	All ND	143	100	12	8.4	No	No	No	Yes	Yes	No	No	Eliminated as a COPC
Bis(2-ethylhexyl)ester	EPA 8270	mg/kg	143	1	0.7	0.017	0.034	710	1,420	7,100	0.017	0.025	0.19	0.10	0.10	0.10	0	0	0	0	No	Yes	No	No	No	Yes	Yes	Eliminated as a COPC
Diethyl phthalate	EPA 8270	mg/kg	143	0	0	0.085	0.17	0.034	0.068	0.34	0.026	0.087	0.56	All ND	All ND	All ND	140	97.9	1	0.7	No	No	No	Yes	Yes	No	No	Eliminated as a COPC
Dimethyl phthalate	EPA 8270	mg/kg	143	0	0	0.017	0.034	0.071	0.14	0.71	0.017	0.025	0.19	All ND	All ND	All ND	6	4.2	0	0	No	No	Yes	Yes	Yes	No	No	Eliminated as a COPC
2,4-Dimethylphenol	EPA 8270	mg/kg	143	2	1.4	0.017	0.034	0.0031	0.0062	0.031	0.017	0.026	0.19	0.028	0.029	0.029	143	100	18	12.6	No	No	No	No	No	No	No	Eliminated as a COPC ⁵
o-Dinitrobenzene	EPA 8270	mg/kg	143	0	0	0.017	0.034	8.0	16	80	0.017	0.025	0.19	All ND	All ND	All ND	0	0	0	0	No	Yes	Yes	Yes	Yes	No	No	Eliminated as a COPC
1,3-Dinitrobenzene	EPA 8270	mg/kg	143	0	0	0.085	0.17	8.0	16	80	0.026	0.084	0.19	All ND	All ND	All ND	0	0	0	0	No	Yes	Yes	Yes	Yes	No	No	Eliminated as a COPC
1,4-Dinitrobenzene	EPA 8270	mg/kg	143	0	0	0.017	0.034	8.0	16	80	0.017	0.025	0.19	All ND	All ND	All ND	0	0	0	0	No	Yes	Yes	Yes	Yes	No	No	Eliminated as a COPC
4,6-Dinitro-2-methylphenol	EPA 8270	mg/kg	143	0	0	0.085	0.17	PCUL NE	PCUL NE	PCUL NE	0.026	0.11	0.97	All ND	All ND	All ND	PCUL NE	PCUL NE	PCUL NE	PCUL NE	Yes	n/a	n/a	n/a	n/a	n/a	n/a	Eliminated as a COPC
2,4-Dinitrophenol	EPA 8270	mg/kg	143	0	0	0.085	0.17	0.029	0.058	0.29	0.026	0.11	0.97	All ND	All ND	All ND	140	97.9	2	1.4	No	No	No	Yes	Yes	No	No	Eliminated as a COPC
2,4-Dinitrotoluene	EPA 8270	mg/kg	143	0	0	0.017	0.034	0.000069	0.00014	0.00069	0.017	0.025	0.19	All ND	All ND	All ND	143	100	143	100	No	No	No	No	Yes	No	No	Eliminated as a COPC
2,6-Dinitrotoluene	EPA 8270	mg/kg	143	0	0	0.017	0.034	0.11	0.22	1.1	0.017	0.025	0.19	All ND	All ND	All ND	5	3.5	0	0	No	No	Yes	Yes	Yes	No	No	Eliminated as a COPC
Di-n-octyl phthalate	EPA 8270	mg/kg	143	0	0	0.017	0.034	0.33	0.66	3.3	0.017	0.025	0.19	All ND	All ND	All ND	0	0	0	0	No	Yes	Yes	Yes	Yes	No	No	Eliminated as a COPC
1,2-Diphenylhydrazine	EPA 8270	mg/kg	143	0	0	0.017	0.034	1.1	2.2	11	0.017	0.025	0.19	All ND	All ND	All ND	0	0	0	0	No	Yes	Yes	Yes	Yes	No	No	Eliminated as a COPC
Hexachlorobenzene	EPA 8270	mg/kg	143	0	0	0.017	0.034	0.00000040	0.00000080	0.0000040	0.017	0.025	0.19	All ND	All ND	All ND	143	100	143	100	No	No	No	No	Yes	No	No	Eliminated as a COPC
Hexachlorobutadiene	EPA 8260 +EPA8270	mg/kg	252	0	0	0.0050	0.010	0.00054	0.0011	0.0054	0.0050	0.017	0.19	All ND	All ND	All ND	252	100	147	58.3	No	No	No	No	No	No	No	Eliminated as a COPC ⁸
	EPA 8260	mg/kg	109	0	0	0.0050	0.010	0.00054	0.0011	0.0054	0.0050	0.005	0.01	All ND</														

Table 4-4
Soil Contaminants of Potential Concern
Port of Seattle - North Terminal 115
Seattle, Washington

Analyte	Analytical Method	Units	Frequency of Detection			Practical Quantitation Limit ¹ (PQL)		Preliminary Cleanup Level ² (PCUL)			Laboratory Reporting Limits (RL)			Detected Concentrations			Comparisons to PCUL		Comparisons to 10x PCUL		Contaminants of Potential Concern (COPC)							COPC Evaluation ⁴	
			Total Number of Samples	Number of Detections	Frequency of Detection (Percent)	PQL	2X PQL	PCUL	2X PCUL	10X PCUL	Minimum	Average	Maximum	Minimum	Average	Maximum	Number of Detects and RLs > PCUL	Percentage of Detects and RLs > PCUL	Number of RLs > 10x PCUL	Percentage of RLs > 10x PCUL	1	2	3A	3B	3C	4A	4B		
2,3,5,6-Tetrachlorophenol	EPA 8270	mg/kg	143	0	0	0.017	0.034	PCUL NE	PCUL NE	PCUL NE	0.017	0.025	0.19	All ND	All ND	All ND	PCUL NE	PCUL NE	PCUL NE	PCUL NE	Yes	n/a	n/a	n/a	n/a	n/a	n/a	Eliminated as a COPC	
1,2,4-Trichlorobenzene	EPA 8260 +EPA8270	mg/kg	252	0	0	0.0010	0.0020	0.000072	0.00014	0.00072	0.0010	0.015	0.19	All ND	All ND	All ND	252	100	252	100	No	No	No	No	No	No	No	Eliminated as a COPC ⁸	
1,2,4-Trichlorobenzene	EPA 8260	mg/kg	109	0	0	0.0010	0.0020	0.000072	0.00014	0.00072	0.0010	0.001	0.00	All ND	All ND	All ND	109	100	109	100	No	No	No	No	Yes	No	No	Eliminated as a COPC	
	EPA 8270	mg/kg	143	0	0	0.0170	0.0340	0.000072	0.00014	0.00072	0.0170	0.025	0.19	All ND	All ND	All ND	143	100	143	100	No	No	No	No	No	No	No	Eliminated as a COPC ⁸	
2,4,5-Trichlorophenol	EPA 8270	mg/kg	143	0	0	0.017	0.034	1.1	2.2	11	0.017	0.025	0.19	All ND	All ND	All ND	0	0	0	0	No	Yes	Yes	Yes	Yes	No	No	Eliminated as a COPC	
2,4,6-Trichlorophenol	EPA 8270	mg/kg	143	0	0	0.017	0.034	0.00019	0.00038	0.0019	0.017	0.025	0.19	All ND	All ND	All ND	143	100	143	100	No	No	No	No	Yes	No	No	Eliminated as a COPC	
Volatile Organic Compounds (VOCs)																													
Acetone	EPA 8260	mg/kg	109	100	91.7	0.0050	0.010	72,000	144,000	720,000	0.0050	0.0050	0.0050	0.0030	0.16	3.3	0	0	0	0	No	Yes	No	No	No	No	Yes	Eliminated as a COPC	
Benzene	EPA 8260	mg/kg	109	12	11	0.0010	0.0020	0.00056	0.0011	0.0056	0.0010	0.0010	0.0015	0.0011	0.0066	0.024	109	100	0	0	No	No	No	No	No	No	No	COPC	
Bromobenzene	EPA 8260	mg/kg	109	0	0	0.0010	0.0020	640	1,280	6,400	0.0010	0.0010	0.0015	All ND	All ND	All ND	0	0	0	0	No	Yes	Yes	Yes	Yes	No	No	Eliminated as a COPC	
Bromochloromethane	EPA 8260	mg/kg	109	0	0	0.0010	0.0020	PCUL NE	PCUL NE	PCUL NE	0.0010	0.0010	0.0015	All ND	All ND	All ND	PCUL NE	PCUL NE	PCUL NE	PCUL NE	Yes	n/a	n/a	n/a	n/a	n/a	n/a	Eliminated as a COPC	
Bromoform (Tribromomethane)	EPA 8260	mg/kg	109	0	0	0.0010	0.0020	0.0050	0.010	0.050	0.0010	0.0010	0.0015	All ND	All ND	All ND	0	0	0	0	No	Yes	Yes	Yes	Yes	No	No	Eliminated as a COPC	
Bromomethane	EPA 8260	mg/kg	109	0	0	0.0010	0.0020	0.079	0.16	0.79	0.0010	0.0010	0.0015	All ND	All ND	All ND	0	0	0	0	No	Yes	Yes	Yes	Yes	No	No	Eliminated as a COPC	
n-Butylbenzene	EPA 8260	mg/kg	109	2	1.8	0.0010	0.0020	4,000	8,000	40,000	0.0010	0.0010	0.0015	0.0033	0.0044	0.0055	0	0	0	0	No	Yes	No	No	No	Yes	Yes	Eliminated as a COPC	
sec-Butylbenzene	EPA 8260	mg/kg	109	3	2.8	0.0010	0.0020	8,000	16,000	80,000	0.0010	0.0010	0.0015	0.0015	0.0045	0.0094	0	0	0	0	No	Yes	No	No	No	Yes	Yes	Eliminated as a COPC	
tert-Butylbenzene	EPA 8260	mg/kg	109	0	0	0.0010	0.0020	8,000	16,000	80,000	0.0010	0.0010	0.0015	All ND	All ND	All ND	0	0	0	0	No	Yes	Yes	Yes	Yes	No	No	Eliminated as a COPC	
Carbon disulfide	EPA 8260	mg/kg	109	44	40.4	0.0010	0.0020	8,000	16,000	80,000	0.0010	0.0010	0.0015	0.0010	0.0045	0.040	0	0	0	0	No	Yes	No	No	No	No	Yes	Eliminated as a COPC	
Carbon tetrachloride	EPA 8260	mg/kg	109	0	0	0.0010	0.0020	0.00015	0.00030	0.0015	0.0010	0.0010	0.0015	All ND	All ND	All ND	109	100	0	0	No	No	No	Yes	Yes	No	No	Eliminated as a COPC	
Chlorobenzene	EPA 8260	mg/kg	109	0	0	0.0010	0.0020	0.10	0.20	1.0	0.0010	0.0010	0.0015	All ND	All ND	All ND	0	0	0	0	No	Yes	Yes	Yes	Yes	No	No	Eliminated as a COPC	
Chloroethane	EPA 8260	mg/kg	109	0	0	0.0050	0.010	PCUL NE	PCUL NE	PCUL NE	0.0050	0.0051	0.0074	All ND	All ND	All ND	PCUL NE	PCUL NE	PCUL NE	PCUL NE	Yes	n/a	n/a	n/a	n/a	n/a	n/a	Eliminated as a COPC	
2-Chloroethyl vinyl ether	EPA 8260	mg/kg	109	0	0	0.0050	0.010	PCUL NE	PCUL NE	PCUL NE	0.0050	0.0051	0.0074	All ND	All ND	All ND	PCUL NE	PCUL NE	PCUL NE	PCUL NE	Yes	n/a	n/a	n/a	n/a	n/a	n/a	Eliminated as a COPC	
Chloroform	EPA 8260	mg/kg	109	0	0	0.0010	0.0020	0.052	0.10	0.52	0.0010	0.0010	0.0015	All ND	All ND	All ND	0	0	0	0	No	Yes	Yes	Yes	Yes	No	No	COPC ⁹	
Chloromethane	EPA 8260	mg/kg	109	0	0	0.0050	0.010	PCUL NE	PCUL NE	PCUL NE	0.0050	0.0051	0.0074	All ND	All ND	All ND	PCUL NE	PCUL NE	PCUL NE	PCUL NE	Yes	n/a	n/a	n/a	n/a	n/a	n/a	Eliminated as a COPC	
2-Chlorotoluene	EPA 8260	mg/kg	109	0	0	0.0010	0.0020	1,600	3,200	16,000	0.0010	0.0010	0.0015	All ND	All ND	All ND	0	0	0	0	No	Yes	Yes	Yes	Yes	No	No	Eliminated as a COPC	
4-Chlorotoluene	EPA 8260	mg/kg	109	0	0	0.0010	0.0020	PCUL NE	PCUL NE	PCUL NE	0.0010	0.0010	0.0015	All ND	All ND	All ND	PCUL NE	PCUL NE	PCUL NE	PCUL NE	Yes	n/a	n/a	n/a	n/a	n/a	n/a	Eliminated as a COPC	
Dibromochloromethane	EPA 8260	mg/kg	109	0	0	0.0010	0.0020	0.00077	0.0015	0.0077	0.0010	0.0010	0.0015	All ND	All ND	All ND	109	100	0	0	No	No	Yes	Yes	Yes	Yes	No	No	Eliminated as a COPC
1,2-Dibromo-3-chloropropane	EPA 8260	mg/kg	109	0	0	0.0050	0.0100	1.3	2.6	13	0.0050	0.0051	0.0074	All ND	All ND	All ND	0	0	0	0	No	Yes	Yes	Yes	Yes	No	No	Eliminated as a COPC	
Dibromomethane	EPA 8260	mg/kg	109	0	0	0.0010	0.0020	800	1,600	8,000	0.0010	0.0010	0.0015	All ND	All ND	All ND	0	0	0	0	No	Yes	Yes	Yes	Yes	No	No	Eliminated as a COPC	
Bromodichloromethane (Dichlorobromomethane)	EPA 8260	mg/kg	109	0	0	0.0010	0.0020	0.00096	0.0019	0.0096	0.0010	0.0010	0.0015	All ND	All ND	All ND	109	100	0	0	No	No	Yes	Yes	Yes	No	No	Eliminated as a COPC	
Dichlorodifluoromethane (CFC-12)	EPA 8260	mg/kg	109	0	0	0.0010	0.0020	16,000	32,000	160,000	0.0010	0.0010	0.0015	All ND	All ND	All ND	0	0	0	0	No	Yes	Yes	Yes	Yes	No	No	Eliminated as a COPC	
1,1-Dichloroethane	EPA 8260	mg/kg	109	0	0	0.0010	0.0020	180	360	1,800	0.0010	0.0010	0.0015	All ND	All ND	All ND	0	0	0	0	No	Yes	Yes	Yes	Yes	No	No	Eliminated as a COPC	
1,2-Dichloroethane (EDC)	EPA 8260	mg/kg	109	0	0	0.0010	0.0020	0.024	0.048	0.24	0.0010	0.0010	0.0015	All ND	All ND	All ND	0	0	0	0	No	Yes	Yes	Yes	Yes	No	No	Eliminated as a COPC	
1,1-Dichloroethene	EPA 8260	mg/kg	109	0	0	0.0010	0.0020	1.4	2.8	14	0.0010	0.0010	0.0015	All ND	All ND	All ND	0	0	0	0	No	Yes	Yes	Yes	Yes	No	No	Eliminated as a COPC	
cis-1,2-Dichloroethene	EPA 8260	mg/kg	109	0	0	0.0010	0.0020	160	320	1,600	0.0010	0.0010	0.0015	All ND	All ND	All ND	0	0	0	0	No	Yes	Yes	Yes	Yes	No	No	Eliminated as a COPC	
trans-1,2-Dichloroethene	EPA 8260	mg/kg	109	0	0	0.0010	0.0020	0.32	0.64	3.2	0.0010	0.0010	0.0015	All ND	All ND	All ND	0	0	0	0	No	Yes							

Table 4-4
Soil Contaminants of Potential Concern
Port of Seattle - North Terminal 115
Seattle, Washington

Analyte	Analytical Method	Units	Frequency of Detection			Practical Quantitation Limit ¹ (PQL)		Preliminary Cleanup Level ² (PCUL)			Laboratory Reporting Limits (RL)			Detected Concentrations			Comparisons to PCUL		Comparisons to 10x PCUL		Contaminants of Potential Concern (COPC) Selection Criteria ³								COPC Evaluation ⁴	
			Total Number of Samples	Number of Detections	Frequency of Detection (Percent)	PQL	2X PQL	PCUL	2X PCUL	10X PCUL	Minimum	Average	Maximum	Minimum	Average	Maximum	Number of Detects and RLs > PCUL	Percentage of Detects and RLs > PCUL	Number of RLs > 10x PCUL	Percentage of RLs > 10x PCUL	1	2	3A	3B	3C	4A	4B			
Tetrachloroethene	EPA 8260	mg/kg	109	1	0.9	0.0010	0.0020	0.0016	0.0032	0.016	0.0010	0.0010	0.0015	0.0022	0.0022	0.0022	1	0.9	0	0	No	No	No	No	No	Yes	Yes	Eliminated as a COPC		
Toluene	EPA 8260	mg/kg	109	10	9.2	0.0050	0.010	0.055	0.11	0.55	0.0050	0.0051	0.0074	0.0060	0.023	0.11	1	0.9	0	0	No	No	No	No	No	No	Yes	Eliminated as a COPC		
1,2,3-Trichlorobenzene	EPA 8260	mg/kg	109	0	0	0.0010	0.0020	20	40	200	0.0010	0.0010	0.0015	All ND	All ND	All ND	0	0	0	0	No	Yes	Yes	Yes	Yes	No	No	Yes	Eliminated as a COPC	
1,1,1-Trichloroethane	EPA 8260	mg/kg	109	0	0	0.0010	0.0020	21	42	210	0.0010	0.0010	0.0015	All ND	All ND	All ND	0	0	0	0	No	Yes	Yes	Yes	Yes	No	No	Yes	Eliminated as a COPC	
1,1,2-Trichloroethane	EPA 8260	mg/kg	109	0	0	0.0010	0.0020	0.00033	0.00066	0.0033	0.0010	0.0010	0.0015	All ND	All ND	All ND	109	100	0	0	No	No	Yes	Yes	Yes	No	No	Yes	Eliminated as a COPC	
Trichloroethene	EPA 8260	mg/kg	109	0	0	0.0010	0.0020	0.00027	0.00054	0.0027	0.0010	0.0010	0.0015	All ND	All ND	All ND	109	100	0	0	No	No	Yes	Yes	Yes	Yes	No	No	Yes	Eliminated as a COPC
Trichlorofluoromethane (CFC-11)	EPA 8260	mg/kg	109	0	0	0.0010	0.0020	24,000	48,000	240,000	0.0010	0.0010	0.0015	All ND	All ND	All ND	0	0	0	0	No	Yes	Yes	Yes	Yes	No	No	Yes	Eliminated as a COPC	
1,2,3-Trichloropropane	EPA 8260	mg/kg	109	0	0	0.0010	0.0020	0.033	0.066	0.33	0.0010	0.0010	0.0015	All ND	All ND	All ND	0	0	0	0	No	Yes	Yes	Yes	Yes	No	No	Yes	Eliminated as a COPC	
1,2,4-Trimethylbenzene	EPA 8260	mg/kg	109	27	24.8	0.0010	0.0020	800	1,600	8,000	0.0010	0.0010	0.0015	0.0010	0.015	0.20	0	0	0	0	No	Yes	No	No	No	No	Yes	Eliminated as a COPC		
1,3,5-Trimethylbenzene	EPA 8260	mg/kg	109	14	12.8	0.0010	0.0020	800	1,600	8,000	0.0010	0.0010	0.0015	0.0010	0.0081	0.054	0	0	0	0	No	Yes	No	No	No	No	Yes	Eliminated as a COPC		
Vinyl acetate	EPA 8260	mg/kg	109	0	0	0.0050	0.010	80,000	16,0000	800,000	0.0050	0.0051	0.0074	All ND	All ND	All ND	0	0	0	0	No	Yes	Yes	Yes	Yes	No	No	Yes	Eliminated as a COPC	
Vinyl chloride	EPA 8260	mg/kg	109	0	0	0.0010	0.0020	0.000055	0.00011	0.00055	0.0010	0.0010	0.0015	All ND	All ND	All ND	109	100	109	100	No	No	No	No	Yes	No	No	Yes	Eliminated as a COPC	
Xylene, m-,p-	EPA 8260	mg/kg	109	11	10.1	0.0020	0.0040	16,000	32,000	160,000	0.0020	0.0020	0.0029	0.0021	0.020	0.14	0	0	0	0	No	Yes	No	No	No	No	Yes	Eliminated as a COPC		
Xylene, o-	EPA 8260	mg/kg	109	12	11	0.0010	0.0020	16,000	32,000	160,000	0.0010	0.0010	0.0015	0.0011	0.0093	0.065	0	0	0	0	No	Yes	No	No	No	No	Yes	Eliminated as a COPC		
Petroleum Hydrocarbons																														
Gasoline-range hydrocarbons	NWTPH-G	mg/kg	58	4	6.9	5.0	10	30	60	300	2.9	4.8	6.6	6.2	20	57	1	1.7	0	0	No	No	No	No	No	No	Yes	COPC ¹⁰		
Diesel-range hydrocarbons	NWTPH-Dx	mg/kg	58	10	17.2	25	50	260	520	2,600	14	19	68	17	71	330	1	1.7	0	0	No	No	No	No	No	No	Yes	Eliminated as a COPC		
Oil-range hydrocarbons	NWTPH-Dx	mg/kg	58	28	48.3	50	100	2,000	4,000	20,000	28	34	66	32	241	2,300	1	1.7	0	0	No	No	No	No	No	No	Yes	Eliminated as a COPC		
Total diesel- and oil-range hydrocarbons	NWTPH-Dx	mg/kg	58	28	48.3	50	100	260	520	2,600	28	34	66	32	231	2,630	4	6.9	0	0	No	No	No	No	No	No	No	COPC		

Notes:

¹ PQL from the North Terminal 115 (T115N) Remedial Investigation/Feasibility Study Work Plan (GeoEngineers 2012) and is the lowest available value from OnSite Environmental, Inc. of Redmond, Washington.

² Most stringent soil Preliminary Cleanup Level (PCUL) for saturated zone soil and non-potable groundwater. Obtained from Ecology's "LDW PCUL Workbook - Soil Summary" dated July 2019.

³ Chemical of Potential Concern (COPC) Selection Criteria:

1 - There is no PCUL in Ecology's CLARC Database.

2 - The maximum RL and maximum detected concentration are less than the PCUL.

3a - Analyte was not detected with a maximum RL less than 10 times the PCUL.

3b - Analyte was not detected with an average RL less than 10 times the PCUL **AND** less than 10 percent of the RLs are greater than 10 times the PCUL.

3c - Analyte was not detected with an average RL less than 2 times the PQL.

4a - Frequency of detection is less than 5 percent, the maximum RL is less than or equal to 10 times the PCUL **AND** the maximum detected concentration is less than or equal to 2 times the PCUL.

4b - Maximum detected concentration and maximum RL are less than 2 times the PCUL **AND** the less than or equal to 10 percent of the detected concentrations and RLs are greater than the PCUL.

⁴ Analyte eliminated as a COPC if "Yes" for any of the selection criterion.

⁵ PCB Aroclors also retained as COPC based on total PCB selection criteria.

⁶ Retained as COPC as dioxins/furans are COC for Lower Duwamish Waterway (LDW) and Glacier NW Site and maximum concentration exceeds simplified TEE screening level (3 ng/kg) as stated in Ecology email dated May 20, 2019.

⁷ Although chromium VI was not evaluated in soil, the groundwater results indicated that chromium VI is not a COPC. Because of the high solubility of chromium VI , the species of chromium at the Site is identified as chromium III.

⁸ Compound eliminated as COPC based on no or few detections close to or below the PCULs and average reporting limits similar to best achievable PQLs found in laboratory surveys as stated in Ecology email dated May 20, 2019.

⁹ Retained as COPC as chloroform is a COPC for groundwater and additional evaluation is requested by Ecology as stated in Ecology email dated May 20, 2019.

¹⁰ Retained as COPC pending evaluation of whether there is a localized area of detections as stated in Ecology email dated May 20, 2019.

All ND = Analyte was not detected in any sample

AD = Analyte was detected in any sample

COPC = Chemical of Potential Concern

mg/kg = Milligram per kilogram

ng/kg = Nanogram per kilogram

n/a = Not applicable

PCUL NE = Preliminary cleanup level not established

PQL = Practical quantitation limit

RL = Reporting limit

TEQ = toxic equivalence quotient

Table 4-5
Groundwater Contaminants of Potential Concern
Port of Seattle - North Terminal 115
Seattle, Washington

Analyte	Analytical Method	Units	Frequency of Detection			Practical Quantitation Limit ¹ (PQL)		Preliminary Cleanup Level ² (PCUL)			Laboratory Reporting Limit (RL)			Detected Concentrations			Comparisons to PCUL		Comparisons to 10x PCUL		Contaminants of Potential Concern (COPC) Selection Criteria ³							COPC Evaluation ⁴	
			Total Number of Samples	Number of Detections	Frequency of Detection (Percent)	PQL	2X PQL	PCUL	2X PCUL	10X PCUL	Minimum	Average	Maximum	Minimum	Average	Maximum	Number of Detects and RLs > PCUL	Percentage of Detects and RLs > PCUL	Number of RLs > 10x PCUL	Percentage of RLs > 10x PCUL	1	2	3A	3B	3C	4A	4B		
Polychlorinated Biphenyls (PCBs)																													
Total PCB Aroclors	EPA 8082	ng/L	3	0	0	10	20	0.007	0.014	0.07	10	10	10	All ND	All ND	All ND	3	100	3	100	No	No	No	No	Yes	No	No	COPC ⁵	
Total PCB Congeners	EPA 1668	ng/L	3	3	100	0.00743	0.01486	0.007	0.014	0.07	AD	AD	AD	1.19	2.53	4.64	3	100	AD	AD	No	No	No	No	No	No	No	COPC	
Dioxins and Furans																													
Total Dioxin/Furan TEQ (ND=0)	EPA 1613	ng/L	1	1	100	0.000002	0.000004	0.0000051	0.0000102	0.000051	AD	AD	AD	0.000974	0.000974	0.000974	1	100	AD	AD	No	No	No	No	No	No	No	COPC	
Total Dioxin/Furan TEQ (ND=0.5RL)	EPA 1613	ng/L	1	1	100	0.000002	0.000004	0.0000051	0.0000102	0.000051	AD	AD	AD	0.000974	0.000974	0.000974	1	100	AD	AD	No	No	No	No	No	No	No	COPC	
Total Metals																													
Antimony	EPA 200.8/7470	µg/l	121	20	16.5	5.5	11	90	180	900	1.0	5.1	10	1.40	29.6	100	1	0.8	0	0	No	No	No	No	No	No	Yes	Eliminated as a COPC	
Arsenic	EPA 200.8/7470	µg/l	121	111	91.7	3.3	6.6	8	16	80	3.0	3.3	3.3	3.60	415	7,800	88	72.7	0	0	No	No	No	No	No	No	No	COPC	
Barium	EPA 200.8/7470	µg/l	106	99	93.4	5	10	200	400	2,000	5.0	5.0	5.0	2.40	99.0	640	20	18.9	0	0	No	No	No	No	No	No	No	COPC	
Beryllium	EPA 200.8/7470	µg/l	121	0	0	10	20	4.4	8.8	44	10	10	11	All ND	All ND	All ND	121	100	0	0	No	No	Yes	Yes	Yes	No	No	Eliminated as a COPC	
Cadmium	EPA 200.8/7470	µg/l	121	14	11.6	0.2	0.4	1.2	2.4	12	0.20	0.98	11	0.220	2.44	7.30	21	17.4	0	0	No	No	No	No	No	No	No	COPC	
Chromium III / Total	EPA 200.8/7470	µg/l	121	78	64.5	2	4	27	54	270	2.0	2.0	2.0	2.10	143	1,200	26	21.5	0	0	No	No	No	No	No	No	No	COPC ⁶	
Chromium VI	EPA 200.8/7470	µg/l	15	0	0	50	100	50	100	1,000	10.0	20.6	50.0	All ND	All ND	All ND	0	0	0	0	No	Yes	Yes	Yes	Yes	Yes	n/a	Eliminated as a COPC	
Copper	EPA 200.8/7470	µg/l	121	65	53.7	2	4	3.1	6.2	31	1.0	2.3	10	1.30	37.8	310	53	43.8	0	0	No	No	No	No	No	No	No	COPC	
Lead	EPA 200.8/7470	µg/l	121	59	48.8	1	2	8.1	16.2	81	1.0	1.0	2.0	1.10	132	1,700	27	22.3	0	0	No	No	No	No	No	No	No	COPC	
Mercury	EPA 200.8/7470	µg/l	121	6	5	0.5	1	0.025	0.05	0.25	0.10	0.48	2.5	0.270	0.640	0.960	121	100	103	85.1	No	No	No	No	No	No	No	COPC	
Nickel	EPA 200.8/7470	µg/l	121	87	71.9	2	4	8.2	16.4	82	2.0	6.1	22	2.20	95.8	1,200	61	50.4	0	0	No	No	No	No	No	No	No	COPC	
Selenium	EPA 200.8/7470	µg/l	121	1	0.8	6	12	71	142	710	5.0	8.7	40	8.60	8.60	8.60	0	0	0	0	No	Yes	No	No	No	No	Yes	Yes	Eliminated as a COPC
Silver	EPA 200.8/7470	µg/l	121	13	10.7	1	2	1.9	3.8	19	1.0	2.6	28	1.50	5.42	8.60	29	24	1	0.8	No	No	No	No	No	No	No	COPC	
Thallium	EPA 200.8/7470	µg/l	121	0	0	2	4	0.062	0.124	0.62	2.0	2.5	14	All ND	All ND	All ND	121	100	121	100	No	No	No	No	Yes	No	No	COPC ⁷	
Tin	EPA 200.8/7470	µg/l	121	52	43	5	10.0	9,600	19,200	96,000	5.0	5.5	10	7.30	434	5,500	0	0	0	0	No	Yes	No	No	No	No	Yes	Eliminated as a COPC	
Zinc	EPA 200.8/7470	µg/l	121	25	20.7	56	112	81	162	810	55	56	58	13.0	198	760	13	10.7	0	0	No	No	No	No	No	No	No	COPC	
Dissolved Metals																													
Antimony	EPA 200.8/7470	µg/l	121	21	17.4	5.5	11	90	180	900	1.0	5.2	10	1.50	24.6	110	1	0.8	0	0	No	No	No	No	No	No	Yes	Eliminated as a COPC	
Arsenic	EPA 200.8/7470	µg/l	121	112	92.6	3.3	6.6	8	16	80	3.3	4.4	8.3	1.60	388	7,900	89	73.6	0	0	No	No	No	No	No	No	No	COPC	
Barium	EPA 200.8/7470	µg/l	106	95	89.6	5	10	200	400	2,000	5.0	5.0	5.0	5.10	97.0	520	20	18.9	0	0	No	No	No	No	No	No	No	COPC	
Beryllium	EPA 200.8/7470	µg/l	121	0	0	10	20	4.4	8.8	44	10	10	10	All ND	All ND	All ND	121	100	0	0	No	No	Yes	Yes	Yes	No	No	Eliminated as a COPC	
Cadmium	EPA 200.8/7470	µg/l	121	10	8.3	0.2	0.4	1.2	2.4	12	0.20	0.73	4.0	0.400	2.94	5.80	20	16.5	0	0	No	No	No	No	No	No	No	COPC	
Chromium III / Total	EPA 200.8/7470	µg/l	121	63	52.1	2	4	27	54	270	2.0	2.0	2.0	2.30	163	1,200	25	20.7	0	0	No	No	No	No	No	No	No	COPC ⁶	
Copper	EPA 200.8/7470	µg/l	121	37	30.6	2	4	3.1	6.2	31	1.0	2.2	10	1.70	40.7	250	34	28.1	0	0	No	No	No	No	No	No	No	COPC	
Lead	EPA 200.8/7470	µg/l	121	34	28.1	1	2	8.1	16.2	81	1.0	1.0	2.0	1.00	161	1,600	20	16.5	0	0	No	No	No	No	No	No	No	COPC	
Mercury	EPA 200.8/7470	µg/l	121	5	4.1	0.5	1	0.025	0.05	0.25	0.10	0.46	0.50	0.190	0.580	1.00	121	100	104	86	No	No	No	No	No	No	No	COPC	
Nickel	EPA 200.8/7470	µg/l	121	84	69.4	2	4	8.2	16.4	82	2.0	6.4	20	2.00	95.5	1,400	51	42.1	0	0	No	No	No	No	No	No	No	COPC	
Selenium	EPA 200.8/7470	µg/l	121	1	0.8	6	12	71	142	710	5.0	8.7	40	7.30	7.30	7.30	0	0	0	0	No	Yes	No	No	No	No	Yes	Yes	Eliminated as a COPC
Silver	EPA 200.8/7470	µg/l	121	11	9.1	1	2	1.9	3.8	19	0.50	2.3	10	4.80	5.88	7.10	30	24.8	0	0	No	No	No	No	No	No	No	COPC	
Thallium	EPA 200.8/7470	µg/l	121	0	0	2	4	0.062	0.124	0.62	2.0	2.4	5.0	All ND	All ND	All ND	121	100	121	100	No	No	No	No	Yes	No	No	COPC ⁷	
Tin	EPA 200.8/7470	µg/l	121	44	36.4	5	10	9,600	19,200	96,000	5.0	5.7	10	6.10	498	5,600	0	0	0	0	No	Yes	No	No	No	No	Yes	Eliminated as a COPC	
Zinc	EPA 200.8/7470	µg/l	121	19	15.7	56	112	81	162	810	5.0	53	56	7.80	187	650	9	7.4	0	0	No	No	No	No	No	No	No	COPC	
Semi-Volatile Organic Compounds (SVOCs) - Polycyclic Aromatic Hydrocarbons (PAHs)																													
Acenaphthene	EPA 8270/SIM	µg/l	121	26	21.5	0.1	0.2	5.3	10.6	53	0.10	0.80	10	0.0530	1.47	13.0	5	4.1	0	0	No	No	No	No	No	No	No	COPC	
Acenaphthylene	EPA 8270/SIM	µg/l	121	6	5	0.1	0.2	PCUL NE	PCUL NE	PCUL NE	0.048	0.68	10	0.220	1.58	4.20	PCUL NE	PCUL NE	PCUL NE	PCUL NE	Yes	n/a	n/a	n/a	n/a	n/a	n/a	Eliminated as a COPC	
Anthracene	EPA 8270/SIM	µg/l	121	5	4.1	0.1	0.2	2.1	4.2	21	0.048	0.70	10	0.120	0.464	0.750	6	5	0	0	No	No	No	No	No	Yes	No	COPC ⁸	
Benzo(a)anthracene	EPA 8270/SIM	µg/l	121	32	26.4	0.01	0.02	0.00016	0.00032	0.0016	0.0048	0.050	1.0	0.0100	0.270	2.00	121	100	89	73.6	No	No	No	No	No	No	No	COPC	
Benzo(b)fluoranthene	EPA 8270/SIM	µg/l	121	18	14.9	0.01	0.02	0.00016	0.00032	0.0016	0.0048	0.071	1.0	0.0100	0.288	2.10	121	100	103	85.									

Table 4-5
Groundwater Contaminants of Potential Concern
Port of Seattle - North Terminal 115
Seattle, Washington

Analyte	Analytical Method	Units	Frequency of Detection			Practical Quantitation Limit ¹ (PQL)		Preliminary Cleanup Level ² (PCUL)			Laboratory Reporting Limit (RL)			Detected Concentrations			Comparisons to PCUL		Comparisons to 10x PCUL		Contaminants of Potential Concern (COPC) Selection Criteria ³							COPC Evaluation ⁴
			Total Number of Samples	Number of Detections	Frequency of Detection (Percent)	PQL	2X PQL	PCUL	2X PCUL	10X PCUL	Minimum	Average	Maximum	Minimum	Average	Maximum	Number of Detects and RLs > PCUL	Percentage of Detects and RLs > PCUL	Number of RLs > 10x PCUL	Percentage of RLs > 10x PCUL	1	2	3A	3B	3C	4A	4B	
Phenanthrene	EPA 8270/SIM	µg/l	121	17	14	0.1	0.2	PCUL NE	PCUL NE	PCUL NE	0.048	0.54	10	0.0690	2.60	18.0	PCUL NE	PCUL NE	PCUL NE	PCUL NE	Yes	n/a	n/a	n/a	n/a	n/a	n/a	Eliminated as a COPC
Pyrene	EPA 8270/SIM	µg/l	121	9	7.4	0.1	0.2	2	4	20	0.048	0.71	10	0.110	0.557	1.50	6	5	0	0	No	No	No	No	No	No	No	COPC
Total cPAH TEQ (ND=0)	EPA 8270/SIM	µg/l	121	35	28.9	0.02	0.04	0.000016	0.000032	0.00016	0.00	0.00	0.00	0.00100	0.0772	0.340	35	28.9	0	0	No	No	No	No	No	No	No	COPC
Total cPAH TEQ (ND=0.5RL)	EPA 8270/SIM	µg/l	121	35	28.9	0.02	0.04	0.000016	0.000032	0.00016	0.0036	0.038	0.76	0.00810	0.180	0.995	121	100	86	71.1	No	No	No	No	No	No	No	COPC
Other SVOCs																												
Aniline	EPA 8270	µg/l	121	1	0.8	0.1	0.2	7.7	15.4	77	0.10	18	500	0.970	0.970	0.970	5	4.1	4	3.3	No	No	No	No	No	No	No	COPC
Benzidine	EPA 8270	µg/l	121	0	0	0.1	0.2	0.000023	0.000046	0.00023	0.10	35	1,000	All ND	All ND	All ND	121	100	121	100	No	No	No	No	No	No	No	Eliminated as a COPC ⁹
Benzoic acid	EPA 8270	µg/l	106	1	0.9	0.5	1	590	1,180	5,900	0.46	1.2	9.5	32.0	32.0	32.0	0	0	0	0	No	Yes	No	No	No	Yes	Yes	Eliminated as a COPC
Benzyl alcohol	EPA 8270	µg/l	121	13	10.7	0.1	0.2	800	1,600	8,000	0.10	4.3	100	0.0970	1.25	5.90	0	0	0	0	No	Yes	No	No	No	No	Yes	Eliminated as a COPC
Bis(2-chloroethoxy)methane	EPA 8270	µg/l	121	0	0	0.1	0.2	PCUL NE	PCUL NE	PCUL NE	0.10	3.9	100	All ND	All ND	All ND	PCUL NE	PCUL NE	PCUL NE	PCUL NE	Yes	n/a	n/a	n/a	n/a	n/a	n/a	Eliminated as a COPC
Bis(2-chloroethyl)ether	EPA 8270	µg/l	121	0	0	0.1	0.2	0.06	0.12	0.6	0.10	3.9	100	All ND	All ND	All ND	121	100	60	49.6	No	No	No	No	No	No	No	COPC
Bis(2-chloroisopropyl)ether	EPA 8270	µg/l	121	0	0	0.1	0.2	900	1,800	9,000	0.10	3.9	100	All ND	All ND	All ND	0	0	0	0	No	Yes	Yes	Yes	No	No	No	Eliminated as a COPC
Bis(2-ethylhexyl)phthalate	EPA 8270	µg/l	121	14	11.6	0.1	0.2	0.046	0.092	0.46	0.10	4.8	100	0.140	3.14	13.0	121	100	70	57.9	No	No	No	No	No	No	No	COPC
4-Bromophenyl phenyl ether	EPA 8270	µg/l	121	0	0	0.1	0.2	PCUL NE	PCUL NE	PCUL NE	0.10	3.9	100	All ND	All ND	All ND	PCUL NE	PCUL NE	PCUL NE	PCUL NE	Yes	n/a	n/a	n/a	n/a	n/a	n/a	Eliminated as a COPC
Butyl benzyl phthalate	EPA 8270	µg/l	121	2	1.7	0.1	0.2	0.013	0.026	0.13	0.10	4.0	100	9.00	10.0	11.0	121	100	62	51.2	No	No	No	No	No	No	No	COPC
Carbazole	EPA 8270	µg/l	121	7	5.8	0.1	0.2	PCUL NE	PCUL NE	PCUL NE	0.10	4.1	100	0.120	0.740	2.20	PCUL NE	PCUL NE	PCUL NE	PCUL NE	Yes	n/a	n/a	n/a	n/a	n/a	n/a	Eliminated as a COPC
4-Chloroaniline	EPA 8270	µg/l	121	0	0	0.1	0.2	2,300	4,600	23,000	0.10	34	1,000	All ND	All ND	All ND	0	0	0	0	No	Yes	Yes	Yes	No	No	No	Eliminated as a COPC
4-Chloro-3-methylphenol	EPA 8270	µg/l	121	3	2.5	0.1	0.2	36	72	360	0.10	4.0	100	0.150	0.240	0.310	4	3.3	0	0	No	No	No	No	No	Yes	No	Eliminated as a COPC
2-Chloronaphthalene	EPA 8270	µg/l	121	0	0	0.1	0.2	100	200	1,000	0.10	3.9	100	All ND	All ND	All ND	0	0	0	0	No	No	Yes	Yes	No	No	No	Eliminated as a COPC
2-Chlorophenol	EPA 8270	µg/l	121	5	4.1	0.1	0.2	17	34	170	0.10	4.0	100	1.70	2.76	4.60	4	3.3	0	0	No	No	No	No	No	Yes	No	Eliminated as a COPC
4-Chlorophenyl-phenylether	EPA 8270	µg/l	121	0	0	0.1	0.20	PCUL NE	PCUL NE	PCUL NE	0.10	3.9	100	All ND	All ND	All ND	PCUL NE	PCUL NE	PCUL NE	PCUL NE	Yes	n/a	n/a	n/a	n/a	n/a	n/a	Eliminated as a COPC
Decane	EPA 8270	µg/l	106	1	0.9	2	4	PCUL NE	PCUL NE	PCUL NE	0.46	3.3	30	0.640	0.640	0.640	PCUL NE	PCUL NE	PCUL NE	PCUL NE	Yes	n/a	n/a	n/a	n/a	n/a	n/a	Eliminated as a COPC
Dibutyl phthalate	EPA 8270	µg/l	121	31	25.6	0.1	0.2	8	16	80	0.10	5.9	100	0.140	1.88	6.10	6	5	4	3.3	No	No	No	No	No	No	No	Eliminated as a COPC ⁹
2,3-Dichloroaniline	EPA 8270	µg/l	121	0	0	0.1	0.2	PCUL NE	PCUL NE	PCUL NE	0.10	3.9	100	All ND	All ND	All ND	PCUL NE	PCUL NE	PCUL NE	PCUL NE	Yes	n/a	n/a	n/a	n/a	n/a	n/a	Eliminated as a COPC
1,2-Dichlorobenzene (o-Dichlorobenzene)	EPA 8260 +EPA8270	µg/l	214	0	0	0.1	0.2	4.6	9.2	46	0.10	2.5	100	All ND	All ND	All ND	5	2.3	4	1.9	No	No	No	Yes	No	No	No	Eliminated as a COPC
1,2-Dichlorobenzene (o-Dichlorobenzene)	EPA 8260	µg/l	93	0	0	0.2	0.4	4.6	9.2	46	0.20	0.66	4.0	All ND	All ND	All ND	0	0	0	0	No	No	Yes	Yes	No	No	No	Eliminated as a COPC
1,2-Dichlorobenzene (o-Dichlorobenzene)	EPA 8270	µg/l	121	0	0	0.1	0.2				0.10	3.9	100	All ND	All ND	All ND	5	4.1	4	3.3	No	No	No	Yes	No	No	No	No
1,3-Dichlorobenzene (m-Dichlorobenzene)	EPA 8260 +EPA8270	µg/l	214	0	0	0.1	0.2	2	4	20	0.10	2.5	100	All ND	All ND	All ND	10	4.7	4	1.9	No	No	No	Yes	No	No	No	Eliminated as a COPC
1,3-Dichlorobenzene (m-Dichlorobenzene)	EPA 8260	µg/l	93	0	0	0.2	0.4	2	4	20	0.20	0.66	4.0	All ND	All ND	All ND	4	4.3	0	0	No	No	Yes	Yes	No	No	No	Eliminated as a COPC
1,3-Dichlorobenzene (m-Dichlorobenzene)	EPA 8270	µg/l	121	0	0	0.1	0.2				0.10	3.9	100	All ND	All ND	All ND	6	5	4	3.3	No	No	No	Yes	No	No	No	No
1,4-Dichlorobenzene (p-Dichlorobenzene)	EPA 8260 +EPA8270	µg/l	214	0	0	0.1	0.2	4.9	9.8	49	0.10	2.5	100	All ND	All ND	All ND	5	2.3	4	1.9	No	No	No	Yes	No	No	No	Eliminated as a COPC
1,4-Dichlorobenzene (p-Dichlorobenzene)	EPA 8260	µg/l	93	0	0	0.2	0.40	4.9	9.8	49	0.20	0.66	4.0	All ND	All ND	All ND	0	0	0	0	No	No	Yes	Yes	No	No	No	Eliminated as a COPC
1,4-Dichlorobenzene (p-Dichlorobenzene)	EPA 8270	µg/l	121	0	0	0.1	0.2				0.10	3.9	100	All ND	All ND	All ND	5	4.1	4	3.3	No	No	No	Yes	No	No	No	No
3,3'-Dichlorobenzidine	EPA 8270	µg/l	121	0	0	0.1	0.2	0.0033	0.0066	0.033	0.10	34	1,000	All ND	All ND	All ND	121	100	121	100	No	No	No	No	No	No	No	Eliminated as a COPC ⁹
2,4-Dichlorophenol	EPA 8270	µg/l	121	8	6.6	0.1	0.2	10	20	100	0.10	4.2	100	0.130	3.13	16.0	5	4.1	0	0	No	No	No	No	No	No	No	COPC ⁵
Bis(2-ethylhexyl)ester	EPA 8270	µg/l	121	2	1.7	0.1	0.20	400	800	4,000	0.10	4.0	100	2.20	2.35	2.50	0	0	0	0	No	Yes	No	No	No	Yes	Yes	Eliminated as a COPC
Diethyl phthalate	EPA 8270	µg/l	121	22	18.2	0.1	0.2	93	186	930	0.10	3.7	100	0.120	9.75	190	4	3.3	0	0	No	No	No	No	No	No	No	COPC ⁵
Dimethyl phthalate	EPA 8270	µg/l	121	0	0	0.1	0.2	600	1,200	6,000	0.10	3.9	100	All ND	All ND	All ND	0											

Table 4-5
Groundwater Contaminants of Potential Concern
Port of Seattle - North Terminal 115
Seattle, Washington

Analyte	Analytical Method	Units	Frequency of Detection			Practical Quantitation Limit ¹ (PQL)		Preliminary Cleanup Level ² (PCUL)			Laboratory Reporting Limit (RL)			Detected Concentrations			Comparisons to PCUL		Comparisons to 10x PCUL		Contaminants of Potential Concern (COPC)								COPC Evaluation ⁴
			Total Number of Samples	Number of Detections	Frequency of Detection (Percent)	PQL	2X PQL	PCUL	2X PCUL	10X PCUL	Minimum	Average	Maximum	Minimum	Average	Maximum	Number of Detects and RLs > PCUL	Percentage of Detects and RLs > PCUL	Number of RLs > 10x PCUL	Percentage of RLs > 10x PCUL	1	2	3A	3B	3C	4A	4B		
2-methylphenol (o-Cresol)	EPA 8270	µg/l	121	18	14.9	0.1	0.2	27	54	270	0.10	3.4	100	0.550	30.3	120	9	7.4	0	0	No	No	No	No	No	No	No	COPC	
3 & 4 Methylphenol (m-, p-Cresol)	EPA 8270	µg/l	106	19	17.9	0.1	0.2	400	800	4,000	0.10	0.40	1.5	0.200	81.5	430	2	1.9	0	0	No	No	No	No	No	No	Yes	Eliminated as a COPC	
2-Nitroaniline	EPA 8270	µg/l	121	0	0	0.1	0.20	160	320	1,600	0.10	3.9	100	All ND	All ND	All ND	0	0	0	0	No	Yes	Yes	Yes	No	No	No	Eliminated as a COPC	
3-Nitroaniline	EPA 8270	µg/l	121	0	0	0.1	0.2	PCUL NE	PCUL NE	PCUL NE	0.10	3.9	100	All ND	All ND	All ND	PCUL NE	PCUL NE	PCUL NE	PCUL NE	Yes	n/a	n/a	n/a	n/a	n/a	n/a	Eliminated as a COPC	
4-Nitroaniline	EPA 8270	µg/l	121	0	0	0.1	0.2	PCUL NE	PCUL NE	PCUL NE	0.10	3.9	100	All ND	All ND	All ND	PCUL NE	PCUL NE	PCUL NE	PCUL NE	Yes	n/a	n/a	n/a	n/a	n/a	n/a	Eliminated as a COPC	
Nitrobenzene	EPA 8270	µg/l	121	0	0	0.1	0.2	100	200	1,000	0.10	3.9	100	All ND	All ND	All ND	0	0	0	0	No	No	Yes	Yes	No	No	No	Eliminated as a COPC	
2-Nitrophenol	EPA 8270	µg/l	121	0	0	0.1	0.2	PCUL NE	PCUL NE	PCUL NE	0.10	3.9	100	All ND	All ND	All ND	PCUL NE	PCUL NE	PCUL NE	PCUL NE	Yes	n/a	n/a	n/a	n/a	n/a	n/a	Eliminated as a COPC	
4-Nitrophenol (p-Nitrophenol)	EPA 8270	µg/l	121	2	1.7	0.1	0.2	PCUL NE	PCUL NE	PCUL NE	0.10	4.0	100	0.140	0.175	0.210	PCUL NE	PCUL NE	PCUL NE	PCUL NE	Yes	n/a	n/a	n/a	n/a	n/a	n/a	Eliminated as a COPC	
n-Nitrosodimethylamine	EPA 8270	µg/l	121	0	0	0.1	0.2	0.34	0.68	3.4	0.10	3.9	100	All ND	All ND	All ND	62	51.2	6	5	No	No	No	No	No	No	No	COPC	
n-Nitrosodiphenylamine (as diphenylamine)	EPA 8270	µg/l	121	0	0	0.1	0.2	0.69	1.38	6.9	0.10	34	1,000	All ND	All ND	All ND	60	49.6	16	13.2	No	No	No	No	No	No	No	COPC	
n-Nitrosodi-n-propylamine	EPA 8270	µg/l	121	3	2.5	0.1	0.2	0.058	0.116	0.58	0.10	4.0	100	0.100	0.153	0.190	121	100	60	49.6	No	No	No	No	No	No	No	COPC	
n-Octadecane	EPA 8270	µg/l	106	9	8.5	0.1	0.2	PCUL NE	PCUL NE	PCUL NE	0.10	0.64	9.5	0.110	0.268	0.440	PCUL NE	PCUL NE	PCUL NE	PCUL NE	Yes	n/a	n/a	n/a	n/a	n/a	n/a	Eliminated as a COPC	
Pentachlorophenol	EPA 8270	µg/l	121	5	4.1	0.5	1	0.002	0.004	0.02	0.46	19	500	0.690	5.24	12.0	121	100	116	95.9	No	No	No	No	No	No	No	COPC	
Phenol	EPA 8270	µg/l	121	10	8.3	0.1	0.2	370	740	3,700	0.10	3.2	100	5.90	27.4	120	0	0	0	0	No	Yes	No	No	No	No	Yes	COPC ⁵	
Pyridine	EPA 8270	µg/l	121	0	0	0.1	0.2	8	16	80	0.10	34	1,000	All ND	All ND	All ND	16	13.2	4	3.3	No	No	No	Yes	No	No	No	Eliminated as a COPC	
2,3,4,6-Tetrachlorophenol	EPA 8270	µg/l	121	3	2.5	0.1	0.2	480	960	4,800	0.10	4.0	100	3.90	4.60	5.20	0	0	0	0	No	Yes	No	No	No	Yes	Yes	Eliminated as a COPC	
2,3,5,6-Tetrachlorophenol	EPA 8270	µg/l	121	4	3.3	0.1	0.2	PCUL NE	PCUL NE	PCUL NE	0.10	4.0	100	5.10	14.0	21.0	PCUL NE	PCUL NE	PCUL NE	PCUL NE	Yes	n/a	n/a	n/a	n/a	n/a	n/a	Eliminated as a COPC	
1,2,4-Trichlorobenzene	EPA 8260 +EPA8270	µg/l	214	0	0	0.1	0.2	0.037	0.074	0.37	0.10	2.5	100	All ND	All ND	All ND	214	100	96	44.9	No	No	No	No	No	No	No	Eliminated as a COPC ⁹	
1,2,4-Trichlorobenzene	EPA 8260	µg/l	93	0	0	0.2	0.4	0.037	0.074	0.37	0.20	0.70	6.0	All ND	All ND	All ND	93	100	34	36.6	No	No	No	No	No	No	No	Eliminated as a COPC ⁹	
	EPA 8270	µg/l	121	0	0	0.1	0.2				0.10	3.9	100	All ND	All ND	All ND	121	100	62	51.2	No	No	No	No	No	No	No	No	Eliminated as a COPC ⁹
2,4,5-Trichlorophenol	EPA 8270	µg/l	121	1	0.8	0.1	0.2	600	1,200	6,000	0.10	3.9	100	0.200	0.200	0.200	0	0	0	0	No	Yes	No	No	No	Yes	Yes	Eliminated as a COPC	
2,4,6-Trichlorophenol	EPA 8270	µg/l	121	3	2.5	0.1	0.2	0.28	0.56	2.8	0.10	4.0	100	0.110	0.837	1.20	62	51.2	6	5	No	No	No	No	No	No	No	COPC	
Volatile Organic Compounds (VOCs)																													
Acetone	EPA 8260	µg/l	93	27	29	5	10	PCUL NE	PCUL NE	PCUL NE	5.0	13	50	6.90	256	2,400	PCUL NE	PCUL NE	PCUL NE	PCUL NE	Yes	n/a	n/a	n/a	n/a	n/a	n/a	Eliminated as a COPC	
Benzene	EPA 8260	µg/l	93	13	14	0.2	0.4	1.6	3.2	16	0.20	0.69	4.0	0.220	1.96	4.80	15	16.1	0	0	No	No	No	No	No	No	No	COPC	
Bromobenzene	EPA 8260	µg/l	93	0	0	0.2	0.4	PCUL NE	PCUL NE	PCUL NE	0.20	0.66	4.0	All ND	All ND	All ND	PCUL NE	PCUL NE	PCUL NE	PCUL NE	Yes	n/a	n/a	n/a	n/a	n/a	n/a	Eliminated as a COPC	
Bromochloromethane	EPA 8260	µg/l	93	0	0	0.2	0.4	PCUL NE	PCUL NE	PCUL NE	0.20	0.66	4.0	All ND	All ND	All ND	PCUL NE	PCUL NE	PCUL NE	PCUL NE	Yes	n/a	n/a	n/a	n/a	n/a	n/a	Eliminated as a COPC	
Bromoform (Tribromomethane)	EPA 8260	µg/l	93	0	0	1	2	12	24	120	1.0	3.3	20	All ND	All ND	All ND	4	4.3	0	0	No	No	Yes	Yes	No	No	No	Eliminated as a COPC	
Bromomethane	EPA 8260	µg/l	93	0	0	0.2	0.4	13	26	130	0.20	1.1	11	All ND	All ND	All ND	0	0	0	0	No	Yes	Yes	Yes	No	No	No	Eliminated as a COPC	
n-Butylbenzene	EPA 8260	µg/l	93	0	0	0.2	0.4	400	800	4,000	0.20	0.66	4.0	All ND	All ND	All ND	0	0	0	0	No	Yes	Yes	Yes	No	No	No	Eliminated as a COPC	
sec-Butylbenzene	EPA 8260	µg/l	93	0	0	0.2	0.4	800	1,600	8,000	0.20	0.66	4.0	All ND	All ND	All ND	0	0	0	0	No	Yes	Yes	Yes	No	No	No	Eliminated as a COPC	
tert-Butylbenzene	EPA 8260	µg/l	93	0	0	0.2	0.4	800	1,600	8,000	0.20	0.66	4.0	All ND	All ND	All ND	0	0	0	0	No	Yes	Yes	Yes	No	No	No	Eliminated as a COPC	
Carbon disulfide	EPA 8260	µg/l	93	13	14	0.2	0.4	400	800	4,000	0.20	0.68	4.0	0.220	8.18	71.0	0	0	0	0	No	Yes	No	No	No	No	Yes	Eliminated as a COPC	
Carbon tetrachloride	EPA 8260	µg/l	93	0	0	0.2	0.4	0.35	0.7	3.5	0.20	0.66	4.0	All ND	All ND	All ND	34	36.6	4	4.3	No	No	No	Yes	No	No	No	Eliminated as a COPC	
Chlorobenzene	EPA 8260	µg/l	93	0	0	0.2	0.4	200	400	2,000	0.20	0.66	4.0	All ND	All ND	All ND	0	0	0	0	No	Yes	Yes	Yes	No	No	No	Eliminated as a COPC	
Chloroethane	EPA 8260	µg/l	93	0	0	1	2	19,000	38,000	190,000	1.0	3.3	20	All ND	All ND	All ND	0	0	0	0	No	Yes	Yes	Yes	No	No	No	Eliminated as a COPC	
2-Chloroethyl vinyl ether	EPA 8260	µg/l	93	0	0	1	2	PCUL NE	PCUL NE	PCUL NE	1.0	4.7	40	All ND	All ND	All ND	PCUL NE	PCUL NE	PCUL NE	PCUL NE	Yes	n/a	n/a	n/a	n/a	n/a	n/a	Eliminated as a COPC	
Chloroform	EPA 8260	µg/l	93	2	2.2	0.2	0.4	1.2	2.4	12	0.20	0.67	4.0	2.10															

Table 4-5
Groundwater Contaminants of Potential Concern
Port of Seattle - North Terminal 115
Seattle, Washington

Analyte	Analytical Method	Units	Frequency of Detection			Practical Quantitation Limit ¹ (PQL)		Preliminary Cleanup Level ² (PCUL)			Laboratory Reporting Limit (RL)			Detected Concentrations			Comparisons to PCUL		Comparisons to 10x PCUL		Contaminants of Potential Concern (COPC) Selection Criteria ³							COPC Evaluation ⁴
			Total Number of Samples	Number of Detections	Frequency of Detection (Percent)	PQL	2X PQL	PCUL	2X PCUL	10X PCUL	Minimum	Average	Maximum	Minimum	Average	Maximum	Number of Detects and RLs > PCUL	Percentage of Detects and RLs > PCUL	Number of RLs > 10x PCUL	Percentage of RLs > 10x PCUL	1	2	3A	3B	3C	4A	4B	
trans-1,3-Dichloropropene	EPA 8260	µg/l	93	0	0	0.2	0.4	2	4	20	0.20	0.66	4.0	All ND	All ND	All ND	4	4.3	0	0	No	No	Yes	Yes	No	No	No	Eliminated as a COPC
Ethylbenzene	EPA 8260	µg/l	93	5	5.4	0.2	0.4	31	62	310	0.20	0.65	4.0	0.670	1.13	1.40	0	0	0	0	No	Yes	No	No	No	No	Yes	Eliminated as a COPC
1,2-Dibromoethane (EDB)	EPA 8260	µg/l	93	0	0	0.2	0.4	0.27	0.54	2.7	0.20	0.66	4.0	All ND	All ND	All ND	34	36.6	4	4.3	No	No	No	Yes	No	No	No	Eliminated as a COPC
2-Hexanone	EPA 8260	µg/l	93	3	3.2	2	4	40	80	400	2.0	6.6	40	10.0	13.7	20.0	0	0	0	0	No	No	No	No	No	Yes	Yes	Eliminated as a COPC
Isopropylbenzene (Cumene)	EPA 8260	µg/l	93	2	2.2	0.2	0.4	800	1,600	8,000	0.20	0.65	4.0	1.30	1.30	1.30	0	0	0	0	No	Yes	No	No	No	Yes	Yes	Eliminated as a COPC
p-Isopropyltoluene	EPA 8260	µg/l	93	19	20.4	0.2	0.4	PCUL NE	PCUL NE	PCUL NE	0.20	0.66	4.0	0.260	1.87	6.10	PCUL NE	PCUL NE	PCUL NE	PCUL NE	Yes	n/a	n/a	n/a	n/a	n/a	n/a	Eliminated as a COPC
2-Butanone (MEK)	EPA 8260	µg/l	93	10	10.8	5	10	1,700,000	3,400,000	17,000,000	5.0	13	50	6.10	95.7	240	0	0	0	0	No	Yes	No	No	No	No	Yes	Eliminated as a COPC
Methyl iodide (Iodomethane)	EPA 8260	µg/l	93	0	0	1	2	PCUL NE	PCUL NE	PCUL NE	1.0	4.9	54	All ND	All ND	All ND	PCUL NE	PCUL NE	PCUL NE	PCUL NE	Yes	n/a	n/a	n/a	n/a	n/a	n/a	Eliminated as a COPC
4-Methyl-2-pentanone (Methyl isobutyl ketone)	EPA 8260	µg/l	93	5	5.4	2	4	470,000	940,000	4,700,000	2.0	6.7	40	2.10	16.9	46.0	0	0	0	0	No	Yes	No	No	No	No	Yes	Eliminated as a COPC
Methyl tert-butyl ether (MTBE)	EPA 8260	µg/l	93	0	0	0.2	0.40	600	1,200	6,000	0.20	0.66	4.0	All ND	All ND	All ND	0	0	0	0	No	Yes	Yes	Yes	No	No	No	Eliminated as a COPC
Methylene chloride	EPA 8260	µg/l	93	0	0	1	2	100	200	1,000	1.0	3.3	20	All ND	All ND	All ND	0	0	0	0	No	Yes	Yes	Yes	No	No	No	Eliminated as a COPC
n-Propylbenzene	EPA 8260	µg/l	93	0	0	0.2	0.4	800	1,600	8,000	0.20	0.66	4.0	All ND	All ND	All ND	0	0	0	0	No	Yes	Yes	Yes	No	No	No	Eliminated as a COPC
Styrene	EPA 8260	µg/l	93	0	0	0.2	0.4	8,200	16,400	82,000	0.20	0.66	4.0	All ND	All ND	All ND	0	0	0	0	No	Yes	Yes	Yes	No	No	No	Eliminated as a COPC
1,1,1,2-Tetrachloroethane	EPA 8260	µg/l	93	0	0	0.2	0.4	7.4	14.8	74	0.20	0.66	4.0	All ND	All ND	All ND	0	0	0	0	No	Yes	Yes	Yes	No	No	No	Eliminated as a COPC
1,1,2,2-Tetrachloroethane	EPA 8260	µg/l	93	0	0	0.2	0.4	0.3	0.6	3	0.20	0.66	4.0	All ND	All ND	All ND	34	36.6	4	4.3	No	No	No	Yes	No	No	No	Eliminated as a COPC
Tetrachloroethene	EPA 8260	µg/l	93	0	0	0.2	0.4	2.9	5.8	29	0.20	0.66	4.0	All ND	All ND	All ND	4	4.3	0	0	No	No	Yes	Yes	No	No	No	Eliminated as a COPC
Toluene	EPA 8260	µg/l	93	6	6.5	1	2	130	260	1,300	1.0	3.3	20	2.00	6.52	8.00	0	0	0	0	No	Yes	No	No	No	No	Yes	Eliminated as a COPC
1,2,3-Trichlorobenzene	EPA 8260	µg/l	93	0	0	0.2	0.4	PCUL NE	PCUL NE	PCUL NE	0.20	0.74	7.8	All ND	All ND	All ND	PCUL NE	PCUL NE	PCUL NE	PCUL NE	Yes	n/a	n/a	n/a	n/a	n/a	n/a	Eliminated as a COPC
1,1,1-Trichloroethane	EPA 8260	µg/l	93	0	0	0.2	0.4	5,500	11,000	55,000	0.20	0.66	4.0	All ND	All ND	All ND	0	0	0	0	No	Yes	Yes	Yes	No	No	No	Eliminated as a COPC
1,1,2-Trichloroethane	EPA 8260	µg/l	93	0	0	0.2	0.4	0.9	1.8	9	0.20	0.66	4.0	All ND	All ND	All ND	30	32.3	0	0	No	No	Yes	Yes	No	No	No	Eliminated as a COPC
Trichloroethene	EPA 8260	µg/l	93	0	0	0.2	0.4	0.7	1.4	7	0.20	0.66	4.0	All ND	All ND	All ND	30	32.3	0	0	No	No	Yes	Yes	No	No	No	Eliminated as a COPC
Trichlorofluoromethane (CFC-11)	EPA 8260	µg/l	93	0	0	0.2	0.4	120	240	1,200	0.20	0.66	4.0	All ND	All ND	All ND	0	0	0	0	No	Yes	Yes	Yes	No	No	No	Eliminated as a COPC
1,2,3-Trichloropropane	EPA 8260	µg/l	93	0	0	0.2	0.4	1,500	3,000	15,000	0.20	0.66	4.0	All ND	All ND	All ND	0	0	0	0	No	Yes	Yes	Yes	No	No	No	Eliminated as a COPC
1,2,4-Trimethylbenzene	EPA 8260	µg/l	93	18	19.4	0.2	0.4	240	480	2,400	0.20	0.72	4.0	0.220	0.912	2.70	0	0	0	0	No	Yes	No	No	No	No	Yes	Eliminated as a COPC
1,3,5-Trimethylbenzene	EPA 8260	µg/l	93	3	3.2	0.2	0.4	80	160	800	0.20	0.67	4.0	0.380	0.427	0.470	0	0	0	0	No	Yes	No	No	No	Yes	Yes	Eliminated as a COPC
Vinyl acetate	EPA 8260	µg/l	93	0	0	2	4	7,800	15,600	78,000	1.0	3.6	20	All ND	All ND	All ND	0	0	0	0	No	Yes	Yes	Yes	Yes	No	No	Eliminated as a COPC
Vinyl chloride	EPA 8260	µg/l	93	0	0	0.2	0.4	0.18	0.36	1.8	0.020	0.61	4.0	All ND	All ND	All ND	78	83.9	10	10.8	No	No	No	No	No	No	No	Eliminated as a COPC ¹⁰
Xylene, m-,p-	EPA 8260	µg/l	93	8	8.6	0.4	0.8	290	580	2,900	0.40	1.3	8.0	0.470	3.91	7.30	0	0	0	0	No	Yes	No	No	No	No	Yes	Eliminated as a COPC
Xylene, o-	EPA 8260	µg/l	93	13	14	0.2	0.4	430	860	4,300	0.20	0.69	4.0	0.220	1.26	3.40	0	0	0	0	No	Yes	No	No	No	No	Yes	Eliminated as a COPC
Petroleum Hydrocarbons																												
Gasoline-range hydrocarbons	NWTPH-G	µg/l	53	3	5.7	100	200	800	1,600	8,000	100	100	100	130	213	260	0	0	0	0	No	Yes	No	No	No	No	Yes	COPC ¹¹
Diesel-range hydrocarbons	NWTPH-Dx	µg/l	70	42	60	250	500	500	1,000	5,000	200	240	260	250	3,170	18,000	23	32.9	0	0	No	No	No	No	No	No	No	COPC
Oil-range hydrocarbons	NWTPH-Dx	µg/l	70	38	54.3	400	800	500	1,000	5,000	330	381	400	330	5,400	39,000	31	44.3	0	0	No	No	No	No	No	No	No	COPC
Total diesel- and oil-range hydrocarbons	NWTPH-Dx	µg/l	70	51	72.9	400	800	500	1,000	5,000	330	381	400	260	9,667	57,000	32	45.7	0	0	No	No	No	No	No	No	No	COPC

Notes:

¹ PQL from the North Terminal 115 (T115N) Remedial Investigation/Feasibility Study Work Plan (GeoEngineers 2012) and is the lowest available value from OnSite Environmental, Inc. of Redmond, Washington except for dioxins/furans. The PQL for total dioxins/furans TEQ was calculated using reporting limits for individual congeners obtained from samples collected at T115N by Ecology.

² Most stringent groundwater Preliminary Cleanup Level (PCUL) for non-potable groundwater. Obtained from Ecology's "LDW PCUL Workbook - Soil Summary" dated July 2019. Screening values for most stringent potable groundwater used when non-potable groundwater PCULs not available.

³ Chemical of Potential Concern (COPC) Selection Criteria:

1 - There is no PCUL in Ecology's CLARC Database.

2 - The maximum RL and maximum detected concentration are less than the PCUL.

3a - Analyte was not detected with a maximum RL less than 10 times the PCUL.

3b - Analyte was not detected with an average RL less than 10 times the PCUL **AND** less than 10 percent of the RLs are greater than 10 times the PCUL.

3c - Analyte was not detected with an average RL less than 2 times the PQL.

4a - Frequency of detection is less than 5 percent, the maximum RL is less than or equal to 10 times the PCUL **AND** the maximum detected concentration is less than or equal to 2 times the PCUL.

4b - Maximum detected concentration and maximum RL are less than 2 times the PCUL **AND** the less than or equal to 10 percent of the detected concentrations and RLs are greater than the PCUL.

⁴ Analyte eliminated as a COPC if "Yes" for any of the selection criterion.

⁵ PCBs retained as COPC based on detections in groundwater and as PCBs are COC for Lower Duwamish Waterway (LDW) and because PCBs are COPC for soil.

⁷ Thallium retained as COPC based on PQL (2.0 µg/L) being higher than median attainable PQL (0.005 µg/L) identified by Ecology in laboratory surveys.

⁸ Compound retained as COPC as Ecology stated further evaluation needed to assess whether COPC based on differences in datasets in email dated May 20, 2019.

⁹ Compound eliminated as COPC based on no or few detections close to or below the PCULs and average reporting limits similar to best achievable PQLs found in laboratory surveys as stated in Ecology email dated May 20, 2019.

¹⁰ Compound eliminated as COPC as it was never detected and PCE and TCE are not COPCs in soil or groundwater as stated in Ecology email dated May 20, 2019.

¹¹ Retained as COPC pending evaluation of whether there is a localized area of detections as stated in Ecology email dated May 20, 2019.

All ND = Analyte was not detected in any sample
AD = Analyte was detected in any sample
COPC = Chemical of Potential Concern
ng/L = nanogram per liter
µg/L = Microgram per liter

n/a = Not applicable
PCUL NE = Preliminary cleanup level not established
PQL = Practical quantitation limit
RL = Reporting limit
TEQ = toxic equivalence quotient

Table 4-6
Catch Basin Solids Contaminants of Potential Concern
Port of Seattle - North Terminal 115
Seattle, Washington

Analyte	Analytical Method	Units	Frequency of Detection			Practical Quantitation Limit ¹ (PQL)		Preliminary Cleanup Level ² (PCUL)			Laboratory Reporting Limit (RL)			Detected Concentrations			Comparisons to PCUL		Comparisons to 10x PCUL		Chemical of Potential Concern (COPC) Selection Criteria ³								COPC Evaluation ⁴
			Total Number of Samples	Number of Detections	Frequency of Detection (Percent)	PQL	2X PQL	PCUL	2X PCUL	10X PCUL	Minimum	Average	Maximum	Minimum	Average	Maximum	Number of Detects and RLs > PCUL	Percentage of Detects and RLs > PCUL	Number of RLs > 10x PCUL	Percentage of RLs > 10x PCUL	1	2	3A	3B	3C	4A	4B		
Polychlorinated Biphenyls (PCBs)																													
Total PCB Aroclors	EPA 8082	mg/kg	5	2	40	0.004	0.008	0.13	0.26	1.30	0.057	0.075	0.095	0.13	0.14	0.16	1	20	0	0	No	No	No	No	No	No	No	COPC	
Dioxins and Furans																													
Total Dioxin/Furan TEQ (ND=0)	EPA 1613	ng/kg	5	5	100	5.0	10	5.0	10	50	AD	AD	AD	11	27	68	5	100	AD	AD	No	No	No	No	No	No	No	COPC	
Total Dioxin/Furan TEQ (ND=0.5RL)	EPA 1613	ng/kg	5	5	100	5.0	10	5.0	10	50	AD	AD	AD	11	27	68	5	100	AD	AD	No	No	No	No	No	No	No	COPC	
Metals																													
Antimony	EPA 6000/7000	mg/kg	5	2	40	0.20	0.40	88	176	880	5.0	5.0	5.0	7.2	16	25	0	0	0	0	No	Yes	No	No	No	No	Yes	Eliminated as a COPC	
Arsenic	EPA 6000/7000	mg/kg	5	5	100	0.20	0.40	7.0	14	70	AD	AD	AD	4.6	14	25	4	80	AD	AD	No	No	No	No	No	No	No	COPC	
Barium	EPA 6000/7000	mg/kg	5	5	100	0.50	1.0	44,000	88,000	440,000	AD	AD	AD	130	230	350	0	0	AD	AD	No	Yes	No	No	No	No	Yes	Eliminated as a COPC	
Beryllium	EPA 6000/7000	mg/kg	5	0	0	0.20	0.40	440	880	4,400	0.50	0.50	0.50	All ND	All ND	All ND	0	0	0	0	All ND	Yes	Yes	Yes	No	No	No	Eliminated as a COPC	
Cadmium	EPA 6000/7000	mg/kg	5	5	100	0.10	0.20	5.1	10	51	AD	AD	AD	0.7	1.7	3.2	0	0	AD	AD	No	Yes	No	No	No	No	Yes	Eliminated as a COPC	
Chromium III/ Total	EPA 6000/7000	mg/kg	5	5	100	0.50	1.0	260	520	2,600	AD	AD	AD	33	72	100	0	0	AD	AD	No	Yes	No	No	No	No	Yes	Eliminated as a COPC	
Chromium VI	EPA 6000/7000	mg/kg	0	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	PCUL NE	PCUL NE	PCUL NE	PCUL NE	Yes	n/a	n/a	n/a	n/a	n/a	n/a	Eliminated as a COPC	
Copper	EPA 6000/7000	mg/kg	5	5	100	0.50	1.0	390	780	3,900	AD	AD	AD	100	220	530	1	20	AD	AD	No	No	No	No	No	No	No	COPC	
Lead	EPA 6000/7000	mg/kg	5	5	100	0.10	0.20	450	900	4,500	AD	AD	AD	61	150	330	0	0	AD	AD	No	Yes	No	No	No	No	Yes	Eliminated as a COPC	
Mercury	EPA 6000/7000	mg/kg	5	5	100	0.025	0.050	0.41	4.10	41	AD	AD	AD	0.094	0.19	0.38	0	0	AD	AD	No	Yes	No	No	No	No	No	Eliminated as a COPC	
Nickel	EPA 6000/7000	mg/kg	5	5	100	0.50	1.0	4,400	8,800	44,000	AD	AD	AD	30	50	69	0	0	AD	AD	No	Yes	No	No	No	No	Yes	Eliminated as a COPC	
Selenium	EPA 6000/7000	mg/kg	5	4	80	0.50	1.0	1,100	2,200	11,000	0.50	0.50	0.50	0.80	1.0	1.3	0	0	0	0	No	Yes	No	No	No	No	Yes	Eliminated as a COPC	
Silver	EPA 6000/7000	mg/kg	5	2	40	0.20	0.40	6.1	12	61	0.50	0.50	0.50	0.52	0.66	0.81	0	0	0	0	No	Yes	No	No	No	No	Yes	Eliminated as a COPC	
Thallium	EPA 6000/7000	mg/kg	5	0	0	0.20	0.40	2.2	4.4	22	0.25	0.25	0.25	All ND	All ND	All ND	0	0	0	0	No	Yes	Yes	Yes	Yes	No	No	Eliminated as a COPC	
Tin	EPA 6000/7000	mg/kg	5	5	100	1.0	2.0	130,000	260,000	1,300,000	AD	AD	AD	100	2300	10000	0	0	AD	AD	No	Yes	No	No	No	No	Yes	Eliminated as a COPC	
Zinc	EPA 6000/7000	mg/kg	5	5	100	4.0	8.0	410	820	4,100	AD	AD	AD	910	1800	2700	5	100	AD	AD	No	No	No	No	No	No	No	COPC	
Semi-Volatile Organic Compounds (SVOCs) - Polycyclic Aromatic Hydrocarbons (PAHs)																													
Acenaphthene	EPA 8270/SIM	mg/kg	5	0	0	0.0050	0.010	0.50	1.0	5.0	0.046	0.057	0.076	All ND	All ND	All ND	0	0	0	0	No	Yes	Yes	Yes	No	No	No	Eliminated as a COPC	
Acenaphthylene	EPA 8270/SIM	mg/kg	5	2	40	0.0050	0.010	1.3	2.6	13	0.046	0.060	0.076	0.077	0.13	0.18	0	0	0	0	No	Yes	No	No	No	No	Yes	Eliminated as a COPC	
Anthracene	EPA 8270/SIM	mg/kg	5	3	60	0.0050	0.010	0.96	1.9	9.6	0.057	0.066	0.076	0.050	0.19	0.34	0	0	0	0	No	Yes	No	No	No	No	Yes	Eliminated as a COPC	
Benzo(a)anthracene	EPA 8270/SIM	mg/kg	5	5	100	0.0050	0.010	1.3	2.6	13	AD	AD	AD	0.14	0.48	1.5	1	20	AD	AD	No	No	No	No	No	No	No	COPC	
Benzo(b)fluoranthene	EPA 8270/SIM	mg/kg	5	5	100	0.0050	0.010	3.2	6.4	32	AD	AD	AD	0.25	0.80	2.2	0	0	AD	AD	No	Yes	No	No	No	No	Yes	Eliminated as a COPC	
Benzo(k)fluoranthene	EPA 8270/SIM	mg/kg	5	4	80	0.0050	0.010	3.2	6.4	32	0.057	0.057	0.057	0.085	0.19	0.38	0	0	0	0	No	Yes	No	No	No	No	Yes	Eliminated as a COPC	
Benzo(g,h,i)perylene	EPA 8270/SIM	mg/kg	5	5	100	0.0050	0.010	0.67	1.3	6.7	AD	AD	AD	0.21	0.55	1.4	1	20	AD	AD	No	No	No	No	No	No	No	COPC	
Benzo(a)pyrene	EPA 8270/SIM	mg/kg	5	5	100	0.0050	0.010	1.6	3.2	16	AD	AD	AD	0.13	0.38	1.1	0	0	AD	AD	No	Yes	No	No	No	No	No	Eliminated as a COPC	
Chrysene	EPA 8270/SIM	mg/kg	5	5	100	0.0050	0.010	1.4	2.8	14	AD	AD	AD	0.31	0.97	2.9	1	20	AD	AD	No	No	No	No	No	No	No	COPC	
Dibenzo(a,h)anthracene	EPA 8270/SIM	mg/kg	5	3	60	0.0050	0.010	0.23	0.46	2.3	0.057	0.066	0.076	0.058	0.13	0.25	1	20	0	0	No	No	No	No	No	No	No	COPC	
Dibenzofuran	EPA 8270/SIM	mg/kg	5	0	0	0.0200	0.040	0.54	1.1	5.4	0.23	0.28	0.38	All ND	All ND	All ND	0	0	0	0	No	Yes	Yes	Yes	No	No	No	Eliminated as a COPC	
Fluoranthene	EPA 8270/SIM	mg/kg	5	5	100	0.0050	0.010	1.7	3.4	17	AD	AD	AD	0.27	0.86	2.6	1	20	AD	AD	No	No	No	No	No	No	No	COPC	
Fluorene	EPA 8270/SIM	mg/kg	5	2	40	0.0050	0.010	0.54	1.1	5.4	0.046	0.060	0.076	0.064	0.100	0.14	0	0	0	0	No	Yes	No	No	No	No	Yes	Eliminated as a COPC	
Indeno(1,2,3-c,d)pyrene	EPA 8270/SIM	mg/kg	5	5	100	0.0050	0.010	0.60	1.2	6.0	AD	AD	AD	0.10	0.28	0.75	1	20	AD	AD	No	No	No	No	No	No	No	COPC	
1-Methylnaphthalene	EPA 8270/SIM	mg/kg	5	0	0	0.0050	0.010	29	58	290	0.046	0.057	0.076	All ND	All ND	All ND	0	0	0	0	No	Yes	Yes	Yes	No	No	No	Eliminated as a COPC	
2-Methylnaphthalene	EPA 8270/SIM	mg/kg	5	1	20	0.0050	0.010	0.67	1.3	6.7	0.046	0.056	0.076	0.066	0.066	0.066	0	0	0	0	No	Yes	No	No	No	No	No	Yes	Eliminated as a COPC
Naphthalene	EPA 8270/SIM	mg/kg	10	5	50	0.0050	0.010	2.1	4.2	21	0.001	0.036	0.076	0.005	0.032	0.085	0	0	0	0	No	Yes	No	No	No	No	Yes	Eliminated as a COPC	
Phenanthrene	EPA 8270/SIM	mg/kg	5	5	100	0.0050	0.010	1.5	3.0	15	AD	AD	AD	0.15	0.38	1.1	0	0	AD	AD	No	Yes	No	No	No	No	Yes	Eliminated as a COPC	
Pyrene	EPA 8270/SIM	mg/kg	5	5	100	0.0050	0.010	2.6	5.2	26	AD	AD	AD	0.27	0.84	2.5	0	0	AD	AD	No	Yes	No	No	No	No	Yes	Eliminated as a COPC	
Total LPAH ⁵	EPA 8270/SIM	mg/kg	6	6	100	0.0050	0.010	5.2	10.4	52	AD	AD	AD	1.56	4.63	15.0	0	0	0	0	No	Yes	No	No	No	No	No	Eliminated as a COPC	
Total HPAH ⁶	EPA 8270/SIM	mg/kg	6	6	100	0.0050	0.010	12	24.0	120	AD	AD	AD	1.68	4.83	15.6	1	17	0	0	No	No	No	No	No	No	No	COPC	
Total cPAH TEQ (ND=0)	EPA 8270/SIM	mg/kg	5	5	100	0.0080	0.016	0.090	0.18	0.90	AD	AD	AD	0.20	0.57	1.6	5	100	All Detect	All Detect	No	No	No	No	No	No	No	COPC	

Table 4-6
Catch Basin Solids Contaminants of Potential Concern
Port of Seattle - North Terminal 115
Seattle, Washington

Analyte	Analytical Method	Units	Frequency of Detection			Practical Quantitation Limit ¹ (PQL)		Preliminary Cleanup Level ² (PCUL)			Laboratory Reporting Limit (RL)			Detected Concentrations			Comparisons to PCUL		Comparisons to 10x PCUL		Chemical of Potential Concern (COPC) Selection Criteria ³								COPC Evaluation ⁴
			Total Number of Samples	Number of Detections	Frequency of Detection (Percent)	PQL	2X PQL	PCUL	2X PCUL	10X PCUL	Minimum	Average	Maximum	Minimum	Average	Maximum	Number of Detects and RLs > PCUL	Percentage of Detects and RLs > PCUL	Number of RLs > 10x PCUL	Percentage of RLs > 10x PCUL	1	2	3A	3B	3C	4A	4B		
Carbazole	EPA 8270	mg/kg	5	0	0	0.020	0.040	PCUL NE	PCUL NE	PCUL NE	0.23	0.28	0.38	All ND	All ND	All ND	PCUL NE	PCUL NE	PCUL NE	PCUL NE	Yes	n/a	n/a	n/a	n/a	n/a	n/a	Eliminated as a COPC	
4-Chloroaniline	EPA 8270	mg/kg	5	0	0	0.020	0.040	4.3	8.6	43	0.23	0.28	0.38	All ND	All ND	All ND	0	0	0	0	No	Yes	Yes	Yes	No	No	No	Eliminated as a COPC	
4-Chloro-3-methylphenol	EPA 8270	mg/kg	5	0	0	0.020	0.040	PCUL NE	PCUL NE	PCUL NE	0.23	0.28	0.38	All ND	All ND	All ND	PCUL NE	PCUL NE	PCUL NE	PCUL NE	Yes	n/a	n/a	n/a	n/a	n/a	n/a	Eliminated as a COPC	
2-Chloronaphthalene	EPA 8270	mg/kg	5	0	0	0.020	0.040	14,000	28,000	140,000	0.23	0.28	0.38	All ND	All ND	All ND	0	0	0	0	No	Yes	Yes	Yes	No	No	No	Eliminated as a COPC	
2-Chlorophenol	EPA 8270	mg/kg	5	0	0	0.020	0.040	840	1,680	8,400	0.23	0.28	0.38	All ND	All ND	All ND	0	0	0	0	No	Yes	Yes	Yes	No	No	No	Eliminated as a COPC	
4-Chlorophenyl-phenylether	EPA 8270	mg/kg	5	0	0	0.020	0.040	PCUL NE	PCUL NE	PCUL NE	0.23	0.28	0.38	All ND	All ND	All ND	PCUL NE	PCUL NE	PCUL NE	PCUL NE	Yes	n/a	n/a	n/a	n/a	n/a	n/a	Eliminated as a COPC	
Decane	EPA 8270	mg/kg	5	0	0	0.020	0.040	PCUL NE	PCUL NE	PCUL NE	0.23	0.28	0.38	All ND	All ND	All ND	PCUL NE	PCUL NE	PCUL NE	PCUL NE	Yes	n/a	n/a	n/a	n/a	n/a	n/a	Eliminated as a COPC	
Dibutyl phthalate	EPA 8270	mg/kg	5	1	20	0.020	0.040	1.4	2.8	14	0.23	0.30	0.38	0.68	0.68	0.68	0	0	0	0	No	Yes	No	No	No	No	Yes	Eliminated as a COPC	
2,3-Dichloroaniline	EPA 8270	mg/kg	5	0	0	0.020	0.040	PCUL NE	PCUL NE	PCUL NE	0.23	0.28	0.38	All ND	All ND	All ND	PCUL NE	PCUL NE	PCUL NE	PCUL NE	Yes	n/a	n/a	n/a	n/a	n/a	n/a	Eliminated as a COPC	
1,2-Dichlorobenzene (o-Dichlorobenzene)	EPA 8260 +EPA8270	mg/kg	10	0	0	0.001	0.003	0.035	0.070	0.35	0.0013	0.1400	0.3800	All ND	All ND	All ND	5	50	1	10	No	No	No	No	No	No	No	Eliminated as a COPC ⁷	
1,2-Dichlorobenzene (o-Dichlorobenzene)	EPA 8260	mg/kg	5	0	0	0.001	0.003	0.035	0.070	0.35	0.0013	0.0022	0.0030	All ND	All ND	All ND	0	0	0	0	No	Yes	Yes	Yes	Yes	No	No	Eliminated as a COPC	
1,3-Dichlorobenzene (m-Dichlorobenzene)	EPA 8270	mg/kg	5	0	0	0.230	0.460	0.035	0.070	0.35	0.2300	0.2800	0.3800	All ND	All ND	All ND	5	100	1	20	No	No	No	No	No	No	No	Eliminated as a COPC ⁷	
1,3-Dichlorobenzene (m-Dichlorobenzene)	EPA 8260 +EPA8270	mg/kg	10	0	0	0.020	0.040	PCUL NE	PCUL NE	PCUL NE	0.0013	0.1400	0.3800	All ND	All ND	All ND	PCUL NE	PCUL NE	PCUL NE	PCUL NE	Yes	n/a	n/a	n/a	n/a	n/a	n/a	Eliminated as a COPC	
1,3-Dichlorobenzene (m-Dichlorobenzene)	EPA 8260	mg/kg	5	0	0	0.001	0.003	PCUL NE	PCUL NE	PCUL NE	0.0013	0.0022	0.0030	All ND	All ND	All ND	PCUL NE	PCUL NE	PCUL NE	PCUL NE	Yes	n/a	n/a	n/a	n/a	n/a	n/a	Eliminated as a COPC	
1,4-Dichlorobenzene (p-Dichlorobenzene)	EPA 8260 +EPA8270	mg/kg	10	0	0	0.230	0.460	PCUL NE	PCUL NE	PCUL NE	0.2300	0.2800	0.3800	All ND	All ND	All ND	PCUL NE	PCUL NE	PCUL NE	PCUL NE	Yes	n/a	n/a	n/a	n/a	n/a	n/a	Eliminated as a COPC	
1,4-Dichlorobenzene (p-Dichlorobenzene)	EPA 8260	mg/kg	5	0	0	0.001	0.003	0.11	0.22	1.1	0.0013	0.1400	0.3800	All ND	All ND	All ND	5	50	0	0	No	No	Yes	Yes	No	No	No	Eliminated as a COPC	
1,4-Dichlorobenzene (p-Dichlorobenzene)	EPA 8270	mg/kg	5	0	0	0.230	0.460	0.11	0.22	1.1	0.2300	0.2800	0.3800	All ND	All ND	All ND	5	100	0	0	No	No	Yes	Yes	Yes	No	No	Eliminated as a COPC	
3,3'-Dichlorobenzidine	EPA 8270	mg/kg	5	0	0	0.10	0.20	1.9	3.8	19	0.23	0.28	0.38	All ND	All ND	All ND	0	0	0	0	No	Yes	Yes	Yes	No	No	No	Eliminated as a COPC	
2,4-Dichlorophenol	EPA 8270	mg/kg	5	0	0	0.10	0.20	510	1,020	5,100	0.23	0.28	0.38	All ND	All ND	All ND	0	0	0	0	No	Yes	Yes	Yes	No	No	No	Eliminated as a COPC	
Bis(2-ethylhexyl)ester	EPA 8270	mg/kg	5	0	0	0.025	0.050	PCUL NE	PCUL NE	PCUL NE	0.23	0.28	0.38	All ND	All ND	All ND	PCUL NE	PCUL NE	PCUL NE	PCUL NE	Yes	n/a	n/a	n/a	n/a	n/a	n/a	Eliminated as a COPC	
Diethyl phthalate	EPA 8260	mg/kg	5	0	0	0.020	0.040	0.07	0.14	0.7	0.2	0.3	0.4	All ND	All ND	All ND	5	100	0	0	No	No	Yes	Yes	No	No	No	Eliminated as a COPC	
Dimethyl phthalate	EPA 8270	mg/kg	5	0	0	0.020	0.040	0.200	0.40	2.00	1.20	1.40	1.80	All ND	All ND	All ND	5	100	0	0	No	No	Yes	Yes	No	No	No	Eliminated as a COPC	
2,4-Dimethylphenol	EPA 8270	mg/kg	5	0	0	0.020	0.040	0.029	0.058	0.29	0.23	0.28	0.38	All ND	All ND	All ND	5	100	1	20	No	No	No	No	No	No	No	COPC	
o-Dinitrobenzene	EPA 8270	mg/kg	5	0	0	0.020	0.040	PCUL NE	PCUL NE	PCUL NE	0.23	0.28	0.38	All ND	All ND	All ND	PCUL NE	PCUL NE	PCUL NE	PCUL NE	Yes	n/a	n/a	n/a	n/a	n/a	n/a	Eliminated as a COPC	
1,3-Dinitrobenzene	EPA 8270	mg/kg	5	0	0	0.020	0.040	PCUL NE	PCUL NE	PCUL NE	1.2	1.4	1.8	All ND	All ND	All ND	PCUL NE	PCUL NE	PCUL NE	PCUL NE	Yes	n/a	n/a	n/a	n/a	n/a	n/a	Eliminated as a COPC	
1,4-Dinitrobenzene	EPA 8270	mg/kg	5	0	0	0.020	0.040	PCUL NE	PCUL NE	PCUL NE	0.23	0.28	0.38	All ND	All ND	All ND	PCUL NE	PCUL NE	PCUL NE	PCUL NE	Yes	n/a	n/a	n/a	n/a	n/a	n/a	Eliminated as a COPC	
4,6-Dinitro-2-methylphenol	EPA 8270	mg/kg	5	0	0	0.020	0.040	PCUL NE	PCUL NE	PCUL NE	1.2	1.4	1.8	All ND	All ND	All ND	PCUL NE	PCUL NE	PCUL NE	PCUL NE	Yes	n/a	n/a	n/a	n/a	n/a	n/a	Eliminated as a COPC	
2,4-Dinitrophenol	EPA 8270	mg/kg	5	0	0	0.020	0.040	340	680	3,400	1.2	1.4	1.8	All ND	All ND	All ND	0	0	0	0	No	Yes	Yes	Yes	No	No	No	Eliminated as a COPC	
2,4-Dinitrotoluene	EPA 8270	mg/kg	5	0	0	0.10	0.20	2.8	5.6	28	0.23	0.28	0.38	All ND	All ND	All ND	0	0	0	0	No	Yes	Yes	Yes	No	No	No	Eliminated as a COPC	
2,6-Dinitrotoluene	EPA 8270	mg/kg	5	0	0	0.10	0.20	0.57	1.1	5.7	0.23	0.28	0.38	All ND	All ND	All ND	0	0	0	0	No	Yes	Yes	Yes	No	No	No	Eliminated as a COPC	
Di-n-octyl phthalate	EPA 8270	mg/kg	5	0	0	0.020	0.040	6.2	12	62	0.23	0.28	0.38	All ND	All ND	All ND	0	0	0	0	No	Yes	Yes	Yes	No	No	No	Eliminated as a COPC	
1,2-Diphenylhydrazine	EPA 8270	mg/kg	5	0	0	0.020	0.040	PCUL NE	PCUL NE	PCUL NE	0.23	0.28	0.38	All ND	All ND	All ND	PCUL NE	PCUL NE	PCUL NE	PCUL NE	Yes	n/a	n/a	n/a	n/a	n/a	n/a	Eliminated as a COPC	
Hexachlorobenzene	EPA 8270	mg/kg	5	0	0	0.0050	0.010	0.001	0.002	0.01	0.23	0.28	0.38	All ND	All ND	All ND	5	100	5	100	No	No	No	No	No	No	No	COPC	
Hexachlorobutadiene	EPA 8260 +EPA8270	mg/kg	10	0	0	0.0050	0.010	0.011	0.022	0.11	0.0065	0.150	0.380	All ND	All ND	All ND	7	70	5	50	No	No	No	No	No	No	No	Eliminated as a COPC ⁷	
Hexachlorobutadiene	EPA 8260	mg/kg	5	0	0	0.0065	0.013	0.011	0.022	0.11	0.0065	0.011	0.015	All ND	All ND	All ND	2	40	0	0	No	No	Yes	Yes	No	No	No	Eliminated as a COPC	
Hexachlorobutadiene	EPA 8270	mg/kg	5	0	0	0.2300	0.460	0.011	0.022	0.11	0.2300	0.280	0.380	All ND	All ND	All ND	5	100	5	100	No	No	No	No	No	No	No	Eliminated as a COPC ⁷	
Hexachlorocyclopentadiene</																													

Table 4-6
Catch Basin Solids Contaminants of Potential Concern
Port of Seattle - North Terminal 115
Seattle, Washington

Analyte	Analytical Method	Units	Frequency of Detection			Practical Quantitation Limit ¹ (PQL)		Preliminary Cleanup Level ² (PCUL)			Laboratory Reporting Limit (RL)			Detected Concentrations			Comparisons to PCUL		Comparisons to 10x PCUL		Chemical of Potential Concern (COPC) Selection Criteria ³							COPC Evaluation ⁴	
			Total Number of Samples	Number of Detections	Frequency of Detection (Percent)	PQL	2X PQL	PCUL	2X PCUL	10X PCUL	Minimum	Average	Maximum	Minimum	Average	Maximum	Number of Detects and RLs > PCUL	Percentage of Detects and RLs > PCUL	Number of RLs > 10x PCUL	Percentage of RLs > 10x PCUL	1	2	3A	3B	3C	4A	4B		
n-Octadecane	EPA 8270	mg/kg	5	2	40	0.020	0.040	PCUL NE	PCUL NE	PCUL NE	0.23	0.25	0.29	1.1	1.7	2.3	PCUL NE	PCUL NE	PCUL NE	PCUL NE	Yes	n/a	n/a	n/a	n/a	n/a	n/a	Eliminated as a COPC	
Pentachlorophenol	EPA 8270	mg/kg	5	0	0	0.020	0.04	0.36	0.72	3.6	1.2	1.4	1.8	All ND	All ND	All ND	5	100	0	0	No	No	Yes	Yes	No	No	No	Eliminated as a COPC	
Phenol	EPA 8270	mg/kg	5	0	0	0.020	0.040	0.42	0.84	4.2	0.23	0.28	0.38	All ND	All ND	All ND	0	0	0	0	No	Yes	Yes	Yes	No	No	No	Eliminated as a COPC	
Pyridine	EPA 8270	mg/kg	5	0	0	0.020	0.040	PCUL NE	PCUL NE	PCUL NE	0.23	0.28	0.38	All ND	All ND	All ND	PCUL NE	PCUL NE	PCUL NE	PCUL NE	Yes	n/a	n/a	n/a	n/a	n/a	n/a	Eliminated as a COPC	
2,3,4,6-Tetrachlorophenol	EPA 8270	mg/kg	5	0	0	0.020	0.040	PCUL NE	PCUL NE	PCUL NE	0.23	0.28	0.38	All ND	All ND	All ND	PCUL NE	PCUL NE	PCUL NE	PCUL NE	Yes	n/a	n/a	n/a	n/a	n/a	n/a	Eliminated as a COPC	
2,3,5,6-Tetrachlorophenol	EPA 8270	mg/kg	5	0	0	0.020	0.040	PCUL NE	PCUL NE	PCUL NE	0.23	0.28	0.38	All ND	All ND	All ND	PCUL NE	PCUL NE	PCUL NE	PCUL NE	Yes	n/a	n/a	n/a	n/a	n/a	n/a	Eliminated as a COPC	
1,2,4-Trichlorobenzene	EPA 8260 +EPA8270	mg/kg	10	0	0	0.020	0.040	0.031	0.062	0.31	0.0013	0.1400	0.3800	All ND	All ND	All ND	5	50	1	10	No	No	No	No	No	No	No	Eliminated as a COPC ⁷	
1,2,4-Trichlorobenzene	EPA 8260	mg/kg	5	0	0	0.001	0.003	0.031	0.062	0.31	0.0013	0.0022	0.0030	All ND	All ND	All ND	0	0	0	0	No	Yes	Yes	Yes	Yes	No	No	Eliminated as a COPC	
	EPA 8270	mg/kg	5	0	0	0.230	0.460	0.031	0.062	0.31	0.2300	0.2800	0.3800	All ND	All ND	All ND	5	100	1	20	No	No	No	No	No	No	No	Eliminated as a COPC ⁷	
2,4,5-Trichlorophenol	EPA 8270	mg/kg	5	0	0	0.020	0.040	17,000	34,000	170,000	0.23	0.28	0.38	All ND	All ND	All ND	0	0	0	0	No	Yes	Yes	Yes	No	No	No	Eliminated as a COPC	
2,4,6-Trichlorophenol	EPA 8270	mg/kg	5	0	0	0.020	0.040	78	156	780	0.23	0.28	0.38	All ND	All ND	All ND	0	0	0	0	No	Yes	Yes	Yes	No	No	No	Eliminated as a COPC	
Volatile Organic Compounds (VOCs)																													
Acetone	EPA 8260	mg/kg	5	5	100	0.0010	0.0020	PCUL NE	PCUL NE	PCUL NE	AD	AD	AD	0.098	0.32	0.67	PCUL NE	PCUL NE	All Detect	All Detect	Yes	n/a	n/a	n/a	n/a	n/a	n/a	n/a	Eliminated as a COPC
Benzene	EPA 8260	mg/kg	5	0	0	0.0010	0.0020	PCUL NE	PCUL NE	PCUL NE	0.0013	0.0021	0.0030	All ND	All ND	All ND	PCUL NE	PCUL NE	PCUL NE	PCUL NE	Yes	n/a	n/a	n/a	n/a	n/a	n/a	n/a	Eliminated as a COPC
Bromobenzene	EPA 8260	mg/kg	5	0	0	0.0010	0.0020	PCUL NE	PCUL NE	PCUL NE	0.0013	0.0021	0.0030	All ND	All ND	All ND	PCUL NE	PCUL NE	PCUL NE	PCUL NE	Yes	n/a	n/a	n/a	n/a	n/a	n/a	n/a	Eliminated as a COPC
Bromochloromethane	EPA 8260	mg/kg	5	0	0	0.0010	0.0020	PCUL NE	PCUL NE	PCUL NE	0.0013	0.0021	0.0030	All ND	All ND	All ND	PCUL NE	PCUL NE	PCUL NE	PCUL NE	Yes	n/a	n/a	n/a	n/a	n/a	n/a	n/a	Eliminated as a COPC
Bromoform (Tribromomethane)	EPA 8260	mg/kg	5	0	0	0.0010	0.0020	PCUL NE	PCUL NE	PCUL NE	0.0013	0.0021	0.0030	All ND	All ND	All ND	PCUL NE	PCUL NE	PCUL NE	PCUL NE	Yes	n/a	n/a	n/a	n/a	n/a	n/a	n/a	Eliminated as a COPC
Bromomethane	EPA 8260	mg/kg	5	0	0	0.0010	0.0020	PCUL NE	PCUL NE	PCUL NE	0.0013	0.0021	0.0030	All ND	All ND	All ND	PCUL NE	PCUL NE	PCUL NE	PCUL NE	Yes	n/a	n/a	n/a	n/a	n/a	n/a	n/a	Eliminated as a COPC
n-Butylbenzene	EPA 8260	mg/kg	5	0	0	0.0010	0.0020	PCUL NE	PCUL NE	PCUL NE	0.0013	0.0021	0.0030	All ND	All ND	All ND	PCUL NE	PCUL NE	PCUL NE	PCUL NE	Yes	n/a	n/a	n/a	n/a	n/a	n/a	n/a	Eliminated as a COPC
sec-Butylbenzene	EPA 8260	mg/kg	5	1	20	0.0010	0.0020	PCUL NE	PCUL NE	PCUL NE	0.0013	0.0020	0.0030	0.0061	0.0061	0.0061	PCUL NE	PCUL NE	PCUL NE	PCUL NE	Yes	n/a	n/a	n/a	n/a	n/a	n/a	n/a	Eliminated as a COPC
tert-Butylbenzene	EPA 8260	mg/kg	5	0	0	0.0010	0.0020	PCUL NE	PCUL NE	PCUL NE	0.0013	0.0021	0.0030	All ND	All ND	All ND	PCUL NE	PCUL NE	PCUL NE	PCUL NE	Yes	n/a	n/a	n/a	n/a	n/a	n/a	n/a	Eliminated as a COPC
Carbon disulfide	EPA 8260	mg/kg	5	4	80	0.0010	0.0020	PCUL NE	PCUL NE	PCUL NE	0.0018	0.0018	0.0018	0.0026	0.011	0.019	PCUL NE	PCUL NE	PCUL NE	PCUL NE	Yes	n/a	n/a	n/a	n/a	n/a	n/a	n/a	Eliminated as a COPC
Carbon tetrachloride	EPA 8260	mg/kg	5	0	0	0.0010	0.0020	PCUL NE	PCUL NE	PCUL NE	0.0013	0.0021	0.0030	All ND	All ND	All ND	PCUL NE	PCUL NE	PCUL NE	PCUL NE	Yes	n/a	n/a	n/a	n/a	n/a	n/a	n/a	Eliminated as a COPC
Chlorobenzene	EPA 8260	mg/kg	5	0	0	0.0010	0.0020	PCUL NE	PCUL NE	PCUL NE	0.0013	0.0021	0.0030	All ND	All ND	All ND	PCUL NE	PCUL NE	PCUL NE	PCUL NE	Yes	n/a	n/a	n/a	n/a	n/a	n/a	n/a	Eliminated as a COPC
Chloroethane	EPA 8260	mg/kg	5	0	0	0.0010	0.0020	PCUL NE	PCUL NE	PCUL NE	0.0065	0.010	0.015	All ND	All ND	All ND	PCUL NE	PCUL NE	PCUL NE	PCUL NE	Yes	n/a	n/a	n/a	n/a	n/a	n/a	n/a	Eliminated as a COPC
2-Chloroethyl vinyl ether	EPA 8260	mg/kg	5	0	0	0.0010	0.0020	PCUL NE	PCUL NE	PCUL NE	0.0065	0.010	0.015	All ND	All ND	All ND	PCUL NE	PCUL NE	PCUL NE	PCUL NE	Yes	n/a	n/a	n/a	n/a	n/a	n/a	n/a	Eliminated as a COPC
Chloroform	EPA 8260	mg/kg	5	0	0	0.0010	0.0020	PCUL NE	PCUL NE	PCUL NE	0.0013	0.0021	0.0030	All ND	All ND	All ND	PCUL NE	PCUL NE	PCUL NE	PCUL NE	Yes	n/a	n/a	n/a	n/a	n/a	n/a	n/a	Eliminated as a COPC
Chloromethane	EPA 8260	mg/kg	5	0	0	0.0010	0.0020	PCUL NE	PCUL NE	PCUL NE	0.0065	0.010	0.015	All ND	All ND	All ND	PCUL NE	PCUL NE	PCUL NE	PCUL NE	Yes	n/a	n/a	n/a	n/a	n/a	n/a	n/a	Eliminated as a COPC
2-Chlorotoluene	EPA 8260	mg/kg	5	0	0	0.0010	0.0020	PCUL NE	PCUL NE	PCUL NE	0.0013	0.0021	0.0030	All ND	All ND	All ND	PCUL NE	PCUL NE	PCUL NE	PCUL NE	Yes	n/a	n/a	n/a	n/a	n/a	n/a	n/a	Eliminated as a COPC
4-Chlorotoluene	EPA 8260	mg/kg	5	0	0	0.0010	0.0020	PCUL NE	PCUL NE	PCUL NE	0.0013	0.0021	0.0030	All ND	All ND	All ND	PCUL NE	PCUL NE	PCUL NE	PCUL NE	Yes	n/a	n/a	n/a	n/a	n/a	n/a	n/a	Eliminated as a COPC
Dibromochloromethane	EPA 8260	mg/kg	5	0	0	0.0010	0.0020	PCUL NE	PCUL NE	PCUL NE	0.0013	0.0021	0.0030	All ND	All ND	All ND	PCUL NE	PCUL NE	PCUL NE	PCUL NE	Yes	n/a	n/a	n/a	n/a	n/a	n/a	n/a	Eliminated as a COPC
1,2-Dibromo-3-chloropropane	EPA 8260	mg/kg	5	0	0	0.0010	0.0020	PCUL NE	PCUL NE	PCUL NE	0.0065	0.0100	0.0150	All ND	All ND	All ND	PCUL NE	PCUL NE	PCUL NE	PCUL NE	Yes	n/a	n/a	n/a	n/a	n/a	n/a	n/a	Eliminated as a COPC
Dibromomethane	EPA 8260	mg/kg	5	0	0	0.0010	0.0020	PCUL NE	PCUL NE	PCUL NE	0.0013	0.0021	0.0030	All ND	All ND	All ND	PCUL NE	PCUL NE	PCUL NE	PCUL NE	Yes	n/a	n/a	n/a	n/a	n/a	n/a	n/a	Eliminated as a COPC
Bromodichloromethane (Dichlorobromomethane)	EPA 8260	mg/kg	5	0	0	0.0010	0.0020	PCUL NE	PCUL NE	PCUL NE	0.0013	0.0021	0.0030	All ND	All ND	All ND	PCUL NE	PCUL NE	PCUL NE	PCUL NE	Yes	n/a	n/a	n/a	n/a	n/a	n/a	n/a	Eliminated as a COPC
Dichlorodifluoromethane (CFC-12)	EPA 8260	mg/kg	5	0	0	0.0010	0.0020	PCUL NE	PCUL NE	PCUL NE	0.0013	0.0021	0.0030	All ND	All ND	All ND	PCUL NE	PCUL NE	PCUL NE	PCUL NE	Yes	n/a	n/a	n/a	n/a	n/a	n/a	n/a	Eliminated as a COPC
1,1-Dichloroethane	EPA 8260	mg/kg	5	0	0	0.0010	0.0020	PCUL NE	PCUL NE	PCUL NE																			

Table 4-6
Catch Basin Solids Contaminants of Potential Concern
Port of Seattle - North Terminal 115
Seattle, Washington

Analyte	Analytical Method	Units	Frequency of Detection			Practical Quantitation Limit ¹ (PQL)		Preliminary Cleanup Level ² (PCUL)			Laboratory Reporting Limit (RL)			Detected Concentrations			Comparisons to PCUL		Comparisons to 10x PCUL		Chemical of Potential Concern (COPC) Selection Criteria ³							COPC Evaluation ⁴
			Total Number of Samples	Number of Detections	Frequency of Detection (Percent)	PQL	2X PQL	PCUL	2X PCUL	10X PCUL	Minimum	Average	Maximum	Minimum	Average	Maximum	Number of Detects and RLs > PCUL	Percentage of Detects and RLs > PCUL	Number of RLs > 10x PCUL	Percentage of RLs > 10x PCUL	1	2	3A	3B	3C	4A	4B	
Methyl tert-butyl ether (MTBE)	EPA 8260	mg/kg	5	0	0	0.0010	0.0020	PCUL NE	PCUL NE	PCUL NE	0.0013	0.0021	0.0030	All ND	All ND	All ND	PCUL NE	PCUL NE	PCUL NE	PCUL NE	Yes	n/a	n/a	n/a	n/a	n/a	n/a	Eliminated as a COPC
Methylene chloride	EPA 8260	mg/kg	5	0	0	0.0020	0.0040	PCUL NE	PCUL NE	PCUL NE	0.0065	0.010	0.015	All ND	All ND	All ND	PCUL NE	PCUL NE	PCUL NE	PCUL NE	Yes	n/a	n/a	n/a	n/a	n/a	n/a	Eliminated as a COPC
n-Propylbenzene	EPA 8260	mg/kg	5	2	40	0.0010	0.0020	PCUL NE	PCUL NE	PCUL NE	0.0013	0.0016	0.0018	0.0031	0.0034	0.0036	PCUL NE	PCUL NE	PCUL NE	PCUL NE	Yes	n/a	n/a	n/a	n/a	n/a	n/a	Eliminated as a COPC
Styrene	EPA 8260	mg/kg	5	1	20	0.0010	0.0020	PCUL NE	PCUL NE	PCUL NE	0.0013	0.0022	0.0030	0.0022	0.0022	0.0022	PCUL NE	PCUL NE	PCUL NE	PCUL NE	Yes	n/a	n/a	n/a	n/a	n/a	n/a	Eliminated as a COPC
1,1,1,2-Tetrachloroethane	EPA 8260	mg/kg	5	0	0	0.0010	0.0020	PCUL NE	PCUL NE	PCUL NE	0.0013	0.0021	0.0030	All ND	All ND	All ND	PCUL NE	PCUL NE	PCUL NE	PCUL NE	Yes	n/a	n/a	n/a	n/a	n/a	n/a	Eliminated as a COPC
1,1,2,2-Tetrachloroethane	EPA 8260	mg/kg	5	0	0	0.0010	0.0020	PCUL NE	PCUL NE	PCUL NE	0.0013	0.0021	0.0030	All ND	All ND	All ND	PCUL NE	PCUL NE	PCUL NE	PCUL NE	Yes	n/a	n/a	n/a	n/a	n/a	n/a	Eliminated as a COPC
Tetrachloroethene	EPA 8260	mg/kg	5	0	0	0.0010	0.0020	PCUL NE	PCUL NE	PCUL NE	0.0013	0.0021	0.0030	All ND	All ND	All ND	PCUL NE	PCUL NE	PCUL NE	PCUL NE	Yes	n/a	n/a	n/a	n/a	n/a	n/a	Eliminated as a COPC
Toluene	EPA 8260	mg/kg	5	3	60	0.0010	0.0020	PCUL NE	PCUL NE	PCUL NE	0.0065	0.0077	0.0089	0.021	0.30	0.83	PCUL NE	PCUL NE	PCUL NE	PCUL NE	Yes	n/a	n/a	n/a	n/a	n/a	n/a	Eliminated as a COPC
1,2,3-Trichlorobenzene	EPA 8260	mg/kg	5	0	0	0.0010	0.0020	PCUL NE	PCUL NE	PCUL NE	0.0013	0.0021	0.0030	All ND	All ND	All ND	PCUL NE	PCUL NE	PCUL NE	PCUL NE	Yes	n/a	n/a	n/a	n/a	n/a	n/a	Eliminated as a COPC
1,1,1-Trichloroethane	EPA 8260	mg/kg	5	0	0	0.0010	0.0020	PCUL NE	PCUL NE	PCUL NE	0.0013	0.0021	0.0030	All ND	All ND	All ND	PCUL NE	PCUL NE	PCUL NE	PCUL NE	Yes	n/a	n/a	n/a	n/a	n/a	n/a	Eliminated as a COPC
1,1,2-Trichloroethane	EPA 8260	mg/kg	5	0	0	0.0020	0.0040	PCUL NE	PCUL NE	PCUL NE	0.0013	0.0021	0.0030	All ND	All ND	All ND	PCUL NE	PCUL NE	PCUL NE	PCUL NE	Yes	n/a	n/a	n/a	n/a	n/a	n/a	Eliminated as a COPC
Trichloroethene	EPA 8260	mg/kg	5	0	0	0.0010	0.0020	PCUL NE	PCUL NE	PCUL NE	0.0013	0.0021	0.0030	All ND	All ND	All ND	PCUL NE	PCUL NE	PCUL NE	PCUL NE	Yes	n/a	n/a	n/a	n/a	n/a	n/a	Eliminated as a COPC
Trichlorofluoromethane (CFC-11)	EPA 8260	mg/kg	5	0	0	0.0010	0.0020	PCUL NE	PCUL NE	PCUL NE	0.0013	0.0021	0.0030	All ND	All ND	All ND	PCUL NE	PCUL NE	PCUL NE	PCUL NE	Yes	n/a	n/a	n/a	n/a	n/a	n/a	Eliminated as a COPC
1,2,3-Trichloropropane	EPA 8260	mg/kg	5	0	0	0.0020	0.0040	PCUL NE	PCUL NE	PCUL NE	0.0013	0.0021	0.0030	All ND	All ND	All ND	PCUL NE	PCUL NE	PCUL NE	PCUL NE	Yes	n/a	n/a	n/a	n/a	n/a	n/a	Eliminated as a COPC
1,2,4-Trimethylbenzene	EPA 8260	mg/kg	5	3	60	0.0010	0.0020	PCUL NE	PCUL NE	PCUL NE	0.0013	0.0016	0.0018	0.0071	0.015	0.031	PCUL NE	PCUL NE	PCUL NE	PCUL NE	Yes	n/a	n/a	n/a	n/a	n/a	n/a	Eliminated as a COPC
1,3,5-Trimethylbenzene	EPA 8260	mg/kg	5	3	60	0.0010	0.0020	PCUL NE	PCUL NE	PCUL NE	0.0013	0.0016	0.0018	0.0032	0.0084	0.018	PCUL NE	PCUL NE	PCUL NE	PCUL NE	Yes	n/a	n/a	n/a	n/a	n/a	n/a	Eliminated as a COPC
Vinyl acetate	EPA 8260	mg/kg	5	0	0	0.0010	0.0020	PCUL NE	PCUL NE	PCUL NE	0.0065	0.010	0.015	All ND	All ND	All ND	PCUL NE	PCUL NE	PCUL NE	PCUL NE	Yes	n/a	n/a	n/a	n/a	n/a	n/a	Eliminated as a COPC
Vinyl chloride	EPA 8260	mg/kg	5	0	0	0.0010	0.0020	PCUL NE	PCUL NE	PCUL NE	0.0013	0.0021	0.0030	All ND	All ND	All ND	PCUL NE	PCUL NE	PCUL NE	PCUL NE	Yes	n/a	n/a	n/a	n/a	n/a	n/a	Eliminated as a COPC
Xylene, m-,p-	EPA 8260	mg/kg	5	2	40	0.0010	0.0020	PCUL NE	PCUL NE	PCUL NE	0.0026	0.0040	0.0059	0.0046	0.011	0.018	PCUL NE	PCUL NE	PCUL NE	PCUL NE	Yes	n/a	n/a	n/a	n/a	n/a	n/a	Eliminated as a COPC
Xylene, o-	EPA 8260	mg/kg	5	2	40	0.0010	0.0020	PCUL NE	PCUL NE	PCUL NE	0.0013	0.0020	0.0030	0.0044	0.012	0.019	PCUL NE	PCUL NE	PCUL NE	PCUL NE	Yes	n/a	n/a	n/a	n/a	n/a	n/a	Eliminated as a COPC
Petroleum Hydrocarbons																												
Gasoline-range hydrocarbons	EPA 8260	mg/kg	5	0	0	5.0	10	PCUL NE	PCUL NE	PCUL NE	6.3	8.8	14	All ND	All ND	All ND	PCUL NE	PCUL NE	PCUL NE	PCUL NE	Yes	n/a	n/a	n/a	n/a	n/a	n/a	Eliminated as a COPC
Diesel-range hydrocarbons	EPA 8260	mg/kg	5	1	20	25	50	PCUL NE	PCUL NE	PCUL NE	690	980	1,500	1,100	1,100	1,100	PCUL NE	PCUL NE	PCUL NE	PCUL NE	Yes	n/a	n/a	n/a	n/a	n/a	n/a	Eliminated as a COPC
Oil-range hydrocarbons	EPA 8260	mg/kg	5	5	100	50	100	PCUL NE	PCUL NE	PCUL NE	AD	AD	AD	4,800	7,300	10,000	PCUL NE	PCUL NE	All Detect	All Detect	Yes	n/a	n/a	n/a	n/a	n/a	n/a	Eliminated as a COPC
Total diesel- and oil-range hydrocarbons	EPA 8260	mg/kg	5	5	100	50	100	PCUL NE	PCUL NE	PCUL NE	AD	AD	AD	4,800	7,400	11,100	PCUL NE	PCUL NE	All Detect	All Detect	Yes	n/a	n/a	n/a	n/a	n/a	n/a	Eliminated as a COPC

Notes:

¹ PQL from the North Terminal 115 (T115N) Remedial Investigation/Feasibility Study Work Plan (GeoEngineers, 2012) and is the lowest available value from OnSite Environmental, Inc. of Redmond, Washington.

² Lower tier target sediment concentrations. Obtained from Ecology's "LDW PCUL Workbook - Soil Summary" dated July 2019.

³ Chemical of Potential Concern (COPC) Selection Criteria:

- 1 - There is no PCUL in Ecology's CLARC Database.
- 2 - The maximum RL and maximum detected concentration are less than the PCUL.
- 3a - Analyte was not detected with a maximum RL less than 10 times the PCUL.
- 3b - Analyte was not detected with an average RL less than 10 times the PCUL **AND** less than 10 percent of the RLs are greater than 10 times the PCUL.
- 3c - Analyte was not detected with an average RL less than 2 times the PQL.
- 4a - Frequency of detection is less than 5 percent, the maximum RL is less than or equal to 10 times the PCUL **AND** the maximum detected concentration is less than or equal to 2 times the PCUL.
- 4b - Maximum detected concentration and maximum RL are less than 2 times the PCUL **AND** the less than or equal to 10 percent of the detected concentrations and RLs are greater than the PCUL.

⁴ Analyte eliminated as a COPC if "Yes" for any of the selection criterion.

⁵ Total LPAHs are the total of naphthalene, acenaphthylene, acenaphthene, fluorene, phenanthrene and anthracene; 2-methylnapthalene is not included in the sum of LPAHs.

⁶ Total HPAHs are the total of fluoranthene, pyrene, benzo(a)anthracene, chrysene, benzofluoranthenes, benzo(a)pyrene, indeno(1,2,3-c-d)pyrene, dibenzo(a,h)anthracene and benzo(g,h,i)perylene.

⁷ Eliminated as a COPC based on the EPA Method 8260 laboratory results.

All ND = Analyte was not detected in any sample

AD = Analyte was detected in any sample

COPC = Chemical of Potential Concern

mg/kg = Milligram per kilogram

ng/kg = Nanogram per kilogram

n/a = Not applicable

PCUL NE = Preliminary cleanup level not established

PQL = Practical quantitation limit

RL = Reporting limit

TEQ = toxic equivalence quotient

Table 4-7
Summary of Chemicals of Potential Concern
Port of Seattle - North Terminal 115
Seattle, Washington

Analytes	Chemical of Potential Concern (COPC) Evaluation		
	Soil	Groundwater	Catch Basin Solids
Polychlorinated Biphenyls (PCBs)			
Total PCBs	COPC ¹	COPC ¹	COPC ¹
Dioxins and Furans			
Total Dioxin/Furan TEQ	COPC ²	COPC	COPC
Metals			
Antimony	COPC	Eliminated as a COPC	Eliminated as a COPC
Arsenic	COPC	COPC	COPC
Barium	COPC	COPC	Eliminated as a COPC
Beryllium	Eliminated as a COPC	Eliminated as a COPC	Eliminated as a COPC
Cadmium	COPC	COPC	Eliminated as a COPC
Chromium III / Total	COPC ³	COPC ³	Eliminated as a COPC
Chromium VI	Eliminated as a COPC	Eliminated as a COPC	Eliminated as a COPC
Copper	COPC	COPC	COPC
Lead	COPC	COPC	Eliminated as a COPC
Mercury	COPC	COPC	Eliminated as a COPC
Nickel	COPC	COPC	Eliminated as a COPC
Selenium	COPC	Eliminated as a COPC	Eliminated as a COPC
Silver	COPC	COPC	Eliminated as a COPC
Thallium	COPC	COPC ⁴	Eliminated as a COPC
Tin	COPC	Eliminated as a COPC	Eliminated as a COPC
Zinc	COPC	COPC	COPC
Semi-Volatile Organic Compounds (SVOCs) - Polycyclic Aromatic Hydrocarbons (PAHs)			
Acenaphthene	COPC	COPC	Eliminated as a COPC
Acenaphthylene	Eliminated as a COPC	Eliminated as a COPC	Eliminated as a COPC
Anthracene	COPC	COPC ⁵	Eliminated as a COPC
Benzo(a)anthracene	COPC	COPC	COPC
Benzo(b)fluoranthene	COPC	COPC	Eliminated as a COPC
Benzo(k)fluoranthene	COPC	COPC	Eliminated as a COPC
Benzo(g,h,i)perylene	Eliminated as a COPC	Eliminated as a COPC	COPC
Benzo(a)pyrene	COPC	COPC	Eliminated as a COPC
Chrysene	COPC	COPC	COPC
Dibenzo(a,h)anthracene	COPC	COPC	COPC
Dibenzofuran	COPC	Eliminated as a COPC	Eliminated as a COPC
Fluoranthene	COPC	COPC ⁵	COPC
Fluorene	COPC	COPC ⁵	Eliminated as a COPC
Indeno(1,2,3-c,d)pyrene	COPC	COPC	COPC
1-Methylnaphthalene	COPC ⁶	COPC	Eliminated as a COPC
2-Methylnaphthalene	COPC	Eliminated as a COPC	Eliminated as a COPC
Naphthalene	COPC	COPC	Eliminated as a COPC
Phenanthrene	Eliminated as a COPC	Eliminated as a COPC	Eliminated as a COPC
Pyrene	COPC	COPC	Eliminated as a COPC
Total LPAH ⁵	--	--	Eliminated as a COPC
Total HPAH ⁶	--	--	COPC
Total cPAH TEQ	COPC	COPC	COPC
Other SVOCs			
Aniline	COPC ⁶	COPC	Eliminated as a COPC
Benzidine	Eliminated as a COPC ⁷	Eliminated as a COPC ⁷	Eliminated as a COPC
Benzoic acid	Eliminated as a COPC	Eliminated as a COPC	Eliminated as a COPC
Benzyl alcohol	Eliminated as a COPC	Eliminated as a COPC	Eliminated as a COPC
Bis(2-chloroethoxy)methane	Eliminated as a COPC	Eliminated as a COPC	Eliminated as a COPC
Bis(2-chloroethyl)ether	COPC ⁶	COPC	Eliminated as a COPC
Bis(2-chloroisopropyl)ether	Eliminated as a COPC	Eliminated as a COPC	Eliminated as a COPC
Bis(2-ethylhexyl)phthalate	COPC	COPC	COPC
4-Bromophenyl phenyl ether	Eliminated as a COPC	Eliminated as a COPC	Eliminated as a COPC
Butyl benzyl phthalate	COPC	COPC	COPC
Carbazole	Eliminated as a COPC	Eliminated as a COPC	Eliminated as a COPC
4-Chloroaniline	Eliminated as a COPC	Eliminated as a COPC	Eliminated as a COPC
4-Chloro-3-methylphenol	Eliminated as a COPC	Eliminated as a COPC	Eliminated as a COPC
2-Chloronaphthalene	Eliminated as a COPC	Eliminated as a COPC	Eliminated as a COPC
2-Chlorophenol	Eliminated as a COPC ⁷	Eliminated as a COPC	Eliminated as a COPC
4-Chlorophenyl-phenylether	Eliminated as a COPC	Eliminated as a COPC	Eliminated as a COPC
Decane	Eliminated as a COPC	Eliminated as a COPC	Eliminated as a COPC
Dibutyl phthalate	Eliminated as a COPC ⁷	Eliminated as a COPC ⁷	Eliminated as a COPC
2,3-Dichloroaniline	Eliminated as a COPC	Eliminated as a COPC	Eliminated as a COPC
1,2-Dichlorobenzene (o-Dichlorobenzene)	Eliminated as a COPC ⁷	Eliminated as a COPC	Eliminated as a COPC
1,3-Dichlorobenzene (m-Dichlorobenzene)	Eliminated as a COPC ⁷	Eliminated as a COPC	Eliminated as a COPC
1,4-Dichlorobenzene (p-Dichlorobenzene)	Eliminated as a COPC ⁷	Eliminated as a COPC	Eliminated as a COPC
3,3'-Dichlorobenzidine	COPC	Eliminated as a COPC ⁷	Eliminated as a COPC
2,4-Dichlorophenol	COPC ⁶	COPC ⁵	Eliminated as a COPC
Bis(2-ethylhexyl)ester	Eliminated as a COPC	Eliminated as a COPC	Eliminated as a COPC
Diethyl phthalate	COPC ⁶	COPC ⁵	Eliminated as a COPC
Dimethyl phthalate	Eliminated as a COPC	Eliminated as a COPC	Eliminated as a COPC
2,4-Dimethylphenol	COPC ⁶	COPC ⁵	COPC

Table 4-7
Summary of Chemicals of Potential Concern
Port of Seattle - North Terminal 115
Seattle, Washington

Analytes	Chemical of Potential Concern (COPC) Evaluation		
	Soil	Groundwater	Catch Basin Solids
o-Dinitrobenzene	Eliminated as a COPC	Eliminated as a COPC	Eliminated as a COPC
1,3-Dinitrobenzene	Eliminated as a COPC	Eliminated as a COPC	Eliminated as a COPC
1,4-Dinitrobenzene	Eliminated as a COPC	Eliminated as a COPC	Eliminated as a COPC
4,6-Dinitro-2-methylphenol	Eliminated as a COPC	Eliminated as a COPC	Eliminated as a COPC
2,4-Dinitrophenol	Eliminated as a COPC	Eliminated as a COPC	Eliminated as a COPC
2,4-Dinitrotoluene	Eliminated as a COPC	Eliminated as a COPC ⁷	Eliminated as a COPC
2,6-Dinitrotoluene	Eliminated as a COPC	Eliminated as a COPC	Eliminated as a COPC
Di-n-octyl phthalate	Eliminated as a COPC	Eliminated as a COPC ⁷	Eliminated as a COPC
1,2-Diphenylhydrazine	Eliminated as a COPC	Eliminated as a COPC ⁷	Eliminated as a COPC
Hexachlorobenzene	Eliminated as a COPC	Eliminated as a COPC ⁷	COPC
Hexachlorobutadiene	Eliminated as a COPC	Eliminated as a COPC ⁷	Eliminated as a COPC
Hexachlorocyclopentadiene	Eliminated as a COPC ⁷	Eliminated as a COPC	Eliminated as a COPC
Hexachloroethane	Eliminated as a COPC	Eliminated as a COPC ⁷	Eliminated as a COPC
Isophorone	Eliminated as a COPC	Eliminated as a COPC	Eliminated as a COPC
2-methylphenol (o-Cresol)	COPC	COPC	Eliminated as a COPC
3 & 4 Methylphenol (m-, p-Cresol)	Eliminated as a COPC	Eliminated as a COPC	COPC
2-Nitroaniline	Eliminated as a COPC	Eliminated as a COPC	Eliminated as a COPC
3-Nitroaniline	Eliminated as a COPC	Eliminated as a COPC	Eliminated as a COPC
4-Nitroaniline	Eliminated as a COPC	Eliminated as a COPC	Eliminated as a COPC
Nitrobenzene	Eliminated as a COPC	Eliminated as a COPC	Eliminated as a COPC
2-Nitrophenol	Eliminated as a COPC	Eliminated as a COPC	Eliminated as a COPC
4-Nitrophenol (p-Nitrophenol)	Eliminated as a COPC	Eliminated as a COPC	Eliminated as a COPC
n-Nitrosodimethylamine	COPC ⁶	COPC	COPC
n-Nitrosodiphenylamine (as diphenylamine)	COPC ⁶	COPC	COPC
n-Nitrosodi-n-propylamine	COPC ⁶	COPC	Eliminated as a COPC
n-Octadecane	Eliminated as a COPC	Eliminated as a COPC	Eliminated as a COPC
Pentachlorophenol	COPC	COPC	Eliminated as a COPC
Phenol	COPC	COPC ⁵	Eliminated as a COPC
Pyridine	Eliminated as a COPC	Eliminated as a COPC	Eliminated as a COPC
2,3,4,6-Tetrachlorophenol	Eliminated as a COPC	Eliminated as a COPC	Eliminated as a COPC
2,3,5,6-Tetrachlorophenol	Eliminated as a COPC	Eliminated as a COPC	Eliminated as a COPC
1,2,4-Trichlorobenzene	Eliminated as a COPC ⁷	Eliminated as a COPC ⁷	Eliminated as a COPC
2,4,5-Trichlorophenol	Eliminated as a COPC	Eliminated as a COPC	Eliminated as a COPC
2,4,6-Trichlorophenol	COPC ⁶	COPC	Eliminated as a COPC
Volatile Organic Compounds (VOCs)			
Acetone	Eliminated as a COPC	Eliminated as a COPC	Eliminated as a COPC
Benzene	COPC	COPC	Eliminated as a COPC
Bromobenzene	Eliminated as a COPC	Eliminated as a COPC	Eliminated as a COPC
Bromochloromethane	Eliminated as a COPC	Eliminated as a COPC	Eliminated as a COPC
Bromoform (Tribromomethane)	Eliminated as a COPC	Eliminated as a COPC	Eliminated as a COPC
Bromomethane	Eliminated as a COPC	Eliminated as a COPC	Eliminated as a COPC
n-Butylbenzene	Eliminated as a COPC	Eliminated as a COPC	Eliminated as a COPC
sec-Butylbenzene	Eliminated as a COPC	Eliminated as a COPC	Eliminated as a COPC
tert-Butylbenzene	Eliminated as a COPC	Eliminated as a COPC	Eliminated as a COPC
Carbon disulfide	Eliminated as a COPC	Eliminated as a COPC	Eliminated as a COPC
Carbon tetrachloride	Eliminated as a COPC	Eliminated as a COPC	Eliminated as a COPC
Chlorobenzene	Eliminated as a COPC	Eliminated as a COPC	Eliminated as a COPC
Chloroethane	Eliminated as a COPC	Eliminated as a COPC	Eliminated as a COPC
2-Chloroethyl vinyl ether	Eliminated as a COPC	Eliminated as a COPC	Eliminated as a COPC
Chloroform	COPC ⁸	COPC	Eliminated as a COPC
Chloromethane	Eliminated as a COPC	Eliminated as a COPC	Eliminated as a COPC
2-Chlorotoluene	Eliminated as a COPC	Eliminated as a COPC	Eliminated as a COPC
4-Chlorotoluene	Eliminated as a COPC	Eliminated as a COPC	Eliminated as a COPC
Dibromochloromethane	Eliminated as a COPC	Eliminated as a COPC	Eliminated as a COPC
1,2-Dibromo-3-chloropropane	Eliminated as a COPC	Eliminated as a COPC ⁷	Eliminated as a COPC
Dibromomethane	Eliminated as a COPC	Eliminated as a COPC	Eliminated as a COPC
Bromodichloromethane (dichlorobromomethane)	Eliminated as a COPC	Eliminated as a COPC	Eliminated as a COPC
Dichlorodifluoromethane (CFC-12)	Eliminated as a COPC	Eliminated as a COPC	Eliminated as a COPC
1,1-Dichloroethane	Eliminated as a COPC	Eliminated as a COPC	Eliminated as a COPC
1,2-Dichloroethane	Eliminated as a COPC	Eliminated as a COPC	Eliminated as a COPC
1,1-Dichloroethene	Eliminated as a COPC	Eliminated as a COPC	Eliminated as a COPC
cis-1,2-Dichloroethene	Eliminated as a COPC	Eliminated as a COPC	Eliminated as a COPC
trans-1,2-Dichloroethene	Eliminated as a COPC	Eliminated as a COPC	Eliminated as a COPC
1,2-Dichloropropane	Eliminated as a COPC	Eliminated as a COPC	Eliminated as a COPC
1,3-Dichloropropane	Eliminated as a COPC	Eliminated as a COPC	Eliminated as a COPC
2,2-Dichloropropane	Eliminated as a COPC	Eliminated as a COPC	Eliminated as a COPC
1,1-Dichloropropene	Eliminated as a COPC	Eliminated as a COPC	Eliminated as a COPC
cis-1,3-Dichloropropene	Eliminated as a COPC	Eliminated as a COPC	Eliminated as a COPC
trans-1,3-Dichloropropene	Eliminated as a COPC	Eliminated as a COPC	Eliminated as a COPC
Ethylbenzene	Eliminated as a COPC	Eliminated as a COPC	Eliminated as a COPC
1,2-Dibromoethane (EDB)	Eliminated as a COPC	Eliminated as a COPC	Eliminated as a COPC
2-Hexanone	Eliminated as a COPC	Eliminated as a COPC	Eliminated as a COPC

Table 4-7
Summary of Chemicals of Potential Concern
Port of Seattle - North Terminal 115
Seattle, Washington

Analytes	Chemical of Potential Concern (COPC) Evaluation		
	Soil	Groundwater	Catch Basin Solids
Isopropylbenzene (Cumene)	Eliminated as a COPC	Eliminated as a COPC	Eliminated as a COPC
p-Isopropyltoluene	Eliminated as a COPC	Eliminated as a COPC	Eliminated as a COPC
2-Butanone (MEK)	Eliminated as a COPC	Eliminated as a COPC	Eliminated as a COPC
Methyl iodide (Iodomethane)	Eliminated as a COPC	Eliminated as a COPC	Eliminated as a COPC
4-Methyl-2-pentanone (Methyl isobutyl ketone)	Eliminated as a COPC	Eliminated as a COPC	Eliminated as a COPC
Methyl tert-butyl ether (MTBE)	Eliminated as a COPC	Eliminated as a COPC	Eliminated as a COPC
Methylene chloride	Eliminated as a COPC	Eliminated as a COPC	Eliminated as a COPC
n-Propylbenzene	Eliminated as a COPC	Eliminated as a COPC	Eliminated as a COPC
Styrene	Eliminated as a COPC	Eliminated as a COPC	Eliminated as a COPC
1,1,1,2-Tetrachloroethane	Eliminated as a COPC	Eliminated as a COPC	Eliminated as a COPC
1,1,2,2-Tetrachloroethane	Eliminated as a COPC	Eliminated as a COPC	Eliminated as a COPC
Tetrachloroethene	Eliminated as a COPC	Eliminated as a COPC	Eliminated as a COPC
Toluene	Eliminated as a COPC	Eliminated as a COPC	Eliminated as a COPC
1,2,3-Trichlorobenzene	Eliminated as a COPC	Eliminated as a COPC	Eliminated as a COPC
1,1,1-Trichloroethane	Eliminated as a COPC	Eliminated as a COPC	Eliminated as a COPC
1,1,2-Trichloroethane	Eliminated as a COPC	Eliminated as a COPC	Eliminated as a COPC
Trichloroethene	Eliminated as a COPC	Eliminated as a COPC	Eliminated as a COPC
Trichlorofluoromethane (CFC-11)	Eliminated as a COPC	Eliminated as a COPC	Eliminated as a COPC
1,2,3-Trichloropropane	Eliminated as a COPC	Eliminated as a COPC	Eliminated as a COPC
1,2,4-Trimethylbenzene	Eliminated as a COPC	Eliminated as a COPC	Eliminated as a COPC
1,3,5-Trimethylbenzene	Eliminated as a COPC	Eliminated as a COPC	Eliminated as a COPC
Vinyl acetate	Eliminated as a COPC	Eliminated as a COPC	Eliminated as a COPC
Vinyl chloride	Eliminated as a COPC	Eliminated as a COPC ⁹	Eliminated as a COPC
Xylene, m-,p-	Eliminated as a COPC	Eliminated as a COPC	Eliminated as a COPC
Xylene, o-	Eliminated as a COPC	Eliminated as a COPC	Eliminated as a COPC
Petroleum Hydrocarbons			
Gasoline-range hydrocarbons	COPC ¹⁰	COPC ¹⁰	Eliminated as a COPC
Diesel-range hydrocarbons	COPC ⁶	COPC	Eliminated as a COPC
Oil-range hydrocarbons	COPC ⁶	COPC	Eliminated as a COPC
Total diesel- and oil-range hydrocarbons	COPC	COPC	Eliminated as a COPC
COPCs Per Matrix	54	47	19

Notes:

¹ PCB Aroclors also retained as COPC based on total PCB selection criteria.

² Retained as COPC as dioxins/furans are COC for Lower Duwamish Waterway (LDW) and Glacier NW Site and maximum concentration exceeds simplified TEE screening level (3 ng/kg) as stated in Ecology email dated May 20, 2019.

³ Chromium VI identified as COPC by Ecology as no chromium VI speciation has been performed to eliminate it.

⁴ Thallium retained as COPC based on PQL (2.0 µg/L) being higher than median attainable PQL (0.005 µg/L) identified by Ecology in laboratory surveys.

⁵ Compound retained as COPC as Ecology stated further evaluation needed to assess whether COPC based on differences in datasets in email dated May 20, 2019.

⁶ Identified as a groundwater COPC, therefore retained as a soil COPC for further evaluation.

⁷ Compound eliminated as COPC based on no or few detections close to or below the PCULs and average reporting limits similar to best achievable PQLs found in laboratory surveys as stated in Ecology email dated May 20, 2019.

⁸ Retained as COPC as chloroform is a COPC for groundwater and additional evaluation is requested by Ecology as stated in Ecology email dated May 20, 2019.

⁹ Compound eliminated as COPC as it was never detected and PCE and TCE are not COPCs in soil or groundwater as stated in Ecology email dated May 20, 2019.

¹⁰ Retained as COPC pending evaluation of whether there is a localized area of detections as stated in Ecology email dated May 20, 2019.

 Green shading indicates soil COPC is proposed to be re-evaluated or eliminated as part of the FS based on Weight of Evidence (WOE) evaluation, including one or more of the following:

- COPC not detected greater than the PCUL and is proposed for elimination as a groundwater COPC.
- COPC concentrations are background concentrations.
- PQL for COPC exceeded the PCUL. however, the PQL met the requirements of the RI/FS Work Plan and the PQL was similar to currently available PQLs.
- PCUL for protection of terrestrial ecological receptors is not applicable base on results of the simplified TEE.
- PCUL for protection of surface water via groundwater is not applicable based on investigation results indicating that groundwater to surface water pathway is incomplete.
- PCUL for protection of sediment via groundwater is not applicable based on investigation results indicating that the COPC is not contributing to contamination identified in Glacier Bay (i.e., COPC does not exceed Target Sediment Concentration in Glacier Bay sediment).

 Groundwater COPC is proposed for re-evaluation or elimination as part of the FS based on WOE evaluation, including one or more of the following:

- COPC is not detected or is infrequently detected at a concentration greater than the PCUL.
- COPC concentrations are background concentrations.
- PQL for COPC exceeded the PCUL. however, the PQL met the requirements of the RI/FS Work Plan and the PQL was similar to currently available PQLs.
- Investigation results indicate that COPC is from an off-site source.
- Investigation results indicate that groundwater to surface water transport pathway is incomplete.
- Investigation results indicate that groundwater to sediment transport pathway is incomplete.
- PCUL based on protection of potable groundwater. Groundwater at the Site is non-potable, therefore PCUL based on protection of potable water in not applicable. Proposed to be re-evaluated for protection of non-potable groundwater.

 Catch basin solids COPC is proposed for re-evaluation or elimination based on WOE evaluation, including one or more of the following:

- The results of the investigation indicate that the Site is not a source for the identified COPC.
- The results of the investigation indicate that COPC identified in catch basin solids are not contributing to contamination identified in the LDW.

COPC = Chemical of Potential Concern
TEQ = toxic equivalence quotient
-- = Not analyzed

Table 5-1
Tidal Effects on Groundwater
Port of Seattle - North Terminal 115
Seattle, Washington

Monitoring Well ¹	Distance from Shoreline ² (feet)	Ground-Surface Elevation (feet)	Screen Top Depth (feet)	Screen Bottom Depth (feet)	Well Screen Midpoint Elevation (feet)	Well Screen Length (feet)	Mean Groundwater Elevation (feet)	Tidal Study Result ³	
								Time Lag ⁴ (hours)	Stage Ratio (percent)
Shallow Monitoring Wells									
MW-7	247	17.91	7.50	12.50	7.9	5.0	12.67	Indeterminate	1.8
MW-9	54	16.71	11.50	15.50	3.2	4.0	4.95	3.8	16
MW-10	65	16.31	7.00	11.50	7.1	4.5	10.03	Indeterminate	< 1
MW-12	352	16.95	2.31	10.30	10.6	8.0	8.69	Indeterminate	0.6
MW-13	262	16.65	2.50	11.22	9.8	8.7	8.85	Indeterminate	< 1
MW-14	175	16.08	2.60	8.60	10.5	6.0	8.04	Indeterminate	2
MW-15	223	18.27	2.55	12.55	10.7	10.0	14.66	Indeterminate ⁵	5.3
MW-16	166	18.24	3.52	10.52	11.2	7.0	14.59	Indeterminate	2.7
MW-18	123	18.44	9.25	19.25	4.2	10.0	11.89	Indeterminate	1.8
MW-19	215	18.59	2.82	12.82	10.8	10.0	12.79	Indeterminate	1.6
GMW-26	90	16.61	5.00	15.00	6.6	10.0	8.23	Indeterminate	1
GMW-27	24	16.73	5.00	15.00	6.7	10.0	5.11	3.1	10
Deep Monitoring Wells									
MW-2D	440	18.45	18.80	28.80	-5.4	10.0	5.20	2.6	18
MW-4D	198	15.86	19.82	29.82	-9.0	10.0	5.10	1.8	21
MW-10D	68	16.34	20.90	30.90	-9.6	10.0	5.00	1.3	26

Notes:

¹ Monitoring wells are shown on Figures 5-5 and 5-7.

² Distance is from the well to the nearest shoreline area.

³ The tidal study was performed between May 16 and May 19, 2014. Details regarding the tidal study are presented in Appendix H.

⁴ Time lag is considered indeterminate when the Stage Ratio is below the selected threshold of significance of 3%.

⁵ Observed water level change determined not to be the result of river height changes in the LDW.

Table 5-2
Estimated Hydraulic Conductivity
Port of Seattle - North Terminal 115
Seattle, Washington

Monitoring Well ¹	Hydraulic Conductivity (K, ft/day)	Hydraulic Test Procedure ²
Shallow Monitoring Well		
MW-11	0.26	Slug Test
MW-12	3.20	Slug Test
MW-13	2.50	Slug Test
MW-15	0.18	Slug Test
MW-16	0.21	Slug Test
MW-17	1.10	Slug Test
Geometric Mean	0.67	--
Standard Deviation	1.31	--
Bulk Shallow Aquifer	Inconclusive	Tidal study
Deep Monitoring Well		
MW-4D	75	Slug Test
Bulk Deep Aquifer	111	Tidal study

Notes:

¹ Hydraulic conductivities were calculated for slug tests using Bouwer and Rice (1976) or Butler and Garnett (2000). Hydraulic conductivity values for tidal study were calculated from Ferris (1946) method by converting average diffusivity (T/S) value calculated from tidal response to K values using assumed aquifer thickness of 30 feet for the deep aquifer.

² Procedures for the hydraulic conductivity test are presented in Appendix I.

K = Hydraulic conductivity

ft/day = feet per day

Table 5-3
Remedial Investigation Chemical Analytical Results - Soil COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Sample Location ¹	Analytical Method	Units	MST-1	MST-2	MST-3	DP-1			TP-01		TP-02				Soil Preliminary Cleanup Level ² (PCUL)
Sample Identification			MST-1	MST-2	MST-3	DP-1- (0.5-1)	DP-1- (6-7)	DP-1- (8.5-9.5)	TP01-1-2	TP01-3-4	TP02-1-2	TP02-3-4	TP02-4-5	TP02-7-8	
Sample Date			11/07/97	11/07/97	11/07/97	10/29/09	10/29/09	10/29/09	12/04/13	12/04/13	12/04/13	12/04/13	12/04/13	12/23/13	
Sample Depth			6 inches	5 inches	16 inches	0.5 - 1 ft	6 - 7 ft	8.5 - 9.5 ft	1 - 2 ft	3 - 4 ft	1 - 2 ft	3 - 4 ft	4 - 5 ft	7 - 8 ft	
Stratigraphic Horizon			FO	FO	FO	FO	FI	FI	FO	FI	FO	FO	FI	FI	
Sampled By	KCHD	KCHD	KCHD	Landau	Landau	Landau	GEI	GEI	GEI	GEI	GEI	GEI	GEI		
Polychlorinated Biphenyls (PCBs)															
Total PCB Aroclors	EPA 8082	mg/kg	--	--	--	0.054 U	0.068 U	0.068 U	0.028 U	--	--	--	--	--	0.0000022
Dioxins and Furans															
Total Dioxin/Furan TEQ ³ (ND=0.5RL)	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	0.0000052
Total Dioxin/Furan TEQ ³ (ND=0.5RL)	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	0.0000052
Metals															
Antimony	EPA 6000/7000	mg/kg	--	--	--	5.4 U	6.8 U	6.7 U	5.0 U	5.0 U	5.0 U	--	5.0 U	5.0 U	4.1
Arsenic	EPA 6000/7000	mg/kg	11 U	11 U	12 U	5.4 U	6.8 U	6.7 U	3.7	7.5	16	--	4.3	1.4	7.0
Barium	EPA 6000/7000	mg/kg	120	32	19	--	--	--	41	92	120	--	130	77	8.3
Cadmium	EPA 6000/7000	mg/kg	0.98	0.69	0.59 U	1.2	0.68 U	0.67 U	0.20 U	0.20 U	0.26	--	0.20 U	0.20 U	1.0
Chromium III / Total	EPA 6000/7000	mg/kg	22	33	8.4	72	46	54	31	44	58	--	65	12	48
Chromium VI	EPA 6000/7000	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	18
Copper	EPA 6000/7000	mg/kg	--	--	--	110	29	31	63	26	40	--	33	26	36
Lead	EPA 6000/7000	mg/kg	470	110	36	220	5.5	6	57	21	19	--	5.5	5.2	50
Mercury	EPA 6000/7000	mg/kg	0.29 U	0.27 U	0.29 U	0.11	0.068 U	0.067 U	0.050 U	0.058	0.071	--	0.050 U	0.053	0.070
Nickel	EPA 6000/7000	mg/kg	--	--	--	35	63	58	30	49	60	--	65	13	48
Selenium	EPA 6000/7000	mg/kg	11 U	11 U	12 U	11 U	14 U	13 U	0.50 U	0.50 U	0.74	--	0.51	0.50 U	0.30
Silver	EPA 6000/7000	mg/kg	0.57 U	0.54 U	0.59 U	0.54 U	0.68 U	0.67 U	0.50 U	0.50 U	0.50 U	--	0.50 U	0.50 U	0.016
Thallium	EPA 6000/7000	mg/kg	--	--	--	5.4 U	6.8 U	6.7 U	0.25 U	0.25 U	0.25 U	--	0.25 U	0.25 U	0.0044
Tin	EPA 6000/7000	mg/kg	550	880	170	780	3	1.3 U	350	740	24	--	7.4	2.1	50
Zinc	EPA 6000/7000	mg/kg	310	330	76	1,400	57	66	130	71	76	--	64	76	85
Semi-Volatile Organic Compounds (SVOCs) - Polycyclic Aromatic Hydrocarbons (PAHs)															
Acenaphthene	EPA 8270/SIM	mg/kg	--	--	--	0.88	0.009 U	0.009 U	0.013	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.028
Anthracene	EPA 8270/SIM	mg/kg	--	--	--	0.36	0.009 U	0.009 U	0.021	0.0067 U	0.01	0.0067 U	0.0067 U	0.0067 U	0.051
Benzo(a)anthracene	EPA 8270/SIM	mg/kg	--	--	--	0.41	0.009 U	0.009 U	0.017	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.000057
Benzo(b)fluoranthene	EPA 8270/SIM	mg/kg	--	--	--	0.74	0.009 U	0.009 U	0.031	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.00020
Benzo(k)fluoranthene	EPA 8270/SIM	mg/kg	--	--	--	0.19	0.009 U	0.009 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0020
Benzo(a)pyrene	EPA 8270/SIM	mg/kg	--	--	--	0.35	0.009 U	0.009 U	0.02	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.000016
Chrysene	EPA 8270/SIM	mg/kg	--	--	--	0.69	0.009 U	0.009 U	0.022	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0064
Dibenzo(a,h)anthracene	EPA 8270/SIM	mg/kg	--	--	--	0.055	0.009 U	0.009 U	0.0071	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.000029
Dibenzofuran	EPA 8270/SIM	mg/kg	--	--	--	0.33	0.045 U	0.045 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.54
Fluoranthene	EPA 8270/SIM	mg/kg	--	--	--	1.9	0.009 U	0.009 U	0.05	0.0067 U	0.008	0.0067 U	0.0067 U	0.0067 U	0.090
Fluorene	EPA 8270/SIM	mg/kg	--	--	--	0.55	0.009 U	0.009 U	0.01	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.029
Indeno(1,2,3-c,d)pyrene	EPA 8270/SIM	mg/kg	--	--	--	0.15	0.009 U	0.009 U	0.014	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.00056
1-Methylnaphthalene	EPA 8270/SIM	mg/kg	--	--	--	0.078	0.009 U	0.009 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	29
2-Methylnaphthalene	EPA 8270/SIM	mg/kg	--	--	--	0.13	0.009 U	0.009 U	0.008	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.67
Naphthalene	EPA 8270/SIM	mg/kg	--	--	--	0.077	0.009 U	0.009 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0021
Pyrene	EPA 8270/SIM	mg/kg	--	--	--	2.4	0.009 U	0.009 U	0.053	0.0067 U	0.0087	0.0067 U	0.0073	0.0067 U	0.14
Total cPAH TEQ ⁴ (ND=0)	EPA 8270/SIM	mg/kg	--	--	--	0.51	0 U	0 U	0.027	0 U	0 U	0 U	0 U	0 U	0.000016
Total cPAH TEQ ⁴ (ND=0.5RL)	EPA 8270/SIM	mg/kg	--	--	--	0.51	0.0068 U	0.0068 U	0.027	0.0051 U	0.0051 U	0.0051 U	0.0051 U	0.0051 U	0.000016

Table 5-3
Remedial Investigation Chemical Analytical Results - Soil COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Sample Location ¹	Analytical Method	Units	MST-1	MST-2	MST-3	DP-1			TP-01		TP-02				Soil Preliminary Cleanup Level ² (PCUL)
Sample Identification			MST-1	MST-2	MST-3	DP-1- (0.5-1)	DP-1- (6-7)	DP-1- (8.5-9.5)	TP01-1-2	TP01-3-4	TP02-1-2	TP02-3-4	TP02-4-5	TP02-7-8	
Sample Date			11/07/97	11/07/97	11/07/97	10/29/09	10/29/09	10/29/09	12/04/13	12/04/13	12/04/13	12/04/13	12/04/13	12/23/13	
Sample Depth			6 inches	5 inches	16 inches	0.5 - 1 ft	6 - 7 ft	8.5 - 9.5 ft	1 - 2 ft	3 - 4 ft	1 - 2 ft	3 - 4 ft	4 - 5 ft	7 - 8 ft	
Stratigraphic Horizon			FO	FO	FO	FO	FI	FI	FO	FI	FO	FO	FI	FI	
Sampled By			KCHD	KCHD	KCHD	Landau	Landau	Landau	GEI	GEI	GEI	GEI	GEI	GEI	
Other SVOCs															
Aniline	EPA 8270	mg/kg	--	--	--	0.18 U	0.045 U	0.045 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	150
Bis(2-chloroethyl)ether	EPA 8270	mg/kg	--	--	--	0.18 U	0.045 U	0.045 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.000022
Bis(2-ethylhexyl)phthalate	EPA 8270	mg/kg	--	--	--	0.18	0.045 U	0.045 U	0.41	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.0051
Butyl benzyl phthalate	EPA 8270	mg/kg	--	--	--	0.18 U	0.045 U	0.045 U	0.023	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.00018
3,3'-Dichlorobenzidine	EPA 8270	mg/kg	--	--	--	1.8 U	0.45 U	0.45 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.0000033
2,4-Dichlorophenol	EPA 8270	mg/kg	--	--	--	0.18 U	0.045 U	0.045 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.0043
Diethyl phthalate	EPA 8270	mg/kg	--	--	--	0.18 U	0.045 U	0.045 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.034
2,4-Dimethylphenol	EPA 8270	mg/kg	--	--	--	0.18 U	0.045 U	0.045 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.0031
2-Methylphenol (o-Cresol)	EPA 8270	mg/kg	--	--	--	0.18 U	0.045 U	0.045 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.010
n-Nitrosodimethylamine	EPA 8270	mg/kg	--	--	--	0.18 U	0.045 U	0.045 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017
n-Nitrosodiphenylamine (as Diphenylamine)	EPA 8270	mg/kg	--	--	--	0.18 U	0.045 U	0.045 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.0011
n-Nitrosodi-n-propylamine	EPA 8270	mg/kg	--	--	--	0.18 U	0.045 U	0.045 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.000018
Pentachlorophenol	EPA 8270	mg/kg	--	--	--	0.91 U	0.23 U	0.23 U	0.083 UJ	0.083 UJ	0.083 UJ	0.083 UJ	0.083 UJ	0.083 UJ	0.0000018
Phenol	EPA 8270	mg/kg	--	--	--	0.18 U	0.045 U	0.045 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.12
2,4,6-Trichlorophenol	EPA 8270	mg/kg	--	--	--	0.18 U	0.045 U	0.045 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.00019
Volatile Organic Compounds (VOCs)															
Benzene	EPA 8260	mg/kg	--	--	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.00056
Chloroform	EPA 8260	mg/kg	--	--	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.052
Petroleum Hydrocarbons															
Gasoline-range hydrocarbons	NWTPH-G	mg/kg	--	--	--	--	--	--	--	--	4.5 U	4.7 U	4.6 U	5.0 U	30
Diesel-range hydrocarbons	NWTPH-Dx	mg/kg	--	--	--	--	--	--	--	--	16 U	16 U	16 U	17 U	260
Oil-range hydrocarbons	NWTPH-Dx	mg/kg	--	--	--	--	--	--	--	--	31 U	32 U	56	35 U	2,000
Total diesel- and oil-range hydrocarbons	NWTPH-Dx	mg/kg	--	--	--	--	--	--	--	--	31 U	32 U	56	35 U	260
Conventionals															
pH	N/A	N/A	--	--	--	--	--	--	9.1 J	8.3 J	7.9 J	8.7 J	8.8 J	--	NE

Notes:

- ¹ Sample locations are shown on Figures 3-1 and 3-3.
- ² Preliminary cleanup levels for soil are referenced from Table 4-1.
- ³ Total dioxin/furan Toxic Equivalency Quotients (TEQs) were calculated using United States Environmental Protection Agency (USEPA) Toxicity Equivalency Factor (TEF) values for human health (EPA 2003).
- ⁴ Total carcinogenic PAH (cPAH) TEQs were calculated using TEF values referenced from MTCA Table 708.2 (WAC 173-340-900).

RL = Reporting limit

EPA = Environmental Protection Agency

mg/kg = milligram per kilogram

NE = not established

J = estimated result

FI = Initial (early 1900s) T115N fill deposit

FD = Glacier NW Site dredged fill deposit

FO = T115N operational (1960s) fill deposit

FT = Terminal 115 fill deposit

FP = Settling pond fill deposit

Bold indicates analyte was detected.

Yellow shading identifies the detected results greater than the preliminary cleanup level.

Blue shading identifies the non-detected result greater than the preliminary cleanup level.

COPC = Contaminant of Potential Concern

KCHD = King County Health Department

Landau = Landau Associates

GEI = GeoEngineers

ERM = Environmental Resources Management

Shaw = Shaw Environmental & Infrastructre

U = analyte not detected above the reporting limit

– = not analyzed

AD = Native LDW alluvial deposit

OS = Native organic silt (Aquitard) deposit

Table 5-3
Remedial Investigation Chemical Analytical Results - Soil COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Sample Location ¹	Analytical Method	Units	TP-03				B-1		B-2			B-3		B-4	Soil Preliminary Cleanup Level ² (PCUL)	
Sample Identification			TP03-0-1	TP03-2-3	TP03-2-3Dup	TP03-4-5	B1-2-3	B1-4-5	B2-1-2	B2-3-4	B2-3-4Dup	B3-3-4	B3-5-6	B4-1-2		
Sample Date			12/04/13	12/04/13	12/04/13	12/04/13	01/06/14	01/06/14	01/06/14	01/06/14	01/06/14	01/06/14	01/06/14	01/06/14		
Sample Depth			0 - 1 ft	2 - 3 ft	2 - 3 ft	4 - 5 ft	2 - 3 ft	4 - 5 ft	1 - 2 ft	3 - 4 ft	3 - 4 ft	3 - 4 ft	3 - 4 ft	5 - 6 ft		1 - 2 ft
Stratigraphic Horizon			FO	FO	FO	FI	FO	FI	FO	FI	FI	FI	FI	OS		FO
Sampled By			GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI		
Polychlorinated Biphenyls (PCBs)																
Total PCB Aroclors	EPA 8082	mg/kg	--	--	--	--	--	--	--	--	--	--	--	0.028 U	0.0000022	
Dioxins and Furans																
Total Dioxin/Furan TEQ ³ (ND=0.5RL)	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	0.0000052	
Total Dioxin/Furan TEQ ³ (ND=0.5RL)	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	0.0000052	
Metals																
Antimony	EPA 6000/7000	mg/kg	5.0 U	--	--	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	4.1	
Arsenic	EPA 6000/7000	mg/kg	0.97	--	--	2.5	5.3	4.9	3.4	5.4	4.9	6.4	4.6	1.3	7.0	
Barium	EPA 6000/7000	mg/kg	21	--	--	120	32	110	24	87	84	83	89	12	8.3	
Cadmium	EPA 6000/7000	mg/kg	0.20 U	--	--	0.20 U	0.20 U	0.20 U	0.27	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	1.0	
Chromium III / Total	EPA 6000/7000	mg/kg	11	--	--	64	20	62	24	38	44	64	55	19	48	
Chromium VI	EPA 6000/7000	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	18	
Copper	EPA 6000/7000	mg/kg	130	--	--	24	28	40	70	24	24	37	20	78	36	
Lead	EPA 6000/7000	mg/kg	7.2	--	--	4.5	42	5.6	39	19	17	8.2	3.9	4.9	50	
Mercury	EPA 6000/7000	mg/kg	0.050 U	--	--	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.070	
Nickel	EPA 6000/7000	mg/kg	16	--	--	51	21	70	25	48	46	67	48	32	48	
Selenium	EPA 6000/7000	mg/kg	0.56	--	--	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.30	
Silver	EPA 6000/7000	mg/kg	0.50 U	--	--	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.016	
Thallium	EPA 6000/7000	mg/kg	0.25 U	--	--	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.0044	
Tin	EPA 6000/7000	mg/kg	45	--	--	1.2	150	4.8	120	8.7 J	23 J	1,000	18	7.4	50	
Zinc	EPA 6000/7000	mg/kg	47	--	--	52	55	73	99	53	52	68	47	39	85	
Semi-Volatile Organic Compounds (SVOCs) - Polycyclic Aromatic Hydrocarbons (PAHs)																
Acenaphthene	EPA 8270/SIM	mg/kg	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.022 U	0.0067 U	0.0067 U	0.12	0.0067 U	0.0067 U	0.028	
Anthracene	EPA 8270/SIM	mg/kg	0.0067 U	0.0067 UJ	0.0067 UJ	0.0067 U	0.011	0.0067 U	0.13	0.0067 U	0.0067 U	0.014	0.0067 U	0.0067 U	0.051	
Benzo(a)anthracene	EPA 8270/SIM	mg/kg	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.01	0.0067 U	0.13	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.000057	
Benzo(b)fluoranthene	EPA 8270/SIM	mg/kg	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.014	0.0067 U	0.18	0.0067 U	0.0068	0.0067 U	0.0067 U	0.0067 U	0.00020	
Benzo(k)fluoranthene	EPA 8270/SIM	mg/kg	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.048	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0020	
Benzo(a)pyrene	EPA 8270/SIM	mg/kg	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0078	0.0067 U	0.1	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.000016	
Chrysene	EPA 8270/SIM	mg/kg	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.012	0.0067 U	0.14	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0098	0.0064	
Dibenzo(a,h)anthracene	EPA 8270/SIM	mg/kg	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.022 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.000029	
Dibenzofuran	EPA 8270/SIM	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.055 U	0.017 U	0.017 U	0.12	0.017 U	0.017 U	0.54	
Fluoranthene	EPA 8270/SIM	mg/kg	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.016	0.0067 U	0.24	0.0067 U	0.011	0.012	0.0067 U	0.0067 U	0.090	
Fluorene	EPA 8270/SIM	mg/kg	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.022 U	0.0067 U	0.0067 U	0.1	0.0067 U	0.0067 U	0.029	
Indeno(1,2,3-c,d)pyrene	EPA 8270/SIM	mg/kg	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.075	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.00056	
1-Methylnaphthalene	EPA 8270/SIM	mg/kg	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.022 U	0.0067 U	0.0067 U	0.064	0.0067 U	0.0067 U	29	
2-Methylnaphthalene	EPA 8270/SIM	mg/kg	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.022 U	0.0067 U	0.0067 U	0.11	0.0067 U	0.0067 U	0.67	
Naphthalene	EPA 8270/SIM	mg/kg	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.022 U	0.0067 U	0.0067 U	0.21	0.0067 U	0.0067 U	0.0021	
Pyrene	EPA 8270/SIM	mg/kg	0.0067 U	0.0067 U	0.017	0.01	0.017	0.0067 U	0.2	0.0084	0.01	0.0082	0.0086	0.0067 U	0.14	
Total cPAH TEQ ⁴ (ND=0)	EPA 8270/SIM	mg/kg	0 U	0 U	0 U	0 U	0.01	0 U	0.15	0 U	0.00068	0 U	0 U	0.000098	0.000016	
Total cPAH TEQ ⁴ (ND=0.5RL)	EPA 8270/SIM	mg/kg	0.0051 U	0.0051 U	0.0051 U	0.0051 U	0.011	0.0051 U	0.15	0.0051 U	0.0054	0.0051 U	0.0051 U	0.0051	0.000016	

Table 5-3
Remedial Investigation Chemical Analytical Results - Soil COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Sample Location ¹	Analytical Method	Units	TP-03				B-1		B-2			B-3		B-4	Soil Preliminary Cleanup Level ² (PCUL)
Sample Identification			TP03-0-1	TP03-2-3	TP03-2-3Dup	TP03-4-5	B1-2-3	B1-4-5	B2-1-2	B2-3-4	B2-3-4Dup	B3-3-4	B3-5-6	B4-1-2	
Sample Date			12/04/13	12/04/13	12/04/13	12/04/13	01/06/14	01/06/14	01/06/14	01/06/14	01/06/14	01/06/14	01/06/14	01/06/14	
Sample Depth			0 - 1 ft	2 - 3 ft	2 - 3 ft	4 - 5 ft	2 - 3 ft	4 - 5 ft	1 - 2 ft	3 - 4 ft	3 - 4 ft	3 - 4 ft	5 - 6 ft	1 - 2 ft	
Stratigraphic Horizon			FO	FO	FO	FI	FO	FI	FO	FI	FI	FI	OS	FO	
Sampled By			GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	
Other SVOCs															
Aniline	EPA 8270	mg/kg	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.055 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	150
Bis(2-chloroethyl)ether	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.055 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.000022
Bis(2-ethylhexyl)phthalate	EPA 8270	mg/kg	0.017 U	0.017 U	0.025	0.017 U	0.017 U	0.017 U	0.077	0.017 U	0.017 U	0.017 U	0.044	0.017 U	0.0051
Butyl benzyl phthalate	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.055 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.00018
3,3'-Dichlorobenzidine	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.055 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.0000033
2,4-Dichlorophenol	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.055 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.0043
Diethyl phthalate	EPA 8270	mg/kg	0.085 U	0.085 UJ	0.085 UJ	0.085 U	0.085 U	0.085 U	0.055 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.034
2,4-Dimethylphenol	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.055 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.0031
2-Methylphenol (o-Cresol)	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.055 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.010
n-Nitrosodimethylamine	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.055 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017
n-Nitrosodiphenylamine (as Diphenylamine)	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.055 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.0011
n-Nitrosodi-n-propylamine	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.055 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.000018
Pentachlorophenol	EPA 8270	mg/kg	0.083 UJ	0.083 UJ	0.083 UJ	0.083 UJ	0.083 UJ	0.083 UJ	0.12 J	0.083 UJ	0.083 UJ	0.083 UJ	0.083 UJ	0.083 UJ	0.0000018
Phenol	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.055 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.12
2,4,6-Trichlorophenol	EPA 8270	mg/kg	0.017 U	0.017 UJ	0.017 UJ	0.017 U	0.017 U	0.017 U	0.055 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.00019
Volatile Organic Compounds (VOCs)															
Benzene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	--	--	--	--	--	--	--	0.0010 U	0.00056
Chloroform	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	--	--	--	--	--	--	--	0.0010 U	0.052
Petroleum Hydrocarbons															
Gasoline-range hydrocarbons	NWTPH-G	mg/kg	4.4 U	4.6 U	4.5 U	4.4 U	--	--	--	--	--	--	--	--	30
Diesel-range hydrocarbons	NWTPH-Dx	mg/kg	14 U	16 U	15 U	16 U	--	--	--	--	--	--	--	--	260
Oil-range hydrocarbons	NWTPH-Dx	mg/kg	32	120 J	57 J	31 U	--	--	--	--	--	--	--	--	2,000
Total diesel- and oil-range hydrocarbons	NWTPH-Dx	mg/kg	32	120 J	57 J	31 U	--	--	--	--	--	--	--	--	260
Conventionals															
pH	N/A	N/A	9.0 J	8.5 J	8.5 J	8.6 J	8.5 J	7.6 J	8.2 J	7.2 J	7.1 J	8.5 J	8.6 J	8.7 J	NE

Notes:

- ¹ Sample locations are shown on Figures 3-1 and 3-3.
- ² Preliminary cleanup levels for soil are referenced from Table 4-1.
- ³ Total dioxin/furan Toxic Equivalency Quotients (TEQs) were calculated using United States Environmental Protection Agency (USEPA) Toxicity Equivalency Factor (TEF) values for human health (EPA 2003).
- ⁴ Total carcinogenic PAH (cPAH) TEQs were calculated using TEF values referenced from MTCA Table 708.2 (WAC 173-340-900).

RL = Reporting limit

EPA = Environmental Protection Agency

mg/kg = milligram per kilogram

NE = not established

J = estimated result

FI = Initial (early 1900s) T115N fill deposit

FD = Glacier NW Site dredged fill deposit

FO = T115N operational (1960s) fill deposit

FT = Terminal 115 fill deposit

FP = Settling pond fill deposit

Bold indicates analyte was detected.

Yellow shading identifies the detected results greater than the preliminary cleanup level.

Blue shading identifies the non-detected result greater than the preliminary cleanup level.

COPC = Contaminant of Potential Concern

KCHD = King County Health Department

Landau = Landau Associates

GEI = GeoEngineers

ERM = Environmental Resources Management

Shaw = Shaw Environmental & Infastructre

U = analyte not detected above the reporting limit

-- = not analyzed

AD = Native LDW alluvial deposit

OS = Native organic silt (Aquitard) deposit

Table 5-3
Remedial Investigation Chemical Analytical Results - Soil COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Sample Location ¹	Analytical Method	Units	B-4			B-5					B-6				Soil Preliminary Cleanup Level ² (PCUL)	
Sample Identification			B4-4-5	B4-6-7	B4-10-11	B5-1-2	B5-6-7	B5-10-11	B5-10-11Dup	B5-13-14	B6-2-3	B6-4-5	B6-10-11	B6-17-18		
Sample Date			01/06/14	01/06/14	01/06/14	01/09/14	01/09/14	01/09/14	01/09/14	01/09/14	01/08/14	01/08/14	01/08/14	01/08/14		
Sample Depth			4 - 5 ft	6 - 7 ft	10 - 11 ft	1 - 2 ft	6 - 7 ft	10 - 11 ft	10 - 11 ft	13 - 14 ft	2 - 3 ft	4 - 5 ft	10 - 11 ft	17 - 18 ft		
Stratigraphic Horizon			FI	FI	FI	F0	FI	FI	FI	FI	OS	F0	FI	FI		OS
Sampled By			GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI		GEI
Polychlorinated Biphenyls (PCBs)																
Total PCB Aroclors	EPA 8082	mg/kg	--	--	--	0.027 U	--	--	--	--	--	0.030 U	--	--	0.0000022	
Dioxins and Furans																
Total Dioxin/Furan TEQ ³ (ND=0.5RL)	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	0.0000052	
Total Dioxin/Furan TEQ ³ (ND=0.5RL)	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	0.0000052	
Metals																
Antimony	EPA 6000/7000	mg/kg	--	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	--	4.1	
Arsenic	EPA 6000/7000	mg/kg	--	3.5	3.8	2.2	3	4.2	3.1	7	4.9	5.6	3.8	--	7.0	
Barium	EPA 6000/7000	mg/kg	--	70	140	35	78	85	94	36	28	48	92	--	8.3	
Cadmium	EPA 6000/7000	mg/kg	--	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.23	0.20 U	--	1.0	
Chromium III / Total	EPA 6000/7000	mg/kg	--	71	68	29	56	56	48	16	17	46	64	--	48	
Chromium VI	EPA 6000/7000	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	18	
Copper	EPA 6000/7000	mg/kg	--	36	42	52	27	32	28	27	29	29	37	--	36	
Lead	EPA 6000/7000	mg/kg	--	5.1	5.6	4.9	4.1	4.9	3.8	6.6	45	14	5.1	--	50	
Mercury	EPA 6000/7000	mg/kg	--	0.050 U	0.057	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	--	0.070	
Nickel	EPA 6000/7000	mg/kg	--	65	71	35	60	66	57	11	16	49	75	--	48	
Selenium	EPA 6000/7000	mg/kg	--	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	--	0.30	
Silver	EPA 6000/7000	mg/kg	--	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	--	0.016	
Thallium	EPA 6000/7000	mg/kg	--	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	--	0.0044	
Tin	EPA 6000/7000	mg/kg	--	0.99 U	1.0 U	10	1.0 U	1.0 U	1.0 U	3.3	130	7.3	2.5	--	50	
Zinc	EPA 6000/7000	mg/kg	--	66	80	43	47	51	56	49	79	59	70	--	85	
Semi-Volatile Organic Compounds (SVOCs) - Polycyclic Aromatic Hydrocarbons (PAHs)																
Acenaphthene	EPA 8270/SIM	mg/kg	0.0067 U	0.0067 UJ	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0095	0.0067 U	0.0067 U	0.028	
Anthracene	EPA 8270/SIM	mg/kg	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.051	
Benzo(a)anthracene	EPA 8270/SIM	mg/kg	0.0067 U	0.0067 U	0.0067 U	0.017	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.007	0.0067 U	0.0067 U	0.000057	
Benzo(b)fluoranthene	EPA 8270/SIM	mg/kg	0.0067 U	0.0067 U	0.0067 U	0.013	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.00020	
Benzo(k)fluoranthene	EPA 8270/SIM	mg/kg	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0020	
Benzo(a)pyrene	EPA 8270/SIM	mg/kg	0.0067 U	0.0067 U	0.0067 U	0.011	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.000016	
Chrysene	EPA 8270/SIM	mg/kg	0.0067 U	0.0067 U	0.0067 U	0.024	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0064	
Dibenzo(a,h)anthracene	EPA 8270/SIM	mg/kg	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.000029	
Dibenzofuran	EPA 8270/SIM	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.54	
Fluoranthene	EPA 8270/SIM	mg/kg	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0098	0.045	0.0067 U	0.0067 U	0.090	
Fluorene	EPA 8270/SIM	mg/kg	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.029	
Indeno(1,2,3-c,d)pyrene	EPA 8270/SIM	mg/kg	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.00056	
1-Methylnaphthalene	EPA 8270/SIM	mg/kg	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	29	
2-Methylnaphthalene	EPA 8270/SIM	mg/kg	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.67	
Naphthalene	EPA 8270/SIM	mg/kg	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0021	
Pyrene	EPA 8270/SIM	mg/kg	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.009	0.03	0.0067 U	0.0067 U	0.14	
Total cPAH TEQ ⁴ (ND=0)	EPA 8270/SIM	mg/kg	0 U	0 U	0 U	0.014	0 U	0 U	0 U	0 U	0 U	0.0007	0 U	0 U	0.000016	
Total cPAH TEQ ⁴ (ND=0.5RL)	EPA 8270/SIM	mg/kg	0.0051 U	0.0051 U	0.0051 U	0.015	0.0051 U	0.0051 U	0.0051 U	0.0051 U	0.0051 U	0.0054	0.0051 U	0.0051 U	0.000016	

Table 5-3
Remedial Investigation Chemical Analytical Results - Soil COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Sample Location ¹	Analytical Method	Units	B-4			B-5					B-6				Soil Preliminary Cleanup Level ² (PCUL)	
Sample Identification			B4-4-5	B4-6-7	B4-10-11	B5-1-2	B5-6-7	B5-10-11	B5-10-11Dup	B5-13-14	B6-2-3	B6-4-5	B6-10-11	B6-17-18		
Sample Date			01/06/14	01/06/14	01/06/14	01/09/14	01/09/14	01/09/14	01/09/14	01/09/14	01/08/14	01/08/14	01/08/14	01/08/14		
Sample Depth			4 - 5 ft	6 - 7 ft	10 - 11 ft	1 - 2 ft	6 - 7 ft	10 - 11 ft	10 - 11 ft	13 - 14 ft	2 - 3 ft	4 - 5 ft	10 - 11 ft	17 - 18 ft		
Stratigraphic Horizon			FI	FI	FI	FO	FI	FI	FI	FI	OS	FO	FI	FI		OS
Sampled By			GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI		GEI
Other SVOCs																
Aniline	EPA 8270	mg/kg	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	150	
Bis(2-chloroethyl)ether	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.000022	
Bis(2-ethylhexyl)phthalate	EPA 8270	mg/kg	0.017 U	0.017	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.022	0.017 U	0.017 U	0.017 U	0.0051	
Butyl benzyl phthalate	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.00018	
3,3'-Dichlorobenzidine	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.0000033	
2,4-Dichlorophenol	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.0043	
Diethyl phthalate	EPA 8270	mg/kg	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.034	
2,4-Dimethylphenol	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.0031	
2-Methylphenol (o-Cresol)	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.010	
n-Nitrosodimethylamine	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017	
n-Nitrosodiphenylamine (as Diphenylamine)	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.0011	
n-Nitrosodi-n-propylamine	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.000018	
Pentachlorophenol	EPA 8270	mg/kg	0.083 UJ	0.083 UJ	0.083 UJ	0.083 UJ	0.083 UJ	0.083 UJ	0.083 UJ	0.083 UJ	0.083 UJ	0.083 UJ	0.083 UJ	0.083 UJ	0.0000018	
Phenol	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.12	
2,4,6-Trichlorophenol	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.00019	
Volatile Organic Compounds (VOCs)																
Benzene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.00056	
Chloroform	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.052	
Petroleum Hydrocarbons																
Gasoline-range hydrocarbons	NWTPH-G	mg/kg	--	--	--	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	6.6 U	30	
Diesel-range hydrocarbons	NWTPH-Dx	mg/kg	--	--	--	14 U	16 U	17 U	16 U	18 U	35 U	15 U	17 U	20 U	260	
Oil-range hydrocarbons	NWTPH-Dx	mg/kg	--	--	--	260	33 U	34 U	33 U	37 U	140	30 U	34 U	180	2,000	
Total diesel- and oil-range hydrocarbons	NWTPH-Dx	mg/kg	--	--	--	260	33 U	34 U	33 U	37 U	140	30 U	34 U	180	260	
Conventionals																
pH	N/A	N/A	7.9 J	8.0 J	8.2 J	8.3 J	7.7 J	7.0 J	7.0 J	6.7 J	9.8 J	9.0 J	7.5 J	6.9 J	NE	

Notes:

- ¹ Sample locations are shown on Figures 3-1 and 3-3.
- ² Preliminary cleanup levels for soil are referenced from Table 4-1.
- ³ Total dioxin/furan Toxic Equivalency Quotients (TEQs) were calculated using United States Environmental Protection Agency (USEPA) Toxicity Equivalency Factor (TEF) values for human health (EPA 2003).
- ⁴ Total carcinogenic PAH (cPAH) TEQs were calculated using TEF values referenced from MTCA Table 708.2 (WAC 173-340-900).
- RL = Reporting limit

EPA = Environmental Protection Agency

mg/kg = milligram per kilogram

NE = not established

J = estimated result

FI = Initial (early 1900s) T115N fill deposit

FD = Glacier NW Site dredged fill deposit

FO = T115N operational (1960s) fill deposit

FT = Terminal 115 fill deposit

FP = Settling pond fill deposit

Bold indicates analyte was detected.

Yellow shading identifies the detected results greater than the preliminary cleanup level.

Blue shading identifies the non-detected result greater than the preliminary cleanup level.
- COPC = Contaminant of Potential Concern

KCHD = King County Health Department

Landau = Landau Associates

GEI = GeoEngineers

ERM = Environmental Resources Management

Shaw = Shaw Environmental & Infrastructre

U = analyte not detected above the reporting limit

-- = not analyzed

AD = Native LDW alluvial deposit

OS = Native organic silt (Aquitard) deposit

Table 5-3
Remedial Investigation Chemical Analytical Results - Soil COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Sample Location ¹	Analytical Method	Units	B-7				B-8			B-10				B-11	Soil Preliminary Cleanup Level ² (PCUL)
Sample Identification			B7-3-4	B7-5-6	B7-10-11	B7-16-17	B8-4-5	B8-10-11	B8-15-16	B10-2-3	B10-6-7	B10-10-11	B10-16-17	B11-3-4	
Sample Date			01/10/14	01/10/14	01/10/14	01/10/14	01/10/14	01/10/14	01/10/14	01/09/14	01/09/14	01/09/14	01/09/14	01/07/14	
Sample Depth			3 - 4 ft	5 - 6 ft	10 - 11 ft	16 - 17 ft	4 - 5 ft	10 - 11 ft	15 - 16 ft	2 - 3 ft	6 - 7 ft	10 - 11 ft	16 - 17 ft	3 - 4 ft	
Stratigraphic Horizon			FO	FI	FI	OS	FO	FI	OS	FO	FI	FI	OS	FP	
Sampled By			GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	
Polychlorinated Biphenyls (PCBs)															
Total PCB Aroclors	EPA 8082	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	0.0000022
Dioxins and Furans															
Total Dioxin/Furan TEQ ³ (ND=0.5RL)	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	0.0000052
Total Dioxin/Furan TEQ ³ (ND=0.5RL)	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	0.0000052
Metals															
Antimony	EPA 6000/7000	mg/kg	5.0 U	5.0 U	5.0 U	--	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	--	16	4.1
Arsenic	EPA 6000/7000	mg/kg	1.8	8.5	3.1	--	2.2	2	10	1.4	2.7	3.9	--	26	7.0
Barium	EPA 6000/7000	mg/kg	49	110	88	--	52	56	33	24	70	85	--	120	8.3
Cadmium	EPA 6000/7000	mg/kg	0.36	0.32	0.20 U	--	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	--	0.36	1.0
Chromium III / Total	EPA 6000/7000	mg/kg	21	55	45	--	29	26	19	17	32	43	--	38	48
Chromium VI	EPA 6000/7000	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	18
Copper	EPA 6000/7000	mg/kg	21	37	27	--	15	12	36	31	20	25	--	39	36
Lead	EPA 6000/7000	mg/kg	23	21	3.9	--	14	3.7	4.4	2.4	4.3	4.1	--	170	50
Mercury	EPA 6000/7000	mg/kg	0.050 U	0.066	0.050 U	--	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	--	0.14	0.070
Nickel	EPA 6000/7000	mg/kg	20	67	61	--	38	34	18	15	42	52	--	27	48
Selenium	EPA 6000/7000	mg/kg	0.50 U	0.50 U	0.56	--	0.50 U	0.50 U	0.74	0.50 U	0.50 U	0.50 U	--	0.5	0.30
Silver	EPA 6000/7000	mg/kg	0.50 U	0.50 U	0.50 U	--	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	--	0.50 U	0.016
Thallium	EPA 6000/7000	mg/kg	0.25 U	0.25 U	0.25 U	--	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	--	0.25 U	0.0044
Tin	EPA 6000/7000	mg/kg	1,100	46	11	--	130	15	1.0 U	0.99 U	1.3	1.0 U	--	250	50
Zinc	EPA 6000/7000	mg/kg	200	82	56	--	34	29	41	25	47	49	--	220	85
Semi-Volatile Organic Compounds (SVOCs) - Polycyclic Aromatic Hydrocarbons (PAHs)															
Acenaphthene	EPA 8270/SIM	mg/kg	0.022 U	0.0067 U	0.0067 U	0.0067 U	0.11	0.28 J	3.2	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.028
Anthracene	EPA 8270/SIM	mg/kg	0.022 U	0.0067 U	0.0067 U	0.0067 U	0.14	0.0067 U	0.053	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.015	0.051
Benzo(a)anthracene	EPA 8270/SIM	mg/kg	0.022 U	0.0067 U	0.0067 U	0.0067 U	0.28	0.0067 U	0.0067 U	0.0067 U	0.011	0.0067 U	0.0067 U	0.097	0.000057
Benzo(b)fluoranthene	EPA 8270/SIM	mg/kg	0.022 U	0.0067 U	0.0067 U	0.0067 U	0.16	0.0067 U	0.0067 U	0.0067 U	0.011	0.0067 U	0.0067 U	0.19	0.00020
Benzo(k)fluoranthene	EPA 8270/SIM	mg/kg	0.022 U	0.0067 U	0.0067 U	0.0067 U	0.049	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.055	0.0020
Benzo(a)pyrene	EPA 8270/SIM	mg/kg	0.022 U	0.0067 U	0.0067 U	0.0067 U	0.091	0.0067 U	0.0067 U	0.0067 U	0.0099	0.0067 U	0.0067 U	0.12	0.000016
Chrysene	EPA 8270/SIM	mg/kg	0.038	0.0067 U	0.0067 U	0.0067 U	0.28	0.0067 U	0.0067 U	0.0067 U	0.011	0.0067 U	0.0067 U	0.1	0.0064
Dibenzo(a,h)anthracene	EPA 8270/SIM	mg/kg	0.022 U	0.0067 U	0.0067 U	0.0067 U	0.011	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.019	0.000029
Dibenzofuran	EPA 8270/SIM	mg/kg	0.022 U	0.017 U	0.017 U	0.017 U	0.12	0.2	1.5	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.54
Fluoranthene	EPA 8270/SIM	mg/kg	0.026	0.0088	0.0067 U	0.0067 U	1.1	0.0067 U	0.046	0.0067 U	0.019	0.0067 U	0.0067 U	0.041	0.090
Fluorene	EPA 8270/SIM	mg/kg	0.022 U	0.0067 U	0.0067 U	0.0067 U	0.16	0.17	1.7	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.029
Indeno(1,2,3-c,d)pyrene	EPA 8270/SIM	mg/kg	0.022 U	0.0067 U	0.0067 U	0.0067 U	0.028	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.059	0.00056
1-Methylnaphthalene	EPA 8270/SIM	mg/kg	0.022 U	0.0067 U	0.0067 U	0.0067 U	0.022	0.25	3	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	29
2-Methylnaphthalene	EPA 8270/SIM	mg/kg	0.022 U	0.0067 U	0.0067 U	0.0067 U	0.037	0.42	5.9	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.67
Naphthalene	EPA 8270/SIM	mg/kg	0.022 U	0.0067 U	0.0067 U	0.0067 U	0.048	0.92	12	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0021
Pyrene	EPA 8270/SIM	mg/kg	0.035	0.0076	0.0067 U	0.0067 U	0.82	0.0067 U	0.025	0.0072	0.021	0.0067 U	0.0067 U	0.067	0.14
Total cPAH TEQ ⁴ (ND=0)	EPA 8270/SIM	mg/kg	0.00038	0 U	0 U	0 U	0.15	0 U	0 U	0 U	0.012	0 U	0 U	0.16	0.000016
Total cPAH TEQ ⁴ (ND=0.5RL)	EPA 8270/SIM	mg/kg	0.017	0.0051 U	0.0051 U	0.0051 U	0.15	0.0051 U	0.0051 U	0.0051 U	0.013	0.0051 U	0.0051 U	0.16	0.000016

Table 5-3
Remedial Investigation Chemical Analytical Results - Soil COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Sample Location ¹	Analytical Method	Units	B-7				B-8			B-10				B-11	Soil Preliminary Cleanup Level ² (PCUL)
Sample Identification			B7-3-4	B7-5-6	B7-10-11	B7-16-17	B8-4-5	B8-10-11	B8-15-16	B10-2-3	B10-6-7	B10-10-11	B10-16-17	B11-3-4	
Sample Date			01/10/14	01/10/14	01/10/14	01/10/14	01/10/14	01/10/14	01/10/14	01/09/14	01/09/14	01/09/14	01/09/14	01/07/14	
Sample Depth			3 - 4 ft	5 - 6 ft	10 - 11 ft	16 - 17 ft	4 - 5 ft	10 - 11 ft	15 - 16 ft	2 - 3 ft	6 - 7 ft	10 - 11 ft	16 - 17 ft	3 - 4 ft	
Stratigraphic Horizon			FO	FI	FI	OS	FO	FI	OS	FO	FI	FI	OS	FP	
Sampled By			GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	
Other SVOCs															
Aniline	EPA 8270	mg/kg	0.11 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	150
Bis(2-chloroethyl)ether	EPA 8270	mg/kg	0.022 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.000022
Bis(2-ethylhexyl)phthalate	EPA 8270	mg/kg	0.091	0.017 U	0.017 U	0.017 U	0.0084	0.017 U	0.017 U	0.066	0.017 U	0.017 U	0.017 U	0.024	0.0051
Butyl benzyl phthalate	EPA 8270	mg/kg	0.022 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.00018
3,3'-Dichlorobenzidine	EPA 8270	mg/kg	0.022 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.0000033
2,4-Dichlorophenol	EPA 8270	mg/kg	0.022 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.0043
Diethyl phthalate	EPA 8270	mg/kg	0.11 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.034
2,4-Dimethylphenol	EPA 8270	mg/kg	0.022 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.0031
2-Methylphenol (o-Cresol)	EPA 8270	mg/kg	0.022 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.010
n-Nitrosodimethylamine	EPA 8270	mg/kg	0.022 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017
n-Nitrosodiphenylamine (as Diphenylamine)	EPA 8270	mg/kg	0.022 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.0011
n-Nitrosodi-n-propylamine	EPA 8270	mg/kg	0.022 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.000018
Pentachlorophenol	EPA 8270	mg/kg	0.11 UJ	0.083 UJ	0.083 UJ	0.083 UJ	0.083 UJ	0.083 UJ	0.083 UJ	0.083 UJ	0.083 UJ	0.083 UJ	0.083 UJ	0.083 UJ	0.0000018
Phenol	EPA 8270	mg/kg	0.022 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.12
2,4,6-Trichlorophenol	EPA 8270	mg/kg	0.022 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.00019
Volatile Organic Compounds (VOCs)															
Benzene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	--	--	--	--	0.0010 U	0.00056
Chloroform	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	--	--	--	--	0.0010 U	0.052
Petroleum Hydrocarbons															
Gasoline-range hydrocarbons	NWTPH-G	mg/kg	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	7.5 J	57 J	--	--	--	--	--	30
Diesel-range hydrocarbons	NWTPH-Dx	mg/kg	68 U	15 U	15 U	19 U	15 U	15 U	46	--	--	--	--	--	260
Oil-range hydrocarbons	NWTPH-Dx	mg/kg	550	58	30 U	82	29 U	29 U	74	--	--	--	--	--	2,000
Total diesel- and oil-range hydrocarbons	NWTPH-Dx	mg/kg	550	58	30 U	82	29 U	29 U	120	--	--	--	--	--	260
Conventionals															
pH	N/A	N/A	11 J	9.3 J	7.6 J	6.8 J	10 J	8.0 J	7.9 J	9.2 J	8.7 J	8.1 J	7.1 J	9.9 J	NE

Notes:

- ¹ Sample locations are shown on Figures 3-1 and 3-3.
- ² Preliminary cleanup levels for soil are referenced from Table 4-1.
- ³ Total dioxin/furan Toxic Equivalency Quotients (TEQs) were calculated using United States Environmental Protection Agency (USEPA) Toxicity Equivalency Factor (TEF) values for human health (EPA 2003).
- ⁴ Total carcinogenic PAH (cPAH) TEQs were calculated using TEF values referenced from MTCA Table 708.2 (WAC 173-340-900).
- RL = Reporting limit

EPA = Environmental Protection Agency

mg/kg = milligram per kilogram

NE = not established

J = estimated result

FI = Initial (early 1900s) T115N fill deposit

FD = Glacier NW Site dredged fill deposit

FO = T115N operational (1960s) fill deposit

FT = Terminal 115 fill deposit

FP = Settling pond fill deposit

Bold indicates analyte was detected.

Yellow shading identifies the detected results greater than the preliminary cleanup level.

Blue shading identifies the non-detected result greater than the preliminary cleanup level.
- COPC = Contaminant of Potential Concern

KCHD = King County Health Department

Landau = Landau Associates

GEI = GeoEngineers

ERM = Environmental Resources Management

Shaw = Shaw Environmental & Infrastructre

U = analyte not detected above the reporting limit

-- = not analyzed

AD = Native LDW alluvial deposit

OS = Native organic silt (Aquitard) deposit

Table 5-3
Remedial Investigation Chemical Analytical Results - Soil COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Sample Location ¹	Analytical Method	Units	B-11			B-12			B-13						Soil Preliminary Cleanup Level ² (PCUL)
Sample Identification			B11-7-8	B11-9-10	B11-14-15	B12-7-8	B12-9-10	B12-16-17	B13-1-2	B13-2-3	B13-5-6	B13-6-7	B13-9-10	B13-15-16	
Sample Date			01/07/14	01/07/14	01/07/14	01/10/14	01/10/14	01/10/14	01/07/14	01/07/14	01/07/14	01/07/14	01/07/14	01/07/14	
Sample Depth			7 - 8 ft	9 - 10 ft	14 - 15 ft	7 - 8 ft	9 - 10 ft	16 - 17 ft	1 - 2 ft	2 - 3 ft	5 - 6 ft	6 - 7 ft	9 - 10 ft	15 - 16 ft	
Stratigraphic Horizon			FP	FI	FI	FO	FI	OS	FP	FP	FP	FP	FI	OS	
Sampled By	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI		
Polychlorinated Biphenyls (PCBs)															
Total PCB Aroclors	EPA 8082	mg/kg	--	--	--	0.031 U	--	0.038 U	--	1.1	7.1	--	--	--	0.0000022
Dioxins and Furans															
Total Dioxin/Furan TEQ ³ (ND=0.5RL)	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	0.0000052
Total Dioxin/Furan TEQ ³ (ND=0.5RL)	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	0.0000052
Metals															
Antimony	EPA 6000/7000	mg/kg	15 U	5.0 U	--	5.0 U	5.0 U	5.0 U	8.7	--	16 U	5.0 U	5.0 U	5.0 U	4.1
Arsenic	EPA 6000/7000	mg/kg	15 U	0.50 U	--	3.2	3.4	6.6	6.4 U	--	16 U	0.50 U	0.50 U	82	7.0
Barium	EPA 6000/7000	mg/kg	140	62	--	76	60	34	100	--	130	50	55	24	8.3
Cadmium	EPA 6000/7000	mg/kg	9.1	0.20 U	--	0.20 U	0.32	0.20 U	3.1	--	7.1	0.20 U	0.44	0.20 U	1.0
Chromium III / Total	EPA 6000/7000	mg/kg	650	37	--	48	44	19	180	--	2,200	52	84	23	48
Chromium VI	EPA 6000/7000	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	18
Copper	EPA 6000/7000	mg/kg	180	19	--	21	16	23	64	--	620	18	28	26	36
Lead	EPA 6000/7000	mg/kg	19,000	49	--	3.4	6.1	3.7	4,400	--	49,000	330	900	5.3	50
Mercury	EPA 6000/7000	mg/kg	0.17	0.050 UJ	--	0.050 U	0.050 U	0.050 U	0.065	--	0.3	0.050 U	0.050 U	0.050 U	0.070
Nickel	EPA 6000/7000	mg/kg	39	39	--	49	42	8.6	27	--	120	30	45	9.7	48
Selenium	EPA 6000/7000	mg/kg	3.8 U	0.50 U	--	0.50 U	0.56	0.50 U	1.6 U	--	4.0 U	0.50 U	0.50 U	0.50 U	0.30
Silver	EPA 6000/7000	mg/kg	0.77	0.50 U	--	0.50 U	0.50 U	0.50 U	0.50 U	--	3.2	0.50 U	0.50 U	0.50 U	0.016
Thallium	EPA 6000/7000	mg/kg	1.9 U	0.25 U	--	0.25 U	0.25 U	0.25 U	0.25 U	--	2.0 U	0.25 U	0.25 U	0.25 U	0.0044
Tin	EPA 6000/7000	mg/kg	48,000	2,800	--	50 J	1.0 UJ	26 J	26,000	--	50,000	2,800	2,300	71	50
Zinc	EPA 6000/7000	mg/kg	6,800	170	--	51	49	28	2,000	--	33,000	410	590	14	85
Semi-Volatile Organic Compounds (SVOCs) - Polycyclic Aromatic Hydrocarbons (PAHs)															
Acenaphthene	EPA 8270/SIM	mg/kg	0.1	0.0067 UJ	0.0067 U	1.7	0.070 J	0.0089	0.017	--	0.45	0.076	0.0089	0.012	0.028
Anthracene	EPA 8270/SIM	mg/kg	0.12	0.0067 UJ	0.0067 U	0.031	0.0067 UJ	0.0067 U	0.017	--	0.35	0.025	0.0067 U	0.011	0.051
Benzo(a)anthracene	EPA 8270/SIM	mg/kg	0.17	0.0067 UJ	0.0067 U	0.0067 U	0.0067 UJ	0.0067 U	0.023	--	0.33	0.021	0.0067 U	0.013	0.000057
Benzo(b)fluoranthene	EPA 8270/SIM	mg/kg	0.14	0.0067 UJ	0.0067 U	0.0067 U	0.0067 UJ	0.0067 U	0.014	--	0.15	0.011	0.0067 U	0.0067 U	0.00020
Benzo(k)fluoranthene	EPA 8270/SIM	mg/kg	0.061 U	0.0067 UJ	0.0067 U	0.0067 U	0.0067 UJ	0.0067 U	0.010 U	--	0.16	0.0067 U	0.0067 U	0.0067 U	0.0020
Benzo(a)pyrene	EPA 8270/SIM	mg/kg	0.16	0.0067 UJ	0.0067 U	0.0067 U	0.0067 UJ	0.0067 U	0.014	--	0.21	0.013	0.0067 U	0.0067 U	0.000016
Chrysene	EPA 8270/SIM	mg/kg	0.2	0.0067 UJ	0.0067 U	0.0067 U	0.0067 UJ	0.0067 U	0.021	--	0.28	0.019	0.0067 U	0.0098	0.0064
Dibenzo(a,h)anthracene	EPA 8270/SIM	mg/kg	0.061 U	0.0067 UJ	0.0067 U	0.0067 U	0.0067 UJ	0.0067 U	0.010 U	--	0.064 U	0.0067 U	0.0067 U	0.0067 U	0.000029
Dibenzofuran	EPA 8270/SIM	mg/kg	0.15 U	0.017 UJ	0.017 U	1.3	0.017 J	0.017 U	0.026 U	--	0.53	0.052	0.017 U	0.017 U	0.54
Fluoranthene	EPA 8270/SIM	mg/kg	0.43	0.0067 UJ	0.0069	0.035	0.0067 UJ	0.011	0.071	--	1.5	0.12	0.018	0.053	0.090
Fluorene	EPA 8270/SIM	mg/kg	0.13	0.0067 UJ	0.0067 U	1.1	0.013 J	0.0067 U	0.019	--	0.66	0.071	0.0079	0.021	0.029
Indeno(1,2,3-c,d)pyrene	EPA 8270/SIM	mg/kg	0.061 U	0.0067 UJ	0.0067 U	0.0067 U	0.0067 UJ	0.0067 U	0.010 U	--	0.064 U	0.0067 U	0.0067 U	0.0067 U	0.00056
1-Methylnaphthalene	EPA 8270/SIM	mg/kg	0.066	0.0067 UJ	0.0067 U	0.53	0.085 J	0.0084	0.014	--	0.14	0.024	0.0067 U	0.0067 U	29
2-Methylnaphthalene	EPA 8270/SIM	mg/kg	0.13	0.0067 UJ	0.0067 U	1.1	0.12 J	0.015	0.026	--	0.27	0.043	0.0067 U	0.0067 U	0.67
Naphthalene	EPA 8270/SIM	mg/kg	0.28	0.0067 UJ	0.0067 U	0.7	0.41 J	0.24	0.046	--	0.37	0.042	0.0067 U	0.0072	0.0021
Pyrene	EPA 8270/SIM	mg/kg	0.45	0.0067 UJ	0.0087	0.029	0.0067 UJ	0.011	0.055	--	1	0.091	0.017	0.036	0.14
Total cPAH TEQ ⁴ (ND=0)	EPA 8270/SIM	mg/kg	0.19	0 U	0 U	0 U	0 U	0 U	0.018	--	0.277	0.016	0 U	0.0014	0.000016
Total cPAH TEQ ⁴ (ND=0.5RL)	EPA 8270/SIM	mg/kg	0.2	0.0051 U	0.0051 U	0.0051 U	0.0051 U	0.0051 U	0.019	--	0.28	0.017	0.0051 U	0.0061	0.000016

Table 5-3
Remedial Investigation Chemical Analytical Results - Soil COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Sample Location ¹	Analytical Method	Units	B-11			B-12			B-13						Soil Preliminary Cleanup Level ² (PCUL)
Sample Identification			B11-7-8	B11-9-10	B11-14-15	B12-7-8	B12-9-10	B12-16-17	B13-1-2	B13-2-3	B13-5-6	B13-6-7	B13-9-10	B13-15-16	
Sample Date			01/07/14	01/07/14	01/07/14	01/10/14	01/10/14	01/10/14	01/07/14	01/07/14	01/07/14	01/07/14	01/07/14	01/07/14	
Sample Depth			7 - 8 ft	9 - 10 ft	14 - 15 ft	7 - 8 ft	9 - 10 ft	16 - 17 ft	1 - 2 ft	2 - 3 ft	5 - 6 ft	6 - 7 ft	9 - 10 ft	15 - 16 ft	
Stratigraphic Horizon			FP	FI	FI	FO	FI	OS	FP	FP	FP	FP	FI	OS	
Sampled By			GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	
Other SVOCs															
Aniline	EPA 8270	mg/kg	0.15 U	0.085 UJ	0.085 U	0.085 U	0.085 UJ	0.085 U	0.026 U	--	0.16 U	0.085 U	0.085 U	0.085 U	150
Bis(2-chloroethyl)ether	EPA 8270	mg/kg	0.15 U	0.017 UJ	0.017 U	0.017 U	0.017 UJ	0.017 U	0.026 U	--	0.16 U	0.017 U	0.017 U	0.017 U	0.000022
Bis(2-ethylhexyl)phthalate	EPA 8270	mg/kg	0.15 U	0.025 J	0.017 U	0.017 U	0.017 UJ	0.017 U	0.026 U	--	0.16 U	0.017 U	0.017 U	0.017 U	0.0051
Butyl benzyl phthalate	EPA 8270	mg/kg	0.15 U	0.017 UJ	0.017 U	0.017 U	0.017 UJ	0.017 U	0.026 U	--	0.16 U	0.017 U	0.017 U	0.017 U	0.00018
3,3'-Dichlorobenzidine	EPA 8270	mg/kg	0.41	0.017 UJ	0.017 U	0.017 U	0.017 UJ	0.017 U	0.067	--	0.82	0.017 U	0.017 U	0.017 U	0.0000033
2,4-Dichlorophenol	EPA 8270	mg/kg	0.15 U	0.017 UJ	0.017 U	0.017 U	0.017 UJ	0.017 U	0.026 U	--	0.16 U	0.017 U	0.017 U	0.017 U	0.0043
Diethyl phthalate	EPA 8270	mg/kg	0.15 U	0.085 UJ	0.085 U	0.085 U	0.085 UJ	0.085 U	0.026 U	--	0.16 U	0.085 U	0.085 U	0.085 U	0.034
2,4-Dimethylphenol	EPA 8270	mg/kg	0.15 U	0.017 UJ	0.017 U	0.017 U	0.028 J	0.029	0.026 U	--	0.16 U	0.017 U	0.017 U	0.017 U	0.0031
2-Methylphenol (o-Cresol)	EPA 8270	mg/kg	0.15 U	0.017 UJ	0.017 U	0.017 U	0.017 UJ	0.017 U	0.026 U	--	0.16 U	0.017 U	0.017 U	0.37	0.010
n-Nitrosodimethylamine	EPA 8270	mg/kg	0.15 U	0.017 UJ	0.017 U	0.017 U	0.017 UJ	0.017 U	0.026 U	--	0.16 U	0.017 U	0.017 U	0.017 U	0.017
n-Nitrosodiphenylamine (as Diphenylamine)	EPA 8270	mg/kg	0.15 U	0.017 UJ	0.017 U	0.017 U	0.017 UJ	0.017 U	0.026 U	--	0.16 U	0.017 U	0.017 U	0.017 U	0.0011
n-Nitrosodi-n-propylamine	EPA 8270	mg/kg	0.15 U	0.017 UJ	0.017 U	0.017 U	0.017 UJ	0.017 U	0.026 U	--	0.16 U	0.017 U	0.017 U	0.017 U	0.000018
Pentachlorophenol	EPA 8270	mg/kg	0.15 UJ	0.083 UJ	0.083 UJ	0.083 UJ	0.083 UJ	0.083 UJ	0.026 UJ	--	0.16 UJ	0.083 UJ	0.083 UJ	0.083 UJ	0.0000018
Phenol	EPA 8270	mg/kg	0.15 U	0.017 UJ	0.27	0.017 U	0.017 UJ	0.017 U	0.048	--	0.16 U	0.017 U	0.017 U	7.1	0.12
2,4,6-Trichlorophenol	EPA 8270	mg/kg	0.15 U	0.017 UJ	0.017 U	0.017 U	0.017 UJ	0.017 U	0.026 U	--	0.16 U	0.017 U	0.017 U	0.017 U	0.00019
Volatile Organic Compounds (VOCs)															
Benzene	EPA 8260	mg/kg	0.022	0.0018 J	0.0015	0.0010 U	0.0010 UJ	0.0010 U	0.0010 U	--	0.019	0.0016	0.0011	0.0021	0.00056
Chloroform	EPA 8260	mg/kg	0.0010 U	0.0010 UJ	0.0010 U	0.0010 U	0.0010 UJ	0.0010 U	0.0010 U	--	0.0010 U	0.0010 U	0.0010 U	0.0012 U	0.052
Petroleum Hydrocarbons															
Gasoline-range hydrocarbons	NWTPH-G	mg/kg	--	--	--	6.2 J	9.9 J	5.0 U	--	--	--	--	--	--	30
Diesel-range hydrocarbons	NWTPH-Dx	mg/kg	--	--	--	25 J	15 UJ	19 U	--	--	--	--	--	--	260
Oil-range hydrocarbons	NWTPH-Dx	mg/kg	--	--	--	85	29 UJ	38 U	--	--	--	--	--	--	2,000
Total diesel- and oil-range hydrocarbons	NWTPH-Dx	mg/kg	--	--	--	110 J	29 UJ	38 U	--	--	--	--	--	--	260
Conventionals															
pH	N/A	N/A	11 J	11 J	11 J	10 J	9.2 J	7.7 J	11 J	--	12 J	12 J	12 J	9.6 J	NE

Notes:

- ¹ Sample locations are shown on Figures 3-1 and 3-3.
- ² Preliminary cleanup levels for soil are referenced from Table 4-1.
- ³ Total dioxin/furan Toxic Equivalency Quotients (TEQs) were calculated using United States Environmental Protection Agency (USEPA) Toxicity Equivalency Factor (TEF) values for human health (EPA 2003).
- ⁴ Total carcinogenic PAH (cPAH) TEQs were calculated using TEF values referenced from MTCA Table 708.2 (WAC 173-340-900).
- RL = Reporting limit
EPA = Environmental Protection Agency
mg/kg = milligram per kilogram
NE = not established
J = estimated result
FI = Initial (early 1900s) T115N fill deposit
FD = Glacier NW Site dredged fill deposit
FO = T115N operational (1960s) fill deposit
FT = Terminal 115 fill deposit
FP = Settling pond fill deposit
Bold indicates analyte was detected.

Yellow shading identifies the detected results greater than the preliminary cleanup level.
Blue shading identifies the non-detected result greater than the preliminary cleanup level.

COPC = Contaminant of Potential Concern
KCHD = King County Health Department
Landau = Landau Associates
GEI = GeoEngineers
ERM = Environmental Resources Management
Shaw = Shaw Environmental & Infrastructre
U = analyte not detected above the reporting limit
-- = not analyzed
AD = Native LDW alluvial deposit
OS = Native organic silt (Aquitard) deposit

Table 5-3
Remedial Investigation Chemical Analytical Results - Soil COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Sample Location ¹	Analytical Method	Units	B-14				B-15					B-16			Soil Preliminary Cleanup Level ² (PCUL)
Sample Identification			B14-2-3	B14-7-8	B14-11-12	B14-15-16	B15-2-3	B15-6-7	B15-6-7Dup	B15-9-10	B15-17-18	B16-2-3	B16-2-3Dup	B16-6-7	
Sample Date			01/08/14	01/08/14	01/08/14	01/08/14	01/08/14	01/08/14	01/08/14	01/08/14	01/08/14	01/07/14	01/07/14	01/07/14	
Sample Depth			2 - 3 ft	7 - 8 ft	11 - 12 ft	15 - 16 ft	2 - 3 ft	6 - 7 ft	6 - 7 ft	9 - 10 ft	17 - 18 ft	2 - 3 ft	2 - 3 ft	6 - 7 ft	
Stratigraphic Horizon			FO	FO	FO	AD	FP	FP	FP	FO	FI	FO	FO	FO	
Sampled By	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI		
Polychlorinated Biphenyls (PCBs)															
Total PCB Aroclors	EPA 8082	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	0.0000022
Dioxins and Furans															
Total Dioxin/Furan TEQ ³ (ND=0.5RL)	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	0.0000052
Total Dioxin/Furan TEQ ³ (ND=0.5RL)	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	0.0000052
Metals															
Antimony	EPA 6000/7000	mg/kg	5.0 U	5.0 U	5.0 U	--	12	5.0 U	5.0 U	5.0 U	--	5.0 U	5.0 U	5.0 U	4.1
Arsenic	EPA 6000/7000	mg/kg	5.4	5.1	6.3	--	3.0 U	0.50 U	0.5	2.3	--	0.91	0.81	2.6	7.0
Barium	EPA 6000/7000	mg/kg	39	50	69	--	140	43	58	64	--	53	49	47	8.3
Cadmium	EPA 6000/7000	mg/kg	0.20 U	0.20 U	0.26	--	8.2	0.20 U	0.20 U	0.20 U	--	0.27	0.20 U	0.20 U	1.0
Chromium III / Total	EPA 6000/7000	mg/kg	40	41	52	--	280	44	34	52	--	47 J	30 J	45	48
Chromium VI	EPA 6000/7000	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	18
Copper	EPA 6000/7000	mg/kg	16	20	33	--	52	21	21	24	--	25	20	13	36
Lead	EPA 6000/7000	mg/kg	13	3	18	--	6,100	35 J	3.2 J	3.2	--	140 J	20 J	5	50
Mercury	EPA 6000/7000	mg/kg	0.057	0.050 U	0.14	--	0.050 U	0.050 U	0.050 U	0.050 U	--	0.050 U	0.050 U	0.050 U	0.070
Nickel	EPA 6000/7000	mg/kg	41	48	72	--	34	45	45	53	--	37	31	38	48
Selenium	EPA 6000/7000	mg/kg	0.50 U	0.50 U	0.50 U	--	3.0 U	0.50 U	0.50 U	0.50 U	--	0.50 U	0.50 U	0.50 U	0.30
Silver	EPA 6000/7000	mg/kg	0.50 U	0.50 U	0.50 U	--	3.0 U	0.50 U	0.50 U	0.50 U	--	0.50 U	0.50 U	0.50 U	0.016
Thallium	EPA 6000/7000	mg/kg	0.25 U	0.25 U	0.25 U	--	0.30 U	0.25 U	0.25 U	0.25 U	--	0.25 U	0.25 U	0.25 U	0.0044
Tin	EPA 6000/7000	mg/kg	19	1.2	10	--	62,000	1,800 J	5,800 J	230	--	1,300 J	480 J	1.6	50
Zinc	EPA 6000/7000	mg/kg	38	42	88	--	3,200	66 J	44 J	50	--	210 J	52 J	37	85
Semi-Volatile Organic Compounds (SVOCs) - Polycyclic Aromatic Hydrocarbons (PAHs)															
Acenaphthene	EPA 8270/SIM	mg/kg	0.0082	0.0067 U	0.025 U	0.0067 U	0.0076	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.011 J	0.028
Anthracene	EPA 8270/SIM	mg/kg	0.0077	0.0067 U	0.025 U	0.0067 U	0.0079	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.051
Benzo(a)anthracene	EPA 8270/SIM	mg/kg	0.0067 U	0.0067 U	0.025 U	0.0074	0.013	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.011	0.000057
Benzo(b)fluoranthene	EPA 8270/SIM	mg/kg	0.0067 U	0.0067 U	0.025 U	0.0072	0.016	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0078	0.00020
Benzo(k)fluoranthene	EPA 8270/SIM	mg/kg	0.0067 U	0.0067 U	0.025 U	0.0067 U	0.01	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0020
Benzo(a)pyrene	EPA 8270/SIM	mg/kg	0.0067 U	0.0067 U	0.025 U	0.0069	0.017	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0089	0.000016
Chrysene	EPA 8270/SIM	mg/kg	0.0067 U	0.0067 U	0.032	0.0072	0.016	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0097	0.0064
Dibenzo(a,h)anthracene	EPA 8270/SIM	mg/kg	0.0067 U	0.0067 U	0.025 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.000029
Dibenzofuran	EPA 8270/SIM	mg/kg	0.017 U	0.017 U	0.063 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.54
Fluoranthene	EPA 8270/SIM	mg/kg	0.021	0.0067 U	0.025 U	0.016	0.037	0.0067 U	0.0067 U	0.0067 U	0.0084	0.0088	0.0067 U	0.022	0.090
Fluorene	EPA 8270/SIM	mg/kg	0.017	0.0067 U	0.025 U	0.0067 U	0.0095	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0076	0.029
Indeno(1,2,3-c,d)pyrene	EPA 8270/SIM	mg/kg	0.0067 U	0.0067 U	0.025 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.00056
1-Methylnaphthalene	EPA 8270/SIM	mg/kg	0.0067 U	0.0067 U	0.037	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	29
2-Methylnaphthalene	EPA 8270/SIM	mg/kg	0.0067 U	0.0067 U	0.037	0.0067 U	0.011	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0082	0.67
Naphthalene	EPA 8270/SIM	mg/kg	0.0067 U	0.0067 U	0.027	0.0067 U	0.015	0.0068	0.0073	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.02	0.0021
Pyrene	EPA 8270/SIM	mg/kg	0.015	0.0067 U	0.025 U	0.017	0.035	0.0067 U	0.0067 U	0.0067 U	0.0091	0.0081	0.0067 U	0.022	0.14
Total cPAH TEQ ⁴ (ND=0)	EPA 8270/SIM	mg/kg	0 U	0 U	0.00032	0.0084	0.021	0 U	0 U	0 U	0 U	0 U	0 U	0.011	0.000016
Total cPAH TEQ ⁴ (ND=0.5RL)	EPA 8270/SIM	mg/kg	0.0051 U	0.0051 U	0.019	0.0094	0.022	0.0051 U	0.0051 U	0.0051 U	0.0051 U	0.0051 U	0.0051 U	0.012	0.000016

Table 5-3
Remedial Investigation Chemical Analytical Results - Soil COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Sample Location ¹	Analytical Method	Units	B-14				B-15					B-16			Soil Preliminary Cleanup Level ² (PCUL)	
Sample Identification			B14-2-3	B14-7-8	B14-11-12	B14-15-16	B15-2-3	B15-6-7	B15-6-7Dup	B15-9-10	B15-17-18	B16-2-3	B16-2-3Dup	B16-6-7		
Sample Date			01/08/14	01/08/14	01/08/14	01/08/14	01/08/14	01/08/14	01/08/14	01/08/14	01/08/14	01/08/14	01/07/14	01/07/14		01/07/14
Sample Depth			2 - 3 ft	7 - 8 ft	11 - 12 ft	15 - 16 ft	2 - 3 ft	6 - 7 ft	6 - 7 ft	9 - 10 ft	17 - 18 ft	2 - 3 ft	2 - 3 ft	6 - 7 ft		
Stratigraphic Horizon			FO	FO	FO	AD	FP	FP	FP	FO	FI	FO	FO	FO		
Sampled By			GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI		GEI
Other SVOCs																
Aniline	EPA 8270	mg/kg	0.085 U	0.085 U	0.063 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	150	
Bis(2-chloroethyl)ether	EPA 8270	mg/kg	0.017 U	0.017 U	0.063 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.000022	
Bis(2-ethylhexyl)phthalate	EPA 8270	mg/kg	0.017 U	0.017 U	0.063 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.0051	
Butyl benzyl phthalate	EPA 8270	mg/kg	0.017 U	0.017 U	0.063 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.00018	
3,3'-Dichlorobenzidine	EPA 8270	mg/kg	0.017 U	0.017 U	0.063 U	0.017 U	0.071	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.0000033	
2,4-Dichlorophenol	EPA 8270	mg/kg	0.017 U	0.017 U	0.063 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.0043	
Diethyl phthalate	EPA 8270	mg/kg	0.085 U	0.085 U	0.063 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.034	
2,4-Dimethylphenol	EPA 8270	mg/kg	0.017 U	0.017 U	0.063 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.0031	
2-Methylphenol (o-Cresol)	EPA 8270	mg/kg	0.017 U	0.017 U	0.063 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.010	
n-Nitrosodimethylamine	EPA 8270	mg/kg	0.017 U	0.017 U	0.063 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017	
n-Nitrosodiphenylamine (as Diphenylamine)	EPA 8270	mg/kg	0.017 U	0.017 U	0.063 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.0011	
n-Nitrosodi-n-propylamine	EPA 8270	mg/kg	0.017 U	0.017 U	0.063 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.000018	
Pentachlorophenol	EPA 8270	mg/kg	0.083 UJ	0.083 UJ	0.063 UJ	0.083 UJ	0.083 UJ	0.083 UJ	0.083 UJ	0.083 UJ	0.083 UJ	0.083 UJ	0.083 UJ	0.083 UJ	0.0000018	
Phenol	EPA 8270	mg/kg	0.017 U	0.017 U	0.063 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.018	0.017 U	0.017 U	0.017 U	0.12	
2,4,6-Trichlorophenol	EPA 8270	mg/kg	0.017 U	0.017 U	0.063 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.00019	
Volatile Organic Compounds (VOCs)																
Benzene	EPA 8260	mg/kg	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.00056	
Chloroform	EPA 8260	mg/kg	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.052	
Petroleum Hydrocarbons																
Gasoline-range hydrocarbons	NWTPH-G	mg/kg	--	--	--	--	--	--	--	--	--	5.0 U	5.0 U	5.0 U	30	
Diesel-range hydrocarbons	NWTPH-Dx	mg/kg	--	--	--	--	--	--	--	--	--	15 U	14 U	14 U	260	
Oil-range hydrocarbons	NWTPH-Dx	mg/kg	--	--	--	--	--	--	--	--	--	42	41	28 U	2,000	
Total diesel- and oil-range hydrocarbons	NWTPH-Dx	mg/kg	--	--	--	--	--	--	--	--	--	42	41	28 U	260	
Conventionals																
pH	N/A	N/A	11 J	11 J	11 J	12 J	10 J	11 J	11 J	11 J	12 J	11 J	11 J	9.7 J	NE	

Notes:

- ¹ Sample locations are shown on Figures 3-1 and 3-3.
- ² Preliminary cleanup levels for soil are referenced from Table 4-1.
- ³ Total dioxin/furan Toxic Equivalency Quotients (TEQs) were calculated using United States Environmental Protection Agency (USEPA) Toxicity Equivalency Factor (TEF) values for human health (EPA 2003).
- ⁴ Total carcinogenic PAH (cPAH) TEQs were calculated using TEF values referenced from MTCA Table 708.2 (WAC 173-340-900).

RL = Reporting limit

EPA = Environmental Protection Agency

mg/kg = milligram per kilogram

NE = not established

J = estimated result

FI = Initial (early 1900s) T115N fill deposit

FD = Glacier NW Site dredged fill deposit

FO = T115N operational (1960s) fill deposit

FT = Terminal 115 fill deposit

FP = Settling pond fill deposit

Bold indicates analyte was detected.

Yellow shading identifies the detected results greater than the preliminary cleanup level.

Blue shading identifies the non-detected result greater than the preliminary cleanup level.

COPC = Contaminant of Potential Concern

KCHD = King County Health Department

Landau = Landau Associates

GEI = GeoEngineers

ERM = Environmental Resources Management

Shaw = Shaw Environmental & Infrastructre

U = analyte not detected above the reporting limit

-- = not analyzed

AD = Native LDW alluvial deposit

OS = Native organic silt (Aquitard) deposit

Table 5-3
Remedial Investigation Chemical Analytical Results - Soil COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Sample Location ¹	Analytical Method	Units	B-16		B-17				MW-1			MW-2D			Soil Preliminary Cleanup Level ² (PCUL)
Sample Identification			B16-10-11	B16-17-18	B17-4-5	B17-8-9	B17-8-9Dup	B17-19-20	MW-1-(4-5)	MW-1-(7-8)	MW-1-(11-12)	MW2D-0.5-1.5	MW2D-4.5-5.5	MW2D-5.5-6.5	
Sample Date			01/07/14	01/07/14	01/09/14	01/09/14	01/09/14	01/09/14	10/29/09	10/29/09	10/29/09	12/17/13	12/17/13	12/17/13	
Sample Depth			10 - 11 ft	17 - 18 ft	4 - 5 ft	8 - 9 ft	8 - 9 ft	19 - 20 ft	4 - 5 ft	7 - 8 ft	11 - 12 ft	0.5 - 1.5 ft	4.5 - 5.5 ft	5.5 - 6.5 ft	
Stratigraphic Horizon			FI	OS	FO	FO	FO	AD	FO	FO	FI	FO	FO	FI	
Sampled By	GEI	GEI	GEI	GEI	GEI	GEI	GEI	Landau	Landau	Landau	GEI	GEI	GEI		
Polychlorinated Biphenyls (PCBs)															
Total PCB Aroclors	EPA 8082	mg/kg	--	--	--	--	--	--	0.062 U	0.063 U	0.067 U	--	--	--	0.0000022
Dioxins and Furans															
Total Dioxin/Furan TEQ ³ (ND=0.5RL)	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	0.0000052
Total Dioxin/Furan TEQ ³ (ND=0.5RL)	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	0.0000052
Metals															
Antimony	EPA 6000/7000	mg/kg	5.0 U	--	5.0 U	5.0 U	5.0 U	5.0 U	6.2 U	6.3 U	6.6 U	5.0 U	5.0 U	--	4.1
Arsenic	EPA 6000/7000	mg/kg	1.9	--	2.5	2.3	2.7	2	6.2 U	6.3 U	6.6 U	4.8	3.9	--	7.0
Barium	EPA 6000/7000	mg/kg	43	--	45	52	51	14	--	--	--	51	120	--	8.3
Cadmium	EPA 6000/7000	mg/kg	0.20 U	--	0.20 U	0.20 U	0.20 U	0.20 U	0.62 U	0.63 U	0.66 U	0.38	0.20 U	--	1.0
Chromium III / Total	EPA 6000/7000	mg/kg	32	--	43	33	39	14	39	41	55	25	52	--	48
Chromium VI	EPA 6000/7000	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	18
Copper	EPA 6000/7000	mg/kg	18	--	15	16	17	11	22	28	33	36	38	--	36
Lead	EPA 6000/7000	mg/kg	2.8	--	2.5	2.7	2.8	1.7	19	44	5.5	36	11	--	50
Mercury	EPA 6000/7000	mg/kg	0.050 U	--	0.050 U	0.050 U	0.050 U	0.050 U	0.062 U	0.063 U	0.066 U	0.052	0.050 U	--	0.070
Nickel	EPA 6000/7000	mg/kg	37	--	41	42	47	8.2	44	51	60	28	96	--	48
Selenium	EPA 6000/7000	mg/kg	0.50 U	--	0.50 U	0.50 U	0.50 U	0.50 U	12 U	13 U	13 U	0.50 U	0.50 U	--	0.30
Silver	EPA 6000/7000	mg/kg	0.50 U	--	0.50 U	0.50 U	0.50 U	0.50 U	0.62 U	0.63 U	0.66 U	0.50 U	0.50 U	--	0.016
Thallium	EPA 6000/7000	mg/kg	0.25 U	--	0.25 U	0.25 U	0.25 U	0.25 U	6.2 U	6.3 U	6.6 U	0.25 U	0.25 U	--	0.0044
Tin	EPA 6000/7000	mg/kg	16	--	1.0 U	0.99 U	0.99 U	0.99 U	48	96	1.3 U	76	28	--	50
Zinc	EPA 6000/7000	mg/kg	35	--	30	33	33	21	52	77	62	69	74	--	85
Semi-Volatile Organic Compounds (SVOCs) - Polycyclic Aromatic Hydrocarbons (PAHs)															
Acenaphthene	EPA 8270/SIM	mg/kg	0.017	0.0067 U	0.0067 U	0.026	0.021	0.0067 U	0.015	0.13	0.0089 U	0.0067 U	0.0067 U	0.0067 U	0.028
Anthracene	EPA 8270/SIM	mg/kg	0.012	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.01	0.0082 U	0.072	0.0089 U	0.0067 U	0.0067 U	0.0067 U	0.051
Benzo(a)anthracene	EPA 8270/SIM	mg/kg	0.02	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.016	0.0082 U	0.043	0.0089 U	0.0088	0.0067 U	0.0067 U	0.000057
Benzo(b)fluoranthene	EPA 8270/SIM	mg/kg	0.019	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.012	0.0082 U	0.023	0.0089 U	0.01	0.0067 U	0.0067 U	0.00020
Benzo(k)fluoranthene	EPA 8270/SIM	mg/kg	0.0073	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0082 U	0.0084 U	0.0089 U	0.0071	0.0067 U	0.0067 U	0.0020
Benzo(a)pyrene	EPA 8270/SIM	mg/kg	0.017	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.013	0.0082 U	0.014	0.0089 U	0.0089	0.0067 U	0.0067 U	0.000016
Chrysene	EPA 8270/SIM	mg/kg	0.018	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.013	0.0082 U	0.034	0.0089 U	0.0095	0.0067 U	0.0067 U	0.0064
Dibenzo(a,h)anthracene	EPA 8270/SIM	mg/kg	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0082 U	0.0084 U	0.0089 U	0.0067 U	0.0067 U	0.0067 U	0.000029
Dibenzofuran	EPA 8270/SIM	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.041 U	0.087	0.044 U	0.017 U	0.017 U	0.017 U	0.54
Fluoranthene	EPA 8270/SIM	mg/kg	0.051	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.032	0.021	0.29	0.0089 U	0.017	0.0074	0.0067 U	0.090
Fluorene	EPA 8270/SIM	mg/kg	0.016	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0087	0.011	0.13	0.0089 U	0.0067 U	0.0067 U	0.0067 U	0.029
Indeno(1,2,3-c,d)pyrene	EPA 8270/SIM	mg/kg	0.0093	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0082 U	0.0085	0.0089 U	0.0067 U	0.0067 U	0.0067 U	0.00056
1-Methylnaphthalene	EPA 8270/SIM	mg/kg	0.0067 U	0.0067 U	0.0067 U	0.016	0.012	0.0067 U	0.0082 U	0.042	0.0089 U	0.0067 U	0.0067 U	0.0067 U	29
2-Methylnaphthalene	EPA 8270/SIM	mg/kg	0.0067	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067	0.0082 U	0.066	0.0089 U	0.0067 U	0.0067 U	0.0067 U	0.67
Naphthalene	EPA 8270/SIM	mg/kg	0.026	0.0067 U	0.0067 U	0.050 J	0.035 J	0.0067 U	0.0082 U	0.026	0.0089 U	0.0067 U	0.0067 U	0.0067 U	0.0021
Pyrene	EPA 8270/SIM	mg/kg	0.041	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.035	0.019	0.18	0.0089 U	0.019	0.011	0.0067 U	0.14
Total cPAH TEQ ⁴ (ND=0)	EPA 8270/SIM	mg/kg	0.023	0 U	0 U	0 U	0 U	0.016	0 U	0.022	0 U	0.012	0 U	0 U	0.000016
Total cPAH TEQ ⁴ (ND=0.5RL)	EPA 8270/SIM	mg/kg	0.023	0.0051 U	0.0051 U	0.0051 U	0.0051 U	0.017	0.0062 U	0.023	0.0067 U	0.012	0.0051 U	0.0051 U	0.000016

Table 5-3
Remedial Investigation Chemical Analytical Results - Soil COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Sample Location ¹	Analytical Method	Units	B-16		B-17				MW-1			MW-2D			Soil Preliminary Cleanup Level ² (PCUL)
Sample Identification			B16-10-11	B16-17-18	B17-4-5	B17-8-9	B17-8-9Dup	B17-19-20	MW-1-(4-5)	MW-1-(7-8)	MW-1-(11-12)	MW2D-0.5-1.5	MW2D-4.5-5.5	MW2D-5.5-6.5	
Sample Date			01/07/14	01/07/14	01/09/14	01/09/14	01/09/14	01/09/14	10/29/09	10/29/09	10/29/09	12/17/13	12/17/13	12/17/13	
Sample Depth			10 - 11 ft	17 - 18 ft	4 - 5 ft	8 - 9 ft	8 - 9 ft	19 - 20 ft	4 - 5 ft	7 - 8 ft	11 - 12 ft	0.5 - 1.5 ft	4.5 - 5.5 ft	5.5 - 6.5 ft	
Stratigraphic Horizon			FI	OS	FO	FO	FO	AD	FO	FO	FI	FO	FO	FI	
Sampled By			GEI	GEI	GEI	GEI	GEI	GEI	Landau	Landau	Landau	GEI	GEI	GEI	
Other SVOCs															
Aniline	EPA 8270	mg/kg	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.041 U	0.042 U	0.044 U	0.085 U	0.085 U	0.085 U	150
Bis(2-chloroethyl)ether	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.041 U	0.042 U	0.044 U	0.017 U	0.017 U	0.017 U	0.000022
Bis(2-ethylhexyl)phthalate	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.041 U	0.042	0.044 U	0.081	0.017 U	0.041	0.0051
Butyl benzyl phthalate	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.041 U	0.042 U	0.044 U	0.017 U	0.072	0.017 U	0.00018
3,3'-Dichlorobenzidine	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.41 U	0.42 U	0.44 U	0.017 U	0.017 U	0.017 U	0.0000033
2,4-Dichlorophenol	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.041 U	0.042 U	0.044 U	0.017 U	0.017 U	0.017 U	0.0043
Diethyl phthalate	EPA 8270	mg/kg	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.041 U	0.042 U	0.044 U	0.085 U	0.085 U	0.085 U	0.034
2,4-Dimethylphenol	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.041 U	0.042 U	0.044 U	0.017 U	0.017 U	0.017 U	0.0031
2-Methylphenol (o-Cresol)	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.041 U	0.042 U	0.044 U	0.017 U	0.017 U	0.017 U	0.010
n-Nitrosodimethylamine	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.041 U	0.042 U	0.044 U	0.017 U	0.017 U	0.017 U	0.017
n-Nitrosodiphenylamine (as Diphenylamine)	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.041 U	0.042 U	0.044 U	0.017 U	0.017 U	0.017 U	0.0011
n-Nitrosodi-n-propylamine	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.041 U	0.042 U	0.044 U	0.017 U	0.017 U	0.017 U	0.000018
Pentachlorophenol	EPA 8270	mg/kg	0.083 UJ	0.083 UJ	0.083 UJ	0.083 UJ	0.083 UJ	0.083 UJ	0.21 U	0.21 U	0.22 U	0.083 UJ	0.083 UJ	0.083 UJ	0.0000018
Phenol	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.041 U	0.042 U	0.044 U	0.017 U	0.017 U	0.017 U	0.12
2,4,6-Trichlorophenol	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.041 U	0.042 U	0.044 U	0.017 U	0.017 U	0.017 U	0.00019
Volatile Organic Compounds (VOCs)															
Benzene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 UJ	0.0010 U	–	–	–	0.0010 U	0.0010 U	0.0010 U	0.00056
Chloroform	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 UJ	0.0010 U	–	–	–	0.0010 U	0.0010 U	0.0010 U	0.052
Petroleum Hydrocarbons															
Gasoline-range hydrocarbons	NWTPH-G	mg/kg	5.0 U	5.0 U	–	–	–	–	4.4 U	4.7 U	5.7 U	2.9 U	4.4 U	5.0 U	30
Diesel-range hydrocarbons	NWTPH-Dx	mg/kg	17	15 U	–	–	–	–	31 U	32 U	33 U	15 U	16 U	16 U	260
Oil-range hydrocarbons	NWTPH-Dx	mg/kg	29 U	30 U	–	–	–	–	62 U	83	66 U	130	48	33 U	2,000
Total diesel- and oil-range hydrocarbons	NWTPH-Dx	mg/kg	17	30 U	–	–	–	–	62 U	83	66 U	130	48	33 U	260
Conventionals															
pH	N/A	N/A	11 J	8.6 J	8.4 J	8.6 J	8.6 J	8.2 J	–	–	–	8.2 J	7.9 J	8.4 J	NE

Notes:

- ¹ Sample locations are shown on Figures 3-1 and 3-3.
- ² Preliminary cleanup levels for soil are referenced from Table 4-1.
- ³ Total dioxin/furan Toxic Equivalency Quotients (TEQs) were calculated using United States Environmental Protection Agency (USEPA) Toxicity Equivalency Factor (TEF) values for human health (EPA 2003).
- ⁴ Total carcinogenic PAH (cPAH) TEQs were calculated using TEF values referenced from MTCA Table 708.2 (WAC 173-340-900).

RL = Reporting limit

EPA = Environmental Protection Agency

mg/kg = milligram per kilogram

NE = not established

J = estimated result

FI = Initial (early 1900s) T115N fill deposit

FD = Glacier NW Site dredged fill deposit

FO = T115N operational (1960s) fill deposit

FT = Terminal 115 fill deposit

FP = Settling pond fill deposit

Bold indicates analyte was detected.

Yellow shading identifies the detected results greater than the preliminary cleanup level.

Blue shading identifies the non-detected result greater than the preliminary cleanup level.

COPC = Contaminant of Potential Concern

KCHD = King County Health Department

Landau = Landau Associates

GEI = GeoEngineers

ERM = Environmental Resources Management

Shaw = Shaw Environmental & Infastructre

U = analyte not detected above the reporting limit

– = not analyzed

AD = Native LDW alluvial deposit

OS = Native organic silt (Aquitard) deposit

Table 5-3
Remedial Investigation Chemical Analytical Results - Soil COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Sample Location ¹	Analytical Method	Units	MW-2D			MW-3			MW-4D						Soil Preliminary Cleanup Level ² (PCUL)
Sample Identification			MW2D-11.5-12.5	MW2D-13.5-14.5	MW2D-26-27	MW-3-(6.5-7)	MW-3-(10.5-11.5)	MW-3-(17-18)	MW4D-2-3	MW4D-7-8	MW4D-8-9	MW4D-8-9Dup	MW4D-10-11	MW4D-24-25	
Sample Date			12/17/13	12/17/13	12/17/13	10/29/09	10/29/09	10/29/09	12/19/13	12/19/13	12/19/13	12/19/13	12/19/13	12/19/13	
Sample Depth			11.5 - 12.5 ft	13.5 - 14.5 ft	26 - 27 ft	6.5 - 7 ft	10.5 -11.5 ft	17 - 18 ft	2 - 3 ft	7 - 8 ft	8 - 9 ft	8 - 9 ft	10 - 11 ft	24 - 25 ft	
Stratigraphic Horizon			FI	OS	AD	FO	FI	FI	FO	FO	FI	FI	OS	AD	
Sampled By	GEI	GEI	GEI	Landau	Landau	Landau	GEI	GEI	GEI	GEI	GEI	GEI	GEI		
Polychlorinated Biphenyls (PCBs)															
Total PCB Aroclors	EPA 8082	mg/kg	--	--	--	0.057 U	0.069 U	0.058 U	--	--	--	--	--	--	0.0000022
Dioxins and Furans															
Total Dioxin/Furan TEQ ³ (ND=0.5RL)	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	0.0000052
Total Dioxin/Furan TEQ ³ (ND=0.5RL)	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	0.0000052
Metals															
Antimony	EPA 6000/7000	mg/kg	--	5.0 U	5.0 U	5.7 U	6.9 U	5.8 U	5.0 U	--	5.0 U	5.0 U	5.0 U	5.0 U	4.1
Arsenic	EPA 6000/7000	mg/kg	--	5.2	2	5.7 U	11	5.8 U	2.9	--	460 J	260 J	76	1.9	7.0
Barium	EPA 6000/7000	mg/kg	--	34	29	--	--	--	42	--	74	55	53	18	8.3
Cadmium	EPA 6000/7000	mg/kg	--	0.20 U	0.20 U	0.57 U	0.69 U	0.58 U	0.20 U	--	0.31	0.36	0.20 U	0.20 U	1.0
Chromium III / Total	EPA 6000/7000	mg/kg	--	19	11	38	55	42	37	--	42 J	29 J	26	10	48
Chromium VI	EPA 6000/7000	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	18
Copper	EPA 6000/7000	mg/kg	--	23	9.1	19	33	38	16	--	42	42	25	8.7	36
Lead	EPA 6000/7000	mg/kg	--	16	0.98	9.8	46	17	4.5	--	26	34	9.8	1.1	50
Mercury	EPA 6000/7000	mg/kg	--	0.050 U	0.050 U	0.057 U	0.086	0.058 U	0.050 U	--	0.075	0.084	0.056	0.050 U	0.070
Nickel	EPA 6000/7000	mg/kg	--	11	8.4	37	72	40	35	--	46	37	30	7.4	48
Selenium	EPA 6000/7000	mg/kg	--	0.57	0.50 U	11 U	14 U	12 U	0.50 U	--	0.50 U	0.50 U	0.50 U	0.50 U	0.30
Silver	EPA 6000/7000	mg/kg	--	0.50 U	0.50 U	0.57 U	0.69 U	0.58 U	0.50 U	--	0.50 U	0.50 U	0.50 U	0.50 U	0.016
Thallium	EPA 6000/7000	mg/kg	--	0.25 U	0.25 U	5.7 U	6.9 U	5.8 U	0.25 U	--	0.25 U	0.25 U	0.25 U	0.25 U	0.0044
Tin	EPA 6000/7000	mg/kg	--	5.4	1.0 U	1.1 U	12	77	2.6	--	1.4	2.5	1.0 U	1.0 U	50
Zinc	EPA 6000/7000	mg/kg	--	27	23	34	83	52	33	--	74	62	36	21	85
Semi-Volatile Organic Compounds (SVOCs) - Polycyclic Aromatic Hydrocarbons (PAHs)															
Acenaphthene	EPA 8270/SIM	mg/kg	0.0067 U	0.0067 U	0.0067 U	0.18	0.0093 U	0.41	0.0067 U	0.0067 U	0.0067 U	0.018	0.0067 U	0.0067 U	0.028
Anthracene	EPA 8270/SIM	mg/kg	0.0067 U	0.0067 U	0.0067 U	0.008 U	0.0093 U	0.14	0.028	0.0067 U	0.014 J	0.058 J	0.0067 U	0.0067 U	0.051
Benzo(a)anthracene	EPA 8270/SIM	mg/kg	0.0067 U	0.0067 U	0.0067 U	--	0.0093 U	--	0.011	0.0098	0.028 J	0.11 J	0.0072	0.0067 U	0.000057
Benzo(b)fluoranthene	EPA 8270/SIM	mg/kg	0.0067 U	0.0067 U	0.0067 U	--	0.0093 U	--	0.0067 U	0.025 U	0.026 J	0.086 J	0.0067 U	0.0067 U	0.00020
Benzo(k)fluoranthene	EPA 8270/SIM	mg/kg	0.0067 U	0.0067 U	0.0067 U	--	0.0093 U	--	0.0067 U	0.025 U	0.017 J	0.066 J	0.0067 U	0.0067 U	0.0020
Benzo(a)pyrene	EPA 8270/SIM	mg/kg	0.0067 U	0.0067 U	0.0067 U	--	0.0093 U	--	0.0074	0.025 U	0.026 J	0.095 J	0.0069	0.0067 U	0.000016
Chrysene	EPA 8270/SIM	mg/kg	0.0067 U	0.0067 U	0.0067 U	--	0.0093 U	--	0.0093	0.021	0.028 J	0.095 J	0.0067 U	0.0067 U	0.0064
Dibenzo(a,h)anthracene	EPA 8270/SIM	mg/kg	0.0067 U	0.0067 U	0.0067 U	--	0.0093 U	--	0.0067 U	0.025 U	0.0067 UJ	0.028 UJ	0.0067 U	0.0067 U	0.000029
Dibenzofuran	EPA 8270/SIM	mg/kg	0.017 U	0.017 U	0.017 U	0.096	0.046 U	0.31	0.017 U	0.025 U	0.017 U	0.028 U	0.017 U	0.017 U	0.54
Fluoranthene	EPA 8270/SIM	mg/kg	0.0067 U	0.0067 U	0.0067 U	0.021	0.011	0.93	0.035	0.021	0.055 J	0.24 J	0.015	0.0067 U	0.090
Fluorene	EPA 8270/SIM	mg/kg	0.0067 U	0.0067 U	0.0067 U	0.099	0.0093 U	0.47	0.013	0.0094	0.0085 J	0.023 J	0.0067 U	0.0067 U	0.029
Indeno(1,2,3-c,d)pyrene	EPA 8270/SIM	mg/kg	0.0067 U	0.0067 U	0.0067 U	--	0.0093 U	--	0.0067 U	0.025 U	0.014 J	0.044 J	0.0067 U	0.0067 U	0.00056
1-Methylnaphthalene	EPA 8270/SIM	mg/kg	0.0067 U	0.0067 U	0.0067 U	0.11	0.0093 U	0.094	0.0067 U	0.0081	0.0067 U	0.0075	0.0067 U	0.0067 U	29
2-Methylnaphthalene	EPA 8270/SIM	mg/kg	0.0067 U	0.0067 U	0.0067 U	0.17	0.0093 U	0.2	0.0067 U	0.01	0.0067 U	0.0099	0.0067 U	0.0067 U	0.67
Naphthalene	EPA 8270/SIM	mg/kg	0.0067 U	0.0067 U	0.0067 U	0.28	0.0093 U	0.081	0.0067 U	0.012	0.0067 U	0.008	0.0067 U	0.0067 U	0.0021
Pyrene	EPA 8270/SIM	mg/kg	0.0067 U	0.0067 U	0.0067 U	0.013	0.0093 U	0.52	0.031	0.03	0.049 J	0.27 J	0.017	0.0067 U	0.14
Total cPAH TEQ ⁴ (ND=0)	EPA 8270/SIM	mg/kg	0 U	0 U	0 U	--	0 U	--	0.0086	0.0012	0.035	0.13	0.0076	0 U	0.000016
Total cPAH TEQ ⁴ (ND=0.5RL)	EPA 8270/SIM	mg/kg	0.0051 U	0.0051 U	0.0051 U	--	0.0070 U	--	0.0099	0.019	0.035	0.13	0.009	0.0051 U	0.000016

Table 5-3
Remedial Investigation Chemical Analytical Results - Soil COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Sample Location ¹	Analytical Method	Units	MW-2D			MW-3			MW-4D						Soil Preliminary Cleanup Level ² (PCUL)
Sample Identification			MW2D-11.5-12.5	MW2D-13.5-14.5	MW2D-26-27	MW-3-(6.5-7)	MW-3-(10.5-11.5)	MW-3-(17-18)	MW4D-2-3	MW4D-7-8	MW4D-8-9	MW4D-8-9Dup	MW4D-10-11	MW4D-24-25	
Sample Date			12/17/13	12/17/13	12/17/13	10/29/09	10/29/09	10/29/09	12/19/13	12/19/13	12/19/13	12/19/13	12/19/13	12/19/13	
Sample Depth			11.5 - 12.5 ft	13.5 - 14.5 ft	26 - 27 ft	6.5 - 7 ft	10.5 -11.5 ft	17 - 18 ft	2 - 3 ft	7 - 8 ft	8 - 9 ft	8 - 9 ft	10 - 11 ft	24 - 25 ft	
Stratigraphic Horizon			FI	OS	AD	FO	FI	FI	FO	FO	FI	FI	OS	AD	
Sampled By			GEI	GEI	GEI	Landau	Landau	Landau	GEI	GEI	GEI	GEI	GEI	GEI	
Other SVOCs															
Aniline	EPA 8270	mg/kg	0.085 U	0.085 U	0.085 U	0.038 U	0.046 U	0.19 U	0.085 U	0.13 U	0.085 UJ	0.70 UJ	0.085 U	0.085 U	150
Bis(2-chloroethyl)ether	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.038 U	0.046 U	0.19 U	0.017 U	0.025 U	0.017 UJ	0.14 UJ	0.017 U	0.017 U	0.000022
Bis(2-ethylhexyl)phthalate	EPA 8270	mg/kg	0.045	0.017	0.041	0.038 U	0.046 U	0.19 U	0.06	0.071	0.029	0.042	0.018	0.018	0.0051
Butyl benzyl phthalate	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.038 U	0.046 U	0.19 U	0.017 U	0.025 U	0.017 U	0.028 U	0.017 U	0.017 U	0.00018
3,3'-Dichlorobenzidine	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.38 U	0.46 U	1.9 U	0.017 U	0.025 U	0.017 U	0.028 U	0.017 U	0.017 U	0.0000033
2,4-Dichlorophenol	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.038 U	0.046 U	0.19 U	0.017 U	0.025 U	0.017 UJ	0.70 UJ	0.017 U	0.017 U	0.0043
Diethyl phthalate	EPA 8270	mg/kg	0.085 U	0.085 U	0.085 U	0.038 U	0.046 U	0.19 U	0.085 U	0.13 U	0.085 U	0.028 U	0.085 U	0.085 U	0.034
2,4-Dimethylphenol	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.038 U	0.046 U	0.19 U	0.017 U	0.025 U	0.017 UJ	0.14 UJ	0.017 U	0.017 U	0.0031
2-Methylphenol (o-Cresol)	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.038 U	0.046 U	0.19 U	0.017 U	0.025 U	0.017 UJ	0.14 UJ	0.017 U	0.017 U	0.010
n-Nitrosodimethylamine	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.038 U	0.046 U	0.19 U	0.017 U	0.025 U	0.017 UJ	0.14 UJ	0.017 U	0.017 U	0.017
n-Nitrosodiphenylamine (as Diphenylamine)	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.038 U	0.046 U	0.19 U	0.017 U	0.025 U	0.017 U	0.028 U	0.017 U	0.017 U	0.0011
n-Nitrosodi-n-propylamine	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.038 U	0.046 U	0.19 U	0.017 U	0.025 U	0.017 UJ	0.14 UJ	0.017 U	0.017 U	0.000018
Pentachlorophenol	EPA 8270	mg/kg	0.083 UJ	0.083 UJ	0.083 UJ	0.19 U	0.23 U	0.97 U	0.083 UJ	0.13 UJ	0.083 UJ	0.028 UJ	0.083 UJ	0.083 UJ	0.0000018
Phenol	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.038 U	0.046 U	0.19 U	0.017 U	0.025 U	0.017 UJ	0.14 UJ	0.017 U	0.017 U	0.12
2,4,6-Trichlorophenol	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.038 U	0.046 U	0.19 U	0.017 U	0.025 U	0.017 UJ	0.14 UJ	0.017 U	0.017 U	0.00019
Volatile Organic Compounds (VOCs)															
Benzene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	–	–	–	0.024	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.00056
Chloroform	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	–	–	–	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.052
Petroleum Hydrocarbons															
Gasoline-range hydrocarbons	NWTPH-G	mg/kg	4.6 UJ	4.6 U	3.5 U	–	–	–	–	–	–	–	–	–	30
Diesel-range hydrocarbons	NWTPH-Dx	mg/kg	16 U	18 U	14 U	–	–	–	–	–	–	–	–	–	260
Oil-range hydrocarbons	NWTPH-Dx	mg/kg	33 U	79	29 U	–	–	–	–	–	–	–	–	–	2,000
Total diesel- and oil-range hydrocarbons	NWTPH-Dx	mg/kg	33 U	79	29 U	–	–	–	–	–	–	–	–	–	260
Conventionals															
pH	N/A	N/A	7.7 J	7.3 J	8.1 J	–	–	–	10 J	9.6 J	9.3 J	9.3 J	8.5 J	8.4 J	NE

Notes:

- ¹ Sample locations are shown on Figures 3-1 and 3-3.
- ² Preliminary cleanup levels for soil are referenced from Table 4-1.
- ³ Total dioxin/furan Toxic Equivalency Quotients (TEQs) were calculated using United States Environmental Protection Agency (USEPA) Toxicity Equivalency Factor (TEF) values for human health (EPA 2003).
- ⁴ Total carcinogenic PAH (cPAH) TEQs were calculated using TEF values referenced from MTCA Table 708.2 (WAC 173-340-900).
- RL = Reporting limit

EPA = Environmental Protection Agency

mg/kg = milligram per kilogram

NE = not established

J = estimated result

FI = Initial (early 1900s) T115N fill deposit

FD = Glacier NW Site dredged fill deposit

FO = T115N operational (1960s) fill deposit

FT = Terminal 115 fill deposit

FP = Settling pond fill deposit

Bold indicates analyte was detected.

Yellow shading identifies the detected results greater than the preliminary cleanup level.

Blue shading identifies the non-detected result greater than the preliminary cleanup level.
- COPC = Contaminant of Potential Concern

KCHD = King County Health Department

Landau = Landau Associates

GEI = GeoEngineers

ERM = Environmental Resources Management

Shaw = Shaw Environmental & Infrastructre

U = analyte not detected above the reporting limit

-- = not analyzed

AD = Native LDW alluvial deposit

OS = Native organic silt (Aquitard) deposit

Table 5-3
Remedial Investigation Chemical Analytical Results - Soil COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Sample Location ¹	Analytical Method	Units	MW-5			MW-10		MW-10D					MW-11		Soil Preliminary Cleanup Level ² (PCUL)
Sample Identification			MW-5-(4-5)	MW-5-(10-11)	MW-5-(16-17)	MW-10-(3-8)	MW-10-(10-12)	MW10D-2-3	MW10D-6.5-7.5	MW10D-17-18	MW10D-23-24	MW10D-28-29	MW11-1-2	MW11-3-4	
Sample Date			10/29/09	10/29/09	10/29/09	10/30/09	10/30/09	12/30/13	12/30/13	12/30/13	12/30/13	12/30/13	12/16/13	12/16/13	
Sample Depth			4 - 5 ft	10 - 11 ft	16 - 17 ft	3 - 8 ft	10 - 12 ft	2 - 3 ft	6.5 - 7.5 ft	17 - 18 ft	23 - 24 ft	28 - 29 ft	1 - 2 ft	3 - 4 ft	
Stratigraphic Horizon			FO	FO	FI	FO	FO	FO	FO	FO	AD	AD	FO	FO	
Sampled By	Landau	Landau	Landau	Landau	Landau	Landau	Landau	GEI	GEI	GEI	GEI	GEI	GEI	GEI	
Polychlorinated Biphenyls (PCBs)															
Total PCB Aroclors	EPA 8082	mg/kg	0.062 U	0.057 U	0.060 U	--	--	0.027 U	--	--	--	--	--	--	0.0000022
Dioxins and Furans															
Total Dioxin/Furan TEQ ³ (ND=0.5RL)	EPA 1613	mg/kg	--	--	--	--	--	0.00000207	--	--	--	--	0.000000025	--	0.0000052
Total Dioxin/Furan TEQ ³ (ND=0.5RL)	EPA 1613	mg/kg	--	--	--	--	--	0.00000229	--	--	--	--	0.000000264	--	0.0000052
Metals															
Antimony	EPA 6000/7000	mg/kg	6.1 U	5.7 U	6 U	0.25	0.78	5.0 U	5.0 U	--	5.0 U	--	5.0 U	5.0 U	4.1
Arsenic	EPA 6000/7000	mg/kg	6.1 U	5.7 U	6 U	7.62	11.6	1.2	4.1	--	2.4	--	0.50 U	4.5	7.0
Barium	EPA 6000/7000	mg/kg	--	--	--	--	--	17	68	--	15	--	7.3	130	8.3
Cadmium	EPA 6000/7000	mg/kg	0.61 U	0.57 U	0.6 U	0.16	0.1 U	0.20 U	0.28	--	0.20 U	--	0.20 U	0.20 U	1.0
Chromium III / Total	EPA 6000/7000	mg/kg	55	34	34	31	28.1	16	40	--	9.2	--	10	57	48
Chromium VI	EPA 6000/7000	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	18
Copper	EPA 6000/7000	mg/kg	31	19	20	34.7	20.5	79	26	--	9	--	100	38	36
Lead	EPA 6000/7000	mg/kg	7.8	13	27	141	16.2	8.5	21	--	2.5	--	1.4	6	50
Mercury	EPA 6000/7000	mg/kg	0.061 U	0.057 U	0.06 U	0.0313	0.0217	0.050 U	0.051	--	0.050 U	--	0.050 U	0.050 U	0.070
Nickel	EPA 6000/7000	mg/kg	65	38	35	33	35.3	26	37	--	7.5	--	24	75	48
Selenium	EPA 6000/7000	mg/kg	12 U	11 U	12 U	0.5 U	0.5 U	0.50 U	0.50 U	--	0.50 U	--	0.50 U	0.50 U	0.30
Silver	EPA 6000/7000	mg/kg	0.61 U	0.57 U	0.6 U	0.1 U	0.1 U	0.50 U	0.50 U	--	0.50 U	--	0.50 U	0.50 U	0.016
Thallium	EPA 6000/7000	mg/kg	6.1 U	5.7 U	6 U	--	--	0.25 U	0.25 U	--	0.25 U	--	0.25 U	0.25 U	0.0044
Tin	EPA 6000/7000	mg/kg	7.7	28	170	--	--	52 J	110 J	--	16 J	--	2.9	1.0 U	50
Zinc	EPA 6000/7000	mg/kg	59	42	50	--	--	48	49	--	25	--	27	70	85
Semi-Volatile Organic Compounds (SVOCs) - Polycyclic Aromatic Hydrocarbons (PAHs)															
Acenaphthene	EPA 8270/SIM	mg/kg	0.0082 U	0.05	0.0099	--	--	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.61	0.028
Anthracene	EPA 8270/SIM	mg/kg	0.0082 U	0.13	0.019	--	--	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.68	0.051
Benzo(a)anthracene	EPA 8270/SIM	mg/kg	0.0082 U	0.17	0.025	--	--	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.013	0.21	0.000057
Benzo(b)fluoranthene	EPA 8270/SIM	mg/kg	0.0082 U	0.16	0.028	--	--	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.022 U	0.083	0.00020
Benzo(k)fluoranthene	EPA 8270/SIM	mg/kg	0.0082 U	0.06	0.008 U	--	--	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.022 U	0.053	0.0020
Benzo(a)pyrene	EPA 8270/SIM	mg/kg	0.0082 U	0.14	0.023	--	--	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.022 U	0.065	0.000016
Chrysene	EPA 8270/SIM	mg/kg	0.0082 U	0.16	0.027	--	--	0.0067 U	0.015	0.0067 U	0.0067 U	0.0067 U	0.053	0.17	0.0064
Dibenzo(a,h)anthracene	EPA 8270/SIM	mg/kg	0.0082 U	0.038 U	0.008 U	--	--	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.022 U	0.0067 U	0.000029
Dibenzofuran	EPA 8270/SIM	mg/kg	0.041 U	0.038 U	0.04 U	--	--	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.022 U	0.31	0.54
Fluoranthene	EPA 8270/SIM	mg/kg	0.0082 U	0.46	0.087	--	--	0.0067 U	0.018	0.0067 U	0.0067 U	0.0067 U	0.0067 U	1.1	0.090
Fluorene	EPA 8270/SIM	mg/kg	0.0082 U	0.06	0.011	--	--	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.58	0.029
Indeno(1,2,3-c,d)pyrene	EPA 8270/SIM	mg/kg	0.0082 U	0.074	0.011	--	--	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.022 U	0.015	0.00056
1-Methylnaphthalene	EPA 8270/SIM	mg/kg	0.0082 U	0.038 U	0.008 U	--	--	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0097	0.28	29
2-Methylnaphthalene	EPA 8270/SIM	mg/kg	0.0082 U	0.038 U	0.008 U	--	--	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.017	0.61	0.67
Naphthalene	EPA 8270/SIM	mg/kg	0.0082 U	0.038 U	0.008 U	--	--	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.059	0.0021
Pyrene	EPA 8270/SIM	mg/kg	0.0082 U	0.37	0.086	--	--	0.0067 U	0.0067 U	0.0077	0.0067 U	0.0067 U	0.017	0.76	0.14
Total cPAH TEQ ⁴ (ND=0)	EPA 8270/SIM	mg/kg	0 U	0.19	0.03	--	--	0 U	0.00015	0 U	0 U	0 U	0.0018	0.103	0.000016
Total cPAH TEQ ⁴ (ND=0.5RL)	EPA 8270/SIM	mg/kg	0.0062 U	0.19	0.03	--	--	0.0051 U	0.0052	0.0051 U	0.0051 U	0.0051 U	0.017	0.1	0.000016

Table 5-3
Remedial Investigation Chemical Analytical Results - Soil COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Sample Location ¹	Analytical Method	Units	MW-5			MW-10		MW-10D					MW-11		Soil Preliminary Cleanup Level ² (PCUL)
Sample Identification			MW-5-(4-5)	MW-5-(10-11)	MW-5-(16-17)	MW-10-(3-8)	MW-10-(10-12)	MW10D-2-3	MW10D-6.5-7.5	MW10D-17-18	MW10D-23-24	MW10D-28-29	MW11-1-2	MW11-3-4	
Sample Date			10/29/09	10/29/09	10/29/09	10/30/09	10/30/09	12/30/13	12/30/13	12/30/13	12/30/13	12/30/13	12/16/13	12/16/13	
Sample Depth			4 - 5 ft	10 - 11 ft	16 - 17 ft	3 - 8 ft	10 - 12 ft	2 - 3 ft	6.5 - 7.5 ft	17 - 18 ft	23 - 24 ft	28 - 29 ft	1 - 2 ft	3 - 4 ft	
Stratigraphic Horizon			FO	FO	FI	FO	FO	FO	FO	FO	AD	AD	FO	FO	
Sampled By			Landau	Landau	Landau	Landau	Landau	GEI	GEI	GEI	GEI	GEI	GEI	GEI	
Other SVOCs															
Aniline	EPA 8270	mg/kg	0.041 U	0.038 U	0.04 U	--	--	0.085 U	0.085 U	0.085 U	0.085 U	0.085	0.11 U	0.085 U	150
Bis(2-chloroethyl)ether	EPA 8270	mg/kg	0.041 U	0.038 U	0.04 U	--	--	0.017 U	0.017 U	0.017 U	0.017 U	0.017	0.022 U	0.017 U	0.000022
Bis(2-ethylhexyl)phthalate	EPA 8270	mg/kg	0.041 U	0.038 U	0.04 U	--	--	0.04	0.017 U	0.017 U	0.017 U	0.017	0.022 U	0.017 U	0.0051
Butyl benzyl phthalate	EPA 8270	mg/kg	0.041 U	0.038 U	0.04 U	--	--	0.017 U	0.017 U	0.017 U	0.017 U	0.017	0.022 U	0.017 U	0.00018
3,3'-Dichlorobenzidine	EPA 8270	mg/kg	0.41 U	0.38 U	0.4 U	--	--	0.017 U	0.017 U	0.017 U	0.017 U	0.017	0.022 U	0.017 U	0.0000033
2,4-Dichlorophenol	EPA 8270	mg/kg	0.041 U	0.038 U	0.04 U	--	--	0.017 U	0.017 U	0.017 U	0.017 U	0.017	0.022 U	0.017 U	0.0043
Diethyl phthalate	EPA 8270	mg/kg	0.041 U	0.038 U	0.04 U	--	--	0.085 U	0.085 U	0.085 U	0.085 U	0.085	0.11 U	0.085 U	0.034
2,4-Dimethylphenol	EPA 8270	mg/kg	0.041 U	0.038 U	0.04 U	--	--	0.017 U	0.017 U	0.017 U	0.017 U	0.017	0.022 U	0.017 U	0.0031
2-Methylphenol (o-Cresol)	EPA 8270	mg/kg	0.041 U	0.038 U	0.04 U	--	--	0.017 U	0.017 U	0.017 U	0.017 U	0.017	0.022 U	0.017 U	0.010
n-Nitrosodimethylamine	EPA 8270	mg/kg	0.041 U	0.038 U	0.04 U	--	--	0.017 U	0.017 U	0.017 U	0.017 U	0.017	0.022 U	0.017 U	0.017
n-Nitrosodiphenylamine (as Diphenylamine)	EPA 8270	mg/kg	0.041 U	0.038 U	0.04 U	--	--	0.017 U	0.017 U	0.017 U	0.017 U	0.017	0.022 U	0.017 U	0.0011
n-Nitrosodi-n-propylamine	EPA 8270	mg/kg	0.041 U	0.038 U	0.04 U	--	--	0.017 U	0.017 U	0.017 U	0.017 U	0.017	0.022 U	0.017 U	0.000018
Pentachlorophenol	EPA 8270	mg/kg	0.21 U	0.19 U	0.2 U	--	--	0.083 UJ	0.083 UJ	0.083 UJ	0.083 UJ	0.083 UJ	0.11 UJ	0.083 UJ	0.0000018
Phenol	EPA 8270	mg/kg	0.041 U	0.038 U	0.04 U	--	--	0.017 U	0.017 U	0.017 U	0.017 U	0.017	0.022 U	0.017 U	0.12
2,4,6-Trichlorophenol	EPA 8270	mg/kg	0.041 U	0.038 U	0.04 U	--	--	0.017 U	0.017 U	0.017 U	0.017 U	0.017	0.022 U	0.017 U	0.00019
Volatile Organic Compounds (VOCs)															
Benzene	EPA 8260	mg/kg	--	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 UJ	0.0010 UJ	0.0011	0.0010 U	0.00056
Chloroform	EPA 8260	mg/kg	--	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 UJ	0.0010 UJ	0.0010 U	0.0010 U	0.052
Petroleum Hydrocarbons															
Gasoline-range hydrocarbons	NWTPH-G	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	30
Diesel-range hydrocarbons	NWTPH-Dx	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	260
Oil-range hydrocarbons	NWTPH-Dx	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	2,000
Total diesel- and oil-range hydrocarbons	NWTPH-Dx	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	260
Conventionals															
pH	N/A	N/A	--	--	--	--	--	9.1 J	11 J	10 J	8.9 J	9.0 J	8.3 J	7.9 J	NE

Notes:

- ¹ Sample locations are shown on Figures 3-1 and 3-3.
- ² Preliminary cleanup levels for soil are referenced from Table 4-1.
- ³ Total dioxin/furan Toxic Equivalency Quotients (TEQs) were calculated using United States Environmental Protection Agency (USEPA) Toxicity Equivalency Factor (TEF) values for human health (EPA 2003).
- ⁴ Total carcinogenic PAH (cPAH) TEQs were calculated using TEF values referenced from MTCA Table 708.2 (WAC 173-340-900).
- RL = Reporting limit

EPA = Environmental Protection Agency

mg/kg = milligram per kilogram

NE = not established

J = estimated result

FI = Initial (early 1900s) T115N fill deposit

FD = Glacier NW Site dredged fill deposit

FO = T115N operational (1960s) fill deposit

FT = Terminal 115 fill deposit

FP = Settling pond fill deposit

Bold indicates analyte was detected.

Yellow shading identifies the detected results greater than the preliminary cleanup level.

Blue shading identifies the non-detected result greater than the preliminary cleanup level.
- COPC = Contaminant of Potential Concern

KCHD = King County Health Department

Landau = Landau Associates

GEI = GeoEngineers

ERM = Environmental Resources Management

Shaw = Shaw Environmental & Infastructre

U = analyte not detected above the reporting limit

-- = not analyzed

AD = Native LDW alluvial deposit

OS = Native organic silt (Aquitard) deposit

Table 5-3
Remedial Investigation Chemical Analytical Results - Soil COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Sample Location ¹	Analytical Method	Units	MW-11			MW-12				MW-13					Soil Preliminary Cleanup Level ² (PCUL)
Sample Identification			MW11-9-10	MW11-13-14	MW11-13-14Dup	MW12-4-5	MW12-8-9	MW12-8-9Dup	MW12-11-12	MW13-1-2	MW13-5-6	MW13-7-8	MW13-9-10	MW13-11-12	
Sample Date			12/16/13	12/16/13	12/16/13	12/30/13	12/30/13	12/30/13	12/30/13	12/18/13	12/18/13	12/18/13	12/18/13	12/18/13	
Sample Depth			9 - 10 ft	13 - 14 ft	13 - 14 ft	4 - 5 ft	8 - 9 ft	8 - 9 ft	11 - 12 ft	1 - 2 ft	5 - 6 ft	7 - 8 ft	9 - 10 ft	11 - 12 ft	
Stratigraphic Horizon			FI	OS	OS	FO	FO	FO	OS	FO	FO	FI	FI	OS	
Sampled By	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	
Polychlorinated Biphenyls (PCBs)															
Total PCB Aroclors	EPA 8082	mg/kg	--	--	--	--	--	--	--	--	0.028 U	--	--	--	0.0000022
Dioxins and Furans															
Total Dioxin/Furan TEQ ³ (ND=0.5RL)	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	0.00000323	--	--	--	0.0000052
Total Dioxin/Furan TEQ ³ (ND=0.5RL)	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	0.00000339	--	--	--	0.0000052
Metals															
Antimony	EPA 6000/7000	mg/kg	--	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	--	4.1
Arsenic	EPA 6000/7000	mg/kg	--	11	11	1.8	2.3	3.1	11	3.2	0.72	2.6	5.2	--	7.0
Barium	EPA 6000/7000	mg/kg	--	56	50	18	32	38	24	30	18	82	120	--	8.3
Cadmium	EPA 6000/7000	mg/kg	--	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	--	1.0
Chromium III / Total	EPA 6000/7000	mg/kg	--	24	25	9.6	16	18	18	26	26	120	50	--	48
Chromium VI	EPA 6000/7000	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	18
Copper	EPA 6000/7000	mg/kg	--	35	37	16	12	17	27	40	86	28	34	--	36
Lead	EPA 6000/7000	mg/kg	--	5	6	2.2	2.7	2.8	5	22	39	3.8	7.8	--	50
Mercury	EPA 6000/7000	mg/kg	--	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	--	0.070
Nickel	EPA 6000/7000	mg/kg	--	19	16	8.4	20	22	12	35	39	68	56	--	48
Selenium	EPA 6000/7000	mg/kg	--	1.1	1.5	0.50 U	0.50 U	0.50 U	0.58	0.50 U	0.50 U	0.72	0.59	--	0.30
Silver	EPA 6000/7000	mg/kg	--	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	--	0.016
Thallium	EPA 6000/7000	mg/kg	--	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	--	0.0044
Tin	EPA 6000/7000	mg/kg	--	1.0 U	1.0 U	4.7 J	1.6 J	2.2 J	1.0 UJ	91 J	310	1,100	110 J	--	50
Zinc	EPA 6000/7000	mg/kg	--	35	32	23	22	28	25	44	55	48	66	--	85
Semi-Volatile Organic Compounds (SVOCs) - Polycyclic Aromatic Hydrocarbons (PAHs)															
Acenaphthene	EPA 8270/SIM	mg/kg	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.028
Anthracene	EPA 8270/SIM	mg/kg	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.051
Benzo(a)anthracene	EPA 8270/SIM	mg/kg	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.000057
Benzo(b)fluoranthene	EPA 8270/SIM	mg/kg	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.00020
Benzo(k)fluoranthene	EPA 8270/SIM	mg/kg	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0020
Benzo(a)pyrene	EPA 8270/SIM	mg/kg	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.000016
Chrysene	EPA 8270/SIM	mg/kg	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0064
Dibenzo(a,h)anthracene	EPA 8270/SIM	mg/kg	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.000029
Dibenzofuran	EPA 8270/SIM	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.54
Fluoranthene	EPA 8270/SIM	mg/kg	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.090
Fluorene	EPA 8270/SIM	mg/kg	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.029
Indeno(1,2,3-c,d)pyrene	EPA 8270/SIM	mg/kg	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.00056
1-Methylnaphthalene	EPA 8270/SIM	mg/kg	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	29
2-Methylnaphthalene	EPA 8270/SIM	mg/kg	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.67
Naphthalene	EPA 8270/SIM	mg/kg	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0021
Pyrene	EPA 8270/SIM	mg/kg	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0095	0.0067 U	0.0067 U	0.0067 U	0.14
Total cPAH TEQ ⁴ (ND=0)	EPA 8270/SIM	mg/kg	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0.000016
Total cPAH TEQ ⁴ (ND=0.5RL)	EPA 8270/SIM	mg/kg	0.0051 U	0.0051 U	0.0051 U	0.0051 U	0.0051 U	0.0051 U	0.0051 U	0.0051 U	0.0051 U	0.0051 U	0.0051 U	0.0051 U	0.000016

Table 5-3
Remedial Investigation Chemical Analytical Results - Soil COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Sample Location ¹	Analytical Method	Units	MW-11			MW-12				MW-13					Soil Preliminary Cleanup Level ² (PCUL)
Sample Identification			MW11-9-10	MW11-13-14	MW11-13-14Dup	MW12-4-5	MW12-8-9	MW12-8-9Dup	MW12-11-12	MW13-1-2	MW13-5-6	MW13-7-8	MW13-9-10	MW13-11-12	
Sample Date			12/16/13	12/16/13	12/16/13	12/30/13	12/30/13	12/30/13	12/30/13	12/18/13	12/18/13	12/18/13	12/18/13	12/18/13	
Sample Depth			9 - 10 ft	13 - 14 ft	13 - 14 ft	4 - 5 ft	8 - 9 ft	8 - 9 ft	11 - 12 ft	1 - 2 ft	5 - 6 ft	7 - 8 ft	9 - 10 ft	11 - 12 ft	
Stratigraphic Horizon			FI	OS	OS	FO	FO	FO	OS	FO	FO	FI	FI	OS	
Sampled By			GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	
Other SVOCs															
Aniline	EPA 8270	mg/kg	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	150
Bis(2-chloroethyl)ether	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.000022
Bis(2-ethylhexyl)phthalate	EPA 8270	mg/kg	0.028	0.046	0.041	0.017 U	0.083 J	0.14 J	0.017 U	0.12	0.32	0.017 U	0.057	0.017 U	0.0051
Butyl benzyl phthalate	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.00018
3,3'-Dichlorobenzidine	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.0000033
2,4-Dichlorophenol	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.0043
Diethyl phthalate	EPA 8270	mg/kg	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.034
2,4-Dimethylphenol	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.0031
2-Methylphenol (o-Cresol)	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.010
n-Nitrosodimethylamine	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017
n-Nitrosodiphenylamine (as Diphenylamine)	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.0011
n-Nitrosodi-n-propylamine	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.000018
Pentachlorophenol	EPA 8270	mg/kg	0.083 UJ	0.083 UJ	0.083 UJ	0.083 UJ	0.083 UJ	0.083 UJ	0.083 UJ	0.083 UJ	0.083 UJ	0.083 UJ	0.083 UJ	0.083 UJ	0.0000018
Phenol	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.12
2,4,6-Trichlorophenol	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.00019
Volatile Organic Compounds (VOCs)															
Benzene	EPA 8260	mg/kg	0.0010 U	0.0014 U	0.0015 U	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0011 U	0.00056
Chloroform	EPA 8260	mg/kg	0.0010 U	0.0014 U	0.0015 U	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0011 U	0.052
Petroleum Hydrocarbons															
Gasoline-range hydrocarbons	NWTPH-G	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	30
Diesel-range hydrocarbons	NWTPH-Dx	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	260
Oil-range hydrocarbons	NWTPH-Dx	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	2,000
Total diesel- and oil-range hydrocarbons	NWTPH-Dx	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	260
Conventionals															
pH	N/A	N/A	8.0 J	6.7 J	6.7 J	7.9 J	7.7 J	7.6 J	7.4 J	9.2 J	9.3 J	8.8 J	8.9 J	7.2 J	NE

Notes:

- ¹ Sample locations are shown on Figures 3-1 and 3-3.
- ² Preliminary cleanup levels for soil are referenced from Table 4-1.
- ³ Total dioxin/furan Toxic Equivalency Quotients (TEQs) were calculated using United States Environmental Protection Agency (USEPA) Toxicity Equivalency Factor (TEF) values for human health (EPA 2003).
- ⁴ Total carcinogenic PAH (cPAH) TEQs were calculated using TEF values referenced from MTCA Table 708.2 (WAC 173-340-900).

RL = Reporting limit

EPA = Environmental Protection Agency

mg/kg = milligram per kilogram

NE = not established

J = estimated result

FI = Initial (early 1900s) T115N fill deposit

FD = Glacier NW Site dredged fill deposit

FO = T115N operational (1960s) fill deposit

FT = Terminal 115 fill deposit

FP = Settling pond fill deposit

Bold indicates analyte was detected.

COPC = Contaminant of Potential Concern

KCHD = King County Health Department

Landau = Landau Associates

GEI = GeoEngineers

ERM = Environmental Resources Management

Shaw = Shaw Environmental & Infrastructre

U = analyte not detected above the reporting limit

-- = not analyzed

AD = Native LDW alluvial deposit

OS = Native organic silt (Aquitard) deposit

Yellow shading identifies the detected results greater than the preliminary cleanup level.

Blue shading identifies the non-detected result greater than the preliminary cleanup level.

Table 5-3
Remedial Investigation Chemical Analytical Results - Soil COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Sample Location ¹	Analytical Method	Units	MW-14				MW-15			MW-16						Soil Preliminary Cleanup Level ² (PCUL)
Sample Identification			MW14-2-3	MW14-5-6	MW14-7-8	MW14-10-11	MW15-3-4	MW15-7-8	MW15-13-14	MW16-3-4	MW16-5-6	MW16-7.5-8.5	MW16-11.5-12.5	MW16-11.5-12.5Dup		
Sample Date			12/18/13	12/18/13	12/18/13	12/18/13	12/27/13	12/27/13	12/27/13	12/27/13	12/27/13	12/27/13	12/27/13	12/27/13		
Sample Depth			2 - 3 ft	5 - 6 ft	7 - 8 ft	10 - 11 ft	3 - 4 ft	7 - 8 ft	13 - 14 ft	3 - 4 ft	5 - 6 ft	7.5 - 8.5 ft	11.5 - 12.5 ft	11.5 - 12.5 ft		
Stratigraphic Horizon			FD	FD	FD	OS	FO	FO	OS	FP	FP	FI	OS	OS		
Sampled By			GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	
Polychlorinated Biphenyls (PCBs)																
Total PCB Aroclors	EPA 8082	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	0.0000022	
Dioxins and Furans																
Total Dioxin/Furan TEQ ³ (ND=0.5RL)	EPA 1613	mg/kg	--	--	--	--	0.000000124	0.000000442	--	--	--	--	--	--	0.0000052	
Total Dioxin/Furan TEQ ³ (ND=0.5RL)	EPA 1613	mg/kg	--	--	--	--	0.000000473	0.000000804	--	--	--	--	--	--	0.0000052	
Metals																
Antimony	EPA 6000/7000	mg/kg	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	4.1	
Arsenic	EPA 6000/7000	mg/kg	22	43	460	13	1.3	4.6	140	0.50 U	0.50 U	0.50 U	20 J	12 J	7.0	
Barium	EPA 6000/7000	mg/kg	24	31	15	33	130	55	43	72	55	54	39	39	8.3	
Cadmium	EPA 6000/7000	mg/kg	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.38	1.6	0.29	0.20 U	0.20 U	0.20 U	1.0	
Chromium III / Total	EPA 6000/7000	mg/kg	24	11	10	18	34	50	60	140	30	31	20 J	17 J	48	
Chromium VI	EPA 6000/7000	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	18	
Copper	EPA 6000/7000	mg/kg	26	25	18	29	33	12	32	40	24	17	26	25	36	
Lead	EPA 6000/7000	mg/kg	10	10	7.3	4.5	57	19	63	4,100	1,200	100	19 J	140 J	50	
Mercury	EPA 6000/7000	mg/kg	0.050 U	0.057	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.057	0.050 U	0.070	
Nickel	EPA 6000/7000	mg/kg	23	9.8	7.7	15	38	48	42	32	28	37	17	12	48	
Selenium	EPA 6000/7000	mg/kg	0.50 U	0.50 U	0.50 U	1.2	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.30	
Silver	EPA 6000/7000	mg/kg	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.016	
Thallium	EPA 6000/7000	mg/kg	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.0044	
Tin	EPA 6000/7000	mg/kg	28 J	25 J	34 J	1.3 J	1,500	89	89	11,000	3,500	3,000	61 J	180 J	50	
Zinc	EPA 6000/7000	mg/kg	35	24	85	47	61	28	57	1,200	240	130	44	42	85	
Semi-Volatile Organic Compounds (SVOCs) - Polycyclic Aromatic Hydrocarbons (PAHs)																
Acenaphthene	EPA 8270/SIM	mg/kg	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.23	0.024	0.0067 U	0.0095	0.0077	0.028	
Anthracene	EPA 8270/SIM	mg/kg	0.0067 U	0.0067 U	0.018	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.075	0.015	0.0067 U	0.0067 U	0.0067 U	0.051	
Benzo(a)anthracene	EPA 8270/SIM	mg/kg	0.019	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.059	0.019	0.0067 U	0.0067 UJ	0.0067 UJ	0.000057	
Benzo(b)fluoranthene	EPA 8270/SIM	mg/kg	0.022 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.015	0.014	0.0067 U	0.0067 UJ	0.0067 UJ	0.00020	
Benzo(k)fluoranthene	EPA 8270/SIM	mg/kg	0.022 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.017	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0020	
Benzo(a)pyrene	EPA 8270/SIM	mg/kg	0.022 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.017	0.012	0.0067 U	0.0067 U	0.0067 U	0.000016	
Chrysene	EPA 8270/SIM	mg/kg	0.052	0.014	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.051	0.018	0.0067 U	0.0067 U	0.0067 U	0.0064	
Dibenzo(a,h)anthracene	EPA 8270/SIM	mg/kg	0.022 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.000029	
Dibenzofuran	EPA 8270/SIM	mg/kg	0.11 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.18	0.021	0.017 U	0.017 U	0.017 U	0.54	
Fluoranthene	EPA 8270/SIM	mg/kg	0.011	0.0067 U	0.022	0.0067 U	0.0067 U	0.015	0.0067 U	0.33	0.062	0.01	0.0067 U	0.0067 U	0.090	
Fluorene	EPA 8270/SIM	mg/kg	0.0084	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067	0.0067 U	0.24	0.027	0.0067 U	0.0067 U	0.0067 U	0.029	
Indeno(1,2,3-c,d)pyrene	EPA 8270/SIM	mg/kg	0.022 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0069	0.0069	0.0067 U	0.0067 U	0.0067 U	0.00056	
1-Methylnaphthalene	EPA 8270/SIM	mg/kg	0.009	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.068	0.0082	0.0067 U	0.0067 U	0.0067 U	29	
2-Methylnaphthalene	EPA 8270/SIM	mg/kg	0.013	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.15	0.018	0.0067 U	0.0067 U	0.0067 U	0.67	
Naphthalene	EPA 8270/SIM	mg/kg	0.0073	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.091	0.016	0.0067 U	0.0067 U	0.0067 U	0.0021	
Pyrene	EPA 8270/SIM	mg/kg	0.024	0.01	0.016	0.0067 U	0.0067 U	0.0097	0.0067 U	0.2	0.047	0.0091	0.0067 U	0.0067 U	0.14	
Total cPAH TEQ ⁴ (ND=0)	EPA 8270/SIM	mg/kg	0.0024	0.00014	0 U	0 U	0 U	0 U	0 U	0.027	0.016	0 U	0 U	0 U	0.000016	
Total cPAH TEQ ⁴ (ND=0.5RL)	EPA 8270/SIM	mg/kg	0.018	0.0052	0.0051 U	0.0051 U	0.0051 U	0.0051 U	0.0051 U	0.028	0.017	0.0051 U	0.0051 U	0.0051 U	0.000016	

Table 5-3
Remedial Investigation Chemical Analytical Results - Soil COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Sample Location ¹	Analytical Method	Units	MW-14				MW-15			MW-16						Soil Preliminary Cleanup Level ² (PCUL)
Sample Identification			MW14-2-3	MW14-5-6	MW14-7-8	MW14-10-11	MW15-3-4	MW15-7-8	MW15-13-14	MW16-3-4	MW16-5-6	MW16-7.5-8.5	MW16-11.5-12.5	MW16-11.5-12.5Dup		
Sample Date			12/18/13	12/18/13	12/18/13	12/18/13	12/27/13	12/27/13	12/27/13	12/27/13	12/27/13	12/27/13	12/27/13	12/27/13		
Sample Depth			2 - 3 ft	5 - 6 ft	7 - 8 ft	10 - 11 ft	3 - 4 ft	7 - 8 ft	13 - 14 ft	3 - 4 ft	5 - 6 ft	7.5 - 8.5 ft	11.5 - 12.5 ft	11.5 - 12.5 ft		
Stratigraphic Horizon			FD	FD	FD	OS	FO	FO	OS	FP	FP	FI	OS	OS		
Sampled By			GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	
Other SVOCs																
Aniline	EPA 8270	mg/kg	0.56 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 UJ	0.085 UJ	150	
Bis(2-chloroethyl)ether	EPA 8270	mg/kg	0.11 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.000022	
Bis(2-ethylhexyl)phthalate	EPA 8270	mg/kg	0.11 U	0.35	0.023	0.017 U	0.048	0.076	0.019	0.017 U	0.032	0.017 U	0.034	0.034	0.0051	
Butyl benzyl phthalate	EPA 8270	mg/kg	0.11 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.00018	
3,3'-Dichlorobenzidine	EPA 8270	mg/kg	0.56 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.026	0.017 U	0.017 UJ	0.017 UJ	0.0000033	
2,4-Dichlorophenol	EPA 8270	mg/kg	0.56 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.0043	
Diethyl phthalate	EPA 8270	mg/kg	0.56 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 UJ	0.085 UJ	0.034	
2,4-Dimethylphenol	EPA 8270	mg/kg	0.11 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.0031	
2-Methylphenol (o-Cresol)	EPA 8270	mg/kg	0.11 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.025	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.010	
n-Nitrosodimethylamine	EPA 8270	mg/kg	0.11 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017	
n-Nitrosodiphenylamine (as Diphenylamine)	EPA 8270	mg/kg	0.11 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.0011	
n-Nitrosodi-n-propylamine	EPA 8270	mg/kg	0.11 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.000018	
Pentachlorophenol	EPA 8270	mg/kg	0.56 UJ	0.083 UJ	0.083 UJ	0.083 UJ	0.083 UJ	0.083 UJ	0.083 UJ	0.083 UJ	0.083 UJ	0.083 UJ	0.083 UJ	0.083 UJ	0.0000018	
Phenol	EPA 8270	mg/kg	0.11 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.12	0.017 U	0.017 U	0.017 U	1.8 J	1.1 J	0.12	
2,4,6-Trichlorophenol	EPA 8270	mg/kg	0.11 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.00019	
Volatile Organic Compounds (VOCs)																
Benzene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0012 U	--	--	--	0.0015	0.0010 U	0.0015	0.0010 U	0.0010 U	0.00056	
Chloroform	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0012 U	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.052	
Petroleum Hydrocarbons																
Gasoline-range hydrocarbons	NWTPH-G	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	30	
Diesel-range hydrocarbons	NWTPH-Dx	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	260	
Oil-range hydrocarbons	NWTPH-Dx	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	2,000	
Total diesel- and oil-range hydrocarbons	NWTPH-Dx	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	260	
Conventionals																
pH	N/A	N/A	8.1 J	8.3 J	6.5 J	6.2 J	11 J	10 J	9.4 J	11 J	11 J	11 J	11 J	11 J	NE	

Notes:

- ¹ Sample locations are shown on Figures 3-1 and 3-3.
- ² Preliminary cleanup levels for soil are referenced from Table 4-1.
- ³ Total dioxin/furan Toxic Equivalency Quotients (TEQs) were calculated using United States Environmental Protection Agency (USEPA) Toxicity Equivalency Factor (TEF) values for human health (EPA 2003).
- ⁴ Total carcinogenic PAH (cPAH) TEQs were calculated using TEF values referenced from MTCA Table 708.2 (WAC 173-340-900).

RL = Reporting limit

EPA = Environmental Protection Agency

mg/kg = milligram per kilogram

NE = not established

J = estimated result

FI = Initial (early 1900s) T115N fill deposit

FD = Glacier NW Site dredged fill deposit

FO = T115N operational (1960s) fill deposit

FT = Terminal 115 fill deposit

FP = Settling pond fill deposit

Bold indicates analyte was detected.

COPC = Contaminant of Potential Concern

KCHD = King County Health Department

Landau = Landau Associates

GEI = GeoEngineers

ERM = Environmental Resources Management

Shaw = Shaw Environmental & Infrastructre

U = analyte not detected above the reporting limit

-- = not analyzed

AD = Native LDW alluvial deposit

OS = Native organic silt (Aquitard) deposit

Yellow shading identifies the detected results greater than the preliminary cleanup level.

Blue shading identifies the non-detected result greater than the preliminary cleanup level.

Table 5-3
Remedial Investigation Chemical Analytical Results - Soil COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Sample Location ¹	Analytical Method	Units	MW-17				MW-18				MW-19D				Soil Preliminary Cleanup Level ² (PCUL)
Sample Identification			MW17-2.5-3.5	MW17-5.5-6.5	MW17-7.5-8.5	MW17-19-20	MW18-2-3	MW18-5-6	MW18-10-11	MW18-18-19	MW19D-3-4	MW19D-3-4Dup	MW19D-7-8	MW19D-10-11	
Sample Date			12/26/13	12/26/13	12/26/13	12/26/13	12/18/13	12/18/13	12/18/13	12/18/13	12/26/13	12/26/13	12/26/13	12/26/13	
Sample Depth			2.5 - 3.5 ft	5.5. - 6.5 ft	7.5 - 8.5 ft	19 - 20 ft	2 - 3 ft	5 - 6 ft	10 - 11 ft	18 - 19 ft	3 - 4 ft	3 - 4 ft	7 - 8 ft	10 - 11 ft	
Stratigraphic Horizon			FO	FO	FO	AD	FO	FO	FO	AD	FO	FO	FO	FO	
Sampled By	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI		
Polychlorinated Biphenyls (PCBs)															
Total PCB Aroclors	EPA 8082	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	0.0000022
Dioxins and Furans															
Total Dioxin/Furan TEQ ³ (ND=0.5RL)	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	0.00000296	--	--	--	0.0000052
Total Dioxin/Furan TEQ ³ (ND=0.5RL)	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	0.00000305	--	--	--	0.0000052
Metals															
Antimony	EPA 6000/7000	mg/kg	20	14	5.0 U	--	9.2	5.0 U	5.0 U	--	5.0 U	5.0 U	5.0 U	--	4.1
Arsenic	EPA 6000/7000	mg/kg	91	54	2.4	--	0.59	3	4.2	--	2.2 J	1.1 J	1.4	--	7.0
Barium	EPA 6000/7000	mg/kg	60	50	39	--	93	73	58	--	26	26	42	--	8.3
Cadmium	EPA 6000/7000	mg/kg	1.2	0.84	0.20 U	--	7.7	0.20 U	0.20 U	--	0.20 U	0.20 U	0.20 U	--	1.0
Chromium III / Total	EPA 6000/7000	mg/kg	12	9.4	6.1	--	690	54	41	--	7.9 J	5.2 J	6.7	--	48
Chromium VI	EPA 6000/7000	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	18
Copper	EPA 6000/7000	mg/kg	48	43	15	--	220	23	21	--	12	9.5	11	--	36
Lead	EPA 6000/7000	mg/kg	340	210	10	--	22,000	300	40	--	57	42	32	--	50
Mercury	EPA 6000/7000	mg/kg	0.050 U	0.050 U	0.050 U	--	0.099	0.050 U	0.050 U	--	0.050 U	0.050 U	0.050 U	--	0.070
Nickel	EPA 6000/7000	mg/kg	14	12	13	--	51	47	52	--	10	8.6	7.9	--	48
Selenium	EPA 6000/7000	mg/kg	1.2	0.8	0.50 U	--	3.1 U	0.50 U	0.50 U	--	0.50 U	0.50 U	0.50 U	--	0.30
Silver	EPA 6000/7000	mg/kg	0.72	0.50 U	0.50 U	--	1.2	0.50 U	0.50 U	--	0.50 U	0.50 U	0.50 U	--	0.016
Thallium	EPA 6000/7000	mg/kg	0.47	0.32	0.25 U	--	0.25 U	0.25 U	0.25 U	--	0.25 U	0.25 U	0.25 U	--	0.0044
Tin	EPA 6000/7000	mg/kg	74	59	2.6	--	27,000	2,700	40 J	--	380	270	190	--	50
Zinc	EPA 6000/7000	mg/kg	390	240	50	--	9,200	190	62	--	77	62	62	--	85
Semi-Volatile Organic Compounds (SVOCs) - Polycyclic Aromatic Hydrocarbons (PAHs)															
Acenaphthene	EPA 8270/SIM	mg/kg	0.027	0.016	0.0067 U	0.0067 U	0.028	0.0077	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.028
Anthracene	EPA 8270/SIM	mg/kg	0.0073	0.0067 U	0.0067 U	0.0094	0.024	0.01	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.051
Benzo(a)anthracene	EPA 8270/SIM	mg/kg	0.0067 U	0.0075	0.0067 U	0.021	0.027	0.0067 U	0.0067 U	0.0082	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.000057
Benzo(b)fluoranthene	EPA 8270/SIM	mg/kg	0.0067 U	0.0067 U	0.0067 U	0.019	0.011	0.0067 U	0.0067 U	0.0081	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.00020
Benzo(k)fluoranthene	EPA 8270/SIM	mg/kg	0.0067 U	0.0067 U	0.0067 U	0.01	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0020
Benzo(a)pyrene	EPA 8270/SIM	mg/kg	0.0067 U	0.0067 U	0.0067 U	0.02	0.01	0.0067 U	0.0067 U	0.007	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.000016
Chrysene	EPA 8270/SIM	mg/kg	0.0067 U	0.0097	0.0067 U	0.02	0.027	0.0081	0.0067 U	0.0074	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0064
Dibenzo(a,h)anthracene	EPA 8270/SIM	mg/kg	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.000029
Dibenzofuran	EPA 8270/SIM	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.022	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.54
Fluoranthene	EPA 8270/SIM	mg/kg	0.034	0.025	0.0067 U	0.036	0.093	0.016	0.013	0.012	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.090
Fluorene	EPA 8270/SIM	mg/kg	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.033	0.0098	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.029
Indeno(1,2,3-c,d)pyrene	EPA 8270/SIM	mg/kg	0.0067 U	0.0067 U	0.0067 U	0.013	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.00056
1-Methylnaphthalene	EPA 8270/SIM	mg/kg	0.013	0.0096	0.0067 U	0.0067 U	0.01	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	29
2-Methylnaphthalene	EPA 8270/SIM	mg/kg	0.029	0.02	0.0067 U	0.0067 U	0.029	0.0093	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.67
Naphthalene	EPA 8270/SIM	mg/kg	0.037	0.037	0.0067 U	0.0067 U	0.028	0.0099	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0021
Pyrene	EPA 8270/SIM	mg/kg	0.026	0.021	0.0067 U	0.043	0.078	0.018	0.014	0.015	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.14
Total cPAH TEQ ⁴ (ND=0)	EPA 8270/SIM	mg/kg	0 U	0.00085	0 U	0.027	0.014	0.000081	0 U	0.0087	0 U	0 U	0 U	0 U	0.000016
Total cPAH TEQ ⁴ (ND=0.5RL)	EPA 8270/SIM	mg/kg	0.0051 U	0.0055	0.0051 U	0.027	0.015	0.0051	0.0051 U	0.0097	0.0051 U	0.0051 U	0.0051 U	0.0051 U	0.000016

Table 5-3
Remedial Investigation Chemical Analytical Results - Soil COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Sample Location ¹	Analytical Method	Units	MW-17				MW-18				MW-19D				Soil Preliminary Cleanup Level ² (PCUL)
Sample Identification			MW17-2.5-3.5	MW17-5.5-6.5	MW17-7.5-8.5	MW17-19-20	MW18-2-3	MW18-5-6	MW18-10-11	MW18-18-19	MW19D-3-4	MW19D-3-4Dup	MW19D-7-8	MW19D-10-11	
Sample Date			12/26/13	12/26/13	12/26/13	12/26/13	12/18/13	12/18/13	12/18/13	12/18/13	12/26/13	12/26/13	12/26/13	12/26/13	
Sample Depth			2.5 - 3.5 ft	5.5. - 6.5 ft	7.5 - 8.5 ft	19 - 20 ft	2 - 3 ft	5 - 6 ft	10 - 11 ft	18 - 19 ft	3 - 4 ft	3 - 4 ft	7 - 8 ft	10 - 11 ft	
Stratigraphic Horizon			FO	FO	FO	AD	FO	FO	FO	AD	FO	FO	FO	FO	
Sampled By			GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	
Other SVOCs															
Aniline	EPA 8270	mg/kg	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 UJ	0.085 UJ	0.085 U	0.085 U	150
Bis(2-chloroethyl)ether	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.000022
Bis(2-ethylhexyl)phthalate	EPA 8270	mg/kg	0.069	0.55	0.08	0.037	0.017 U	0.074	0.052	0.019	0.056 J	0.12 J	0.046	0.15	0.0051
Butyl benzyl phthalate	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.00018
3,3'-Dichlorobenzidine	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.0000033
2,4-Dichlorophenol	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 UJ	0.017 UJ	0.017 U	0.017 U	0.0043
Diethyl phthalate	EPA 8270	mg/kg	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 UJ	0.085 UJ	0.085 U	0.085 U	0.034
2,4-Dimethylphenol	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.0031
2-Methylphenol (o-Cresol)	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.010
n-Nitrosodimethylamine	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017
n-Nitrosodiphenylamine (as Diphenylamine)	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 UJ	0.017 UJ	0.017 U	0.017 U	0.0011
n-Nitrosodi-n-propylamine	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.000018
Pentachlorophenol	EPA 8270	mg/kg	0.083 UJ	0.083 UJ	0.083 UJ	0.083 UJ	0.083 UJ	0.083 UJ	0.083 UJ	0.083 UJ	0.083 UJ	0.083 UJ	0.083 UJ	0.083 UJ	0.0000018
Phenol	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.12
2,4,6-Trichlorophenol	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.00019
Volatile Organic Compounds (VOCs)															
Benzene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0023	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.00056
Chloroform	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.052
Petroleum Hydrocarbons															
Gasoline-range hydrocarbons	NWTPH-G	mg/kg	5.0 U	5.0 U	5.0 U	5.0 U	4.4 UJ	3.6 U	3.2 U	3.8 U	5.0 U	5.0 U	5.0 U	5.0 U	30
Diesel-range hydrocarbons	NWTPH-Dx	mg/kg	18 U	21	15 U	33	330 J	130 J	17 J	53 J	14 U	14 U	15 U	15 U	260
Oil-range hydrocarbons	NWTPH-Dx	mg/kg	96	150	31 U	110	2,300	750	140	180	29 U	28 U	29 U	29 U	2,000
Total diesel- and oil-range hydrocarbons	NWTPH-Dx	mg/kg	96	171	31 U	143	2,630 J	880 J	157 J	233 J	29 U	28 U	29 U	29 U	260
Conventionals															
pH	N/A	N/A	11 J	11 J	9.1 J	8.2 J	9.5 J	9.8 J	9.7 J	8.7 J	9.2 J	9.3 J	8.6 J	5.6 J	NE

Notes:

- ¹ Sample locations are shown on Figures 3-1 and 3-3.
- ² Preliminary cleanup levels for soil are referenced from Table 4-1.
- ³ Total dioxin/furan Toxic Equivalency Quotients (TEQs) were calculated using United States Environmental Protection Agency (USEPA) Toxicity Equivalency Factor (TEF) values for human health (EPA 2003).
- ⁴ Total carcinogenic PAH (cPAH) TEQs were calculated using TEF values referenced from MTCA Table 708.2 (WAC 173-340-900).
- RL = Reporting limit

EPA = Environmental Protection Agency

mg/kg = milligram per kilogram

NE = not established

J = estimated result

FI = Initial (early 1900s) T115N fill deposit

FD = Glacier NW Site dredged fill deposit

FO = T115N operational (1960s) fill deposit

FT = Terminal 115 fill deposit

FP = Settling pond fill deposit

Bold indicates analyte was detected.

Yellow shading identifies the detected results greater than the preliminary cleanup level.

Blue shading identifies the non-detected result greater than the preliminary cleanup level.
- COPC = Contaminant of Potential Concern

KCHD = King County Health Department

Landau = Landau Associates

GEI = GeoEngineers

ERM = Environmental Resources Management

Shaw = Shaw Environmental & Infrastructre

U = analyte not detected above the reporting limit

-- = not analyzed

AD = Native LDW alluvial deposit

OS = Native organic silt (Aquitard) deposit

Table 5-3
Remedial Investigation Chemical Analytical Results - Soil COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Sample Location ¹	Analytical Method	Units	MW-19D	MW-20				GP-10	GP-11	GP-14	GP-15		GP-18	GP-19	Soil Preliminary Cleanup Level ² (PCUL)
Sample Identification			MW19D-26-27	MW20-2-3	MW20-4-5	MW20-9-10	MW20-13-14	GP-10-3261996	GP-11-3261996	GP-14-3261996	GP-15-3-4:12071995	GP-15-3261996	GP-18-3261996	GP-19-3261996	
Sample Date			12/26/13	12/16/13	12/16/13	12/16/13	12/16/13	03/26/96	03/26/96	03/26/96	12/07/95	03/26/96	03/26/96	03/26/96	
Sample Depth			26 - 27 ft	2 - 3 ft	4 - 5 ft	9 - 10 ft	13 - 14 ft	7 - 9 ft	7 - 9 ft	7 - 9 ft	3 - 4 ft	7-9 ft	7 - 9 ft	7 - 9 ft	
Stratigraphic Horizon			AD	F0	F0	FI	OS	FD	FD	FD	FD	FD	FD	FD	
Sampled By			GEI	GEI	GEI	GEI	GEI	RETEC	RETEC	RETEC	RETEC	RETEC	RETEC	RETEC	
Polychlorinated Biphenyls (PCBs)															
Total PCB Aroclors	EPA 8082	mg/kg	--	--	--	--	--	--	--	--	--	--	--	0.0000022	
Dioxins and Furans															
Total Dioxin/Furan TEQ ³ (ND=0.5RL)	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	0.0000052	
Total Dioxin/Furan TEQ ³ (ND=0.5RL)	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	0.0000052	
Metals															
Antimony	EPA 6000/7000	mg/kg	5.0 U	5.0 U	5.0 U	--	5.0 U	--	--	--	--	--	--	4.1	
Arsenic	EPA 6000/7000	mg/kg	4.8	5.6	5.1	--	6.3	320	99	28	140	--	21.0 U	93	7.0
Barium	EPA 6000/7000	mg/kg	22	100	110	--	37	--	--	--	--	--	--	--	8.3
Cadmium	EPA 6000/7000	mg/kg	0.44	0.20 U	0.20 U	--	0.20 U	--	--	--	--	--	--	--	1.0
Chromium III / Total	EPA 6000/7000	mg/kg	11	52	51	--	22	--	--	--	--	--	--	--	48
Chromium VI	EPA 6000/7000	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	18
Copper	EPA 6000/7000	mg/kg	24	42	41	--	24	--	--	--	--	--	--	--	36
Lead	EPA 6000/7000	mg/kg	14	7.3	9.6	--	4.9	--	--	--	--	--	--	--	50
Mercury	EPA 6000/7000	mg/kg	0.17	0.050 U	0.050 U	--	0.055	--	--	--	--	--	--	--	0.070
Nickel	EPA 6000/7000	mg/kg	8.5	62	68	--	19	--	--	--	--	--	--	--	48
Selenium	EPA 6000/7000	mg/kg	0.50 U	0.50 U	0.50 U	--	0.69	--	--	--	--	--	--	--	0.30
Silver	EPA 6000/7000	mg/kg	0.50 U	0.50 U	0.50 U	--	0.50 U	--	--	--	--	--	--	--	0.016
Thallium	EPA 6000/7000	mg/kg	0.25 U	0.25 U	0.25 U	--	0.25 U	--	--	--	--	--	--	--	0.0044
Tin	EPA 6000/7000	mg/kg	2.8	25	31	--	1.2	--	--	--	--	--	--	--	50
Zinc	EPA 6000/7000	mg/kg	62	330	81	--	35	--	--	--	--	--	--	--	85
Semi-Volatile Organic Compounds (SVOCs) - Polycyclic Aromatic Hydrocarbons (PAHs)															
Acenaphthene	EPA 8270/SIM	mg/kg	0.24	0.0067 U	0.0067 U	0.0067 U	0.0067 U	--	--	--	--	--	--	--	0.028
Anthracene	EPA 8270/SIM	mg/kg	0.084	0.0067 U	0.0067 U	0.0067 U	0.0067 U	--	--	--	--	--	--	--	0.051
Benzo(a)anthracene	EPA 8270/SIM	mg/kg	0.026	0.0079	0.0067 U	0.0067 U	0.0067 U	--	--	--	--	--	--	--	0.000057
Benzo(b)fluoranthene	EPA 8270/SIM	mg/kg	0.027	0.026 U	0.0067 U	0.0067 U	0.0067 U	--	--	--	--	--	--	--	0.00020
Benzo(k)fluoranthene	EPA 8270/SIM	mg/kg	0.0086	0.026 U	0.0067 U	0.0067 U	0.0067 U	--	--	--	--	--	--	--	0.0020
Benzo(a)pyrene	EPA 8270/SIM	mg/kg	0.018	0.026 U	0.0067 U	0.0067 U	0.0067 U	--	--	--	--	--	--	--	0.000016
Chrysene	EPA 8270/SIM	mg/kg	0.03	0.033	0.0067 U	0.0067 U	0.0067 U	--	--	--	--	--	--	--	0.0064
Dibenzo(a,h)anthracene	EPA 8270/SIM	mg/kg	0.0067 U	0.026 U	0.0067 U	0.0067 U	0.0067 U	--	--	--	--	--	--	--	0.000029
Dibenzofuran	EPA 8270/SIM	mg/kg	0.26	0.026 U	0.017 U	0.017 U	0.017 U	--	--	--	--	--	--	--	0.54
Fluoranthene	EPA 8270/SIM	mg/kg	0.13	0.0067 U	0.0067 U	0.0067 U	0.0067 U	--	--	--	--	--	--	--	0.090
Fluorene	EPA 8270/SIM	mg/kg	0.32	0.0067 U	0.0067 U	0.0067 U	0.0067 U	--	--	--	--	--	--	--	0.029
Indeno(1,2,3-c,d)pyrene	EPA 8270/SIM	mg/kg	0.0067 U	0.026 U	0.0067 U	0.0067 U	0.0067 U	--	--	--	--	--	--	--	0.00056
1-Methylnaphthalene	EPA 8270/SIM	mg/kg	0.027	0.0067 U	0.0067 U	0.0067 U	0.0067 U	--	--	--	--	--	--	--	29
2-Methylnaphthalene	EPA 8270/SIM	mg/kg	0.059	0.0067 U	0.0067 U	0.0067 U	0.0067 U	--	--	--	--	--	--	--	0.67
Naphthalene	EPA 8270/SIM	mg/kg	0.047	0.0067 U	0.0067 U	0.0067 U	0.0067 U	--	--	--	--	--	--	--	0.0021
Pyrene	EPA 8270/SIM	mg/kg	0.082	0.012	0.03	0.008	0.0067 U	--	--	--	--	--	--	--	0.14
Total cPAH TEQ ⁴ (ND=0)	EPA 8270/SIM	mg/kg	0.024	0.0011	0 U	0 U	0 U	--	--	--	--	--	--	--	0.000016
Total cPAH TEQ ⁴ (ND=0.5RL)	EPA 8270/SIM	mg/kg	0.025	0.019	0.0051 U	0.0051 U	0.0051 U	--	--	--	--	--	--	--	0.000016

Table 5-3
Remedial Investigation Chemical Analytical Results - Soil COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Sample Location ¹	Analytical Method	Units	MW-19D	MW-20				GP-10	GP-11	GP-14	GP-15		GP-18	GP-19	Soil Preliminary Cleanup Level ² (PCUL)
Sample Identification			MW19D-26-27	MW20-2-3	MW20-4-5	MW20-9-10	MW20-13-14	GP-10-3261996	GP-11-3261996	GP-14-3261996	GP-15-3-4:12071995	GP-15-3261996	GP-18-3261996	GP-19-3261996	
Sample Date			12/26/13	12/16/13	12/16/13	12/16/13	12/16/13	03/26/96	03/26/96	03/26/96	12/07/95	03/26/96	03/26/96	03/26/96	
Sample Depth			26 - 27 ft	2 - 3 ft	4 - 5 ft	9 - 10 ft	13 - 14 ft	7 - 9 ft	7 - 9 ft	7 - 9 ft	3 - 4 ft	7-9 ft	7 - 9 ft	7 - 9 ft	
Stratigraphic Horizon			AD	FO	FO	FI	OS	FD	FD	FD	FD	FD	FD	FD	
Sampled By			GEI	GEI	GEI	GEI	GEI	RETEC	RETEC	RETEC	RETEC	RETEC	RETEC	RETEC	
Other SVOCs															
Aniline	EPA 8270	mg/kg	0.085 U	0.026 U	0.085 U	0.085 U	0.085 U	–	–	–	–	–	–	–	150
Bis(2-chloroethyl)ether	EPA 8270	mg/kg	0.017 U	0.026 U	0.017 U	0.017 U	0.017 U	–	–	–	–	–	–	–	0.000022
Bis(2-ethylhexyl)phthalate	EPA 8270	mg/kg	0.06	0.23	0.017 U	0.028	0.026	–	–	–	–	–	–	–	0.0051
Butyl benzyl phthalate	EPA 8270	mg/kg	0.017 U	0.026 U	0.017 U	0.017 U	0.017 U	–	–	–	–	–	–	–	0.00018
3,3'-Dichlorobenzidine	EPA 8270	mg/kg	0.017 U	0.026 U	0.017 U	0.017 U	0.017 U	–	–	–	–	–	–	–	0.0000033
2,4-Dichlorophenol	EPA 8270	mg/kg	0.017 U	0.026 U	0.017 U	0.017 U	0.017 U	–	–	–	–	–	–	–	0.0043
Diethyl phthalate	EPA 8270	mg/kg	0.085 U	0.026 U	0.085 U	0.085 U	0.085 U	–	–	–	–	–	–	–	0.034
2,4-Dimethylphenol	EPA 8270	mg/kg	0.017 U	0.026 U	0.017 U	0.017 U	0.017 U	–	–	–	–	–	–	–	0.0031
2-Methylphenol (o-Cresol)	EPA 8270	mg/kg	0.017 U	0.026 U	0.017 U	0.017 U	0.017 U	–	–	–	–	–	–	–	0.010
n-Nitrosodimethylamine	EPA 8270	mg/kg	0.017 U	0.026 U	0.017 U	0.017 U	0.017 U	–	–	–	–	–	–	–	0.017
n-Nitrosodiphenylamine (as Diphenylamine)	EPA 8270	mg/kg	0.017 U	0.026 U	0.017 U	0.017 U	0.017 U	–	–	–	–	–	–	–	0.0011
n-Nitrosodi-n-propylamine	EPA 8270	mg/kg	0.017 U	0.026 U	0.017 U	0.017 U	0.017 U	–	–	–	–	–	–	–	0.000018
Pentachlorophenol	EPA 8270	mg/kg	0.083 UJ	0.026 UJ	0.083 UJ	0.083 UJ	0.083 UJ	–	–	–	–	–	–	–	0.0000018
Phenol	EPA 8270	mg/kg	0.017 U	0.026 U	0.017 U	0.017 U	0.017 U	–	–	–	–	–	–	–	0.12
2,4,6-Trichlorophenol	EPA 8270	mg/kg	0.017 U	0.026 U	0.017 U	0.017 U	0.017 U	–	–	–	–	–	–	–	0.00019
Volatile Organic Compounds (VOCs)															
Benzene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	–	–	–	–	–	–	–	0.00056
Chloroform	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	–	–	–	–	–	–	–	0.052
Petroleum Hydrocarbons															
Gasoline-range hydrocarbons	NWTPH-G	mg/kg	5.0 U	4.8 U	4.6 UJ	4.9 UJ	4.7 UJ	–	–	–	–	–	–	–	30
Diesel-range hydrocarbons	NWTPH-Dx	mg/kg	37	32 U	18 U	18 U	18 U	–	–	–	–	–	–	–	260
Oil-range hydrocarbons	NWTPH-Dx	mg/kg	120	750	35 U	36 U	44	–	–	–	–	–	–	–	2,000
Total diesel- and oil-range hydrocarbons	NWTPH-Dx	mg/kg	157	750	35 U	36 U	44	–	–	–	–	–	–	–	260
Conventionals															
pH	N/A	N/A	8.2 J	8.7 J	7.9 J	8.0 J	7.4 J	–	–	–	–	–	–	–	NE

Notes:

- ¹ Sample locations are shown on Figures 3-1 and 3-3.
- ² Preliminary cleanup levels for soil are referenced from Table 4-1.
- ³ Total dioxin/furan Toxic Equivalency Quotients (TEQs) were calculated using United States Environmental Protection Agency (USEPA) Toxicity Equivalency Factor (TEF) values for human health (EPA 2003).
- ⁴ Total carcinogenic PAH (cPAH) TEQs were calculated using TEF values referenced from MTCA Table 708.2 (WAC 173-340-900).

RL = Reporting limit

EPA = Environmental Protection Agency

mg/kg = milligram per kilogram

NE = not established

J = estimated result

FI = Initial (early 1900s) T115N fill deposit

FD = Glacier NW Site dredged fill deposit

FO = T115N operational (1960s) fill deposit

FT = Terminal 115 fill deposit

FP = Settling pond fill deposit

Bold indicates analyte was detected.

Yellow shading identifies the detected results greater than the preliminary cleanup level.

Blue shading identifies the non-detected result greater than the preliminary cleanup level.

COPC = Contaminant of Potential Concern

KCHD = King County Health Department

Landau = Landau Associates

GEI = GeoEngineers

ERM = Environmental Resources Management

Shaw = Shaw Environmental & Infrastructre

U = analyte not detected above the reporting limit

– = not analyzed

AD = Native LDW alluvial deposit

OS = Native organic silt (Aquitard) deposit

Table 5-3
Remedial Investigation Chemical Analytical Results - Soil COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Sample Location ¹	Analytical Method	Units	GP-22	GP-23	GP-57					GP-58			GP-59		Soil Preliminary Cleanup Level ² (PCUL)	
Sample Identification			GP-22-3261996	GP-23-3261996	GP-57-1.5-3.5	GP-57-4-6.25	GP-57-6.25-6.8	GP-57-8.8-10.8	GP-57-10.8-12	GP-58-1.75-3.75	GP-58-4.25-6.25	GP-58-8.25-10.5	GP-59-2.3-3.9	GP-59-4.25-6.25		
Sample Date			03/26/96	03/26/96	08/31/12	10/10/12	10/10/12	10/10/12	10/10/12	08/31/12	10/08/12	10/08/12	08/31/12	10/10/12		
Sample Depth			7 - 9 ft	7 - 9 ft	1.5 - 3.5 ft	4 - 6.25 ft	6.25 - 6.8 ft	8.8 - 10.8 ft	10.8 - 12 ft	1.75 - 3.75 ft	4.25 - 6.25 ft	8.25 - 10.5 ft	2.3 - 3.9 ft	4.25 - 6.25 ft		
Stratigraphic Horizon			FD	FD	FD	FD	FD	FD	OS	FD	FD	FD	FD	FD		FD
Sampled By			RETEC	RETEC	ERM	ERM	ERM	ERM	ERM	ERM	ERM	ERM	ERM	ERM		ERM
Polychlorinated Biphenyls (PCBs)																
Total PCB Aroclors	EPA 8082	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	0.0000022	
Dioxins and Furans																
Total Dioxin/Furan TEQ ³ (ND=0.5RL)	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	0.0000052	
Total Dioxin/Furan TEQ ³ (ND=0.5RL)	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	0.0000052	
Metals																
Antimony	EPA 6000/7000	mg/kg	--	--	--	0.2 UJ	0.3 UJ	0.2 UJ	0.3 UJ	--	0.2 UJ	0.3 UJ	--	0.2 UJ	4.1	
Arsenic	EPA 6000/7000	mg/kg	21.0 U	24.0 U	6.2	78.7	24	8.4	4	4.6	86.3	203	20.7	33.2	7.0	
Barium	EPA 6000/7000	mg/kg	--	--	49.8	28.8	67.5	16.1	26.1	9	26	22	39.5	26.6	8.3	
Cadmium	EPA 6000/7000	mg/kg	--	--	0.1	0.1 U	0.3	0.1 U	0.1 U	0.2 U	0.1 U	0.1 U	0.1 U	0.1 U	1.0	
Chromium III / Total	EPA 6000/7000	mg/kg	--	--	25.5	12.7	23.5	10.1	10.4	3	10.2	11.4	32.1	18.6	48	
Chromium VI	EPA 6000/7000	mg/kg	--	--	0.405 U	0.414 U	1.00	0.497 U	0.965	20.8	0.607	0.503 U	0.424 U	0.758	18	
Copper	EPA 6000/7000	mg/kg	--	--	22.4	22.1 J	37.9 J	9.0 J	14.0 J	14.9	68.8	15.7	39.1	158 J	36	
Lead	EPA 6000/7000	mg/kg	--	--	26.6	3.9	10	1	2.2	1.9	4.9	3.4	20.3	11.7 J	50	
Mercury	EPA 6000/7000	mg/kg	--	--	0.030 U	0.020 U	0.11	0.030 U	0.060 U	0.040 U	0.03	0.03	0.020 U	0.03	0.070	
Nickel	EPA 6000/7000	mg/kg	--	--	30	8	23	7	8	2.0 U	7	10	39	11	48	
Selenium	EPA 6000/7000	mg/kg	--	--	--	0.5 U	0.7 U	0.6 U	0.6 U	--	0.5 U	0.6 U	--	0.6 U	0.30	
Silver	EPA 6000/7000	mg/kg	--	--	0.3 U	0.3 U	0.4 U	0.4 U	0.4 U	0.6 U	0.3 U	0.4 U	0.3 U	0.3 U	0.016	
Thallium	EPA 6000/7000	mg/kg	--	--	--	0.2 U	0.3 U	0.2 U	0.3 U	--	0.2 U	0.3 U	--	0.2 U	0.0044	
Tin	EPA 6000/7000	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	50	
Zinc	EPA 6000/7000	mg/kg	--	--	56	31	59	21	23	12	40	63	45	40	85	
Semi-Volatile Organic Compounds (SVOCs) - Polycyclic Aromatic Hydrocarbons (PAHs)																
Acenaphthene	EPA 8270/SIM	mg/kg	--	--	--	--	--	--	--	--	0.0012 U	0.0013 U	--	0.0013 U	0.028	
Anthracene	EPA 8270/SIM	mg/kg	--	--	--	--	--	--	--	--	0.0013 U	0.0014 U	--	0.0042 J	0.051	
Benzo(a)anthracene	EPA 8270/SIM	mg/kg	--	--	--	--	--	--	--	--	0.0044	0.0015 U	--	0.0054	0.000057	
Benzo(b)fluoranthene	EPA 8270/SIM	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	0.00020	
Benzo(k)fluoranthene	EPA 8270/SIM	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	0.0020	
Benzo(a)pyrene	EPA 8270/SIM	mg/kg	--	--	--	--	--	--	--	--	0.0035 J	0.0017 U	--	0.0037 J	0.000016	
Chrysene	EPA 8270/SIM	mg/kg	--	--	--	--	--	--	--	--	0.0077	0.0027 J	--	0.012	0.0064	
Dibenzo(a,h)anthracene	EPA 8270/SIM	mg/kg	--	--	--	--	--	--	--	--	0.0021 U	0.0023 U	--	0.0023 U	0.000029	
Dibenzofuran	EPA 8270/SIM	mg/kg	--	--	--	--	--	--	--	--	0.0043 J	0.0014 U	--	0.012	0.54	
Fluoranthene	EPA 8270/SIM	mg/kg	--	--	--	--	--	--	--	--	0.023	0.0084	--	0.022	0.090	
Fluorene	EPA 8270/SIM	mg/kg	--	--	--	--	--	--	--	--	0.0028 J	0.0012 U	--	0.0058	0.029	
Indeno(1,2,3-c,d)pyrene	EPA 8270/SIM	mg/kg	--	--	--	--	--	--	--	--	0.0031 U	0.0033 U	--	0.0034 U	0.00056	
1-Methylnaphthalene	EPA 8270/SIM	mg/kg	--	--	--	--	--	--	--	--	0.015	0.0016 U	--	0.023	29	
2-Methylnaphthalene	EPA 8270/SIM	mg/kg	--	--	--	--	--	--	--	--	0.012	0.0014 U	--	0.034	0.67	
Naphthalene	EPA 8270/SIM	mg/kg	--	--	--	--	--	--	--	--	0.022	0.0044 J	--	0.057	0.0021	
Pyrene	EPA 8270/SIM	mg/kg	--	--	--	--	--	--	--	--	0.017	0.0074	--	0.021	0.14	
Total cPAH TEQ ⁴ (ND=0)	EPA 8270/SIM	mg/kg	--	--	--	--	--	--	--	--	0.0051	0	--	0.0056	0.000016	
Total cPAH TEQ ⁴ (ND=0.5RL)	EPA 8270/SIM	mg/kg	--	--	--	--	--	--	--	--	0.0054	0.0013	--	0.0058	0.000016	

Table 5-3
Remedial Investigation Chemical Analytical Results - Soil COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Sample Location ¹	Analytical Method	Units	GP-22	GP-23	GP-57					GP-58			GP-59		Soil Preliminary Cleanup Level ² (PCUL)
Sample Identification			GP-22-3261996	GP-23-3261996	GP-57-1.5-3.5	GP-57-4-6.25	GP-57-6.25-6.8	GP-57-8.8-10.8	GP-57-10.8-12	GP-58-1.75-3.75	GP-58-4.25-6.25	GP-58-8.25-10.5	GP-59-2.3-3.9	GP-59-4.25-6.25	
Sample Date			03/26/96	03/26/96	08/31/12	10/10/12	10/10/12	10/10/12	10/10/12	08/31/12	10/08/12	10/08/12	08/31/12	10/10/12	
Sample Depth			7 - 9 ft	7 - 9 ft	1.5 - 3.5 ft	4 - 6.25 ft	6.25 - 6.8 ft	8.8 - 10.8 ft	10.8 - 12 ft	1.75 - 3.75 ft	4.25 - 6.25 ft	8.25 - 10.5 ft	2.3 - 3.9 ft	4.25 - 6.25 ft	
Stratigraphic Horizon			FD	FD	FD	FD	FD	FD	OS	FD	FD	FD	FD	FD	
Sampled By			RETEC	RETEC	ERM	ERM	ERM	ERM	ERM	ERM	ERM	ERM	ERM	ERM	
Other SVOCs															
Aniline	EPA 8270	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	150
Bis(2-chloroethyl)ether	EPA 8270	mg/kg	--	--	--	--	--	--	--	--	0.0031 U	0.0033 U	--	0.0033 U	0.000022
Bis(2-ethylhexyl)phthalate	EPA 8270	mg/kg	--	--	--	--	--	--	--	--	0.024 U	0.025 U	--	0.025 U	0.0051
Butyl benzyl phthalate	EPA 8270	mg/kg	--	--	--	--	--	--	--	--	0.0057 U	0.0061 U	--	0.0060 U	0.00018
3,3'-Dichlorobenzidine	EPA 8270	mg/kg	--	--	--	--	--	--	--	--	0.016 U	0.018 U	--	0.017 U	0.0000033
2,4-Dichlorophenol	EPA 8270	mg/kg	--	--	--	--	--	--	--	0.063 U	0.02 U	0.021 U	0.02 U	0.021 U	0.0043
Diethyl phthalate	EPA 8270	mg/kg	--	--	--	--	--	--	--	--	0.034 U	0.036 U	--	0.036 U	0.034
2,4-Dimethylphenol	EPA 8270	mg/kg	--	--	--	--	--	--	--	--	0.0032 U	0.0034 U	--	0.0034 U	0.0031
2-Methylphenol (o-Cresol)	EPA 8270	mg/kg	--	--	--	--	--	--	--	--	0.0049 U	0.0052 U	--	0.0051 U	0.010
n-Nitrosodimethylamine	EPA 8270	mg/kg	--	--	--	--	--	--	--	--	0.0050 U	0.0053 U	--	0.0053 U	0.017
n-Nitrosodiphenylamine (as Diphenylamine)	EPA 8270	mg/kg	--	--	--	--	--	--	--	--	0.0031 U	0.0033 U	--	0.0033 U	0.0011
n-Nitrosodi-n-propylamine	EPA 8270	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	0.000018
Pentachlorophenol	EPA 8270	mg/kg	--	--	--	--	--	--	--	0.84	0.0080 U	0.012 J	0.043	0.21	0.0000018
Phenol	EPA 8270	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	0.12
2,4,6-Trichlorophenol	EPA 8270	mg/kg	--	--	--	--	--	--	--	0.066 U	0.021 U	0.022 U	0.02 U	0.022 U	0.00019
Volatile Organic Compounds (VOCs)															
Benzene	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	0.00056
Chloroform	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	0.052
Petroleum Hydrocarbons															
Gasoline-range hydrocarbons	NWTPH-G	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	30
Diesel-range hydrocarbons	NWTPH-Dx	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	260
Oil-range hydrocarbons	NWTPH-Dx	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	2,000
Total diesel- and oil-range hydrocarbons	NWTPH-Dx	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	260
Conventionals															
pH	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	NE

Notes:

- ¹ Sample locations are shown on Figures 3-1 and 3-3.
- ² Preliminary cleanup levels for soil are referenced from Table 4-1.
- ³ Total dioxin/furan Toxic Equivalency Quotients (TEQs) were calculated using United States Environmental Protection Agency (USEPA) Toxicity Equivalency Factor (TEF) values for human health (EPA 2003).
- ⁴ Total carcinogenic PAH (cPAH) TEQs were calculated using TEF values referenced from MTCA Table 708.2 (WAC 173-340-900).
- RL = Reporting limit

EPA = Environmental Protection Agency

mg/kg = milligram per kilogram

NE = not established

J = estimated result

FI = Initial (early 1900s) T115N fill deposit

FD = Glacier NW Site dredged fill deposit

FO = T115N operational (1960s) fill deposit

FT = Terminal 115 fill deposit

FP = Settling pond fill deposit

Bold indicates analyte was detected.

Yellow shading identifies the detected results greater than the preliminary cleanup level.

Blue shading identifies the non-detected result greater than the preliminary cleanup level.
- COPC = Contaminant of Potential Concern

KCHD = King County Health Department

Landau = Landau Associates

GEI = GeoEngineers

ERM = Environmental Resources Management

Shaw = Shaw Environmental & Infrastructre

U = analyte not detected above the reporting limit

-- = not analyzed

AD = Native LDW alluvial deposit

OS = Native organic silt (Aquitard) deposit

Table 5-3
Remedial Investigation Chemical Analytical Results - Soil COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Sample Location ¹	Analytical Method	Units	GP-59		GMW-18		GMW-20		GMW-24			GMW-25			Soil Preliminary Cleanup Level ² (PCUL)
Sample Identification			GP-59-8.25-10.25	GP-59-10.25-11.5	MW-18:5.5-6.5	MW-18:13-13.5	MW-20:5.5-6.5	MW-20:13-13.5	MW-24:5-5.5	MW-24:8.5-9	MW-24:13-13.5	MW-25:3.5-4	MW-25:8-8.5	MW-25:13-13.5	
Sample Date			10/10/12	10/10/12	10/14/98	10/14/98	10/14/98	10/14/98	07/23/03	07/23/03	07/23/03	07/23/03	07/23/03	07/23/03	
Sample Depth			8.25 - 10.25 ft	10.25 - 11.5 ft	5.5 - 6.5 ft	13 - 13.5 ft	5.5 - 6.5 ft	13 - 13.5 ft	5 - 5.5 ft	8.5 - 9 ft	13 - 13.5 ft	3.5 - 4 ft	8 - 8.5 ft	13 - 13.5 ft	
Stratigraphic Horizon			FD	OS	FD	OS	FD	OS	FD	FD	OS	FD	FD	OS	
Sampled By			ERM	ERM	RETEC	RETEC	RETEC	RETEC	RETEC	Shaw	Shaw	Shaw	Shaw	Shaw	
Polychlorinated Biphenyls (PCBs)															
Total PCB Aroclors	EPA 8082	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	0.0000022
Dioxins and Furans															
Total Dioxin/Furan TEQ ³ (ND=0.5RL)	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	0.0000052
Total Dioxin/Furan TEQ ³ (ND=0.5RL)	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	0.0000052
Metals															
Antimony	EPA 6000/7000	mg/kg	0.2 UJ	0.3 UJ	--	--	--	--	--	--	--	--	--	--	4.1
Arsenic	EPA 6000/7000	mg/kg	868	3,070	46.8	4.33	13.5	2.6	4.20 U	4.00 U	5.90 U	2.70 U	11	7.80 U	7.0
Barium	EPA 6000/7000	mg/kg	18.5	45.5	--	--	--	--	--	--	--	--	--	--	8.3
Cadmium	EPA 6000/7000	mg/kg	0.1 U	0.2 U	--	--	--	--	--	--	--	--	--	--	1.0
Chromium III / Total	EPA 6000/7000	mg/kg	10.9	20.2	--	--	--	--	--	--	--	--	--	--	48
Chromium VI	EPA 6000/7000	mg/kg	0.849	0.788	--	--	--	--	--	--	--	--	--	--	18
Copper	EPA 6000/7000	mg/kg	31.9 J	80.3 J	--	--	--	--	--	--	--	--	--	--	36
Lead	EPA 6000/7000	mg/kg	4.5	11	--	--	--	--	--	--	--	--	--	--	50
Mercury	EPA 6000/7000	mg/kg	0.020 U	0.05	--	--	--	--	--	--	--	--	--	--	0.070
Nickel	EPA 6000/7000	mg/kg	7	21	--	--	--	--	--	--	--	--	--	--	48
Selenium	EPA 6000/7000	mg/kg	0.6 U	0.8 U	--	--	--	--	--	--	--	--	--	--	0.30
Silver	EPA 6000/7000	mg/kg	0.4 U	0.5 U	--	--	--	--	--	--	--	--	--	--	0.016
Thallium	EPA 6000/7000	mg/kg	0.2 U	0.3 U	--	--	--	--	--	--	--	--	--	--	0.0044
Tin	EPA 6000/7000	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	50
Zinc	EPA 6000/7000	mg/kg	89	2,080	--	--	--	--	--	--	--	--	--	--	85
Semi-Volatile Organic Compounds (SVOCs) - Polycyclic Aromatic Hydrocarbons (PAHs)															
Acenaphthene	EPA 8270/SIM	mg/kg	0.0027 J	0.037	--	--	--	--	--	--	--	--	--	--	0.028
Anthracene	EPA 8270/SIM	mg/kg	0.0028 J	0.014	--	--	--	--	--	--	--	--	--	--	0.051
Benzo(a)anthracene	EPA 8270/SIM	mg/kg	0.0037 J	0.013	--	--	--	--	--	--	--	--	--	--	0.000057
Benzo(b)fluoranthene	EPA 8270/SIM	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	0.00020
Benzo(k)fluoranthene	EPA 8270/SIM	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	0.0020
Benzo(a)pyrene	EPA 8270/SIM	mg/kg	0.0036 J	0.013	--	--	--	--	--	--	--	--	--	--	0.000016
Chrysene	EPA 8270/SIM	mg/kg	0.0045 J	0.019	--	--	--	--	--	--	--	--	--	--	0.0064
Dibenzo(a,h)anthracene	EPA 8270/SIM	mg/kg	0.0022 U	0.0024 J	--	--	--	--	--	--	--	--	--	--	0.000029
Dibenzofuran	EPA 8270/SIM	mg/kg	0.0039 J	0.027	--	--	--	--	--	--	--	--	--	--	0.54
Fluoranthene	EPA 8270/SIM	mg/kg	0.015	0.078	--	--	--	--	--	--	--	--	--	--	0.090
Fluorene	EPA 8270/SIM	mg/kg	0.0037 J	0.029	--	--	--	--	--	--	--	--	--	--	0.029
Indeno(1,2,3-c,d)pyrene	EPA 8270/SIM	mg/kg	0.0032 U	0.011	--	--	--	--	--	--	--	--	--	--	0.00056
1-Methylnaphthalene	EPA 8270/SIM	mg/kg	0.0049	0.0016 U	--	--	--	--	--	--	--	--	--	--	29
2-Methylnaphthalene	EPA 8270/SIM	mg/kg	0.007	0.03	--	--	--	--	--	--	--	--	--	--	0.67
Naphthalene	EPA 8270/SIM	mg/kg	0.024	0.16	--	--	--	--	--	--	--	--	--	--	0.0021
Pyrene	EPA 8270/SIM	mg/kg	0.014	0.076	--	--	--	--	--	--	--	--	--	--	0.14
Total cPAH TEQ ⁴ (ND=0)	EPA 8270/SIM	mg/kg	0.0047	0.019	--	--	--	--	--	--	--	--	--	--	0.000016
Total cPAH TEQ ⁴ (ND=0.5RL)	EPA 8270/SIM	mg/kg	0.005	0.019	--	--	--	--	--	--	--	--	--	--	0.000016

Table 5-3
Remedial Investigation Chemical Analytical Results - Soil COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Sample Location ¹	Analytical Method	Units	GP-59		GMW-18		GMW-20		GMW-24			GMW-25			Soil Preliminary Cleanup Level ² (PCUL)
Sample Identification			GP-59-8.25-10.25	GP-59-10.25-11.5	MW-18:5.5-6.5	MW-18:13-13.5	MW-20:5.5-6.5	MW-20:13-13.5	MW-24:5-5.5	MW-24:8.5-9	MW-24:13-13.5	MW-25:3.5-4	MW-25:8-8.5	MW-25:13-13.5	
Sample Date			10/10/12	10/10/12	10/14/98	10/14/98	10/14/98	10/14/98	07/23/03	07/23/03	07/23/03	07/23/03	07/23/03	07/23/03	
Sample Depth			8.25 - 10.25 ft	10.25 - 11.5 ft	5.5 - 6.5 ft	13 - 13.5 ft	5.5 - 6.5 ft	13 - 13.5 ft	5 - 5.5 ft	8.5 - 9 ft	13 - 13.5 ft	3.5 - 4 ft	8 - 8.5 ft	13 - 13.5 ft	
Stratigraphic Horizon			FD	OS	FD	OS	FD	OS	FD	FD	OS	FD	FD	OS	
Sampled By			ERM	ERM	RETEC	RETEC	RETEC	RETEC	Shaw	Shaw	Shaw	Shaw	Shaw	Shaw	
Other SVOCs															
Aniline	EPA 8270	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	150
Bis(2-chloroethyl)ether	EPA 8270	mg/kg	0.0031 U	0.0032 U	--	--	--	--	--	--	--	--	--	--	0.000022
Bis(2-ethylhexyl)phthalate	EPA 8270	mg/kg	0.014 U	0.063 U	--	--	--	--	--	--	--	--	--	--	0.0051
Butyl benzyl phthalate	EPA 8270	mg/kg	0.0057 U	0.0059 U	--	--	--	--	--	--	--	--	--	--	0.00018
3,3'-Dichlorobenzidine	EPA 8270	mg/kg	0.017 U	0.017 U	--	--	--	--	--	--	--	--	--	--	0.0000033
2,4-Dichlorophenol	EPA 8270	mg/kg	0.02 U	0.021 U	--	--	--	--	--	--	--	--	--	--	0.0043
Diethyl phthalate	EPA 8270	mg/kg	0.034 U	0.035 U	--	--	--	--	--	--	--	--	--	--	0.034
2,4-Dimethylphenol	EPA 8270	mg/kg	0.0032 U	0.0033 U	--	--	--	--	--	--	--	--	--	--	0.0031
2-Methylphenol (o-Cresol)	EPA 8270	mg/kg	0.0049 U	0.0050 U	--	--	--	--	--	--	--	--	--	--	0.010
n-Nitrosodimethylamine	EPA 8270	mg/kg	0.0050 U	0.0051 U	--	--	--	--	--	--	--	--	--	--	0.017
n-Nitrosodiphenylamine (as Diphenylamine)	EPA 8270	mg/kg	0.0031 U	0.0032 U	--	--	--	--	--	--	--	--	--	--	0.0011
n-Nitrosodi-n-propylamine	EPA 8270	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	0.000018
Pentachlorophenol	EPA 8270	mg/kg	0.045 U	0.046 U	--	--	--	--	--	--	--	--	--	--	0.0000018
Phenol	EPA 8270	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	0.12
2,4,6-Trichlorophenol	EPA 8270	mg/kg	0.021 U	0.021 U	--	--	--	--	--	--	--	--	--	--	0.00019
Volatile Organic Compounds (VOCs)															
Benzene	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	0.00056
Chloroform	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	0.052
Petroleum Hydrocarbons															
Gasoline-range hydrocarbons	NWTPH-G	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	30
Diesel-range hydrocarbons	NWTPH-Dx	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	260
Oil-range hydrocarbons	NWTPH-Dx	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	2,000
Total diesel- and oil-range hydrocarbons	NWTPH-Dx	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	260
Conventionals															
pH	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	NE

Notes:

- ¹ Sample locations are shown on Figures 3-1 and 3-3.
- ² Preliminary cleanup levels for soil are referenced from Table 4-1.
- ³ Total dioxin/furan Toxic Equivalency Quotients (TEQs) were calculated using United States Environmental Protection Agency (USEPA) Toxicity Equivalency Factor (TEF) values for human health (EPA 2003).
- ⁴ Total carcinogenic PAH (cPAH) TEQs were calculated using TEF values referenced from MTCA Table 708.2 (WAC 173-340-900).
- RL = Reporting limit

EPA = Environmental Protection Agency

mg/kg = milligram per kilogram

NE = not established

J = estimated result

FI = Initial (early 1900s) T115N fill deposit

FD = Glacier NW Site dredged fill deposit

FO = T115N operational (1960s) fill deposit

FT = Terminal 115 fill deposit

FP = Settling pond fill deposit

Bold indicates analyte was detected.

Yellow shading identifies the detected results greater than the preliminary cleanup level.

Blue shading identifies the non-detected result greater than the preliminary cleanup level.
- COPC = Contaminant of Potential Concern

KCHD = King County Health Department

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Shaw = Shaw Environmental & Infrastructre

U = analyte not detected above the reporting limit

-- = not analyzed

AD = Native LDW alluvial deposit

OS = Native organic silt (Aquitard) deposit

Table 5-3
Remedial Investigation Chemical Analytical Results - Soil COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Sample Location ¹	Analytical Method	Units	GMW-26				GMW-27				Soil Preliminary Cleanup Level ² (PCUL)
Sample Identification			MW-26:5.5-6	MW-26:8-8.5	MW-26:10.5-11	MW-26:13-13.5	MW-27:5.5-6	MW-27:8-8.5	MW-27:10.5-11	MW-27:13-13.5	
Sample Date			07/23/03	07/23/03	07/23/03	07/23/03	07/23/03	07/23/03	07/23/03	07/23/03	
Sample Depth			5.5 - 6 ft	8 - 8.5 ft	10.5 - 11 ft	13 - 13.5 ft	5.5 - 6 ft	8 - 8.5 ft	10.5 - 11 ft	13 - 13.5 ft	
Stratigraphic Horizon			FD	FD	FD	OS	FD	FD	FD	OS	
Sampled By			Shaw	Shaw	Shaw	Shaw	Shaw	Shaw	Shaw	Shaw	
Polychlorinated Biphenyls (PCBs)											
Total PCB Aroclors	EPA 8082	mg/kg	--	--	--	--	--	--	--	--	0.0000022
Dioxins and Furans											
Total Dioxin/Furan TEQ ³ (ND=0.5RL)	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	0.0000052
Total Dioxin/Furan TEQ ³ (ND=0.5RL)	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	0.0000052
Metals											
Antimony	EPA 6000/7000	mg/kg	--	--	--	--	--	--	--	--	4.1
Arsenic	EPA 6000/7000	mg/kg	180	9.1	250	24	3.60 U	3.70 U	4.40 U	3.60 U	7.0
Barium	EPA 6000/7000	mg/kg	--	--	--	--	--	--	--	--	8.3
Cadmium	EPA 6000/7000	mg/kg	--	--	--	--	--	--	--	--	1.0
Chromium III / Total	EPA 6000/7000	mg/kg	--	--	--	--	--	--	--	--	48
Chromium VI	EPA 6000/7000	mg/kg	--	--	--	--	--	--	--	--	18
Copper	EPA 6000/7000	mg/kg	--	--	--	--	--	--	--	--	36
Lead	EPA 6000/7000	mg/kg	--	--	--	--	--	--	--	--	50
Mercury	EPA 6000/7000	mg/kg	--	--	--	--	--	--	--	--	0.070
Nickel	EPA 6000/7000	mg/kg	--	--	--	--	--	--	--	--	48
Selenium	EPA 6000/7000	mg/kg	--	--	--	--	--	--	--	--	0.30
Silver	EPA 6000/7000	mg/kg	--	--	--	--	--	--	--	--	0.016
Thallium	EPA 6000/7000	mg/kg	--	--	--	--	--	--	--	--	0.0044
Tin	EPA 6000/7000	mg/kg	--	--	--	--	--	--	--	--	50
Zinc	EPA 6000/7000	mg/kg	--	--	--	--	--	--	--	--	85
Semi-Volatile Organic Compounds (SVOCs) - Polycyclic Aromatic Hydrocarbons (PAHs)											
Acenaphthene	EPA 8270/SIM	mg/kg	--	--	--	--	--	--	--	--	0.028
Anthracene	EPA 8270/SIM	mg/kg	--	--	--	--	--	--	--	--	0.051
Benzo(a)anthracene	EPA 8270/SIM	mg/kg	--	--	--	--	--	--	--	--	0.000057
Benzo(b)fluoranthene	EPA 8270/SIM	mg/kg	--	--	--	--	--	--	--	--	0.00020
Benzo(k)fluoranthene	EPA 8270/SIM	mg/kg	--	--	--	--	--	--	--	--	0.0020
Benzo(a)pyrene	EPA 8270/SIM	mg/kg	--	--	--	--	--	--	--	--	0.000016
Chrysene	EPA 8270/SIM	mg/kg	--	--	--	--	--	--	--	--	0.0064
Dibenzo(a,h)anthracene	EPA 8270/SIM	mg/kg	--	--	--	--	--	--	--	--	0.000029
Dibenzofuran	EPA 8270/SIM	mg/kg	--	--	--	--	--	--	--	--	0.54
Fluoranthene	EPA 8270/SIM	mg/kg	--	--	--	--	--	--	--	--	0.090
Fluorene	EPA 8270/SIM	mg/kg	--	--	--	--	--	--	--	--	0.029
Indeno(1,2,3-c,d)pyrene	EPA 8270/SIM	mg/kg	--	--	--	--	--	--	--	--	0.00056
1-Methylnaphthalene	EPA 8270/SIM	mg/kg	--	--	--	--	--	--	--	--	29
2-Methylnaphthalene	EPA 8270/SIM	mg/kg	--	--	--	--	--	--	--	--	0.67
Naphthalene	EPA 8270/SIM	mg/kg	--	--	--	--	--	--	--	--	0.0021
Pyrene	EPA 8270/SIM	mg/kg	--	--	--	--	--	--	--	--	0.14
Total cPAH TEQ ⁴ (ND=0)	EPA 8270/SIM	mg/kg	--	--	--	--	--	--	--	--	0.000016
Total cPAH TEQ ⁴ (ND=0.5RL)	EPA 8270/SIM	mg/kg	--	--	--	--	--	--	--	--	0.000016

Table 5-3
Remedial Investigation Chemical Analytical Results - Soil COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Sample Location ¹	Analytical Method	Units	GMW-26				GMW-27				Soil Preliminary Cleanup Level ² (PCUL)
Sample Identification			MW-26:5.5-6	MW-26:8-8.5	MW-26:10.5-11	MW-26:13-13.5	MW-27:5.5-6	MW-27:8-8.5	MW-27:10.5-11	MW-27:13-13.5	
Sample Date			07/23/03	07/23/03	07/23/03	07/23/03	07/23/03	07/23/03	07/23/03	07/23/03	
Sample Depth			5.5 - 6 ft	8 - 8.5 ft	10.5 - 11 ft	13 - 13.5 ft	5.5 - 6 ft	8 - 8.5 ft	10.5 - 11 ft	13 - 13.5 ft	
Stratigraphic Horizon			FD	FD	FD	OS	FD	FD	FD	OS	
Sampled By			Shaw	Shaw	Shaw	Shaw	Shaw	Shaw	Shaw	Shaw	
Other SVOCs											
Aniline	EPA 8270	mg/kg	--	--	--	--	--	--	--	--	150
Bis(2-chloroethyl)ether	EPA 8270	mg/kg	--	--	--	--	--	--	--	--	0.000022
Bis(2-ethylhexyl)phthalate	EPA 8270	mg/kg	--	--	--	--	--	--	--	--	0.0051
Butyl benzyl phthalate	EPA 8270	mg/kg	--	--	--	--	--	--	--	--	0.00018
3,3'-Dichlorobenzidine	EPA 8270	mg/kg	--	--	--	--	--	--	--	--	0.0000033
2,4-Dichlorophenol	EPA 8270	mg/kg	--	--	--	--	--	--	--	--	0.0043
Diethyl phthalate	EPA 8270	mg/kg	--	--	--	--	--	--	--	--	0.034
2,4-Dimethylphenol	EPA 8270	mg/kg	--	--	--	--	--	--	--	--	0.0031
2-Methylphenol (o-Cresol)	EPA 8270	mg/kg	--	--	--	--	--	--	--	--	0.010
n-Nitrosodimethylamine	EPA 8270	mg/kg	--	--	--	--	--	--	--	--	0.017
n-Nitrosodiphenylamine (as Diphenylamine)	EPA 8270	mg/kg	--	--	--	--	--	--	--	--	0.0011
n-Nitrosodi-n-propylamine	EPA 8270	mg/kg	--	--	--	--	--	--	--	--	0.000018
Pentachlorophenol	EPA 8270	mg/kg	--	--	--	--	--	--	--	--	0.0000018
Phenol	EPA 8270	mg/kg	--	--	--	--	--	--	--	--	0.12
2,4,6-Trichlorophenol	EPA 8270	mg/kg	--	--	--	--	--	--	--	--	0.00019
Volatile Organic Compounds (VOCs)											
Benzene	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	0.00056
Chloroform	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	0.052
Petroleum Hydrocarbons											
Gasoline-range hydrocarbons	NWTPH-G	mg/kg	--	--	--	--	--	--	--	--	30
Diesel-range hydrocarbons	NWTPH-Dx	mg/kg	--	--	--	--	--	--	--	--	260
Oil-range hydrocarbons	NWTPH-Dx	mg/kg	--	--	--	--	--	--	--	--	2,000
Total diesel- and oil-range hydrocarbons	NWTPH-Dx	mg/kg	--	--	--	--	--	--	--	--	260
Conventionals											
pH	N/A	N/A	--	--	--	--	--	--	--	--	NE

Notes:

- ¹ Sample locations are shown on Figures 3-1 and 3-3.
- ² Preliminary cleanup levels for soil are referenced from Table 4-1.
- ³ Total dioxin/furan Toxic Equivalency Quotients (TEQs) were calculated using United States Environmental Protection Agency (USEPA) Toxicity Equivalency Factor (TEF) values for human health (EPA 2003).
- ⁴ Total carcinogenic PAH (cPAH) TEQs were calculated using TEF values referenced from MTCA Table 708.2 (WAC 173-340-900).
- RL = Reporting limit

EPA = Environmental Protection Agency

mg/kg = milligram per kilogram

NE = not established

J = estimated result

FI = Initial (early 1900s) T115N fill deposit

FD = Glacier NW Site dredged fill deposit

FO = T115N operational (1960s) fill deposit

FT = Terminal 115 fill deposit

FP = Settling pond fill deposit

Bold indicates analyte was detected.

Yellow shading identifies the detected results greater than the preliminary cleanup level.

Blue shading identifies the non-detected result greater than the preliminary cleanup level.
- COPC = Contaminant of Potential Concern

KCHD = King County Health Department

Landau = Landau Associates

GEI = GeoEngineers

ERM = Environmental Resources Management

Shaw = Shaw Environmental & Infastructre

U = analyte not detected above the reporting limit

-- = not analyzed

AD = Native LDW alluvial deposit

OS = Native organic silt (Aquitard) deposit

Table 5-4
Remedial Investigation Chemical Analytical Results - Groundwater COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Monitoring Well ¹	Analytical Method	Units	DP-1	MW-1	MW-1 ²	MW-1 ²	MW-1 ²	MW-1 ²	MW-2	MW-2 ²	MW-2 ²	MW-2	MW-2 ²	MW-2D	Groundwater Preliminary Cleanup Level ³ (PCUL)
Sample Date			10/29/09	11/05/09	06/10/14	09/22/14	01/23/15	04/21/15	11/05/09	06/13/14	09/22/14	01/19/15	04/21/15	06/13/14	
Monitoring Event			Oct-09	Nov-09	Jun-14	Sep-14	Jan-15	Apr-15	Nov-09	Jun-14	Sep-14	Jan-15	Apr-15	Jun-14	
Sampled By			Landau	Landau	GEI	GEI	GEI	GEI	Landau	GEI	GEI	GEI	GEI	GEI	
Polychlorinated Biphenyls (PCBs)															
Total PCB Aroclors	EPA 8082	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	0.000007
Total PCB Congeners	EPA 1668	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	0.000007
Dioxins and Furans															
Total Dioxin/Furan TEQ ⁺ (ND=0RL)	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	0.0000000051
Total Dioxin/Furan TEQ ⁺ (ND=0.5RL)	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	0.0000000051
Total Metals															
Arsenic	EPA 200.8/7470	µg/L	10	19	--	--	--	--	20	--	--	46	--	3.6	8.0
Barium	EPA 200.8/7470	µg/L	--	--	--	--	--	--	--	--	--	150	--	92	200
Cadmium	EPA 200.8/7470	µg/L	4.4 U	4.4 U	--	--	--	--	4.4 U	--	--	0.20 U	--	0.20 U	1.2
Chromium III / Total	EPA 200.8/7470	µg/L	44	11	--	--	--	--	13	--	--	12	--	2.2	27
Chromium VI	EPA 200.8/7470	µg/L	10 U	10 U	--	--	--	--	10 U	--	--	--	--	--	50
Copper	EPA 200.8/7470	µg/L	170	22	--	--	--	--	59	--	--	7.3	--	2.0 U	3.1
Lead	EPA 200.8/7470	µg/L	180	68	--	--	--	--	9.4	--	--	1.5	--	1.0 U	8.1
Mercury	EPA 200.8/7470	µg/L	0.1 U	0.1 U	--	--	--	--	0.1 U	--	--	0.50 U	--	0.50 U	0.025
Nickel	EPA 200.8/7470	µg/L	78	22 U	--	--	--	--	54	--	--	24	--	4.4	8.2
Silver	EPA 200.8/7470	µg/L	11 U	11 U	--	--	--	--	11 U	--	--	1.0 U	--	1.0 U	1.9
Thallium	EPA 200.8/7470	µg/L	5.6 U	5.6 U	--	--	--	--	5.6 U	--	--	2.0 U	--	2.0 U	0.062
Zinc	EPA 200.8/7470	µg/L	480	78	--	--	--	--	69	--	--	56 U	--	56 U	81
Dissolved Metals															
Arsenic	EPA 200.8/7470	µg/L	5.1	17	--	--	--	--	19	--	--	13	--	3.3 U	8.0
Barium	EPA 200.8/7470	µg/L	--	--	--	--	--	--	--	--	--	120	--	78	200
Cadmium	EPA 200.8/7470	µg/L	4 U	4 U	--	--	--	--	4 U	--	--	0.20 U	--	0.20 U	1.2
Chromium III / Total	EPA 200.8/7470	µg/L	2 U	6.6	--	--	--	--	2 U	--	--	2.0 U	--	2.0 U	27
Copper	EPA 200.8/7470	µg/L	5.9	4	--	--	--	--	1 U	--	--	2.0 U	--	2.0 U	3.1
Lead	EPA 200.8/7470	µg/L	1.1	3	--	--	--	--	1 U	--	--	1.0 U	--	1.0 U	8.1
Mercury	EPA 200.8/7470	µg/L	0.1 U	0.1 U	--	--	--	--	0.1 U	--	--	0.50 U	--	0.50 U	0.025
Nickel	EPA 200.8/7470	µg/L	20 U	20 U	--	--	--	--	20 U	--	--	9.4	--	3.1	8.2
Silver	EPA 200.8/7470	µg/L	10 U	10 U	--	--	--	--	10 U	--	--	1.0 U	--	1.0 U	1.9
Thallium	EPA 200.8/7470	µg/L	5 U	5 U	--	--	--	--	5 U	--	--	2.0 U	--	2.0 U	0.062
Zinc	EPA 200.8/7470	µg/L	12	7.8	--	--	--	--	7.8	--	--	56 U	--	56 U	81
Semi-Volatile Organic Compounds (SVOCs) - Polycyclic Aromatic Hydrocarbons (PAHs)															
Acenaphthene	EPA 8270/SIM	µg/L	0.42	2.2	--	--	--	--	0.1 U	--	--	0.10 U	--	0.47 U	5.3
Anthracene	EPA 8270/SIM	µg/L	0.24	0.1 U	--	--	--	--	0.1 U	--	--	0.10 U	--	0.47 U	2.1
Benzo(a)anthracene	EPA 8270/SIM	µg/L	0.14	0.012	--	--	--	--	0.01 U	--	--	0.010 U	--	0.047 U	0.00016
Benzo(b)fluoranthene	EPA 8270/SIM	µg/L	0.24	0.01 U	--	--	--	--	0.01 U	--	--	0.010 U	--	0.047 U	0.00016
Benzo(j,k)fluoranthene	EPA 8270/SIM	µg/L	0.062	0.01 U	--	--	--	--	0.01 U	--	--	0.010 U	--	0.047 U	0.0016
Benzo(a)pyrene	EPA 8270/SIM	µg/L	0.11	0.01 U	--	--	--	--	0.01 U	--	--	0.010 U	--	0.047 U	0.000016
Chrysene	EPA 8270/SIM	µg/L	0.25	0.01 U	--	--	--	--	0.01 U	--	--	0.010 U	--	0.047 U	0.016
Dibenzo(a,h)anthracene	EPA 8270/SIM	µg/L	0.044	0.01 U	--	--	--	--	0.01 U	--	--	0.010 U	--	0.047 U	0.000016
Fluoranthene	EPA 8270/SIM	µg/L	0.67	0.16	--	--	--	--	0.1 U	--	--	0.10 U	--	0.47 U	1.8
Fluorene	EPA 8270/SIM	µg/L	0.31	0.12	--	--	--	--	0.1 U	--	--	0.10 U	--	0.47 U	3.7
Indeno(1,2,3-c,d)pyrene	EPA 8270/SIM	µg/L	0.085	0.01 U	--	--	--	--	0.01 U	--	--	0.010 U	--	0.047 U	0.00016
1-Methylnaphthalene	EPA 8270/SIM	µg/L	0.095 U	0.1 U	--	--	--	--	0.1 U	--	--	0.10 U	--	0.47 U	1.5
Naphthalene	EPA 8270/SIM	µg/L	0.095 U	0.1 U	--	--	--	--	0.1	--	--	0.10 U	--	0.47 U	1.4
Pyrene	EPA 8270/SIM	µg/L	0.56	0.1 U	--	--	--	--	0.1 U	--	--	0.10 U	--	0.47 U	2
Total cPAH TEQ ⁵ (ND=0)	EPA 8270/SIM	µg/L	0.1696	0.0012	--	--	--	--	0 U	--	--	0 U	--	0 U	0.000016
Total cPAH TEQ ⁵ (ND=0.5RL)	EPA 8270/SIM	µg/L	0.1696	0.0083	--	--	--	--	0.0076 U	--	--	0.0076 U	--	0.0350 U	0.000016

Table 5-4
Remedial Investigation Chemical Analytical Results - Groundwater COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Monitoring Well ¹	Analytical Method	Units	DP-1	MW-1	MW-1 ²	MW-1 ²	MW-1 ²	MW-1 ²	MW-2	MW-2 ²	MW-2 ²	MW-2	MW-2 ²	MW-2D	Groundwater Preliminary Cleanup Level ³ (PCUL)	
Sample Date			10/29/09	11/05/09	06/10/14	09/22/14	01/23/15	04/21/15	11/05/09	06/13/14	09/22/14	01/19/15	04/21/15	06/13/14		
Monitoring Event			Oct-09	Nov-09	Jun-14	Sep-14	Jan-15	Apr-15	Nov-09	Jun-14	Sep-14	Jan-15	Apr-15	Jun-14		
Sampled By			Landau	Landau	GEI	GEI	GEI	GEI	Landau	GEI	GEI	GEI	GEI	GEI		
Other SVOCs (mg/kg)																
Aniline	EPA 8270	µg/L	4.8 U	5 U	--	--	--	--	5 U	--	--	0.11 U	--	0.94 U	7.7	
Bis(2-chloroethyl)ether	EPA 8270	µg/L	0.95 U	1 U	--	--	--	--	1 U	--	--	0.11 U	--	0.94 U	0.06	
Bis(2-ethylhexyl)phthalate	EPA 8270	µg/L	4.2	1 U	--	--	--	--	1 U	--	--	0.24 U	--	0.94 U	0.046	
Butyl Benzyl Phthalate	EPA 8270	µg/L	0.95 U	1 U	--	--	--	--	1 U	--	--	0.11 U	--	0.94 U	0.013	
2,4-Dichlorophenol	EPA 8270	µg/L	0.95 U	1 U	--	--	--	--	1 U	--	--	0.11 UJ	--	0.94 U	10	
Diethyl phthalate	EPA 8270	µg/L	0.98	1.2	--	--	--	--	1 U	--	--	0.52	--	0.94 U	93	
2,4-Dimethylphenol	EPA 8270	µg/L	0.95 U	1 U	--	--	--	--	1 U	--	--	0.11 UJ	--	0.94 U	6.30	
2-Methylphenol (o-Cresol)	EPA 8270	µg/L	0.95 U	1 U	--	--	--	--	1 U	--	--	0.11 U	--	0.94 U	27	
n-Nitrosodimethylamine	EPA 8270	µg/L	0.95 U	1 U	--	--	--	--	1 U			0.11 U	--	0.94 U	0.34	
n-Nitrosodiphenylamine (as Diphenylamine)	EPA 8270	µg/L	9.5 U	10 U	--	--	--	--	10 U	--	--	0.11 U	--	0.94 U	0.69	
n-Nitrosodi-n-propylamine	EPA 8270	µg/L	0.95 U	1 U	--	--	--	--	1 U	--	--	0.11 U	--	0.94 U	0.058	
Pentachlorophenol	EPA 8270	µg/L	4.8 U	5 U	--	--	--	--	5 U	--	--	0.54 UJ	--	0.94 UJ	0.002	
Phenol	EPA 8270	µg/L	0.95 U	1 U	--	--	--	--	1 U	--	--	0.11 UJ	--	0.94 U	370	
2,4,6-Trichlorophenol	EPA 8270	µg/L	0.95 U	1 U	--	--	--	--	1 U	--	--	0.11 UJ	--	0.94 U	0.28	
Volatile Organic Compounds (VOCs)																
Benzene	EPA 8260	µg/L	0.2 U	0.2 U	--	--	--	--	0.2 U	--	--	0.20 U	--	0.20 U	1.6	
Chloroform	EPA 8260	µg/L	0.2 U	0.2 U	--	--	--	--	0.2 U	--	--	0.20 U	--	0.20 U	1.2	
Petroleum Hydrocarbons																
Gasoline-range hydrocarbons	NWTPH-G	µg/L	100 U	100 U	--	--	--	--	--	--	--	100 U	--	--	800	
Diesel-range hydrocarbons	NWTPH-Dx	µg/L	260 U	220 U	--	--	--	--	--	--	--	270	--	--	500	
Oil-range hydrocarbons	NWTPH-Dx	µg/L	1,800	350 U	--	--	--	--	--	--	--	400 U	--	--	500	
Total diesel- and oil-range hydrocarbons	NWTPH-Dx	µg/L	1,800	350 U	--	--	--	--	--	--	--	270	--	--	500	
Diesel-range hydrocarbons	NWTPH-Dx Si/Gel	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	500	
Oil-range hydrocarbons	NWTPH-Dx Si/Gel	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	500	
Total diesel- and oil-range hydrocarbons	NWTPH-Dx Si/Gel	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	500	
Conventional Parameters																
Total organic carbon (TOC)	SM 5310B	mg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE	
Field Measured Parameters																
pH	N/A	N/A	--	8.06	--	--	--	--	6.55	--	--	6.54	--	5.49	NE	

Notes:

¹ Monitoring well locations are shown on Figures 3-2 and 3-4.

² Insufficient water to collect groundwater sample for chemical analysis.

³ Groundwater screening levels referenced from Table 4-2.

⁴ Total dioxin/furan Toxic Equivalency Quotients (TEQs) were calculated using United States Environmental Protection Agency (USEPA) Toxicity Equivalency Factor (TEF) values for human health (EPA 2003).

⁵ Total carcinogenic PAH (cPAH) TEQs were calculated using TEF values referenced from MTCA Table 708.2 (WAC 173-340-900).

mg/L = milligram per liter

µg/L = microgram per liter

NE = not established

Landau = Landau Associates

GEI = GeoEngineers

Bold indicates analyte was detected.

Yellow shading identifies the detected results greater than the preliminary cleanup level.

Blue shading identifies the non-detected result greater than the preliminary cleanup level.

NE = not established

J = estimated result

U = analyte not detected above the reporting limit

-- = not analyzed

COPC = Contaminant of Potential Concern

Table 5-4
Remedial Investigation Chemical Analytical Results - Groundwater COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Monitoring Well ¹	Analytical Method	Units	MW-2D	MW-2D	MW-2D	MW-3	MW-3	MW-3 ²	MW-3	MW-3	MW-3	MW-4	MW-4	MW-4	Groundwater Preliminary Cleanup Level ³ (PCUL)
Sample Date			09/22/14	01/19/15	04/21/15	11/6/2009	06/11/14	09/25/14	01/19/15	04/22/15	03/17/17	11/5/2009	06/11/14	09/25/14	
Monitoring Event			Sep-14	Jan-15	Apr-15	Nov-09	Jun-14	Sep-14	Jan-15	Apr-15	Mar-17	Nov-09	Jun-14	Sep-14	
Sampled By			GEI	GEI	GEI	Landau	GEI	GEI	GEI	GEI	Ecology	Landau	GEI	GEI	
Polychlorinated Biphenyls (PCBs)															
Total PCB Aroclors	EPA 8082	µg/L	--	--	--	--	--	--	--	--	0.010 U	--	--	--	0.000007
Total PCB Congeners	EPA 1668	µg/L	--	--	--	--	--	--	--	--	0.0012 J	--	--	--	0.000007
Dioxins and Furans															
Total Dioxin/Furan TEQ ⁺ (ND=0RL)	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	0.0000000051
Total Dioxin/Furan TEQ ⁺ (ND=0.5RL)	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	0.0000000051
Total Metals															
Arsenic	EPA 200.8/7470	µg/L	3.3 U	3.3 U	3.3 U	11	32	--	43	20	--	1,900	1,400	1,700	8.0
Barium	EPA 200.8/7470	µg/L	77	76	62	--	530	--	640	280	--	--	320	340	200
Cadmium	EPA 200.8/7470	µg/L	0.20 U	0.20 U	0.20 U	11 U	0.20 U	--	0.20 U	0.20 U	--	7.3	4.7	5.1	1.2
Chromium III / Total	EPA 200.8/7470	µg/L	3.2	2.0 U	2.0 U	8.2	4.1	--	5.4	2.5 J	--	1,100	1,000	1,200	27
Chromium VI	EPA 200.8/7470	µg/L	--	--	--	10 U	--	--	--	--	--	50 U	--	--	50
Copper	EPA 200.8/7470	µg/L	2.0 U	2.0 U	2.0 U	5.7	2.0 U	--	2.0 U	3.6	--	310	230	250	3.1
Lead	EPA 200.8/7470	µg/L	1.0 U	1.0 U	1.0 U	5.5	1.0 U	--	2.9	1.2	--	460	400	480	8.1
Mercury	EPA 200.8/7470	µg/L	0.50 U	0.50 U	0.50 U	0.1 U	2.5 U	--	0.50 U	0.50 U	--	0.94	0.49	0.87	0.025
Nickel	EPA 200.8/7470	µg/L	3.9	2.7	3.3	26	19	--	21	6.5	--	500	390	400	8.2
Silver	EPA 200.8/7470	µg/L	1.0 U	1.0 U	1.0 U	11 U	1.0 U	--	1.0 U	1.0 U	--	11 U	5	4.5	1.9
Thallium	EPA 200.8/7470	µg/L	2.0 U	2.0 U	2.0 U	5.6 U	2.0 U	--	2.0 U	2.0 U	--	5.6 U	2.0 U	2.0 U	0.062
Zinc	EPA 200.8/7470	µg/L	56 U	56 U	56 U	40	56 U	--	55 U	140	--	760	410	540	81
Dissolved Metals															
Arsenic	EPA 200.8/7470	µg/L	1.6	3.3 U	3.3 U	15	29	--	25	27	--	1,400	1,600	1,700 J	8.0
Barium	EPA 200.8/7470	µg/L	71	70	70	--	510	--	520	270	--	--	350	350	200
Cadmium	EPA 200.8/7470	µg/L	0.20 U	0.20 U	0.20 U	4 U	0.20 U	--	0.20 U	0.20 U	--	4.2	4.4	5.8	1.2
Chromium III / Total	EPA 200.8/7470	µg/L	2.0 U	2.0 U	2.0 U	11	3.6	--	4	2.6	--	520	1,100	1,200	27
Copper	EPA 200.8/7470	µg/L	2.0 U	2.0 U	2.0 U	1.7	2.0 U	--	2.0 U	2.0 U	--	120	210	250	3.1
Lead	EPA 200.8/7470	µg/L	1.0 U	1.0 U	1.0 U	1 U	1.0 U	--	1.0 U	1.0 U	--	470	410	490	8.1
Mercury	EPA 200.8/7470	µg/L	0.50 U	0.50 U	0.50 U	0.1 U	0.50 U	--	0.50 U	0.50 U	--	0.79	0.66	1	0.025
Nickel	EPA 200.8/7470	µg/L	2.8	2.4	2.0 U	26	18	--	22	6.8	--	410	420	410	8.2
Silver	EPA 200.8/7470	µg/L	1.0 U	2.5 U	1.0 U	10 U	1.0 U	--	1.0 U	1.0 U	--	10 U	5.2	5.4	1.9
Thallium	EPA 200.8/7470	µg/L	2.0 U	2.0 U	2.0 U	5 U	2.0 U	--	2.0 U	2.0 U	--	5 U	2.0 U	2.0 U	0.062
Zinc	EPA 200.8/7470	µg/L	56 U	56 U	56 U	39	56 U	--	55 U	150	--	460	420	570	81
Semi-Volatile Organic Compounds (SVOCs) - Polycyclic Aromatic Hydrocarbons (PAHs)															
Acenaphthene	EPA 8270/SIM	µg/L	0.10 U	0.10 U	0.10 U	10 U	0.48 U	--	0.47 U	0.97 U	--	10 U	2.0 U	0.48 U	5.3
Anthracene	EPA 8270/SIM	µg/L	0.10 U	0.10 U	0.10 U	10 U	0.48 U	--	0.47 U	0.97 U	--	10 U	2.0 U	0.48 U	2.1
Benzo(a)anthracene	EPA 8270/SIM	µg/L	0.010 U	0.012	0.010 U	1.3	0.077	--	0.047 U	0.049 U	--	1 U	0.47	0.14	0.00016
Benzo(b)fluoranthene	EPA 8270/SIM	µg/L	0.010 U	0.010 U	0.010 U	2.1	0.048 U	--	0.047 U	0.049 U	--	1 U	0.20 U	0.13	0.00016
Benzo(j,k)fluoranthene	EPA 8270/SIM	µg/L	0.010 U	0.010 U	0.010 U	1 U	0.048 U	--	0.047 U	0.049 U	--	1 U	0.20 U	0.13	0.0016
Benzo(a)pyrene	EPA 8270/SIM	µg/L	0.010 U	0.010 U	0.010 U	1 U	0.048 U	--	0.047 U	0.049 U	--	1 U	0.20 U	0.086	0.000016
Chrysene	EPA 8270/SIM	µg/L	0.010 U	0.010 U	0.010 U	1 U	0.048 U	--	0.047 U	0.049 U	--	1 U	0.52	0.31	0.016
Dibenzo(a,h)anthracene	EPA 8270/SIM	µg/L	0.010 U	0.010 U	0.010 U	1 U	0.048 U	--	0.047 U	0.049 U	--	1 U	0.20 U	0.048 U	0.000016
Fluoranthene	EPA 8270/SIM	µg/L	0.10 U	0.050 U	0.10 U	10 U	0.48 U	--	0.47 U	0.97 U	--	10 U	2.0 U	0.48 U	1.8
Fluorene	EPA 8270/SIM	µg/L	0.10 U	0.10 U	0.10 U	11	0.48 U	--	0.47 U	0.97 U	--	10 U	2.0 U	0.48 U	3.7
Indeno(1,2,3-c,d)pyrene	EPA 8270/SIM	µg/L	0.010 U	0.010 U	0.010 U	1 U	0.048 U	--	0.047 U	0.049 U	--	1 U	0.20 U	0.048	0.00016
1-Methylnaphthalene	EPA 8270/SIM	µg/L	0.10 U	0.10 U	0.10 U	10 U	0.48 U	--	0.47 U	0.97 U	--	10 U	2.0 U	0.48 U	1.5
Naphthalene	EPA 8270/SIM	µg/L	0.10 U	0.10 U	0.10 U	17	0.48 U	--	0.47 U	0.97 U	--	10 U	2.0 U	0.64	1.4
Pyrene	EPA 8270/SIM	µg/L	0.10 U	0.10 U	0.10 U	10 U	0.48 U	--	0.48	0.49 U	--	10 U	2.0 U	0.48 U	2
Total cPAH TEQ ⁵ (ND=0)	EPA 8270/SIM	µg/L	0 U	0.0012	0 U	0.3400	0.0077	--	0 U	0 U	--	0 U	0.0522	0.1339	0.000016
Total cPAH TEQ ⁵ (ND=0.5RL)	EPA 8270/SIM	µg/L	0.0076 U	0.0083	0.0076 U	0.9950	0.0420	--	0.0355 U	0.037 U	--	0.755 U	0.1900	0.1400	0.000016

Table 5-4
Remedial Investigation Chemical Analytical Results - Groundwater COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Monitoring Well ¹	Analytical Method	Units	MW-2D	MW-2D	MW-2D	MW-3	MW-3	MW-3 ²	MW-3	MW-3	MW-3	MW-3	MW-4	MW-4	MW-4	Groundwater Preliminary Cleanup Level ³ (PCUL)
Sample Date			09/22/14	01/19/15	04/21/15	11/6/2009	06/11/14	09/25/14	01/19/15	04/22/15	03/17/17	11/5/2009	06/11/14	09/25/14		
Monitoring Event			Sep-14	Jan-15	Apr-15	Nov-09	Jun-14	Sep-14	Jan-15	Apr-15	Mar-17	Nov-09	Jun-14	Sep-14		
Sampled By			GEI	GEI	GEI	Landau	GEI	GEI	GEI	GEI	Ecology	Landau	GEI	GEI		
Other SVOCs (mg/kg)																
Aniline	EPA 8270	µg/L	0.10 U	0.10 U	0.10 U	500 U	0.96 U	--	0.93 U	0.97 U	--	500 U	4.0 U	0.96 U	7.7	
Bis(2-chloroethyl)ether	EPA 8270	µg/L	0.10 U	0.10 U	0.10 U	100 U	0.96 U	--	0.93 U	0.97 U	--	100 U	4.0 U	0.96 U	0.06	
Bis(2-ethylhexyl)phthalate	EPA 8270	µg/L	0.26 U	0.72 U	0.57 U	100 U	0.96 U	--	2.5 U	0.97 U	--	100 U	4.0 U	0.96 U	0.046	
Butyl Benzyl Phthalate	EPA 8270	µg/L	0.10 U	0.10 U	0.10 U	100 U	0.96 U	--	0.93 U	0.97 U	--	100 U	4.0 U	0.96 U	0.013	
2,4-Dichlorophenol	EPA 8270	µg/L	0.10 U	0.10 U	0.10 U	100 U	0.96 U	--	0.93 U	0.97 U	--	100 U	4.0 U	0.96 U	10	
Diethyl phthalate	EPA 8270	µg/L	0.10 U	0.12	0.10 U	190	0.96 U	--	0.93 U	0.97 U	--	100 U	4.0 U	0.96 U	93	
2,4-Dimethylphenol	EPA 8270	µg/L	0.10 U	0.10 U	0.10 U	100 U	0.96 U	--	0.93 U	0.97 U	--	100 U	9.1	0.96 U	6.30	
2-Methylphenol (o-Cresol)	EPA 8270	µg/L	0.10 U	0.10 U	0.10 U	100 U	0.96 U	--	0.93 U	0.97 U	--	120	77	96	27	
n-Nitrosodimethylamine	EPA 8270	µg/L	0.10 U	0.10 U	0.10 U	100 U	0.96 U	--	0.93 U	0.97 U	--	100 U	4.0 U	0.96 U	0.34	
n-Nitrosodiphenylamine (as Diphenylamine)	EPA 8270	µg/L	0.10 U	0.10 U	0.10 U	1000 U	0.96 U	--	0.93 U	0.97 U	--	1000 U	4.0 U	0.96 U	0.69	
n-Nitrosodi-n-propylamine	EPA 8270	µg/L	0.10 U	0.10 UJ	0.1	100 U	0.96 U	--	0.93 U	0.97 U	--	100 U	4.0 U	0.96 U	0.058	
Pentachlorophenol	EPA 8270	µg/L	0.50 U	0.50 U	0.50 U	500 U	0.96 U	--	4.7 U	0.97 U	--	500 U	4.0 U	0.96 U	0.002	
Phenol	EPA 8270	µg/L	0.10 U	0.10 U	0.10 U	100 U	0.96 U	--	0.93 U	0.97 U	--	120	4.0 U	0.96 U	370	
2,4,6-Trichlorophenol	EPA 8270	µg/L	0.10 U	0.10 U	0.10 U	100 U	0.96 U	--	0.93 U	0.97 U	--	100 U	4.0 U	0.96 U	0.28	
Volatile Organic Compounds (VOCs)																
Benzene	EPA 8260	µg/L	0.20 U	0.20 U	0.20 U	0.2 U	2.0 UJ	--	2.0 U	2.0 U	--	1.7	4.0 UJ	4.0 U	1.6	
Chloroform	EPA 8260	µg/L	0.20 U	0.20 U	0.20 U	0.2 U	2.0 UJ	--	2.0 U	2.0 U	--	0.4 U	4.0 UJ	4.0 U	1.2	
Petroleum Hydrocarbons																
Gasoline-range hydrocarbons	NWTPH-G	µg/L	--	--	--	--	100 U	--	100 U	100 U	--	--	--	--	800	
Diesel-range hydrocarbons	NWTPH-Dx	µg/L	--	--	--	--	4,100	--	4,600	2,000	--	--	--	9,100 J	500	
Oil-range hydrocarbons	NWTPH-Dx	µg/L	--	--	--	--	3,700	--	5,500	2,700	--	--	--	26,000 J	500	
Total diesel- and oil-range hydrocarbons	NWTPH-Dx	µg/L	--	--	--	--	7,800	--	10,100	4,700	--	--	--	35,100 J	500	
Diesel-range hydrocarbons	NWTPH-Dx Si/Gel	µg/L	--	--	--	--	--	--	250 U	250 U	--	--	--	--	500	
Oil-range hydrocarbons	NWTPH-Dx Si/Gel	µg/L	--	--	--	--	--	--	400 U	400 U	--	--	--	--	500	
Total diesel- and oil-range hydrocarbons	NWTPH-Dx Si/Gel	µg/L	--	--	--	--	--	--	400 U	400 U	--	--	--	--	500	
Conventional Parameters																
Total organic carbon (TOC)	SM 5310B	mg/L	--	--	--	--	250	--	110	--		--	--	--	NE	
Field Measured Parameters																
pH	N/A	N/A	6.55	5.52	6.59	6.56	6.79	--	6.69	6.73	--	8.37	7.70	7.75	NE	

Notes:

¹ Monitoring well locations are shown on Figures 3-2 and 3-4.

² Insufficient water to collect groundwater sample for chemical analysis.

³ Groundwater screening levels referenced from Table 4-2.

⁴ Total dioxin/furan Toxic Equivalency Quotients (TEQs) were calculated using United States Environmental Protection Agency (USEPA) Toxicity Equivalency Factor (TEF) values for human health (EPA 2003).

⁵ Total carcinogenic PAH (cPAH) TEQs were calculated using TEF values referenced from MTCA Table 708.2 (WAC 173-340-900).

mg/L = milligram per liter

µg/L = microgram per liter

NE = not established

Landau = Landau Associates

GEI = GeoEngineers

Bold indicates analyte was detected.

Yellow shading identifies the detected results greater than the preliminary cleanup level.

Blue shading identifies the non-detected result greater than the preliminary cleanup level.

NE = not established

J = estimated result

U = analyte not detected above the reporting limit

-- = not analyzed

COPC = Contaminant of Potential Concern

Table 5-4
Remedial Investigation Chemical Analytical Results - Groundwater COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Monitoring Well ¹	Analytical Method	Units	MW-4	MW-4	MW-4D	MW-4D	MW-4D	MW-4D	MW-4D	MW-4D	MW-4D	MW-4D	MW-5	MW-5	Groundwater Preliminary Cleanup Level ³ (PCUL)
Sample Date			01/22/15	04/22/15	06/11/14	06/11/14	09/23/14	09/23/14	01/22/15	01/22/15	04/22/15	04/22/15	11/5/2009	11/5/2009	
Monitoring Event			Jan-15	Apr-15	Jun-14	Jun-14 (Dup)	Sep-14	Sep-14 (Dup)	Jan-15	Jan-15 (Dup)	Apr-15	Apr-15 (Dup)	Nov-09	Nov-09 (Dup)	
Sampled By			GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	Landau	Landau	
Polychlorinated Biphenyls (PCBs)															
Total PCB Aroclors	EPA 8082	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	0.000007
Total PCB Congeners	EPA 1668	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	0.000007
Dioxins and Furans															
Total Dioxin/Furan TEQ ⁺ (ND=ORL)	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	0.0000000051
Total Dioxin/Furan TEQ ⁺ (ND=0.5RL)	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	0.0000000051
Total Metals															
Arsenic	EPA 200.8/7470	µg/L	1,500	1,600	7.8 J	3.6 J	6.6	7	8	8.2	6.5	5.8	760	790	8.0
Barium	EPA 200.8/7470	µg/L	360	340	25	26	22	21	21	23	17	19	--	--	200
Cadmium	EPA 200.8/7470	µg/L	4.7	4.9	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	11 U	11 U	1.2
Chromium III / Total	EPA 200.8/7470	µg/L	1,100	1,200 J	15	15	15	15	16	17	13	14	410	430	27
Chromium VI	EPA 200.8/7470	µg/L	--	--	--	--	--	--	--	--	--	--	50 UJ	50 U	50
Copper	EPA 200.8/7470	µg/L	210	240	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 UJ	6.0 J	53	55	3.1
Lead	EPA 200.8/7470	µg/L	370	470	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	32	34	8.1
Mercury	EPA 200.8/7470	µg/L	0.50 U	0.96	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.27	0.31	0.025
Nickel	EPA 200.8/7470	µg/L	420	430	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	1,000	1,200	8.2
Silver	EPA 200.8/7470	µg/L	6	5.1	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	11 U	28 U	1.9
Thallium	EPA 200.8/7470	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	5.6 U	14 U	0.062
Zinc	EPA 200.8/7470	µg/L	600	590	56 U	56 U	56 U	56 U	55 U	55 U	58 U	58 U	63	75	81
Dissolved Metals															
Arsenic	EPA 200.8/7470	µg/L	1,400	1,400	8.4	7.4	6.5	7.1	7	6.8	6.7	6.1	820	640	8.0
Barium	EPA 200.8/7470	µg/L	340	300	24	24	20	21	20	20	19	18	--	--	200
Cadmium	EPA 200.8/7470	µg/L	4.8	5.3	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	4 U	4 U	1.2
Chromium III / Total	EPA 200.8/7470	µg/L	1,000	1,100	14	14	14	14	15	15	13	13	410	460	27
Copper	EPA 200.8/7470	µg/L	200	220	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	49	77	3.1
Lead	EPA 200.8/7470	µg/L	370	410	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	32	27	8.1
Mercury	EPA 200.8/7470	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.26	0.19	0.025
Nickel	EPA 200.8/7470	µg/L	390	430	2.7	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.2	2.0 U	1400	970	8.2
Silver	EPA 200.8/7470	µg/L	5.4	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	10 U	10 U	1.9
Thallium	EPA 200.8/7470	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	5 U	5 U	0.062
Zinc	EPA 200.8/7470	µg/L	650	540	56 U	56 U	56 U	56 U	55 U	55 U	56 U	56 U	61	81	81
Semi-Volatile Organic Compounds (SVOCs) - Polycyclic Aromatic Hydrocarbons (PAHs)															
Acenaphthene	EPA 8270/SIM	µg/L	0.46 U	0.97 U	0.47 U	0.47 U	0.67	0.66	1	0.62	0.59	0.53	10 U	10 U	5.3
Anthracene	EPA 8270/SIM	µg/L	0.46 U	0.97 U	0.47 U	0.47 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	10 U	10 U	2.1
Benzo(a)anthracene	EPA 8270/SIM	µg/L	0.14	0.17	0.047 U	0.047 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	2	1.5	0.00016
Benzo(b)fluoranthene	EPA 8270/SIM	µg/L	0.046 U	0.5	0.047 U	0.047 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	1.1	1 U	0.00016
Benzo(j,k)fluoranthene	EPA 8270/SIM	µg/L	0.046 U	0.44	0.047 U	0.047 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	1 U	1 U	0.0016
Benzo(a)pyrene	EPA 8270/SIM	µg/L	0.046 U	0.12	0.047 U	0.047 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	1 U	1 U	0.000016
Chrysene	EPA 8270/SIM	µg/L	0.1	0.39	0.047 U	0.047 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	1.8	1.3	0.016
Dibenzo(a,h)anthracene	EPA 8270/SIM	µg/L	0.046 U	0.056	0.047 U	0.047 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	1 U	1 U	0.000016
Fluoranthene	EPA 8270/SIM	µg/L	0.51	0.97 U	0.47 U	0.47 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	10 U	10 U	1.8
Fluorene	EPA 8270/SIM	µg/L	0.46 U	0.97 U	0.47 U	0.47 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	10 U	10 U	3.7
Indeno(1,2,3-c,d)pyrene	EPA 8270/SIM	µg/L	0.046 U	0.076	0.047 U	0.047 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	1 U	1 U	0.00016
1-Methylnaphthalene	EPA 8270/SIM	µg/L	0.46 U	0.48 U	0.47 U	0.47 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	10 U	10 U	1.5
Naphthalene	EPA 8270/SIM	µg/L	0.59	1.0	0.47 U	0.47 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	10 U	10 U	1.4
Pyrene	EPA 8270/SIM	µg/L	0.46 U	0.97 U	0.47 U	0.47 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	10 U	10 U	2
Total cPAH TEQ ⁵ (ND=0)	EPA 8270/SIM	µg/L	0.0150	0.2481	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0.3280	0.1630	0.000016
Total cPAH TEQ ⁵ (ND=0.5RL)	EPA 8270/SIM	µg/L	0.0472	0.2481	0.035 U	0.035 U	0.0076 U	0.0076 U	0.0076 U	0.0076 U	0.0076 U	0.0076 U	0.9780	0.8630	0.000016

Table 5-4
Remedial Investigation Chemical Analytical Results - Groundwater COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Monitoring Well ¹	Analytical Method	Units	MW-4	MW-4	MW-4D	MW-4D	MW-4D	MW-4D	MW-4D	MW-4D	MW-4D	MW-4D	MW-5	MW-5	Groundwater Preliminary Cleanup Level ³ (PCUL)	
Sample Date			01/22/15	04/22/15	06/11/14	06/11/14	09/23/14	09/23/14	01/22/15	01/22/15	04/22/15	04/22/15	11/5/2009	11/5/2009		
Monitoring Event			Jan-15	Apr-15	Jun-14	Jun-14 (Dup)	Sep-14	Sep-14 (Dup)	Jan-15	Jan-15 (Dup)	Apr-15	Apr-15 (Dup)	Nov-09	Nov-09 (Dup)		
Sampled By			GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	Landau	Landau		
Other SVOCs (mg/kg)																
Aniline	EPA 8270	µg/L	0.92 U	0.97 U	0.94 UJ	0.94 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	500 U	500 U	7.7	
Bis(2-chloroethyl)ether	EPA 8270	µg/L	0.92 U	0.97 U	0.94 UJ	0.94 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	100 U	100 U	0.06	
Bis(2-ethylhexyl)phthalate	EPA 8270	µg/L	0.92 U	0.97 U	0.94 UJ	0.94 U	0.22 U	0.22 U	0.55 U	0.41 U	0.62 U	0.41 U	100 U	100 U	0.046	
Butyl Benzyl Phthalate	EPA 8270	µg/L	0.92 U	0.97 U	0.94 UJ	0.94 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	100 U	100 U	0.013	
2,4-Dichlorophenol	EPA 8270	µg/L	0.92 U	0.97 U	0.94 U	0.94 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	100 U	100 U	10	
Diethyl phthalate	EPA 8270	µg/L	0.92 U	0.97 U	0.94 UJ	0.94 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.43	0.43	100 U	100 U	93
2,4-Dimethylphenol	EPA 8270	µg/L	6.5	12	0.94 U	0.94 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	100 U	100 U	6.30	
2-Methylphenol (o-Cresol)	EPA 8270	µg/L	77	99	0.94 U	0.94 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	100 U	100 U	27	
n-Nitrosodimethylamine	EPA 8270	µg/L	0.92 U	0.97 U	0.94 UJ	0.94 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	100 U	100 U	0.34	
n-Nitrosodiphenylamine (as Diphenylamine)	EPA 8270	µg/L	0.92 U	0.97 U	0.94 UJ	0.94 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	1000 U	1000 U	0.69	
n-Nitrosodi-n-propylamine	EPA 8270	µg/L	0.92 U	0.97 U	0.94 UJ	0.94 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	100 U	100 U	0.058	
Pentachlorophenol	EPA 8270	µg/L	4.6 U	0.97 U	0.94 U	0.94 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	500 U	500 U	0.002	
Phenol	EPA 8270	µg/L	0.92 U	0.97 U	0.94 U	0.94 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	100 U	100 U	370	
2,4,6-Trichlorophenol	EPA 8270	µg/L	0.92 U	1.2	0.94 U	0.94 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	100 U	100 U	0.28	
Volatile Organic Compounds (VOCs)																
Benzene	EPA 8260	µg/L	4.0 U	4.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1 U	1 U	1.6	
Chloroform	EPA 8260	µg/L	4.0 U	4.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1 U	1 U	1.2	
Petroleum Hydrocarbons																
Gasoline-range hydrocarbons	NWTPH-G	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	800	
Diesel-range hydrocarbons	NWTPH-Dx	µg/L	16,000	18,000	--	--	260	290	260	290	250 U	280	--	--	500	
Oil-range hydrocarbons	NWTPH-Dx	µg/L	17,000	39,000	--	--	330 U	330 U	400 U	400 U	400 U	400 U	--	--	500	
Total diesel- and oil-range hydrocarbons	NWTPH-Dx	µg/L	33,000	57,000	--	--	260	290	260	290	--	280	--	--	500	
Diesel-range hydrocarbons	NWTPH-Dx Si/Gel	µg/L	--	250 U	--	--	--	--	--	--	--	--	--	--	500	
Oil-range hydrocarbons	NWTPH-Dx Si/Gel	µg/L	--	400 U	--	--	--	--	--	--	--	--	--	--	500	
Total diesel- and oil-range hydrocarbons	NWTPH-Dx Si/Gel	µg/L	--	400 U	--	--	--	--	--	--	--	--	--	--	500	
Conventional Parameters																
Total organic carbon (TOC)	SM 5310B	mg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE	
Field Measured Parameters																
pH	N/A	N/A	7.80	7.84	7.01	7.01	6.92	6.92	6.79	6.79	6.83	6.83	10.08	10.08	NE	

Notes:

¹ Monitoring well locations are shown on Figures 3-2 and 3-4.

² Insufficient water to collect groundwater sample for chemical analysis.

³ Groundwater screening levels referenced from Table 4-2.

⁴ Total dioxin/furan Toxic Equivalency Quotients (TEQs) were calculated using United States Environmental Protection Agency (USEPA) Toxicity Equivalency Factor (TEF) values for human health (EPA 2003).

⁵ Total carcinogenic PAH (cPAH) TEQs were calculated using TEF values referenced from MTCA Table 708.2 (WAC 173-340-900).

mg/L = milligram per liter

µg/L = microgram per liter

NE = not established

Landau = Landau Associates

GEI = GeoEngineers

Bold indicates analyte was detected.

Yellow shading identifies the detected results greater than the preliminary cleanup level.

Blue shading identifies the non-detected result greater than the preliminary cleanup level.

NE = not established

J = estimated result

U = analyte not detected above the reporting limit

-- = not analyzed

COPC = Contaminant of Potential Concern

Table 5-4
Remedial Investigation Chemical Analytical Results - Groundwater COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Monitoring Well ¹	Analytical Method	Units	MW-5	MW-5 ²	MW-5	MW-5 ²	MW-6	MW-6 ²	MW-6	MW-6	MW-6	MW-6	MW-7	MW-7	MW-7	Groundwater Preliminary Cleanup Level ³ (PCUL)
Sample Date			06/10/14	09/25/14	01/20/15	04/22/15	11/5/2009	06/10/14	09/25/14	01/19/15	04/23/15	11/4/2009	06/12/14	09/24/14		
Monitoring Event			Jun-14	Sep-14	Jan-15	Apr-15	Nov-09	Jun-14	Sep-14	Jan-15	Apr-15	Nov-09	Jun-14	Sep-14		
Sampled By			GEI	GEI	GEI	GEI	Landau	GEI	GEI	GEI	GEI	Landau	GEI	GEI		
Polychlorinated Biphenyls (PCBs)																
Total PCB Aroclors	EPA 8082	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	0.000007
Total PCB Congeners	EPA 1668	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	0.000007
Dioxins and Furans																
Total Dioxin/Furan TEQ ⁺ (ND=ORL)	EPA 1613	µg/L	--	--	--	--		--	--	--	--	--	--	--	--	0.0000000051
Total Dioxin/Furan TEQ ⁺ (ND=0.5RL)	EPA 1613	µg/L	--	--	--	--		--	--	--	--	--	--	--	--	0.0000000051
Total Metals																
Arsenic	EPA 200.8/7470	µg/L	930	--	940	--	21	--	9.3	8.3	6.6	620	940	1,100		8.0
Barium	EPA 200.8/7470	µg/L	320	--	380	--	--	--	50	52	48	--	53	45		200
Cadmium	EPA 200.8/7470	µg/L	1	--	0.8	--	4.4 U	--	0.20 U	0.20 U	0.20 U	4.4 U	1	1.7		1.2
Chromium III / Total	EPA 200.8/7470	µg/L	740	--	840	--	44	--	17	13	13	100	170	180		27
Chromium VI	EPA 200.8/7470	µg/L	--	--	--	--	10 U	--	--	--	--	50 U	--	--		50
Copper	EPA 200.8/7470	µg/L	61	--	36	--	6.2	--	12	7.7	7.7	40	27	44		3.1
Lead	EPA 200.8/7470	µg/L	52	--	25	--	22	--	4.1	3.4	3	220	94	180		8.1
Mercury	EPA 200.8/7470	µg/L	0.50 U	--	0.50 U	--	0.1 U	--	0.50 U	0.50 U	0.50 U	0.1 U	0.50 U	0.50 U		0.025
Nickel	EPA 200.8/7470	µg/L	850	--	780	--	41	--	11	10	9.1	64	55	84		8.2
Silver	EPA 200.8/7470	µg/L	5.3	--	6.5	--	11 U	--	1.0 U	1.0 U	1.0 U	11 U	1.5	1.0 U		1.9
Thallium	EPA 200.8/7470	µg/L	2.0 U	--	2.0 U	--	5.6 U	--	2.0 U	2.0 U	2.0 U	5.6 U	2.0 U	2.0 U		0.062
Zinc	EPA 200.8/7470	µg/L	56 U	--	55 U	--	140	--	56 U	55 U	56 U	230	110	180		81
Dissolved Metals																
Arsenic	EPA 200.8/7470	µg/L	960	--	720	--	18	--	8.3 J	7.7	6.9	590	280	1100		8.0
Barium	EPA 200.8/7470	µg/L	340	--	370	--	--	--	23	23	22	--	48	45		200
Cadmium	EPA 200.8/7470	µg/L	0.80 U	--	0.63	--	4 U	--	0.20 U	0.20 U	0.20 U	4 U	0.20 U	2		1.2
Chromium III / Total	EPA 200.8/7470	µg/L	770	--	850	--	13	--	5.4	4.8	3.7	69	79	180		27
Copper	EPA 200.8/7470	µg/L	31	--	24	--	8.9	--	2.0 U	3	2.0 U	4.8	4.2	39		3.1
Lead	EPA 200.8/7470	µg/L	22	--	3.5	--	4.1	--	1.0 U	1.4	1.0 U	40	7.6	170		8.1
Mercury	EPA 200.8/7470	µg/L	0.50 U	--	0.50 U	--	0.1 U	--	0.50 U	0.50 U	0.50 U	0.1 U	0.50 U	0.50 U		0.025
Nickel	EPA 200.8/7470	µg/L	800	--	630	--	16	--	2.0 U	2.0 U	2.0 U	52	47	83		8.2
Silver	EPA 200.8/7470	µg/L	5.1	--	7.1	--	10 U	--	1.0 U	1.0 U	1.0 U	10 U	1.0 U	1.0 U		1.9
Thallium	EPA 200.8/7470	µg/L	2.0 U	--	2.0 U	--	5 U	--	2.0 U	2.0 U	2.0 U	5 U	2.0 U	2.0 U		0.062
Zinc	EPA 200.8/7470	µg/L	56 U	--	56 U	--	26	--	56 U	55 U	56 U	66	67	160		81
Semi-Volatile Organic Compounds (SVOCs) - Polycyclic Aromatic Hydrocarbons (PAHs)																
Acenaphthene	EPA 8270/SIM	µg/L	1.0 U	--	1.5	--	13	--	1.3 J	1.6	4.5	0.7	0.49	1.1		5.3
Anthracene	EPA 8270/SIM	µg/L	1.0 U	--	1.5 U	--	0.1 U	--	0.10 UJ	0.10 U	0.10 U	0.12	0.47 U	0.48 U		2.1
Benzo(a)anthracene	EPA 8270/SIM	µg/L	0.26	--	0.099	--	0.014	--	0.010 UJ	0.010 U	0.10 U	0.061	0.1	0.17		0.00016
Benzo(b)fluoranthene	EPA 8270/SIM	µg/L	0.16	--	0.15	--	0.014	--	0.010 UJ	0.010 U	0.10 U	0.071	0.06	0.12		0.00016
Benzo(j,k)fluoranthene	EPA 8270/SIM	µg/L	0.11	--	0.075 U	--	0.01 U	--	0.010 UJ	0.010 U	0.10 U	0.017	0.047 U	0.11		0.0016
Benzo(a)pyrene	EPA 8270/SIM	µg/L	0.13	--	0.075 U	--	0.01 U	--	0.010 UJ	0.010 U	0.10 U	0.037	0.047 U	0.1		0.000016
Chrysene	EPA 8270/SIM	µg/L	0.25	--	0.075 U	--	0.014	--	0.010 UJ	0.010 U	0.10 U	0.061	0.091	0.15		0.016
Dibenzo(a,h)anthracene	EPA 8270/SIM	µg/L	0.10 U	--	0.075 U	--	0.01 U	--	0.010 UJ	0.010 U	0.10 U	0.012	0.047 U	0.048 U		0.000016
Fluoranthene	EPA 8270/SIM	µg/L	1.0 U	--	1.5 U	--	0.1 U	--	0.10 UJ	0.050 U	0.10 U	0.23	0.47 U	0.48 U		1.8
Fluorene	EPA 8270/SIM	µg/L	1.0 U	--	1.5 U	--	2.5	--	0.10 UJ	0.16	0.35	0.29	0.47 U	0.48 U		3.7
Indeno(1,2,3-c,d)pyrene	EPA 8270/SIM	µg/L	0.10 U	--	0.075 U	--	0.01 U	--	0.010 UJ	0.010 U	0.10 U	0.024	0.047 U	0.062		0.00016
1-Methylnaphthalene	EPA 8270/SIM	µg/L	1.0 U	--	1.5 U	--	7.4	--	0.10 UJ	0.58	2	0.9	0.47 U	0.99		1.5
Naphthalene	EPA 8270/SIM	µg/L	1.0 U		1.5 U		3.4		0.10 UJ	11	3.8	12	170 J	10		1.4
Pyrene	EPA 8270/SIM	µg/L	1.0 U		1.5 U		0.1 U		0.10 UJ	0.10 U	0.10 U	0.28	0.47 U	0.62		2
Total cPAH TEQ ⁵ (ND=0)	EPA 8270/SIM	µg/L	0.1855	--	0.0249	--	0.0029	--	0 U	0 U	0 U	0.0561	0.0169	0.1477		0.000016
Total cPAH TEQ ⁵ (ND=0.5RL)	EPA 8270/SIM	µg/L	0.2000	--	0.0740	--	0.0094	--	0.0076 U	0.0076 U	0.0076 U	0.0561	0.0470	0.1500		0.000016

Table 5-4
Remedial Investigation Chemical Analytical Results - Groundwater COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Monitoring Well ¹	Analytical Method	Units	MW-5	MW-5 ²	MW-5	MW-5 ²	MW-6	MW-6 ²	MW-6	MW-6	MW-6	MW-6	MW-7	MW-7	MW-7	Groundwater Preliminary Cleanup Level ³ (PCUL)
Sample Date			06/10/14	09/25/14	01/20/15	04/22/15	11/5/2009	06/10/14	09/25/14	01/19/15	04/23/15	11/4/2009	06/12/14	09/24/14		
Monitoring Event			Jun-14	Sep-14	Jan-15	Apr-15	Nov-09	Jun-14	Sep-14	Jan-15	Apr-15	Nov-09	Jun-14	Sep-14		
Sampled By			GEI	GEI	GEI	GEI	Landau	GEI	GEI	GEI	GEI	Landau	GEI	GEI		
Other SVOCs (mg/kg)																
Aniline	EPA 8270	µg/L	2.0 U	--	1.5 U	--	5 U	--	0.10 UJ	0.10 U	0.10 U	5 U	0.95 U	0.97	7.7	
Bis(2-chloroethyl)ether	EPA 8270	µg/L	2.0 U	--	1.5 U	--	1 U	--	0.10 UJ	0.10 U	0.10 U	1 U	0.95 U	0.97 U	0.06	
Bis(2-ethylhexyl)phthalate	EPA 8270	µg/L	2.0 U	--	17 U	--	1.3	--	0.23 UJ	0.53 U	0.21 U	1.6	1.2 U	0.97 U	0.046	
Butyl Benzyl Phthalate	EPA 8270	µg/L	2.0 U	--	1.5 U	--	1 U	--	0.10 UJ	0.10 U	0.10 U	1 U	0.95 U	0.97 U	0.013	
2,4-Dichlorophenol	EPA 8270	µg/L	2.0 U	--	1.5 U	--	1 U	--	0.10 U	0.10 U	0.10 U	1 U	0.95 U	0.97 U	10	
Diethyl phthalate	EPA 8270	µg/L	2.0 U	--	1.5 U	--	1 U	--	5.1 J	0.8	2.7	1 U	0.95 U	0.97 U	93	
2,4-Dimethylphenol	EPA 8270	µg/L	2.0 U	--	1.5 U	--	11	--	0.10 U	0.10 U	0.10 U	2.9	1.8	2.1	6.30	
2-Methylphenol (o-Cresol)	EPA 8270	µg/L	28	--	14	--	1	--	0.10 U	0.10 U	0.10 U	1 U	0.95 U	0.97 U	27	
n-Nitrosodimethylamine	EPA 8270	µg/L	2.0 U	--	1.5 U	--	1 U	--	0.10 UJ	0.10 U	0.10 U	1 U	0.95 U	0.97 U	0.34	
n-Nitrosodiphenylamine (as Diphenylamine)	EPA 8270	µg/L	2.0 U	--	1.5 U	--	10 U	--	0.10 UJ	0.10 U	0.10 U	10 U	0.95 U	0.97 U	0.69	
n-Nitrosodi-n-propylamine	EPA 8270	µg/L	2.0 U	--	1.5 U	--	1 U	--	0.10 UJ	0.10 U	0.10 U	1 U	0.95 U	0.97 U	0.058	
Pentachlorophenol	EPA 8270	µg/L	2.0 U	--	7.5 U	--	5 U	--	0.50 U	0.50 U	0.50 U	5 U	0.95 UJ	0.97 U	0.002	
Phenol	EPA 8270	µg/L	2.0 U	--	1.5 U	--	1 U	--	0.10 U	0.10 U	0.10 U	51	7.4	16	370	
2,4,6-Trichlorophenol	EPA 8270	µg/L	2.0 U	--	1.5 U	--	1 U	--	0.10 U	0.10 U	0.10 U	1 U	0.95 U	0.97 U	0.28	
Volatile Organic Compounds (VOCs)																
Benzene	EPA 8260	µg/L	2.0 UJ	--	2.0 U	--	0.29	--	0.20 U	0.20 U	0.20 U	0.24	0.55	2.0 U	1.6	
Chloroform	EPA 8260	µg/L	2.0 UJ	--	2.0 U	--	0.2 U	--	0.20 U	0.20 U	0.20 U	0.2 U	0.40 U	2.0 U	1.2	
Petroleum Hydrocarbons																
Gasoline-range hydrocarbons	NWTPH-G	µg/L	130	--	100 U	--	--	--	100 U	100 U	100 U	--	100 U	100 U	800	
Diesel-range hydrocarbons	NWTPH-Dx	µg/L	7,200	--	12,000	--	--	--	310	340	250	--	580	400 J	500	
Oil-range hydrocarbons	NWTPH-Dx	µg/L	15,000	--	19,000	--	--	--	340 U	400 U	400 U	--	750	400 UJ	500	
Total diesel- and oil-range hydrocarbons	NWTPH-Dx	µg/L	22,200	--	31,000	--	--	--	310	340	250	--	1,330	400 J	500	
Diesel-range hydrocarbons	NWTPH-Dx Si/Gel	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	500	
Oil-range hydrocarbons	NWTPH-Dx Si/Gel	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	500	
Total diesel- and oil-range hydrocarbons	NWTPH-Dx Si/Gel	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	500	
Conventional Parameters																
Total organic carbon (TOC)	SM 5310B	mg/L	--	--	--	--	--	--	--	--	--	--	--	160	NE	
Field Measured Parameters																
pH	N/A	N/A	10.05	--	9.63	--	22.36	--	6.42	6.80	6.96	10.99	11.07	11.03	NE	

Notes:

¹ Monitoring well locations are shown on Figures 3-2 and 3-4.

² Insufficient water to collect groundwater sample for chemical analysis.

³ Groundwater screening levels referenced from Table 4-2.

⁴ Total dioxin/furan Toxic Equivalency Quotients (TEQs) were calculated using United States Environmental Protection Agency (USEPA) Toxicity Equivalency Factor (TEF) values for human health (EPA 2003).

⁵ Total carcinogenic PAH (cPAH) TEQs were calculated using TEF values referenced from MTCA Table 708.2 (WAC 173-340-900).

mg/L = milligram per liter

µg/L = microgram per liter

NE = not established

Landau = Landau Associates

GEI = GeoEngineers

Bold indicates analyte was detected.

Yellow shading identifies the detected results greater than the preliminary cleanup level.

Blue shading identifies the non-detected result greater than the preliminary cleanup level.

NE = not established

J = estimated result

U = analyte not detected above the reporting limit

-- = not analyzed

COPC = Contaminant of Potential Concern

Table 5-4
Remedial Investigation Chemical Analytical Results - Groundwater COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Monitoring Well ¹	Analytical Method	Units	MW-7	MW-7	MW-8	MW-8	MW-8	MW-8	MW-8	MW-9	MW-9	MW-9	MW-9	MW-9	Groundwater Preliminary Cleanup Level ³ (PCUL)
Sample Date			01/21/15	04/23/15	11/4/2009	06/12/14	09/26/14	01/21/15	04/23/15	11/4/2009	06/13/14	09/25/14	01/20/15	04/20/15	
Monitoring Event			Jan-15	Apr-15	Nov-09	Jun-14	Sep-14	Jan-15	Apr-15	Nov-09	Jun-14	Sep-14	Jan-15	Apr-15	
Sampled By			GEI	GEI	Landau	GEI	GEI	GEI	GEI	Landau	GEI	GEI	GEI	GEI	
Polychlorinated Biphenyls (PCBs)															
Total PCB Aroclors	EPA 8082	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	0.000007
Total PCB Congeners	EPA 1668	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	0.000007
Dioxins and Furans															
Total Dioxin/Furan TEQ ⁺ (ND=ORL)	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	0.0000000051
Total Dioxin/Furan TEQ ⁺ (ND=0.5RL)	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	0.0000000051
Total Metals															
Arsenic	EPA 200.8/7470	µg/L	880	750	11	7.9	5.6	6.3	5.1	160	190	170	350	510	8.0
Barium	EPA 200.8/7470	µg/L	70	82	--	17	6.6	7	6.9	--	18	37	18	29	200
Cadmium	EPA 200.8/7470	µg/L	1.3	0.88	4.4 U	0.20 U	0.20 U	0.20 U	0.20 U	4.4 U	0.20 U	0.20 U	0.20 U	0.20 U	1.2
Chromium III / Total	EPA 200.8/7470	µg/L	180	140	2.8	4	2.3	2.0 U	2.0 U	2 U	2.0 U	2.0 U	2.0 U	2.0 U	27
Chromium VI	EPA 200.8/7470	µg/L	--	--	10 U	--	--	--	--	10 UJ	--	--	--	--	50
Copper	EPA 200.8/7470	µg/L	31	20	2.1	6.2	2.0 U	2.0 U	2.0 U	1.3	8.3	2.0 U	2.0 U	2.0 U	3.1
Lead	EPA 200.8/7470	µg/L	110	76	2.8	5.6	1.3	1.0 U	1.0 U	1 U	1.0 U	1.0 U	1.0 U	1.0 U	8.1
Mercury	EPA 200.8/7470	µg/L	0.50 U	0.50 U	0.1 U	0.50 U	0.50 U	0.50 U	0.50 U	0.1 U	0.50 U	0.50 U	0.50 U	0.50 U	0.025
Nickel	EPA 200.8/7470	µg/L	61	46	22 U	3.1	2.0 U	2.0 U	2.0 U	22 U	10	11	3.7	4.2	8.2
Silver	EPA 200.8/7470	µg/L	1.0 U	1.0 U	11 U	1.0 U	1.0 U	1.0 U	1.0 U	11 U	1.0 U	1.0 U	1.0 U	1.0 U	1.9
Thallium	EPA 200.8/7470	µg/L	2.0 U	2.0 U	5.6 U	2.0 U	2.0 U	2.0 U	2.0 U	5.6 U	2.0 U	2.0 U	2.0 U	2.0 U	0.062
Zinc	EPA 200.8/7470	µg/L	140	100	32	56 U	56 U	56 U	56 U	13	56 U	56 U	56 U	56 U	81
Dissolved Metals															
Arsenic	EPA 200.8/7470	µg/L	890	880	12	5.3	4.7	7.3	4.6	180	180	180 J	290	480	8.0
Barium	EPA 200.8/7470	µg/L	59	81	--	5.1	5.0 U	7.2	6.7	--	18	37	18	26	200
Cadmium	EPA 200.8/7470	µg/L	0.99	0.85	4 U	0.20 U	0.20 U	0.20 U	0.20 U	4 U	0.20 U	0.20 U	0.20 U	0.20 U	1.2
Chromium III / Total	EPA 200.8/7470	µg/L	180	190	3.2	2.0 U	2.0 U	2.0 U	2.0 U	2.5	2.0 U	2.0 U	2.0 U	2.0 U	27
Copper	EPA 200.8/7470	µg/L	26	27	1 U	2.0 U	2.0 U	2.0 U	2.0 U	1 U	2.0 U	2.0 U	2.0 U	2.0 U	3.1
Lead	EPA 200.8/7470	µg/L	95	89	1 U	1.0 U	1.0 U	1.0 U	1.0 U	1 U	1.0 U	1.0 U	1.0 U	1.0 U	8.1
Mercury	EPA 200.8/7470	µg/L	0.50 U	0.50 U	0.1 U	0.50 U	0.50 U	0.50 U	0.50 U	0.1 U	0.50 U	0.50 U	0.50 U	0.50 U	0.025
Nickel	EPA 200.8/7470	µg/L	59	50	20 U	2.0 U	2.0 U	2.0 U	2.0 U	20 U	10	12	3.9	4.1	8.2
Silver	EPA 200.8/7470	µg/L	1.0 U	1.0 U	10 U	1.0 U	1.0 U	1.0 U	1.0 U	10 U	1.0 U	1.0 U	1.0 U	1.0 U	1.9
Thallium	EPA 200.8/7470	µg/L	2.0 U	2.0 U	5 U	2.0 U	2.0 U	2.0 U	2.0 U	5 U	2.0 U	2.0 U	2.0 U	2.0 U	0.062
Zinc	EPA 200.8/7470	µg/L	120	110	10	56 U	56 U	56 U	56 U	5 U	56 U	56 U	56 U	56 U	81
Semi-Volatile Organic Compounds (SVOCs) - Polycyclic Aromatic Hydrocarbons (PAHs)															
Acenaphthene	EPA 8270/SIM	µg/L	0.95 U	0.97 U	0.1 U	0.54 U	0.10 UJ	0.10 U	0.10 U	0.1 U	0.51 U	0.10 U	0.10 U	0.10 U	5.3
Anthracene	EPA 8270/SIM	µg/L	0.95 U	0.97 U	0.1 U	0.54 U	0.10 UJ	0.10 U	0.10 U	0.1 U	0.51 U	0.10 U	0.10 U	0.10 U	2.1
Benzo(a)anthracene	EPA 8270/SIM	µg/L	0.18	0.15	0.01 U	0.054 U	0.010 J	0.010 U	0.10 U	0.01 U	0.051 U	0.010 U	0.010 U	0.010 U	0.00016
Benzo(b)fluoranthene	EPA 8270/SIM	µg/L	0.11	0.97 U	0.01 U	0.054 U	0.010 UJ	0.010 U	0.10 U	0.01 U	0.051 U	0.010 U	0.010 U	0.010 U	0.00016
Benzo(j,k)fluoranthene	EPA 8270/SIM	µg/L	0.06	0.97 U	0.01 U	0.054 U	0.010 UJ	0.010 U	0.10 U	0.01 U	0.051 U	0.010 U	0.010 U	0.010 U	0.0016
Benzo(a)pyrene	EPA 8270/SIM	µg/L	0.079	0.97 U	0.01 U	0.054 U	0.010 UJ	0.010 U	0.10 U	0.01 U	0.051 U	0.010 U	0.010 U	0.010 U	0.000016
Chrysene	EPA 8270/SIM	µg/L	0.14	0.14	0.01 U	0.054 U	0.010 UJ	0.010 U	0.10 U	0.01 U	0.051 U	0.010 U	0.010 U	0.010 U	0.016
Dibenzo(a,h)anthracene	EPA 8270/SIM	µg/L	0.047 U	0.97 U	0.01 U	0.054 U	0.010 UJ	0.010 U	0.10 U	0.01 U	0.051 U	0.010 U	0.010 U	0.010 U	0.000016
Fluoranthene	EPA 8270/SIM	µg/L	0.95 U	0.97 U	0.1 U	0.54 U	0.10 UJ	0.10 U	0.10 U	0.1 U	0.51 U	0.10 U	0.10 U	0.10 U	1.8
Fluorene	EPA 8270/SIM	µg/L	0.95 U	0.97 U	0.1 U	0.54 U	0.10 UJ	0.10 U	0.10 U	0.1 U	0.51 U	0.10 U	0.10 U	0.10 U	3.7
Indeno(1,2,3-c,d)pyrene	EPA 8270/SIM	µg/L	0.047 U	0.97 U	0.01 U	0.054 U	0.010 UJ	0.010 U	0.10 U	0.01 U	0.051 U	0.010 U	0.010 U	0.010 U	0.00016
1-Methylnaphthalene	EPA 8270/SIM	µg/L	0.95 U	0.97 U	0.1 U	0.54 U	0.10 UJ	0.10 U	0.10 U	0.1 U	0.51 U	0.10 U	0.10 U	0.10 U	1.5
Naphthalene	EPA 8270/SIM	µg/L	5.2	3.4	0.1 U	0.54 U	0.10 UJ	0.10 U	0.063	0.1 U	0.51 U	0.10 U	0.10 U	0.10 U	1.4
Pyrene	EPA 8270/SIM	µg/L	0.95 U	0.97 U	0.1 U	0.54 U	0.10 UJ	0.10 U	0.10 U	0.1 U	0.51 U	0.10 U	0.050 U	0.10 U	2
Total cPAH TEQ ⁵ (ND=0)	EPA 8270/SIM	µg/L	0.1154	0.0164	0 U	0 U	0.001	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0.000016
Total cPAH TEQ ⁵ (ND=0.5RL)	EPA 8270/SIM	µg/L	0.1201	0.6954	0.0076 U	0.041 U	0.0081	0.0076 U	0.0076 U	0.0076 U	0.0390 U	0.0076 U	0.0076 U	0.0076 U	0.000016

Table 5-4
Remedial Investigation Chemical Analytical Results - Groundwater COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Monitoring Well ¹	Analytical Method	Units	MW-7	MW-7	MW-8	MW-8	MW-8	MW-8	MW-8	MW-9	MW-9	MW-9	MW-9	MW-9	Groundwater Preliminary Cleanup Level ³ (PCUL)
Sample Date			01/21/15	04/23/15	11/4/2009	06/12/14	09/26/14	01/21/15	04/23/15	11/4/2009	06/13/14	09/25/14	01/20/15	04/20/15	
Monitoring Event			Jan-15	Apr-15	Nov-09	Jun-14	Sep-14	Jan-15	Apr-15	Nov-09	Jun-14	Sep-14	Jan-15	Apr-15	
Sampled By			GEI	GEI	Landau	GEI	GEI	GEI	GEI	Landau	GEI	GEI	GEI	GEI	
Other SVOCs (mg/kg)															
Aniline	EPA 8270	µg/L	0.94 U	0.97 U	5 U	1.1 U	0.10 UJ	0.10 U	0.10 U	5 U	1.0 U	0.10 U	0.10 U	0.10 U	7.7
Bis(2-chloroethyl)ether	EPA 8270	µg/L	0.94 U	0.97 U	1 U	1.1 U	0.10 UJ	0.10 U	0.10 U	1 U	1.0 U	0.10 U	0.10 U	0.10 U	0.06
Bis(2-ethylhexyl)phthalate	EPA 8270	µg/L	5.3 U	1.6 U	1 U	1.1 U	0.10 UJ	0.49 U	0.21 U	1 U	1.0 U	0.12 U	0.28 U	0.14	0.046
Butyl Benzyl Phthalate	EPA 8270	µg/L	0.94 U	0.97 U	1 U	1.1 U	0.10 UJ	0.10 U	0.10 U	1 U	1.0 U	0.10 U	0.10 U	0.10 U	0.013
2,4-Dichlorophenol	EPA 8270	µg/L	0.94 U	0.97 U	1 U	1.1 U	0.10 UJ	0.10 U	0.32	1 U	1.0 U	0.10 U	0.10 U	0.10 U	10
Diethyl phthalate	EPA 8270	µg/L	0.94 U	0.97 U	1 U	1.1 U	0.19 J	0.10 U	1.9	1 U	1.0 U	0.16	0.10 U	0.10 U	93
2,4-Dimethylphenol	EPA 8270	µg/L	0.94 U	2.4	1 U	1.1 U	0.10 UJ	0.10 U	0.10 U	1 U	1.0 U	0.10 U	0.10 U	0.10 U	6.30
2-Methylphenol (o-Cresol)	EPA 8270	µg/L	0.94 U	0.97 U	1 U	1.1 U	0.10 UJ	0.10 U	0.10 U	1 U	1.0 U	0.10 U	0.10 U	0.10 U	27
n-Nitrosodimethylamine	EPA 8270	µg/L	0.94 U	0.97 U	1 U	1.1 U	0.10 UJ	0.10 U	0.10 U	1 U	1.0 U	0.10 U	0.10 U	0.10 U	0.34
n-Nitrosodiphenylamine (as Diphenylamine)	EPA 8270	µg/L	0.94 U	0.97 U	10 U	1.1 U	0.10 UJ	0.10 U	0.10 U	10 U	1.0 U	0.10 U	0.10 U	0.10 U	0.69
n-Nitrosodi-n-propylamine	EPA 8270	µg/L	0.94 U	0.97 U	1 U	1.1 U	0.10 UJ	0.10 U	0.10 U	1 U	1.0 U	0.10 U	0.10 U	0.17	0.058
Pentachlorophenol	EPA 8270	µg/L	4.7 U	0.97 U	5 U	1.1 UJ	0.50 UJ	0.50 U	0.50 U	5 U	1.0 UJ	0.50 U	0.50 U	0.50 U	0.002
Phenol	EPA 8270	µg/L	7.7	5.9	1 U	1.1 U	0.10 UJ	0.10 U	0.10 U	1 U	1.0 U	0.10 U	0.10 U	0.10 U	370
2,4,6-Trichlorophenol	EPA 8270	µg/L	0.94 U	0.97 U	1 U	1.1 U	0.10 UJ	0.10 U	0.10 U	1 U	1.0 U	0.10 U	0.10 U	0.10 U	0.28
Volatile Organic Compounds (VOCs)															
Benzene	EPA 8260	µg/L	0.40 U	0.40 U	0.22	0.20 U	0.20 U	0.20 U	0.20 U	0.2 U	--	0.20 U	0.20 U	0.20 U	1.6
Chloroform	EPA 8260	µg/L	0.40 U	0.40 U	0.2 U	0.20 U	0.20 U	0.20 U	0.20 U	0.2 U	--	0.20 U	0.20 U	0.20 U	1.2
Petroleum Hydrocarbons															
Gasoline-range hydrocarbons	NWTPH-G	µg/L	100 U	100 U	--	--	--	--	--	--	--	100 U	--	--	800
Diesel-range hydrocarbons	NWTPH-Dx	µg/L	700	590 J	--	--	210 U	250 U	250 U	--	--	200 U	250 U	250 U	500
Oil-range hydrocarbons	NWTPH-Dx	µg/L	1,000	820 J	--	--	340 U	400 U	400 U	--	--	330 U	400 U	400 U	500
Total diesel- and oil-range hydrocarbons	NWTPH-Dx	µg/L	1,700	1,410 J	--	--	340 U	400 U	400 U	--	--	330 U	400 U	400 U	500
Diesel-range hydrocarbons	NWTPH-Dx Si/Gel	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	500
Oil-range hydrocarbons	NWTPH-Dx Si/Gel	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	500
Total diesel- and oil-range hydrocarbons	NWTPH-Dx Si/Gel	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	500
Conventional Parameters															
Total organic carbon (TOC)	SM 5310B	mg/L	120	130	--	--	--	--	--	--	--	2.7	4.9	5.7	NE
Field Measured Parameters															
pH	N/A	N/A	11.23	11.08	8.38	7.31	7.56	7.66	7.79	6.33	6.17	6.31	6.51	6.08	NE

Notes:

¹ Monitoring well locations are shown on Figures 3-2 and 3-4.

² Insufficient water to collect groundwater sample for chemical analysis.

³ Groundwater screening levels referenced from Table 4-2.

⁴ Total dioxin/furan Toxic Equivalency Quotients (TEQs) were calculated using United States Environmental Protection Agency (USEPA) Toxicity Equivalency Factor (TEF) values for human health (EPA 2003).

⁵ Total carcinogenic PAH (cPAH) TEQs were calculated using TEF values referenced from MTCA Table 708.2 (WAC 173-340-900).

mg/L = milligram per liter

µg/L = microgram per liter

NE = not established

Landau = Landau Associates

GEI = GeoEngineers

Bold indicates analyte was detected.

Yellow shading identifies the detected results greater than the preliminary cleanup level.

Blue shading identifies the non-detected result greater than the preliminary cleanup level.

NE = not established

J = estimated result

U = analyte not detected above the reporting limit

-- = not analyzed

COPC = Contaminant of Potential Concern

Table 5-4
Remedial Investigation Chemical Analytical Results - Groundwater COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Monitoring Well ¹	Analytical Method	Units	MW-10	MW-10	MW-10	MW-10	MW-10	MW-10	MW-10D	MW-10D	MW-10D	MW-10D	MW-11	MW-11 ²	Groundwater Preliminary Cleanup Level ³ (PCUL)
Sample Date			11/4/2009	06/09/14	09/23/14	01/20/15	04/23/15	03/17/17	06/09/14	09/23/14	01/20/15	04/23/15	06/13/14	09/24/14	
Monitoring Event			Nov-09	Jun-14	Sep-14	Jan-15	Apr-15	Mar-17	Jun-14	Sep-14	Jan-15	Apr-15	Jun-14	Sep-14	
Sampled By			Landau	GEI	GEI	GEI	GEI	Ecology	GEI	GEI	GEI	GEI	GEI	GEI	
Polychlorinated Biphenyls (PCBs)															
Total PCB Aroclors	EPA 8082	µg/L	--	--	--	--	--	0.010 U	--	--	--	--	--	--	0.000007
Total PCB Congeners	EPA 1668	µg/L	--	--	--	--	--	0.0018 J	--	--	--	--	--	--	0.000007
Dioxins and Furans															
Total Dioxin/Furan TEQ ⁺ (ND=0RL)	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	0.0000000051
Total Dioxin/Furan TEQ ⁺ (ND=0.5RL)	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	0.0000000051
Total Metals															
Arsenic	EPA 200.8/7470	µg/L	6.9	7.3	6.9	3.3 U	3.3 U	--	31	25	32	34	5.9	--	8.0
Barium	EPA 200.8/7470	µg/L	--	16	19	11	7.6	--	21	19	25	21	170	--	200
Cadmium	EPA 200.8/7470	µg/L	4.4 U	0.20 U	0.20 U	0.20 U	0.20 U	--	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	--	1.2
Chromium III / Total	EPA 200.8/7470	µg/L	5.4	2.0 U	2.0 U	2.0 U	2.0 U	--	20	12	25	26	2.1	--	27
Chromium VI	EPA 200.8/7470	µg/L	10 U	--	--	--	--	--	--	--	--	--	--	--	50
Copper	EPA 200.8/7470	µg/L	13	2.0 U	2	2.1	2.0 U	--	2.0 U	2.0 U	2.7	2.0 U	3.3	--	3.1
Lead	EPA 200.8/7470	µg/L	86	5.3	3.3	3.5	6.7	--	1.7	1.7	6	1.0 U	1.1	--	8.1
Mercury	EPA 200.8/7470	µg/L	0.1 U	0.50 U	0.50 U	0.50 U	0.50 U	--	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	--	0.025
Nickel	EPA 200.8/7470	µg/L	22 U	2.0 U	2.0 U	2.0 U	2.0 U	--	2.8	2.6	4.1	2.5	11	--	8.2
Silver	EPA 200.8/7470	µg/L	11 U	1.0 U	1.0 U	1.0 U	1.0 U	--	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	--	1.9
Thallium	EPA 200.8/7470	µg/L	5.6 U	2.0 U	2.0 U	2.0 U	2.0 U	--	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	--	0.062
Zinc	EPA 200.8/7470	µg/L	53	56 U	56 U	56 U	56 U	--	56 U	56 U	56 U	56 U	56 U	--	81
Dissolved Metals															
Arsenic	EPA 200.8/7470	µg/L	6	6.9	7.2	3.3 U	3.3 U	--	26	26	27	35	5.4	--	8.0
Barium	EPA 200.8/7470	µg/L	--	15	19	10	9.4	--	19	18	18	19	160	--	200
Cadmium	EPA 200.8/7470	µg/L	4 U	0.20 U	0.20 U	0.20 U	0.20 U	--	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	--	1.2
Chromium III / Total	EPA 200.8/7470	µg/L	2 U	2.0 U	2.0 U	2.0 U	2.0 U	--	15	13	22	27	2.0 U	--	27
Copper	EPA 200.8/7470	µg/L	5.9	2.0 U	2.0 U	2.0 U	2.0 U	--	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	--	3.1
Lead	EPA 200.8/7470	µg/L	2.5	1.0 U	1.1	1	2.2	--	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	--	8.1
Mercury	EPA 200.8/7470	µg/L	0.1 U	0.50 U	0.50 U	0.50 U	0.50 U	--	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	--	0.025
Nickel	EPA 200.8/7470	µg/L	20 U	2.0 U	2.0 U	2.0 U	2.0 U	--	2.4	2	3.1	3.6	7.6	--	8.2
Silver	EPA 200.8/7470	µg/L	10 U	1.0 U	1.0 U	1.0 U	1.0 U	--	0.50 U	1.0 U	1.0 U	1.0 U	1.0 U	--	1.9
Thallium	EPA 200.8/7470	µg/L	5 U	2.0 U	2.0 U	2.0 U	2.0 U	--	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	--	0.062
Zinc	EPA 200.8/7470	µg/L	5 U	56 U	56 U	56 U	56 U	--	56 U	56 U	56 U	56 U	56 U	--	81
Semi-Volatile Organic Compounds (SVOCs) - Polycyclic Aromatic Hydrocarbons (PAHs)															
Acenaphthene	EPA 8270/SIM	µg/L	0.1 U	0.48 U	0.15 J	0.10 U	0.10 U	--	0.50 U	0.10 U	0.10 U	0.053 J	0.47 U	--	5.3
Anthracene	EPA 8270/SIM	µg/L	0.1 U	0.48 U	0.10 UJ	0.10 U	0.10 U	--	0.50 U	0.10 U	0.10 U	0.10 U	0.47 U	--	2.1
Benzo(a)anthracene	EPA 8270/SIM	µg/L	0.01 U	0.073	0.010 UJ	0.010 U	0.10 U	--	0.093	0.010 U	0.010 U	0.10 U	0.047 U	--	0.00016
Benzo(b)fluoranthene	EPA 8270/SIM	µg/L	0.01 U	0.048 U	0.010 UJ	0.010 U	0.10 U	--	0.067	0.010 U	0.010 U	0.010 U	0.047 U	--	0.00016
Benzo(j,k)fluoranthene	EPA 8270/SIM	µg/L	0.01 U	0.048 U	0.010 UJ	0.010 U	0.10 U	--	0.081	0.010 U	0.010 U	0.010 U	0.047 U	--	0.0016
Benzo(a)pyrene	EPA 8270/SIM	µg/L	0.01 U	0.048 U	0.010 UJ	0.010 U	0.10 U	--	0.052	0.010 U	0.010 U	0.010 U	0.047 U	--	0.000016
Chrysene	EPA 8270/SIM	µg/L	0.01 U	0.048 U	0.010 UJ	0.010 U	0.10 U	--	0.066	0.010 U	0.010 U	0.10 U	0.047 U	--	0.016
Dibenzo(a,h)anthracene	EPA 8270/SIM	µg/L	0.01 U	0.048 U	0.010 UJ	0.010 U	0.10 U	--	0.06	0.010 U	0.010 U	0.010 U	0.047 U	--	0.000016
Fluoranthene	EPA 8270/SIM	µg/L	0.1 U	0.48 U	0.10 UJ	0.10 U	0.10 U	--	0.50 U	0.10 U	0.10 U	0.10 U	0.47 U	--	1.8
Fluorene	EPA 8270/SIM	µg/L	0.1 U	0.48 U	0.10 UJ	0.10 U	0.10 U	--	0.50 U	0.10 U	0.10 U	0.10 U	0.47 U	--	3.7
Indeno(1,2,3-c,d)pyrene	EPA 8270/SIM	µg/L	0.01 U	0.048 U	0.010 UJ	0.010 U	0.10 U	--	0.065	0.010 U	0.010 U	0.010 U	0.047 U	--	0.00016
1-Methylnaphthalene	EPA 8270/SIM	µg/L	0.1 U	0.48 U	0.10 UJ	0.10 U	0.10 U	--	0.50 U	0.10 U	0.10 U	0.10 U	0.47 U	--	1.5
Naphthalene	EPA 8270/SIM	µg/L	0.1 U	0.48 U	0.10 UJ	0.10 U	0.10 U	--	0.50 U	0.10 U	0.10 U	0.10 U	0.47 U	--	1.4
Pyrene	EPA 8270/SIM	µg/L	0.1 U	0.48 U	0.10 UJ	0.050 U	0.10 U	--	0.50 U	0.10 U	0.050 U	0.10 UJ	0.47 U	--	2
Total cPAH TEQ ⁵ (ND=0)	EPA 8270/SIM	µg/L	0 U	0.007	0 U	0 U	0 U	--	0.089	0 U	0 U	0 U	0 U	--	0.000016
Total cPAH TEQ ⁵ (ND=0.5RL)	EPA 8270/SIM	µg/L	0.0076 U	0.041	0.0076 U	0.0076 U	0.0076 U	--	0.089	0.0076 U	0.0076 U	0.013 U	0.035 U	--	0.000016

Table 5-4
Remedial Investigation Chemical Analytical Results - Groundwater COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Monitoring Well ¹	Analytical Method	Units	MW-10	MW-10	MW-10	MW-10	MW-10	MW-10	MW-10D	MW-10D	MW-10D	MW-10D	MW-11	MW-11 ²	Groundwater Preliminary Cleanup Level ³ (PCUL)	
Sample Date			11/4/2009	06/09/14	09/23/14	01/20/15	04/23/15	03/17/17	06/09/14	09/23/14	01/20/15	04/23/15	06/13/14	09/24/14		
Monitoring Event			Nov-09	Jun-14	Sep-14	Jan-15	Apr-15	Mar-17	Jun-14	Sep-14	Jan-15	Apr-15	Jun-14	Sep-14		
Sampled By			Landau	GEI	GEI	GEI	GEI	Ecology	GEI	GEI	GEI	GEI	GEI	GEI		
Other SVOCs (mg/kg)																
Aniline	EPA 8270	µg/L	5 U	0.96 U	0.10 UJ	0.10 U	0.10 U	--	0.99 U	0.10 U	0.10 U	0.10 U	0.94 U	--	7.7	
Bis(2-chloroethyl)ether	EPA 8270	µg/L	1 U	0.96 U	0.10 UJ	0.10 U	0.10 U	--	0.99 U	0.10 U	0.10 U	0.10 U	0.94 U	--	0.06	
Bis(2-ethylhexyl)phthalate	EPA 8270	µg/L	1 U	0.96 U	0.10 UJ	0.43 U	0.21 U	--	0.99 U	0.23 U	0.39 U	0.30 U	0.94	--	0.046	
Butyl Benzyl Phthalate	EPA 8270	µg/L	1 U	0.96 U	0.10 UJ	0.10 U	0.10 U	--	0.99 U	0.10 U	0.10 U	0.10 U	0.94 U	--	0.013	
2,4-Dichlorophenol	EPA 8270	µg/L	1 U	0.96 U	0.10 UJ	0.10 U	0.13	--	0.99 U	0.10 U	0.10 U	0.10 U	0.94 U	--	10	
Diethyl phthalate	EPA 8270	µg/L	1 U	0.96 U	0.52 J	0.10 U	0.10 U	--	0.99 U	0.10 U	0.10 U	0.10 U	0.94 U	--	93	
2,4-Dimethylphenol	EPA 8270	µg/L	1 U	0.96 U	0.10 UJ	0.10 U	0.10 U	--	0.99 U	0.10 U	0.10 U	0.10 U	0.94 U	--	6.30	
2-Methylphenol (o-Cresol)	EPA 8270	µg/L	1 U	0.96 U	0.10 UJ	0.10 U	0.10 U	--	0.99 U	0.10 U	0.10 U	0.10 U	0.94 U	--	27	
n-Nitrosodimethylamine	EPA 8270	µg/L	1 U	0.96 U	0.10 UJ	0.10 U	0.10 U	--	0.99 U	0.10 U	0.10 U	0.10 U	0.94 U	--	0.34	
n-Nitrosodiphenylamine (as Diphenylamine)	EPA 8270	µg/L	10 U	0.96 U	0.10 UJ	0.10 U	0.10 U	--	0.99 U	0.10 U	0.10 U	0.10 U	0.94 U	--	0.69	
n-Nitrosodi-n-propylamine	EPA 8270	µg/L	1 U	0.96 U	0.10 UJ	0.10 U	0.10 U	--	0.99 U	0.10 U	0.10 U	0.10 U	0.94 U	--	0.058	
Pentachlorophenol	EPA 8270	µg/L	5 U	0.96 U	0.50 UJ	0.73	0.50 U	--	0.99 U	0.50 U	0.50 U	0.50 U	0.94 UJ	--	0.002	
Phenol	EPA 8270	µg/L	1 U	0.96 U	0.10 UJ	0.10 U	0.10 U	--	0.99 U	0.10 U	0.10 U	0.10 U	0.94 U	--	370	
2,4,6-Trichlorophenol	EPA 8270	µg/L	1 U	0.96 U	0.10 UJ	0.10 U	0.10 U	--	0.99 U	0.10 U	0.10 U	0.10 U	0.94 U	--	0.28	
Volatile Organic Compounds (VOCs)																
Benzene	EPA 8260	µg/L	0.2 U	0.20 U	0.20 U	0.20 U	0.20 U	--	0.20 U	0.20 U	0.20 U	0.20 U	--	--	1.6	
Chloroform	EPA 8260	µg/L	0.2 U	0.20 U	0.20 U	2.1	3.4	--	0.20 U	0.20 U	0.20 U	0.20 U	--	--	1.2	
Petroleum Hydrocarbons																
Gasoline-range hydrocarbons	NWTPH-G	µg/L	--	--	100 U	100 U	100 U	--	--	100 U	100 U	100 U	--	--	800	
Diesel-range hydrocarbons	NWTPH-Dx	µg/L	--	--	200 U	250 U	250 U	--	--	270	250 U	250 U	--	--	500	
Oil-range hydrocarbons	NWTPH-Dx	µg/L	--	--	330 U	400 U	400 U	--	--	330 U	400 U	400 U	--	--	500	
Total diesel- and oil-range hydrocarbons	NWTPH-Dx	µg/L	--	--	330 U	400 U	400 U	--	--	270	400 U	400 U	--	--	500	
Diesel-range hydrocarbons	NWTPH-Dx Si/Gel	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	500	
Oil-range hydrocarbons	NWTPH-Dx Si/Gel	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	500	
Total diesel- and oil-range hydrocarbons	NWTPH-Dx Si/Gel	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	500	
Conventional Parameters																
Total organic carbon (TOC)	SM 5310B	mg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE	
Field Measured Parameters																
pH	N/A	N/A	6.89	6.96	7.29	6.99	7.21	--	9.00	7.07	6.97	7.14	7.40	--	NE	

Notes:

¹ Monitoring well locations are shown on Figures 3-2 and 3-4.

² Insufficient water to collect groundwater sample for chemical analysis.

³ Groundwater screening levels referenced from Table 4-2.

⁴ Total dioxin/furan Toxic Equivalency Quotients (TEQs) were calculated using United States Environmental Protection Agency (USEPA) Toxicity Equivalency Factor (TEF) values for human health (EPA 2003).

⁵ Total carcinogenic PAH (cPAH) TEQs were calculated using TEF values referenced from MTCA Table 708.2 (WAC 173-340-900).

mg/L = milligram per liter

µg/L = microgram per liter

NE = not established

Landau = Landau Associates

GEI = GeoEngineers

Bold indicates analyte was detected.

Yellow shading identifies the detected results greater than the preliminary cleanup level.

Blue shading identifies the non-detected result greater than the preliminary cleanup level.

NE = not established

J = estimated result

U = analyte not detected above the reporting limit

-- = not analyzed

COPC = Contaminant of Potential Concern

Table 5-4
Remedial Investigation Chemical Analytical Results - Groundwater COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Monitoring Well ¹	Analytical Method	Units	MW-11	MW-11	MW-12	MW-12	MW-12	MW-12	MW-13	MW-13	MW-13	MW-13	MW-13	MW-13	Groundwater Preliminary Cleanup Level ³ (PCUL)
Sample Date			01/22/15	04/20/15	06/12/14	09/24/14	01/22/15	04/20/15	06/12/14	09/25/14	09/25/14	01/22/15	01/22/15	04/20/15	
Monitoring Event			Jan-15	Apr-15	Jun-14	Sep-14	Jan-15	Apr-15	Jun-14	Sep-14	Sep-14 (Dup)	Jan-15	Jan-15 (Dup)	Apr-15	
Sampled By			GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	
Polychlorinated Biphenyls (PCBs)															
Total PCB Aroclors	EPA 8082	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	0.000007
Total PCB Congeners	EPA 1668	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	0.000007
Dioxins and Furans															
Total Dioxin/Furan TEQ ⁺ (ND=ORL)	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	0.0000000051
Total Dioxin/Furan TEQ ⁺ (ND=0.5RL)	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	0.0000000051
Total Metals															
Arsenic	EPA 200.8/7470	µg/L	3.3 U	4.1	5.5	3.3 U	3.3 U	3.0 U	18	20	22	15	14	11	8.0
Barium	EPA 200.8/7470	µg/L	110	120	26	10	22	9.2	50	43	39	45	47	40	200
Cadmium	EPA 200.8/7470	µg/L	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	1.2
Chromium III / Total	EPA 200.8/7470	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	4.1	4.6	5.1	2.7	2.6	2.2	27
Chromium VI	EPA 200.8/7470	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	50
Copper	EPA 200.8/7470	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	3	10	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	3.1
Lead	EPA 200.8/7470	µg/L	1.0 U	1.2	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	8.1
Mercury	EPA 200.8/7470	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.025
Nickel	EPA 200.8/7470	µg/L	5	6.1	2.6	10	10	2.5	2.0 U	2.3	2.3	2.0 U	2.2	2.0 U	8.2
Silver	EPA 200.8/7470	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.9
Thallium	EPA 200.8/7470	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	0.062
Zinc	EPA 200.8/7470	µg/L	56 U	56 U	56 U	56 U	56 U	56 U	56 U	56 U	56 U	55 U	55 U	56 U	81
Dissolved Metals															
Arsenic	EPA 200.8/7470	µg/L	3.3 U	4.1	5.4	8.3 U	3.3 U	12	16	22 J	22 J	15	15	9.4	8.0
Barium	EPA 200.8/7470	µg/L	88	100	25	9.3	18	41	48	37	45	43	44	38	200
Cadmium	EPA 200.8/7470	µg/L	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	1.2
Chromium III / Total	EPA 200.8/7470	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	4.1	4.4	4.4	3.3	2.7	2.0 U	27
Copper	EPA 200.8/7470	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	8	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	3.1
Lead	EPA 200.8/7470	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	8.1
Mercury	EPA 200.8/7470	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.025
Nickel	EPA 200.8/7470	µg/L	3.9	3.3	2.6	9.9	7.7	3.8	2.4	2.6	2.2	2.1	2.0 U	3.3	8.2
Silver	EPA 200.8/7470	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.9
Thallium	EPA 200.8/7470	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	0.062
Zinc	EPA 200.8/7470	µg/L	56 U	56 U	56 U	56 U	56 U	56 U	56 U	56 U	56 U	55 U	55 U	56 U	81
Semi-Volatile Organic Compounds (SVOCs) - Polycyclic Aromatic Hydrocarbons (PAHs)															
Acenaphthene	EPA 8270/SIM	µg/L	0.10 U	0.10 U	0.48 U	0.10 U	0.10 U	0.10 U	0.48 U	0.10 U	0.10 U	0.10 UJ	0.10 U	0.10 U	5.3
Anthracene	EPA 8270/SIM	µg/L	0.10 U	0.10 U	0.48 U	0.10 U	0.10 U	0.10 U	0.48 U	0.10 U	0.10 U	0.10 UJ	0.10 U	0.10 U	2.1
Benzo(a)anthracene	EPA 8270/SIM	µg/L	0.010 U	0.010 U	0.048 U	0.010 U	0.010 U	0.010 U	0.07	0.010 U	0.010 U	0.010 UJ	0.012	0.010 U	0.00016
Benzo(b)fluoranthene	EPA 8270/SIM	µg/L	0.010 U	0.010 U	0.048 U	0.010 U	0.010 U	0.010 U	0.048 U	0.010 U	0.010 U	0.010 UJ	0.010 U	0.010 U	0.00016
Benzo(j,k)fluoranthene	EPA 8270/SIM	µg/L	0.010 U	0.010 U	0.048 U	0.010 U	0.010 U	0.010 U	0.048 U	0.010 U	0.010 U	0.010 UJ	0.010 U	0.010 U	0.0016
Benzo(a)pyrene	EPA 8270/SIM	µg/L	0.010 U	0.010 U	0.048 U	0.010 U	0.010 U	0.010 U	0.048 U	0.010 U	0.010 U	0.010 UJ	0.010 U	0.010 U	0.000016
Chrysene	EPA 8270/SIM	µg/L	0.010 U	0.010 U	0.048 U	0.010 U	0.010 U	0.010 U	0.048 U	0.010 U	0.010 U	0.010 UJ	0.011	0.010 U	0.016
Dibenzo(a,h)anthracene	EPA 8270/SIM	µg/L	0.010 U	0.010 U	0.048 U	0.010 U	0.010 U	0.010 U	0.048 U	0.010 U	0.010 U	0.010 UJ	0.010 U	0.010 U	0.000016
Fluoranthene	EPA 8270/SIM	µg/L	0.10 U	0.10 U	0.48 U	0.10 U	0.10 U	0.10 U	0.48 U	0.10 U	0.10 U	0.10 UJ	0.10 U	0.10 U	1.8
Fluorene	EPA 8270/SIM	µg/L	0.10 U	0.10 U	0.48 U	0.10 U	0.10 U	0.10 U	0.48 U	0.10 U	0.10 U	0.10 UJ	0.10 U	0.10 U	3.7
Indeno(1,2,3-c,d)pyrene	EPA 8270/SIM	µg/L	0.010 U	0.010 U	0.048 U	0.010 U	0.010 U	0.010 U	0.048 U	0.010 U	0.010 U	0.010 UJ	0.010 U	0.010 U	0.00016
1-Methylnaphthalene	EPA 8270/SIM	µg/L	0.10 U	0.10 U	0.48 U	0.10 U	0.10 U	0.10 U	0.48 U	0.10 U	0.10 U	0.10 UJ	0.10 U	0.10 U	1.5
Naphthalene	EPA 8270/SIM	µg/L	0.10 U	0.54	0.48 U	0.10 U	0.10 U	0.10 U	0.48 U	0.10 U	0.10 U	0.10 UJ	0.10 U	0.10 U	1.4
Pyrene	EPA 8270/SIM	µg/L	0.10 U	0.10 U	0.48 U	0.10 U	0.10 U	0.10 U	0.48 U	0.10 U	0.10 U	0.10 UJ	0.10 U	0.10 U	2
Total cPAH TEQ ⁵ (ND=0)	EPA 8270/SIM	µg/L	0 U	0 U	0 U	0 U	0 U	0 U	0.007	0 U	0 U	0 U	0.001	0 U	0.000016
Total cPAH TEQ ⁵ (ND=0.5RL)	EPA 8270/SIM	µg/L	0.0076 U	0.0076 U	0.036 U	0.0076 U	0.0076 U	0.0076 U	0.041	0.0076 U	0.0076 U	0.0076 U	0.008	0.0076 U	0.000016

Table 5-4
Remedial Investigation Chemical Analytical Results - Groundwater COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Monitoring Well ¹	Analytical Method	Units	MW-11	MW-11	MW-12	MW-12	MW-12	MW-12	MW-13	MW-13	MW-13	MW-13	MW-13	MW-13	Groundwater Preliminary Cleanup Level ³ (PCUL)	
Sample Date			01/22/15	04/20/15	06/12/14	09/24/14	01/22/15	04/20/15	06/12/14	09/25/14	09/25/14	01/22/15	01/22/15	04/20/15		
Monitoring Event			Jan-15	Apr-15	Jun-14	Sep-14	Jan-15	Apr-15	Jun-14	Sep-14	Sep-14 (Dup)	Jan-15	Jan-15 (Dup)	Apr-15		
Sampled By			GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI		
Other SVOCs (mg/kg)																
Aniline	EPA 8270	µg/L	0.10 U	0.10 U	0.96 U	0.10 U	0.10 U	0.10 U	0.97 U	0.10 U	0.10 U	0.10 UJ	0.10 U	0.10 U	7.7	
Bis(2-chloroethyl)ether	EPA 8270	µg/L	0.10 U	0.10 U	0.96 U	0.10 U	0.10 U	0.10 U	0.97 U	0.10 U	0.10 U	0.10 UJ	0.10 U	0.10 U	0.06	
Bis(2-ethylhexyl)phthalate	EPA 8270	µg/L	0.73 U	0.33 U	0.96 U	0.24 U	0.47 U	0.35 U	0.97 U	0.32 U	0.33 U	0.59 UJ	0.35 U	0.48	0.046	
Butyl Benzyl Phthalate	EPA 8270	µg/L	0.10 U	0.10 U	0.96 U	0.10 U	0.10 U	0.10 U	0.97 U	0.10 U	0.10 U	0.10 UJ	0.10 U	0.10 U	0.013	
2,4-Dichlorophenol	EPA 8270	µg/L	0.10 U	0.10 UJ	0.96 U	0.10 U	0.10 U	0.10 U	0.97 U	0.10 U	0.10 U	0.10 UJ	0.10 U	0.10 U	10	
Diethyl phthalate	EPA 8270	µg/L	0.10 U	0.10 U	0.96 U	0.10 U	0.10 U	0.27	0.97 U	0.10 U	0.10 U	0.10 UJ	0.10 U	0.10 U	93	
2,4-Dimethylphenol	EPA 8270	µg/L	0.10 U	0.10 UJ	0.96 U	0.10 U	0.10 U	0.10 U	0.97 U	0.10 U	0.10 U	0.10 UJ	0.10 U	0.10 U	6.30	
2-Methylphenol (o-Cresol)	EPA 8270	µg/L	0.10 U	0.10 U	0.96 U	0.10 U	0.10 U	0.10 U	0.97 U	0.10 U	0.10 U	0.10 UJ	0.10 U	0.10 U	27	
n-Nitrosodimethylamine	EPA 8270	µg/L	0.10 U	0.10 U	0.96 U	0.10 U	0.10 U	0.10 U	0.97 U	0.10 U	0.10 U	0.10 UJ	0.10 U	0.10 U	0.34	
n-Nitrosodiphenylamine (as Diphenylamine)	EPA 8270	µg/L	0.10 U	0.10 U	0.96 U	0.10 U	0.10 U	0.10 U	0.97 U	0.10 U	0.10 U	0.10 UJ	0.10 U	0.10 U	0.69	
n-Nitrosodi-n-propylamine	EPA 8270	µg/L	0.10 U	0.10 U	0.96 U	0.10 U	0.10 U	0.10 U	0.97 U	0.10 U	0.10 U	0.10 UJ	0.10 U	0.10 U	0.058	
Pentachlorophenol	EPA 8270	µg/L	0.50 U	0.50 UJ	0.96 UJ	0.50 U	0.50 U	0.50 U	0.97 UJ	0.50 U	0.50 U	0.50 UJ	0.50 U	0.50 U	0.002	
Phenol	EPA 8270	µg/L	0.10 U	0.10 UJ	0.96 U	0.10 U	0.10 U	0.10 U	0.97 U	0.10 U	0.10 U	0.10 UJ	0.10 U	0.10 U	370	
2,4,6-Trichlorophenol	EPA 8270	µg/L	0.10 U	0.10 UJ	0.96 U	0.10 U	0.10 U	0.10 U	0.97 U	0.10 U	0.10 U	0.10 UJ	0.10 U	0.10 U	0.28	
Volatile Organic Compounds (VOCs)																
Benzene	EPA 8260	µg/L	--	--	--	--	--	--	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	1.6	
Chloroform	EPA 8260	µg/L	--	--	--	--	--	--	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	1.2	
Petroleum Hydrocarbons																
Gasoline-range hydrocarbons	NWTPH-G	µg/L	--	--	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U	800	
Diesel-range hydrocarbons	NWTPH-Dx	µg/L	--	--	210 U	210 U	250 U	250 U	510	460	530	480 J	560 J	630	500	
Oil-range hydrocarbons	NWTPH-Dx	µg/L	--	--	340 U	330 U	400 U	400 U	1,100	790	890	900 J	910 J	950	500	
Total diesel- and oil-range hydrocarbons	NWTPH-Dx	µg/L	--	--	340 U	330 U	400 U	400 U	1,610	1,250	1,420	1,380 J	1,470 J	1,580	500	
Diesel-range hydrocarbons	NWTPH-Dx Si/Gel	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	500	
Oil-range hydrocarbons	NWTPH-Dx Si/Gel	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	500	
Total diesel- and oil-range hydrocarbons	NWTPH-Dx Si/Gel	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	500	
Conventional Parameters																
Total organic carbon (TOC)	SM 5310B	mg/L	2.9	2.3	--	--	--	--	--	--	--	--	--	--	NE	
Field Measured Parameters																
pH	N/A	N/A	6.40	6.41	6.51	6.52	6.41	6.70	6.82	7.08	7.08	6.94	6.94	6.84	NE	

Notes:

¹ Monitoring well locations are shown on Figures 3-2 and 3-4.

² Insufficient water to collect groundwater sample for chemical analysis.

³ Groundwater screening levels referenced from Table 4-2.

⁴ Total dioxin/furan Toxic Equivalency Quotients (TEQs) were calculated using United States Environmental Protection Agency (USEPA) Toxicity Equivalency Factor (TEF) values for human health (EPA 2003).

⁵ Total carcinogenic PAH (cPAH) TEQs were calculated using TEF values referenced from MTCA Table 708.2 (WAC 173-340-900).

mg/L = milligram per liter

µg/L = microgram per liter

NE = not established

Landau = Landau Associates

GEI = GeoEngineers

Bold indicates analyte was detected.

Yellow shading identifies the detected results greater than the preliminary cleanup level.

Blue shading identifies the non-detected result greater than the preliminary cleanup level.

NE = not established

J = estimated result

U = analyte not detected above the reporting limit

-- = not analyzed

COPC = Contaminant of Potential Concern

Table 5-4
Remedial Investigation Chemical Analytical Results - Groundwater COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Monitoring Well ¹	Analytical Method	Units	MW-13	MW-14	MW-14 ²	MW-14	MW-14	MW-15	MW-15	MW-15	MW-15	MW-15	MW-16	MW-16	MW-16	Groundwater Preliminary Cleanup Level ³ (PCUL)
Sample Date			04/20/15	06/10/14	09/22/14	01/21/15	04/21/15	06/10/14	09/23/14	01/21/15	04/21/15	06/11/14	09/23/14	01/22/15		
Monitoring Event			Apr-15 (Dup)	Jun-14	Sep-14	Jan-15	Apr-15	Jun-14	Sep-14	Jan-15	Apr-15	Jun-14	Sep-14	Jan-15		
Sampled By			GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI		
Polychlorinated Biphenyls (PCBs)																
Total PCB Aroclors	EPA 8082	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	0.000007
Total PCB Congeners	EPA 1668	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	0.000007
Dioxins and Furans																
Total Dioxin/Furan TEQ ⁺ (ND=ORL)	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	0.0000000051
Total Dioxin/Furan TEQ ⁺ (ND=0.5RL)	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	0.0000000051
Total Metals																
Arsenic	EPA 200.8/7470	µg/L	11	4,500	--	7,800	5,100	64	71	160	64	440	160	140		8.0
Barium	EPA 200.8/7470	µg/L	42	5.0 U	--	2.4	5.0 U	44	54	71	46	15	16	11		200
Cadmium	EPA 200.8/7470	µg/L	0.20 U	0.20 U	--	0.20 U	0.20 U	0.22	0.50 U	0.20 U	0.20 U	0.32	0.3	0.20 U		1.2
Chromium III / Total	EPA 200.8/7470	µg/L	2.4	2.0 U	--	2.0 U	2.0 U	9.7	13	24	9.9	48	40	19		27
Chromium VI	EPA 200.8/7470	µg/L	--	--	--	--	--	--	--	--	--	--	--	--		50
Copper	EPA 200.8/7470	µg/L	2.0 U	2.0 U	--	2.0 U	2.0 U	30	11	4.2	3.7	62	55	20		3.1
Lead	EPA 200.8/7470	µg/L	1.0 U	1.0 U	--	1.0 U	1.0 U	110	53	9.9	15	1,500	1,700	370		8.1
Mercury	EPA 200.8/7470	µg/L	0.50 U	0.50 U	--	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U		0.025
Nickel	EPA 200.8/7470	µg/L	2.0 U	2.0 U	--	2.0 U	2.0 U	25	24	44	27	140	42	33		8.2
Silver	EPA 200.8/7470	µg/L	1.0 U	1.0 U	--	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U		1.9
Thallium	EPA 200.8/7470	µg/L	2.0 U	2.0 U	--	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U		0.062
Zinc	EPA 200.8/7470	µg/L	56 U	56 U	--	56 U	56 U	56 U	56 U	55 U	56 U	56 U	56	55 U		81
Dissolved Metals																
Arsenic	EPA 200.8/7470	µg/L	12	4,200	--	7,900	4,200	68	78	140	76	480	180	130		8.0
Barium	EPA 200.8/7470	µg/L	37	5.0 U	--	5.0 U	5.0 U	39	53	71	52	11	11	5.0 U		200
Cadmium	EPA 200.8/7470	µg/L	0.20 U	0.20 U	--	0.20 U	0.20 U	0.20 U	0.50 U	0.20 U	0.20 U	0.20 U	0.4	0.20 U		1.2
Chromium III / Total	EPA 200.8/7470	µg/L	2.3	2.0 U	--	2.0 U	2.0 U	7.4	16	29	13	36	36	16		27
Copper	EPA 200.8/7470	µg/L	2.5	2.0 U	--	2.0 U	2.0 U	11	9.3	2.8	3.3	23	56	14		3.1
Lead	EPA 200.8/7470	µg/L	1.0 U	1.0 U	--	1.0 U	1.0 U	38	38	5.3	8.1	430	1,600	280		8.1
Mercury	EPA 200.8/7470	µg/L	0.50 U	0.50 U	--	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U		0.025
Nickel	EPA 200.8/7470	µg/L	4	2.0 U	--	2.0 U	2.0 U	22	24	41	29	150	47	33		8.2
Silver	EPA 200.8/7470	µg/L	1.0 U	1.0 U	--	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U		1.9
Thallium	EPA 200.8/7470	µg/L	2.0 U	2.0 U	--	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U		0.062
Zinc	EPA 200.8/7470	µg/L	56 U	56 U	--	56 U	56 U	56 U	56 U	55 U	56 U	56 U	56 U	55 U		81
Semi-Volatile Organic Compounds (SVOCs) - Polycyclic Aromatic Hydrocarbons (PAHs)																
Acenaphthene	EPA 8270/SIM	µg/L	0.10 U	0.49 U	--	0.95 U	0.96 U	0.47 U	0.08	0.94 U	0.99 U	4.7 U	0.47 U	2.3 U		5.3
Anthracene	EPA 8270/SIM	µg/L	0.10 U	0.49 U	--	0.95 U	0.96 U	0.47 U	0.048 U	0.94 U	0.99 U	4.7 U	0.57	2.3 U		2.1
Benzo(a)anthracene	EPA 8270/SIM	µg/L	0.010 U	0.049 U	--	0.048 U	0.048 U	0.047 U	0.0048 U	0.047 U	0.049 U	0.51	0.047 U	0.23 U		0.00016
Benzo(b)fluoranthene	EPA 8270/SIM	µg/L	0.01	0.049 U	--	0.048 U	0.048 U	0.047 U	0.0048 U	0.047 U	0.049 U	0.47 U	0.091	0.23 U		0.00016
Benzo(j,k)fluoranthene	EPA 8270/SIM	µg/L	0.010 U	0.049 U	--	0.048 U	0.048 U	0.047 U	0.0048 U	0.047 U	0.049 U	0.47 U	0.047 U	0.23 U		0.0016
Benzo(a)pyrene	EPA 8270/SIM	µg/L	0.010 U	0.049 U	--	0.048 U	0.048 U	0.047 U	0.0048 U	0.047 U	0.049 U	0.47 U	0.047 U	0.23 U		0.000016
Chrysene	EPA 8270/SIM	µg/L	0.010 U	0.049 U	--	0.048 U	0.048 U	0.047 U	0.0048 U	0.047 U	0.049 U	0.47 U	0.047 U	0.23 U		0.016
Dibenzo(a,h)anthracene	EPA 8270/SIM	µg/L	0.010 U	0.049 U	--	0.048 U	0.048 U	0.047 U	0.0048 U	0.047 U	0.049 U	0.47 U	0.047 U	0.23 U		0.000016
Fluoranthene	EPA 8270/SIM	µg/L	0.10 U	0.49 U	--	0.95 U	0.96 U	0.47 U	0.048 U	0.94 U	0.99 U	4.7 U	0.47 U	2.3 U		1.8
Fluorene	EPA 8270/SIM	µg/L	0.10 U	0.49 U	--	0.95 U	0.96 U	0.47 U	0.048 U	0.94 U	0.99 U	4.7 U	0.47 U	2.3 U		3.7
Indeno(1,2,3-c,d)pyrene	EPA 8270/SIM	µg/L	0.010 U	0.049 U	--	0.048 U	0.048 U	0.047 U	0.0048 U	0.047 U	0.049 U	0.47 U	0.047 U	0.23 U		0.00016
1-Methylnaphthalene	EPA 8270/SIM	µg/L	0.10 U	0.49 U	--	0.95 U	0.96 U	0.47 U	0.048 U	0.94 U	0.99 U	4.7 U	0.47 U	2.3 U		1.5
Naphthalene	EPA 8270/SIM	µg/L	0.10 U	0.49 U	--	0.95 U	0.96 U	0.47 U	0.079	0.94 U	0.99 U	4.7 U	1.1	0.99		1.4
Pyrene	EPA 8270/SIM	µg/L	0.10 U	0.49 U	--	0.95 U	0.96 U	0.47 U	0.048 U	0.94 U	0.99 U	4.7 U	0.47 U	2.3 U		2
Total cPAH TEQ ⁵ (ND=0)	EPA 8270/SIM	µg/L	0.001	0 U	--	0 U	0 U	0 U	0 U	0 U	0 U	0.051	0.009	0 U		0.000016
Total cPAH TEQ ⁵ (ND=0.5RL)	EPA 8270/SIM	µg/L	0.008	0.037 U	--	0.037 U	0.037 U	0.035 U	0.0036 U	0.037 U	0.037 U	0.380	0.042	0.174 U		0.000016

Table 5-4
Remedial Investigation Chemical Analytical Results - Groundwater COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Monitoring Well ¹	Analytical Method	Units	MW-13	MW-14	MW-14 ²	MW-14	MW-14	MW-15	MW-15	MW-15	MW-15	MW-16	MW-16	MW-16	Groundwater Preliminary Cleanup Level ³ (PCUL)
Sample Date			04/20/15	06/10/14	09/22/14	01/21/15	04/21/15	06/10/14	09/23/14	01/21/15	04/21/15	06/11/14	09/23/14	01/22/15	
Monitoring Event			Apr-15 (Dup)	Jun-14	Sep-14	Jan-15	Apr-15	Jun-14	Sep-14	Jan-15	Apr-15	Jun-14	Sep-14	Jan-15	
Sampled By			GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	
Other SVOCs (mg/kg)															
Aniline	EPA 8270	µg/L	0.10 U	0.98 U	--	0.95 U	0.96 U	0.94 U	0.48 U	0.94 U	0.99 U	9.5 U	0.95 U	0.94 U	7.7
Bis(2-chloroethyl)ether	EPA 8270	µg/L	0.10 U	0.98 U	--	0.95 U	0.96 U	0.94 U	0.48 U	0.94 U	0.99 U	9.5 U	0.95 U	0.94 U	0.06
Bis(2-ethylhexyl)phthalate	EPA 8270	µg/L	0.63	0.98 U	--	3.4 U	0.96 U	1.4	1.2 U	1.8 U	2.1 U	9.5 U	0.95 U	3.4	0.046
Butyl Benzyl Phthalate	EPA 8270	µg/L	0.10 U	0.98 U	--	0.95 U	0.96 U	0.94 U	0.48 U	0.94 U	0.99 U	9.5 U	0.95 U	0.94 U	0.013
2,4-Dichlorophenol	EPA 8270	µg/L	0.10 U	0.98 U	--	0.95 U	0.96 U	1	1.3	0.94 U	0.99 U	9.5 U	0.95 U	0.94 U	10
Diethyl phthalate	EPA 8270	µg/L	0.12	0.98 U	--	0.95 U	0.96 U	0.94 U	0.48 U	3.7	0.99 U	9.5 U	0.95 U	0.94 U	93
2,4-Dimethylphenol	EPA 8270	µg/L	0.10 U	0.98 U	--	0.95 U	0.96 U	0.94 U	0.85	0.94 U	0.99 U	9.5 U	0.95 U	0.94 U	6.30
2-Methylphenol (o-Cresol)	EPA 8270	µg/L	0.10 U	0.98 U	--	0.95 U	0.96 U	1.4	3.9	9.4	3.8	9.5 U	3.1	3	27
n-Nitrosodimethylamine	EPA 8270	µg/L	0.10 U	0.98 U	--	0.95 U	0.96 U	0.94 U	0.48 U	0.94 U	0.99 U	9.5 U	0.95 U	0.94 U	0.34
n-Nitrosodiphenylamine (as Diphenylamine)	EPA 8270	µg/L	0.10 U	0.98 U	--	0.95 U	0.96 U	0.94 U	0.48 U	0.94 U	0.99 U	9.5 U	0.95 U	0.94 U	0.69
n-Nitrosodi-n-propylamine	EPA 8270	µg/L	0.10 U	0.98 U	--	0.95 U	0.96 U	0.94 U	0.48 U	0.94 U	0.99 U	9.5 U	0.95 U	0.94 U	0.058
Pentachlorophenol	EPA 8270	µg/L	0.50 U	0.98 U	--	4.8 U	0.96 U	0.94 U	0.69	4.7 U	0.99 U	9.5 U	8.1	4.7	0.002
Phenol	EPA 8270	µg/L	0.10 U	0.98 U	--	0.95 U	0.96 U	0.94 U	0.48 U	0.94 U	0.99 U	35	12	7.5	370
2,4,6-Trichlorophenol	EPA 8270	µg/L	0.10 U	0.98 U	--	0.95 U	0.96 U	0.94 U	0.48 U	0.94 U	0.99 U	9.5 U	0.95 U	0.94 U	0.28
Volatile Organic Compounds (VOCs)															
Benzene	EPA 8260	µg/L	0.20 U	0.20 U	--	0.20 U	0.20 U	0.80 J	1.3	1.1	1.2	4.0 J	4.8	4.6	1.6
Chloroform	EPA 8260	µg/L	0.20 U	0.20 U	--	0.20 U	0.20 U	0.20 UJ	0.20 U	0.20 U	0.20 U	1.0 UJ	1.0 U	1.0 U	1.2
Petroleum Hydrocarbons															
Gasoline-range hydrocarbons	NWTPH-G	µg/L	100 U	--	--	--	--	--	--	--	--	--	--	--	800
Diesel-range hydrocarbons	NWTPH-Dx	µg/L	580	--	--	250 U	250 U	--	--	--	--	--	--	--	500
Oil-range hydrocarbons	NWTPH-Dx	µg/L	1,100	--	--	400 U	400 U	--	--	--	--	--	--	--	500
Total diesel- and oil-range hydrocarbons	NWTPH-Dx	µg/L	1,680	--	--	400 U	400 U	--	--	--	--	--	--	--	500
Diesel-range hydrocarbons	NWTPH-Dx Si/Gel	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	500
Oil-range hydrocarbons	NWTPH-Dx Si/Gel	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	500
Total diesel- and oil-range hydrocarbons	NWTPH-Dx Si/Gel	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	500
Conventional Parameters															
Total organic carbon (TOC)	SM 5310B	mg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
Field Measured Parameters															
pH	N/A	N/A	6.84	6.25	--	6.46	6.49	10.60	9.53	9.93	9.58	13.01	11.39	11.70	NE

Notes:

¹ Monitoring well locations are shown on Figures 3-2 and 3-4.

² Insufficient water to collect groundwater sample for chemical analysis.

³ Groundwater screening levels referenced from Table 4-2.

⁴ Total dioxin/furan Toxic Equivalency Quotients (TEQs) were calculated using United States Environmental Protection Agency (USEPA) Toxicity Equivalency Factor (TEF) values for human health (EPA 2003).

⁵ Total carcinogenic PAH (cPAH) TEQs were calculated using TEF values referenced from MTCA Table 708.2 (WAC 173-340-900).

mg/L = milligram per liter

µg/L = microgram per liter

NE = not established

Landau = Landau Associates

GEI = GeoEngineers

Bold indicates analyte was detected.

Yellow shading identifies the detected results greater than the preliminary cleanup level.

Blue shading identifies the non-detected result greater than the preliminary cleanup level.

NE = not established

J = estimated result

U = analyte not detected above the reporting limit

-- = not analyzed

COPC = Contaminant of Potential Concern

Table 5-4
Remedial Investigation Chemical Analytical Results - Groundwater COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Monitoring Well ¹	Analytical Method	Units	MW-16	MW-17	MW-17	MW-17	MW-17	MW-18	MW-18	MW-18	MW-18	MW-18	MW-18	MW-18	Groundwater Preliminary Cleanup Level ³ (PCUL)
Sample Date			04/20/15	06/09/14	09/22/14	01/20/15	04/22/15	06/09/14	06/09/14	09/23/14	09/23/14	01/22/15	01/22/15	04/20/15	
Monitoring Event			Apr-15	Jun-14	Sep-14	Jan-15	Apr-15	Jun-14	Jun-14 (Dup)	Sep-14	Sep-14 (Dup)	Jan-15	Jan-15 (Dup)	Apr-15	
Sampled By			GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	
Polychlorinated Biphenyls (PCBs)															
Total PCB Aroclors	EPA 8082	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	0.000007
Total PCB Congeners	EPA 1668	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	0.000007
Dioxins and Furans															
Total Dioxin/Furan TEQ ⁺ (ND=ORL)	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	0.0000000051
Total Dioxin/Furan TEQ ⁺ (ND=0.5RL)	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	0.0000000051
Total Metals															
Arsenic	EPA 200.8/7470	µg/L	160	11	21	8.9	11	170	190	380	400	370	340	290	8.0
Barium	EPA 200.8/7470	µg/L	11	31	24	21	23	220	230	360	340	330	310	280	200
Cadmium	EPA 200.8/7470	µg/L	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.80 U	0.80 U	1.0 U	1.0 U	0.50 U	0.50 U	1.0 U	1.2
Chromium III / Total	EPA 200.8/7470	µg/L	20	2.0 U	2.0 U	2.0 U	2.0 U	110	120	290	290	250	230	200	27
Chromium VI	EPA 200.8/7470	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	50
Copper	EPA 200.8/7470	µg/L	22	3.6	2.0 U	2.9	2.2	6.9	6.7	10	9.6	5.9	5.1	10 U	3.1
Lead	EPA 200.8/7470	µg/L	540	1.0 U	1.0 U	1.0 U	1.0 U	4.9	4.6	7.6	5.4	2.9	2.8	2.0 U	8.1
Mercury	EPA 200.8/7470	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.025
Nickel	EPA 200.8/7470	µg/L	49	6.8	4	5.8	4.3	76	80	180	180	140	130	130	8.2
Silver	EPA 200.8/7470	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	4.3	4.5	5.5	5.3	8.4	8.6	5.0 U	1.9
Thallium	EPA 200.8/7470	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	0.062
Zinc	EPA 200.8/7470	µg/L	56 U	56 U	56 U	56 U	56 U	56 U	56 U	56 U	56 U	55 U	55 U	56 U	81
Dissolved Metals															
Arsenic	EPA 200.8/7470	µg/L	170	9.6	23	8.2	12	190	200	560	520	300	310	320	8.0
Barium	EPA 200.8/7470	µg/L	6.2	24	25	20	22	220	230	370	360	310	310	280	200
Cadmium	EPA 200.8/7470	µg/L	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.80 U	0.80 U	1.0 U	1.0 U	0.50 U	0.50 U	1.0 U	1.2
Chromium III / Total	EPA 200.8/7470	µg/L	17	2.0 U	2.0 U	2.0 U	2.0 U	120	120	320	300	210	210	220	27
Copper	EPA 200.8/7470	µg/L	16	2.1	2.0 U	2.1	2.0 U	4.0 U	4.0 U	14	18	5.6	6.1	10 U	3.1
Lead	EPA 200.8/7470	µg/L	380	1.0 U	1.0 U	1.0 U	1.0 U	2.0 U	2.0 U	19	17	2.5	2.6	2.0 U	8.1
Mercury	EPA 200.8/7470	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.025
Nickel	EPA 200.8/7470	µg/L	59	4.5	4.8	5.1	3.5	80	84	220	210	130	130	130	8.2
Silver	EPA 200.8/7470	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	4.8	5.1	6.5	6.3	6.9	6.9	5.0 U	1.9
Thallium	EPA 200.8/7470	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	0.062
Zinc	EPA 200.8/7470	µg/L	56 U	56 U	56 U	56 U	56 U	56 U	56 U	56 U	55 U	55 U	55 U	56 U	81
Semi-Volatile Organic Compounds (SVOCs) - Polycyclic Aromatic Hydrocarbons (PAHs)															
Acenaphthene	EPA 8270/SIM	µg/L	0.94 UJ	0.47 U	0.10 U	0.10 U	0.10 U	1.1	1.1	1.1	1	0.57	2.1	0.10 U	5.3
Anthracene	EPA 8270/SIM	µg/L	0.94 UJ	0.47 U	0.10 U	0.10 U	0.10 U	0.48 U	0.48 U	0.46 U	0.75	0.64	0.93 UJ	0.10 U	2.1
Benzo(a)anthracene	EPA 8270/SIM	µg/L	0.94 UJ	0.048	0.010 U	0.039	0.010 U	0.2	0.048 U	0.21	0.25	0.046 U	0.049	0.10 U	0.00016
Benzo(b)fluoranthene	EPA 8270/SIM	µg/L	0.94 UJ	0.047 U	0.010 U	0.011	0.010 U	0.048 U	0.048 U	0.098	0.16	0.046 U	0.046 UJ	0.10 U	0.00016
Benzo(j,k)fluoranthene	EPA 8270/SIM	µg/L	0.94 UJ	0.047 U	0.010 U	0.010 U	0.010 U	0.048 U	0.048 U	0.1	0.18	0.046 U	0.046 UJ	0.10 U	0.0016
Benzo(a)pyrene	EPA 8270/SIM	µg/L	0.94 UJ	0.047 U	0.010 U	0.02	0.010 U	0.048 U	0.048 U	0.14	0.18	0.046 U	0.046 UJ	0.10 U	0.000016
Chrysene	EPA 8270/SIM	µg/L	0.94 UJ	0.047 U	0.010 U	0.039	0.010 U	0.056	0.048 U	0.2	0.29	0.046 U	0.046 UJ	0.10 U	0.016
Dibenzo(a,h)anthracene	EPA 8270/SIM	µg/L	0.94 UJ	0.047 U	0.010 U	0.010 U	0.010 U	0.048 U	0.048 U	0.046 U	0.059	0.046 U	0.046 UJ	0.10 U	0.000016
Fluoranthene	EPA 8270/SIM	µg/L	0.94 UJ	0.47 U	0.10 U	0.10 U	0.10 U	0.48 U	0.48 U	0.99	1.4	0.46 U	0.93 UJ	0.10 U	1.8
Fluorene	EPA 8270/SIM	µg/L	0.94 UJ	0.47 U	0.10 U	0.10 U	0.10 U	0.54	0.55	0.98	1.2	0.46 U	0.93 UJ	0.10 U	3.7
Indeno(1,2,3-c,d)pyrene	EPA 8270/SIM	µg/L	0.94 UJ	0.047 U	0.010 U	0.010 U	0.010 U	0.048 U	0.048 U	0.065	0.069	0.046 U	0.046 UJ	0.10 U	0.00016
1-Methylnaphthalene	EPA 8270/SIM	µg/L	0.94 UJ	0.47 U	0.10 U	0.10 U	0.10 U	0.48 U	0.48 U	0.68	0.78	0.46 U	0.93 UJ	0.39	1.5
Naphthalene	EPA 8270/SIM	µg/L	2.2 J	0.47 U	0.10 U	0.1	0.10 U	2.2	2.2	5.9	7.3	9	12	9.7	1.4
Pyrene	EPA 8270/SIM	µg/L	0.94 UJ	0.47 U	0.10 U	0.10 U	0.10 U	0.48 U	0.48 U	1	1.5	0.46 U	0.93 UJ	0.10 U	2
Total cPAH TEQ ⁵ (ND=0)	EPA 8270/SIM	µg/L	0 U	0.005	0 U	0.025	0 U	0.021	0 U	0.189	0.255	0 U	0.005	0 U	0.000016
Total cPAH TEQ ⁵ (ND=0.5RL)	EPA 8270/SIM	µg/L	0.710 U	0.038	0.0076 U	0.027	0.0076 U	0.054	0.036 U	0.190	0.250	0.036 U	0.037	0.0076 U	0.000016

Table 5-4
Remedial Investigation Chemical Analytical Results - Groundwater COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Monitoring Well ¹	Analytical Method	Units	MW-16	MW-17	MW-17	MW-17	MW-17	MW-18	MW-18	MW-18	MW-18	MW-18	MW-18	MW-18	Groundwater Preliminary Cleanup Level ³ (PCUL)
Sample Date			04/20/15	06/09/14	09/22/14	01/20/15	04/22/15	06/09/14	06/09/14	09/23/14	09/23/14	01/22/15	01/22/15	04/20/15	
Monitoring Event			Apr-15	Jun-14	Sep-14	Jan-15	Apr-15	Jun-14	Jun-14 (Dup)	Sep-14	Sep-14 (Dup)	Jan-15	Jan-15 (Dup)	Apr-15	
Sampled By			GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	
Other SVOCs (mg/kg)															
Aniline	EPA 8270	µg/L	0.94 UJ	0.95 U	0.10 U	0.10 U	0.10 U	0.96 U	0.97 U	0.93 U	0.46 U	0.92 U	0.93 UJ	0.10 U	7.7
Bis(2-chloroethyl)ether	EPA 8270	µg/L	0.94 UJ	0.95 U	0.10 U	0.10 U	0.10 U	0.96 U	0.97 U	0.93 U	0.46 U	0.92 U	0.93 UJ	0.10 U	0.06
Bis(2-ethylhexyl)phthalate	EPA 8270	µg/L	0.94 UJ	0.95 U	0.21 U	0.47 U	0.32 U	1.3	0.97 U	2.7 U	2.3 U	2.9	2.9 J	13	0.046
Butyl Benzyl Phthalate	EPA 8270	µg/L	0.94 UJ	0.95 U	0.10 U	0.10 U	0.10 U	0.96 U	0.97 U	0.93 U	0.46 U	0.92 U	0.93 UJ	9	0.013
2,4-Dichlorophenol	EPA 8270	µg/L	0.94 U	0.95 U	0.10 U	0.10 U	0.10 U	0.96 U	0.97 U	0.93 U	0.46 U	0.92 U	0.93 UJ	0.10 U	10
Diethyl phthalate	EPA 8270	µg/L	0.94 UJ	0.95 U	0.16	0.10 U	0.10 U	2.7	0.97 U	2.2	0.46 U	0.92 U	0.93 UJ	0.10 U	93
2,4-Dimethylphenol	EPA 8270	µg/L	2.7	0.95 U	0.10 U	0.10 U	0.10 U	2.4	2.5	6.2	6.3	3.3	3.1	4.9	6.30
2-Methylphenol (o-Cresol)	EPA 8270	µg/L	4.6 J	0.95 U	0.10 U	0.10 U	0.10 U	0.96 U	0.97 U	1.7	1.8	0.92 U	0.93 UJ	0.55	27
n-Nitrosodimethylamine	EPA 8270	µg/L	0.94 UJ	0.95 U	0.10 U	0.10 U	0.10 U	0.96 U	0.97 U	0.93 U	0.46 U	0.92 U	0.93 UJ	0.10 U	0.34
n-Nitrosodiphenylamine (as Diphenylamine)	EPA 8270	µg/L	0.94 UJ	0.95 U	0.10 U	0.10 U	0.10 U	0.96 U	0.97 U	0.93 U	0.46 U	0.92 U	0.93 UJ	0.10 U	0.69
n-Nitrosodi-n-propylamine	EPA 8270	µg/L	0.94 UJ	0.95 U	0.10 U	0.10 U	0.10 U	0.96 U	0.97 U	0.93 U	0.46 U	0.92 U	0.93 UJ	0.10 U	0.058
Pentachlorophenol	EPA 8270	µg/L	12	0.95 U	0.50 U	0.50 U	0.50 U	0.96 U	0.97 U	0.93 U	0.46 U	4.6 U	4.6 UJ	0.50 U	0.002
Phenol	EPA 8270	µg/L	12	0.95 U	0.10 U	0.10 U	0.10 U	0.96 U	0.97 U	0.93 U	0.46 U	0.92 U	0.93 UJ	0.10 U	370
2,4,6-Trichlorophenol	EPA 8270	µg/L	1.2	0.95 U	0.10 U	0.10 U	0.10 U	0.96 U	0.97 U	0.93 U	0.46 U	0.92 U	0.93 UJ	0.10 U	0.28
Volatile Organic Compounds (VOCs)															
Benzene	EPA 8260	µg/L	4.7	0.20 U	0.20 U	0.20 U	0.20 U	--	--	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.6
Chloroform	EPA 8260	µg/L	1.0 U	0.20 U	0.20 U	0.20 U	0.20 U	--	--	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.2
Petroleum Hydrocarbons															
Gasoline-range hydrocarbons	NWTPH-G	µg/L	--	100 U	100 U	100 U	100 U	100 U	100 U	250	260	100 U	100 U	100 U	800
Diesel-range hydrocarbons	NWTPH-Dx	µg/L	--	200 U	200 U	250 U	250 U	5,400	3,800	15,000	12,000	5,700	13,000	9,700	500
Oil-range hydrocarbons	NWTPH-Dx	µg/L	--	350	330	400 U	400 U	6,400 J	4,200 J	18,000	16,000	6,600	17,000	11,000	500
Total diesel- and oil-range hydrocarbons	NWTPH-Dx	µg/L	--	350	330	400 U	400 U	11,800 J	8,000 J	33,000	28,000	12,300	30,000	20,700	500
Diesel-range hydrocarbons	NWTPH-Dx Si/Gel	µg/L	--	--	--	--	--	--	--	200 U	300	250 U	250 U	250 U	500
Oil-range hydrocarbons	NWTPH-Dx Si/Gel	µg/L	--	--	--	--	--	--	--	320 U	320 U	400 U	400 U	400 U	500
Total diesel- and oil-range hydrocarbons	NWTPH-Dx Si/Gel	µg/L	--	--	--	--	--	--	--	320 U	300	400 U	400 U	400 U	500
Conventional Parameters															
Total organic carbon (TOC)	SM 5310B	mg/L	--	--	--	--	--	--	--	1400 J	1800 J	760	680	700	NE
Field Measured Parameters															
pH	N/A	N/A	11.45	7.14	7.14	7.36	7.25	8.70	8.70	9.10	9.10	8.80	8.80	8.91	NE

Notes:

¹ Monitoring well locations are shown on Figures 3-2 and 3-4.

² Insufficient water to collect groundwater sample for chemical analysis.

³ Groundwater screening levels referenced from Table 4-2.

⁴ Total dioxin/furan Toxic Equivalency Quotients (TEQs) were calculated using United States Environmental Protection Agency (USEPA) Toxicity Equivalency Factor (TEF) values for human health (EPA 2003).

⁵ Total carcinogenic PAH (cPAH) TEQs were calculated using TEF values referenced from MTCA Table 708.2 (WAC 173-340-900).

mg/L = milligram per liter

µg/L = microgram per liter

NE = not established

Landau = Landau Associates

GEI = GeoEngineers

Bold indicates analyte was detected.

Yellow shading identifies the detected results greater than the preliminary cleanup level.

Blue shading identifies the non-detected result greater than the preliminary cleanup level.

NE = not established

J = estimated result

U = analyte not detected above the reporting limit

-- = not analyzed

COPC = Contaminant of Potential Concern

Table 5-4
Remedial Investigation Chemical Analytical Results - Groundwater COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Monitoring Well ¹	Analytical Method	Units	MW-18	MW-19	MW-19	MW-19	MW-19	MW-19D	MW-19D	MW-19D	MW-19D	MW-20	MW-20	MW-20	Groundwater Preliminary Cleanup Level ³ (PCUL)
Sample Date			04/20/15	06/09/14	09/22/14	01/20/15	04/22/15	06/09/14	09/22/14	01/20/15	04/22/15	06/10/14	09/22/14	01/19/15	
Monitoring Event			Apr-15 (Dup)	Jun-14	Sep-14	Jan-15	Apr-15	Jun-14	Sep-14	Jan-15	Apr-15	Jun-14	Sep-14	Jan-15	
Sampled By			GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	
Polychlorinated Biphenyls (PCBs)															
Total PCB Aroclors	EPA 8082	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	0.000007
Total PCB Congeners	EPA 1668	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	0.000007
Dioxins and Furans															
Total Dioxin/Furan TEQ ⁺ (ND=ORL)	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	0.0000000051
Total Dioxin/Furan TEQ ⁺ (ND=0.5RL)	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	0.0000000051
Total Metals															
Arsenic	EPA 200.8/7470	µg/L	290	31	34	12	21	56	62	55	49	3.3 U	6.1	4.6	8.0
Barium	EPA 200.8/7470	µg/L	280	260	310	96	270	45	53	59	77	33	54	26	200
Cadmium	EPA 200.8/7470	µg/L	1.0 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	1.2
Chromium III / Total	EPA 200.8/7470	µg/L	210	4.1	4.8	2.2	6.2 J	5.3	2.6	2.4	5.7 J	2.0 U	7.2	2.0 U	27
Chromium VI	EPA 200.8/7470	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	50
Copper	EPA 200.8/7470	µg/L	10 U	2.0 U	2.0 U	2.0 U	3	5.6	3.7	2.0 U	4.4	2.0 U	5.1	3.1	3.1
Lead	EPA 200.8/7470	µg/L	2.0 U	1.7	1.0 U	2.1	3.8	3.4	1.0 U	1.0 U	3.1	1.0 U	1.2	1.0 U	8.1
Mercury	EPA 200.8/7470	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.025
Nickel	EPA 200.8/7470	µg/L	130	15	16	8.4	12	5.3	4.7	3.4	9.8	4.4	10	3.7	8.2
Silver	EPA 200.8/7470	µg/L	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.9
Thallium	EPA 200.8/7470	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	0.062
Zinc	EPA 200.8/7470	µg/L	56 U	56 U	56 U	56 U	56 U	56 U	56 U	56 U	56 U	56 U	56 U	56 U	81
Dissolved Metals															
Arsenic	EPA 200.8/7470	µg/L	270	26	36	14	21	48	64	59	46	8.3 U	4.8	5.1	8.0
Barium	EPA 200.8/7470	µg/L	280	240	290	100	220	29	43	55	62	31	33	26	200
Cadmium	EPA 200.8/7470	µg/L	1.0 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	1.2
Chromium III / Total	EPA 200.8/7470	µg/L	210	2.5	3.4	2.0 U	2.4	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	27
Copper	EPA 200.8/7470	µg/L	10 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	3.1
Lead	EPA 200.8/7470	µg/L	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	8.1
Mercury	EPA 200.8/7470	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.025
Nickel	EPA 200.8/7470	µg/L	130	15	14	7.8	8.4	3.1	3.2	2.9	2.4	3.8	2.7	3.4	8.2
Silver	EPA 200.8/7470	µg/L	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.9
Thallium	EPA 200.8/7470	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	0.062
Zinc	EPA 200.8/7470	µg/L	56 U	56 U	56 U	56 U	56 U	56 U	56 U	56 U	56 U	56 U	56 U	56 U	81
Semi-Volatile Organic Compounds (SVOCs) - Polycyclic Aromatic Hydrocarbons (PAHs)															
Acenaphthene	EPA 8270/SIM	µg/L	0.10 U	0.47 U	0.10 U	0.11 U	0.18	0.47 U	0.10 U	0.11 U	0.10 U	0.48 U	0.10 U	0.10 U	5.3
Anthracene	EPA 8270/SIM	µg/L	0.10 U	0.47 U	0.10 U	0.11 U	0.10 U	0.47 U	0.10 U	0.053 U	0.10 U	0.48 U	0.10 U	0.10 U	2.1
Benzo(a)anthracene	EPA 8270/SIM	µg/L	0.10 U	0.047 U	0.010 U	0.010 U	0.010 U	0.047 U	0.010 U	0.010 U	0.010 U	0.048 U	0.010 U	0.010 U	0.00016
Benzo(b)fluoranthene	EPA 8270/SIM	µg/L	0.10 U	0.047 U	0.010 U	0.010 U	0.010 U	0.047 U	0.010 U	0.010 U	0.010 U	0.048 U	0.010 U	0.010 U	0.00016
Benzo(j,k)fluoranthene	EPA 8270/SIM	µg/L	0.10 U	0.047 U	0.010 U	0.010 U	0.010 U	0.047 U	0.010 U	0.010 U	0.010 U	0.048 U	0.010 U	0.010 U	0.0016
Benzo(a)pyrene	EPA 8270/SIM	µg/L	0.10 U	0.047 U	0.010 U	0.010 U	0.010 U	0.047 U	0.010 U	0.010 U	0.010 U	0.048 U	0.010 U	0.010 U	0.000016
Chrysene	EPA 8270/SIM	µg/L	0.10 U	0.047 U	0.010 U	0.010 U	0.010 U	0.047 U	0.010 U	0.010 U	0.010 U	0.048 U	0.010 U	0.010 U	0.016
Dibenzo(a,h)anthracene	EPA 8270/SIM	µg/L	0.10 U	0.047 U	0.010 U	0.016	0.010 U	0.047 U	0.010 U	0.010 U	0.010 U	0.048 U	0.010 U	0.010 U	0.000016
Fluoranthene	EPA 8270/SIM	µg/L	0.42	0.47 U	0.10 U	0.11 U	0.10 U	0.47 U	0.10 U	0.11 U	0.10 U	0.48 U	0.10 U	0.050 U	1.8
Fluorene	EPA 8270/SIM	µg/L	0.25	0.47 U	0.10 U	0.11 U	0.10 U	0.47 U	0.10 U	0.11 U	0.10 U	0.48 U	0.10 U	0.10 U	3.7
Indeno(1,2,3-c,d)pyrene	EPA 8270/SIM	µg/L	0.10 U	0.047 U	0.010 U	0.018	0.010 U	0.047 U	0.010 U	0.010 U	0.010 U	0.048 U	0.010 U	0.010 U	0.00016
1-Methylnaphthalene	EPA 8270/SIM	µg/L	0.33	0.47 U	0.10 U	0.11 U	0.11	0.47 U	0.10 U	0.11 U	0.10 U	0.48 U	0.10 U	0.10 U	1.5
Naphthalene	EPA 8270/SIM	µg/L	10	0.47 U	0.10 U	0.11 U	0.6	0.47 U	0.10 U	0.11 U	0.10 U	0.48 U	0.10 U	0.10 U	1.4
Pyrene	EPA 8270/SIM	µg/L	0.35	0.47 U	0.10 U	0.11 U	0.11	0.47 U	0.10 U	0.11 U	0.10 U	0.48 U	0.10 U	0.11	2
Total cPAH TEQ ⁵ (ND=0)	EPA 8270/SIM	µg/L	0 U	0 U	0 U	0.003	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0.000016
Total cPAH TEQ ⁵ (ND=0.5RL)	EPA 8270/SIM	µg/L	0.0076 U	0.035 U	0.0076 U	0.010	0.0076 U	0.035 U	0.0076 U	0.0076 U	0.0076 U	0.035 U	0.0076 U	0.0076 U	0.000016

Table 5-4
Remedial Investigation Chemical Analytical Results - Groundwater COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Monitoring Well ¹	Analytical Method	Units	MW-18	MW-19	MW-19	MW-19	MW-19	MW-19D	MW-19D	MW-19D	MW-19D	MW-20	MW-20	MW-20	Groundwater Preliminary Cleanup Level ³ (PCUL)
Sample Date			04/20/15	06/09/14	09/22/14	01/20/15	04/22/15	06/09/14	09/22/14	01/20/15	04/22/15	06/10/14	09/22/14	01/19/15	
Monitoring Event			Apr-15 (Dup)	Jun-14	Sep-14	Jan-15	Apr-15	Jun-14	Sep-14	Jan-15	Apr-15	Jun-14	Sep-14	Jan-15	
Sampled By			GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	
Other SVOCs (mg/kg)															
Aniline	EPA 8270	µg/L	0.10 U	0.94 U	0.10 U	0.11 U	0.10 U	0.95 U	0.10 U	0.11 U	0.10 U	0.97 U	0.10 U	0.10 U	7.7
Bis(2-chloroethyl)ether	EPA 8270	µg/L	0.10 U	0.94 U	0.10 U	0.11 U	0.10 U	0.95 U	0.10 U	0.11 U	0.10 U	0.97 U	0.10 U	0.10 U	0.06
Bis(2-ethylhexyl)phthalate	EPA 8270	µg/L	9.8	0.94 U	0.39 U	0.77 U	0.69 U	0.95 U	0.17 U	0.98 U	0.46 U	0.97 U	0.28 U	0.59 U	0.046
Butyl Benzyl Phthalate	EPA 8270	µg/L	11	0.94 U	0.10 U	0.11 U	0.10 U	0.95 U	0.10 U	0.11 U	0.10 U	0.97 U	0.10 U	0.10 U	0.013
2,4-Dichlorophenol	EPA 8270	µg/L	0.10 U	0.94 U	0.10 U	0.11 U	0.10 U	0.95 U	0.10 U	0.11 UJ	0.10 U	0.97 U	0.10 U	0.10 U	10
Diethyl phthalate	EPA 8270	µg/L	0.10 U	0.94 U	0.10 U	0.11 U	0.10 U	0.95 U	0.10 U	0.11 U	0.10 U	0.97 U	0.10 U	0.12	93
2,4-Dimethylphenol	EPA 8270	µg/L	2.5	0.94 U	0.10 U	0.11 U	0.10 U	0.95 U	0.10 U	0.11 UJ	0.10 U	0.97 U	0.10 U	0.10 U	6.30
2-Methylphenol (o-Cresol)	EPA 8270	µg/L	0.10 U	0.94 U	0.10 U	0.11 U	0.10 U	0.95 U	0.10 U	0.11 U	0.10 U	0.97 U	0.10 U	0.10 U	27
n-Nitrosodimethylamine	EPA 8270	µg/L	0.10 U	0.94 U	0.10 U	0.11 U	0.10 U	0.95 U	0.10 U	0.11 U	0.10 U	0.97 U	0.10 U	0.10 U	0.34
n-Nitrosodiphenylamine (as Diphenylamine)	EPA 8270	µg/L	0.10 U	0.94 U	0.10 U	0.11 U	0.10 U	0.95 U	0.10 U	0.11 U	0.10 U	0.97 U	0.10 U	0.10 U	0.69
n-Nitrosodi-n-propylamine	EPA 8270	µg/L	0.10 U	0.94 U	0.10 U	0.11 U	0.10 U	0.95 U	0.10 U	0.11 U	0.10 U	0.97 U	0.10 U	0.10 U	0.058
Pentachlorophenol	EPA 8270	µg/L	0.50 U	0.94 U	0.50 U	0.55 U	0.50 U	0.95 U	0.50 U	0.53 UJ	0.50 U	0.97 U	0.50 U	0.50 U	0.002
Phenol	EPA 8270	µg/L	0.10 U	0.94 U	0.10 U	0.11 U	0.10 U	0.95 U	0.10 U	0.11 UJ	0.10 U	0.97 U	0.10 U	0.10 U	370
2,4,6-Trichlorophenol	EPA 8270	µg/L	0.11	0.94 U	0.10 U	0.11 U	0.10 U	0.95 U	0.10 U	0.11 UJ	0.10 U	0.97 U	0.10 U	0.10 U	0.28
Volatile Organic Compounds (VOCs)															
Benzene	EPA 8260	µg/L	1.0 U	--	0.20 U	0.20 U	0.20 U	--	0.20 U	0.20 U	0.20 U	--	--	--	1.6
Chloroform	EPA 8260	µg/L	1.0 U	--	0.20 U	0.20 U	0.20 U	--	0.20 U	0.20 U	0.20 U	--	--	--	1.2
Petroleum Hydrocarbons															
Gasoline-range hydrocarbons	NWTPH-G	µg/L	100 U	100 U	100 U	100 U	100 U	--	--	--	--	100 U	100 U	100 U	800
Diesel-range hydrocarbons	NWTPH-Dx	µg/L	11,000	370	620	250 U	400	--	210 U	270	250 U	380	250	320	500
Oil-range hydrocarbons	NWTPH-Dx	µg/L	14,000	670	960	420	670	--	410	400	440	800	410	570	500
Total diesel- and oil-range hydrocarbons	NWTPH-Dx	µg/L	25,000	1,040	1,580	420	1,070	--	410	670	440	1,180	660	890	500
Diesel-range hydrocarbons	NWTPH-Dx Si/Gel	µg/L	--	--	--	--	--	--	--	--	--	--	250 U	250 U	500
Oil-range hydrocarbons	NWTPH-Dx Si/Gel	µg/L	--	--	--	--	--	--	--	--	--	--	400 U	400 U	500
Total diesel- and oil-range hydrocarbons	NWTPH-Dx Si/Gel	µg/L	--	--	--	--	--	--	--	--	--	--	400 U	400 U	500
Conventional Parameters															
Total organic carbon (TOC)	SM 5310B	mg/L	870	--	--	--	--	--	--	--	--	--	5.3	7.3	NE
Field Measured Parameters															
pH	N/A	N/A	8.91	7.09	6.67	6.18	6.85	6.97	6.67	6.51	6.70	6.52	6.73	5.97	NE

Notes:

¹ Monitoring well locations are shown on Figures 3-2 and 3-4.

² Insufficient water to collect groundwater sample for chemical analysis.

³ Groundwater screening levels referenced from Table 4-2.

⁴ Total dioxin/furan Toxic Equivalency Quotients (TEQs) were calculated using United States Environmental Protection Agency (USEPA) Toxicity Equivalency Factor (TEF) values for human health (EPA 2003).

⁵ Total carcinogenic PAH (cPAH) TEQs were calculated using TEF values referenced from MTCA Table 708.2 (WAC 173-340-900).

mg/L = milligram per liter

µg/L = microgram per liter

NE = not established

Landau = Landau Associates

GEI = GeoEngineers

Bold indicates analyte was detected.

Yellow shading identifies the detected results greater than the preliminary cleanup level.

Blue shading identifies the non-detected result greater than the preliminary cleanup level.

NE = not established

J = estimated result

U = analyte not detected above the reporting limit

-- = not analyzed

COPC = Contaminant of Potential Concern

Table 5-4
Remedial Investigation Chemical Analytical Results - Groundwater COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Monitoring Well ¹	Analytical Method	Units	MW-20	MW-20	GMW-3S	GMW-3S	GMW-3S	GMW-3S	GMW-3S	GMW-3S	GMW-3D	GMW-3D	GMW-3D	GMW-3D	Groundwater Preliminary Cleanup Level ³ (PCUL)
Sample Date			04/21/15	03/17/17	03/23/09	04/28/10	10/28/10	04/27/11	12/01/11	04/27/12	03/23/09	04/28/10	10/28/10	04/27/11	
Monitoring Event			Apr-15	Mar-17	Mar-09	Apr-10	Oct-10	Apr-11	Dec-11	Apr-12	Mar-09	Apr-10	Oct-10	Apr-11	
Sampled By			GEI	Ecology	ERM	ERM	ERM	ERM	ERM	ERM	ERM	ERM	ERM	ERM	
Polychlorinated Biphenyls (PCBs)															
Total PCB Aroclors	EPA 8082	µg/L	--	0.010 U	--	--	--	--	--	--	--	--	--	--	0.000007
Total PCB Congeners	EPA 1668	µg/L	--	0.0046 J	--	--	--	--	--	--	--	--	--	--	0.000007
Dioxins and Furans															
Total Dioxin/Furan TEQ ⁺ (ND=0RL)	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	0.0000000051
Total Dioxin/Furan TEQ ⁺ (ND=0.5RL)	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	0.0000000051
Total Metals															
Arsenic	EPA 200.8/7470	µg/L	4.4	--	604	445	546	480	414	387	55	31.1	34.8	35.6	8.0
Barium	EPA 200.8/7470	µg/L	21	--	--	--	--	--	--	--	--	--	--	--	200
Cadmium	EPA 200.8/7470	µg/L	0.20 U	--	--	--	--	0.1 U	0.10 U	0.1	--	--	--	--	1.2
Chromium III / Total	EPA 200.8/7470	µg/L	2.0 U	--	0.5 U	0.64	0.77	0.5 U	1.00 U	0.5 U	3.7	3.7	4.4	3.1	27
Chromium VI	EPA 200.8/7470	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	50
Copper	EPA 200.8/7470	µg/L	190	--	0.584 J	2	4.7	2	2	0.9	0.59 J	0.20 U	0.25 J	0.7	3.1
Lead	EPA 200.8/7470	µg/L	1.0 U	--	--	--	--	0.1 U	0.10 U	0.1 U	--	--	--	--	8.1
Mercury	EPA 200.8/7470	µg/L	0.50 U	--	--	--	--	0.10 U	0.10 U	0.10 U	--	--	--	--	0.025
Nickel	EPA 200.8/7470	µg/L	33	--	--	--	--	0.8	1	0.5 J	--	--	--	--	8.2
Silver	EPA 200.8/7470	µg/L	1.0 U	--	0.085 U	0.071 UJ	0.071 UJ	0.2 U	3.0 U	0.2 U	0.085 U	0.071 UJ	0.071 UJ	0.2 U	1.9
Thallium	EPA 200.8/7470	µg/L	2.0 U	--	--	--	--	0.2 U	0.20 U	0.2 U	--	--	--	--	0.062
Zinc	EPA 200.8/7470	µg/L	56 U	--	10 UJ	5.00 U	1.30 U	4.0 U	10.0 U	4.0 U	9.40 J	5.00 U	1.30 U	4.0 U	81
Dissolved Metals															
Arsenic	EPA 200.8/7470	µg/L	3.5	--	601	442	574	460	412	383	54.2	31.1	35.6	39.4	8.0
Barium	EPA 200.8/7470	µg/L	20	--	--	--	--	--	--	--	--	--	--	--	200
Cadmium	EPA 200.8/7470	µg/L	0.20 U	--	--	--	--	0.1 U	0.10 U	0.1 U	--	--	--	--	1.2
Chromium III / Total	EPA 200.8/7470	µg/L	2.0 U	--	0.37 J	0.62	0.83	0.5 U	1.00 U	0.5 U	3.5	3.3	4.1	3.4	27
Copper	EPA 200.8/7470	µg/L	2.0 U	--	2 UJ	0.20 U	1.1	0.5 U	2.0 U	0.9	0.48 J	0.20 U	0.20 U	0.5 U	3.1
Lead	EPA 200.8/7470	µg/L	1.0 U	--	--	--	--	0.1 U	0.10 U	0.1 U	--	--	--	--	8.1
Mercury	EPA 200.8/7470	µg/L	0.50 U	--	--	--	--	0.10 U	0.10 U	0.10 U	--	--	--	--	0.025
Nickel	EPA 200.8/7470	µg/L	2.3	--	--	--	--	0.8	0.9	0.6	--	--	--	--	8.2
Silver	EPA 200.8/7470	µg/L	1.0 U	--	1 U	0.071 U	0.071 UJ	0.2 U	3.0 UJ	0.2 U	0.028 U	0.071 U	0.071 UJ	0.2 U	1.9
Thallium	EPA 200.8/7470	µg/L	2.0 U	--	--	--	--	0.2 U	0.20 U	0.2 U	--	--	--	--	0.062
Zinc	EPA 200.8/7470	µg/L	56 U	--	10 UJ	3.10 J	1.30 U	4.0 U	10.0 U	4.0 U	3.10 J	5.00 U	1.30 U	4.0 U	81
Semi-Volatile Organic Compounds (SVOCs) - Polycyclic Aromatic Hydrocarbons (PAHs)															
Acenaphthene	EPA 8270/SIM	µg/L	0.10 U	--	--	--	--	--	--	--	--	--	--	--	5.3
Anthracene	EPA 8270/SIM	µg/L	0.10 U	--	--	--	--	--	--	--	--	--	--	--	2.1
Benzo(a)anthracene	EPA 8270/SIM	µg/L	0.010 U	--	--	--	--	--	--	--	--	--	--	--	0.00016
Benzo(b)fluoranthene	EPA 8270/SIM	µg/L	0.010 U	--	--	--	--	--	--	--	--	--	--	--	0.00016
Benzo(j,k)fluoranthene	EPA 8270/SIM	µg/L	0.010 U	--	--	--	--	--	--	--	--	--	--	--	0.0016
Benzo(a)pyrene	EPA 8270/SIM	µg/L	0.010 U	--	--	--	--	--	--	--	--	--	--	--	0.000016
Chrysene	EPA 8270/SIM	µg/L	0.010 U	--	--	--	--	--	--	--	--	--	--	--	0.016
Dibenzo(a,h)anthracene	EPA 8270/SIM	µg/L	0.010 U	--	--	--	--	--	--	--	--	--	--	--	0.000016
Fluoranthene	EPA 8270/SIM	µg/L	0.10 U	--	--	--	--	--	--	--	--	--	--	--	1.8
Fluorene	EPA 8270/SIM	µg/L	0.10 U	--	--	--	--	--	--	--	--	--	--	--	3.7
Indeno(1,2,3-c,d)pyrene	EPA 8270/SIM	µg/L	0.010 U	--	--	--	--	--	--	--	--	--	--	--	0.00016
1-Methylnaphthalene	EPA 8270/SIM	µg/L	0.10 U	--	--	--	--	--	--	--	--	--	--	--	1.5
Naphthalene	EPA 8270/SIM	µg/L	0.10 U	--	--	--	--	--	--	--	--	--	--	--	1.4
Pyrene	EPA 8270/SIM	µg/L	0.10 U	--	--	--	--	--	--	--	--	--	--	--	2
Total cPAH TEQ ⁵ (ND=0)	EPA 8270/SIM	µg/L	0 U	--	--	--	--	--	--	--	--	--	--	--	0.000016
Total cPAH TEQ ⁵ (ND=0.5RL)	EPA 8270/SIM	µg/L	0.0076 U	--	--	--	--	--	--	--	--	--	--	--	0.000016

Table 5-4
Remedial Investigation Chemical Analytical Results - Groundwater COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Monitoring Well ¹	Analytical Method	Units	MW-20	MW-20	GMW-3S	GMW-3S	GMW-3S	GMW-3S	GMW-3S	GMW-3S	GMW-3D	GMW-3D	GMW-3D	GMW-3D	Groundwater Preliminary Cleanup Level ³ (PCUL)	
Sample Date			04/21/15	03/17/17	03/23/09	04/28/10	10/28/10	04/27/11	12/01/11	04/27/12	03/23/09	04/28/10	10/28/10	04/27/11		
Monitoring Event			Apr-15	Mar-17	Mar-09	Apr-10	Oct-10	Apr-11	Dec-11	Apr-12	Mar-09	Apr-10	Oct-10	Apr-11		
Sampled By			GEI	Ecology	ERM	ERM	ERM	ERM	ERM	ERM	ERM	ERM	ERM	ERM		
Other SVOCs (mg/kg)																
Aniline	EPA 8270	µg/L	0.10 U	--	--	--	--	--	--	--	--	--	--	--	7.7	
Bis(2-chloroethyl)ether	EPA 8270	µg/L	0.10 U	--	--	--	--	--	--	--	--	--	--	--	0.06	
Bis(2-ethylhexyl)phthalate	EPA 8270	µg/L	0.70 U	--	--	--	--	--	--	--	--	--	--	--	0.046	
Butyl Benzyl Phthalate	EPA 8270	µg/L	0.10 U	--	--	--	--	--	--	--	--	--	--	--	0.013	
2,4-Dichlorophenol	EPA 8270	µg/L	0.10 U	--	0.29 U	0.38 U	0.38 U	2.6 UJ	2.6 U	2.6 U	0.29 U	0.39 U	0.38 UJ	2.6 UJ	10	
Diethyl phthalate	EPA 8270	µg/L	0.10 U	--	--	--	--	--	--	--	--	--	--	--	93	
2,4-Dimethylphenol	EPA 8270	µg/L	0.10 U	--	--	--	--	--	--	--	--	--	--	--	6.30	
2-Methylphenol (o-Cresol)	EPA 8270	µg/L	0.10 U	--	--	--	--	--	--	--	--	--	--	--	27	
n-Nitrosodimethylamine	EPA 8270	µg/L	0.10 U	--	--	--	--	--	--	--	--	--	--	--	0.34	
n-Nitrosodiphenylamine (as Diphenylamine)	EPA 8270	µg/L	0.10 U	--	--	--	--	--	--	--	--	--	--	--	0.69	
n-Nitrosodi-n-propylamine	EPA 8270	µg/L	0.10 U	--	--	--	--	--	--	--	--	--	--	--	0.058	
Pentachlorophenol	EPA 8270	µg/L	0.50 U	--	0.68 U	0.44 U	0.44 U	2.4 UJ	2.4 U	0.085 U	0.68 U	0.45 U	0.44 UJ	2.4 UJ	0.002	
Phenol	EPA 8270	µg/L	0.10 U	--	0.53 U	0.12 U	0.12 U	0.50 U	0.50 U	0.50 U	0.53 U	0.13 U	0.12 UJ	0.50 UJ	370	
2,4,6-Trichlorophenol	EPA 8270	µg/L	0.10 U	--	0.3 U	0.19 U	0.19 U	2.4 UJ	2.4 U	2.4 U	0.30 U	0.20 U	0.19 UJ	2.4 UJ	0.28	
Volatile Organic Compounds (VOCs)																
Benzene	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	1.6	
Chloroform	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	1.2	
Petroleum Hydrocarbons																
Gasoline-range hydrocarbons	NWTPH-G	µg/L	100 U	--	--	--	--	--	--	--	--	--	--	--	800	
Diesel-range hydrocarbons	NWTPH-Dx	µg/L	250 U	--	--	--	--	--	--	--	--	--	--	--	500	
Oil-range hydrocarbons	NWTPH-Dx	µg/L	580	--	--	--	--	--	--	--	--	--	--	--	500	
Total diesel- and oil-range hydrocarbons	NWTPH-Dx	µg/L	580	--	--	--	--	--	--	--	--	--	--	--	500	
Diesel-range hydrocarbons	NWTPH-Dx Si/Gel	µg/L	250 U	--	--	--	--	--	--	--	--	--	--	--	500	
Oil-range hydrocarbons	NWTPH-Dx Si/Gel	µg/L	400 U	--	--	--	--	--	--	--	--	--	--	--	500	
Total diesel- and oil-range hydrocarbons	NWTPH-Dx Si/Gel	µg/L	400 U	--	--	--	--	--	--	--	--	--	--	--	500	
Conventional Parameters																
Total organic carbon (TOC)	SM 5310B	mg/L	4.3	--	--	--	--	--	--	--	--	--	--	--	NE	
Field Measured Parameters																
pH	N/A	N/A	6.56	--	8.65	6.16	6.38	6.45	6.26	5.77	8.68	5.95	6.3	6.38	NE	

Notes:

¹ Monitoring well locations are shown on Figures 3-2 and 3-4.

² Insufficient water to collect groundwater sample for chemical analysis.

³ Groundwater screening levels referenced from Table 4-2.

⁴ Total dioxin/furan Toxic Equivalency Quotients (TEQs) were calculated using United States Environmental Protection Agency (USEPA) TEF values for human health (EPA 2003).

⁵ Total carcinogenic PAH (cPAH) TEQs were calculated using Toxicity Equivalency Factors (TEFs) values referenced from MTCA Table 708.2 (WAC 173-340-900).

mg/L = milligram per liter

µg/L = microgram per liter

NE = not established

Landau = Landau Associates

GEI = GeoEngineers

Bold indicates analyte was detected.

Yellow shading identifies the detected results greater than the preliminary cleanup level.

Blue shading identifies the non-detected result greater than the preliminary cleanup level.

NE = not established

J = estimated result

U = analyte not detected above the reporting limit

-- = not analyzed

COPC = Contaminant of Potential Concern

Table 5-4
Remedial Investigation Chemical Analytical Results - Groundwater COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Monitoring Well ¹	Analytical Method	Units	GMW-3D	GMW-3D	GMW-18	GMW-18	GMW-18	GMW-18	GMW-18	GMW-18	GMW-18	GMW-18	GMW-20	GMW-20	GMW-20	Groundwater Preliminary Cleanup Level ³ (PCUL)
Sample Date			12/01/11	04/27/12	03/26/09	04/29/10	10/27/10	04/27/11	11/30/11	11/30/11	04/26/12	03/26/09	04/28/10	10/25/10		
Monitoring Event			Dec-11	Apr-12	Mar-09	Apr-10	Oct-10	Apr-11	Nov-11	Nov-11 (Dup)	Apr-12	Mar-09	Apr-10	Oct-10		
Sampled By			ERM	ERM	ERM	ERM	ERM	ERM	ERM	ERM	ERM	ERM	ERM	ERM		
Polychlorinated Biphenyls (PCBs)																
Total PCB Aroclors	EPA 8082	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	0.000007	
Total PCB Congeners	EPA 1668	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	0.000007	
Dioxins and Furans																
Total Dioxin/Furan TEQ ⁺ (ND=0RL)	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	0.0000000051	
Total Dioxin/Furan TEQ ⁺ (ND=0.5RL)	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	0.0000000051	
Total Metals																
Arsenic	EPA 200.8/7470	µg/L	34.8	27.7	4.11	10.3	8.4	11.4	3.6	--	6.2	1,490	2,000	1,340	8.0	
Barium	EPA 200.8/7470	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	200	
Cadmium	EPA 200.8/7470	µg/L	--	--	--	--	--	0.1 U	0.10 U	0.10 U	0.1 U	--	--	--	1.2	
Chromium III / Total	EPA 200.8/7470	µg/L	5.0 U	3.9	--	--	--	0.9	0.50 U	0.5	0.6	--	--	--	27	
Chromium VI	EPA 200.8/7470	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	50	
Copper	EPA 200.8/7470	µg/L	2.0 U	0.9	--	--	--	1.7	2.0 U	2.0 U	1.9	--	--	--	3.1	
Lead	EPA 200.8/7470	µg/L	--	--	--	--	--	0.1 U	0.10 U	0.10 U	0.1 U	--	--	--	8.1	
Mercury	EPA 200.8/7470	µg/L	--	--	--	--	--	0.10 U	0.10 U	0.10 U	0.10 U	--	--	--	0.025	
Nickel	EPA 200.8/7470	µg/L	--	--	--	--	--	1.2	0.7	0.7	9.2 J	--	--	--	8.2	
Silver	EPA 200.8/7470	µg/L	3.0 U	0.2 U	--	--	--	0.2 U	3.0 U	3.0 U	0.2 U	--	--	--	1.9	
Thallium	EPA 200.8/7470	µg/L	--	--	--	--	--	0.2 U	0.20 U	0.20 U	0.2 U	--	--	--	0.062	
Zinc	EPA 200.8/7470	µg/L	10.0 U	4.0 U	--	--	--	4.0 U	10.0 U	10.0 U	4.0 U	--	--	--	81	
Dissolved Metals																
Arsenic	EPA 200.8/7470	µg/L	35.8	28.1	3.7	9.5	8	13.1	4	--	5.9	1,430	1,760	1,350	8.0	
Barium	EPA 200.8/7470	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	200	
Cadmium	EPA 200.8/7470	µg/L	--	--	--	--	--	0.1 U	0.10 U	0.10 U	0.1 U	--	--	--	1.2	
Chromium III / Total	EPA 200.8/7470	µg/L	4	3.9	--	--	--	0.8	0.50 U	0.50 U	0.5 U	--	--	--	27	
Copper	EPA 200.8/7470	µg/L	2.0 U	0.6	--	--	--	1	2.0 U	2.0 U	1.7	--	--	--	3.1	
Lead	EPA 200.8/7470	µg/L	--	--	--	--	--	0.1 U	0.10 U	0.10 U	0.1 U	--	--	--	8.1	
Mercury	EPA 200.8/7470	µg/L	--	--	--	--	--	0.10 U	0.10 U	0.10 U	0.10 U	--	--	--	0.025	
Nickel	EPA 200.8/7470	µg/L	--	--	--	--	--	2.7 J	0.6	0.50 U	0.5 U	--	--	--	8.2	
Silver	EPA 200.8/7470	µg/L	3.0 U	0.2 U	--	--	--	0.2 U	3.0 UJ	3.0 U	0.2 U	--	--	--	1.9	
Thallium	EPA 200.8/7470	µg/L	--	--	--	--	--	0.2 U	0.20 U	0.20 U	0.2 U	--	--	--	0.062	
Zinc	EPA 200.8/7470	µg/L	10.0 U	4.0 U	--	--	--	4.0 U	10.0 U	10.0 U	4.0 U	--	--	--	81	
Semi-Volatile Organic Compounds (SVOCs) - Polycyclic Aromatic Hydrocarbons (PAHs)																
Acenaphthene	EPA 8270/SIM	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	5.3	
Anthracene	EPA 8270/SIM	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	2.1	
Benzo(a)anthracene	EPA 8270/SIM	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	0.00016	
Benzo(b)fluoranthene	EPA 8270/SIM	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	0.00016	
Benzo(j,k)fluoranthene	EPA 8270/SIM	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	0.0016	
Benzo(a)pyrene	EPA 8270/SIM	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	0.000016	
Chrysene	EPA 8270/SIM	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	0.016	
Dibenzo(a,h)anthracene	EPA 8270/SIM	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	0.000016	
Fluoranthene	EPA 8270/SIM	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	1.8	
Fluorene	EPA 8270/SIM	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	3.7	
Indeno(1,2,3-c,d)pyrene	EPA 8270/SIM	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	0.00016	
1-Methylnaphthalene	EPA 8270/SIM	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	1.5	
Naphthalene	EPA 8270/SIM	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	1.4	
Pyrene	EPA 8270/SIM	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	2	
Total cPAH TEQ ⁵ (ND=0)	EPA 8270/SIM	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	0.000016	
Total cPAH TEQ ⁵ (ND=0.5RL)	EPA 8270/SIM	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	0.000016	

Table 5-4
Remedial Investigation Chemical Analytical Results - Groundwater COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Monitoring Well ¹	Analytical Method	Units	GMW-3D	GMW-3D	GMW-18	GMW-18	GMW-18	GMW-18	GMW-18	GMW-18	GMW-18	GMW-20	GMW-20	GMW-20	Groundwater Preliminary Cleanup Level ³ (PCUL)	
Sample Date			12/01/11	04/27/12	03/26/09	04/29/10	10/27/10	04/27/11	11/30/11	11/30/11	04/26/12	03/26/09	04/28/10	10/25/10		
Monitoring Event			Dec-11	Apr-12	Mar-09	Apr-10	Oct-10	Apr-11	Nov-11	Nov-11 (Dup)	Apr-12	Mar-09	Apr-10	Oct-10		
Sampled By			ERM	ERM	ERM	ERM	ERM	ERM	ERM	ERM	ERM	ERM	ERM	ERM		
Other SVOCs (mg/kg)																
Aniline	EPA 8270	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	7.7	
Bis(2-chloroethyl)ether	EPA 8270	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	0.06	
Bis(2-ethylhexyl)phthalate	EPA 8270	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	0.046	
Butyl Benzyl Phthalate	EPA 8270	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	0.013	
2,4-Dichlorophenol	EPA 8270	µg/L	2.6 U	2.6 U	0.30 U	0.38 U	0.38 U	2.6 UJ	2.6 U	--	2.6 U	0.29 U	0.38 U	0.43 U	10	
Diethyl phthalate	EPA 8270	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	93	
2,4-Dimethylphenol	EPA 8270	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	6.30	
2-Methylphenol (o-Cresol)	EPA 8270	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	27	
n-Nitrosodimethylamine	EPA 8270	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	0.34	
n-Nitrosodiphenylamine (as Diphenylamine)	EPA 8270	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	0.69	
n-Nitrosodi-n-propylamine	EPA 8270	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	0.058	
Pentachlorophenol	EPA 8270	µg/L	2.4 U	0.085 U	0.68 U	0.44 U	0.44 U	2.4 UJ	2.4 U	--	0.085 U	0.68 U	0.44 U	0.50 U	0.002	
Phenol	EPA 8270	µg/L	0.50 U	0.50 U	0.53 U	0.12 U	0.12 U	0.50 U	0.50 U	--	0.50 U	0.53 U	0.12 U	0.14 U	370	
2,4,6-Trichlorophenol	EPA 8270	µg/L	2.4 U	2.4 U	0.31 U	0.19 U	0.19 U	2.4 UJ	2.4 U	--	2.4 U	0.30 U	0.19 U	0.22 U	0.28	
Volatile Organic Compounds (VOCs)																
Benzene	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	1.6	
Chloroform	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	1.2	
Petroleum Hydrocarbons																
Gasoline-range hydrocarbons	NWTPH-G	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	800	
Diesel-range hydrocarbons	NWTPH-Dx	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	500	
Oil-range hydrocarbons	NWTPH-Dx	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	500	
Total diesel- and oil-range hydrocarbons	NWTPH-Dx	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	500	
Diesel-range hydrocarbons	NWTPH-Dx Si/Gel	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	500	
Oil-range hydrocarbons	NWTPH-Dx Si/Gel	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	500	
Total diesel- and oil-range hydrocarbons	NWTPH-Dx Si/Gel	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	500	
Conventional Parameters																
Total organic carbon (TOC)	SM 5310B	mg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE	
Field Measured Parameters																
pH	N/A	N/A	6.31	5.73	9.4	6.54	7.04	6.58	6.57	6.57	6.08	9.69	6	--	NE	

Notes:

¹ Monitoring well locations are shown on Figures 3-2 and 3-4.

² Insufficient water to collect groundwater sample for chemical analysis.

³ Groundwater screening levels referenced from Table 4-2.

⁴ Total dioxin/furan Toxic Equivalency Quotients (TEQs) were calculated using United States Environmental Protection Agency (USEPA) Toxicity Equivalency Factor (TEF) values for human health (EPA 2003).

⁵ Total carcinogenic PAH (cPAH) TEQs were calculated using TEF values referenced from MTCA Table 708.2 (WAC 173-340-900).

mg/L = milligram per liter

µg/L = microgram per liter

NE = not established

Landau = Landau Associates

GEI = GeoEngineers

Bold indicates analyte was detected.

Yellow shading identifies the detected results greater than the preliminary cleanup level.

Blue shading identifies the non-detected result greater than the preliminary cleanup level.

NE = not established

J = estimated result

U = analyte not detected above the reporting limit

-- = not analyzed

COPC = Contaminant of Potential Concern

Table 5-4
Remedial Investigation Chemical Analytical Results - Groundwater COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Monitoring Well ¹	Analytical Method	Units	GMW-20	GMW-20	GMW-20	GMW-24	GMW-24	GMW-24	GMW-24	GMW-24	GMW-24	GMW-24	GMW-25	GMW-25	GMW-25	Groundwater Preliminary Cleanup Level ³ (PCUL)
Sample Date			04/27/11	11/30/2011	4/26/2012	03/25/09	04/28/10	10/25/10	04/27/11	11/30/11	04/25/12	11/5/2009	06/11/14	09/25/14		
Monitoring Event			Apr-11	Nov-11	Apr-12	Mar-09	Apr-10	Oct-10	Apr-11	Nov-11	Apr-12	Nov-09	Jun-14	Sep-14		
Sampled By			ERM	ERM	ERM	ERM	ERM	ERM	ERM	ERM	ERM	Landau	GEI	GEI		
Polychlorinated Biphenyls (PCBs)																
Total PCB Aroclors	EPA 8082	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	0.000007
Total PCB Congeners	EPA 1668	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	0.000007
Dioxins and Furans																
Total Dioxin/Furan TEQ ⁺ (ND=0RL)	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	0.0000000051
Total Dioxin/Furan TEQ ⁺ (ND=0.5RL)	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	0.0000000051
Total Metals																
Arsenic	EPA 200.8/7470	µg/L	1,080	2,770	957	0.595	0.36 J	0.15 J	0.7	0.20 U	0.4	1,400	1,100	990		8.0
Barium	EPA 200.8/7470	µg/L	--	--	--	--	--	--	--	--	--	--	5.0 U	5.0 U		200
Cadmium	EPA 200.8/7470	µg/L	0.1 U	0.2	0.1 U	--	--	--	0.1 U	0.10 U	0.1 U	4.4 U	0.20 U	0.20 U		1.2
Chromium III / Total	EPA 200.8/7470	µg/L	0.5 U	0.50 U	0.5 U	--	--	--	0.5 U	1.00 U	0.5 U	2 U	2.0 U	2.0 U		27
Chromium VI	EPA 200.8/7470	µg/L	--	--	--	--	--	--	--	--	--	10 UJ	--	--		50
Copper	EPA 200.8/7470	µg/L	1.3	3	0.8	--	--	--	0.6	2.0 U	0.5 U	1.5	2.0 U	2.0 U		3.1
Lead	EPA 200.8/7470	µg/L	0.1 U	0.10 U	0.1 U	--	--	--	0.1 U	0.10 U	0.1 U	1 U	1.0 U	1.0 U		8.1
Mercury	EPA 200.8/7470	µg/L	0.10 U	0.10 U	0.10 U	--	--	--	0.10 U	0.10 U	0.10 U	0.1 U	0.50 U	0.50 U		0.025
Nickel	EPA 200.8/7470	µg/L	0.9	1.5	2.9	--	--	--	0.8	1.1	1.1 J	22 U	2.0 U	2.0 U		8.2
Silver	EPA 200.8/7470	µg/L	0.2 U	3.0 U	0.2 U	--	--	--	0.2 U	3.0 U	0.2 U	11 U	1.0 U	1.0 U		1.9
Thallium	EPA 200.8/7470	µg/L	0.2 U	0.20 U	0.2 U	--	--	--	0.2 U	0.20 U	0.2 U	5.6 U	2.0 U	2.0 U		0.062
Zinc	EPA 200.8/7470	µg/L	4.0 U	10.0 U	6	--	--	--	4.0 U	10.0 U	4.0 U	19	56 U	56 U		81
Dissolved Metals																
Arsenic	EPA 200.8/7470	µg/L	1,080	2600	869	0.501	0.32 J	0.12 J	0.7	0.2	0.3 J	1,200	1,000	1,000 J		8.0
Barium	EPA 200.8/7470	µg/L	--	--	--	--	--	--	--	--	--	--	5.0 U	5.0 U		200
Cadmium	EPA 200.8/7470	µg/L	0.1 U	0.10 U	0.1 U	--	--	--	0.1 U	0.10 U	0.1 U	4 U	0.20 U	0.20 U		1.2
Chromium III / Total	EPA 200.8/7470	µg/L	1.0 U	0.50 U	0.5 U	--	--	--	0.5 U	0.50 U	0.5 U	2 U	2.0 U	2.0 U		27
Copper	EPA 200.8/7470	µg/L	0.8	2.0 U	0.5	--	--	--	0.6	2.0 U	0.8	1 U	2.0 U	2.0 U		3.1
Lead	EPA 200.8/7470	µg/L	0.1 U	0.10 U	0.1 U	--	--	--	0.1 U	0.10 U	0.1 U	1 U	1.0 U	1.0 U		8.1
Mercury	EPA 200.8/7470	µg/L	0.10 U	0.10 U	0.10 U	--	--	--	0.10 U	0.10 U	0.10 U	0.1 U	0.50 U	0.50 U		0.025
Nickel	EPA 200.8/7470	µg/L	1.4	0.5	1.2	--	--	--	0.5 U	0.7	0.7	20 U	2.0 U	2.0 U		8.2
Silver	EPA 200.8/7470	µg/L	0.2 U	3.0 UJ	0.2 U	--	--	--	0.2 U	3.0 UJ	0.2 U	10 U	1.0 U	1.0 U		1.9
Thallium	EPA 200.8/7470	µg/L	0.2 U	0.20 U	0.2 U	--	--	--	0.2 U	0.20 U	0.2 U	5 U	2.0 U	2.0 U		0.062
Zinc	EPA 200.8/7470	µg/L	4.0 U	10.0 U	5	--	--	--	4.0 U	10.0 U	4.0 U	5 U	56 U	56 U		81
Semi-Volatile Organic Compounds (SVOCs) - Polycyclic Aromatic Hydrocarbons (PAHs)																
Acenaphthene	EPA 8270/SIM	µg/L	--	--	--	--	--	--	--	--	--	0.1 U	0.49 U	0.10 U		5.3
Anthracene	EPA 8270/SIM	µg/L	--	--	--	--	--	--	--	--	--	0.1 U	0.49 U	0.10 U		2.1
Benzo(a)anthracene	EPA 8270/SIM	µg/L	--	--	--	--	--	--	--	--	--	0.01 U	0.068	0.010 U		0.00016
Benzo(b)fluoranthene	EPA 8270/SIM	µg/L	--	--	--	--	--	--	--	--	--	0.01 U	0.049 U	0.010 U		0.00016
Benzo(j,k)fluoranthene	EPA 8270/SIM	µg/L	--	--	--	--	--	--	--	--	--	0.01 U	0.049 U	0.010 U		0.0016
Benzo(a)pyrene	EPA 8270/SIM	µg/L	--	--	--	--	--	--	--	--	--	0.01 U	0.049 U	0.010 U		0.000016
Chrysene	EPA 8270/SIM	µg/L	--	--	--	--	--	--	--	--	--	0.01 U	0.049 U	0.010 U		0.016
Dibenzo(a,h)anthracene	EPA 8270/SIM	µg/L	--	--	--	--	--	--	--	--	--	0.01 U	0.049 U	0.010 U		0.000016
Fluoranthene	EPA 8270/SIM	µg/L	--	--	--	--	--	--	--	--	--	0.1 U	0.49 U	0.10 U		1.8
Fluorene	EPA 8270/SIM	µg/L	--	--	--	--	--	--	--	--	--	0.1 U	0.49 U	0.10 U		3.7
Indeno(1,2,3-c,d)pyrene	EPA 8270/SIM	µg/L	--	--	--	--	--	--	--	--	--	0.01 U	0.049 U	0.010 U		0.00016
1-Methylnaphthalene	EPA 8270/SIM	µg/L	--	--	--	--	--	--	--	--	--	0.1 U	0.49 U	0.10 U		1.5
Naphthalene	EPA 8270/SIM	µg/L	--	--	--	--	--	--	--	--	--	0.1 U	0.49 U	0.10 U		1.4
Pyrene	EPA 8270/SIM	µg/L	--	--	--	--	--	--	--	--	--	0.1 U	0.49 U	0.10 U		2
Total cPAH TEQ ⁵ (ND=0)	EPA 8270/SIM	µg/L	--	--	--	--	--	--	--	--	--	0 U	0.0068	0 U		0.000016
Total cPAH TEQ ⁵ (ND=0.5RL)	EPA 8270/SIM	µg/L	--	--	--	--	--	--	--	--	--	0.0076 U	0.0410	0.0076 U		0.000016

Table 5-4
Remedial Investigation Chemical Analytical Results - Groundwater COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Monitoring Well ¹	Analytical Method	Units	GMW-20	GMW-20	GMW-20	GMW-24	GMW-24	GMW-24	GMW-24	GMW-24	GMW-24	GMW-24	GMW-25	GMW-25	GMW-25	Groundwater Preliminary Cleanup Level ³ (PCUL)
Sample Date			04/27/11	11/30/2011	4/26/2012	03/25/09	04/28/10	10/25/10	04/27/11	11/30/11	04/25/12	11/5/2009	06/11/14	09/25/14		
Monitoring Event			Apr-11	Nov-11	Apr-12	Mar-09	Apr-10	Oct-10	Apr-11	Nov-11	Apr-12	Nov-09	Jun-14	Sep-14		
Sampled By			ERM	ERM	ERM	ERM	ERM	ERM	ERM	ERM	ERM	Landau	GEI	GEI		
Other SVOCs (mg/kg)																
Aniline	EPA 8270	µg/L	--	--	--	--	--	--	--	--	--	5 U	0.97 U	0.10 U	7.7	
Bis(2-chloroethyl)ether	EPA 8270	µg/L	--	--	--	--	--	--	--	--	--	1 U	0.97 U	0.10 U	0.06	
Bis(2-ethylhexyl)phthalate	EPA 8270	µg/L	--	--	--	--	--	--	--	--	--	1 U	0.97 U	0.12 U	0.046	
Butyl Benzyl Phthalate	EPA 8270	µg/L	--	--	--	--	--	--	--	--	--	1 U	0.97 U	0.10 U	0.013	
2,4-Dichlorophenol	EPA 8270	µg/L	2.6 UJ	2.6 U	2.6 U	0.29 U	0.38 U	0.38 U	2.6 UJ	2.6 U	2.6 U	1 U	0.97 U	0.10 U	10	
Diethyl phthalate	EPA 8270	µg/L	--	--	--	--	--	--	--	--	--	1 U	0.97 U	0.10 U	93	
2,4-Dimethylphenol	EPA 8270	µg/L	--	--	--	--	--	--	--	--	--	1 U	0.97 U	0.10 U	6.30	
2-Methylphenol (o-Cresol)	EPA 8270	µg/L	--	--	--	--	--	--	--	--	--	1 U	0.97 U	0.10 U	27	
n-Nitrosodimethylamine	EPA 8270	µg/L	--	--	--	--	--	--	--	--	--	1 U	0.97 U	0.10 U	0.34	
n-Nitrosodiphenylamine (as Diphenylamine)	EPA 8270	µg/L	--	--	--	--	--	--	--	--	--	10 U	0.97 U	0.10 U	0.69	
n-Nitrosodi-n-propylamine	EPA 8270	µg/L	--	--	--	--	--	--	--	--	--	1 U	0.97 U	0.10 U	0.058	
Pentachlorophenol	EPA 8270	µg/L	2.4 UJ	2.4 U	0.085 U	0.67 U	0.43 U	0.43 U	2.4 UJ	2.4 U	0.085 U	5 U	0.97 U	0.50 U	0.002	
Phenol	EPA 8270	µg/L	0.50 U	0.50 U	0.50 U	0.52 U	0.12 U	0.12 U	0.50 U	0.50 U	0.50 U	1 U	0.97 U	0.10 U	370	
2,4,6-Trichlorophenol	EPA 8270	µg/L	2.4 UJ	2.4 U	2.4 U	0.30 U	0.19 U	0.19 U	2.4 UJ	2.4 U	2.4 U	1 U	0.97 U	0.10 U	0.28	
Volatile Organic Compounds (VOCs)																
Benzene	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	0.2 U	--	--	1.6	
Chloroform	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	0.2 U	--	--	1.2	
Petroleum Hydrocarbons																
Gasoline-range hydrocarbons	NWTPH-G	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	800	
Diesel-range hydrocarbons	NWTPH-Dx	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	500	
Oil-range hydrocarbons	NWTPH-Dx	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	500	
Total diesel- and oil-range hydrocarbons	NWTPH-Dx	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	500	
Diesel-range hydrocarbons	NWTPH-Dx Si/Gel	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	500	
Oil-range hydrocarbons	NWTPH-Dx Si/Gel	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	500	
Total diesel- and oil-range hydrocarbons	NWTPH-Dx Si/Gel	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	500	
Conventional Parameters																
Total organic carbon (TOC)	SM 5310B	mg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE	
Field Measured Parameters																
pH	N/A	N/A	6.59	6.3	5.75	8.45	5.76	6.23	6.24	6.03	6.77	6.26	6.45	6.65	NE	

Notes:

¹ Monitoring well locations are shown on Figures 3-2 and 3-4.

² Insufficient water to collect groundwater sample for chemical analysis.

³ Groundwater screening levels referenced from Table 4-2.

⁴ Total dioxin/furan Toxic Equivalency Quotients (TEQs) were calculated using United States Environmental Protection Agency (USEPA) Toxicity Equivalency Factor (TEF) values for human health (EPA 2003).

⁵ Total carcinogenic PAH (cPAH) TEQs were calculated using TEF values referenced from MTCA Table 708.2 (WAC 173-340-900).

mg/L = milligram per liter

µg/L = microgram per liter

NE = not established

Landau = Landau Associates

GEI = GeoEngineers

Bold indicates analyte was detected.

Yellow shading identifies the detected results greater than the preliminary cleanup level.

Blue shading identifies the non-detected result greater than the preliminary cleanup level.

NE = not established

J = estimated result

U = analyte not detected above the reporting limit

-- = not analyzed

COPC = Contaminant of Potential Concern

Table 5-4
Remedial Investigation Chemical Analytical Results - Groundwater COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Monitoring Well ¹	Analytical Method	Units	GMW-25	GMW-25	GMW-26	GMW-26	GMW-26	GMW-26	GMW-26	GMW-27	GMW-27	GMW-27	GMW-27	GMW-27	Groundwater Preliminary Cleanup Level ³ (PCUL)
Sample Date			01/21/15	04/21/15	11/5/2009	06/11/14	09/25/14	01/21/15	04/21/15	11/5/2009	06/12/14	09/24/14	01/22/15	04/20/15	
Monitoring Event			Jan-15	Apr-15	Nov-09	Jun-14	Sep-14	Jan-15	Apr-15	Nov-09	Jun-14	Sep-14	Jan-15	Apr-15	
Sampled By			GEI	GEI	Landau	GEI	GEI	GEI	GEI	Landau	GEI	GEI	GEI	GEI	
Polychlorinated Biphenyls (PCBs)															
Total PCB Aroclors	EPA 8082	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	0.000007
Total PCB Congeners	EPA 1668	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	0.000007
Dioxins and Furans															
Total Dioxin/Furan TEQ ⁺ (ND=ORL)	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	0.000000001 J	--	0.0000000051
Total Dioxin/Furan TEQ ⁺ (ND=0.5RL)	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	0.000000974 J	--	0.0000000051
Total Metals															
Arsenic	EPA 200.8/7470	µg/L	210	1,300	370	480	310	310	300	26	11	9.4	6.7	8.7	8.0
Barium	EPA 200.8/7470	µg/L	14	8.8	--	5.0 U	5.0 U	4.5	5.0 U	--	6.5	120	23	7.6	200
Cadmium	EPA 200.8/7470	µg/L	0.20 U	0.20 U	4.4 U	0.20 U	0.20 U	0.20 U	0.20 U	4.4 U	0.20 U	0.20 U	0.20 U	0.20 U	1.2
Chromium III / Total	EPA 200.8/7470	µg/L	2.0 U	2.0 U	2 U	2.0 U	2.0 U	2.0 U	2.0 U	5	2.0 U	2.0 U	2.0 U	2.0 U	27
Chromium VI	EPA 200.8/7470	µg/L	--	--	10 U	--	--	--	--	10 U	--	--	--	--	50
Copper	EPA 200.8/7470	µg/L	3	2.0 U	2.8	2.0 U	2.5	2.0 U	2.0 U	1 U	2.0 U	2.0 U	2.0 U	3.4	3.1
Lead	EPA 200.8/7470	µg/L	1.0 U	1.0 U	1 U	1.0 U	1.0 U	1.0 U	1.0 U	1.2	1.0 U	1.0 U	1.0 U	1.0 U	8.1
Mercury	EPA 200.8/7470	µg/L	0.50 U	0.50 U	0.1 U	0.50 U	0.50 U	0.50 U	0.50 U	0.1 U	0.50 U	0.50 U	0.50 U	0.50 U	0.025
Nickel	EPA 200.8/7470	µg/L	8	2.4	22 U	2.0 U	2.0 U	2.2	2.0 U	22 U	4.3	29	9.1	6.8	8.2
Silver	EPA 200.8/7470	µg/L	1.0 U	1.0 U	11 U	1.0 U	1.0 U	1.0 U	1.0 U	11 U	1.0 U	1.0 U	1.0 U	1.0 U	1.9
Thallium	EPA 200.8/7470	µg/L	2.0 U	2.0 U	5.6 U	2.0 U	2.0 U	2.0 U	2.0 U	5.6 U	2.0 U	2.0 U	2.0 U	2.0 U	0.062
Zinc	EPA 200.8/7470	µg/L	56 U	56 U	17	56 U	56 U	56 U	56 U	16	56 U	56 U	56 U	56 U	81
Dissolved Metals															
Arsenic	EPA 200.8/7470	µg/L	150	1,400	400	410	320 J	310	280	25	10	9.3	7	9.3	8.0
Barium	EPA 200.8/7470	µg/L	12	8.4	--	5.0 U	5.0 U	5.0 U	5.0 U	--	6	120	19	5.4	200
Cadmium	EPA 200.8/7470	µg/L	0.20 U	0.20 U	4 U	0.20 U	0.20 U	0.20 U	0.20 U	4 U	0.20 U	0.20 U	0.20 U	0.20 U	1.2
Chromium III / Total	EPA 200.8/7470	µg/L	2.0 U	2.0 U	2 U	2.0 U	2.0 U	2.0 U	2.0 U	8.3	2.0 U	2.0 U	2.0 U	2.0 U	27
Copper	EPA 200.8/7470	µg/L	2.2	2.0 U	1 U	2.0 U	2.0 U	2.0 U	2.0 U	1 U	2.0 U	2.0 U	2.0 U	2.0 U	3.1
Lead	EPA 200.8/7470	µg/L	1.0 U	1.0 U	1 U	1.0 U	1.0 U	1.0 U	1.0 U	1 U	1.0 U	1.0 U	1.0 U	1.0 U	8.1
Mercury	EPA 200.8/7470	µg/L	0.50 U	0.50 U	0.1 U	0.50 U	0.50 U	0.50 U	0.50 U	0.1 U	0.50 U	0.50 U	0.50 U	0.50 U	0.025
Nickel	EPA 200.8/7470	µg/L	7.8	2.3	20 U	2.0 U	2.0 U	2.0 U	2.0 U	20 U	4.2	32	7.9	4.9	8.2
Silver	EPA 200.8/7470	µg/L	1.0 U	1.0 U	10 U	1.0 U	1.0 U	1.0 U	1.0 U	10 U	1.0 U	1.0 U	1.0 U	1.0 U	1.9
Thallium	EPA 200.8/7470	µg/L	2.0 U	2.0 U	5 U	2.0 U	2.0 U	2.0 U	2.0 U	5 U	2.0 U	2.0 U	2.0 U	2.0 U	0.062
Zinc	EPA 200.8/7470	µg/L	56 U	56 U	5 U	56 U	56 U	56 U	56 U	5 U	56 U	56 U	56 U	56 U	81
Semi-Volatile Organic Compounds (SVOCs) - Polycyclic Aromatic Hydrocarbons (PAHs)															
Acenaphthene	EPA 8270/SIM	µg/L	0.10 U	0.10 U	0.1 U	0.48 U	0.10 U	0.10 U	0.10 U	0.1 U	0.48 U	0.10 U	0.10 UJ	0.10 U	5.3
Anthracene	EPA 8270/SIM	µg/L	0.10 U	0.10 U	0.1 U	0.48 U	0.10 U	0.10 U	0.10 U	0.1 U	0.48 U	0.10 U	0.10 UJ	0.10 U	2.1
Benzo(a)anthracene	EPA 8270/SIM	µg/L	0.010 U	0.010 U	0.01 U	0.048 U	0.010 U	0.010 U	0.010 U	0.01 U	0.048 U	0.010 U	0.010 UJ	0.010 U	0.00016
Benzo(b)fluoranthene	EPA 8270/SIM	µg/L	0.010 U	0.010 U	0.01 U	0.048 U	0.010 U	0.010 U	0.010 U	0.01 U	0.048 U	0.010 U	0.010 UJ	0.010 U	0.00016
Benzo(j,k)fluoranthene	EPA 8270/SIM	µg/L	0.010 U	0.010 U	0.01 U	0.048 U	0.010 U	0.010 U	0.010 U	0.01 U	0.048 U	0.010 U	0.010 UJ	0.010 U	0.0016
Benzo(a)pyrene	EPA 8270/SIM	µg/L	0.010 U	0.010 U	0.01 U	0.048 U	0.010 U	0.010 U	0.010 U	0.01 U	0.048 U	0.010 U	0.010 UJ	0.010 U	0.000016
Chrysene	EPA 8270/SIM	µg/L	0.010 U	0.010 U	0.01 U	0.048 U	0.010 U	0.010 U	0.010 U	0.01 U	0.048 U	0.010 U	0.010 UJ	0.010 U	0.016
Dibenzo(a,h)anthracene	EPA 8270/SIM	µg/L	0.010 U	0.010 U	0.01 U	0.048 U	0.010 U	0.010 U	0.010 U	0.01 U	0.048 U	0.010 U	0.010 UJ	0.010 U	0.000016
Fluoranthene	EPA 8270/SIM	µg/L	0.10 U	0.10 U	0.1 U	0.48 U	0.10 U	0.10 U	0.10 U	0.1 U	0.48 U	0.10 U	0.10 UJ	0.10 U	1.8
Fluorene	EPA 8270/SIM	µg/L	0.10 U	0.10 U	0.1 U	0.48 U	0.10 U	0.10 U	0.10 U	0.1 U	0.48 U	0.10 U	0.10 UJ	0.10 U	3.7
Indeno(1,2,3-c,d)pyrene	EPA 8270/SIM	µg/L	0.010 U	0.010 U	0.01 U	0.048 U	0.010 U	0.010 U	0.010 U	0.01 U	0.048 U	0.010 U	0.010 UJ	0.010 U	0.00016
1-Methylnaphthalene	EPA 8270/SIM	µg/L	0.10 U	0.10 U	0.1 U	0.48 U	0.10 U	0.10 U	0.10 U	0.1 U	0.48 U	0.10 U	0.10 UJ	0.10 U	1.5
Naphthalene	EPA 8270/SIM	µg/L	0.10 U	0.10 U	0.1 U	0.48 U	0.10 U	0.10 U	0.10 U	0.1 U	0.48 U	0.10 U	0.10 UJ	0.10 U	1.4
Pyrene	EPA 8270/SIM	µg/L	0.10 U	0.10 U	0.1 U	0.48 U	0.10 U	0.10 U	0.10 U	0.1 U	0.48 U	0.10 U	0.10 UJ	0.10 U	2
Total cPAH TEQ ⁵ (ND=0)	EPA 8270/SIM	µg/L	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0.000016
Total cPAH TEQ ⁵ (ND=0.5RL)	EPA 8270/SIM	µg/L	0.0076 U	0.0076 U	0.0076 U	0.036 U	0.0076 U	0.0076 U	0.0076 U	0.0076 U	0.036 U	0.0076 U	0.0076 U	0.0076 U	0.000016

Table 5-4
Remedial Investigation Chemical Analytical Results - Groundwater COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Monitoring Well ¹	Analytical Method	Units	GMW-25	GMW-25	GMW-26	GMW-26	GMW-26	GMW-26	GMW-26	GMW-27	GMW-27	GMW-27	GMW-27	GMW-27	Groundwater Preliminary Cleanup Level ³ (PCUL)	
Sample Date			01/21/15	04/21/15	11/5/2009	06/11/14	09/25/14	01/21/15	04/21/15	11/5/2009	06/12/14	09/24/14	01/22/15	04/20/15		
Monitoring Event			Jan-15	Apr-15	Nov-09	Jun-14	Sep-14	Jan-15	Apr-15	Nov-09	Jun-14	Sep-14	Jan-15	Apr-15		
Sampled By			GEI	GEI	Landau	GEI	GEI	GEI	GEI	Landau	GEI	GEI	GEI	GEI		
Other SVOCs (mg/kg)																
Aniline	EPA 8270	µg/L	0.10 U	0.10 U	5 U	0.95 U	0.10 U	0.10 U	0.10 U	5 U	0.96 U	0.10 U	0.10 UJ	0.10 U	7.7	
Bis(2-chloroethyl)ether	EPA 8270	µg/L	0.10 U	0.10 U	1 U	0.95 U	0.10 U	0.10 U	0.10 U	1 U	0.96 U	0.10 U	0.10 UJ	0.10 U	0.06	
Bis(2-ethylhexyl)phthalate	EPA 8270	µg/L	0.30 U	0.33 U	1 U	0.95 U	0.10 U	0.18 U	0.59 U	1 U	0.96 U	0.18 U	1.1 UJ	0.10 U	0.046	
Butyl Benzyl Phthalate	EPA 8270	µg/L	0.10 U	0.10 U	1 U	0.95 U	0.10 U	0.10 U	0.10 U	1 U	0.96 U	0.10 U	0.10 UJ	0.10 U	0.013	
2,4-Dichlorophenol	EPA 8270	µg/L	0.10 U	0.10 U	1 U	16	4.7	0.38	1.2	1 U	0.96 U	0.10 U	0.10 UJ	0.10 U	10	
Diethyl phthalate	EPA 8270	µg/L	0.10 U	0.10 U	1 U	0.95 U	0.10 U	0.10 U	0.10 U	1 U	0.96 U	0.10 U	0.10 UJ	0.13	93	
2,4-Dimethylphenol	EPA 8270	µg/L	0.10 U	0.10 U	1 U	0.95 U	0.10 U	0.10 U	0.10 U	1 U	0.96 U	0.10 U	0.10 UJ	0.10 U	6.30	
2-Methylphenol (o-Cresol)	EPA 8270	µg/L	0.10 U	0.10 U	1 U	0.95 U	0.10 U	0.10 U	0.10 U	1 U	0.96 U	0.10 U	0.10 UJ	0.10 U	27	
n-Nitrosodimethylamine	EPA 8270	µg/L	0.10 U	0.10 U	1 U	0.95 U	0.10 U	0.10 U	0.10 U	1 U	0.96 U	0.10 U	0.10 UJ	0.10 U	0.34	
n-Nitrosodiphenylamine (as Diphenylamine)	EPA 8270	µg/L	0.10 U	0.10 U	10 U	0.95 U	0.10 U	0.10 U	0.10 U	10 U	0.96 U	0.10 U	0.10 UJ	0.10 U	0.69	
n-Nitrosodi-n-propylamine	EPA 8270	µg/L	0.10 U	0.10 U	1 U	0.95 U	0.10 U	0.10 U	0.19	1 U	0.96 U	0.10 U	0.10 UJ	0.10 U	0.058	
Pentachlorophenol	EPA 8270	µg/L	0.50 U	0.50 U	5 U	0.95 U	0.50 U	0.50 U	0.50 U	5 U	0.96 UJ	0.50 U	0.50 UJ	0.50 U	0.002	
Phenol	EPA 8270	µg/L	0.10 U	0.10 U	1 U	0.95 U	0.10 U	0.10 U	0.10 U	1 U	0.96 U	0.10 U	0.10 UJ	0.10 U	370	
2,4,6-Trichlorophenol	EPA 8270	µg/L	0.10 U	0.10 U	1 U	0.95 U	0.10 U	0.10 U	0.10 U	1 U	0.96 U	0.10 U	0.10 UJ	0.10 U	0.28	
Volatile Organic Compounds (VOCs)																
Benzene	EPA 8260	µg/L	--	--	0.2 U	--	--	--	--	0.2 U	--	--	--	--	1.6	
Chloroform	EPA 8260	µg/L	--	--	0.2 U	--	--	--	--	0.2 U	--	--	--	--	1.2	
Petroleum Hydrocarbons																
Gasoline-range hydrocarbons	NWTPH-G	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	800	
Diesel-range hydrocarbons	NWTPH-Dx	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	500	
Oil-range hydrocarbons	NWTPH-Dx	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	500	
Total diesel- and oil-range hydrocarbons	NWTPH-Dx	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	500	
Diesel-range hydrocarbons	NWTPH-Dx Si/Gel	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	500	
Oil-range hydrocarbons	NWTPH-Dx Si/Gel	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	500	
Total diesel- and oil-range hydrocarbons	NWTPH-Dx Si/Gel	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	500	
Conventional Parameters																
Total organic carbon (TOC)	SM 5310B	mg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE	
Field Measured Parameters																
pH	N/A	N/A	6.33	6.16	6.04	6.17	6.38	6.28	6.21	6.52	6.41	6.50	6.69	6.43	NE	

Notes:

¹ Monitoring well locations are shown on Figures 3-2 and 3-4.

² Insufficient water to collect groundwater sample for chemical analysis.

³ Groundwater screening levels referenced from Table 4-2.

⁴ Total dioxin/furan Toxic Equivalency Quotients (TEQs) were calculated using United States Environmental Protection Agency (USEPA) Toxicity Equivalency Factor (TEF) values for human health (EPA 2003).

⁵ Total carcinogenic PAH (cPAH) TEQs were calculated using TEF values referenced from MTCA Table 708.2 (WAC 173-340-900).

mg/L = milligram per liter

µg/L = microgram per liter

NE = not established

Landau = Landau Associates

GEI = GeoEngineers

Bold indicates analyte was detected.

Yellow shading identifies the detected results greater than the preliminary cleanup level.

Blue shading identifies the non-detected result greater than the preliminary cleanup level.

NE = not established

J = estimated result

U = analyte not detected above the reporting limit

-- = not analyzed

COPC = Contaminant of Potential Concern

Table 5-5
Remedial Investigation Chemical Analytical Results - Catch Basin Solid COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Sample Location ¹	Analytical Method	Units	CB-313	CB-322	CB-323			CB-324	CB-328	Target Sediment Concentraion ²
Sample Identification			CB-313	CB-322	CB-323	CB-323	CB-323-Dup	CB-324	CB-328	
Sampled By			GEI	GEI	Landau	GEI	GEI	GEI	GEI	
Sample Date			1/16/2014	1/16/2014	11/19/09	1/16/2014	1/16/2014	1/16/2014	1/16/2014	
Polychlorinated Biphenyls (PCBs)										
Total PCB Aroclors	EPA 8082	mg/kg	0.13	0.057 U	0.18 U	0.072 U	0.058 U	0.095 U	0.16	0.13
Dioxins and Furans										
Total Dioxin/Furan TEQ ³ (ND=0RL)	EPA 1613	mg/kg	0.0000292	0.0000149	--	0.0000106	0.0000126	0.0000149	0.0000676	0.000002
Total Dioxin/Furan TEQ ³ (ND=0.5RL)	EPA 1613	mg/kg	0.0000292	0.0000149	--	0.00001058	0.00001256	0.0000149	0.0000676	0.000002
Metals										
Arsenic	EPA 6000/7000	mg/kg	20	10	18 U	4.6	3.5	10	25	7
Copper	EPA 6000/7000	mg/kg	220	140	150	100	110	130	530	390
Zinc	EPA 6000/7000	mg/kg	2,700	2,300	580	910 J	2,000 J	910	2,300	410
Semi-Volatile Organic Compounds (SVOCs) - Polycyclic Aromatic Hydrocarbons (PAHs)										
Benzo(a)anthracene	EPA 8270/SIM	mg/kg	1.5	0.22	0.03	0.14	0.18	0.22	0.3	1.3
Benzo(g,h,i)perylene	EPA 8270/SIM	mg/kg	1.4	0.33	0.044	0.21	0.21	0.36	0.47	0.67
Benzo(a)pyrene	EPA 8270/SIM	mg/kg	1.1	0.2	0.028	0.13	0.13	0.21	0.27	1.6
Chrysene	EPA 8270/SIM	mg/kg	2.9	0.42	0.072	0.31	0.35	0.49	0.72	1.4
Dibenzo(a,h)anthracene	EPA 8270/SIM	mg/kg	0.25	0.058	0.024 U	0.057 U	0.047 U	0.076 U	0.078	0.23
Fluoranthene	EPA 8270/SIM	mg/kg	2.6	0.32	0.077	0.27	0.37	0.39	0.72	1.7
Indeno(1,2,3-c,d)pyrene	EPA 8270/SIM	mg/kg	0.75	0.16	0.024 U	0.099	0.11	0.17	0.21	0.6
Total HPAHs ⁴	EPA 8270/SIM	mg/kg	15.58	2.54	0.4	1.58	2.03	2.75	4.59	12
Total cPAH TEQ ⁵ (ND=0)	EPA 8270/SIM	mg/kg	1.6	0.3	0.039	0.18	0.2	0.31	0.43	0.09
Total cPAH TEQ ⁵ (ND=0.5RL)	EPA 8270/SIM	mg/kg	1.6	0.3	0.039	0.19	0.2	0.31	0.43	0.09
Other SVOCs										
Bis(2-ethylhexyl)phthalate	EPA 8270	mg/kg	12	48	2.5	9.7 J	20 J	18	12	1.3
Butyl benzyl phthalate	EPA 8270	mg/kg	1.4	0.23 U	0.60 U	0.29 U	0.23 U	0.38 U	5	0.063
2,4-Dimethylphenol	EPA 8270	mg/kg	0.29 U	0.23 U	0.60 U	0.29 U	0.23 U	0.38 U	0.23 U	0.029
3 & 4 Methylphenol (m & p-Cresol)	EPA 8270	mg/kg	0.29 U	0.23 U	0.60 U	0.29 UJ	1.1 J	1.4	0.23 U	0.67
n-Nitrosodimethylamine	EPA 8270	mg/kg	0.29 U	0.23 U	0.60 U	0.29 U	0.23 U	0.38 U	0.23 U	0.025
n-Nitrosodiphenylamine (as Diphenylamine)	EPA 8270	mg/kg	0.29 U	0.23 U	0.60 U	0.29 U	0.23 U	0.38 U	0.23 U	0.028

Notes:

¹ Sample locations are shown on Figure 3-5.

² The Target Sediment Concentration screening levels developed by Ecology are used for comparison to the catch basin solid results (Table 4-3).

³ Total dioxin/furan Toxic Equivalency Quotients (TEQs) were calculated using United States Environmental Protection Agency (USEPA) Toxicity Equivalency Factor (TEF) values for human health (EPA 2003).

⁴ Total HPAHs are the sum of detected fluoranthene, pyrene, benzo(a)anthracene, chrysene, benzofluoranthenes, benzo(a)pyrene, indeno(1,2,3)pyrene, dibenzo(a,h)anthracene, and benzo(g,h,i)perylene.

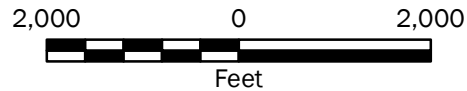
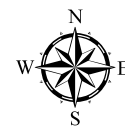
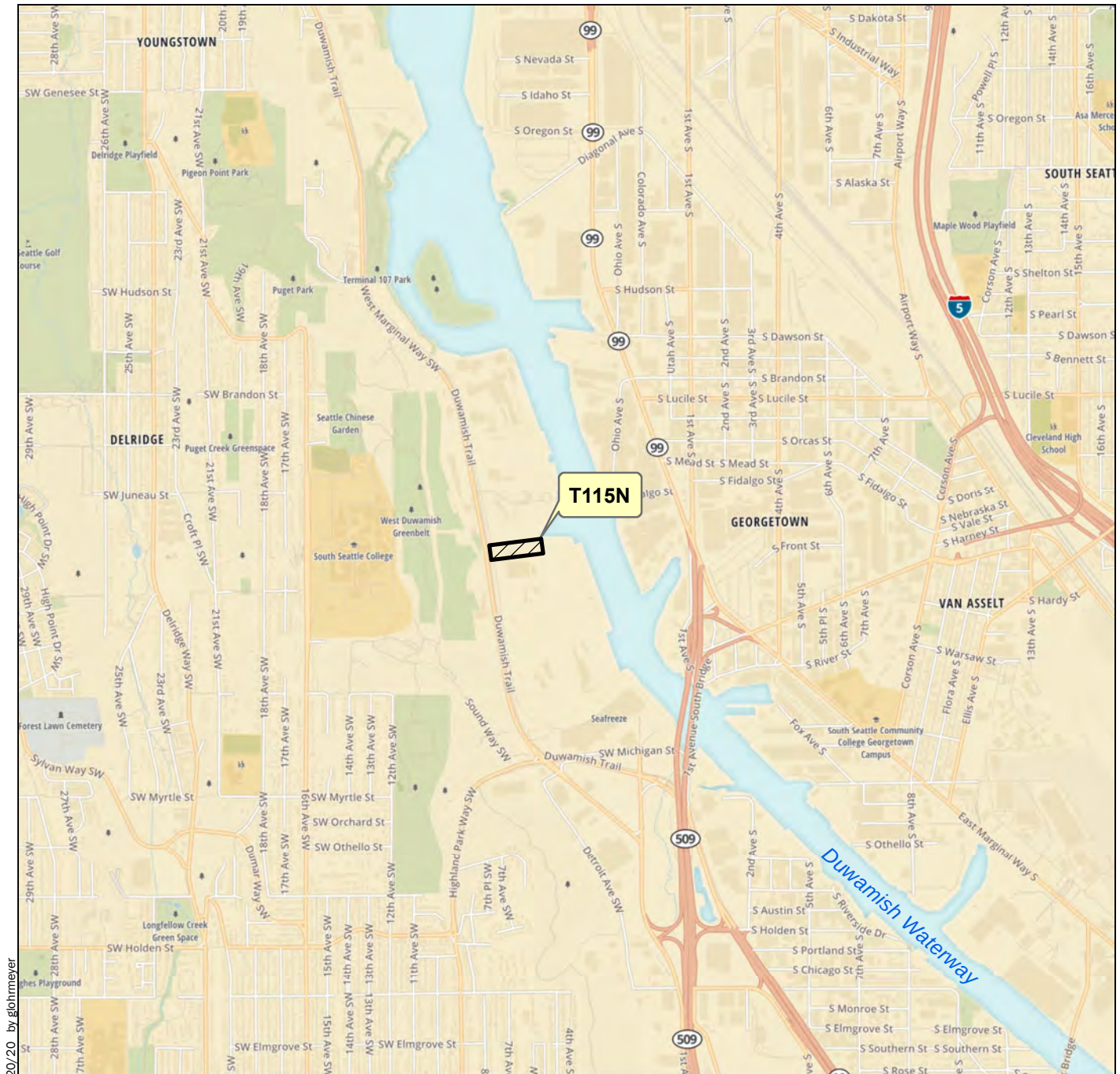
⁵ Total carcinogenic PAH (cPAH) TEQs were calculated using TEF values referenced from MTCA Table 708.2 (WAC 173-340-900).

LPAH = Low Molecular Weight PAH
HPAH = High Molecular Weight PAH
J = estimated result
U = analyte not detected above the reporting limit

EPA = Environmental Protection Agency
mg/kg = milligram per kilogram
-- = not analyzed
Bold indicates analyte was detected.

Yellow shading identifies the detected results greater than the catch basin solids screening level.
Blue shading identifies the non-detected result greater than the catch basin solids screening level.

Figures



Vicinity Map

Port of Seattle - North Terminal 115
Seattle, Washington



Figure 1-1

Notes:

1. The locations of all features shown are approximate.
2. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Data Source: Mapbox Open Street Map, 2020

Projection: NAD 1983 UTM Zone 10N



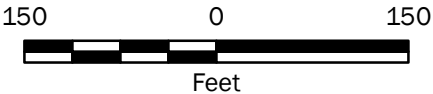
Legend



T115N



Parcel Boundary and Owner Information



Notes:
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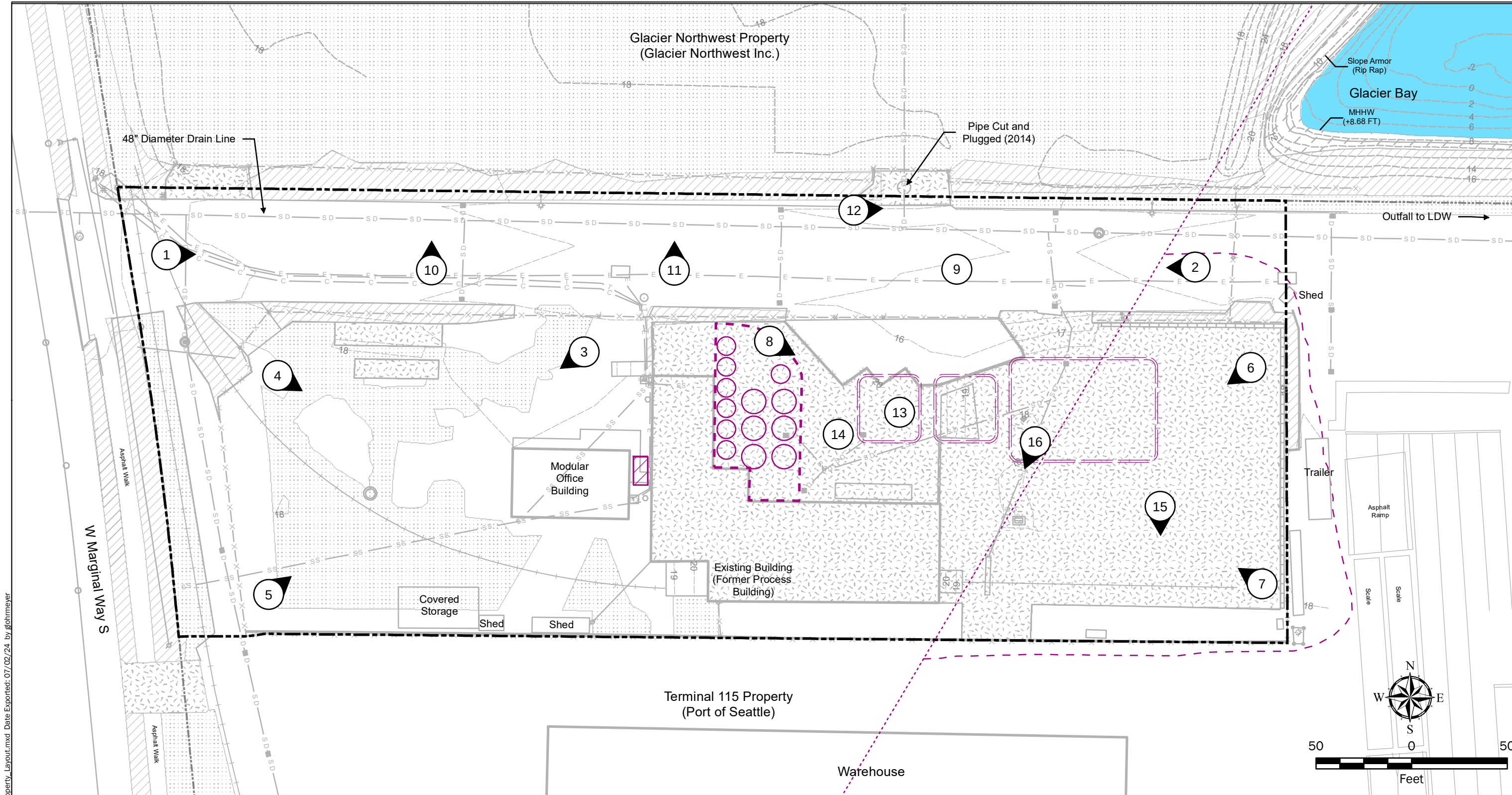
Data Source: King County GIS
Projection: NAD 1983 StatePlane Washington North FIPS 4601 Feet

Site Plan

Port of Seattle - North Terminal 115
Seattle, Washington



Figure 2-1



Notes:

1. Ground surface is asphalt pavement unless otherwise noted.
2. Mean Higher High Water (MHHW) referenced from United States Army Corps of Engineers (USACE) Duwamish Waterway tidal Datum No. 92 for the North Puget Sound Region.
3. NAVD88 is the North American Vertical Datum of 1988.
4. The locations of all features shown are approximate.
5. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Data Source: Base from Dowl HKM 2014 survey and Bush, Roed and Hitchings, Inc. 2008 survey.

Projection: NAD 1983 StatePlane Washington North FIPS 4601 Feet

Utilities

- E — Underground Power Line
- SS — Sanitary Sewer Line
- SD — Storm Drain Line
- T — Telecommunication Line
- C — Cable Line
- D — Catch Basin
- Sign Post
- Manhole Cover

Current Feature

- T115N
- Elevation Contours (Feet NAVD88)
- Fence
- Railroad Tracks (Buried)
- Slope Armor (Rip Rap)
- Compact Gravel
- Soil/Vegetation
- Concrete Pavement

Historical Feature

- Historical Shoreline (Approximate; See Figure 2-5)
- 1965 Shoreline (Approximate; See Figure 2-5)
- Approximate Location of Former Settling Ponds
- Approximate Location of Former Underground Fuel Storage Tank (UST)
- Former Above Ground Storage Tank (AST)
- AST Spill Containment Curb (Approximate)

Current and Historical Property Layout

Port of Seattle - North Terminal 115
Seattle, Washington

GEOENGINEERS

Figure 2-2



Photo 1: Terminal 115 Driveway Looking East.



Photo 2: Terminal 115 Driveway Looking West.



Photo 3: Gene Summy Lumber Co. Lease Area Looking Southwest.



Photo 4: Gene Summy Lumber Co. Lease Area Looking Northeast.



Photo 5: Gene Summy Lumber Co. Lease Area Looking West.



Photo 6: Former Unimacts Global, LLC Area Looking Southwest.



Photo 7: Former Unimacts Global, LLC Area Looking Northwest.



Photo 8: Former Unimacts Global, LLC Area Looking Southeast.

Notes:

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Data Source: GeoEngineers Field Reconnaissance Dated May 8, 2020.

Property Conditions

Port of Seattle – North Terminal 115
Seattle, Washington



Figure 2-3A



Photo 9: Terminal 115 Driveway - Asphalt Surface Wear.



Photo 10: Terminal 115 Driveway - Transverse Cracking.



Photo 11: Terminal 115 Driveway - Transverse Cracking.



Photo 12: Terminal 115 Driveway - Spider Web Cracking.



Photo 13: Former Unimacts Global, LLC Lease Area - Concrete Surface Wear.



Photo 14: Former Unimacts Global, LLC Lease Area - Concrete Joint.



Photo 15: Former Unimacts Global, LLC Lease Area - Cracks in Concrete Surface.



Photo 16: Former Unimacts Global, LLC Stormwater Drain Line Patch.

Notes:

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- GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

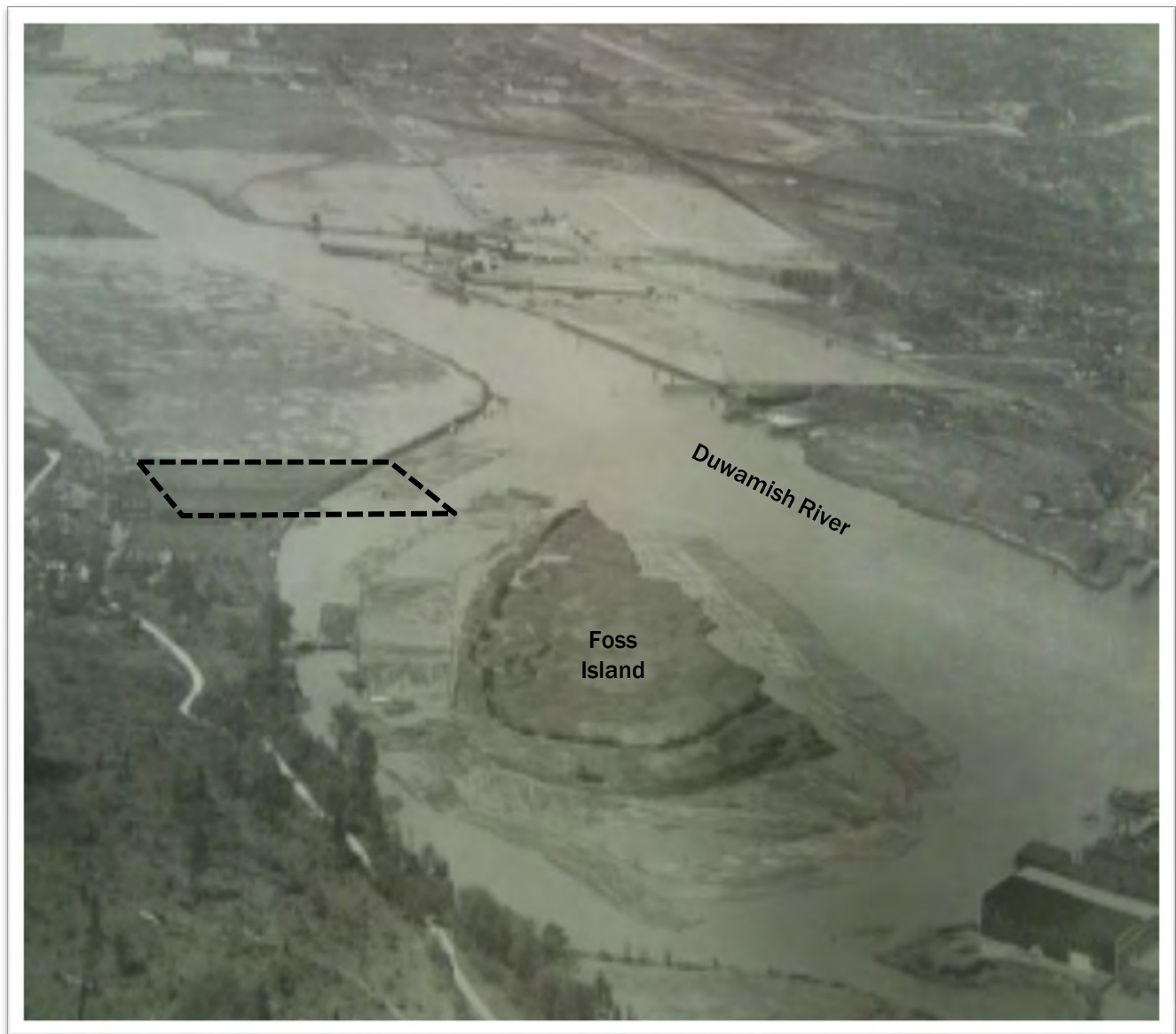
Data Source: GeoEngineers Field Reconnaissance Dated May 8, 2020.

Property Conditions

Port of Seattle – North Terminal 115
Seattle, Washington



Figure 2-3B



Legend



T115N

Notes:

1. The locations of all features shown are approximate.
2. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

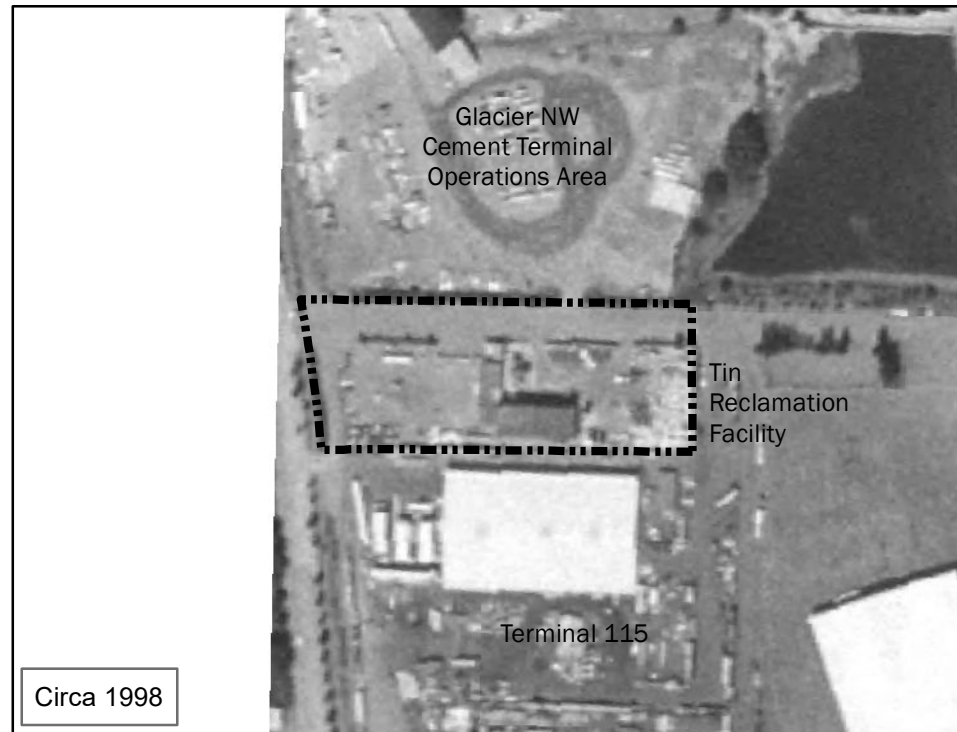
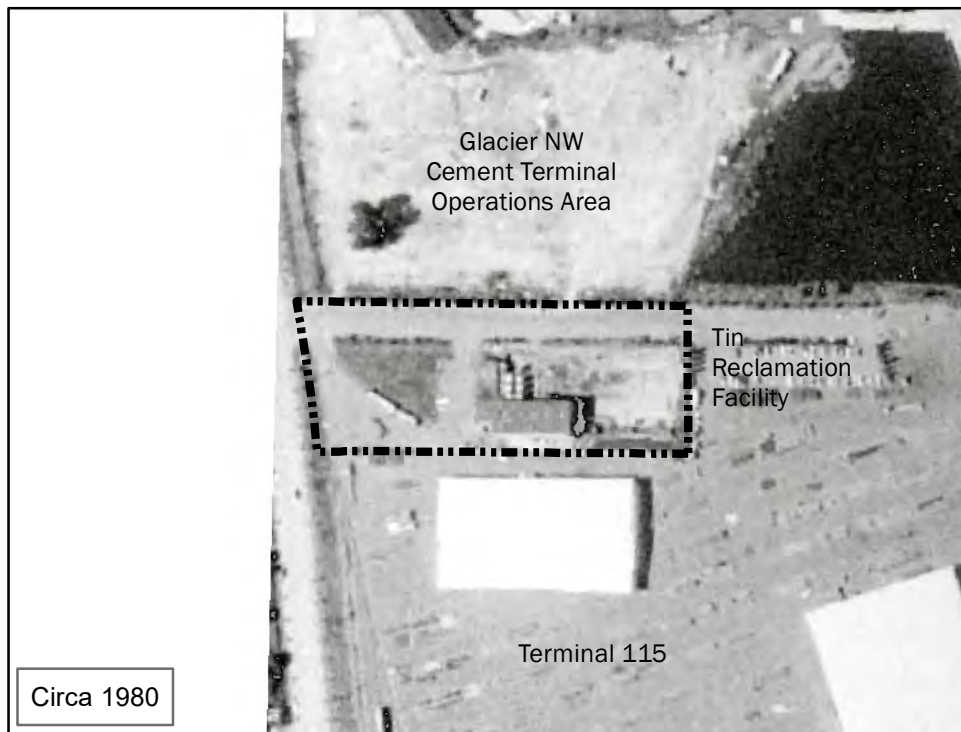
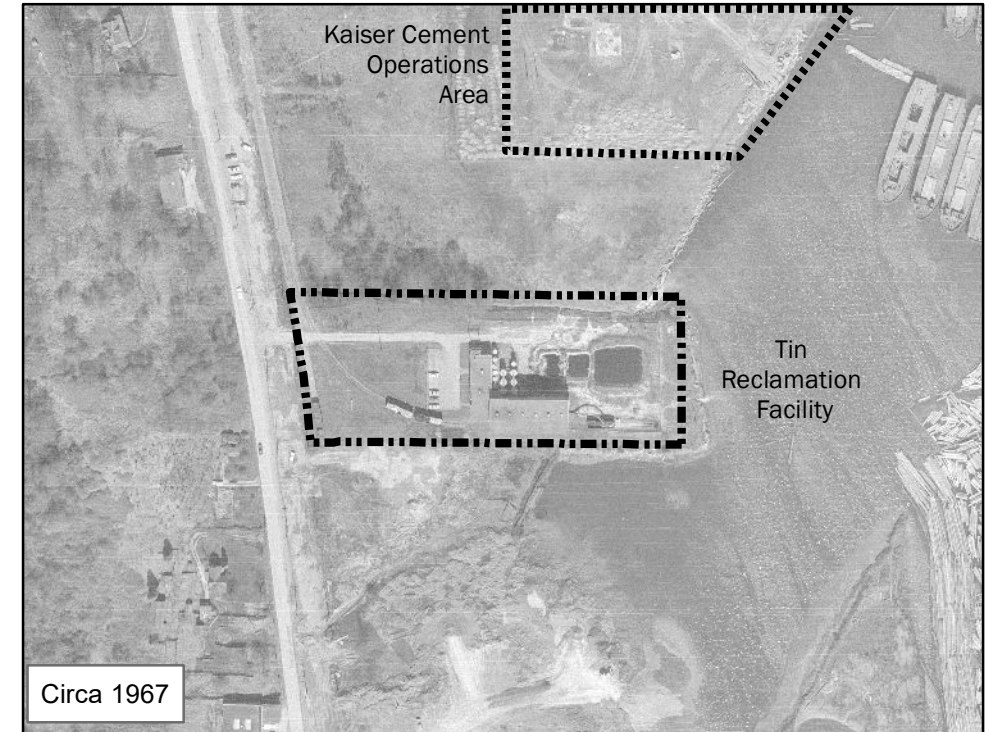
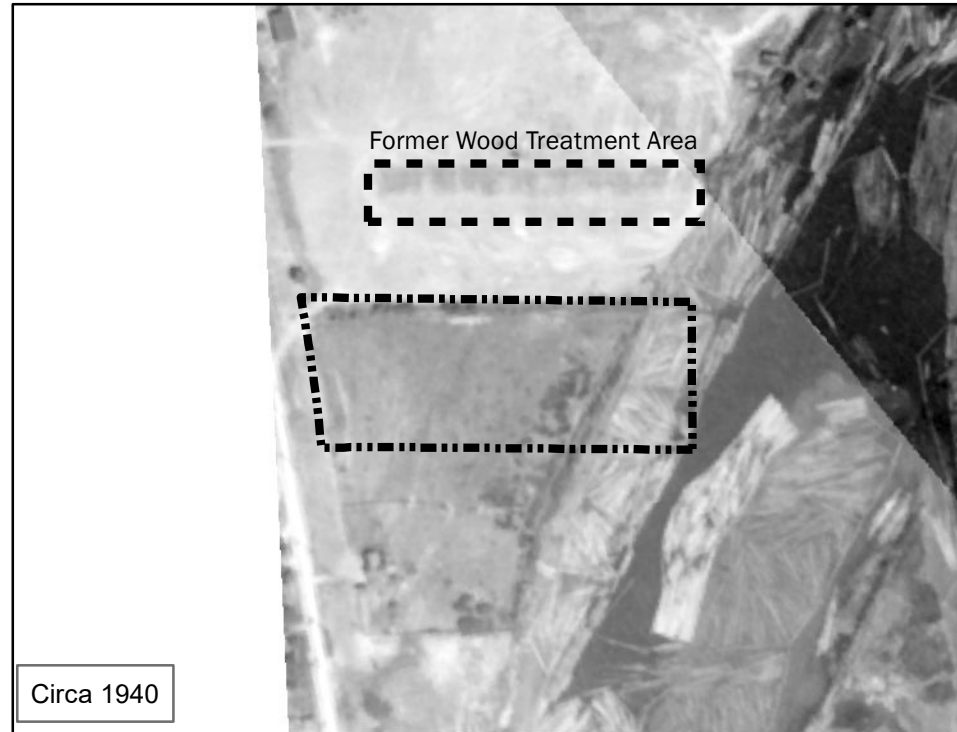
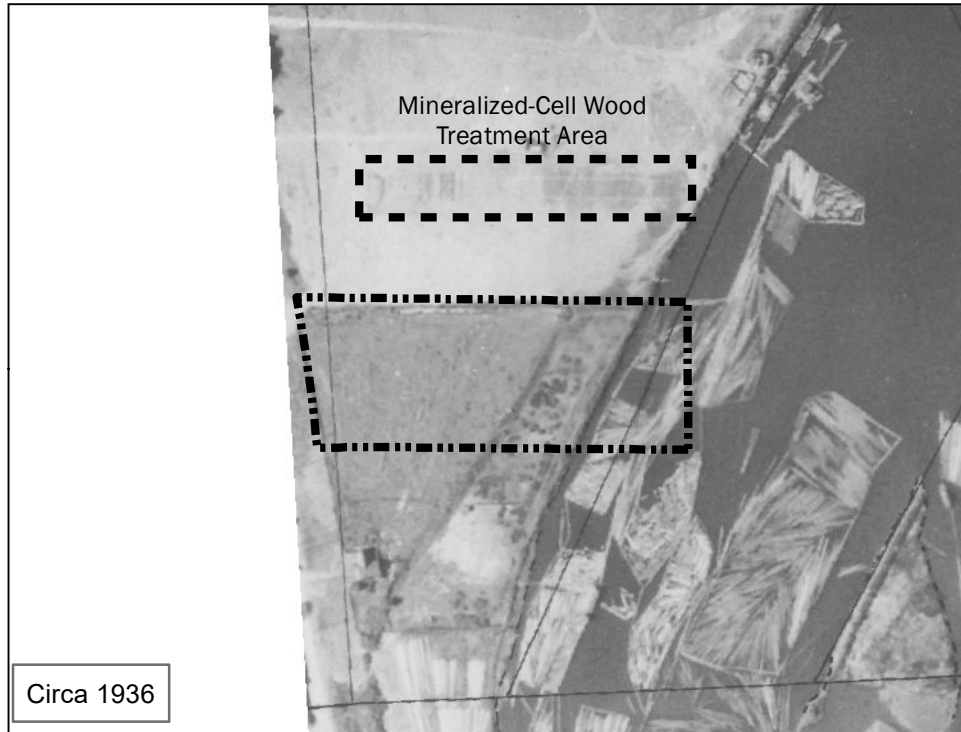
Data Source: Boeing Museum of Flight

**North Terminal 115 and Surrounding Area
Circa 1922**

Port of Seattle – North Terminal 115
Seattle, Washington



Figure 2-4



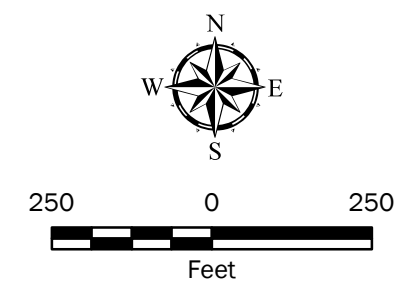
Notes:

1. The locations of all features shown are approximate.
2. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Data Source: Quantum Spatial, King County GIS

Projection: NAD 1983 StatePlane Washington North FIPS 4601 Feet

Legend



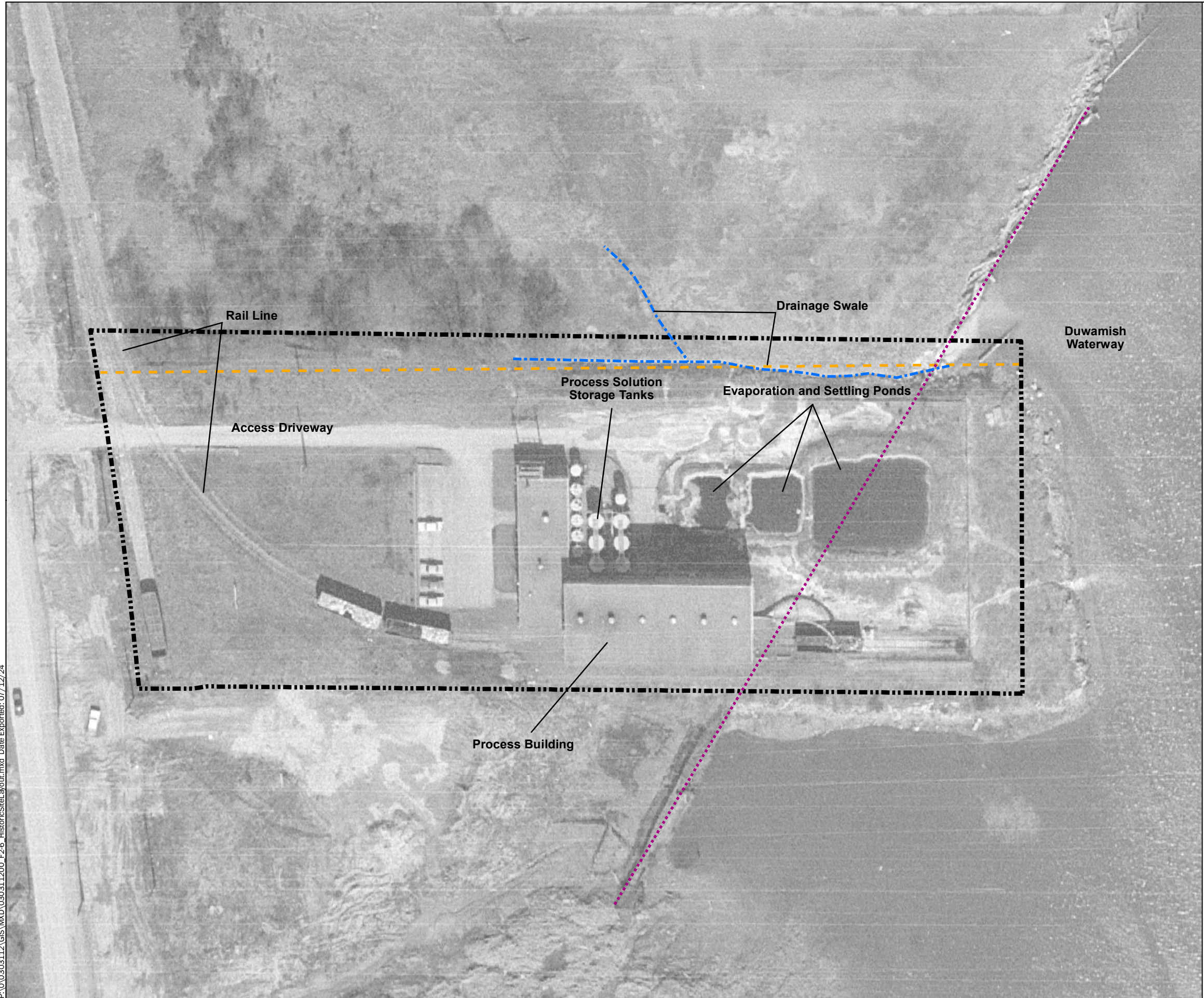
Property Development From 1936 Through 2019

Port of Seattle - North Terminal 115
Seattle, Washington



Figure 2-5

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Legend



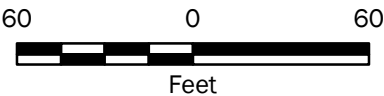
T115N

Historical Feature

..... Historical Shoreline (Approximate)

- - - - - King County Parcel Boundary

- . - . - . Drainage Swale (Approximate)



Notes:

1. The locations of all features shown are approximate.
2. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Data Source: King County GIS,

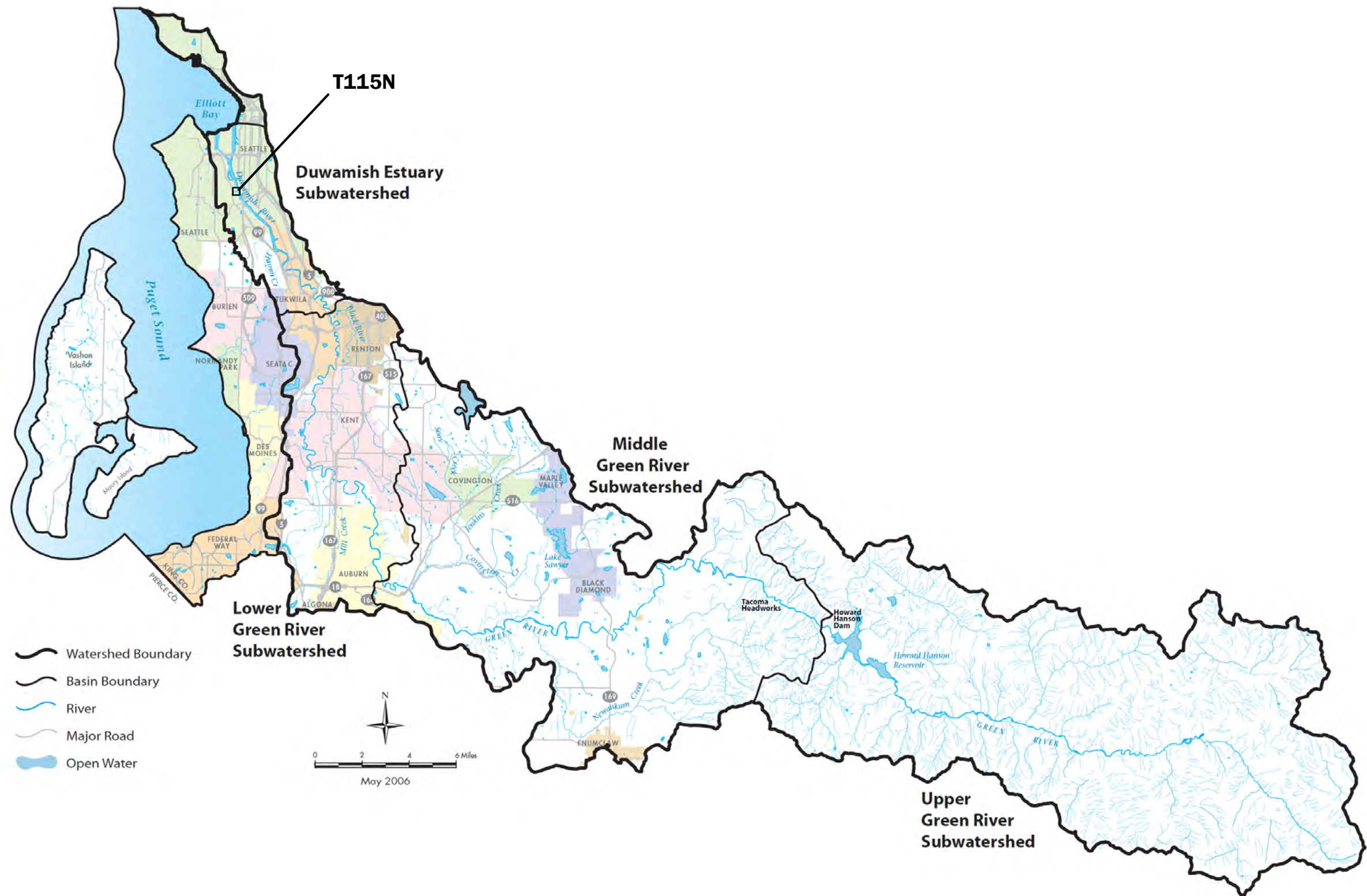
Projection: NAD 1983 StatePlane Washington North FIPS 4601 Feet

Historical Site Layout Circa 1967

Port of Seattle - North Terminal 115
Seattle, Washington



Figure 2-6



Notes:
 1. The locations of all features shown are approximate.
 2. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document.
 GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

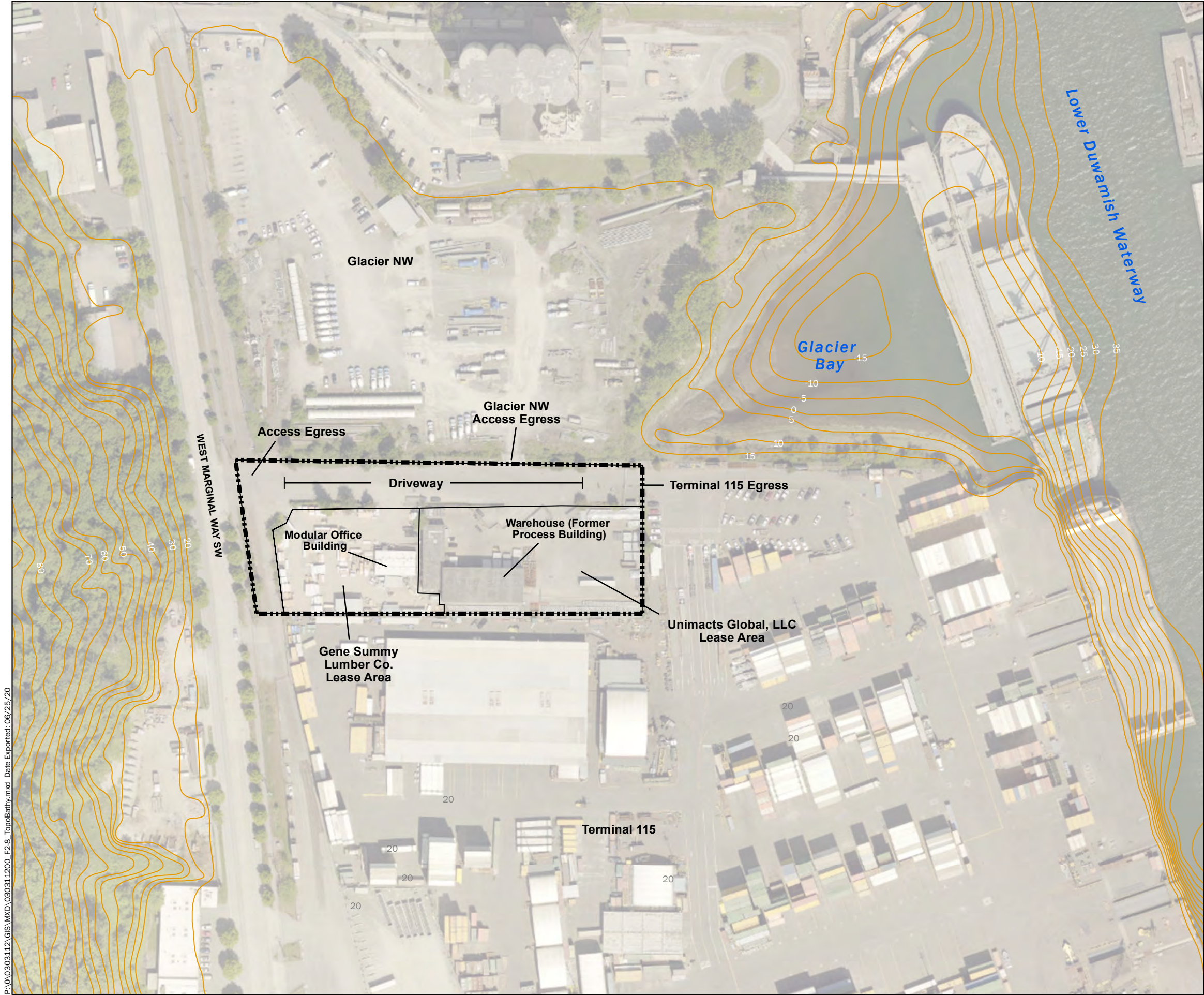
Data Source: King County Department of Natural Resources and Parks
 Water and Land Resources Division

Green/Duwamish River Watershed

Port of Seattle - North Terminal 115
 Seattle, Washington



Figure 2-7



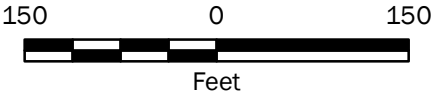
Legend



T115N



5 Foot Elevation Contour (NAVD88)



Notes:

1. The locations of all features shown are approximate.
2. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Data Source: ESRI Data & Maps,
Upland contours generated from King County LiDAR (2016).
Bathymetry traced from King County 5-foot contour map service
https://gismaps.kingcounty.gov/arcgis/rest/services/Topo/KingCo_Contours/MapServer. (http://www5.kingcounty.gov/sdc/FGDCDocs/CONTOUR005_fgdc.htm)
Vertical datum for contours is NAVD88.

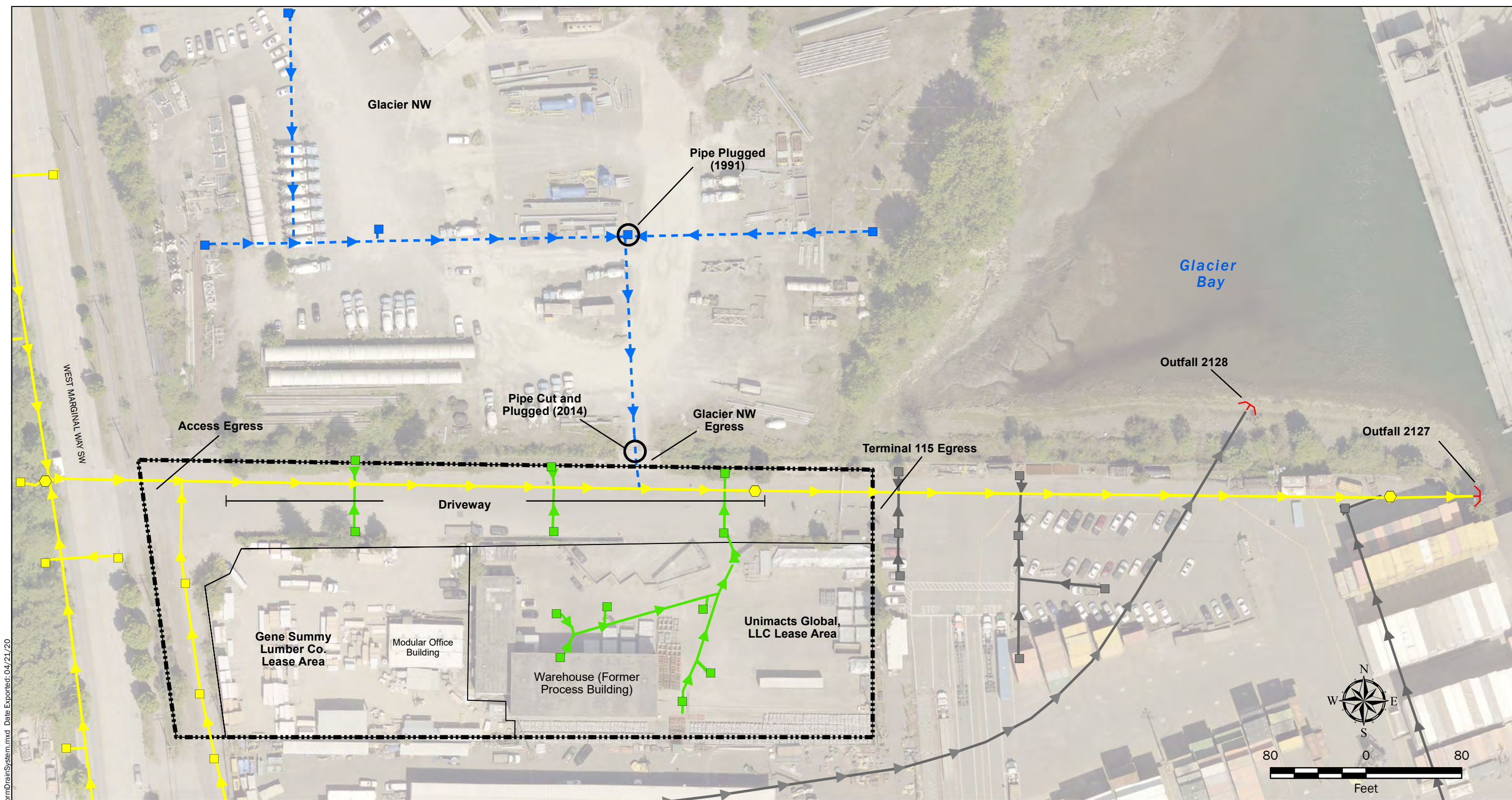
Projection: NAD 1983 StatePlane Washington North FIPS 4601 Feet

Topography/Bathymetry

Port of Seattle - North Terminal 115
Seattle, Washington



Figure 2-8



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Notes:

1. The locations of all features shown are approximate.
2. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

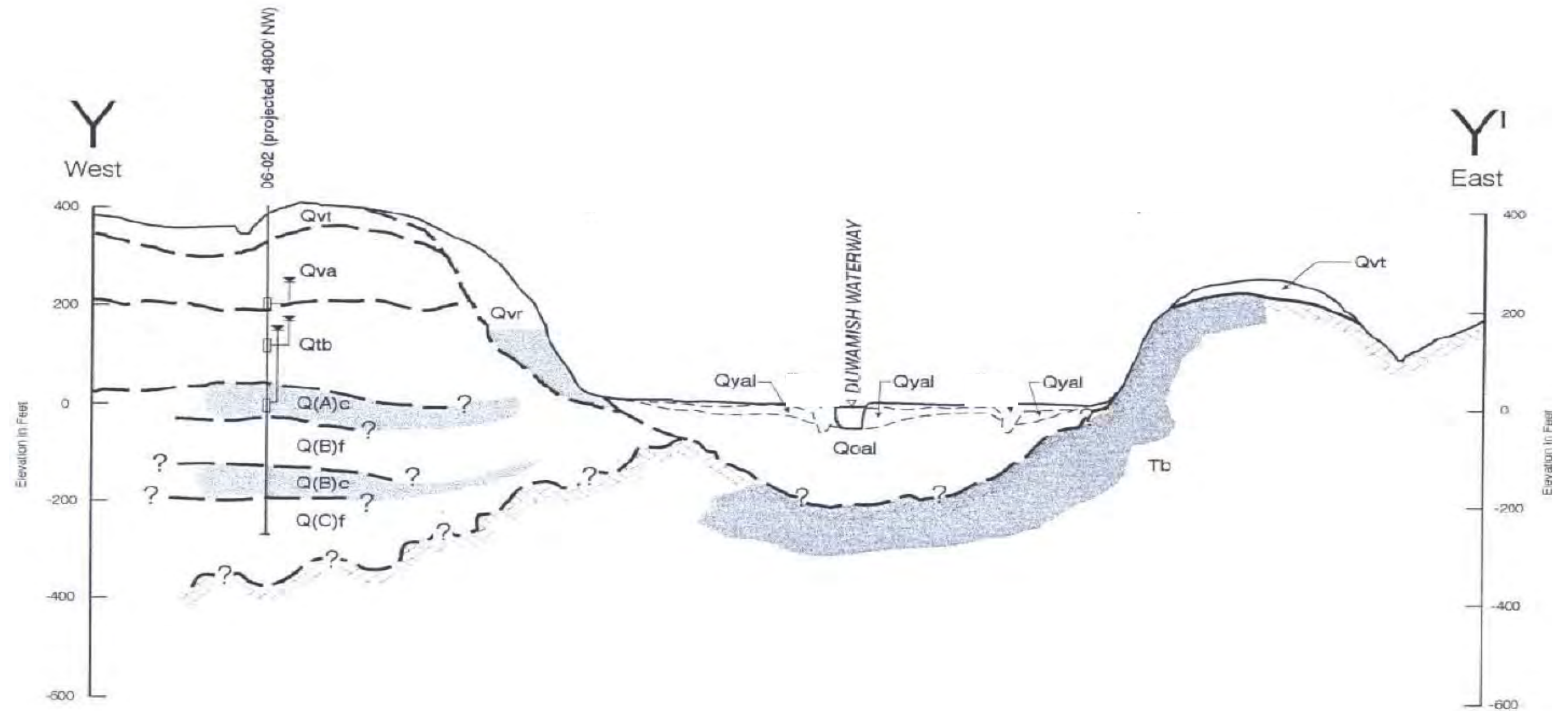
Data Source: King County GIS, City of Seattle
Projection: NAD 1983 StatePlane Washington North FIPS 4601 Feet

Legend

- T115N
- Glacier Northwest Stormwater Drainage Feature and Flow Direction (Abandoned)
- Seattle Public Utility (SPU) Southwest Kenny Street Storm Drain and King County Combined Sewer Overflow (CSO) System and Flow Direction
- Port of Seattle North Terminal 115 Stormwater Drainage System and Flow Direction
- Port of Seattle Terminal 115 Stormwater Drainage System and Flow Direction

- Catch Basin
- Manhole

Stormwater Drainage	
Port of Seattle - North Terminal 115 Seattle, Washington	
	Figure 2-9



Notes:

1. The locations of all features shown are approximate.
 2. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document.
- GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Data Source: Cross-section Y-Y' of the Duwamish Valley at approximately RM 3.0 (Booth and Herman 1998)

Duwamish River Valley Cross-Section

Port of Seattle – North Terminal 115
Seattle, Washington

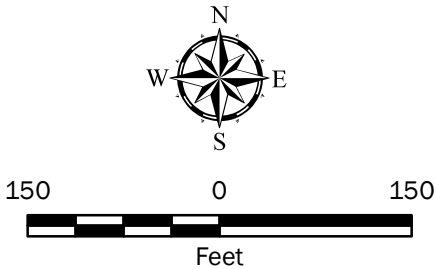


Figure 2-10



Legend

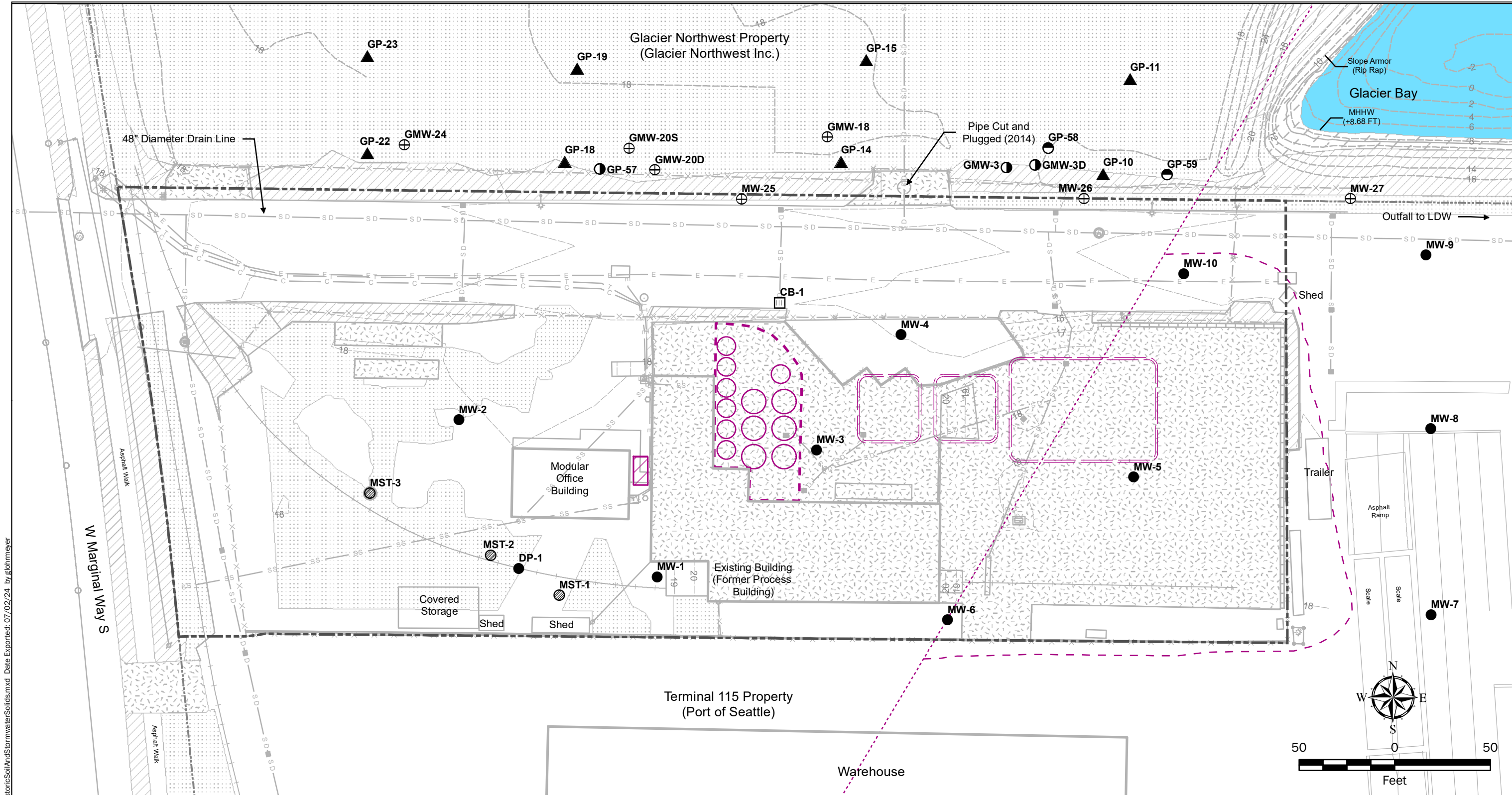
- T115N
- Vegetated Area
- Major Arterial Road
- Railroad Track



Notes:
1. The locations of all features shown are approximate.
2. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document.
GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Data Source: King County GIS, City of Seattle
Projection: NAD 1983 StatePlane Washington North FIPS 4601 Feet

Terrestrial Habitat	
Port of Seattle - North Terminal 115 Seattle, Washington	
GEOENGINEERS	Figure 2-11



Notes:

1. Ground surface is asphalt pavement unless otherwise noted.
2. Mean Higher High Water (MHHW) referenced from United States Army corps of Engineers (USACE) Duwamish Waterway tidal Datum No. 92 for the North Puget Sound Region.
3. NAVD88 is the North American Vertical Datum of 1988.
4. The locations of all features shown are approximate.
5. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Data Source: Base from Dowl HKM 2014 survey and Bush, Roed and Hitchings, Inc. 2008 survey.

Projection: NAD 1983 StatePlane Washington North FIPS 4601 Feet

Sampling Location

T115N Site

- Grab Sample (SKCDPH 1998)
- Soil Characterization Study (Landau 2009)
- Catch Basin Solids Sample (Landau 2009)

Glacier Northwest Site

- Soil Characterization Study (Shaw 2003)
- Soil Characterization Study (RETEC 1995)
- Soil Characterization Study 2 (RETEC 1995)
- Remedial Investigation (ERM 2015)

Current Feature

- T115N
- Elevation Contours (Feet NAVD88)
- Fence
- Railroad Tracks (Buried)
- Slope Armor (Rip Rap)
- Compact Gravel
- Soil/Vegetation
- Concrete Pavement

Historical Feature

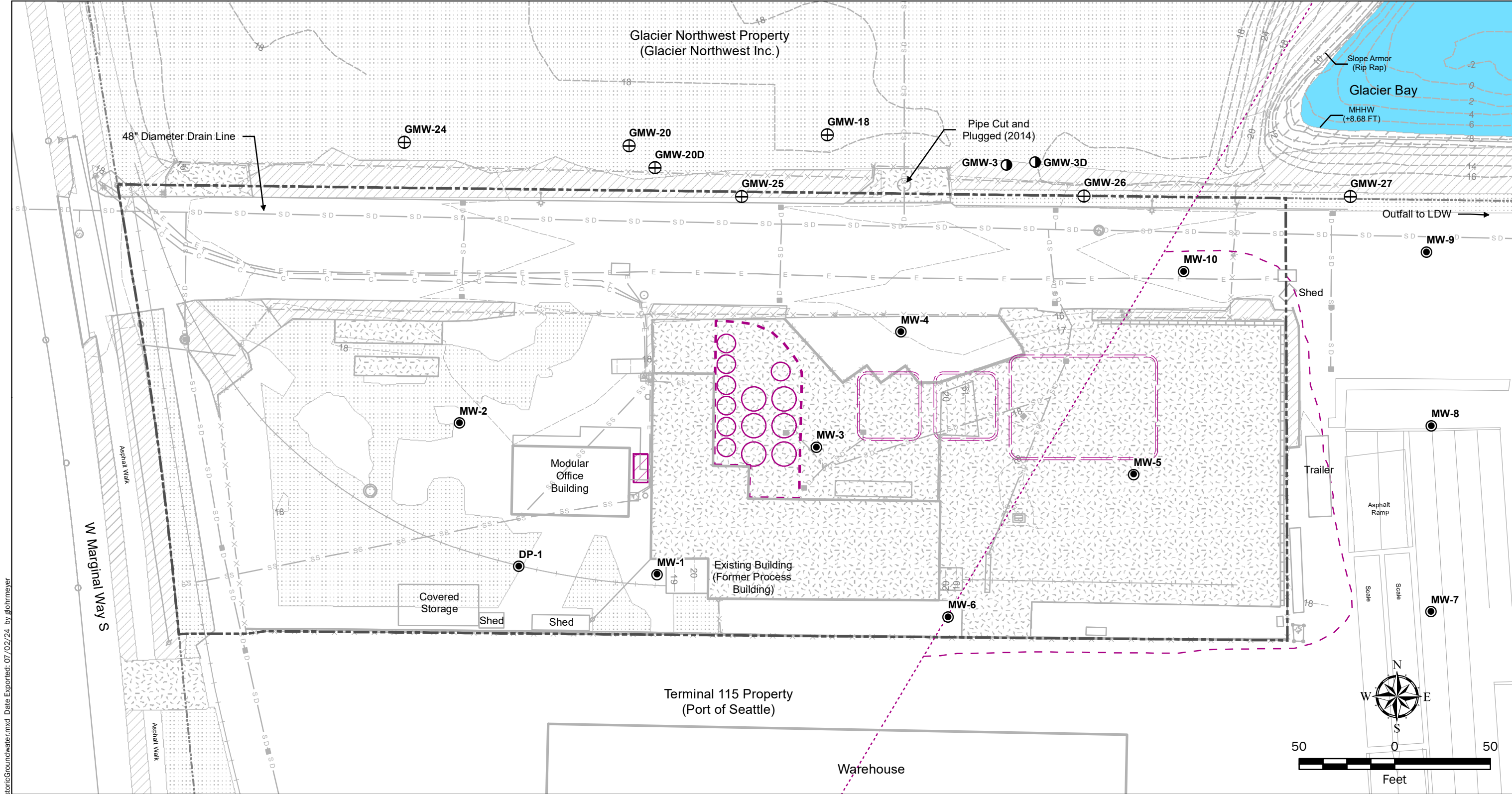
- Historical Shoreline (Approximate; See Figure 2-5)
- 1965 Shoreline (Approximate; See Figure 2-5)
- Approximate Location of Former Settling Ponds
- Approximate Location of Former Underground Fuel Storage Tank (UST)
- Former Above Ground Storage Tank (AST)
- AST Spill Containment Curb (Approximate)

Previous Soil and Stormwater Solids Sampling Location

Port of Seattle - North Terminal 115
Seattle, Washington

GEOENGINEERS

Figure 3-1



Notes:

- 1. Ground surface is asphalt pavement unless otherwise noted.
- 2. Mean Higher High Water (MHHW) referenced from United States Army Corps of Engineers (USACE) Duwamish Waterway tidal Datum No. 92 for the North Puget Sound Region.
- 3. NAVD88 is the North American Vertical Datum of 1988.
- 4. The locations of all features shown are approximate.
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Data Source: Base from Dowl HKM 2014 survey and Bush, Roed and Hitchings, Inc. 2008 survey.
Projection: NAD 1983 StatePlane Washington North FIPS 4601 Feet

Sampling Location

- T115N Site
 - Monitoring Well (Landau 2009)
- Glacier Northwest Site
 - Monitoring Well (RETEC 1995)
 - Monitoring Well (Shaw 2003)

Current Feature

- T115N
 - Elevation Contours (Feet NAVD88)
 - Fence
 - Railroad Tracks (Buried)
 - Slope Armor (Rip Rap)
 - Compact Gravel
 - Soil/Vegetation
 - Concrete Pavement

Historical Feature

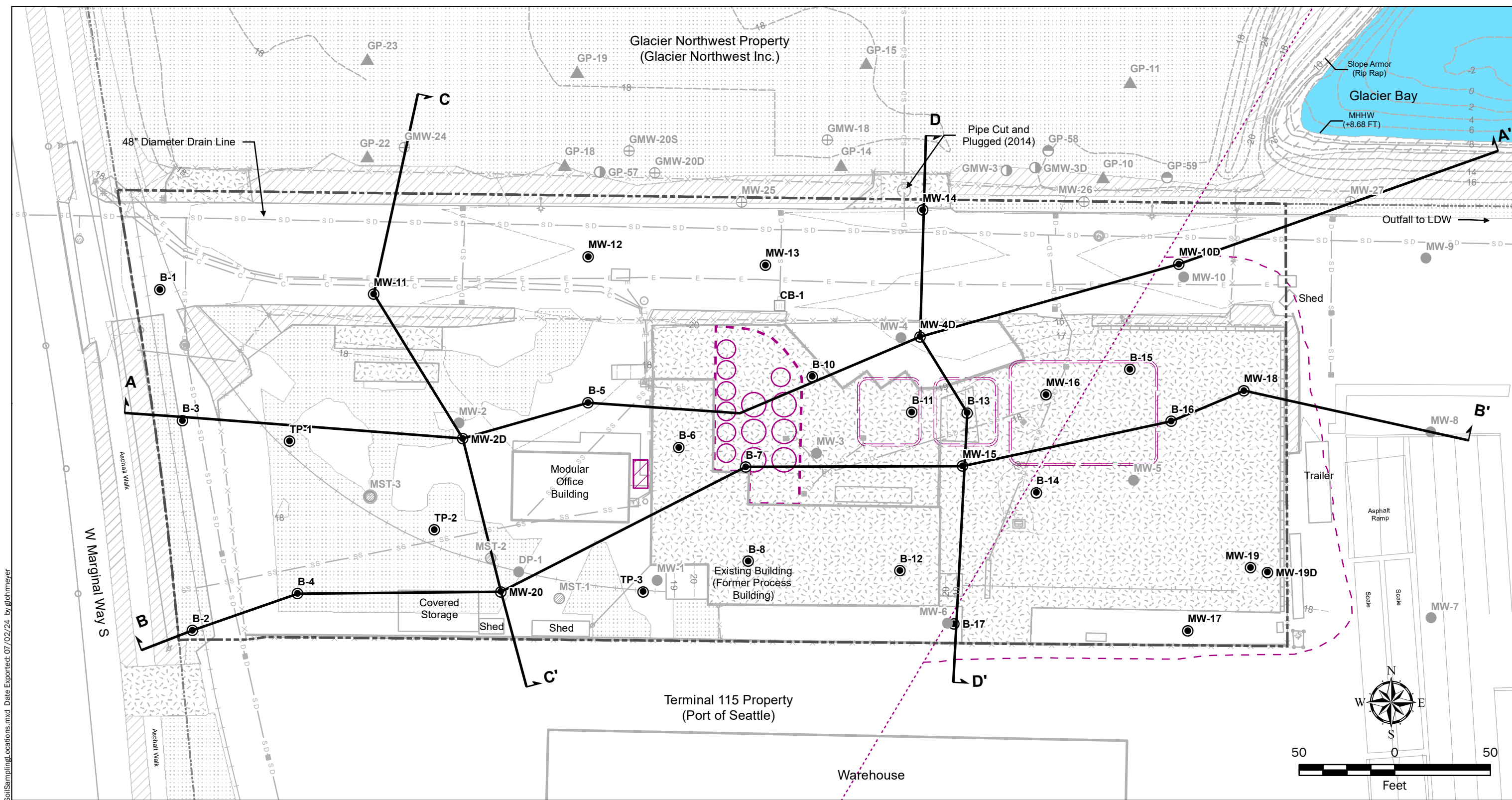
- Historical Shoreline (Approximate)
- 1965 Shoreline (Approximate)
- Approximate Location of Former Settling Ponds
- Approximate Location of Former Underground Fuel Storage Tank (UST)
- Former Above Ground Storage Tank (AST)
- AST Spill Containment Curb (Approximate)

Previous Groundwater Sampling Locations

Port of Seattle - North Terminal 115
Seattle, Washington



Figure 3-2



Notes:

1. Ground surface is asphalt pavement unless otherwise noted.
2. Mean Higher High Water (MHHW) referenced from United States Army Corps of Engineers (USACE) Duwamish Waterway tidal Datum No. 92 for the North Puget Sound Region.
3. NAVD88 is the North American Vertical Datum of 1988.
4. The locations of all features shown are approximate.
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Data Source: Base from Dowl HKM 2014 survey and Bush, Roed and Hitchings, Inc. 2008 survey.

Projection: NAD 1983 StatePlane Washington North FIPS 4601 Feet

Sampling Location

T115N Site

- Remedial Investigation (GeoEngineers 2014)
- Grab Sample (SKCDPH 1998)
- Soil Characterization Study (Landau 2009)
- Catch Basin Solids Sample (Landau 2009)

Glacier Northwest Site

- Soil Characterization Study (Shaw 2003)
- Soil Characterization Study (RETEC 1995)
- Soil Characterization Study 2 (RETEC 1995)
- Remedial Investigation (ERM 2015)

Current Feature

- T115N
- Elevation Contours (Feet NAVD88)
- Fence
- Railroad Tracks (Buried)
- Slope Armor (Rip Rap)
- Compact Gravel
- Soil/Vegetation
- Concrete Pavement

Historical Feature

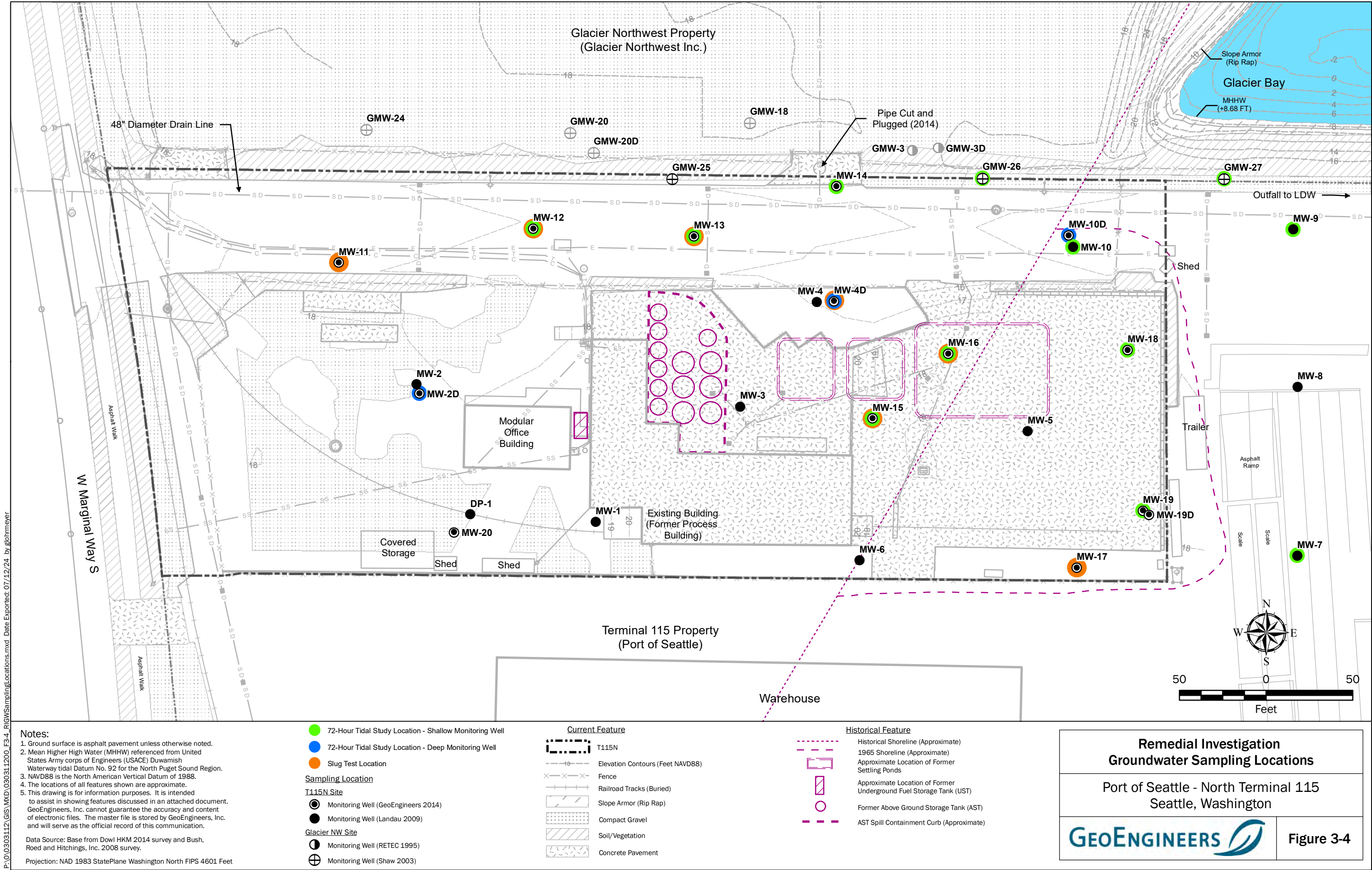
- Historical Shoreline (Approximate)
- 1965 Shoreline (Approximate)
- Approximate Location of Former Settling Ponds
- Approximate Location of Former Underground Fuel Storage Tank (UST)
- Former Above Ground Storage Tank (AST)
- AST Spill Containment Curb (Approximate)

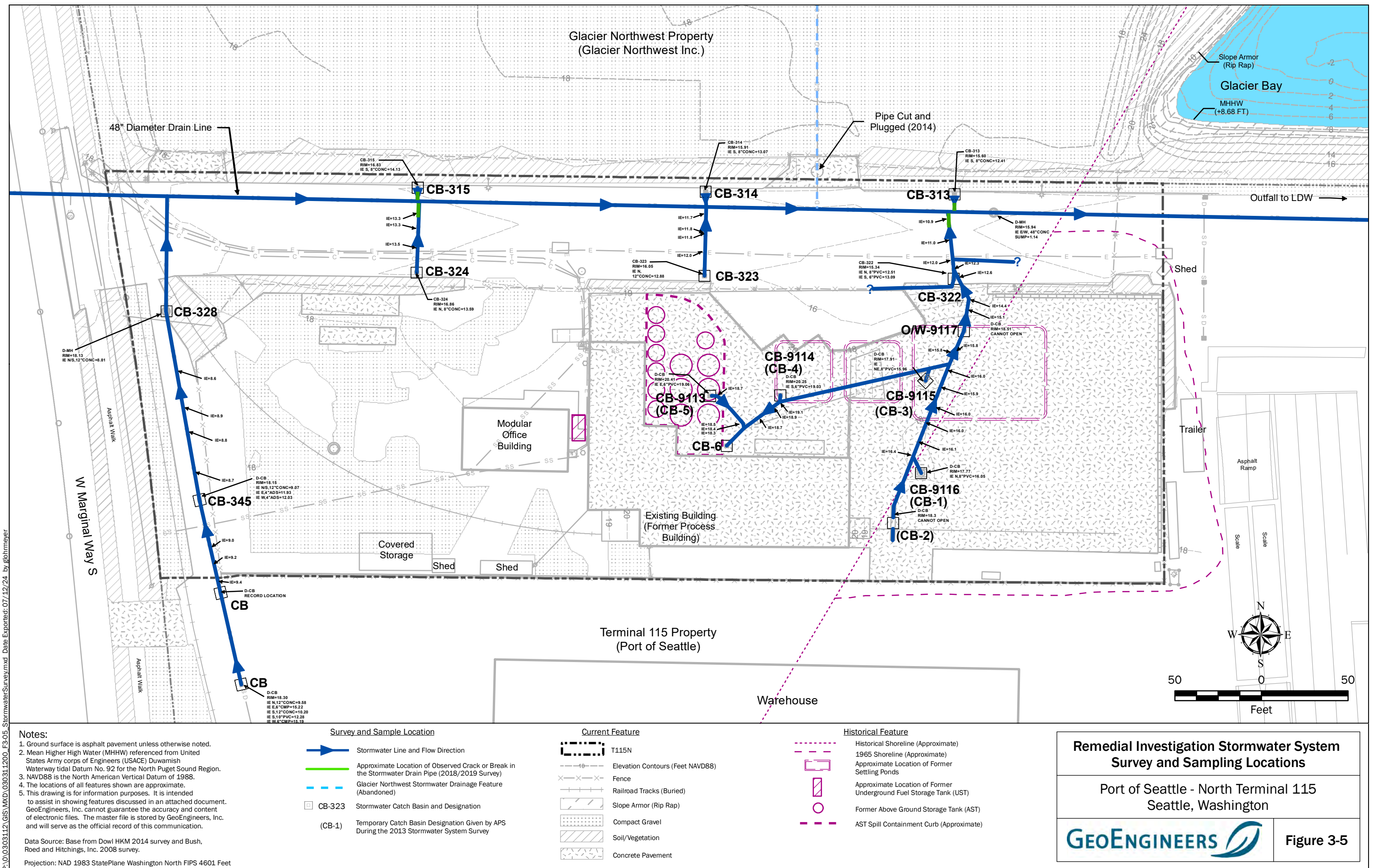
**Remedial Investigation
Soil Sampling Locations**

Port of Seattle - North Terminal 115
Seattle, Washington

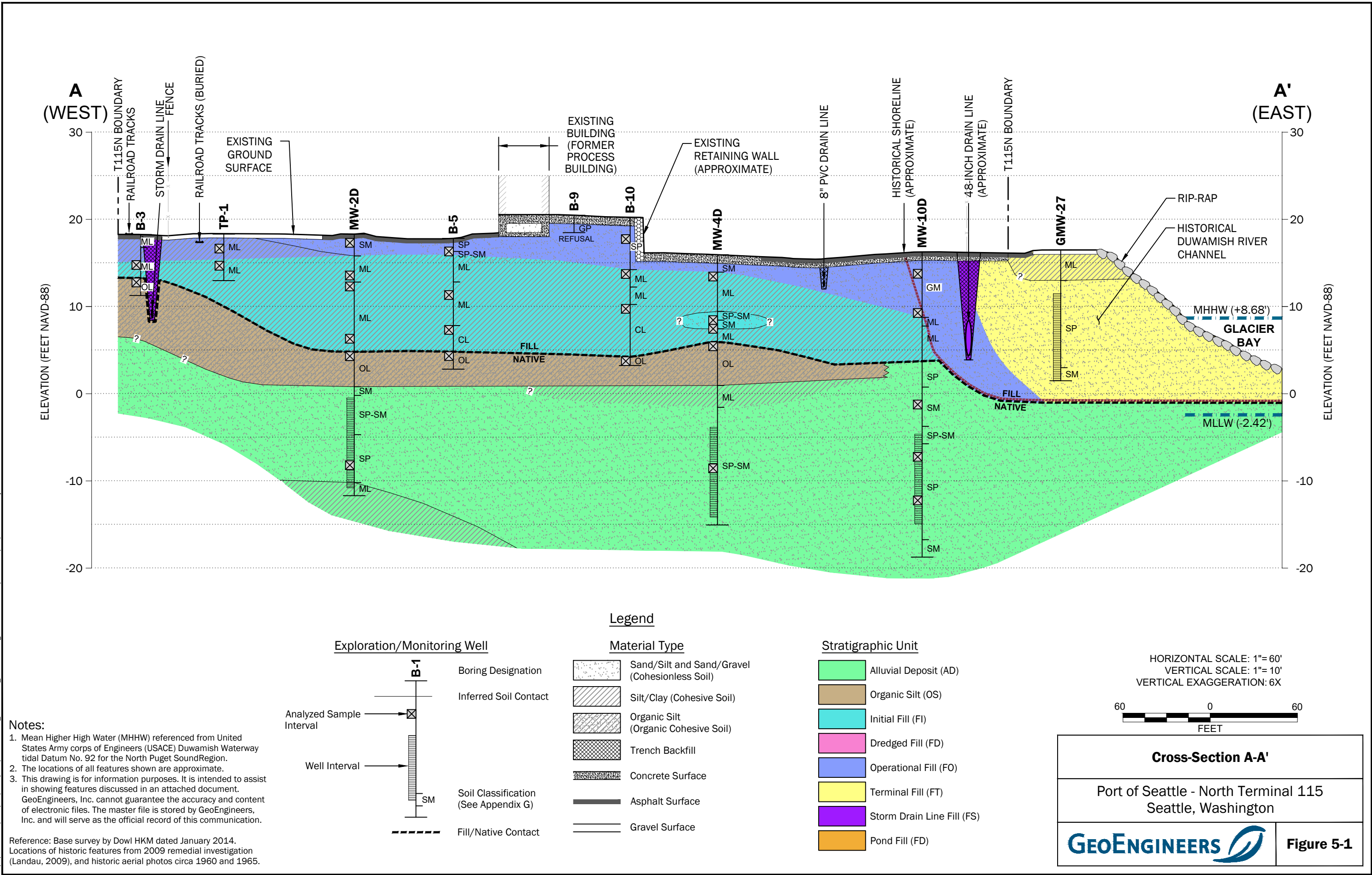
GEOENGINEERS

Figure 3-3

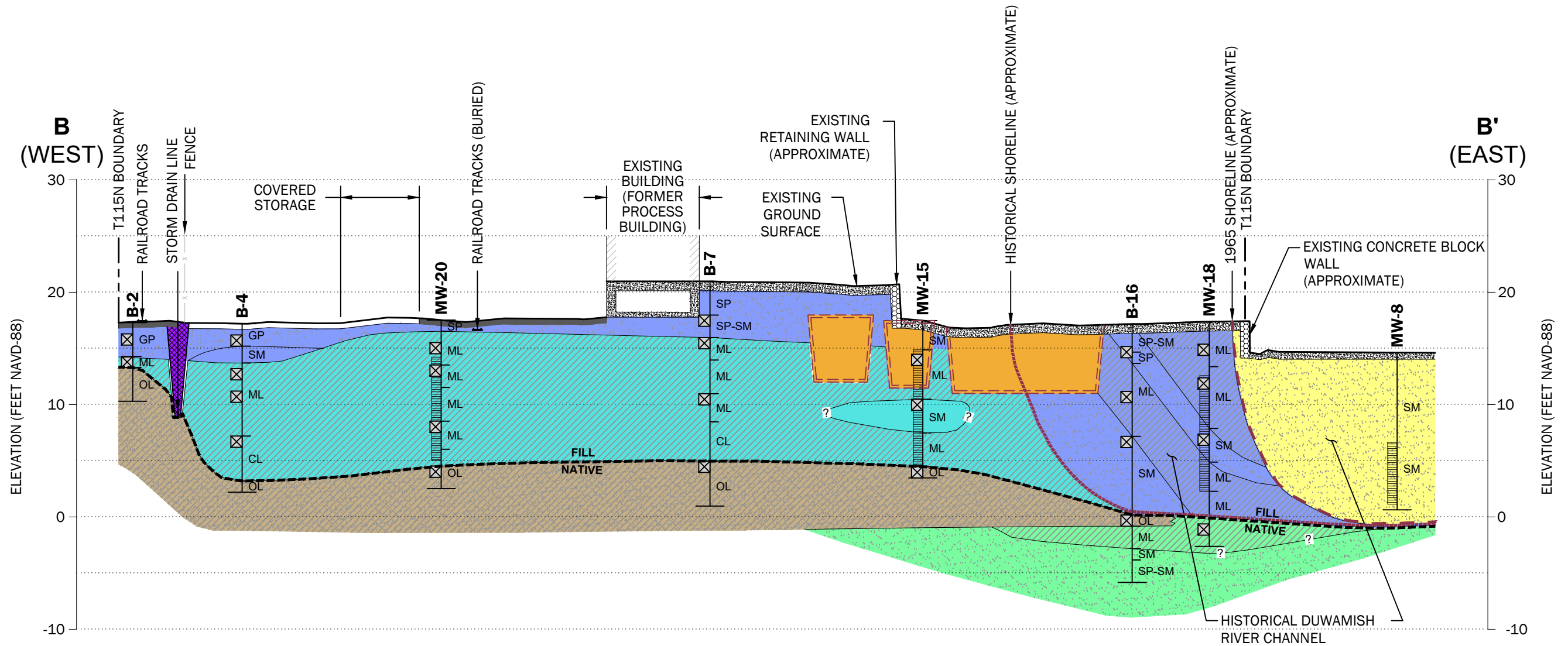




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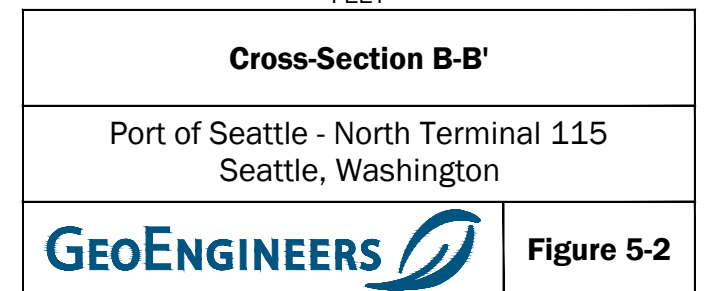
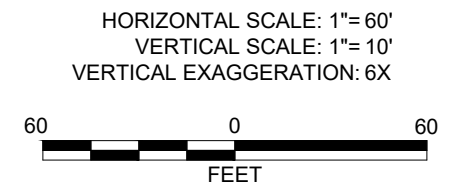
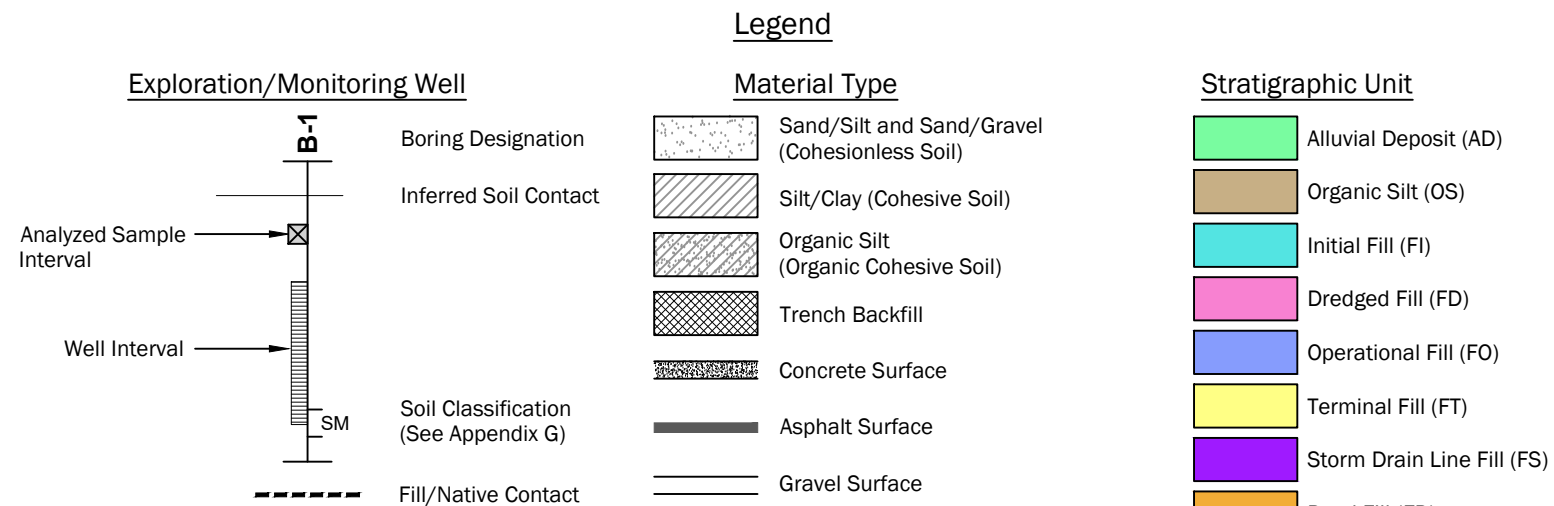
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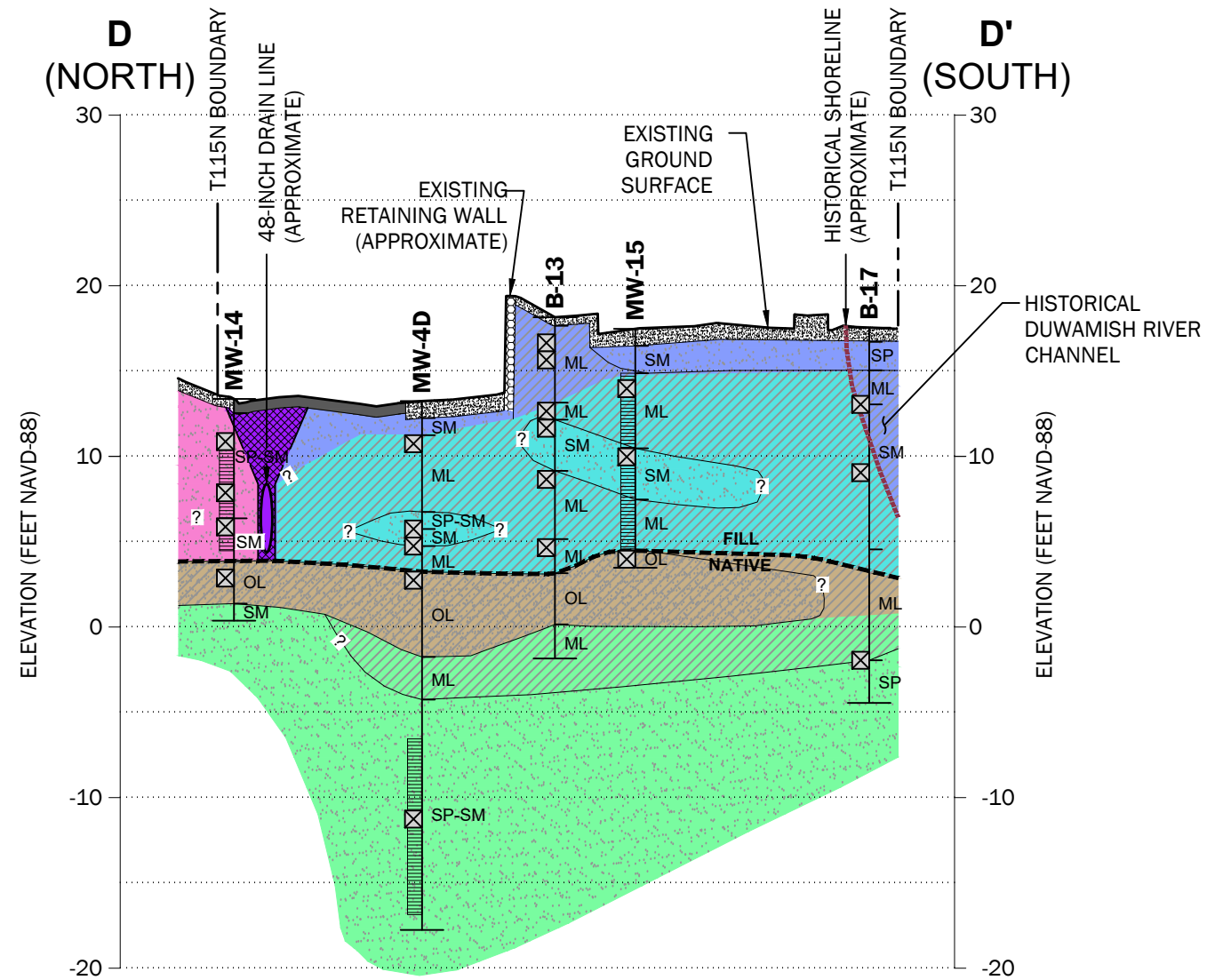
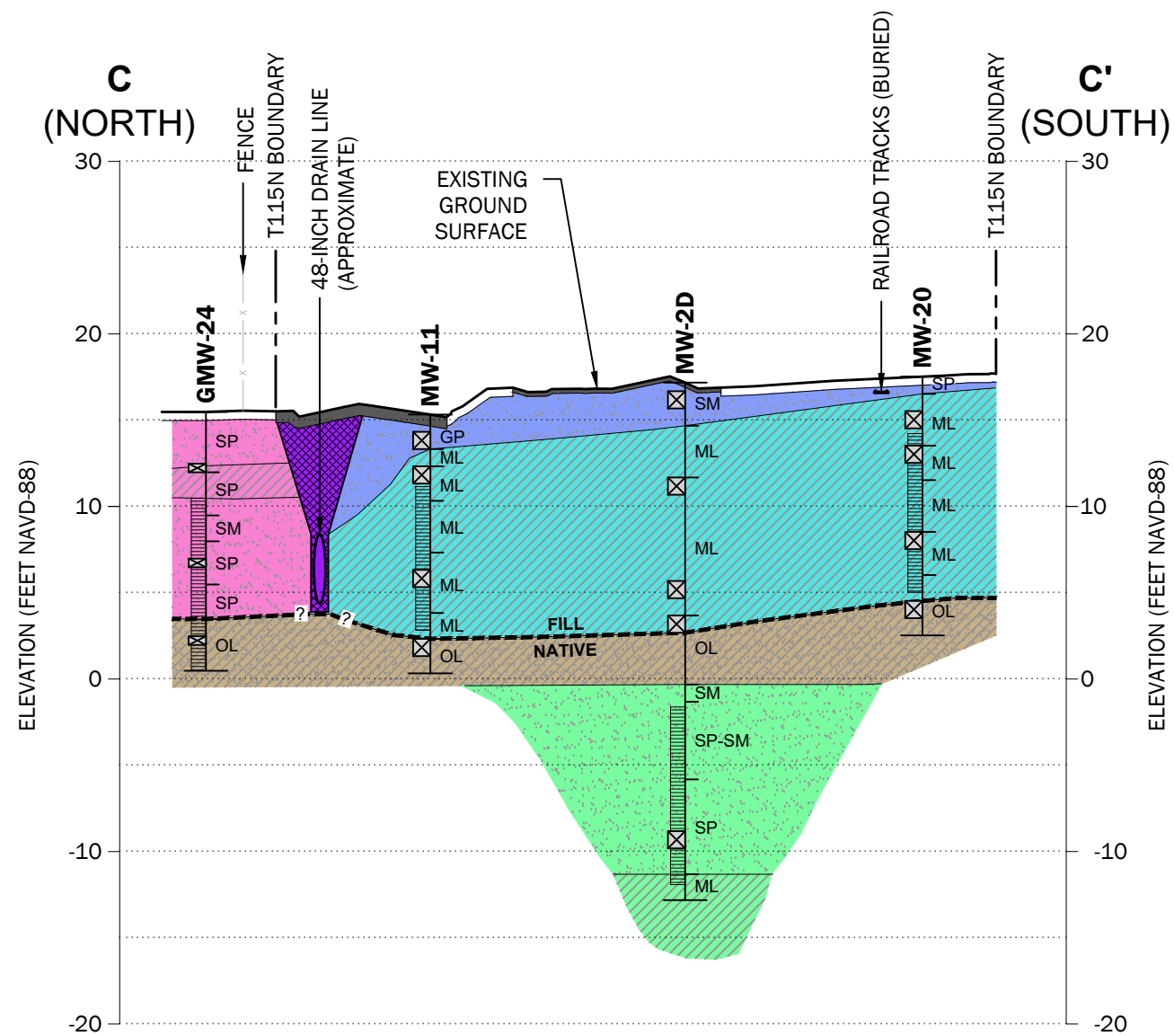
Notes:

1. Mean Higher High Water (MHHW) referenced from United States Army Corps of Engineers (USACE) Duwamish Waterway tidal Datum No. 92 for the North Puget Sound Region.
2. The locations of all features shown are approximate.
3. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Reference: Base survey by Dowl HKM dated January 2014.
Locations of historic features from 2009 remedial investigation (Landau, 2009), and historic aerial photos circa 1960 and 1965.

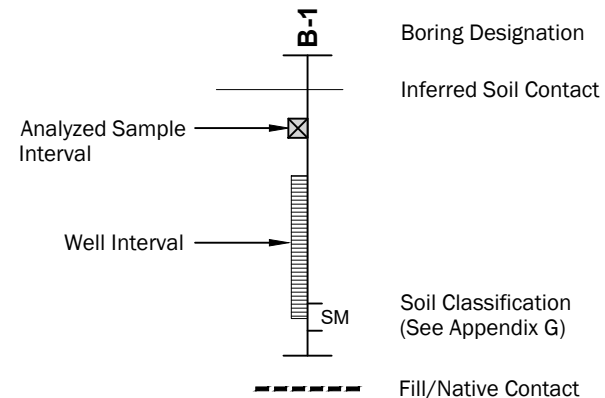


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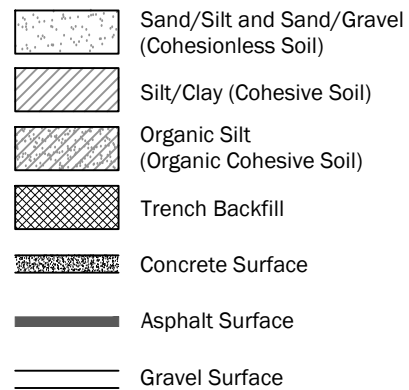


Legend

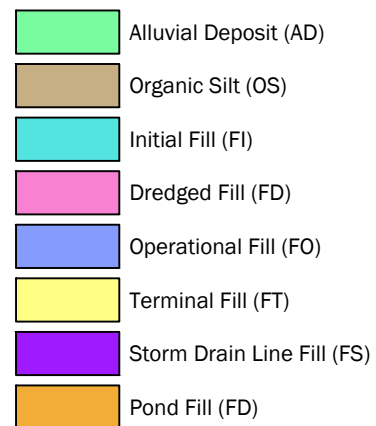
Exploration/Monitoring Well



Material Type



Stratigraphic Unit

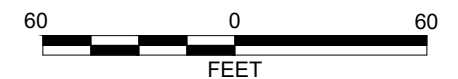


Notes:

1. Mean Higher High Water (MHHW) referenced from United States Army Corps of Engineers (USACE) Duwamish Waterway tidal Datum No. 92 for the North Puget Sound Region.
2. The locations of all features shown are approximate.
3. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Reference: Base survey by Dowl HKM dated January 2014.
Locations of historic features from 2009 remedial investigation (Landau, 2009), and historic aerial photos circa 1960 and 1965.

HORIZONTAL SCALE: 1"= 60'
VERTICAL SCALE: 1"= 10'
VERTICAL EXAGGERATION: 6X

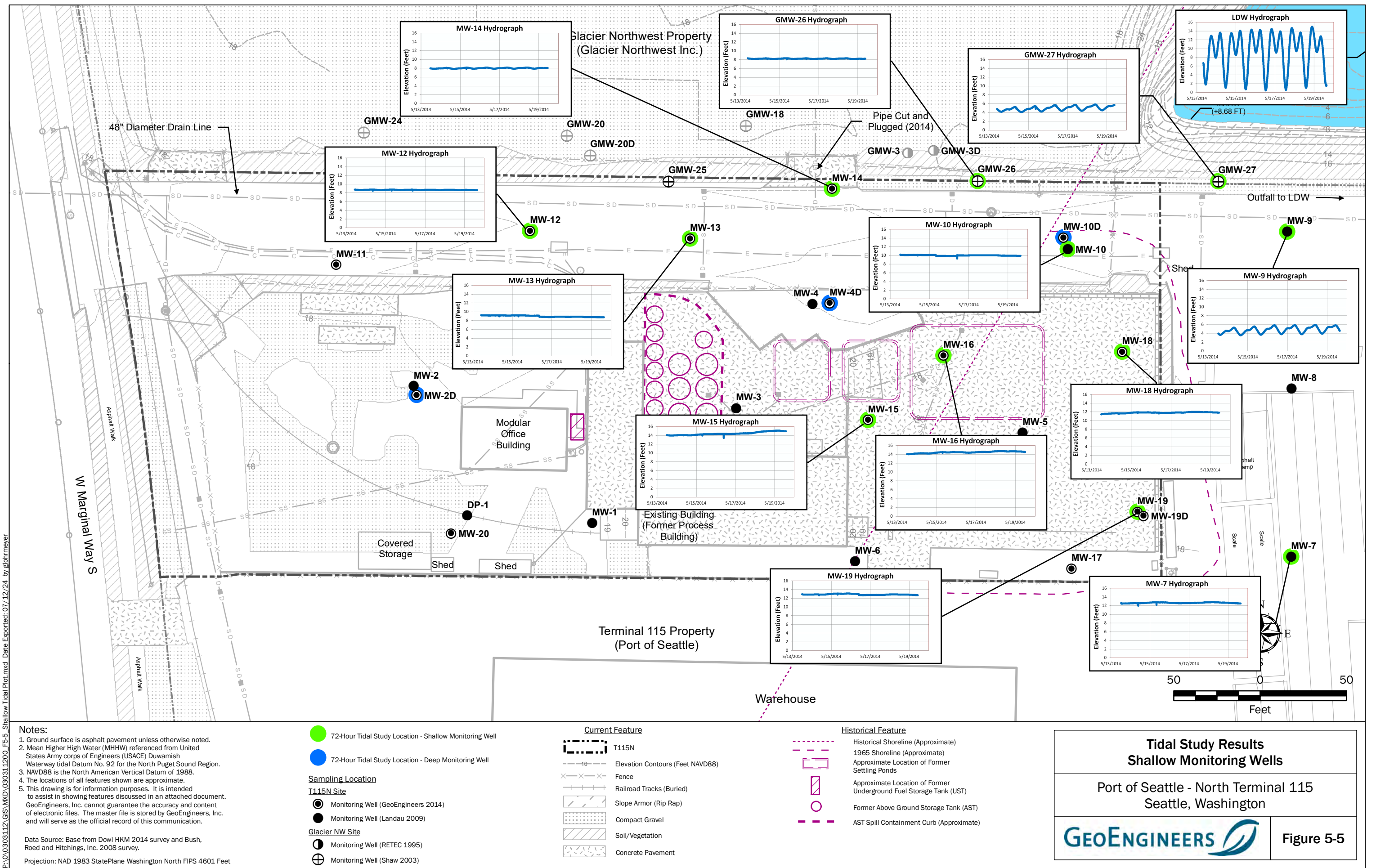


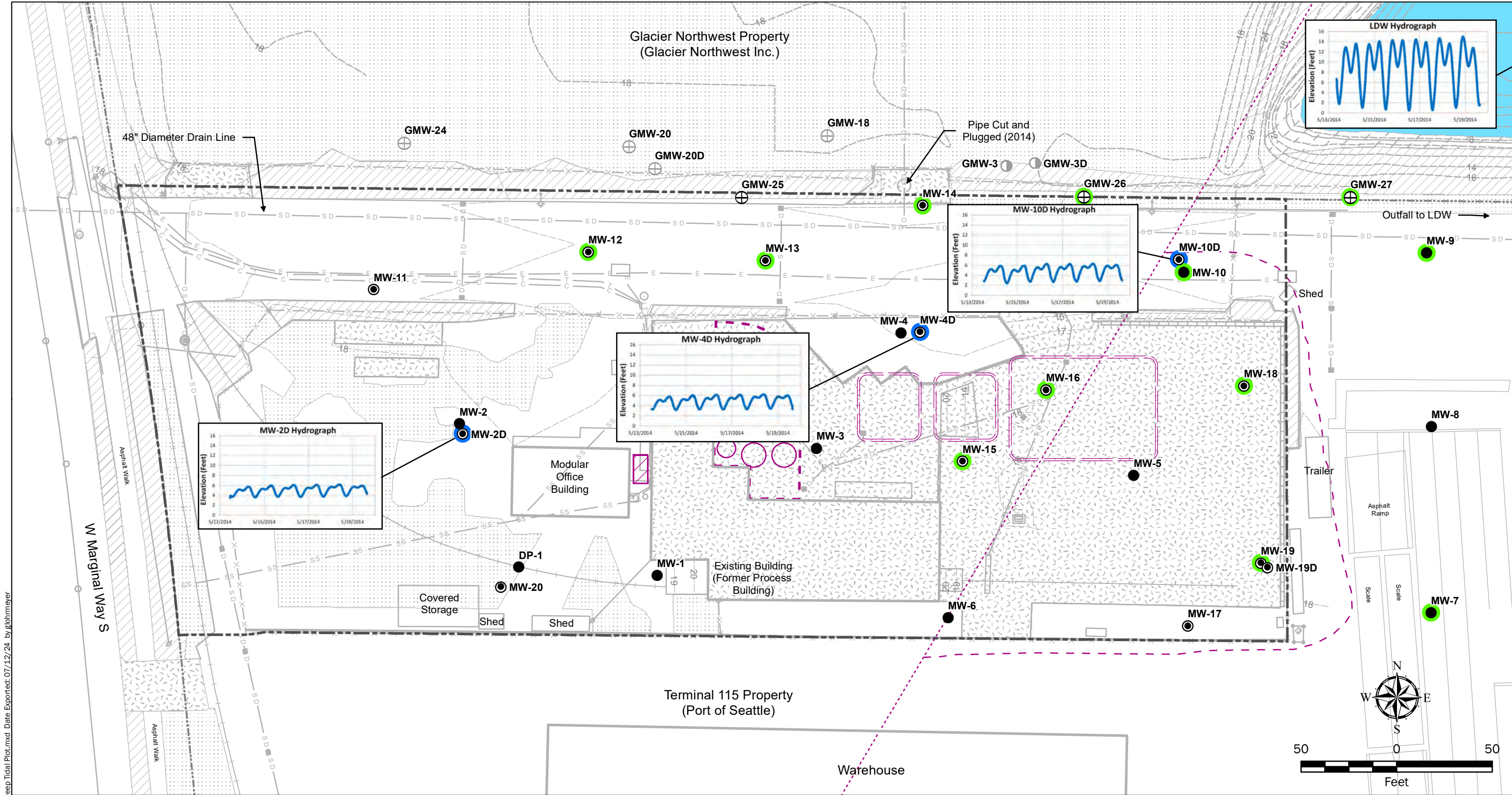
Cross-Section C-C' and D-D'

Port of Seattle - North Terminal 115
Seattle, Washington



Figure 5-3





Notes:

1. Ground surface is asphalt pavement unless otherwise noted.
2. Mean Higher High Water (MHHW) referenced from United States Army Corps of Engineers (USACE) Duwamish Waterway tidal Datum No. 92 for the North Puget Sound Region.
3. NAVD88 is the North American Vertical Datum of 1988.
4. The locations of all features shown are approximate.
5. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Data Source: Base from Dowl HKM 2014 survey and Bush, Roed and Hitchings, Inc. 2008 survey.

Projection: NAD 1983 StatePlane Washington North FIPS 4601 Feet

Sampling Location

T115N Site

- Monitoring Well (GeoEngineers 2014)
- Monitoring Well (Landau 2009)

Glacier NW Site

- Monitoring Well (RETEC 1995)
- Monitoring Well (Shaw 2003)

Current Feature

- T115N
- Elevation Contours (Feet NAVD88)
- Fence
- Railroad Tracks (Buried)
- Slope Armor (Rip Rap)
- Compact Gravel
- Soil/Vegetation
- Concrete Pavement

Historical Feature

- Historical Shoreline (Approximate)
- 1965 Shoreline (Approximate)
- Approximate Location of Former Settling Ponds
- Approximate Location of Former Underground Fuel Storage Tank (UST)
- Former Above Ground Storage Tank (AST)
- AST Spill Containment Curb (Approximate)

Tidal Study Results

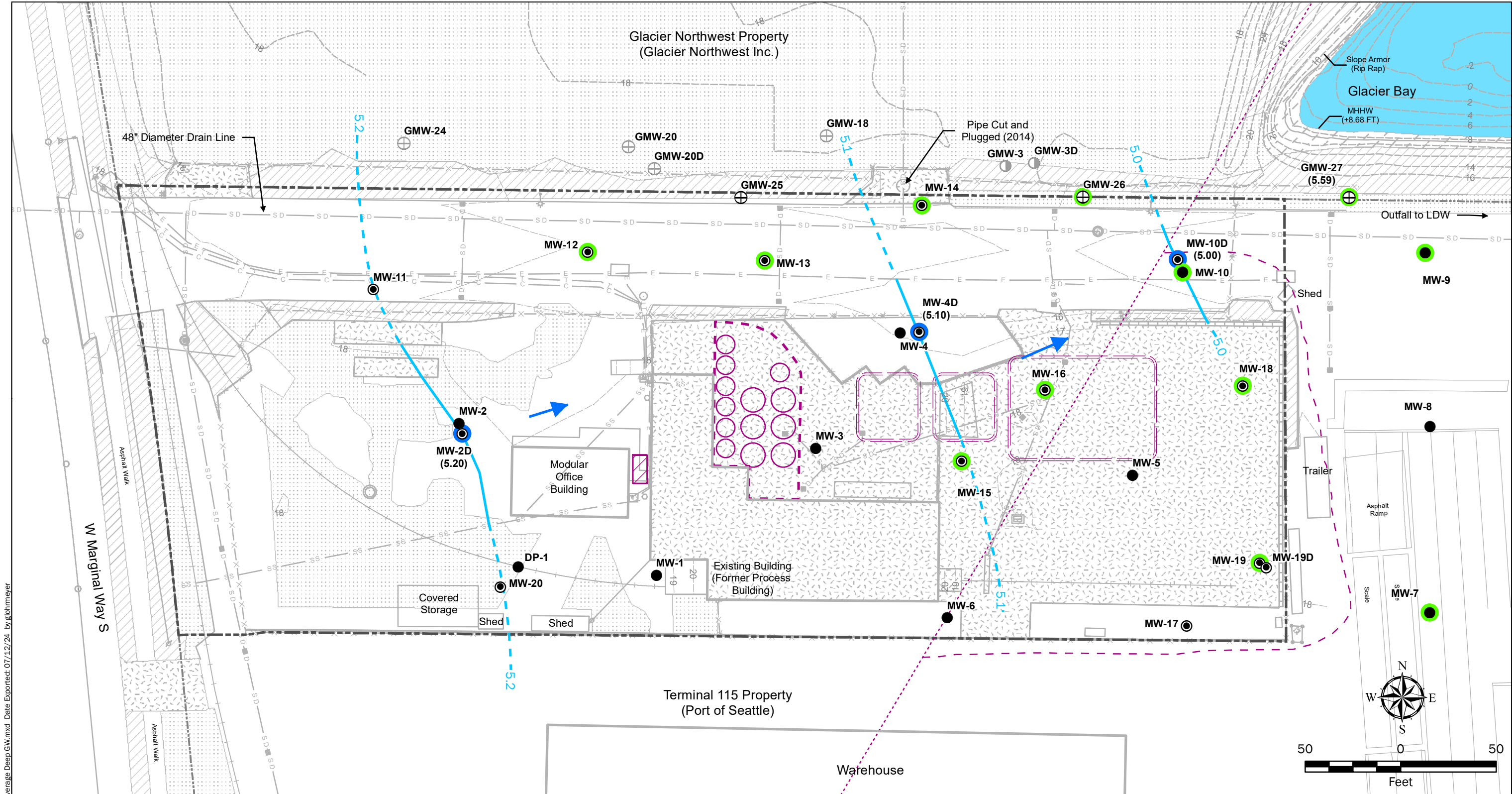
Deep Monitoring Wells

Port of Seattle - North Terminal 115

Seattle, Washington

GEOENGINEERS

Figure 5-6



Notes:

1. Ground surface is asphalt pavement unless otherwise noted.
2. Mean Higher High Water (MHHW) referenced from United States Army corps of Engineers (USACE) Duwamish Waterway tidal Datum No. 92 for the North Puget Sound Region.
3. NAVD88 is the North American Vertical Datum of 1988.
4. The locations of all features shown are approximate.
5. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Data Source: Base from Dowl HKM 2014 survey and Bush, Roed and Hitchings, Inc. 2008 survey.
Projection: NAD 1983 StatePlane Washington North FIPS 4601 Feet

72-Hour Tidal Study Location - Shallow Monitoring Well

72-Hour Tidal Study Location - Deep Monitoring Well

Sampling Location

T115N Site

Monitoring Well (GeoEngineers 2014)

Monitoring Well (Landau 2009)

Glacier NW Site

Monitoring Well (RETEC 1995)

Monitoring Well (Shaw 2003)

(8.69) Average Groundwater Elevation Recorded During Tidal Cycle (feet, NAVD88)

Average 72 Hour Water Level

Inferred Average 72 Hour Water Level

Estimated Groundwater Flow Direction

Current Feature

- T115N
- Elevation Contours (Feet NAVD88)
- Fence
- Railroad Tracks (Buried)
- Slope Armor (Rip Rap)
- Compact Gravel
- Soil/Vegetation
- Concrete Pavement

Historical Feature

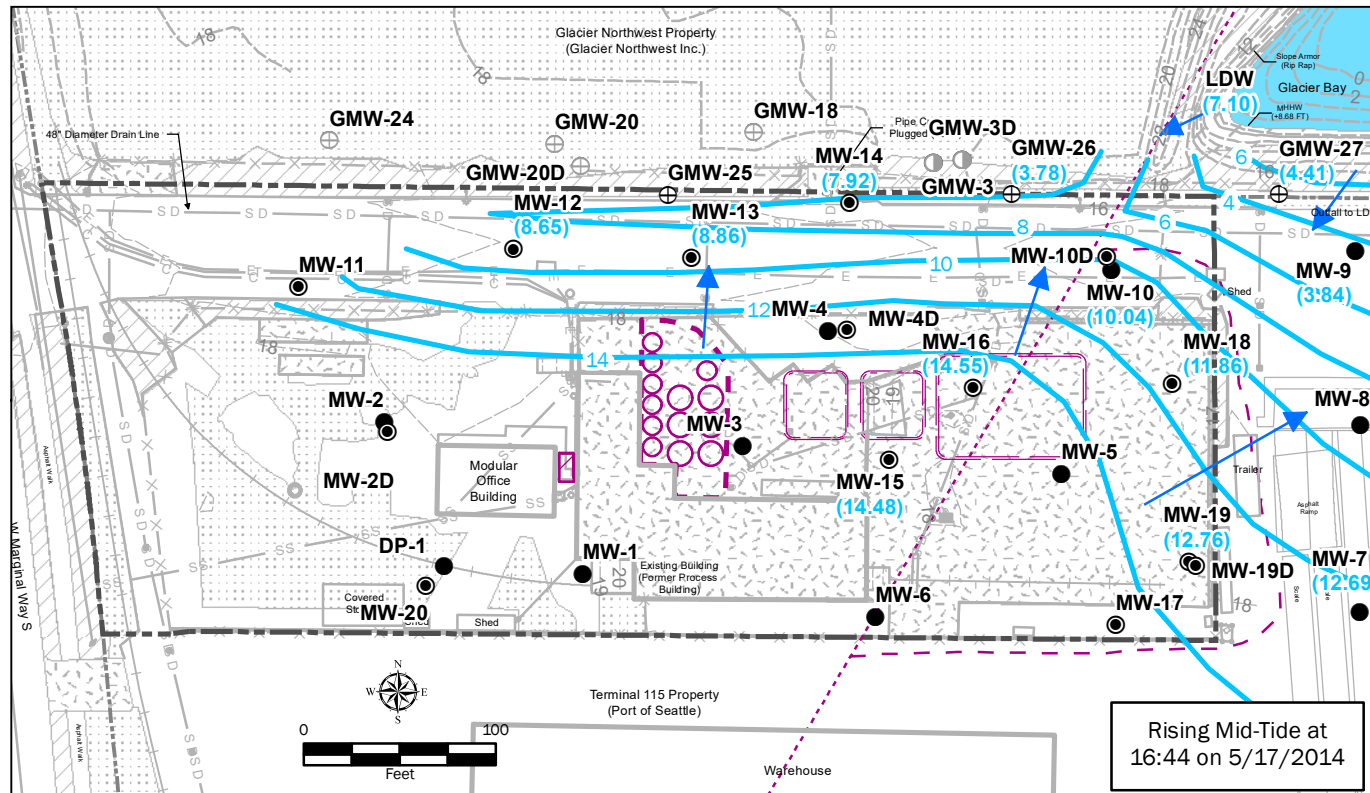
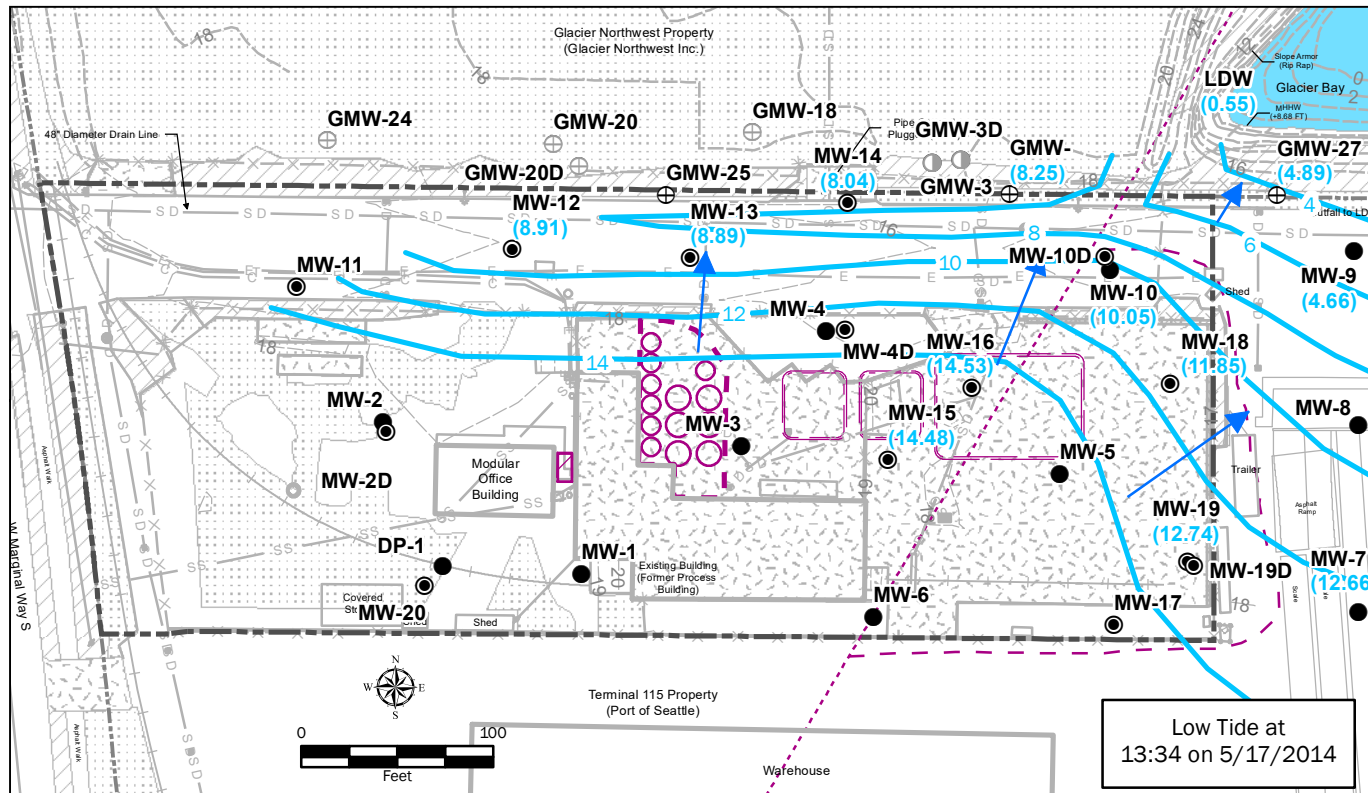
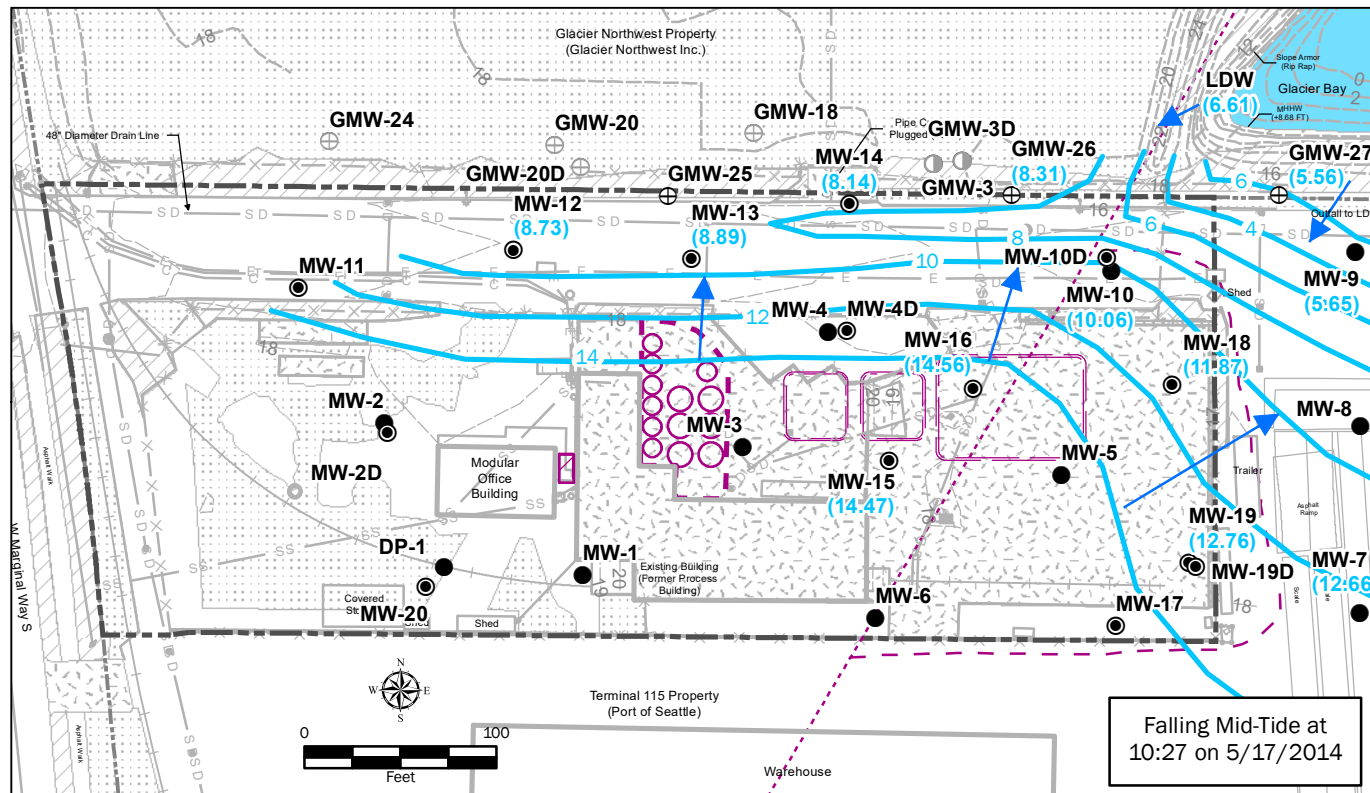
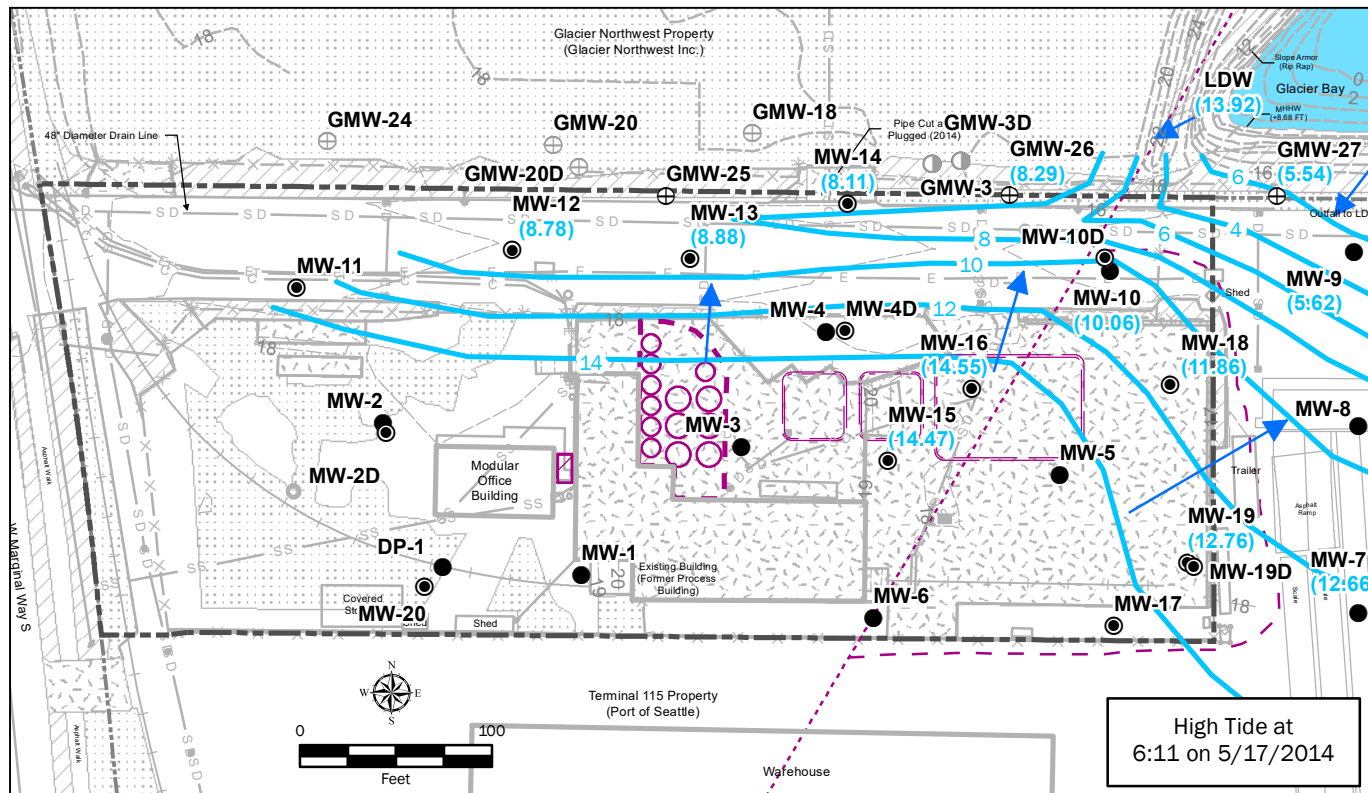
- Historical Shoreline (Approximate)
- 1965 Shoreline (Approximate)
- Approximate Location of Former Settling Ponds
- Approximate Location of Former Underground Fuel Storage Tank (UST)
- Former Above Ground Storage Tank (AST)
- AST Spill Containment Curb (Approximate)

Average Deep Groundwater Elevation and Flow Direction During Tidal Study

Port of Seattle - North Terminal 115
Seattle, Washington

GEOENGINEERS

Figure 5-8



Notes:

1. Ground surface is asphalt pavement unless otherwise noted.
 2. Mean Higher High Water (MHHW) referenced from United States Army Corps of Engineers (USACE) Duwamish Waterway tidal Datum No. 92 for the North Puget Sound Region.
 3. NAVD88 is the North American Vertical Datum of 1988.
 4. The locations of all features shown are approximate.
 5. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.
- Data Source: Base from Dowl HKM 2014 survey and Bush, Roed and Hitchings, Inc. 2008 survey.

Projection: NAD 1983 StatePlane Washington North FIPS 4601 Feet

Sampling Location

T115N Site

- Monitoring Well (GeoEngineers 2014)
- Monitoring Well (Landau 2009)

Glacier NW Site

- Monitoring Well (RETEC 1995)
- Monitoring Well (Shaw 2003)

- (14) Groundwater Elevation Recorded During Tidal Cycle (feet, NAVD88)
- Groundwater Elevation Contour
- Inferred Groundwater Elevation Contour
- Estimated Groundwater Flow Direction

Current Feature

- T115N
- Elevation Contours (Feet NAVD88)
- Fence
- Railroad Tracks (Buried)
- Slope Armor (Rip Rap)
- Compact Gravel
- Soil/Vegetation
- Concrete Pavement

Historical Feature

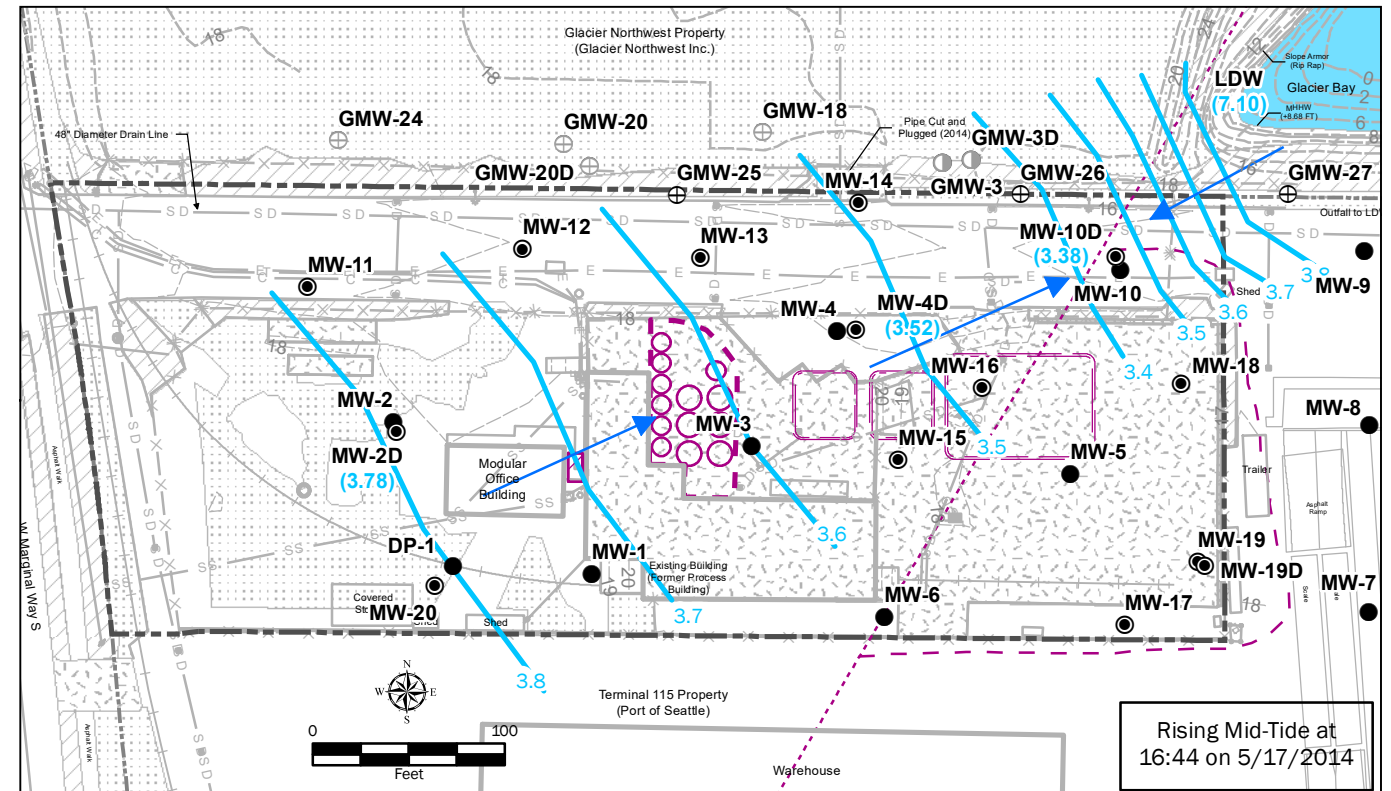
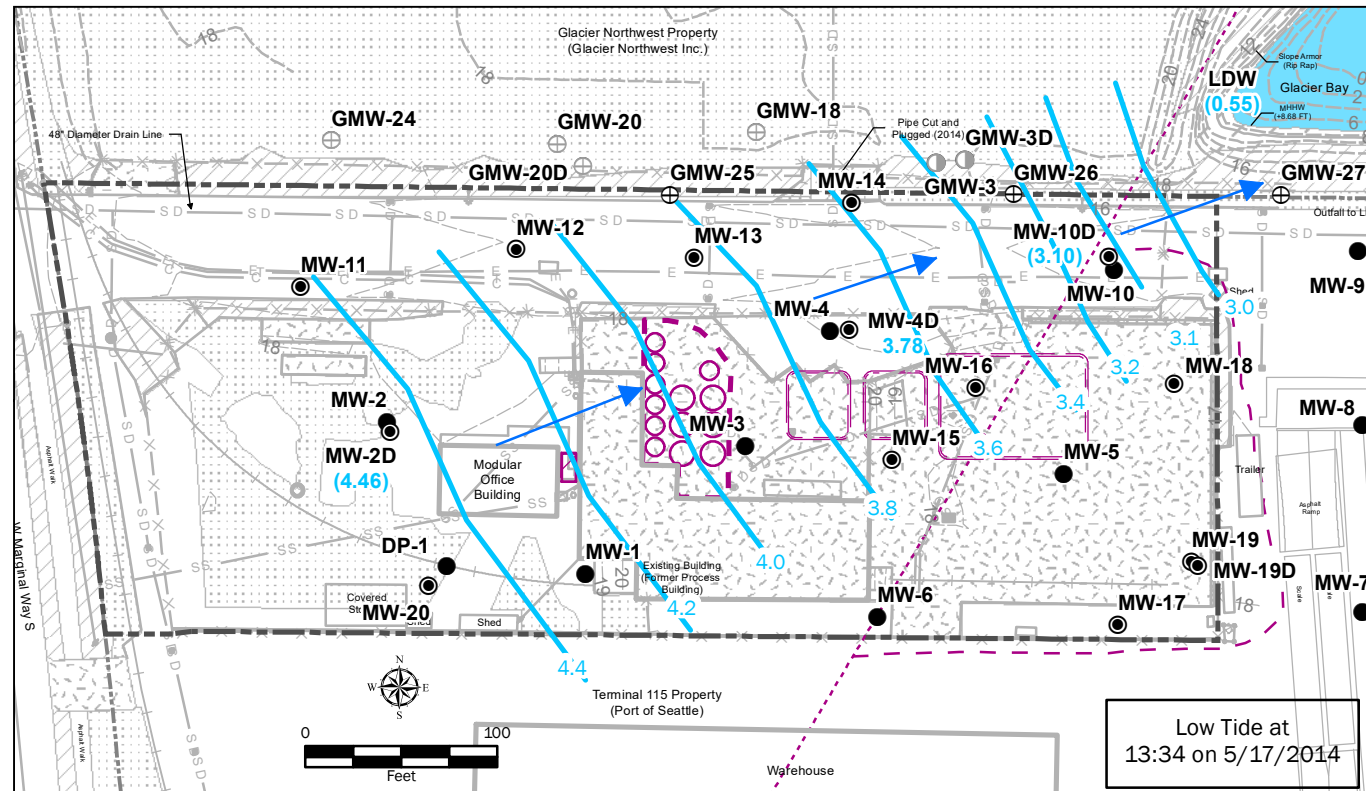
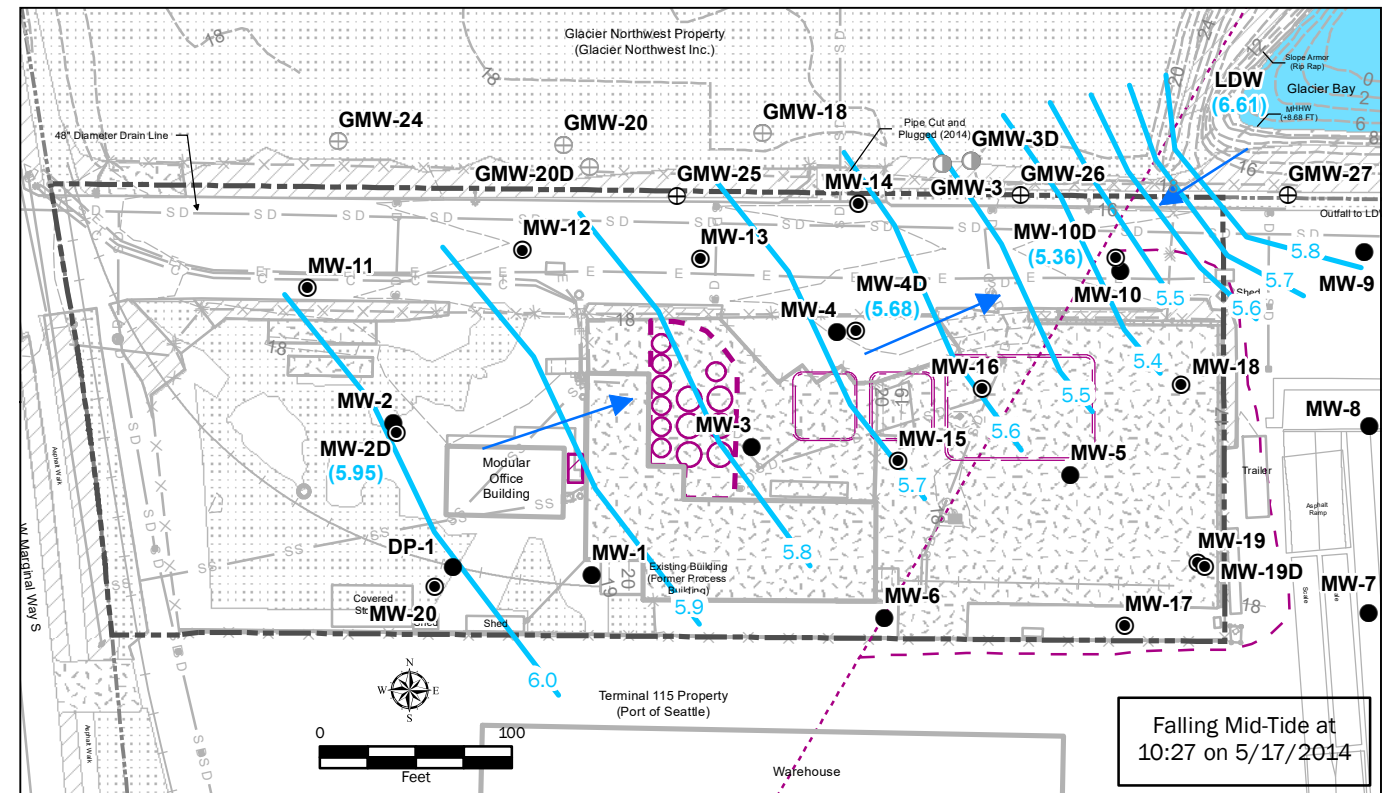
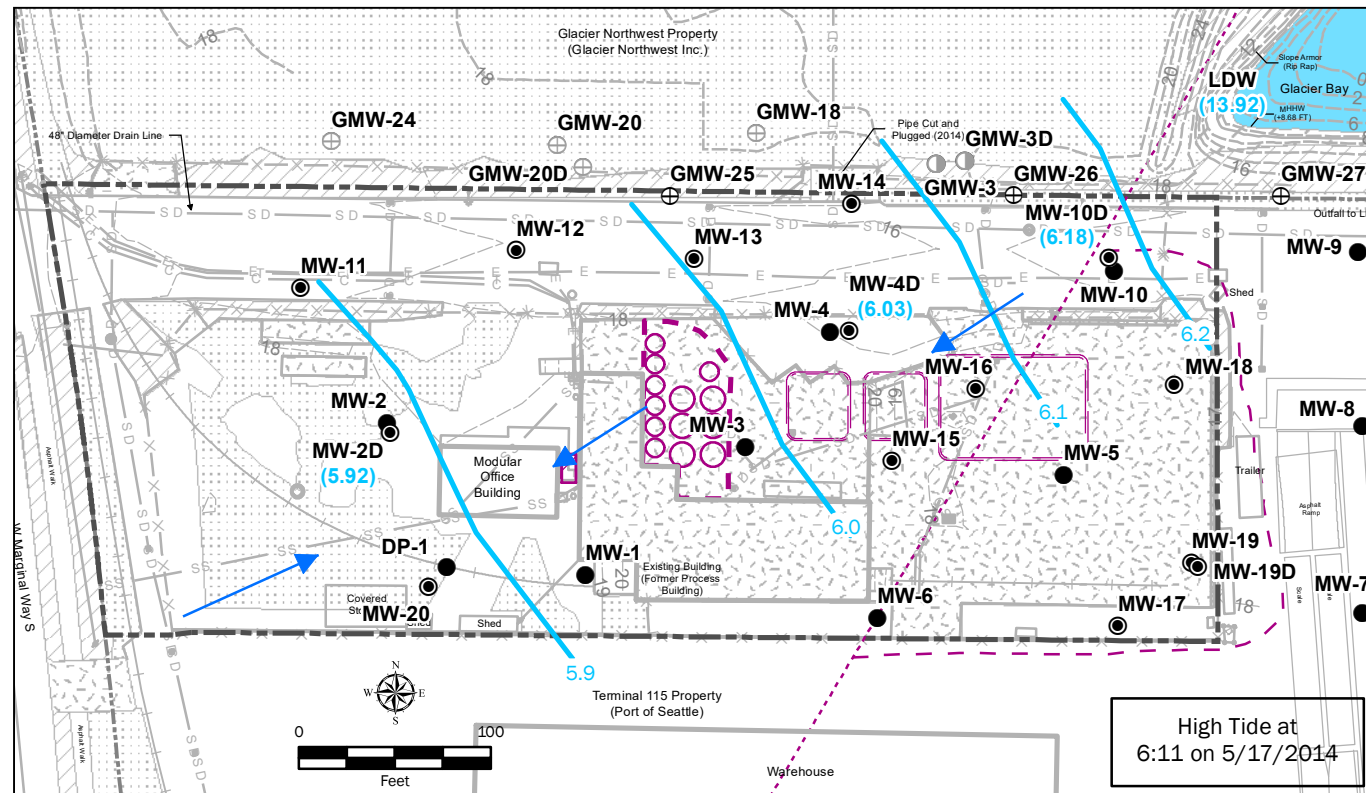
- Historical Shoreline (Approximate)
- 1965 Shoreline (Approximate)
- Approximate Location of Former Settling Ponds
- Approximate Location of Former Underground Fuel Storage Tank (UST)
- Former Above Ground Storage Tank (AST)
- AST Spill Containment Curb (Approximate)

Shallow Groundwater Elevation and Flow Direction During Tide Cycle

Port of Seattle - North Terminal 115
Seattle, Washington

GEOENGINEERS

Figure 5-9



Notes:

1. Ground surface is asphalt pavement unless otherwise noted.
2. Mean Higher High Water (MHHW) referenced from United States Army Corps of Engineers (USACE) Duwamish Waterway tidal Datum No. 92 for the North Puget Sound Region.
3. NAVD88 is the North American Vertical Datum of 1988.
4. The locations of all features shown are approximate.
5. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Data Source: Base from Dowl HKM 2014 survey and Bush, Roed and Hitchings, Inc. 2008 survey.

Projection: NAD 1983 StatePlane Washington North FIPS 4601 Feet

Sampling Location

T115N Site

- Monitoring Well (GeoEngineers 2014)
- Monitoring Well (Landau 2009)

Glacier NW Site

- Monitoring Well (RETEC 1995)
- Monitoring Well (Shaw 2003)

- (5.9) Groundwater Elevation Recorded During Tidal Cycle (feet, NAVD88)
- Groundwater Elevation Contour
- Inferred Groundwater Elevation Contour
- Estimated Groundwater Flow Direction

Current Feature

- T115N
- Elevation Contours (Feet NAVD88)
- Fence
- Railroad Tracks (Buried)
- Slope Armor (Rip Rap)
- Compact Gravel
- Soil/Vegetation
- Concrete Pavement

Historical Feature

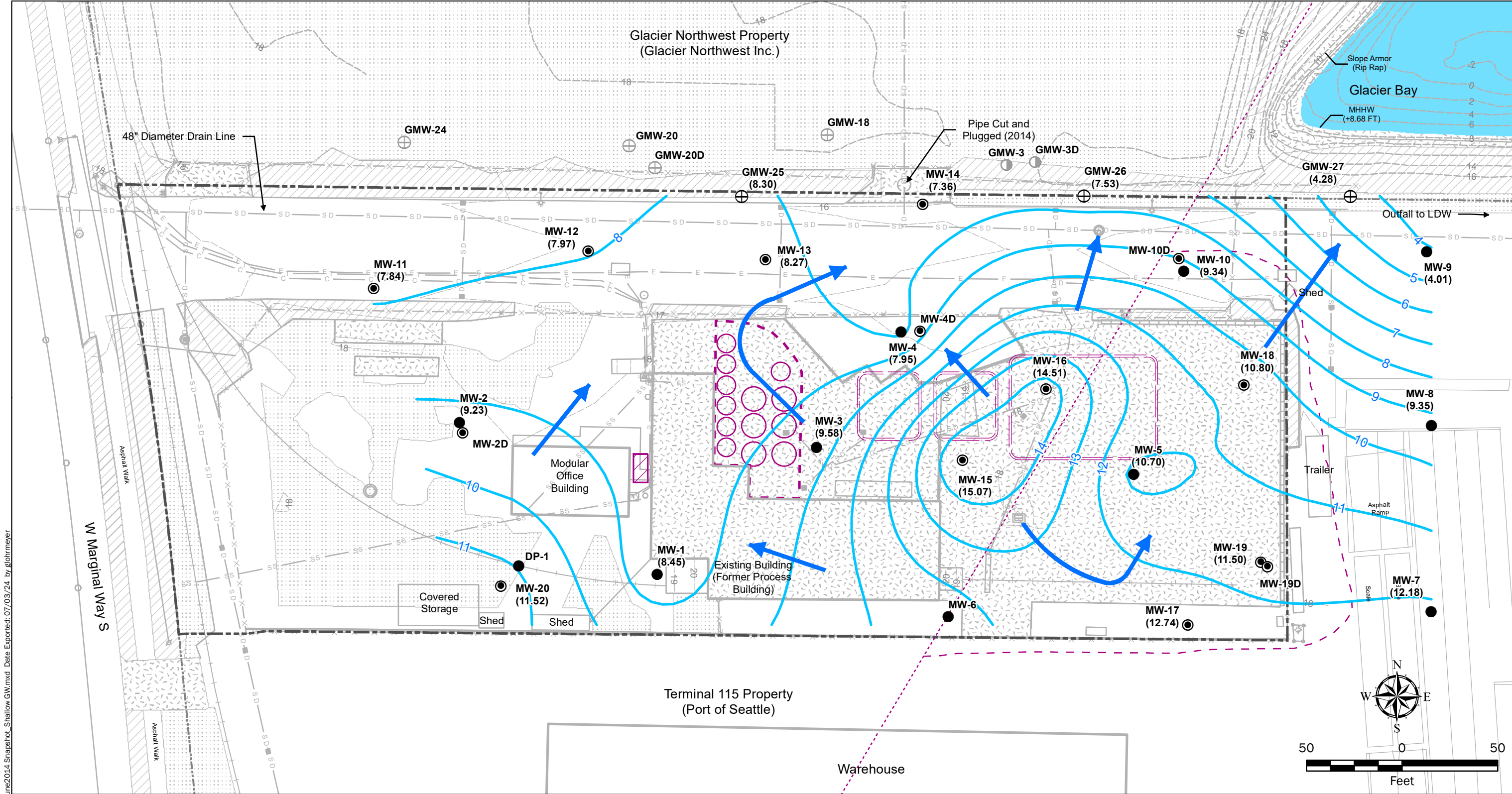
- Historical Shoreline (Approximate)
- 1965 Shoreline (Approximate)
- Approximate Location of Former Settling Ponds
- Approximate Location of Former Underground Fuel Storage Tank (UST)
- Former Above Ground Storage Tank (AST)
- AST Spill Containment Curb (Approximate)

Deep Groundwater Elevation and Flow Direction During Tide Cycle

Port of Seattle - North Terminal 115
Seattle, Washington

GEOENGINEERS

Figure 5-10



Notes:

1. Ground surface is asphalt pavement unless otherwise noted.
2. Mean Higher High Water (MHHW) referenced from United States Army Corps of Engineers (USACE) Duwamish Waterway tidal Datum No. 92 for the North Puget Sound Region.
3. NAVD88 is the North American Vertical Datum of 1988.
4. The locations of all features shown are approximate.
5. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Data Source: Base from Dowl HKM 2014 survey and Bush, Roed and Hitchings, Inc. 2008 survey.

Projection: NAD 1983 StatePlane Washington North FIPS 4601 Feet

Sampling Location

T115N Site

- Monitoring Well (GeoEngineers 2014)
- Monitoring Well (Landau 2009)

Glacier NW Site

- Monitoring Well (RETEC 1995)
- Monitoring Well (Shaw 2003)

Please note that groundwater levels were measured prior to purging and sampling the well over several days and are therefore not true snapshots of the shallow groundwater conditions. However, since shallow groundwater is largely unaffected by LDW tidal fluctuations, the potentiometric surface and hydraulic gradient/flow direction shown are generally representative of groundwater conditions.

Current Feature

- T115N
- Elevation Contours (Feet NAVD88)
- Fence
- Railroad Tracks (Buried)
- Slope Armor (Rip Rap)
- Compact Gravel
- Soil/Vegetation
- Concrete Pavement

Historical Feature

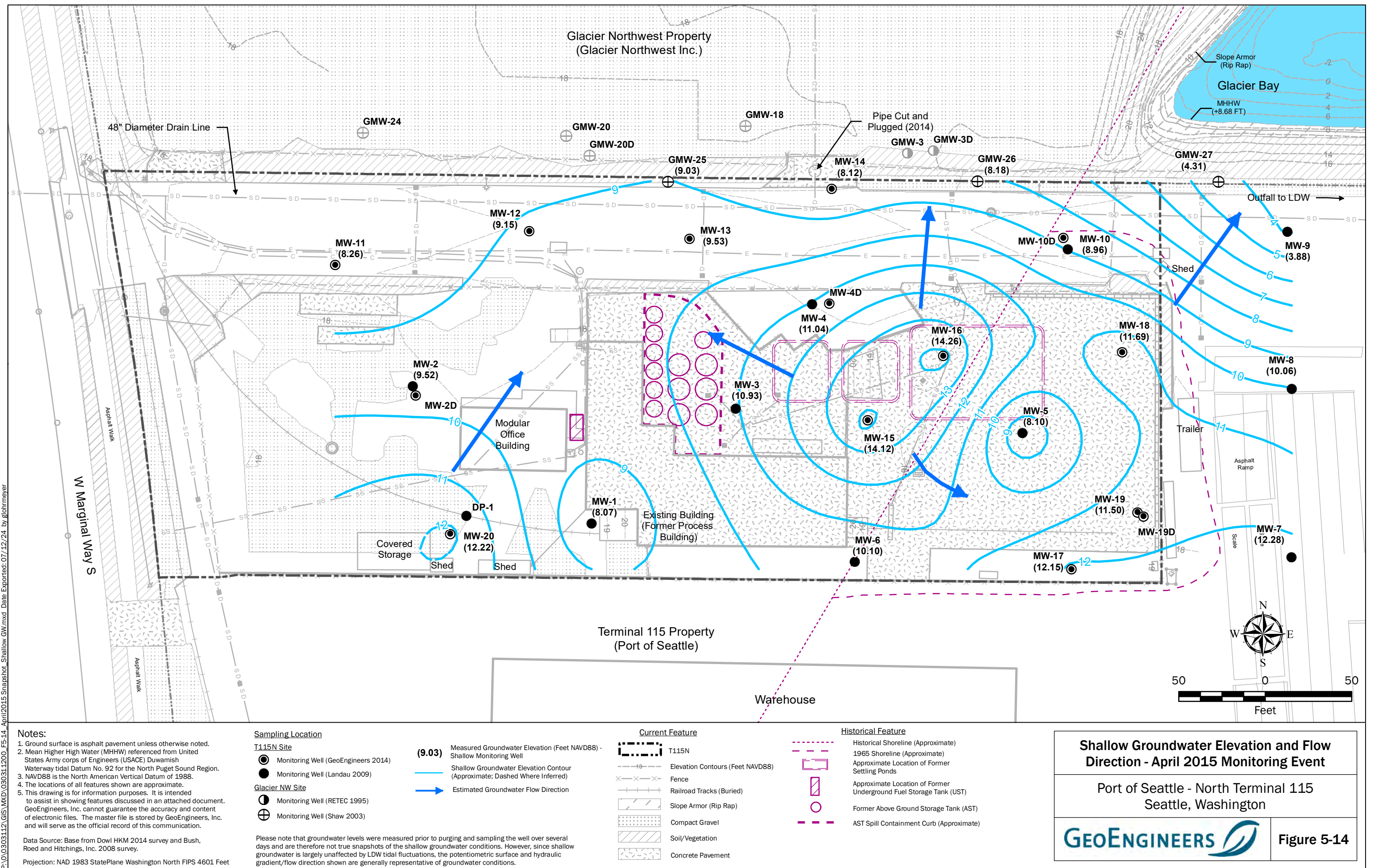
- Historical Shoreline (Approximate)
- 1965 Shoreline (Approximate)
- Approximate Location of Former Settling Ponds
- Approximate Location of Former Underground Fuel Storage Tank (UST)
- Former Above Ground Storage Tank (AST)
- AST Spill Containment Curb (Approximate)

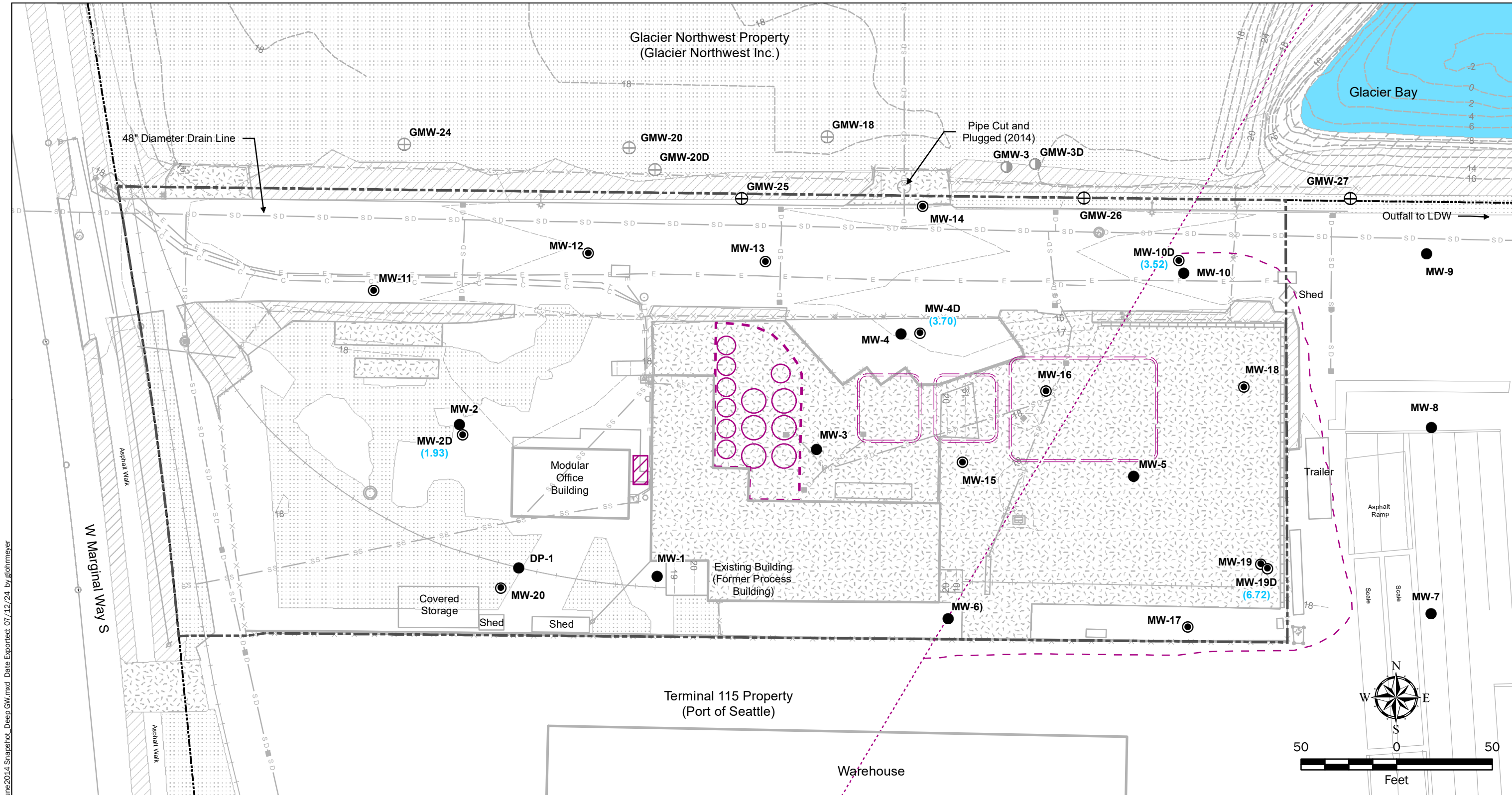
Shallow Groundwater Elevation and Flow Direction - June 2014 Monitoring Event

Port of Seattle - North Terminal 115
Seattle, Washington

GEOENGINEERS

Figure 5-11





Notes:

1. Ground surface is asphalt pavement unless otherwise noted.
2. Mean Higher High Water (MHHW) referenced from United States Army Corps of Engineers (USACE) Duwamish Waterway tidal Datum No. 92 for the North Puget Sound Region.
3. NAVD88 is the North American Vertical Datum of 1988.
4. The locations of all features shown are approximate.
5. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Data Source: Base from Dowl HKM 2014 survey and Bush, Roed and Hitchings, Inc. 2008 survey.
Projection: NAD 1983 StatePlane Washington North FIPS 4601 Feet

Sampling Location

T115N Site

- Monitoring Well (GeoEngineers 2014)
- Monitoring Well (Landau 2009)

Glacier NW Site

- Monitoring Well (RETEC 1995)
- Monitoring Well (Shaw 2003)

Please note that groundwater levels were measured prior to purging and sampling the well over several days at the effective low tide (low tide with lag time taken into consideration) for each well and are therefore not true snapshots of the deep groundwater conditions. As a result, potentiometric groundwater surfaces and gradients were not prepared because the elevations are not a snapshot of the groundwater gradients and only identify the groundwater elevation during the monitoring event.

(1.93) Measured Groundwater Elevation (Feet NAVD88) - Deep Monitoring Well

Current Feature

- T115N
- Elevation Contours (Feet NAVD88)
- Fence
- Railroad Tracks (Buried)
- Slope Armor (Rip Rap)
- Compact Gravel
- Soil/Vegetation
- Concrete Pavement

Historical Feature

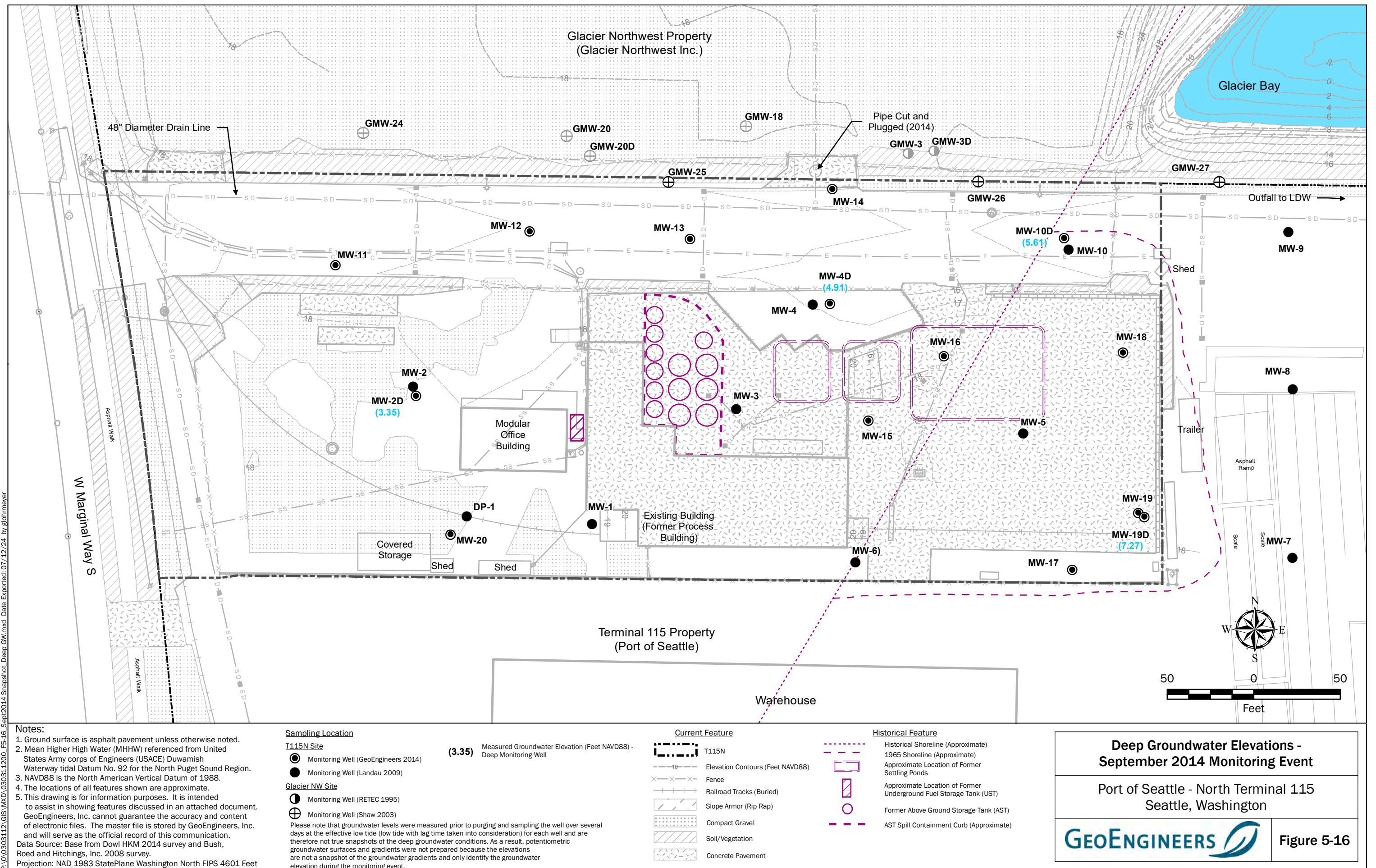
- Historical Shoreline (Approximate)
- 1965 Shoreline (Approximate)
- Approximate Location of Former Settling Ponds
- Approximate Location of Former Underground Fuel Storage Tank (UST)
- Former Above Ground Storage Tank (AST)
- AST Spill Containment Curb (Approximate)

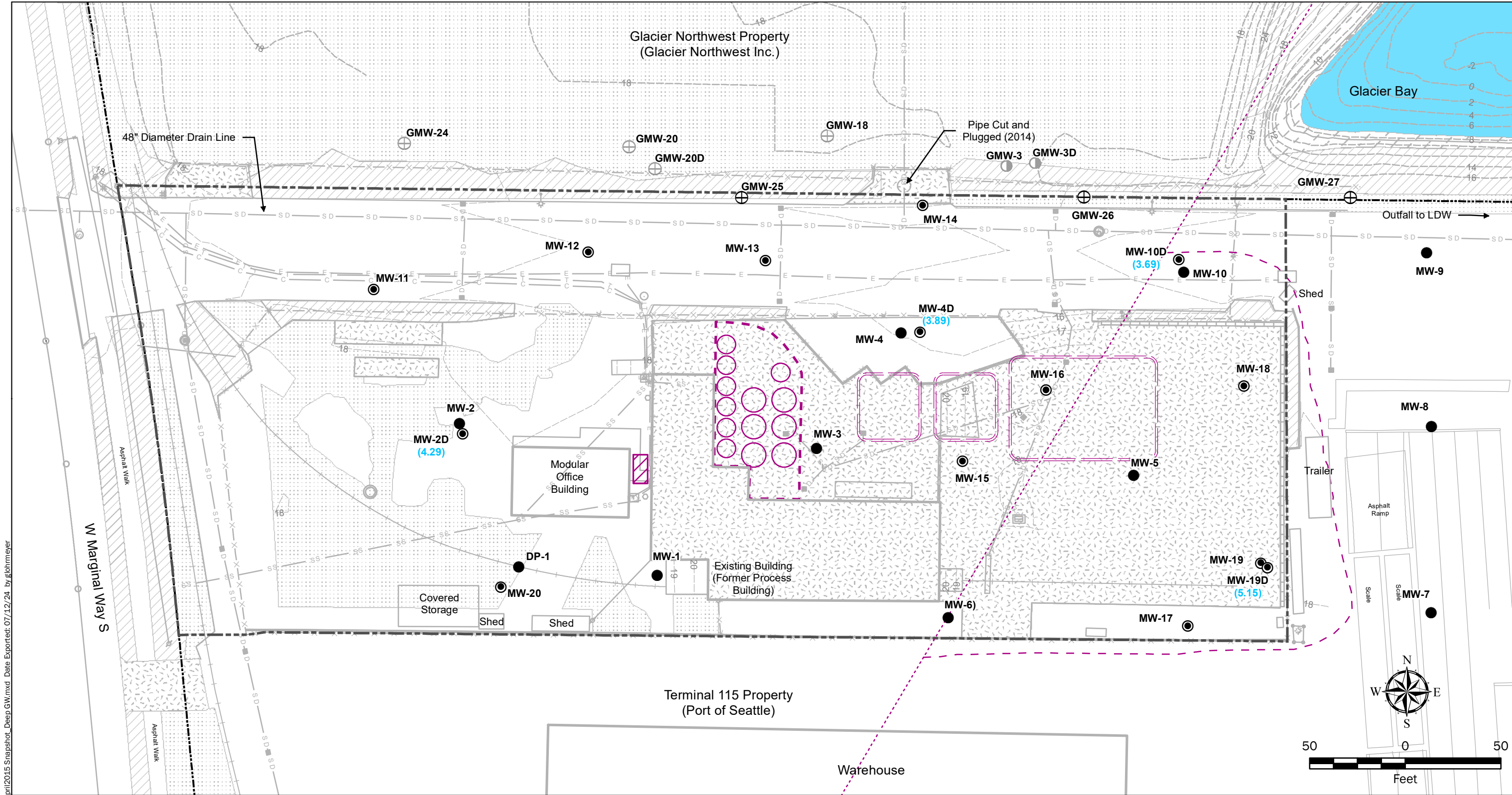
Deep Groundwater Elevations - June 2014 Monitoring Event

Port of Seattle - North Terminal 115
Seattle, Washington

GEOENGINEERS

Figure 5-15





Notes:

- Ground surface is asphalt pavement unless otherwise noted.
- Mean Higher High Water (MHHW) referenced from United States Army Corps of Engineers (USACE) Duwamish Waterway tidal Datum No. 92 for the North Puget Sound Region.
- NAVD88 is the North American Vertical Datum of 1988.
- The locations of all features shown are approximate.
- This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication. Data Source: Base from Dowl HKM 2014 survey and Bush, Roed and Hitchings, Inc. 2008 survey. Projection: NAD 1983 StatePlane Washington North FIPS 4601 Feet

Sampling Location

T115N Site

- Monitoring Well (GeoEngineers 2014)
- Monitoring Well (Landau 2009)

Glacier NW Site

- Monitoring Well (RETEC 1995)
- Monitoring Well (Shaw 2003)

Please note that groundwater levels were measured prior to purging and sampling the well over several days at the effective low tide (low tide with lag time taken into consideration) for each well and are therefore not true snapshots of the deep groundwater conditions. As a result, potentiometric groundwater surfaces and gradients were not prepared because the elevations are not a snapshot of the groundwater gradients and only identify the groundwater elevation during the monitoring event.

Current Feature

- T115N
- Elevation Contours (Feet NAVD88)
- Fence
- Railroad Tracks (Buried)
- Slope Armor (Rip Rap)
- Compact Gravel
- Soil/Vegetation
- Concrete Pavement

Historical Feature

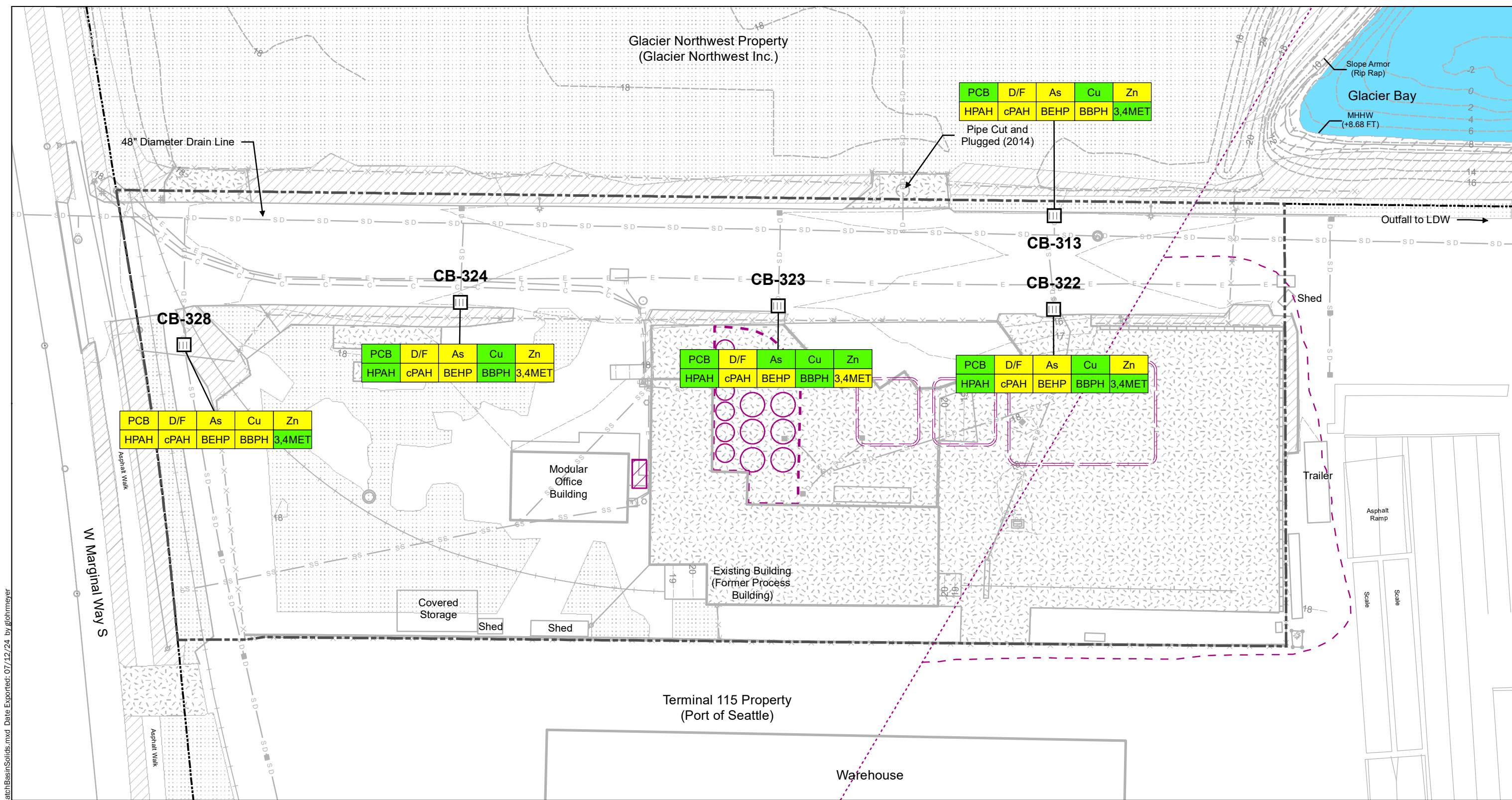
- Historical Shoreline (Approximate)
- 1965 Shoreline (Approximate)
- Approximate Location of Former Settling Ponds
- Approximate Location of Former Underground Fuel Storage Tank (UST)
- Former Above Ground Storage Tank (AST)
- AST Spill Containment Curb (Approximate)

Deep Groundwater Elevations - April 2015 Monitoring Event

Port of Seattle - North Terminal 115

Seattle, Washington

Figure 5-18



Notes:

1. Ground surface asphalt pavement unless otherwise noted.
2. Mean Higher High Water (MHHW) referenced from United States Army Corps of Engineers (USACE) Duwamish Waterway tidal Datum No. 92 for the North Puget Sound Region.
3. The locations of all features shown are approximate.
4. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Data Source: Base from Dowl HKM 2014 survey and Bush, Roed and Hitchings, Inc. 2008 survey.
Projection: NAD 1983 StatePlane Washington North FIPS 4601 Feet
Vertical Datum: North American Vertical Datum 1988 (NAVD88)

Sampling Location

- Sampling Location
- No Exceedance of TSC
- Exceedance of TSC

Contaminant of Potential Concern

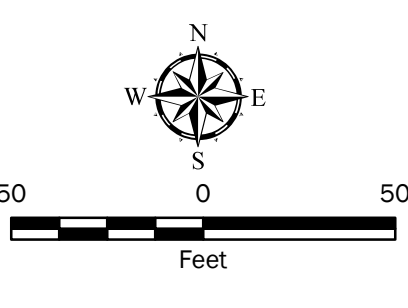
TSC - Target Sediment Concentration
PCB - Polychlorinated Biphenyls (Total Aroclors)
D/F - Total Dioxin and Furan TEQ
As - Arsenic
Cu - Copper
Zn - Zinc
PAH - Polycyclic Aromatic Hydrocarbons
HPAH - High Molecular Weight PAH
cPAH - Total Carcinogenic PAH TEQ
BEHP - Bis(2-Ethylhexyl)Phthalate
BBPH - Butyl Benzyl Phthalate
3,4MET - 3 & 4 Methylphenol

Current Feature

- T115N
- Elevation Contours (Feet NAVD88)
- Fence
- Railroad Tracks (Buried)
- Slope Armor (Rip Rap)
- Compact Gravel
- Soil/Vegetation
- Concrete Pavement

Historical Feature

- Historical Shoreline (Approximate)
- 1965 Shoreline (Approximate)
- Approximate Location of Former Settling Ponds
- Approximate Location of Former Underground Fuel Storage Tank (UST)
- Former Above Ground Storage Tank (AST)
- AST Spill Containment Curb (Approximate)

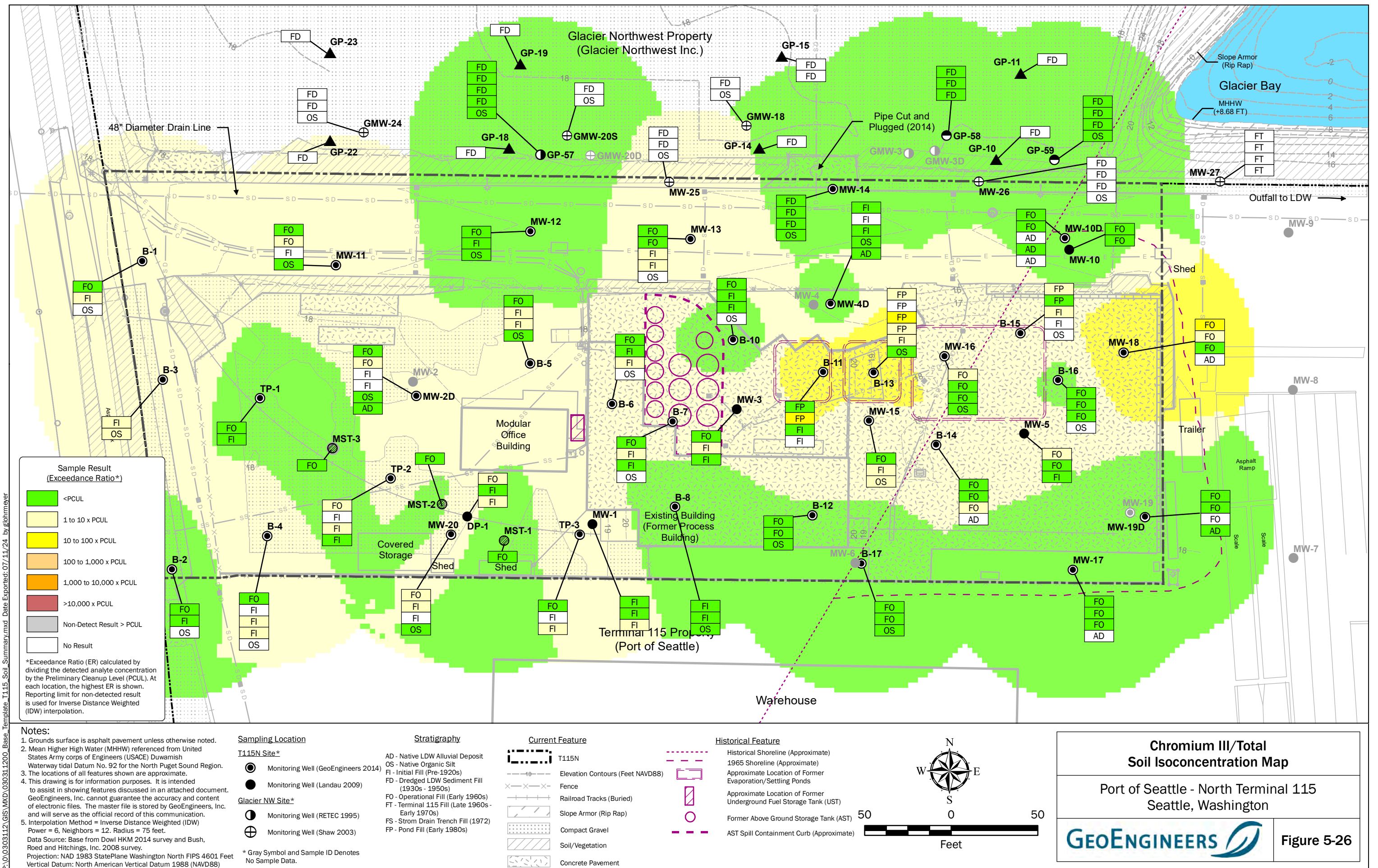


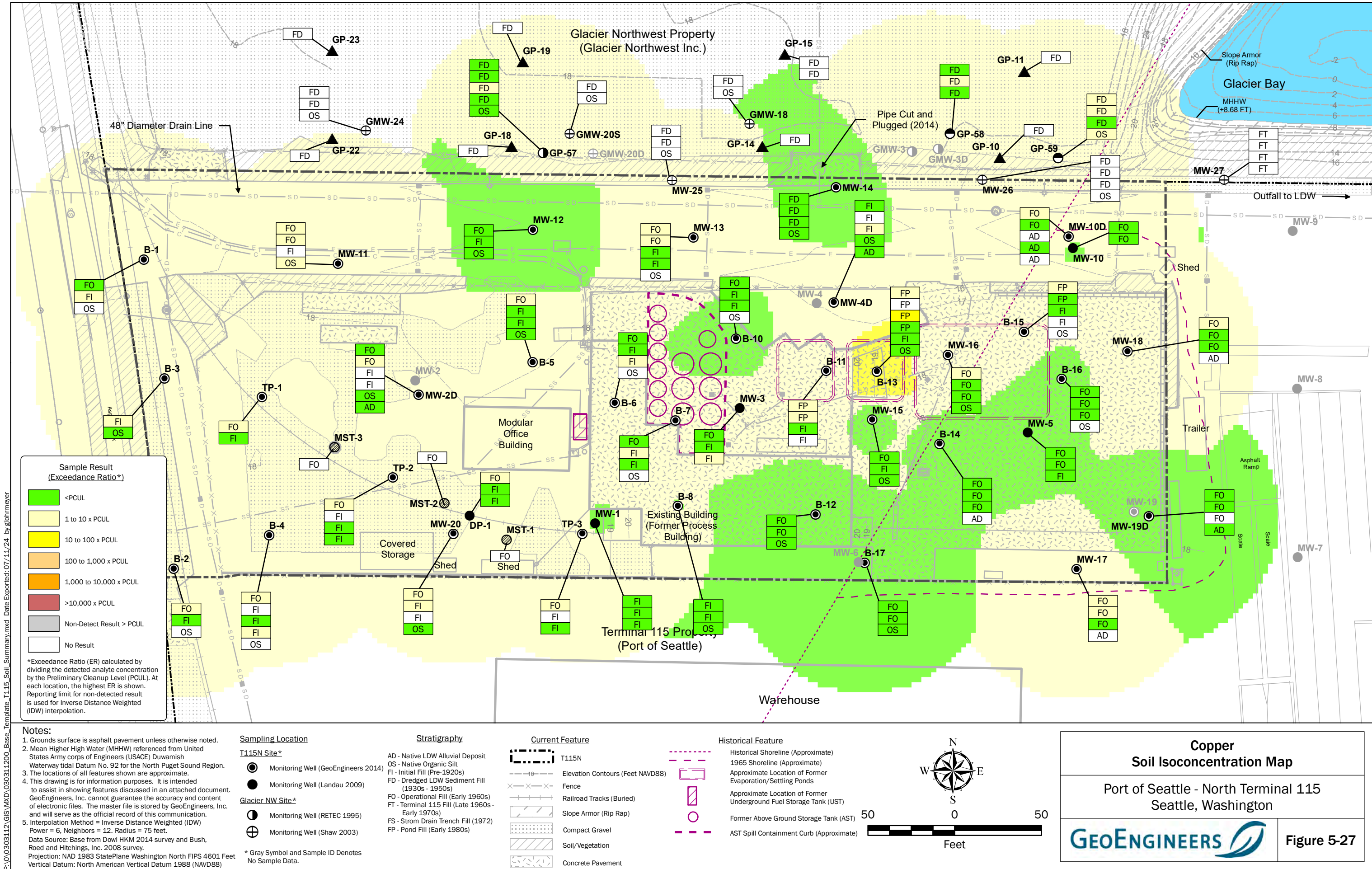
Catch Basin Solids Investigation Results

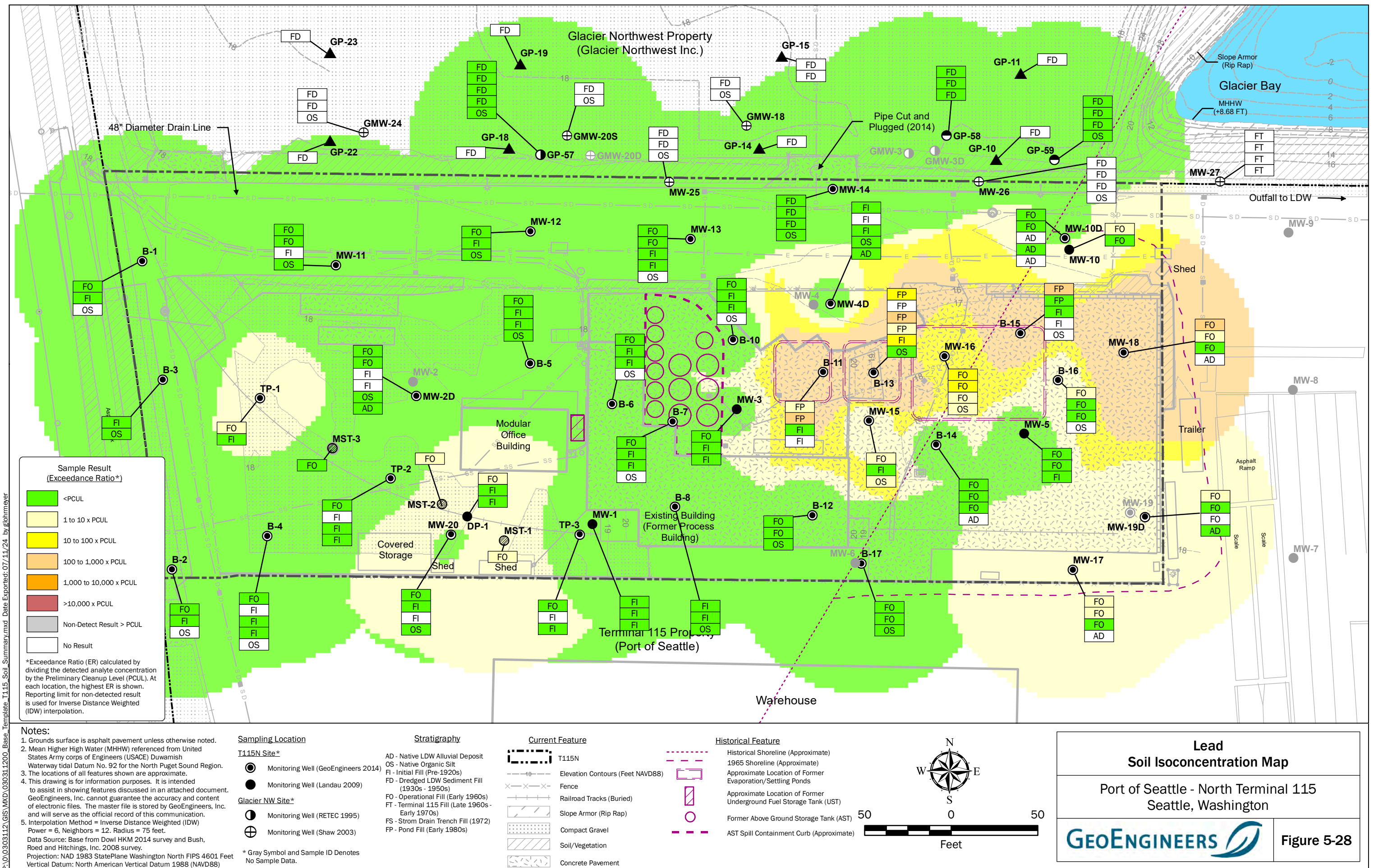
Port of Seattle - North Terminal 115
Seattle, Washington

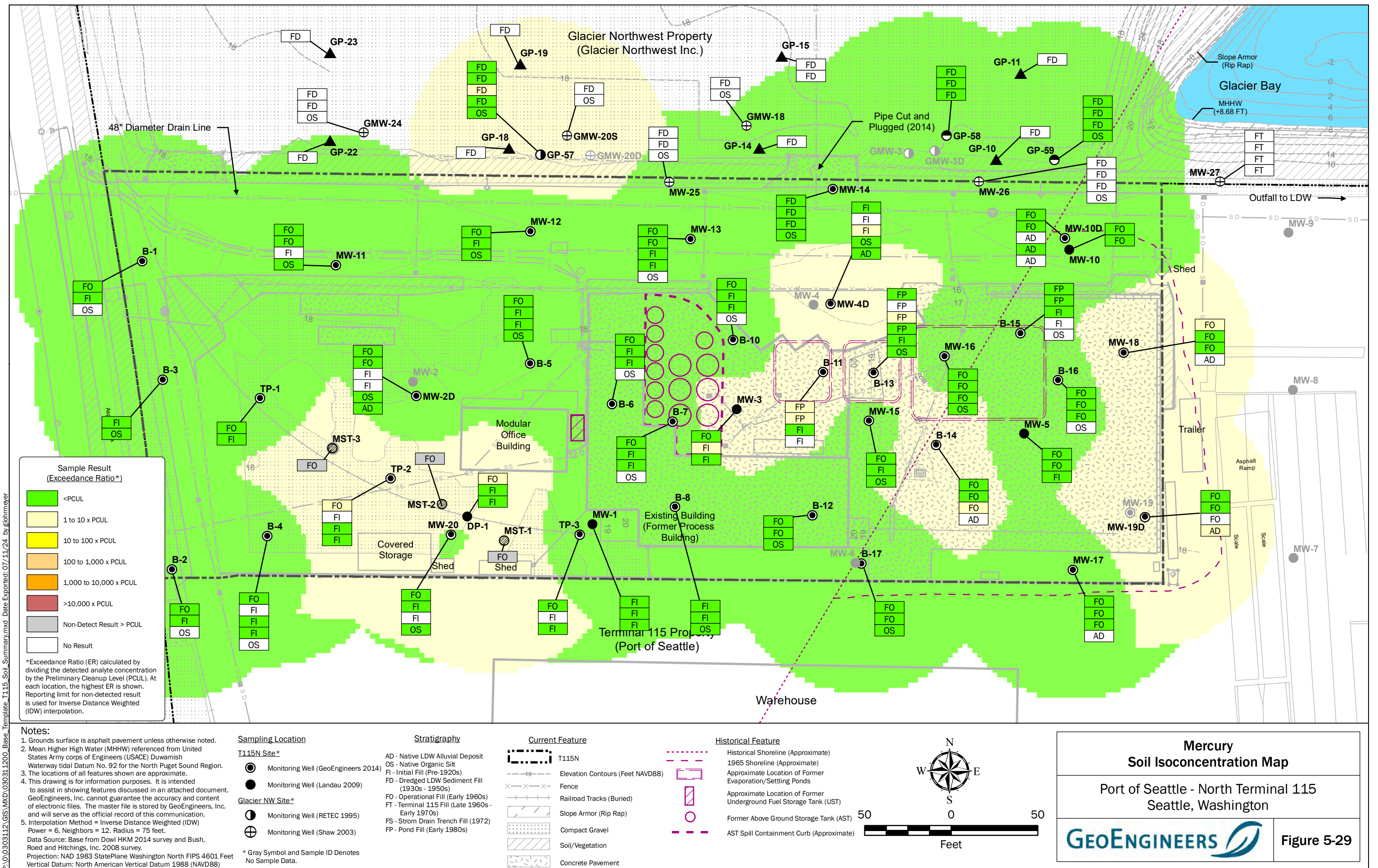
GEOENGINEERS

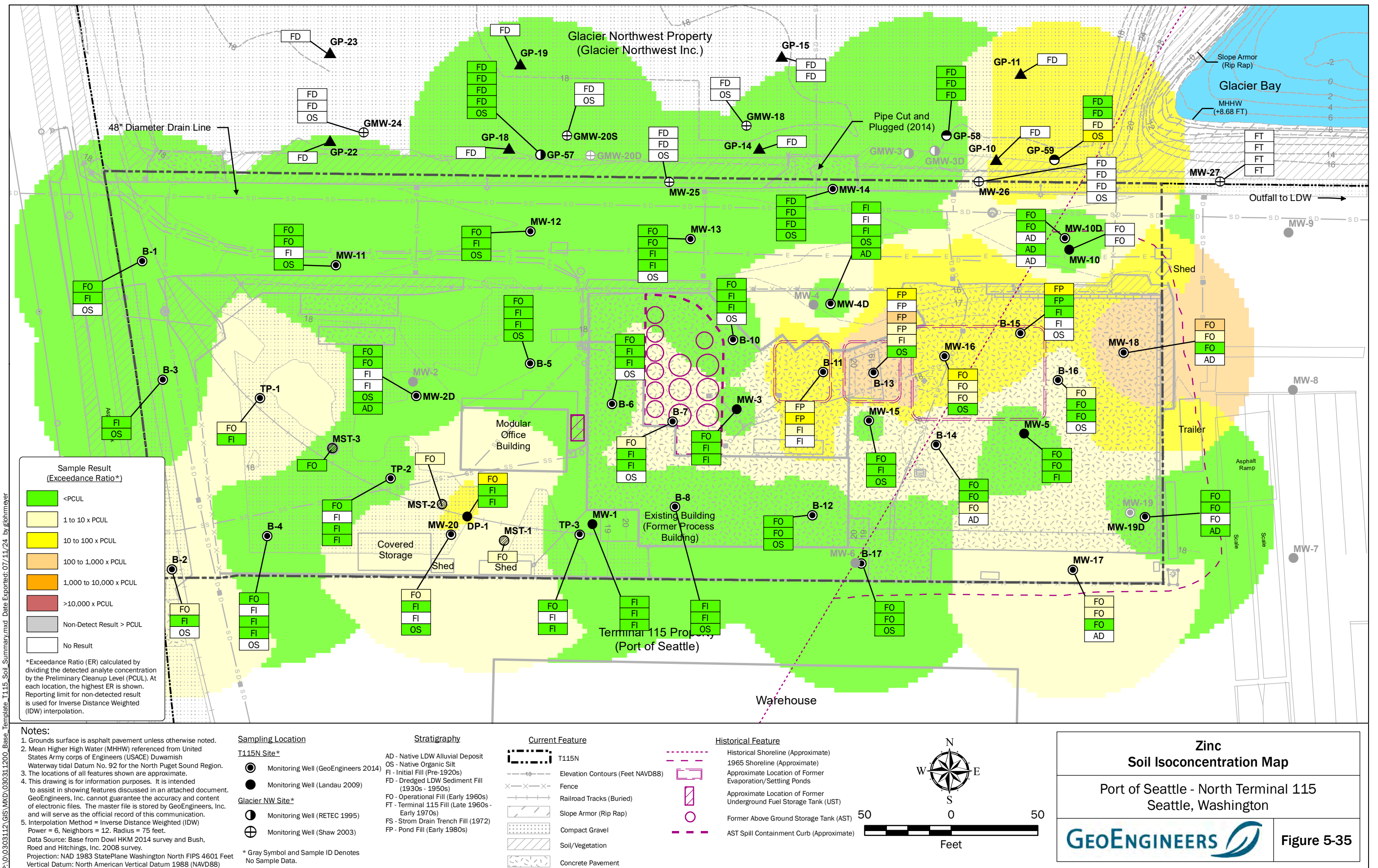
Figure 5-19

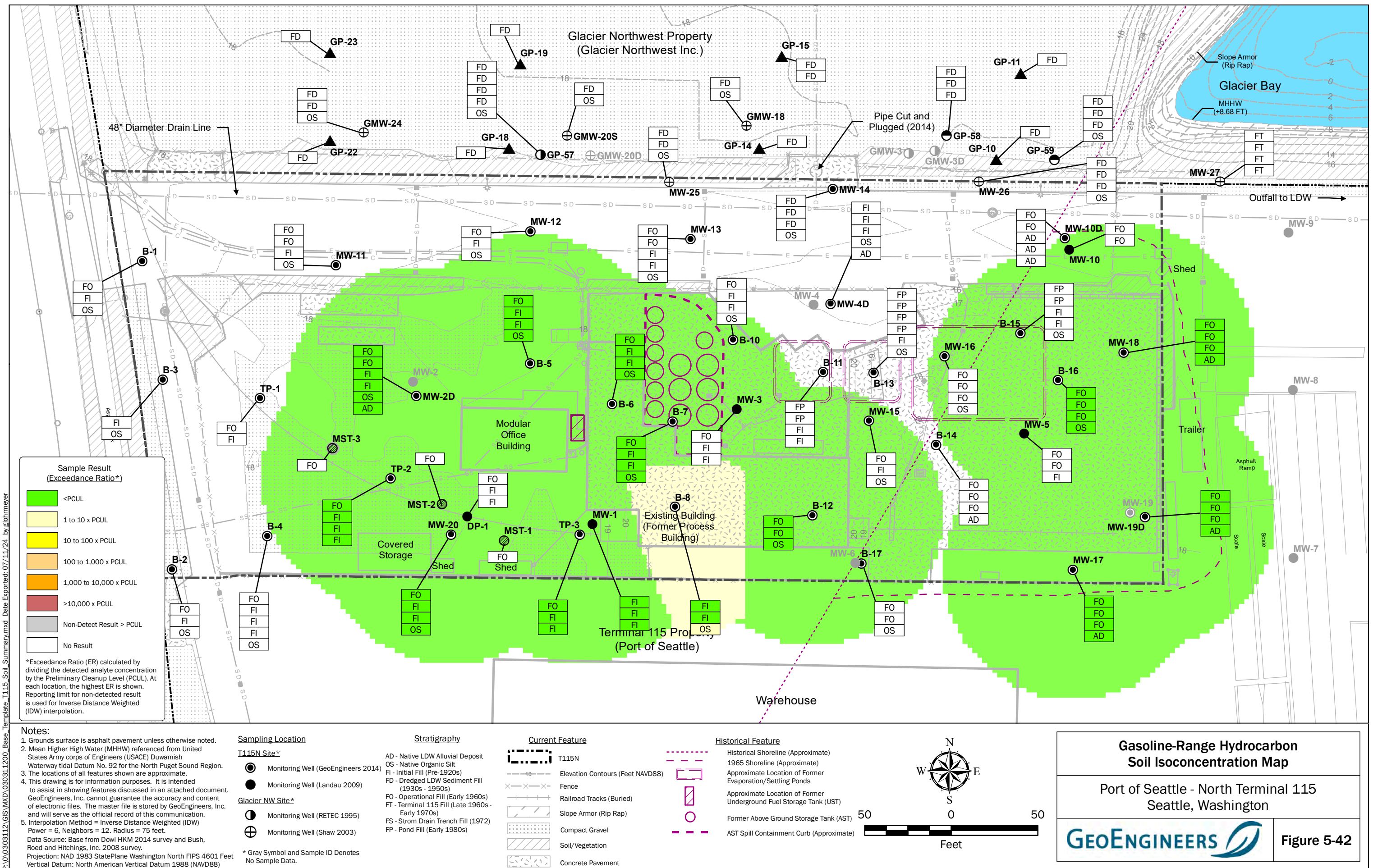


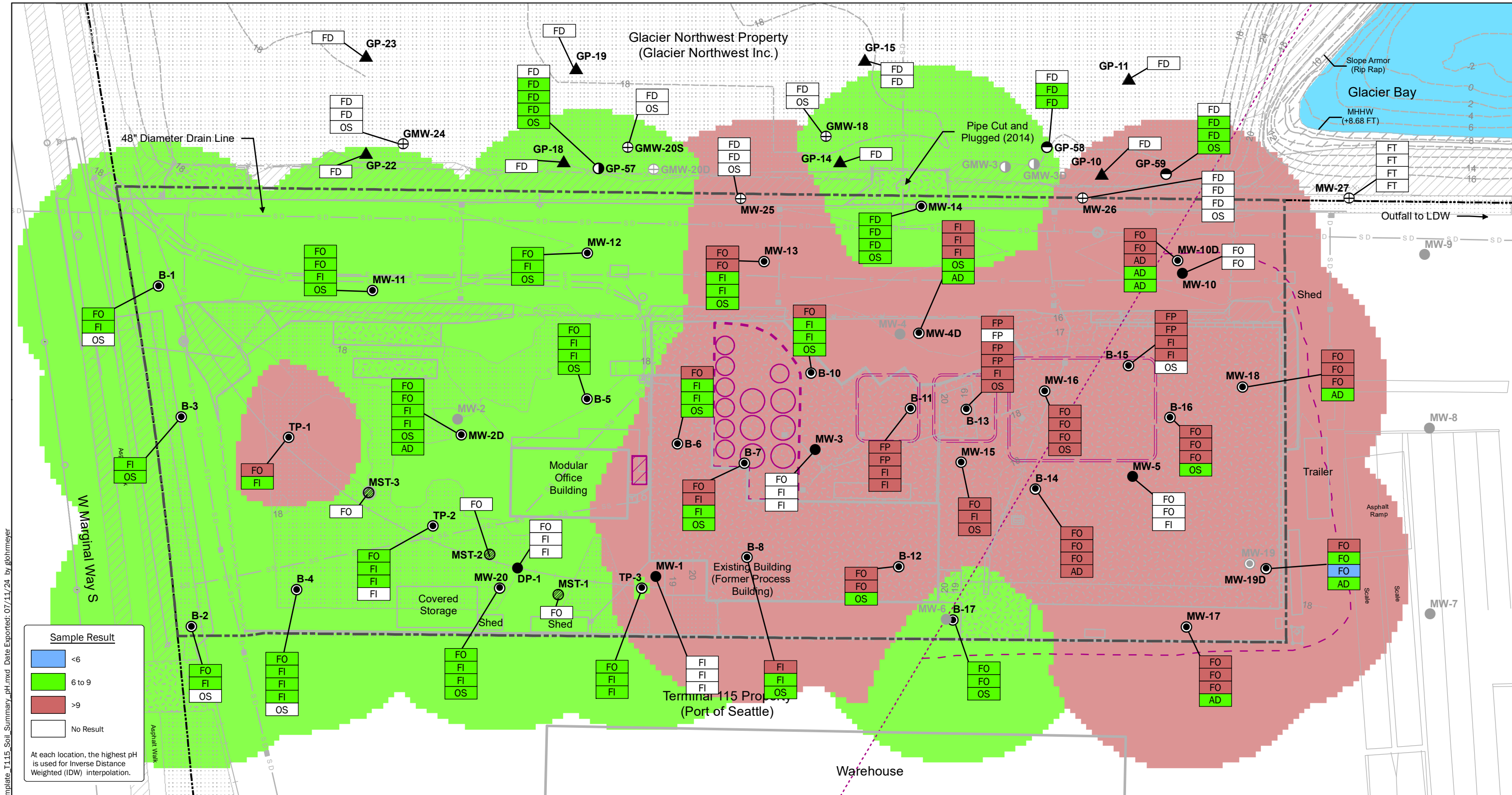












Notes:

- Ground surface is asphalt pavement unless otherwise noted.
- Mean Higher High Water (MHHW) referenced from United States Army Corps of Engineers (USACE) Duwamish Waterway tidal Datum No. 92 for the North Puget Sound Region.
- The locations of all features shown are approximate.
- This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.
- Interpolation Method = Inverse Distance Weighted (IDW)
Power = 6, Neighbors = 12. Radius = 75 feet.
Data Source: Base from Dowl HKM 2014 survey and Bush, Roed and Hitchings, Inc. 2008 survey.
Projection: NAD 1983 StatePlane Washington North FIPS 4601 Feet
Vertical Datum: North American Vertical Datum 1988 (NAVD88)

Sampling Location

T115N Site*

- Monitoring Well (GeoEngineers 2014)
- Monitoring Well (Landau 2009)

Glacier NW Site*

- Monitoring Well (RETEC 1995)
- Monitoring Well (Shaw 2003)

* Gray Symbol and Sample ID Denotes No Sample Data.

Stratigraphy

- AD - Native LDW Alluvial Deposit
- OS - Native Organic Silt
- FI - Initial Fill (Pre-1920s)
- FD - Dredged LDW Sediment Fill (1930s - 1950s)
- FO - Operational Fill (Early 1960s)
- FT - Terminal 115 Fill (Late 1960s - Early 1970s)
- FS - Storm Drain Trench Fill (1972)
- FP - Pond Fill (Early 1980s)

Current Feature

- T115N
- Elevation Contours (Feet NAVD88)
- Fence
- Railroad Tracks (Buried)
- Slope Armor (Rip Rap)
- Compact Gravel
- Soil/Vegetation
- Concrete Pavement

Historical Feature

- Historical Shoreline (Approximate)
- 1965 Shoreline (Approximate)
- Approximate Location of Former Evaporation/Settling Ponds
- Approximate Location of Former Underground Fuel Storage Tank (UST)
- Former Above Ground Storage Tank (AST)
- AST Spill Containment Curb (Approximate)

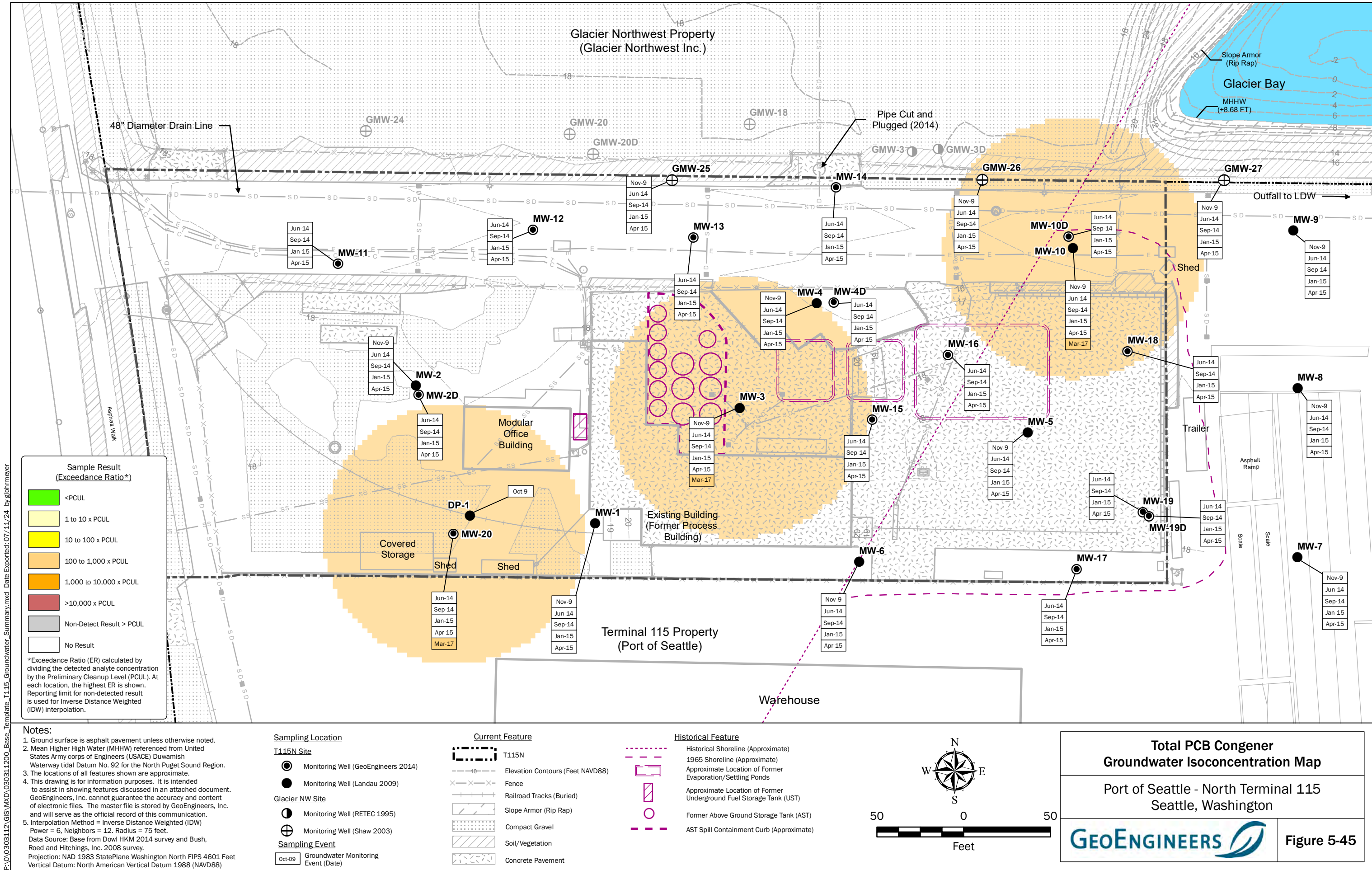
50 0 50
Feet

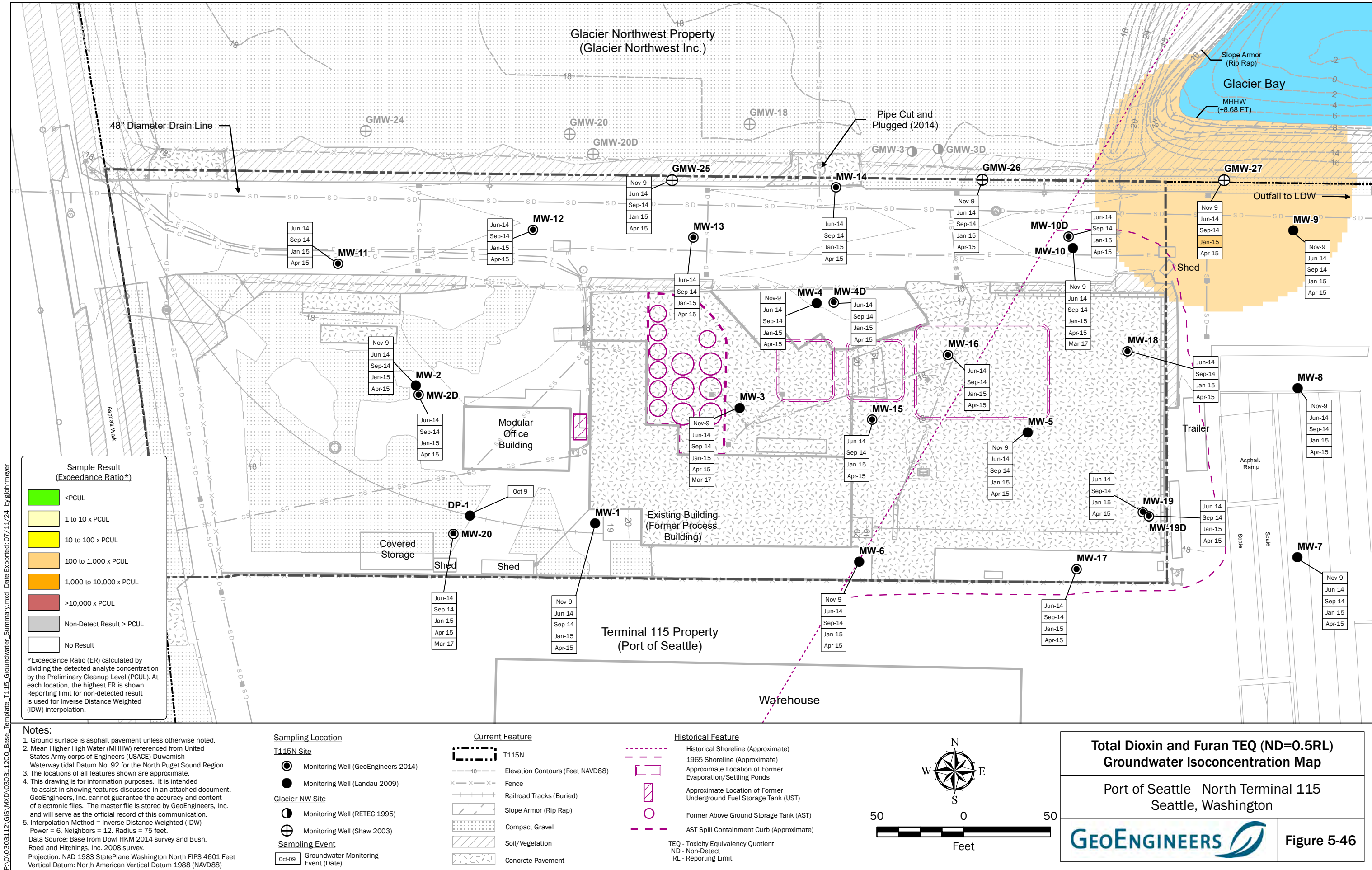
**pH
Soil Isoconcentration Map**

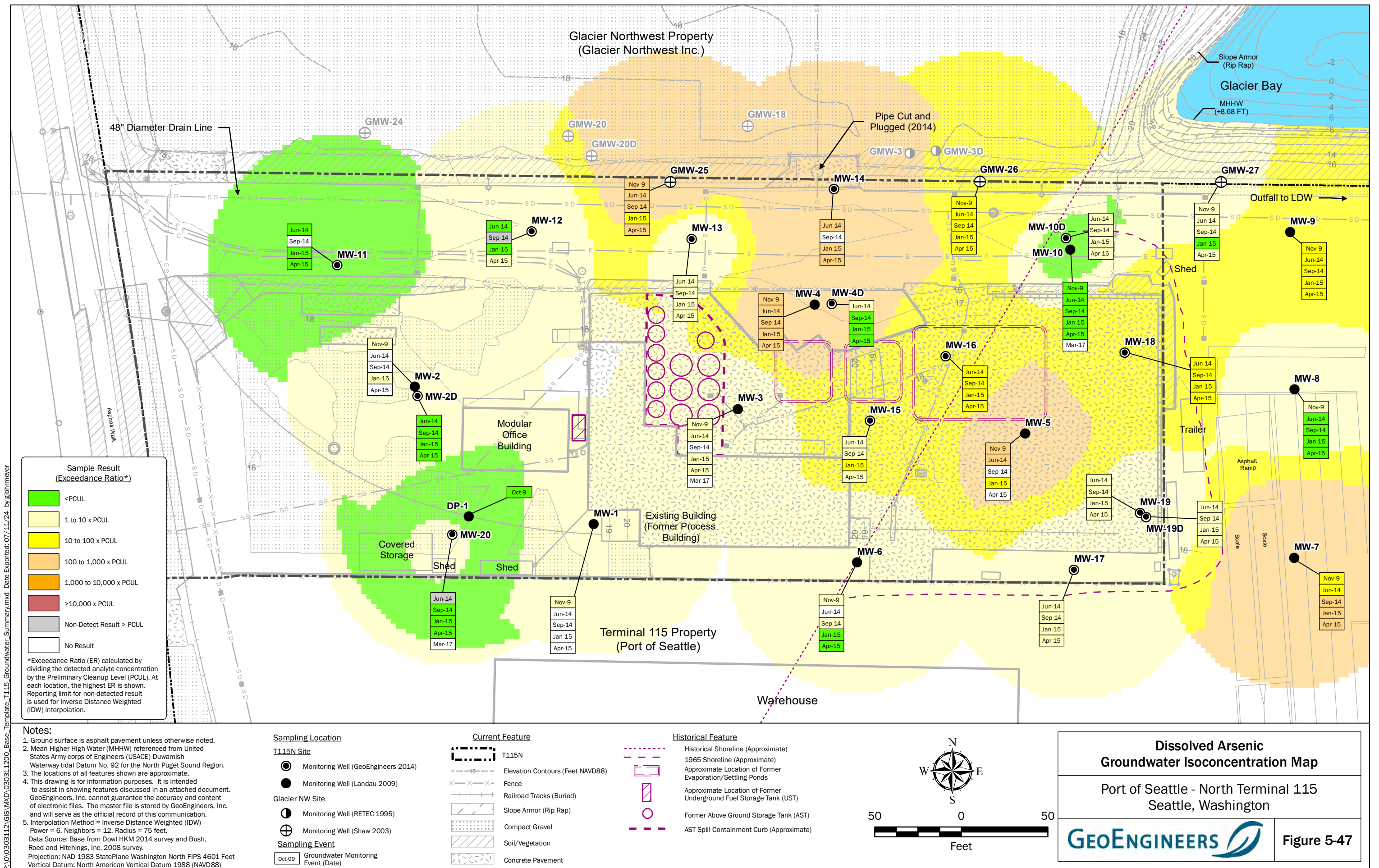
Port of Seattle - North Terminal 115
Seattle, Washington

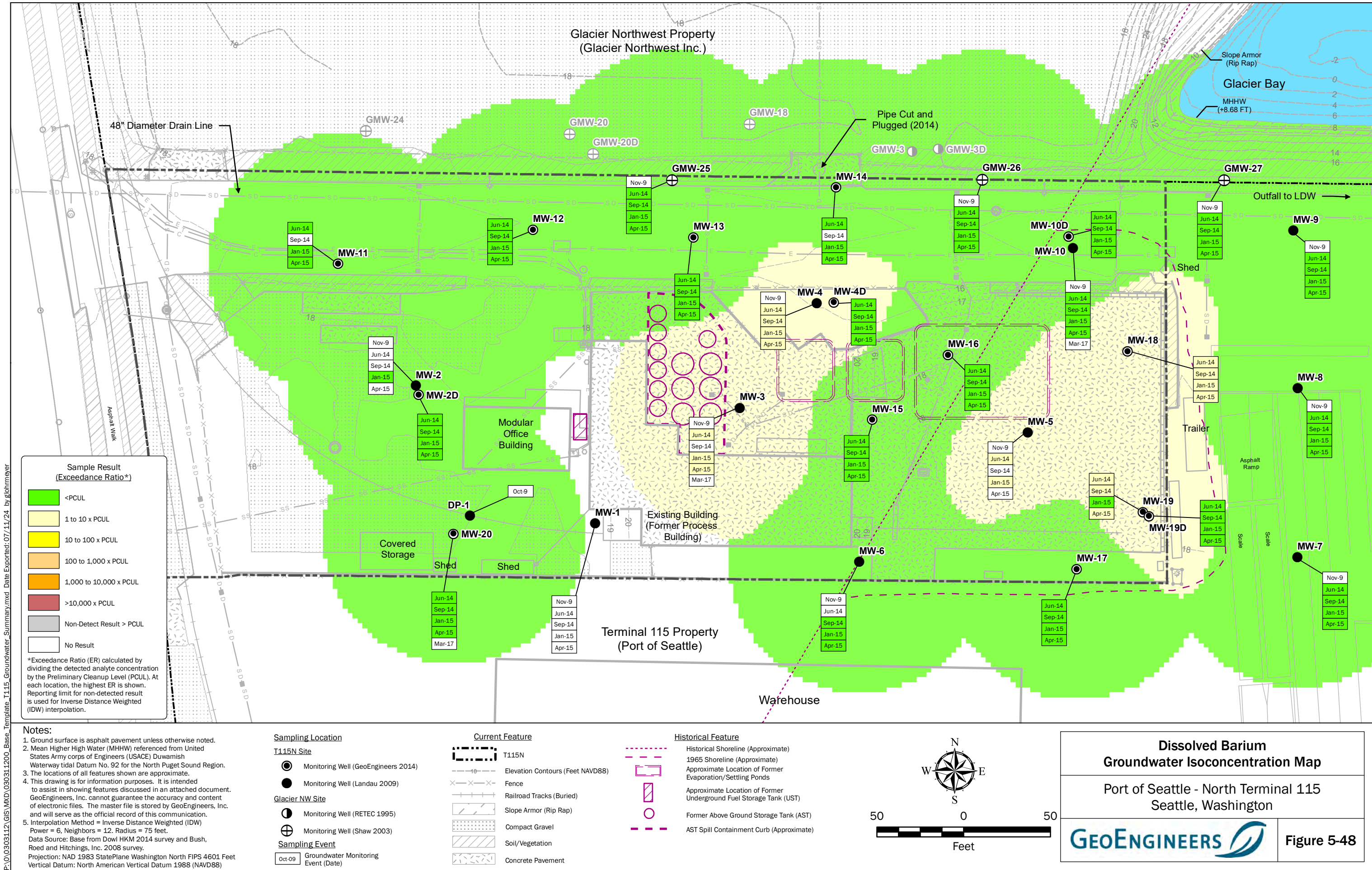
GEOENGINEERS

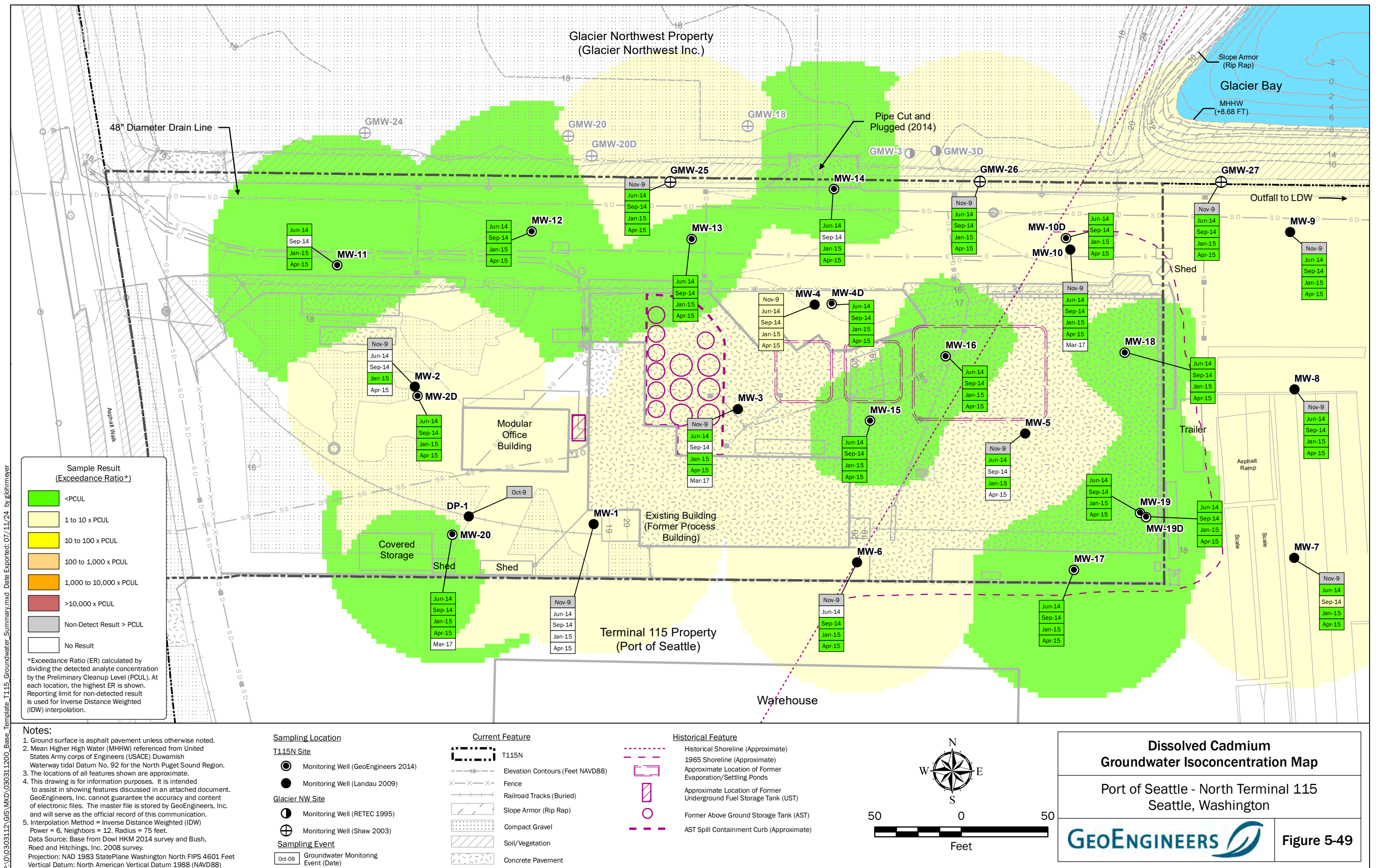
Figure 5-44

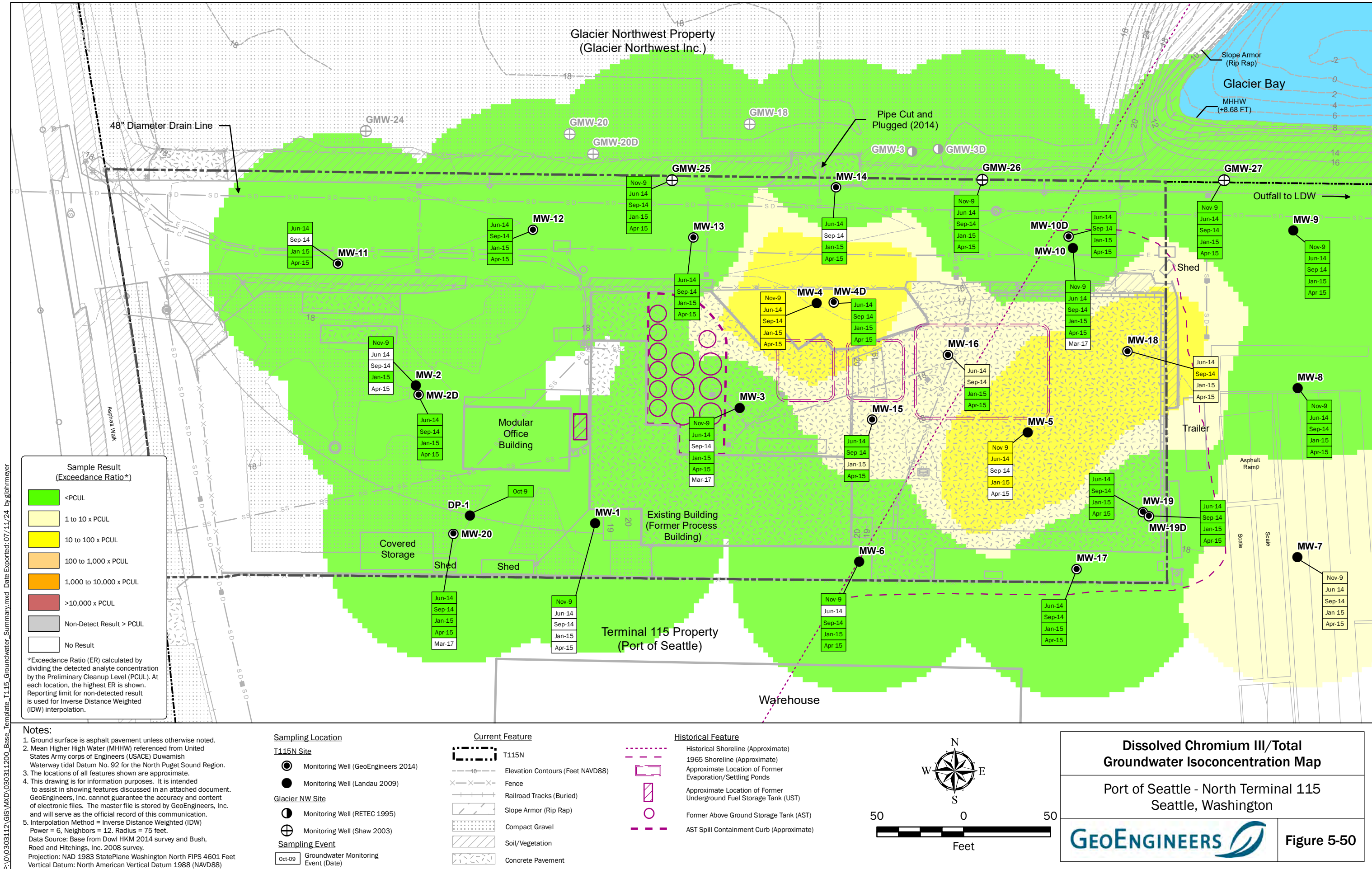


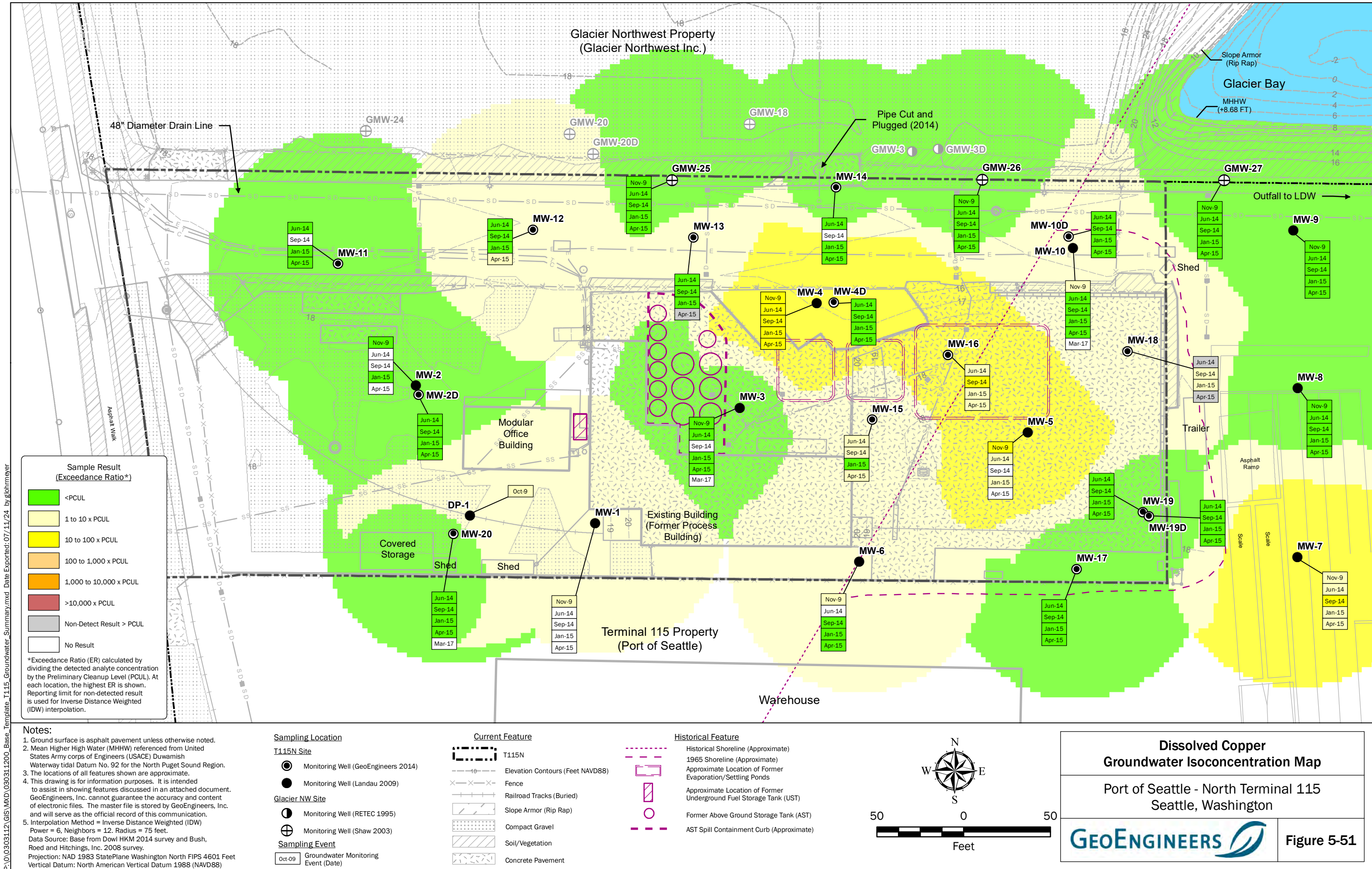


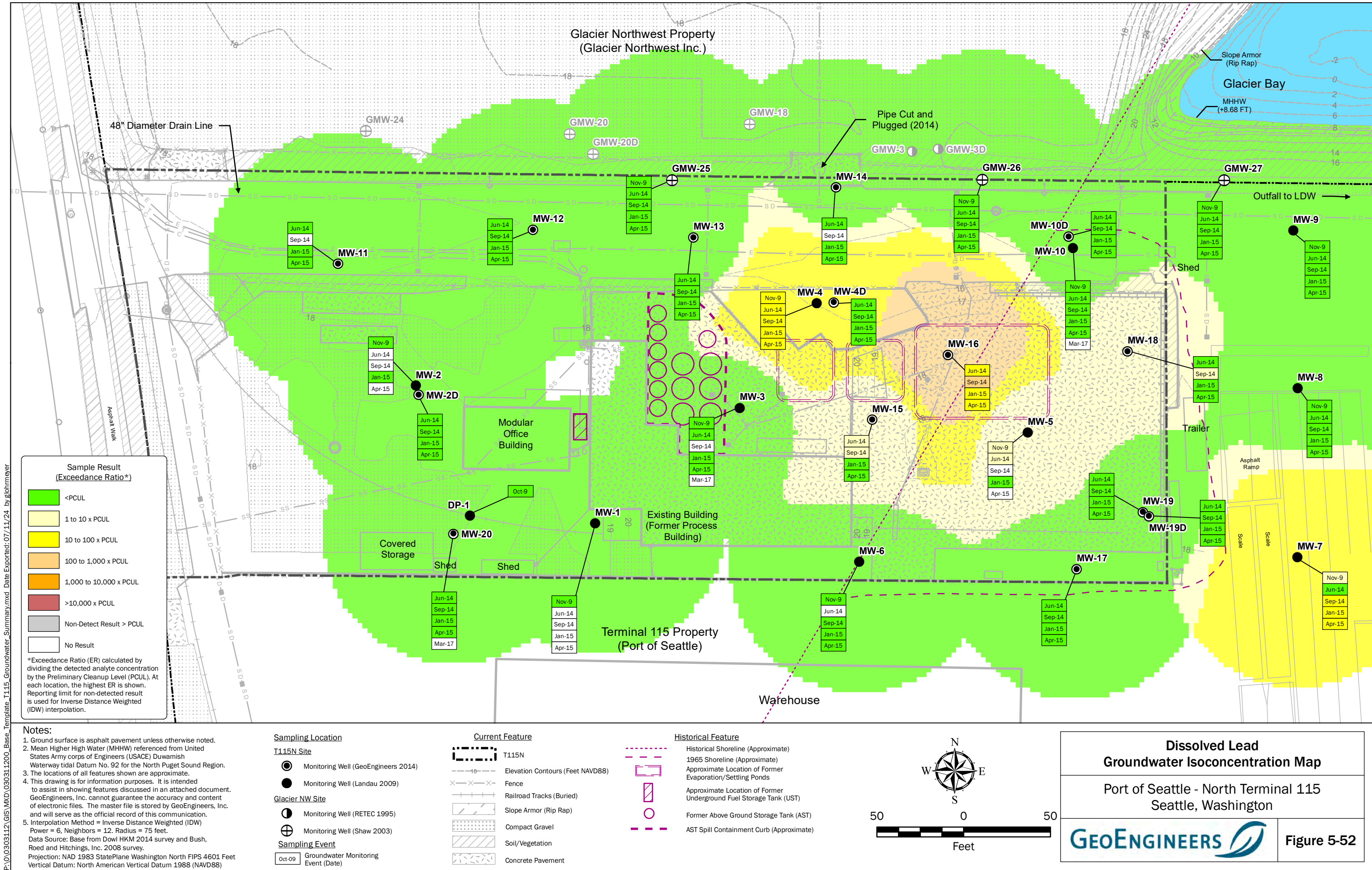


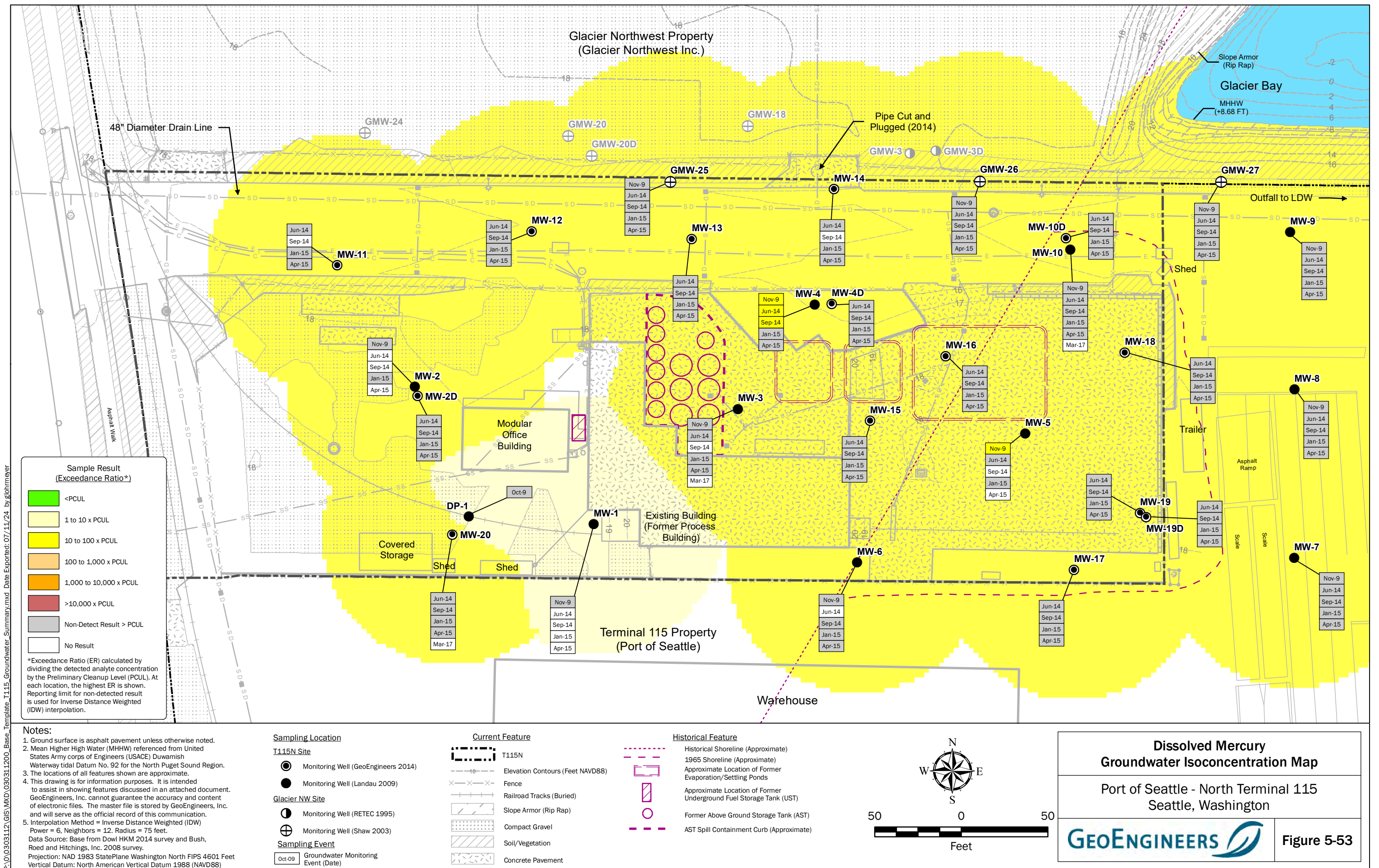


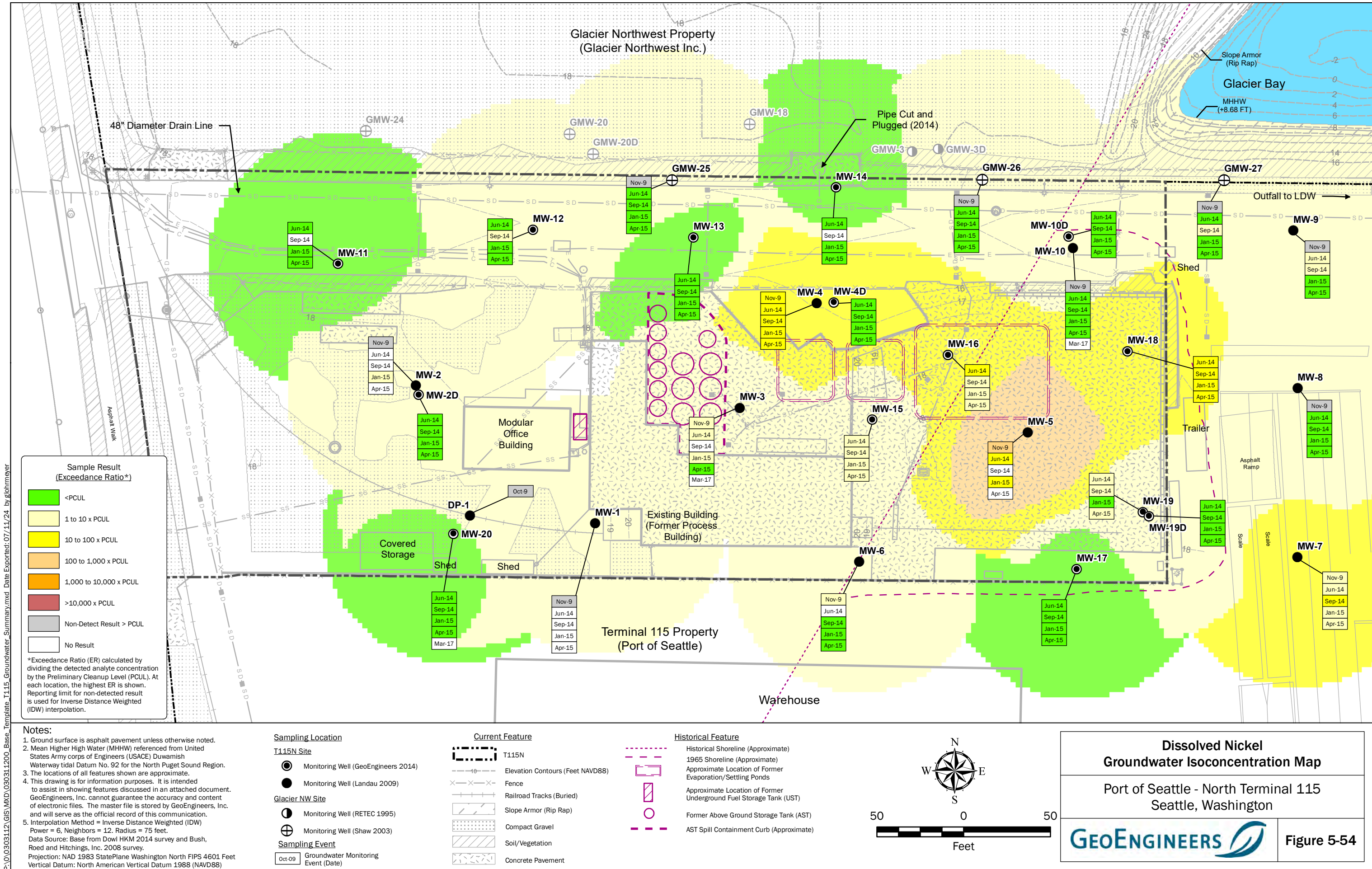


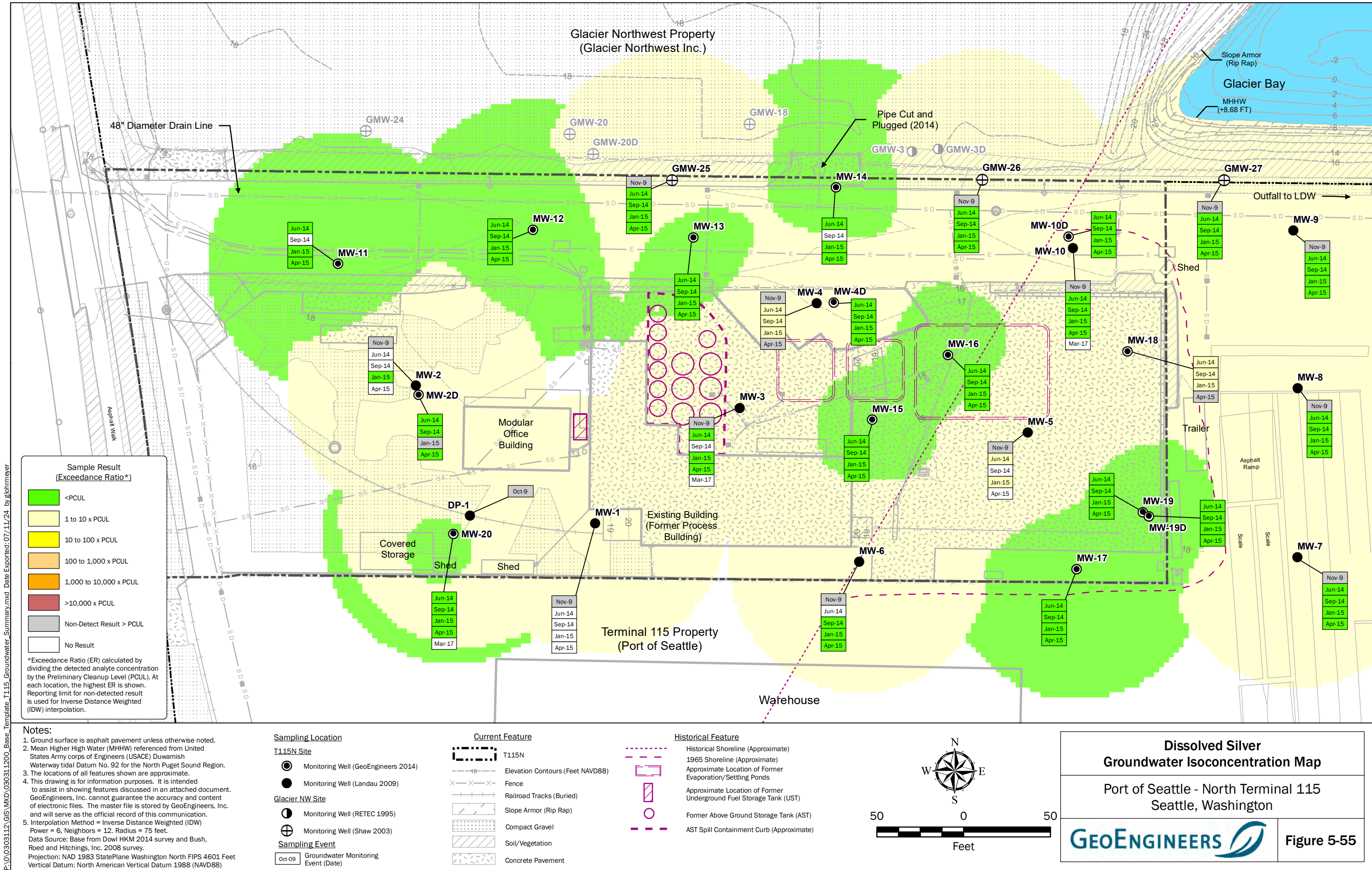


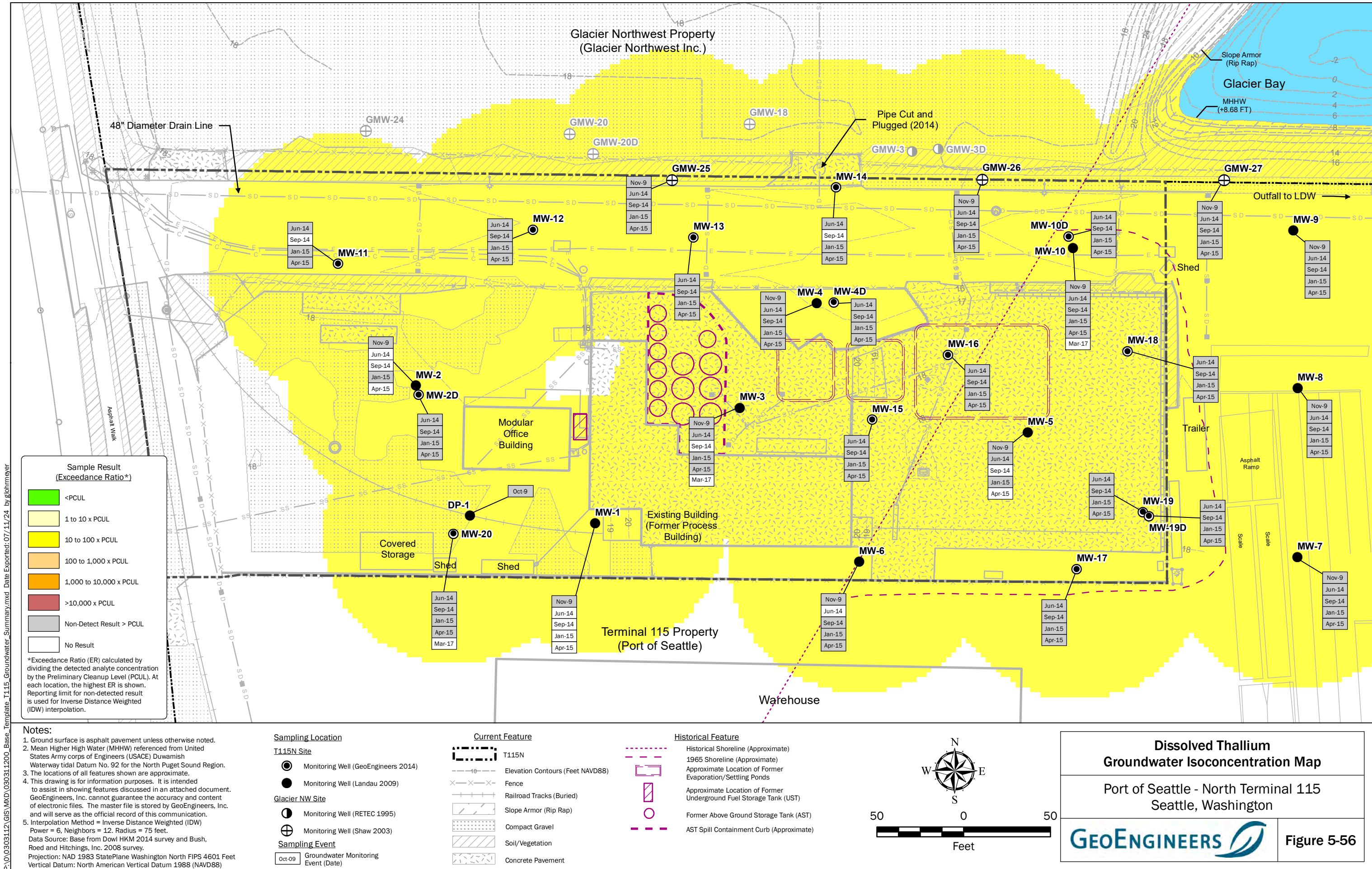


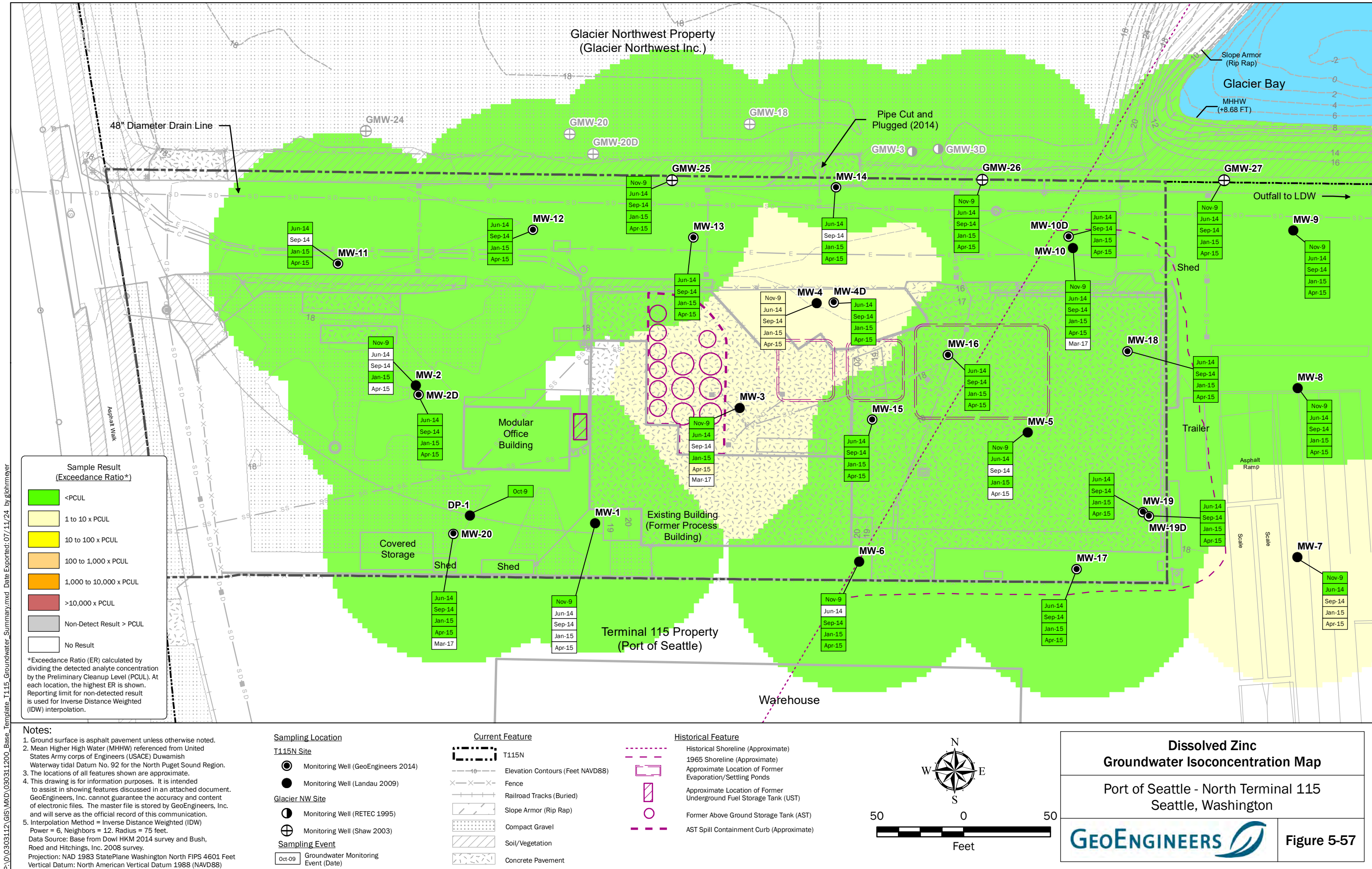


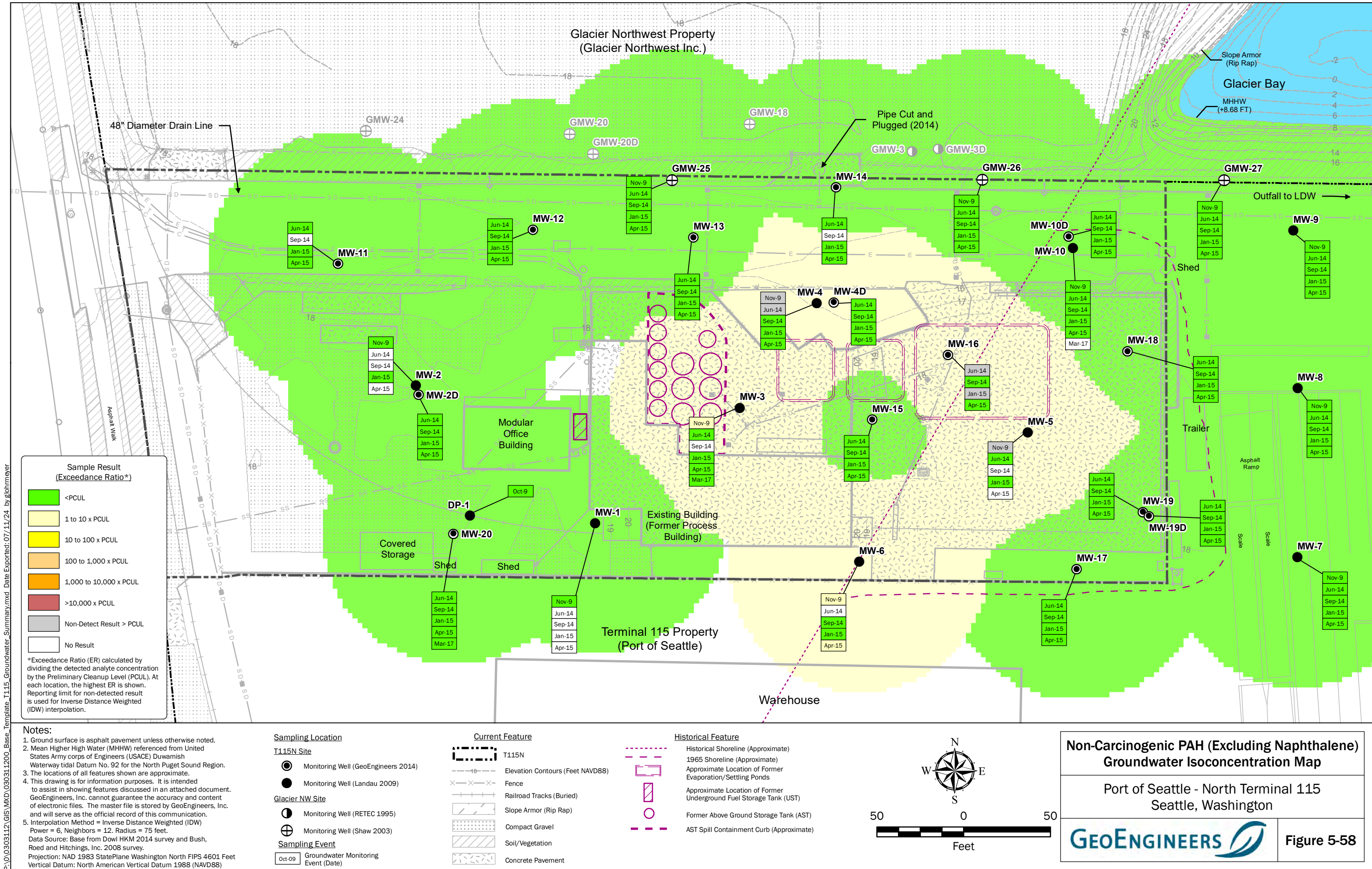


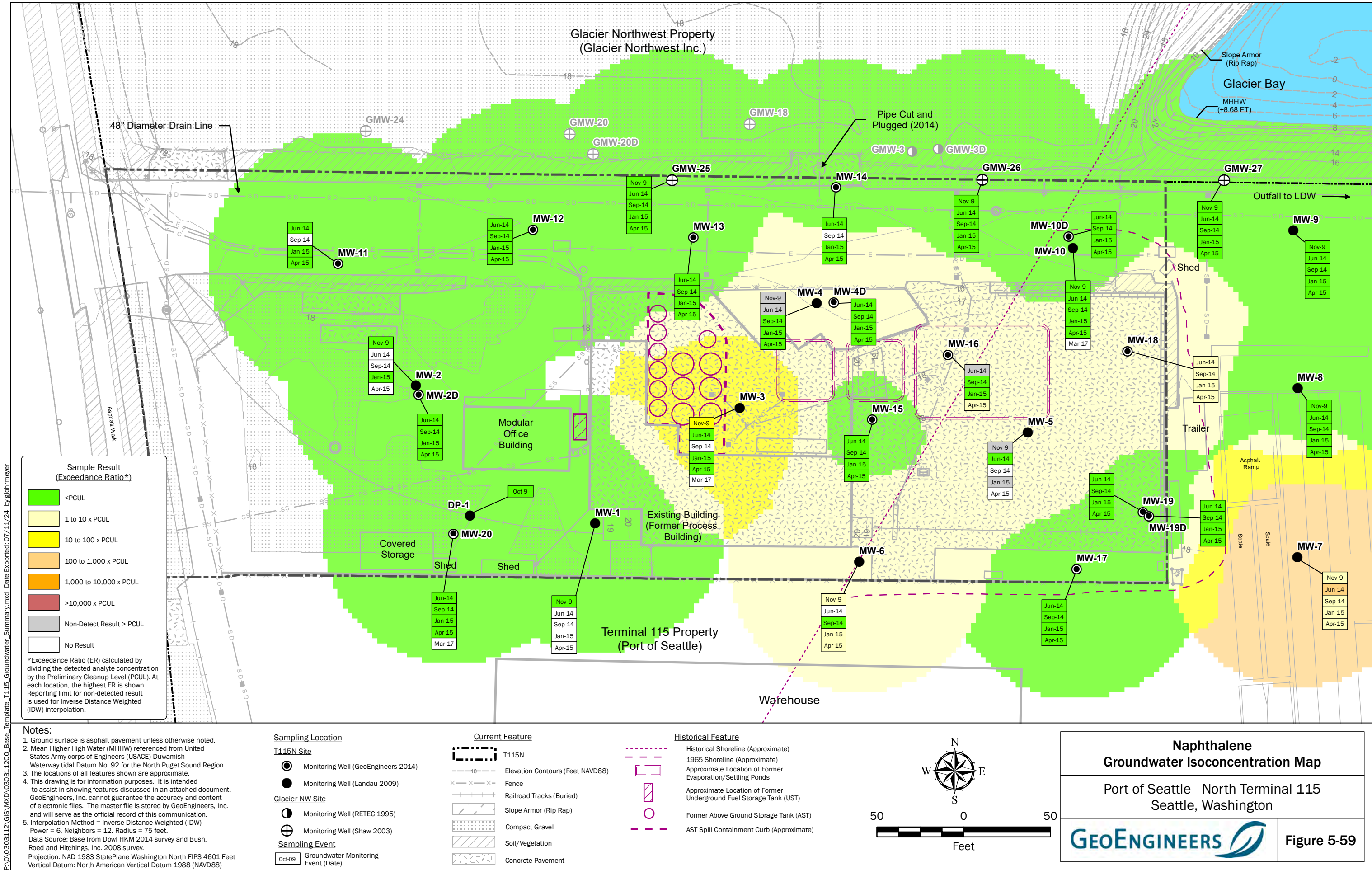


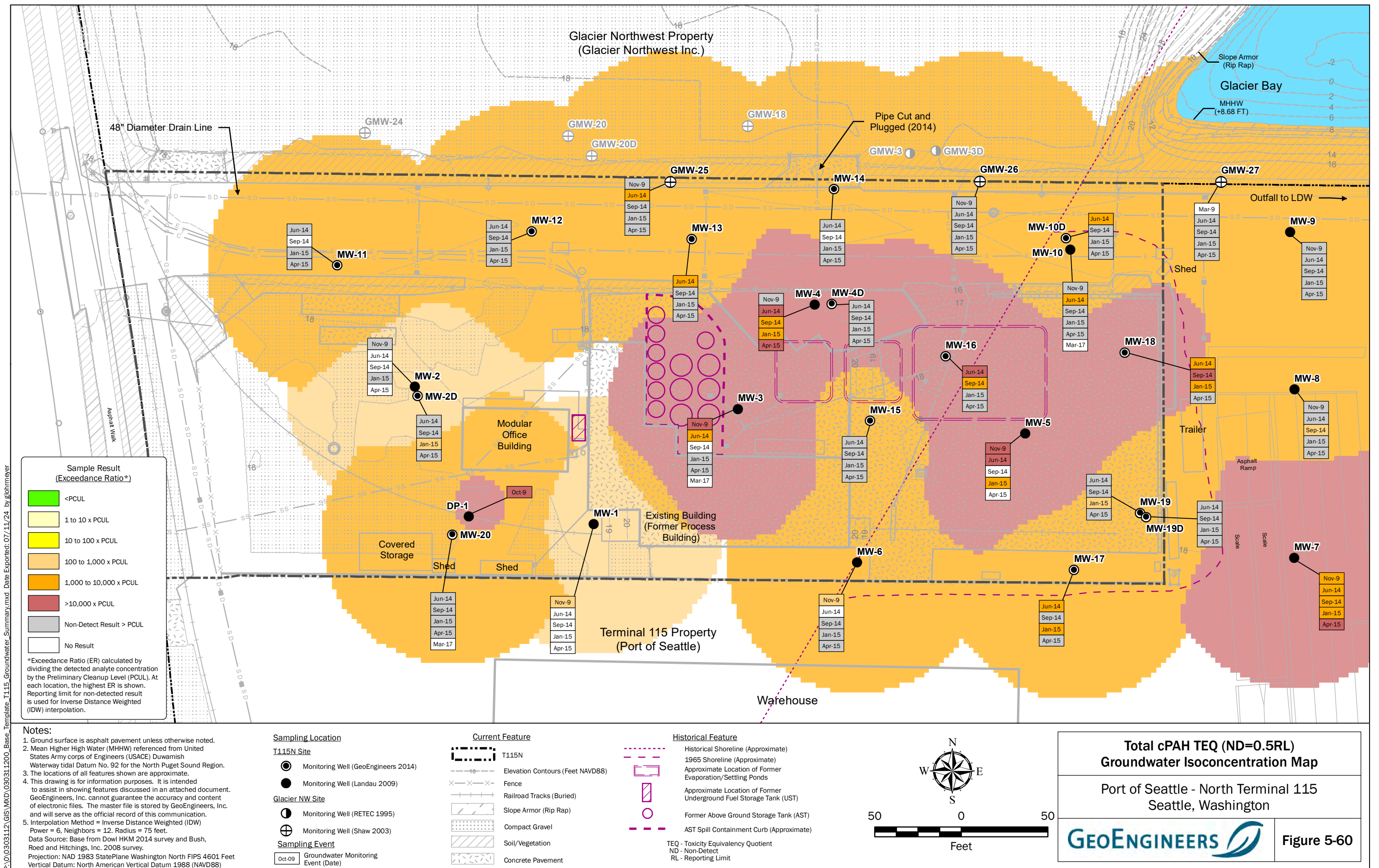


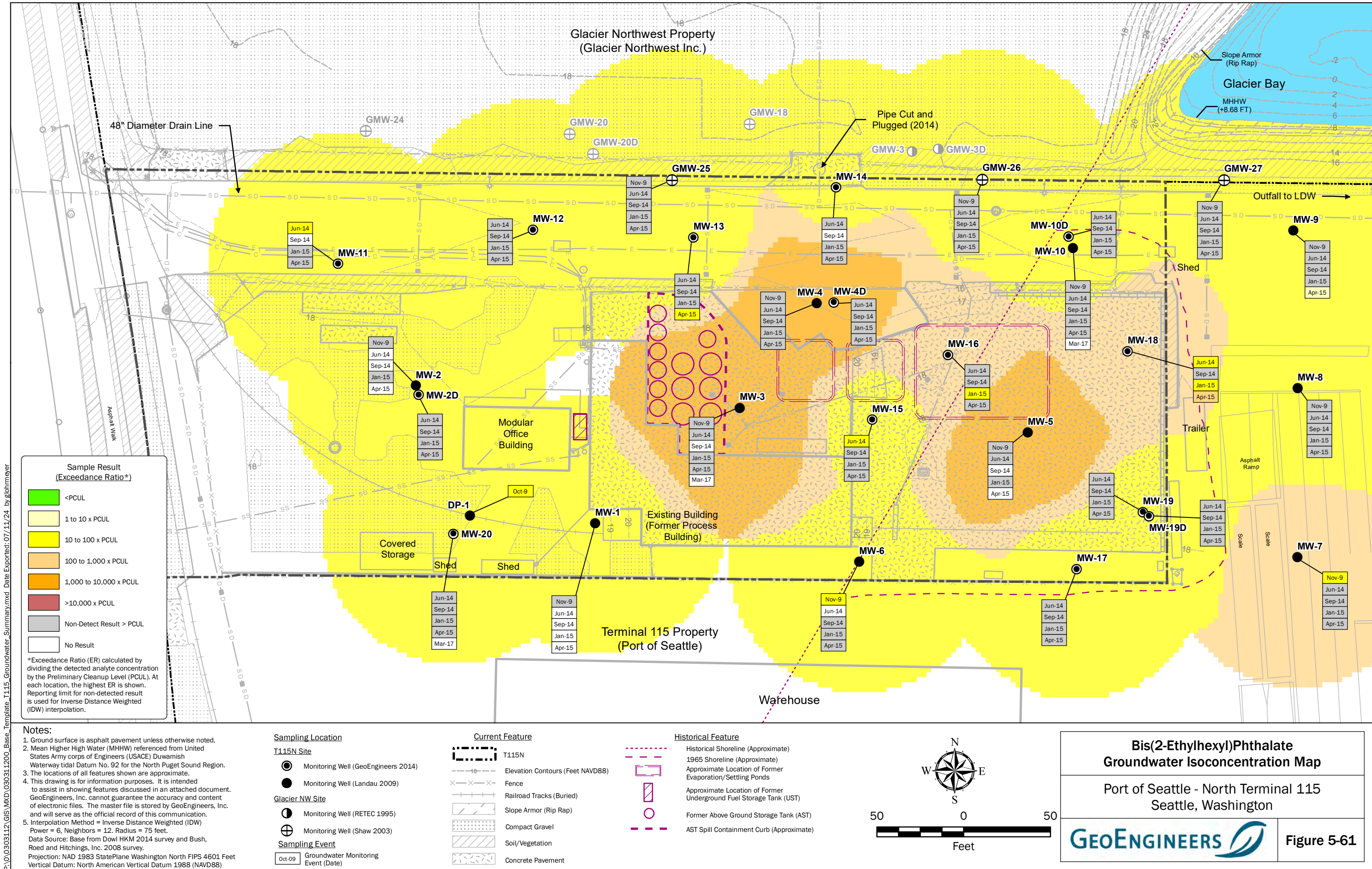


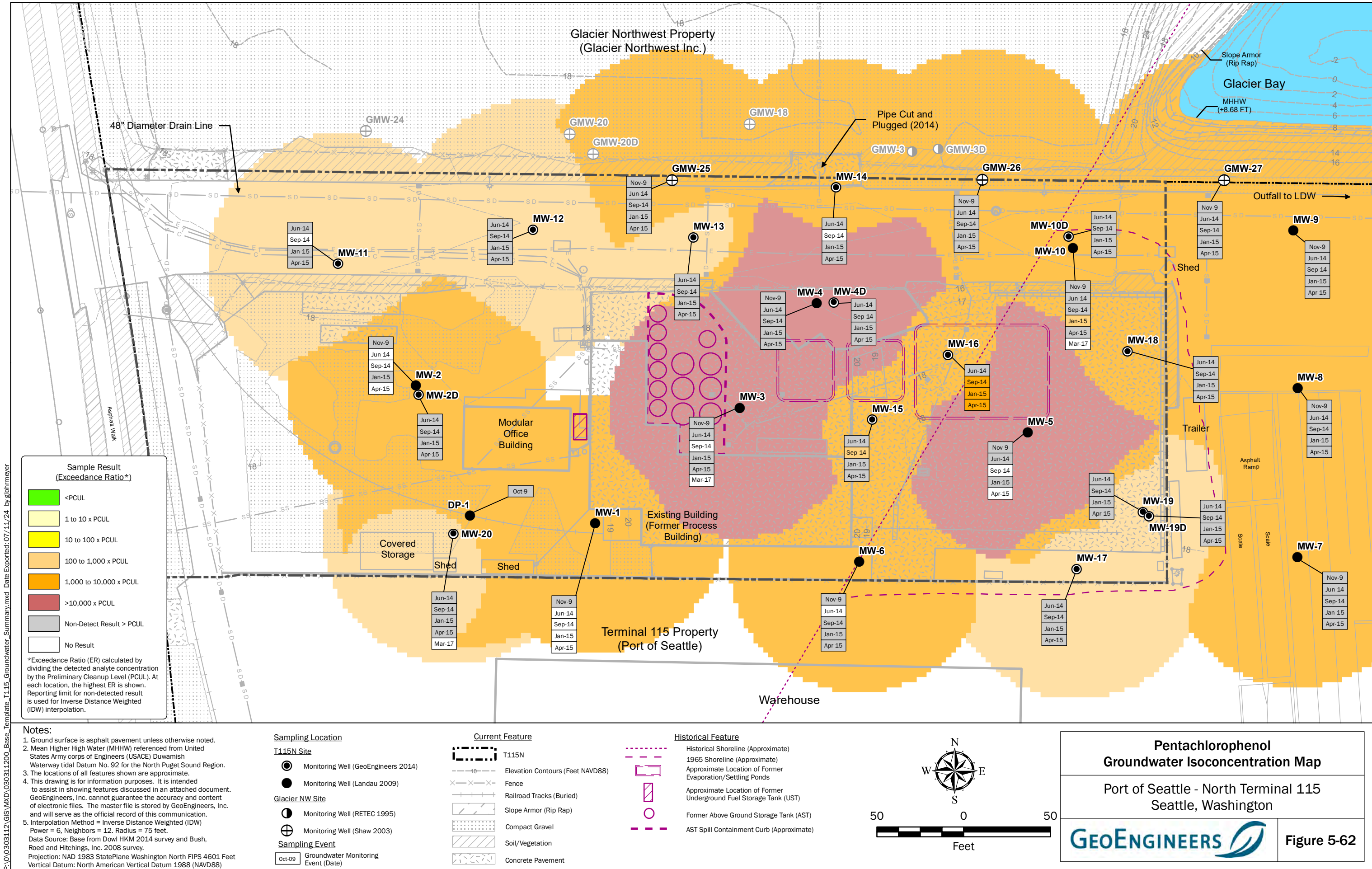


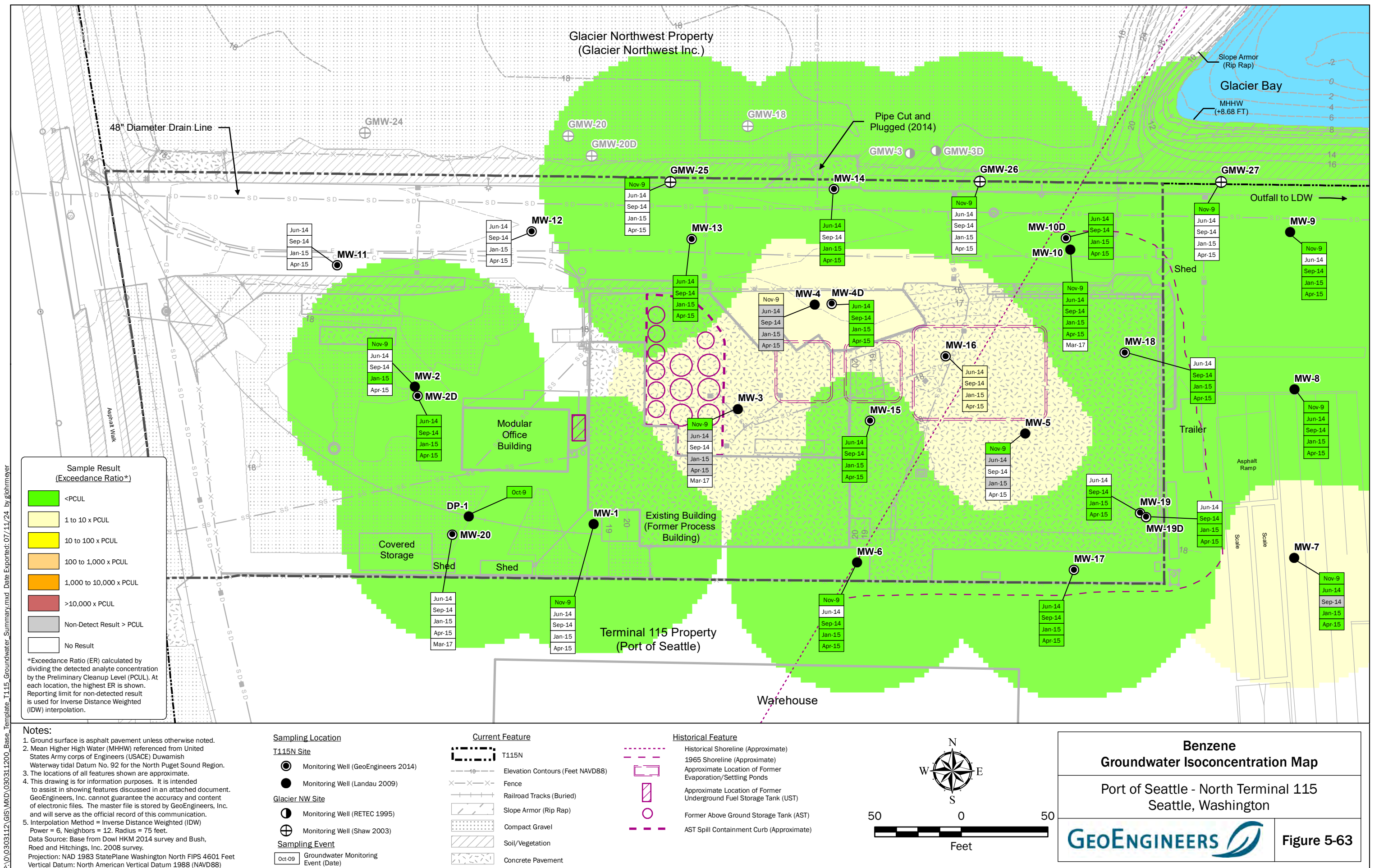


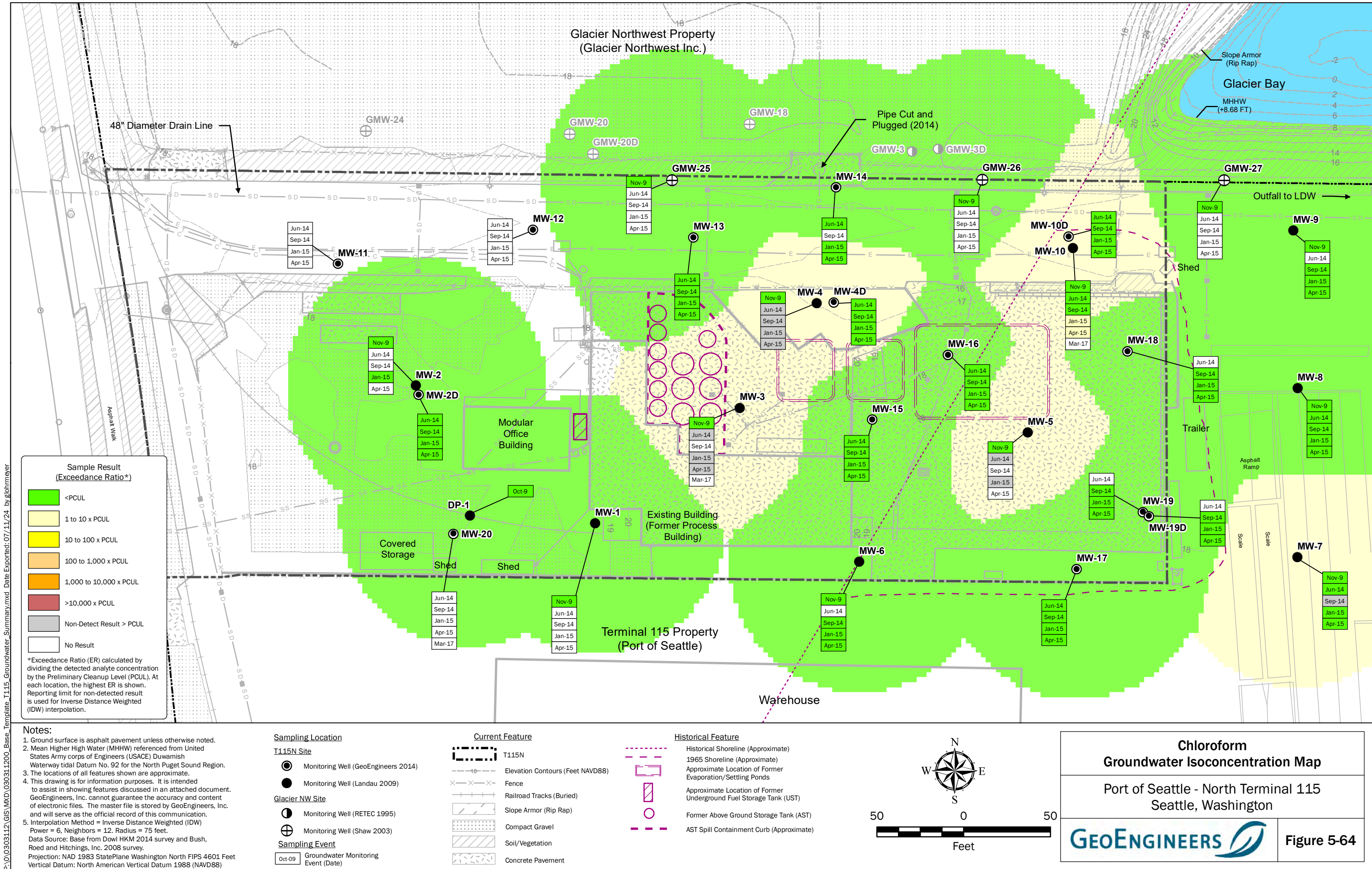


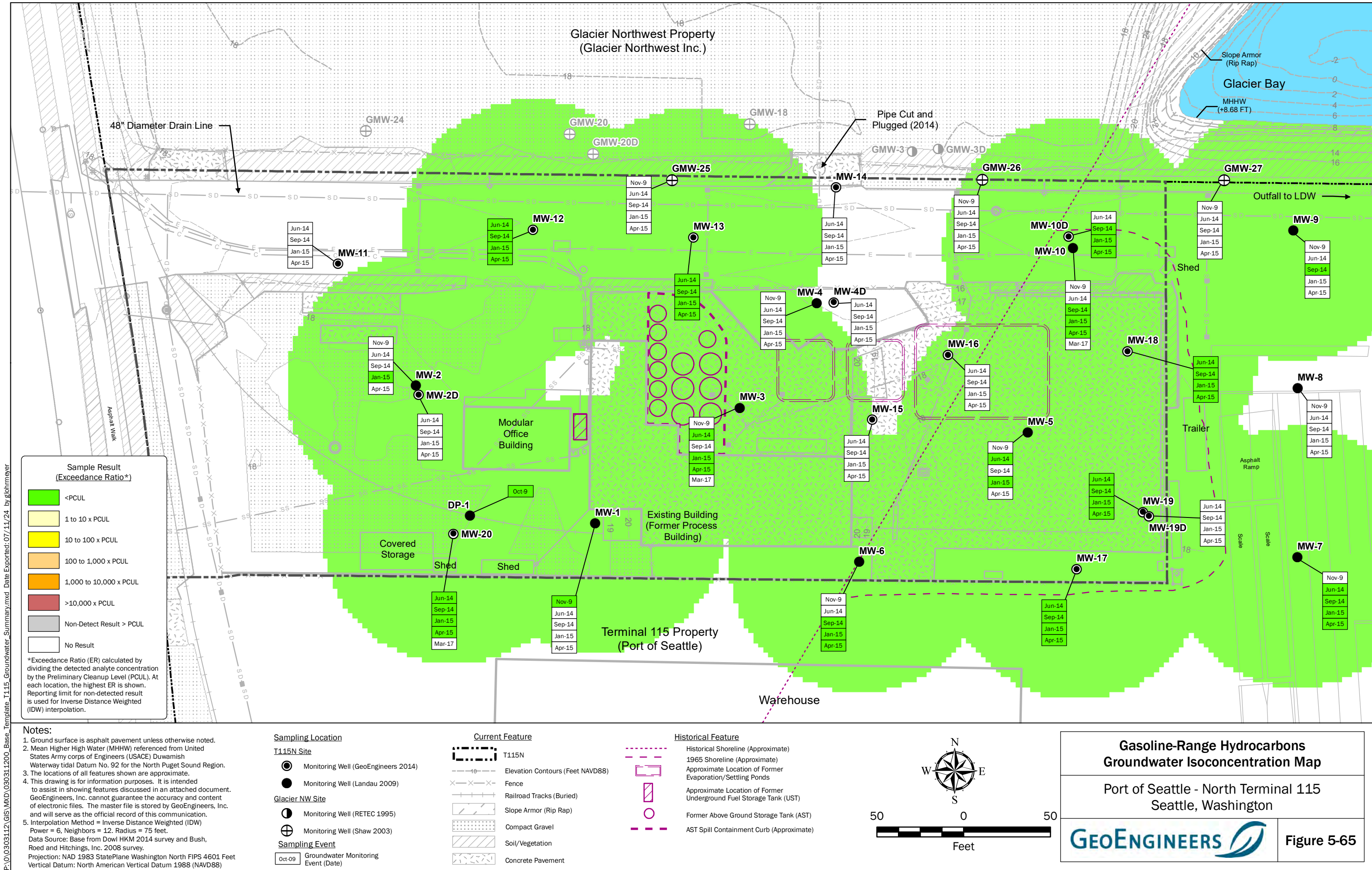


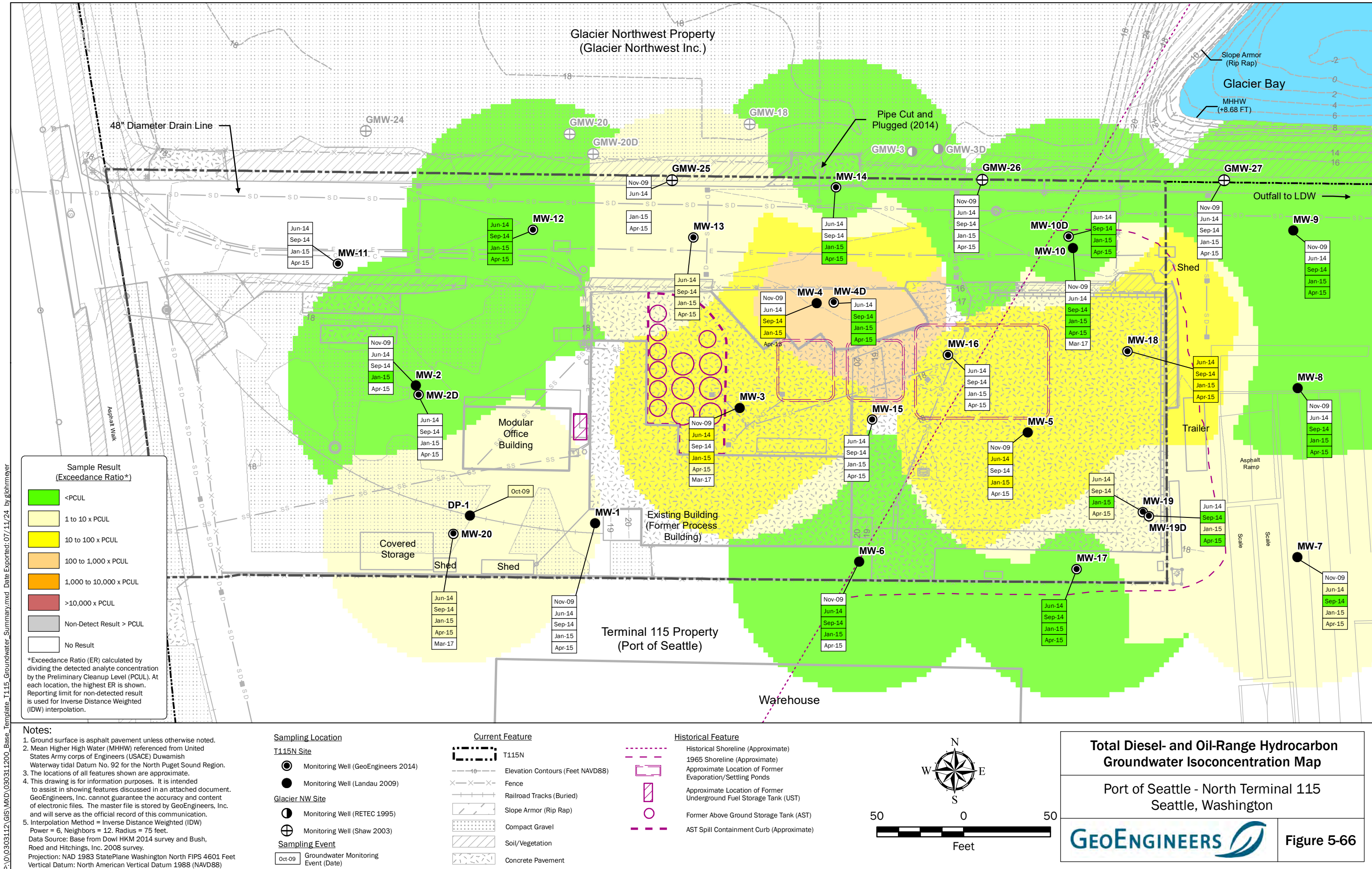


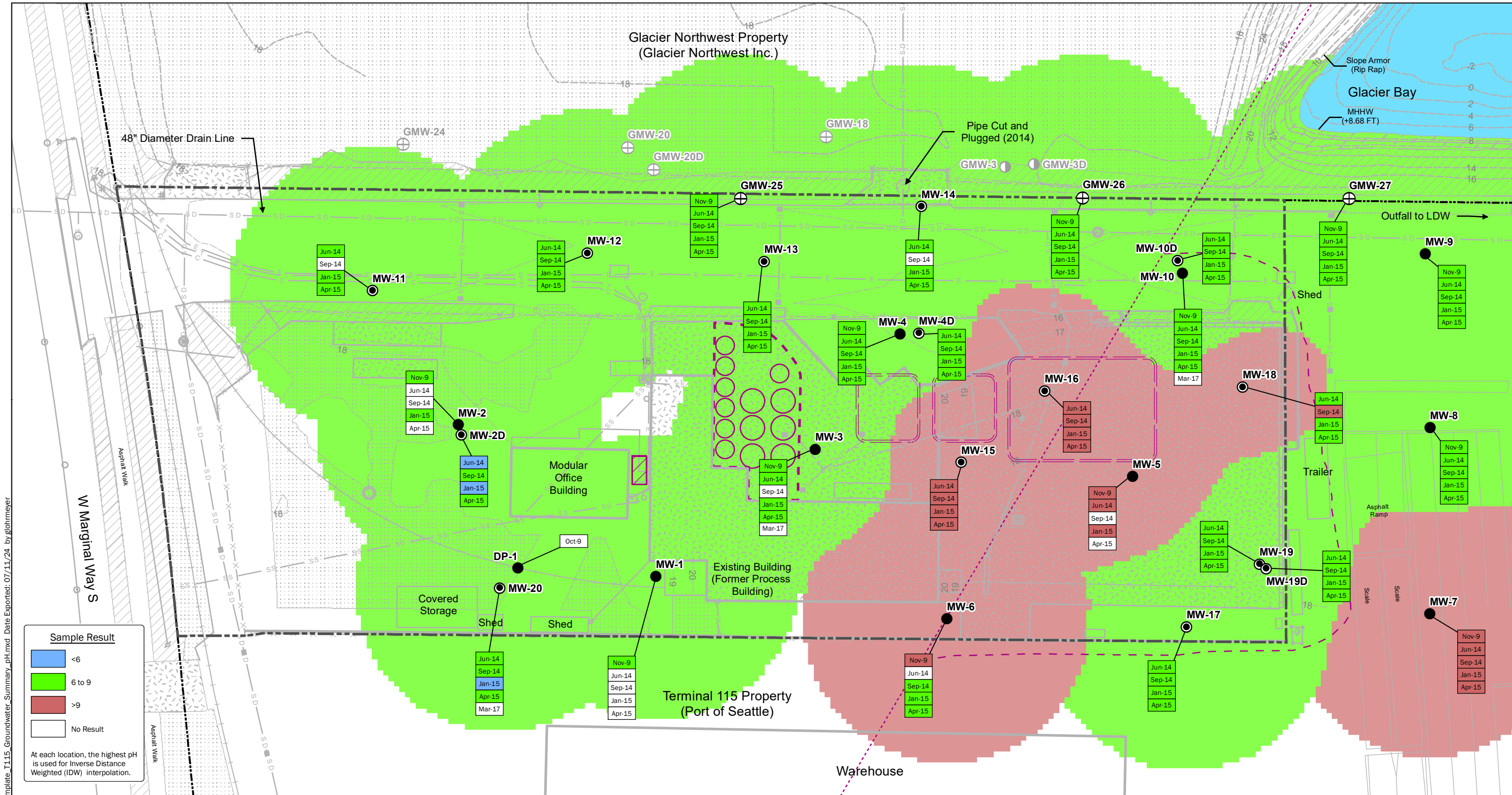












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Notes:

- Ground surface is asphalt pavement unless otherwise noted.
- Mean Higher High Water (MHHW) referenced from United States Army Corps of Engineers (USACE) Duwamish Waterway tidal Datum No. 92 for the North Puget Sound Region.
- The locations of all features shown are approximate.
- This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.
- Interpolation Method = Inverse Distance Weighted (IDW)
Power = 6, Neighbors = 12, Radius = 75 feet.

Data Source: Base from Dowl HKM 2014 survey and Bush, Roed and Hitchings, Inc. 2008 survey.
Projection: NAD 1983 StatePlane Washington North FIPS 4601 Feet
Vertical Datum: North American Vertical Datum 1988 (NAVD88)

Sampling Location

T115N Site

- Monitoring Well (GeoEngineers 2014)
- Monitoring Well (Landau 2009)
- Monitoring Well (RETEC 1995)
- Monitoring Well (Shaw 2003)

Glacier NW Site

- Monitoring Well (RETEC 1995)
- Monitoring Well (Shaw 2003)

Sampling Event

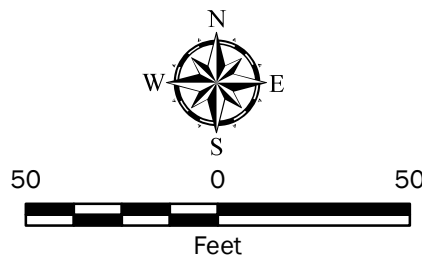
- Groundwater Monitoring Event (Date)

Current Feature

- T115N
- Elevation Contours (Feet NAVD88)
- Fence
- Railroad Tracks (Buried)
- Slope Armor (Rip Rap)
- Compact Gravel
- Soil/Vegetation
- Concrete Pavement

Historical Feature

- Historical Shoreline (Approximate)
- 1965 Shoreline (Approximate)
- Approximate Location of Former Evaporation/Settling Ponds
- Approximate Location of Former Underground Fuel Storage Tank (UST)
- Former Above Ground Storage Tank (AST)
- AST Spill Containment Curb (Approximate)

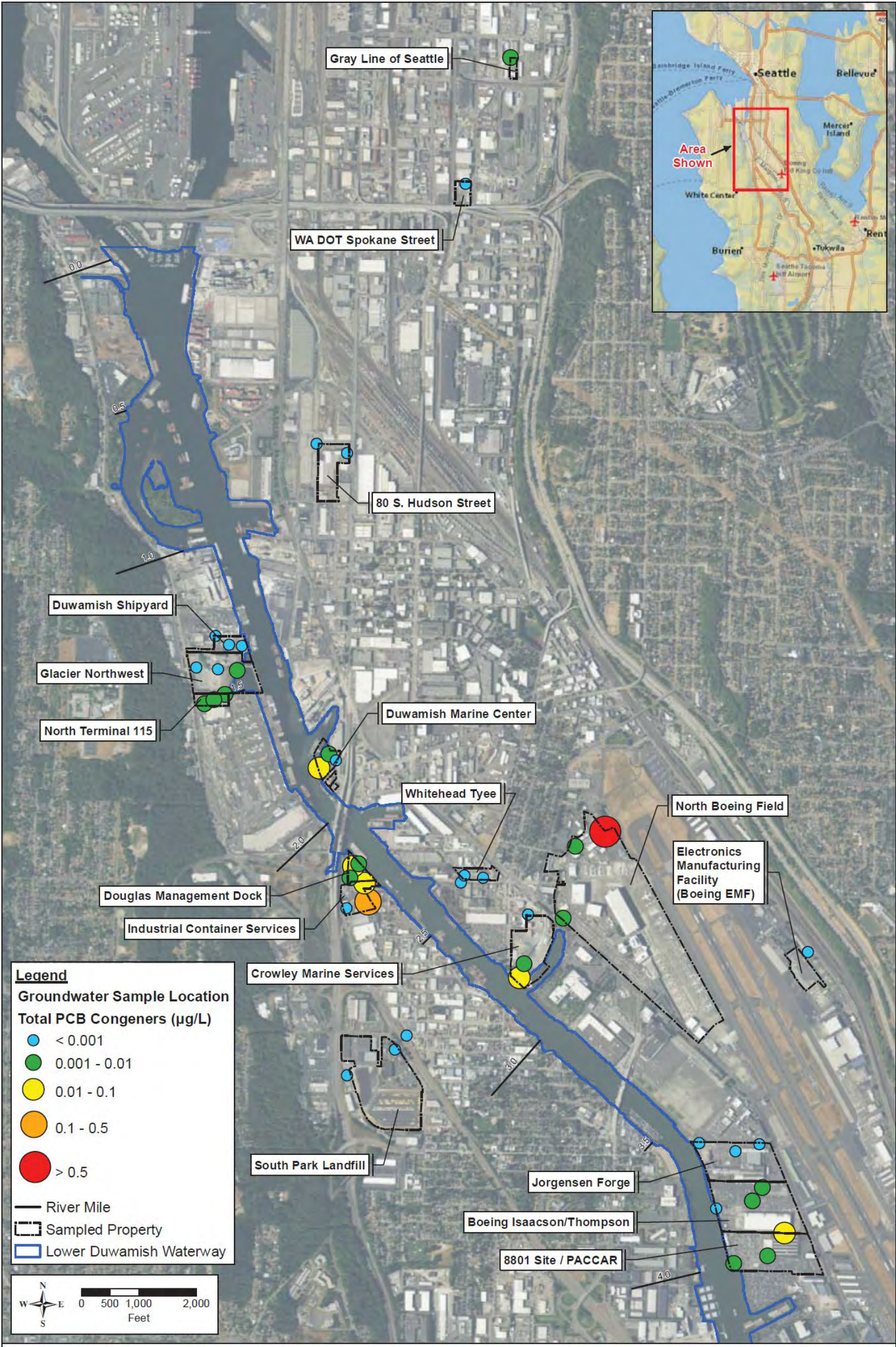


**pH
Groundwater Isoconcentration Map**

Port of Seattle - North Terminal 115
Seattle, Washington



Figure 5-67



Notes:

1. The locations of all features shown are approximate.
2. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

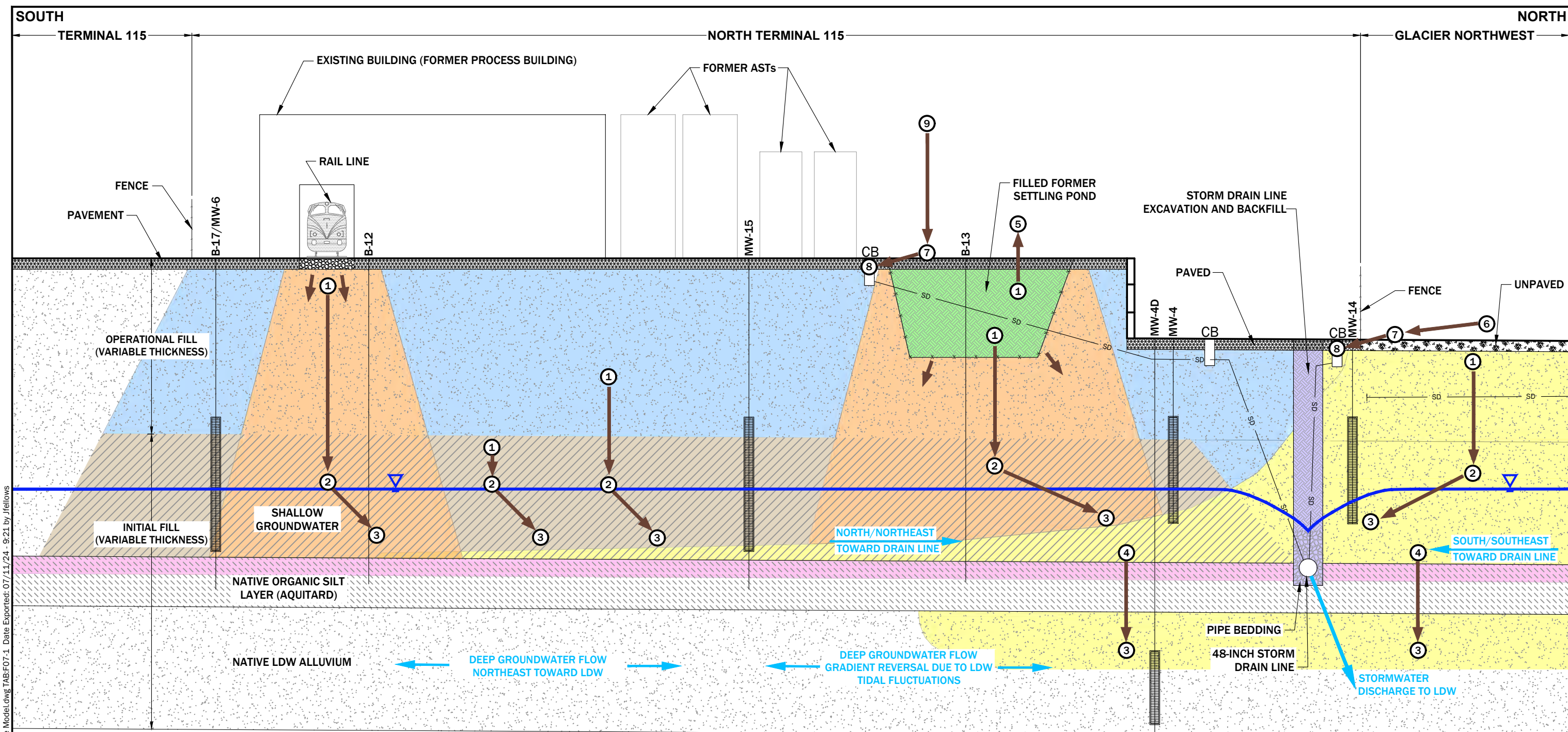
Data Source: Figure 3.1, Relative Concentrations of Total PCBs in LDW Groundwater (Leidos 2017)

Relative Concentrations of Total PCBs
in LDW Groundwater

Port of Seattle – North Terminal 115
Seattle, Washington



Figure 5-68



Notes:

- The locations of all features shown are approximate.
- This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Data Source: Sketch provided by GeoEngineers staff, March 2011.

Note: Conceptual Diagram - Not to Scale

Potential Contaminant Source

- Deposition on Historical Native Surface (Pre-1920s)
- Initial Fill from Undocumented Sources (Early 1900s)
- Release from Glacier Northwest Property (Mid-1930 to late 1960)
- Operational Fill from Undocumented Sources (Early to Mid-1960s)
- Releases from Tin Reclamation Operations (Mid-1960s to Late 1970s)
- Placement of Fill from Unknown Sources within 48-Inch Diameter Drain Line Trench (Early 1970s)
- Placement of Fill from Unknown Source(s) to Backfill Setting Ponds (Late 1970s)

Release and Transport Mechanisms

- ① Deposition/Release to Soil Column
- ② Leaching from Soil Column
- ③ Migration in Groundwater
- ④ Diffusion through Aquitard
- ⑤ Volatilization from Soil and Groundwater
- ⑥ Wind Erosion of Soil/Particulates
- ⑦ Water Erosion of Soil/Particulates
- ⑧ Capture of Soil Particulates in Catch Basins
- ⑨ Atmospheric Deposition

Conceptual Site Model

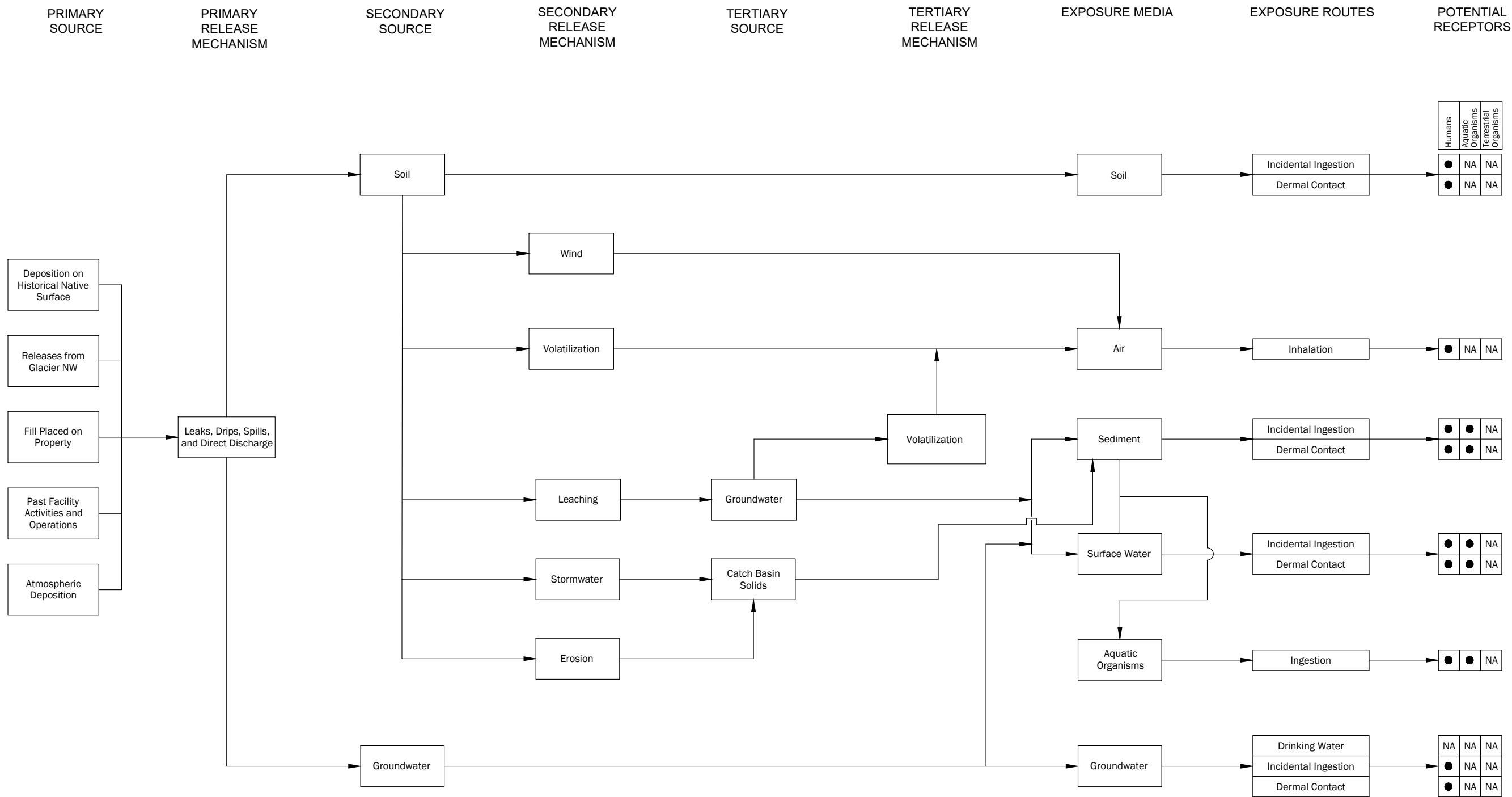
Release Mechanisms and Transport Pathways

Port of Seattle - North Terminal 115

Seattle, Washington

Figure 7-1

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Explanation:

- Potentially Complete Exposure Pathway
- NA Not Applicable

Conceptual Site Model
Potential Exposure Pathways and Receptors

Port of Seattle - North Terminal 115
Seattle, Washington



Figure 7-2

Appendix A

Port of Seattle Stormwater System Inspection Records

Appendix B

Seattle Public Utility 48-Inch Storm Drain Line As-Built

Appendix C

Terrestrial Ecological Evaluation

Appendix D

Remedial Investigation Data Tables

Table D-1
Remedial Investigation Chemical Analytical Results - Soil COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Sample Location ¹	Analytical Method	Units	MST-1	MST-2	MST-3	DP-1			TP-01		TP-02				Soil Preliminary Cleanup Level ² (PCUL)
Sample Identification			MST-1	MST-2	MST-3	DP-1- (0.5-1)	DP-1- (6-7)	DP-1- (8.5-9.5)	TP01-1-2	TP01-3-4	TP02-1-2	TP02-3-4	TP02-4-5	TP02-7-8	
Sample Date			11/07/97	11/07/97	11/07/97	10/29/09	10/29/09	10/29/09	12/04/13	12/04/13	12/04/13	12/04/13	12/04/13	12/23/13	
Sample Depth			6 inches	5 inches	16 inches	0.5 - 1 ft	6 - 7 ft	8.5 - 9.5 ft	1 - 2 ft	3 - 4 ft	1 - 2 ft	3 - 4 ft	4 - 5 ft	7 - 8 ft	
Stratigraphic Horizon			FO	FO	FO	FO	FI	FI	FO	FI	FO	FO	FI	FI	
Sampled By			KCHD	KCHD	KCHD	Landau	Landau	Landau	GEI	GEI	GEI	GEI	GEI	GEI	
Polychlorinated Biphenyls (PCBs)															
PCB-Aroclor 1016	EPA 8082	mg/kg	--	--	--	0.054 U	0.068 U	0.068 U	0.028 U	--	--	--	--	--	NE
PCB-Aroclor 1221	EPA 8082	mg/kg	--	--	--	0.054 U	0.068 U	0.068 U	0.028 U	--	--	--	--	--	NE
PCB-Aroclor 1232	EPA 8082	mg/kg	--	--	--	0.054 U	0.068 U	0.068 U	0.028 U	--	--	--	--	--	NE
PCB-Aroclor 1242	EPA 8082	mg/kg	--	--	--	0.054 U	0.068 U	0.068 U	0.028 U	--	--	--	--	--	NE
PCB-Aroclor 1248	EPA 8082	mg/kg	--	--	--	0.054 U	0.068 U	0.068 U	0.028 U	--	--	--	--	--	NE
PCB-Aroclor 1254	EPA 8082	mg/kg	--	--	--	0.054 U	0.068 U	0.068 U	0.028 U	--	--	--	--	--	NE
PCB-Aroclor 1260	EPA 8082	mg/kg	--	--	--	0.054 U	0.068 U	0.068 U	0.028 U	--	--	--	--	--	NE
Total PCB Aroclors	EPA 8082	mg/kg	--	--	--	0.054 U	0.068 U	0.068 U	0.028 U	--	--	--	--	--	0.0000022
Dioxins and Furans															
1,2,3,4,6,7,8-HpCDD	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,4,6,7,8-HpCDF	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,4,7,8,9-HpCDF	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,4,7,8-HxCDD	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,4,7,8-HxCDF	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,6,7,8-HxCDD	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,6,7,8-HxCDF	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,7,8,9-HxCDD	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,7,8,9-HxCDF	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,7,8-PeCDD	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,7,8-PeCDF	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
2,3,4,6,7,8-HxCDF	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
2,3,4,7,8-PeCDF	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
2,3,7,8-TCDD	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
2,3,7,8-TCDF	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
OCDD	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
OCDF	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
Total Dioxin/Furan TEQ ³ (ND=0.5RL)	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	0.0000052
Total Dioxin/Furan TEQ ³ (ND=0.5RL)	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	0.0000052
Metals															
Antimony	EPA 6000/7000	mg/kg	--	--	--	5.4 U	6.8 U	6.7 U	5.0 U	5.0 U	5.0 U	--	5.0 U	5.0 U	4.1
Arsenic	EPA 6000/7000	mg/kg	11 U	11 U	12 U	5.4 U	6.8 U	6.7 U	3.7	7.5	16	--	4.3	1.4	7.0
Barium	EPA 6000/7000	mg/kg	120	32	19	--	--	--	41	92	120	--	130	77	8.3
Beryllium	EPA 6000/7000	mg/kg	--	--	--	0.54 U	0.68 U	0.67 U	0.50 U	0.50 U	0.50 U	--	0.50 U	0.50 U	3.5
Cadmium	EPA 6000/7000	mg/kg	0.98	0.69	0.59 U	1.2	0.68 U	0.67 U	0.20 U	0.20 U	0.26	--	0.20 U	0.20 U	1.0
Chromium III / Total	EPA 6000/7000	mg/kg	22	33	8.4	72	46	54	31	44	58	--	65	12	48
Chromium VI	EPA 6000/7000	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	18
Copper	EPA 6000/7000	mg/kg	--	--	--	110	29	31	63	26	40	--	33	26	36
Lead	EPA 6000/7000	mg/kg	470	110	36	220	5.5	6	57	21	19	--	5.5	5.2	50
Mercury	EPA 6000/7000	mg/kg	0.29 U	0.27 U	0.29 U	0.11	0.068 U	0.067 U	0.050 U	0.058	0.071	--	0.050 U	0.053	0.070
Nickel	EPA 6000/7000	mg/kg	--	--	--	35	63	58	30	49	60	--	65	13	48
Selenium	EPA 6000/7000	mg/kg	11 U	11 U	12 U	11 U	14 U	13 U	0.50 U	0.50 U	0.74	--	0.51	0.50 U	0.30

Table D-1
Remedial Investigation Chemical Analytical Results - Soil COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Sample Location ¹	Analytical Method	Units	MST-1	MST-2	MST-3	DP-1			TP-01		TP-02				Soil Preliminary Cleanup Level ² (PCUL)
Sample Identification			MST-1	MST-2	MST-3	DP-1(0.5-1)	DP-1(6-7)	DP-1-(8.5-9.5)	TP01-1-2	TP01-3-4	TP02-1-2	TP02-3-4	TP02-4-5	TP02-7-8	
Sample Date			11/07/97	11/07/97	11/07/97	10/29/09	10/29/09	10/29/09	12/04/13	12/04/13	12/04/13	12/04/13	12/04/13	12/23/13	
Sample Depth			6 inches	5 inches	16 inches	0.5 - 1 ft	6 - 7 ft	8.5 - 9.5 ft	1 - 2 ft	3 - 4 ft	1 - 2 ft	3 - 4 ft	4 - 5 ft	7 - 8 ft	
Stratigraphic Horizon			FO	FO	FO	FO	FI	FI	FO	FI	FO	FO	FI	FI	
Sampled By			KCHD	KCHD	KCHD	Landau	Landau	Landau	GEI	GEI	GEI	GEI	GEI	GEI	
Silver	EPA 6000/7000	mg/kg	0.57 U	0.54 U	0.59 U	0.54 U	0.68 U	0.67 U	0.50 U	0.50 U	0.50 U	–	0.50 U	0.50 U	0.016
Thallium	EPA 6000/7000	mg/kg	–	–	–	5.4 U	6.8 U	6.7 U	0.25 U	0.25 U	0.25 U	–	0.25 U	0.25 U	0.0044
Tin	EPA 6000/7000	mg/kg	550	880	170	780	3	1.3 U	350	740	24	–	7.4	2.1	50
Zinc	EPA 6000/7000	mg/kg	310	330	76	1,400	57	66	130	71	76	–	64	76	85
Semi-Volatile Organic Compounds (SVOCs) - Polycyclic Aromatic Hydrocarbons (PAHs)															
Acenaphthene	EPA 8270/SIM	mg/kg	–	–	–	0.88	0.009 U	0.009 U	0.013	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.028
Acenaphthylene	EPA 8270/SIM	mg/kg	–	–	–	0.092	0.009 U	0.009 U	0.0082	0.0067 U	0.0038	0.0067 U	0.0067 U	0.0067 U	1.3
Anthracene	EPA 8270/SIM	mg/kg	–	–	–	0.36	0.009 U	0.009 U	0.021	0.0067 U	0.01	0.0067 U	0.0067 U	0.0067 U	0.051
Benzo(a)anthracene	EPA 8270/SIM	mg/kg	–	–	–	0.41	0.009 U	0.009 U	0.017	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.000057
Benzo(b)fluoranthene	EPA 8270/SIM	mg/kg	–	–	–	0.74	0.009 U	0.009 U	0.031	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.00020
Benzo(k)fluoranthene	EPA 8270/SIM	mg/kg	–	–	–	0.19	0.009 U	0.009 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0020
Benzo(a)fluoranthene (Total)	EPA 8270/SIM	mg/kg	–	–	–	–	–	–	–	–	–	–	–	–	3.2
Benzo(g,h,i)perylene	EPA 8270/SIM	mg/kg	–	–	–	0.19	0.009 U	0.009 U	0.03	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.67
Benzo(a)pyrene	EPA 8270/SIM	mg/kg	–	–	–	0.35	0.009 U	0.009 U	0.02	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.000016
Chrysene	EPA 8270/SIM	mg/kg	–	–	–	0.69	0.009 U	0.009 U	0.022	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0064
Dibenzo(a,h)anthracene	EPA 8270/SIM	mg/kg	–	–	–	0.055	0.009 U	0.009 U	0.0071	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.000029
Dibenzofuran	EPA 8270/SIM	mg/kg	–	–	–	0.33	0.045 U	0.045 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.54
Fluoranthene	EPA 8270/SIM	mg/kg	–	–	–	1.9	0.009 U	0.009 U	0.05	0.0067 U	0.008	0.0067 U	0.0067 U	0.0067 U	0.090
Fluorene	EPA 8270/SIM	mg/kg	–	–	–	0.55	0.009 U	0.009 U	0.01	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.029
Indeno(1,2,3-c,d)pyrene	EPA 8270/SIM	mg/kg	–	–	–	0.15	0.009 U	0.009 U	0.014	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.00056
1-Methylnaphthalene	EPA 8270/SIM	mg/kg	–	–	–	0.078	0.009 U	0.009 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	29
2-Methylnaphthalene	EPA 8270/SIM	mg/kg	–	–	–	0.13	0.009 U	0.009 U	0.008	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.67
Naphthalene	EPA 8270/SIM	mg/kg	–	–	–	0.077	0.009 U	0.009 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0021
Phenanthrene	EPA 8270/SIM	mg/kg	–	–	–	1.3	0.009 U	0.009 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	1.5
Pyrene	EPA 8270/SIM	mg/kg	–	–	–	2.4	0.009 U	0.009 U	0.053	0.0067 U	0.0087	0.0067 U	0.0073	0.0067 U	0.14
Total cPAH TEQ ⁴ (ND=0)	EPA 8270/SIM	mg/kg	–	–	–	0.51	0 U	0 U	0.027	0 U	0 U	0 U	0 U	0 U	0.000016
Total cPAH TEQ ⁴ (ND=0.5RL)	EPA 8270/SIM	mg/kg	–	–	–	0.51	0.0068 U	0.0068 U	0.027	0.0051 U	0.0051 U	0.0051 U	0.0051 U	0.0051 U	0.000016
Other SVOCs															
Aniline	EPA 8270	mg/kg	–	–	–	0.18 U	0.045 U	0.045 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	150
Benzidine	EPA 8270	mg/kg	–	–	–	1.8 U	0.45 U	0.45 U	0.017 UJ	0.017 UJ	0.017 UJ	0.017 UJ	0.017 UJ	0.017 UJ	0.0037
Benzoic acid	EPA 8270	mg/kg	–	–	–	–	–	–	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.17
Benzyl alcohol	EPA 8270	mg/kg	–	–	–	0.18 U	0.045 U	0.045 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.057
Bis(2-chloroethoxy)methane	EPA 8270	mg/kg	–	–	–	0.18 U	0.045 U	0.045 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	NE
Bis(2-chloroethyl)ether	EPA 8270	mg/kg	–	–	–	0.18 U	0.045 U	0.045 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.000022
Bis(2-chloroisopropyl)ether	EPA 8270	mg/kg	–	–	–	0.18 U	0.045 U	0.045 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	3,200
Bis(2-ethylhexyl)phthalate	EPA 8270	mg/kg	–	–	–	0.18	0.045 U	0.045 U	0.41	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.0051
4-Bromophenyl phenyl ether	EPA 8270	mg/kg	–	–	–	0.18 U	0.045 U	0.045 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	NE
Butyl benzyl phthalate	EPA 8270	mg/kg	–	–	–	0.18 U	0.045 U	0.045 U	0.023	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.00018
Carbazole	EPA 8270	mg/kg	–	–	–	0.2	0.045 U	0.045 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	NE
4-Chloroaniline	EPA 8270	mg/kg	–	–	–	0.18 U	0.045 U	0.045 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.81
4-Chloro-3-methylphenol	EPA 8270	mg/kg	–	–	–	0.18 U	0.045 U	0.045 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	NE
2-Chloronaphthalene	EPA 8270	mg/kg	–	–	–	0.18 U	0.045 U	0.045 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	6,400
2-Chlorophenol	EPA 8270	mg/kg	–	–	–	0.18 U	0.045 U	0.045 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.011
4-Chlorophenyl phenyl ether	EPA 8270	mg/kg	–	–	–	0.18 U	0.045 U	0.045 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	NE

Table D-1
Remedial Investigation Chemical Analytical Results - Soil COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Sample Location ¹	Analytical Method	Units	MST-1	MST-2	MST-3	DP-1			TP-01		TP-02				Soil Preliminary Cleanup Level ² (PCUL)
Sample Identification			MST-1	MST-2	MST-3	DP-1(0.5-1)	DP-1(6-7)	DP-1-(8.5-9.5)	TP01-1-2	TP01-3-4	TP02-1-2	TP02-3-4	TP02-4-5	TP02-7-8	
Sample Date			11/07/97	11/07/97	11/07/97	10/29/09	10/29/09	10/29/09	12/04/13	12/04/13	12/04/13	12/04/13	12/04/13	12/23/13	
Sample Depth			6 inches	5 inches	16 inches	0.5 - 1 ft	6 - 7 ft	8.5 - 9.5 ft	1 - 2 ft	3 - 4 ft	1 - 2 ft	3 - 4 ft	4 - 5 ft	7 - 8 ft	
Stratigraphic Horizon			FO	FO	FO	FO	FI	FI	FO	FI	FO	FO	FI	FI	
Sampled By			KCHD	KCHD	KCHD	Landau	Landau	Landau	GEI	GEI	GEI	GEI	GEI	GEI	
Decane	EPA 8270	mg/kg	--	--	--	--	--	--	0.017 UJ	0.017 UJ	0.017 UJ	0.017 UJ	0.017 UJ	0.017 U	NE
Dibutyl phthalate	EPA 8270	mg/kg	--	--	--	0.18 U	0.045 U	0.045 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.015
2,3-Dichloroaniline	EPA 8270	mg/kg	--	--	--	0.18 U	0.045 U	0.045 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	NE
1,2-Dichlorobenzene	EPA 8260	mg/kg	--	--	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0031
(o-Dichlorobenzene)	EPA 8270	mg/kg	--	--	--	0.18 U	0.045 U	0.045 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.0031
1,3-Dichlorobenzene	EPA 8260	mg/kg	--	--	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	NE
(m-Dichlorobenzene)	EPA 8270	mg/kg	--	--	--	0.18 U	0.045 U	0.045 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	NE
1,4-Dichlorobenzene	EPA 8260	mg/kg	--	--	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0081
(p-Dichlorobenzene)	EPA 8270	mg/kg	--	--	--	0.18 U	0.045 U	0.045 U	0.017 UJ	0.017 UJ	0.017 UJ	0.017 UJ	0.017 UJ	0.017 UJ	0.0081
3,3'-Dichlorobenzidine	EPA 8270	mg/kg	--	--	--	1.8 U	0.45 U	0.45 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.0000033
2,4-Dichlorophenol	EPA 8270	mg/kg	--	--	--	0.18 U	0.045 U	0.045 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.0043
Bis(2-ethylhexyl)ester	EPA 8270	mg/kg	--	--	--	0.18 U	0.045 U	0.045 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	710
Diethyl phthalate	EPA 8270	mg/kg	--	--	--	0.18 U	0.045 U	0.045 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.034
Dimethyl phthalate	EPA 8270	mg/kg	--	--	--	0.18 U	0.045 U	0.045 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.071
2,4-Dimethylphenol	EPA 8270	mg/kg	--	--	--	0.18 U	0.045 U	0.045 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.0031
1,2-Dinitrobenzene	EPA 8270	mg/kg	--	--	--	0.18 U	0.045 U	0.045 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	8.0
1,3-Dinitrobenzene	EPA 8270	mg/kg	--	--	--	0.18 U	0.045 U	0.045 U	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	8.0
1,4-Dinitrobenzene	EPA 8270	mg/kg	--	--	--	0.18 U	0.045 U	0.045 U	0.017 UJ	0.017 UJ	0.017 UJ	0.017 UJ	0.017 UJ	0.017 UJ	8.0
4,6-Dinitro-2-methylphenol	EPA 8270	mg/kg	--	--	--	0.91 U	0.23 U	0.23 U	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	NE
2,4-Dinitrophenol	EPA 8270	mg/kg	--	--	--	0.91 U	0.23 U	0.23 U	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.029
2,4-Dinitrotoluene	EPA 8270	mg/kg	--	--	--	0.18 U	0.045 U	0.045 U	0.017 UJ	0.017 UJ	0.017 UJ	0.017 UJ	0.017 UJ	0.017 U	0.000069
2,6-Dinitrotoluene	EPA 8270	mg/kg	--	--	--	0.18 U	0.045 U	0.045 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.11
Di-n-octyl phthalate	EPA 8270	mg/kg	--	--	--	0.18 U	0.045 U	0.045 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.33
1,2-Diphenylhydrazine	EPA 8270	mg/kg	--	--	--	0.18 U	0.045 U	0.045 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	1.1
Hexachlorobenzene	EPA 8270	mg/kg	--	--	--	0.18 U	0.045 U	0.045 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.00000040
Hexachlorobutadiene	EPA 8260	mg/kg	--	--	--	--	--	--	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.00054
	EPA 8270	mg/kg	--	--	--	0.18 U	0.045 U	0.045 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.00054
Hexachlorocyclopentadiene	EPA 8270	mg/kg	--	--	--	0.4	0.045 U	0.045 U	0.017 U	0.017 UJ	0.017 U	0.017 U	0.017 U	0.017 U	0.20
Hexachloroethane	EPA 8270	mg/kg	--	--	--	0.18 U	0.045 U	0.045 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.000041
Isophorone	EPA 8270	mg/kg	--	--	--	0.18 U	0.045 U	0.045 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.037
2-Methylphenol (o-Cresol)	EPA 8270	mg/kg	--	--	--	0.18 U	0.045 U	0.045 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.010
3 & 4 Methylphenol (m-, p-Cresol)	EPA 8270	mg/kg	--	--	--	--	--	--	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	4,000
2-Nitroaniline	EPA 8270	mg/kg	--	--	--	0.18 U	0.045 U	0.045 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	800
3-Nitroaniline	EPA 8270	mg/kg	--	--	--	0.18 U	0.045 U	0.045 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	NE
4-Nitroaniline	EPA 8270	mg/kg	--	--	--	0.18 U	0.045 U	0.045 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	NE
Nitrobenzene	EPA 8270	mg/kg	--	--	--	0.18 U	0.045 U	0.045 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.041
2-Nitrophenol	EPA 8270	mg/kg	--	--	--	0.18 U	0.045 U	0.045 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	NE
4-Nitrophenol (p-Nitrophenol)	EPA 8270	mg/kg	--	--	--	0.18 U	0.045 U	0.045 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	7.0
n-Nitrosodimethylamine	EPA 8270	mg/kg	--	--	--	0.18 U	0.045 U	0.045 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017
n-Nitrosodiphenylamine (as Diphenylamine)	EPA 8270	mg/kg	--	--	--	0.18 U	0.045 U	0.045 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.0011
n-Nitrosodi-n-propylamine	EPA 8270	mg/kg	--	--	--	0.18 U	0.045 U	0.045 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.000018
n-Octadecane	EPA 8270	mg/kg	--	--	--	--	--	--	0.021 J	0.017 UJ	0.017 UJ	0.017 UJ	0.017 UJ	0.017 UJ	NE
Pentachlorophenol	EPA 8270	mg/kg	--	--	--	0.91 U	0.23 U	0.23 U	0.083 UJ	0.083 UJ	0.083 UJ	0.083 UJ	0.083 UJ	0.083 UJ	0.0000018

Table D-1
Remedial Investigation Chemical Analytical Results - Soil COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Sample Location ¹	Analytical Method	Units	MST-1	MST-2	MST-3	DP-1			TP-01		TP-02				Soil Preliminary Cleanup Level ² (PCUL)
Sample Identification			MST-1	MST-2	MST-3	DP-1-(0.5-1)	DP-1-(6-7)	DP-1 -(8.5-9.5)	TP01-1-2	TP01-3-4	TP02-1-2	TP02-3-4	TP02-4-5	TP02-7-8	
Sample Date			11/07/97	11/07/97	11/07/97	10/29/09	10/29/09	10/29/09	12/04/13	12/04/13	12/04/13	12/04/13	12/04/13	12/23/13	
Sample Depth			6 inches	5 inches	16 inches	0.5 - 1 ft	6 - 7 ft	8.5 - 9.5 ft	1 - 2 ft	3 - 4 ft	1 - 2 ft	3 - 4 ft	4 - 5 ft	7 - 8 ft	
Stratigraphic Horizon			FO	FO	FO	FO	FI	FI	FO	FI	FO	FO	FI	FI	
Sampled By			KCHD	KCHD	KCHD	Landau	Landau	Landau	GEI	GEI	GEI	GEI	GEI	GEI	
Phenol	EPA 8270	mg/kg	--	--	--	0.18 U	0.045 U	0.045 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.12
Pyridine	EPA 8270	mg/kg	--	--	--	0.18 U	0.045 U	0.045 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	80
2,3,4,6-Tetrachlorophenol	EPA 8270	mg/kg	--	--	--	0.18 U	0.045 U	0.045 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	490
2,3,5,6-Tetrachlorophenol	EPA 8270	mg/kg	--	--	--	0.18 U	0.045 U	0.045 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	NE
1,2,4-Trichlorobenzene	EPA 8260	mg/kg	--	--	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.000072
	EPA 8270	mg/kg	--	--	--	0.18 U	0.045 U	0.045 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.000072
2,4,5-Trichlorophenol	EPA 8270	mg/kg	--	--	--	0.18 U	0.045 U	0.045 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	1.1
2,4,6-Trichlorophenol	EPA 8270	mg/kg	--	--	--	0.18 U	0.045 U	0.045 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.00019
Volatile Organic Compounds (VOCs)															
Acetone	EPA 8260	mg/kg	--	--	--	--	--	--	0.083	0.068	0.069	0.11	0.093	0.084	72,000
Benzene	EPA 8260	mg/kg	--	--	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.00056
Bromobenzene	EPA 8260	mg/kg	--	--	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	640
Bromochloromethane	EPA 8260	mg/kg	--	--	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	NE
Bromoform (Tribromomethane)	EPA 8260	mg/kg	--	--	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0050
Bromomethane	EPA 8260	mg/kg	--	--	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.079
n-Butylbenzene	EPA 8260	mg/kg	--	--	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	4,000
sec-Butylbenzene	EPA 8260	mg/kg	--	--	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	8,000
tert-Butylbenzene	EPA 8260	mg/kg	--	--	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	8,000
Carbon disulfide	EPA 8260	mg/kg	--	--	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	8,000
Carbon tetrachloride	EPA 8260	mg/kg	--	--	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.00015
Chlorobenzene	EPA 8260	mg/kg	--	--	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.10
Chloroethane	EPA 8260	mg/kg	--	--	--	--	--	--	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	NE
2-Chloroethyl vinyl ether	EPA 8260	mg/kg	--	--	--	--	--	--	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	NE
Chloroform	EPA 8260	mg/kg	--	--	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.052
Chloromethane	EPA 8260	mg/kg	--	--	--	--	--	--	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	NE
2-Chlorotoluene	EPA 8260	mg/kg	--	--	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	1,600
4-Chlorotoluene	EPA 8260	mg/kg	--	--	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	NE
Dibromochloromethane	EPA 8260	mg/kg	--	--	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.00077
1,2-Dibromo-3-chloropropane	EPA 8260	mg/kg	--	--	--	--	--	--	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	1.3
Dibromomethane	EPA 8260	mg/kg	--	--	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	800
Bromodichloromethane (Dichlorobromomethane)	EPA 8260	mg/kg	--	--	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.00096
Dichlorodifluoromethane (CFC-12)	EPA 8260	mg/kg	--	--	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	16,000
1,1-Dichloroethane	EPA 8260	mg/kg	--	--	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	180
1,2-Dichloroethane	EPA 8260	mg/kg	--	--	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.024
1,1-Dichloroethene	EPA 8260	mg/kg	--	--	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	1.4
cis-1,2-Dichloroethene	EPA 8260	mg/kg	--	--	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	160
trans-1,2-Dichloroethene	EPA 8260	mg/kg	--	--	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.32
1,2-Dichloropropane	EPA 8260	mg/kg	--	--	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010
1,3-Dichloropropane	EPA 8260	mg/kg	--	--	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	NE
2,2-Dichloropropane	EPA 8260	mg/kg	--	--	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	NE
1,1-Dichloropropene	EPA 8260	mg/kg	--	--	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	NE
cis-1,3-Dichloropropene	EPA 8260	mg/kg	--	--	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.00063

Table D-1
Remedial Investigation Chemical Analytical Results - Soil COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Sample Location ¹	Analytical Method	Units	MST-1	MST-2	MST-3	DP-1			TP-01		TP-02				Soil Preliminary Cleanup Level ² (PCUL)
Sample Identification			MST-1	MST-2	MST-3	DP-1-(0.5-1)	DP-1-(6-7)	DP-1 -(8.5-9.5)	TP01-1-2	TP01-3-4	TP02-1-2	TP02-3-4	TP02-4-5	TP02-7-8	
Sample Date			11/07/97	11/07/97	11/07/97	10/29/09	10/29/09	10/29/09	12/04/13	12/04/13	12/04/13	12/04/13	12/04/13	12/23/13	
Sample Depth			6 inches	5 inches	16 inches	0.5 - 1 ft	6 - 7 ft	8.5 - 9.5 ft	1 - 2 ft	3 - 4 ft	1 - 2 ft	3 - 4 ft	4 - 5 ft	7 - 8 ft	
Stratigraphic Horizon			FO	FO	FO	FO	FI	FI	FO	FI	FO	FO	FI	FI	
Sampled By			KCHD	KCHD	KCHD	Landau	Landau	Landau	GEI	GEI	GEI	GEI	GEI	GEI	
trans-1,3-Dichloropropene	EPA 8260	mg/kg	--	--	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.00063
Ethylbenzene	EPA 8260	mg/kg	--	--	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.015
1,2-Dibromoethane (EDB)	EPA 8260	mg/kg	--	--	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.50
2-Hexanone	EPA 8260	mg/kg	--	--	--	--	--	--	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	400
Isopropylbenzene (Cumene)	EPA 8260	mg/kg	--	--	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	8,000
p-Isopropyltoluene	EPA 8260	mg/kg	--	--	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	NE
2-Butanone (MEK)	EPA 8260	mg/kg	--	--	--	--	--	--	0.017	0.0087	0.0081	0.02	0.0081	0.0099	48,000
Methyl iodide (Iodomethane)	EPA 8260	mg/kg	--	--	--	--	--	--	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	NE
4-Methyl-2-pentanone (Methyl Isobutyl Ketone)	EPA 8260	mg/kg	--	--	--	--	--	--	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	6,400
Methyl tert-butyl ether (MTBE)	EPA 8260	mg/kg	--	--	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	560
Methylene chloride	EPA 8260	mg/kg	--	--	--	--	--	--	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.030
n-Propylbenzene	EPA 8260	mg/kg	--	--	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	8,000
Styrene	EPA 8260	mg/kg	--	--	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	300
1,1,1,2-Tetrachloroethane	EPA 8260	mg/kg	--	--	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	38
1,1,2,2-Tetrachloroethane	EPA 8260	mg/kg	--	--	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.00011
Tetrachloroethene	EPA 8260	mg/kg	--	--	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0016
Toluene	EPA 8260	mg/kg	--	--	--	--	--	--	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.055
1,2,3-Trichlorobenzene	EPA 8260	mg/kg	--	--	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	20
1,1,1-Trichloroethane	EPA 8260	mg/kg	--	--	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	21
1,1,2-Trichloroethane	EPA 8260	mg/kg	--	--	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.00033
Trichloroethene	EPA 8260	mg/kg	--	--	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.00027
Trichlorofluoromethane (CFC-11)	EPA 8260	mg/kg	--	--	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	24,000
1,2,3-Trichloropropane	EPA 8260	mg/kg	--	--	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.033
1,2,4-Trimethylbenzene	EPA 8260	mg/kg	--	--	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	800
1,3,5-Trimethylbenzene	EPA 8260	mg/kg	--	--	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	800
Vinyl Acetate	EPA 8260	mg/kg	--	--	--	--	--	--	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	80,000
Vinyl Chloride	EPA 8260	mg/kg	--	--	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.000055
Xylene, m-,p-	EPA 8260	mg/kg	--	--	--	--	--	--	0.0020 U	0.0020 U	0.0020 U	0.0020 U	0.0020 U	0.0020 U	16,000
Xylene, o-	EPA 8260	mg/kg	--	--	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	16,000
Petroleum Hydrocarbons															
Gasoline-range hydrocarbons	NWTPH-G	mg/kg	--	--	--	--	--	--	--	--	4.5 U	4.7 U	4.6 U	5.0 U	30
Diesel-range hydrocarbons	NWTPH-Dx	mg/kg	--	--	--	--	--	--	--	--	16 U	16 U	16 U	17 U	260
Oil-range hydrocarbons	NWTPH-Dx	mg/kg	--	--	--	--	--	--	--	--	31 U	32 U	56	35 U	2,000
Total diesel- and oil-range hydrocarbons	NWTPH-Dx	mg/kg	--	--	--	--	--	--	--	--	31 U	32 U	56	35 U	260
Conventionals															
pH	N/A	N/A	--	--	--	--	--	--	9.1 J	8.3 J	7.9 J	8.7 J	8.8 J	--	NE

Table D-1

Remedial Investigation Chemical Analytical Results - Soil COPCs

Port of Seattle - North Terminal 115

Seattle, Washington

Notes:

- ¹ Sample locations are shown on Figures 3-1 and 3-3.
- ² Preliminary cleanup levels for soil are referenced from Table 4-1.
- ³ Total dioxin/furan Toxic Equivalency Quotients (TEQs) were calculated using United States Environmental Protection Agency (USEPA) Toxicity Equivalency Factor (TEF) values for human health (EPA 2003).
- ⁴ Total carcinogenic PAH (cPAH) TEQs were calculated using TEF values referenced from MTCA Table 708.2 (WAC 173-340-900).
- RL = Reporting limit
- EPA = Environmental Protection Agency
- mg/kg = milligram per kilogram
- NE = not established
- J = estimated result
- U = analyte not detected above the reporting limit
- = not analyzed
- AD = Native LDW alluvial deposit
- OS = Native organic silt (Aquitard) deposit
- FI = Initial (early 1900s) T115N fill deposit
- FD = Glacier NW Site dredged fill deposit
- FO = T115N operational (1960s) fill deposit
- FT = Terminal 115 fill deposit
- FP = Settling pond fill deposit
- COPC = Contaminant of Potential Concern
- KCHD = King County Health Department
- Landau = Landau Associates
- GEI = GeoEngineers
- ERM = Environmental Resources Management
- Shaw = Shaw Environmental & Infrastructure
- Bold** indicates analyte was detected.
- Yellow shading identifies the detected results greater than the preliminary cleanup level.
- Blue shading identifies the non-detected result greater than the preliminary cleanup level.

Table D-1
Remedial Investigation Chemical Analytical Results - Soil COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Sample Location ¹	Analytical Method	Units	TP-03				B-1		B-2			B-3		B-4	Soil Preliminary Cleanup Level ² (PCUL)
Sample Identification			TP03-0-1	TP03-2-3	TP03-2-3Dup	TP03-4-5	B1-2-3	B1-4-5	B2-1-2	B2-3-4	B2-3-4Dup	B3-3-4	B3-5-6	B4-1-2	
Sample Date			12/04/13	12/04/13	12/04/13	12/04/13	01/06/14	01/06/14	01/06/14	01/06/14	01/06/14	01/06/14	01/06/14	01/06/14	
Sample Depth			0 - 1 ft	2 - 3 ft	2 - 3 ft	4 - 5 ft	2 - 3 ft	4 - 5 ft	1 - 2 ft	3 - 4 ft	3 - 4 ft	3 - 4 ft	5 - 6 ft	1 - 2 ft	
Stratigraphic Horizon			FO	FO	FO	FI	FO	FI	FO	FI	FI	FI	OS	FO	
Sampled By			GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	
Polychlorinated Biphenyls (PCBs)															
PCB-Aroclor 1016	EPA 8082	mg/kg	--	--	--	--	--	--	--	--	--	--	--	0.028 U	NE
PCB-Aroclor 1221	EPA 8082	mg/kg	--	--	--	--	--	--	--	--	--	--	--	0.028 U	NE
PCB-Aroclor 1232	EPA 8082	mg/kg	--	--	--	--	--	--	--	--	--	--	--	0.028 U	NE
PCB-Aroclor 1242	EPA 8082	mg/kg	--	--	--	--	--	--	--	--	--	--	--	0.028 U	NE
PCB-Aroclor 1248	EPA 8082	mg/kg	--	--	--	--	--	--	--	--	--	--	--	0.028 U	NE
PCB-Aroclor 1254	EPA 8082	mg/kg	--	--	--	--	--	--	--	--	--	--	--	0.028 U	NE
PCB-Aroclor 1260	EPA 8082	mg/kg	--	--	--	--	--	--	--	--	--	--	--	0.028 U	NE
Total PCB Aroclors	EPA 8082	mg/kg	--	--	--	--	--	--	--	--	--	--	--	0.028 U	0.0000022
Dioxins and Furans															
1,2,3,4,6,7,8-HpCDD	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,4,6,7,8-HpCDF	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,4,7,8,9-HpCDF	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,4,7,8-HxCDD	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,4,7,8-HxCDF	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,6,7,8-HxCDD	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,6,7,8-HxCDF	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,7,8,9-HxCDD	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,7,8,9-HxCDF	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,7,8-PeCDD	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,7,8-PeCDF	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
2,3,4,6,7,8-HxCDF	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
2,3,4,7,8-PeCDF	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
2,3,7,8-TCDD	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
2,3,7,8-TCDF	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
OCDD	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
OCDF	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
Total Dioxin/Furan TEQ ³ (ND=0.5RL)	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	0.0000052
Total Dioxin/Furan TEQ ³ (ND=0.5RL)	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	0.0000052
Metals															
Antimony	EPA 6000/7000	mg/kg	5.0 U	--	--	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	4.1
Arsenic	EPA 6000/7000	mg/kg	0.97	--	--	2.5	5.3	4.9	3.4	5.4	4.9	6.4	4.6	1.3	7.0
Barium	EPA 6000/7000	mg/kg	21	--	--	120	32	110	24	87	84	83	89	12	8.3
Beryllium	EPA 6000/7000	mg/kg	0.50 U	--	--	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	3.5
Cadmium	EPA 6000/7000	mg/kg	0.20 U	--	--	0.20 U	0.20 U	0.20 U	0.27	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	1.0
Chromium III / Total	EPA 6000/7000	mg/kg	11	--	--	64	20	62	24	38	44	64	55	19	48
Chromium VI	EPA 6000/7000	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	18
Copper	EPA 6000/7000	mg/kg	130	--	--	24	28	40	70	24	24	37	20	78	36
Lead	EPA 6000/7000	mg/kg	7.2	--	--	4.5	42	5.6	39	19	17	8.2	3.9	4.9	50
Mercury	EPA 6000/7000	mg/kg	0.050 U	--	--	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.070
Nickel	EPA 6000/7000	mg/kg	16	--	--	51	21	70	25	48	46	67	48	32	48
Selenium	EPA 6000/7000	mg/kg	0.56	--	--	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.30

Table D-1
Remedial Investigation Chemical Analytical Results - Soil COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Sample Location ¹	Analytical Method	Units	TP-03				B-1		B-2			B-3		B-4	Soil Preliminary Cleanup Level ² (PCUL)
Sample Identification			TP03-0-1	TP03-2-3	TP03-2-3Dup	TP03-4-5	B1-2-3	B1-4-5	B2-1-2	B2-3-4	B2-3-4Dup	B3-3-4	B3-5-6	B4-1-2	
Sample Date			12/04/13	12/04/13	12/04/13	12/04/13	01/06/14	01/06/14	01/06/14	01/06/14	01/06/14	01/06/14	01/06/14	01/06/14	
Sample Depth			0 - 1 ft	2 - 3 ft	2 - 3 ft	4 - 5 ft	2 - 3 ft	4 - 5 ft	1 - 2 ft	3 - 4 ft	3 - 4 ft	3 - 4 ft	5 - 6 ft	1 - 2 ft	
Stratigraphic Horizon			FO	FO	FO	FI	FO	FI	FO	FI	FI	FI	OS	FO	
Sampled By			GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	
Silver	EPA 6000/7000	mg/kg	0.50 U	--	--	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.016
Thallium	EPA 6000/7000	mg/kg	0.25 U	--	--	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.0044
Tin	EPA 6000/7000	mg/kg	45	--	--	1.2	150	4.8	120	8.7 J	23 J	1,000	18	7.4	50
Zinc	EPA 6000/7000	mg/kg	47	--	--	52	55	73	99	53	52	68	47	39	85
Semi-Volatile Organic Compounds (SVOCs) - Polycyclic Aromatic Hydrocarbons (PAHs)															
Acenaphthene	EPA 8270/SIM	mg/kg	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.022 U	0.0067 U	0.0067 U	0.12	0.0067 U	0.0067 U	0.028
Acenaphthylene	EPA 8270/SIM	mg/kg	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.007	0.0067 U	0.053	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	1.3
Anthracene	EPA 8270/SIM	mg/kg	0.0067 U	0.0067 UJ	0.0067 UJ	0.0067 U	0.011	0.0067 U	0.13	0.0067 U	0.0067 U	0.014	0.0067 U	0.0067 U	0.051
Benzo(a)anthracene	EPA 8270/SIM	mg/kg	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.01	0.0067 U	0.13	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.000057
Benzo(b)fluoranthene	EPA 8270/SIM	mg/kg	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.014	0.0067 U	0.18	0.0067 U	0.0068	0.0067 U	0.0067 U	0.0067 U	0.00020
Benzo(k)fluoranthene	EPA 8270/SIM	mg/kg	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.048	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0020
Benzofluoranthenes (Total)	EPA 8270/SIM	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	3.2
Benzo(g,h,i)perylene	EPA 8270/SIM	mg/kg	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.01	0.0067 U	0.12	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.67
Benzo(a)pyrene	EPA 8270/SIM	mg/kg	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0078	0.0067 U	0.1	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.000016
Chrysene	EPA 8270/SIM	mg/kg	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.012	0.0067 U	0.14	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0098	0.0064
Dibenzo(a,h)anthracene	EPA 8270/SIM	mg/kg	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.022 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.000029
Dibenzofuran	EPA 8270/SIM	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.055 U	0.017 U	0.017 U	0.12	0.017 U	0.017 U	0.54
Fluoranthene	EPA 8270/SIM	mg/kg	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.016	0.0067 U	0.24	0.0067 U	0.011	0.012	0.0067 U	0.0067 U	0.090
Fluorene	EPA 8270/SIM	mg/kg	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.022 U	0.0067 U	0.0067 U	0.1	0.0067 U	0.0067 U	0.029
Indeno(1,2,3-c,d)pyrene	EPA 8270/SIM	mg/kg	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.075	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.00056
1-Methylnaphthalene	EPA 8270/SIM	mg/kg	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.022 U	0.0067 U	0.0067 U	0.064	0.0067 U	0.0067 U	29
2-Methylnaphthalene	EPA 8270/SIM	mg/kg	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.022 U	0.0067 U	0.0067 U	0.11	0.0067 U	0.0067 U	0.67
Naphthalene	EPA 8270/SIM	mg/kg	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.022 U	0.0067 U	0.0067 U	0.21	0.0067 U	0.0067 U	0.0021
Phenanthrene	EPA 8270/SIM	mg/kg	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0077	0.0067 U	0.086	0.0067 U	0.0067 U	0.11	0.012	0.0067 U	1.5
Pyrene	EPA 8270/SIM	mg/kg	0.0067 U	0.0067 U	0.017	0.01	0.017	0.0067 U	0.2	0.0084	0.01	0.0082	0.0086	0.0067 U	0.14
Total cPAH TEQ ⁴ (ND=0)	EPA 8270/SIM	mg/kg	0 U	0 U	0 U	0 U	0.01	0 U	0.15	0 U	0.00068	0 U	0 U	0.000098	0.000016
Total cPAH TEQ ⁴ (ND=0.5RL)	EPA 8270/SIM	mg/kg	0.0051 U	0.0051 U	0.0051 U	0.0051 U	0.011	0.0051 U	0.15	0.0051 U	0.0054	0.0051 U	0.0051 U	0.0051	0.000016
Other SVOCs															
Aniline	EPA 8270	mg/kg	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.055 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	150
Benzidine	EPA 8270	mg/kg	0.017 UJ	0.017 UJ	0.017 UJ	0.017 UJ	0.017 UJ	0.017 UJ	0.055 UJ	0.017 UJ	0.017 UJ	0.017 UJ	0.017 UJ	0.017 UJ	0.0037
Benzoic acid	EPA 8270	mg/kg	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.055 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.17
Benzyl alcohol	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.055 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.057
Bis(2-chloroethoxy)methane	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.055 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	NE
Bis(2-chloroethyl)ether	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.055 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.000022
Bis(2-chloroisopropyl)ether	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.055 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	3,200
Bis(2-ethylhexyl)phthalate	EPA 8270	mg/kg	0.017 U	0.017 U	0.025	0.017 U	0.017 U	0.017 U	0.077	0.017 U	0.017 U	0.017 U	0.044	0.017 U	0.0051
4-Bromophenyl phenyl ether	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.055 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	NE
Butyl benzyl phthalate	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.055 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.00018
Carbazole	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.06	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	NE
4-Chloroaniline	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.055 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.81
4-Chloro-3-methylphenol	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.055 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	NE
2-Chloronaphthalene	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.055 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	6,400
2-Chlorophenol	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.055 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.011
4-Chlorophenyl phenyl ether	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.055 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	NE

Table D-1
Remedial Investigation Chemical Analytical Results - Soil COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Sample Location ¹	Analytical Method	Units	TP-03				B-1		B-2			B-3		B-4	Soil Preliminary Cleanup Level ² (PCUL)
Sample Identification			TP03-0-1	TP03-2-3	TP03-2-3Dup	TP03-4-5	B1-2-3	B1-4-5	B2-1-2	B2-3-4	B2-3-4Dup	B3-3-4	B3-5-6	B4-1-2	
Sample Date			12/04/13	12/04/13	12/04/13	12/04/13	01/06/14	01/06/14	01/06/14	01/06/14	01/06/14	01/06/14	01/06/14	01/06/14	
Sample Depth			0 - 1 ft	2 - 3 ft	2 - 3 ft	4 - 5 ft	2 - 3 ft	4 - 5 ft	1 - 2 ft	3 - 4 ft	3 - 4 ft	3 - 4 ft	5 - 6 ft	1 - 2 ft	
Stratigraphic Horizon			FO	FO	FO	FI	FO	FI	FO	FI	FI	FI	OS	FO	
Sampled By			GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	
Decane	EPA 8270	mg/kg	0.017 UJ	0.017 UJ	0.017 UJ	0.017 UJ	0.017 UJ	0.017 UJ	0.055 UJ	0.017 UJ	0.017 UJ	0.017 UJ	0.017 UJ	0.017 UJ	NE
Dibutyl phthalate	EPA 8270	mg/kg	0.017 U	0.017 UJ	0.017 UJ	0.017 U	0.017 U	0.017 U	0.055 U	0.017 U	0.017 U	0.017 U	0.013	0.017 U	0.015
2,3-Dichloroaniline	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.055 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	NE
1,2-Dichlorobenzene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	--	--	--	--	--	--	--	0.0010 U	0.0031
(o-Dichlorobenzene)	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.055 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.0031
1,3-Dichlorobenzene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	--	--	--	--	--	--	--	0.0010 U	NE
(m-Dichlorobenzene)	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.055 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	NE
1,4-Dichlorobenzene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	--	--	--	--	--	--	--	0.0010 U	0.0081
(p-Dichlorobenzene)	EPA 8270	mg/kg	0.017 UJ	0.017 UJ	0.017 UJ	0.017 UJ	0.017 U	0.017 U	0.055 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.0081
3,3'-Dichlorobenzidine	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.055 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.0000033
2,4-Dichlorophenol	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.055 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.0043
Bis(2-ethylhexyl)ester	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.1	0.055 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	710
Diethyl phthalate	EPA 8270	mg/kg	0.085 U	0.085 UJ	0.085 UJ	0.085 U	0.085 U	0.085 U	0.055 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.034
Dimethyl phthalate	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.055 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.071
2,4-Dimethylphenol	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.055 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.0031
1,2-Dinitrobenzene	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.055 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	8.0
1,3-Dinitrobenzene	EPA 8270	mg/kg	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.055 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	8.0
1,4-Dinitrobenzene	EPA 8270	mg/kg	0.017 UJ	0.017 UJ	0.017 UJ	0.017 UJ	0.017 UJ	0.017 UJ	0.055 UJ	0.017 UJ	0.017 UJ	0.017 UJ	0.017 UJ	0.017 UJ	8.0
4,6-Dinitro-2-methylphenol	EPA 8270	mg/kg	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.055 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	NE
2,4-Dinitrophenol	EPA 8270	mg/kg	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.055 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.029
2,4-Dinitrotoluene	EPA 8270	mg/kg	0.017 UJ	0.017 UJ	0.017 UJ	0.017 UJ	0.017 U	0.017 U	0.055 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.000069
2,6-Dinitrotoluene	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.055 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.11
Di-n-octyl phthalate	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.055 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.33
1,2-Diphenylhydrazine	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.055 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	1.1
Hexachlorobenzene	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.055 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.00000040
Hexachlorobutadiene	EPA 8260	mg/kg	0.0050 U	0.0050 U	0.0050 U	0.0050 U	--	--	--	--	--	--	--	0.0050 U	0.00054
	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.055 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.00054
Hexachlorocyclopentadiene	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.055 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.20
Hexachloroethane	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.055 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.000041
Isophorone	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.055 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.037
2-Methylphenol (o-Cresol)	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.055 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.010
3 & 4 Methylphenol (m-, p-Cresol)	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.055 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	4,000
2-Nitroaniline	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.055 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	800
3-Nitroaniline	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.055 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	NE
4-Nitroaniline	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.055 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	NE
Nitrobenzene	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.055 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.041
2-Nitrophenol	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.055 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	NE
4-Nitrophenol (p-Nitrophenol)	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.023	0.017 U	0.017 U	0.055 U	0.017 U	0.017 U	0.017 U	0.022	0.017 U	7.0
n-Nitrosodimethylamine	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.055 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017
n-Nitrosodiphenylamine (as Diphenylamine)	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.055 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.0011
n-Nitrosodi-n-propylamine	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.055 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.000018
n-Octadecane	EPA 8270	mg/kg	0.017 UJ	0.017 UJ	0.017 UJ	0.017 UJ	0.017 UJ	0.017 UJ	0.055 UJ	0.017 UJ	0.017 UJ	0.017 UJ	0.017 UJ	0.017 UJ	NE
Pentachlorophenol	EPA 8270	mg/kg	0.083 UJ	0.083 UJ	0.083 UJ	0.083 UJ	0.083 UJ	0.083 UJ	0.12 J	0.083 UJ	0.083 UJ	0.083 UJ	0.083 UJ	0.083 UJ	0.0000018

Table D-1
Remedial Investigation Chemical Analytical Results - Soil COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Sample Location ¹	Analytical Method	Units	TP-03				B-1		B-2			B-3		B-4	Soil Preliminary Cleanup Level ² (PCUL)
Sample Identification			TP03-0-1	TP03-2-3	TP03-2-3Dup	TP03-4-5	B1-2-3	B1-4-5	B2-1-2	B2-3-4	B2-3-4Dup	B3-3-4	B3-5-6	B4-1-2	
Sample Date			12/04/13	12/04/13	12/04/13	12/04/13	01/06/14	01/06/14	01/06/14	01/06/14	01/06/14	01/06/14	01/06/14	01/06/14	
Sample Depth			0 - 1 ft	2 - 3 ft	2 - 3 ft	4 - 5 ft	2 - 3 ft	4 - 5 ft	1 - 2 ft	3 - 4 ft	3 - 4 ft	3 - 4 ft	5 - 6 ft	1 - 2 ft	
Stratigraphic Horizon			FO	FO	FO	FI	FO	FI	FO	FI	FI	FI	OS	FO	
Sampled By			GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	
Phenol	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.055 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.12
Pyridine	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.055 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	80
2,3,4,6-Tetrachlorophenol	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.055 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	490
2,3,5,6-Tetrachlorophenol	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.055 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	NE
1,2,4-Trichlorobenzene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	--	--	--	--	--	--	--	0.0010 U	0.000072
	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.055 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.000072
2,4,5-Trichlorophenol	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.055 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	1.1
2,4,6-Trichlorophenol	EPA 8270	mg/kg	0.017 U	0.017 UJ	0.017 UJ	0.017 U	0.017 U	0.017 U	0.055 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.00019
Volatile Organic Compounds (VOCs)															
Acetone	EPA 8260	mg/kg	0.0050 U	0.12	0.14	0.13	--	--	--	--	--	--	--	0.0099	72,000
Benzene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	--	--	--	--	--	--	--	0.0010 U	0.00056
Bromobenzene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	--	--	--	--	--	--	--	0.0010 U	640
Bromochloromethane	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	--	--	--	--	--	--	--	0.0010 U	NE
Bromoform (Tribromomethane)	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	--	--	--	--	--	--	--	0.0010 U	0.0050
Bromomethane	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	--	--	--	--	--	--	--	0.0010 U	0.079
n-Butylbenzene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	--	--	--	--	--	--	--	0.0010 U	4,000
sec-Butylbenzene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	--	--	--	--	--	--	--	0.0010 U	8,000
tert-Butylbenzene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	--	--	--	--	--	--	--	0.0010 U	8,000
Carbon disulfide	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	--	--	--	--	--	--	--	0.0010 U	8,000
Carbon tetrachloride	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	--	--	--	--	--	--	--	0.0010 U	0.00015
Chlorobenzene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	--	--	--	--	--	--	--	0.0010 U	0.10
Chloroethane	EPA 8260	mg/kg	0.0050 U	0.0050 U	0.0050 U	0.0050 U	--	--	--	--	--	--	--	0.0050 U	NE
2-Chloroethyl vinyl ether	EPA 8260	mg/kg	0.0050 U	0.0050 U	0.0050 U	0.0050 U	--	--	--	--	--	--	--	0.0050 U	NE
Chloroform	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	--	--	--	--	--	--	--	0.0010 U	0.052
Chloromethane	EPA 8260	mg/kg	0.0050 U	0.0050 U	0.0050 U	0.0050 U	--	--	--	--	--	--	--	0.0050 U	NE
2-Chlorotoluene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	--	--	--	--	--	--	--	0.0010 U	1,600
4-Chlorotoluene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	--	--	--	--	--	--	--	0.0010 U	NE
Dibromochloromethane	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	--	--	--	--	--	--	--	0.0010 U	0.00077
1,2-Dibromo-3-chloropropane	EPA 8260	mg/kg	0.0050 U	0.0050 U	0.0050 U	0.0050 U	--	--	--	--	--	--	--	0.0050 U	1.3
Dibromomethane	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	--	--	--	--	--	--	--	0.0010 U	800
Bromodichloromethane (Dichlorobromomethane)	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	--	--	--	--	--	--	--	0.0010 U	0.00096
Dichlorodifluoromethane (CFC-12)	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	--	--	--	--	--	--	--	0.0010 U	16,000
1,1-Dichloroethane	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	--	--	--	--	--	--	--	0.0010 U	180
1,2-Dichloroethane	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	--	--	--	--	--	--	--	0.0010 U	0.024
1,1-Dichloroethene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	--	--	--	--	--	--	--	0.0010 U	1.4
cis-1,2-Dichloroethene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	--	--	--	--	--	--	--	0.0010 U	160
trans-1,2-Dichloroethene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	--	--	--	--	--	--	--	0.0010 U	0.32
1,2-Dichloropropane	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	--	--	--	--	--	--	--	0.0010 U	0.0010
1,3-Dichloropropane	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	--	--	--	--	--	--	--	0.0010 U	NE
2,2-Dichloropropane	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	--	--	--	--	--	--	--	0.0010 U	NE
1,1-Dichloropropene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	--	--	--	--	--	--	--	0.0010 U	NE
cis-1,3-Dichloropropene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	--	--	--	--	--	--	--	0.0010 U	0.00063

Table D-1
Remedial Investigation Chemical Analytical Results - Soil COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Sample Location ¹	Analytical Method	Units	TP-03				B-1		B-2			B-3		B-4	Soil Preliminary Cleanup Level ² (PCUL)
Sample Identification			TP03-0-1	TP03-2-3	TP03-2-3Dup	TP03-4-5	B1-2-3	B1-4-5	B2-1-2	B2-3-4	B2-3-4Dup	B3-3-4	B3-5-6	B4-1-2	
Sample Date			12/04/13	12/04/13	12/04/13	12/04/13	01/06/14	01/06/14	01/06/14	01/06/14	01/06/14	01/06/14	01/06/14	01/06/14	
Sample Depth			0 - 1 ft	2 - 3 ft	2 - 3 ft	4 - 5 ft	2 - 3 ft	4 - 5 ft	1 - 2 ft	3 - 4 ft	3 - 4 ft	3 - 4 ft	5 - 6 ft	1 - 2 ft	
Stratigraphic Horizon			FO	FO	FO	FI	FO	FI	FO	FI	FI	FI	OS	FO	
Sampled By			GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	
trans-1,3-Dichloropropene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	--	--	--	--	--	--	--	0.0010 U	0.00063
Ethylbenzene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	--	--	--	--	--	--	--	0.0010 U	0.015
1,2-Dibromoethane (EDB)	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	--	--	--	--	--	--	--	0.0010 U	0.50
2-Hexanone	EPA 8260	mg/kg	0.0050 U	0.0050 U	0.0050 U	0.0050 U	--	--	--	--	--	--	--	0.0050 U	400
Isopropylbenzene (Cumene)	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	--	--	--	--	--	--	--	0.0010 U	8,000
p-Isopropyltoluene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	--	--	--	--	--	--	--	0.0010 U	NE
2-Butanone (MEK)	EPA 8260	mg/kg	0.0050 U	0.02	0.028	0.012	--	--	--	--	--	--	--	0.0050 U	48,000
Methyl iodide (Iodomethane)	EPA 8260	mg/kg	0.0050 U	0.0050 U	0.0050 U	0.0050 U	--	--	--	--	--	--	--	0.0050 U	NE
4-Methyl-2-pentanone (Methyl Isobutyl Ketone)	EPA 8260	mg/kg	0.0050 U	0.0050 U	0.0050 U	0.0050 U	--	--	--	--	--	--	--	0.0050 U	6,400
Methyl tert-butyl ether (MTBE)	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	--	--	--	--	--	--	--	0.0010 U	560
Methylene chloride	EPA 8260	mg/kg	0.0050 U	0.0050 U	0.0050 U	0.0050 U	--	--	--	--	--	--	--	0.0050 U	0.030
n-Propylbenzene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	--	--	--	--	--	--	--	0.0010 U	8,000
Styrene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	--	--	--	--	--	--	--	0.0010 U	300
1,1,1,2-Tetrachloroethane	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	--	--	--	--	--	--	--	0.0010 U	38
1,1,2,2-Tetrachloroethane	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	--	--	--	--	--	--	--	0.0010 U	0.00011
Tetrachloroethene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	--	--	--	--	--	--	--	0.0010 U	0.0016
Toluene	EPA 8260	mg/kg	0.0050 U	0.0050 U	0.0050 U	0.0050 U	--	--	--	--	--	--	--	0.0050 U	0.055
1,2,3-Trichlorobenzene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	--	--	--	--	--	--	--	0.0010 U	20
1,1,1-Trichloroethane	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	--	--	--	--	--	--	--	0.0010 U	21
1,1,2-Trichloroethane	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	--	--	--	--	--	--	--	0.0010 U	0.00033
Trichloroethene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	--	--	--	--	--	--	--	0.0010 U	0.00027
Trichlorofluoromethane (CFC-11)	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	--	--	--	--	--	--	--	0.0010 U	24,000
1,2,3-Trichloropropane	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	--	--	--	--	--	--	--	0.0010 U	0.033
1,2,4-Trimethylbenzene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	--	--	--	--	--	--	--	0.0010 U	800
1,3,5-Trimethylbenzene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	--	--	--	--	--	--	--	0.0010 U	800
Vinyl Acetate	EPA 8260	mg/kg	0.0050 U	0.0050 U	0.0050 U	0.0050 U	--	--	--	--	--	--	--	0.0050 U	80,000
Vinyl Chloride	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	--	--	--	--	--	--	--	0.0010 U	0.000055
Xylene, m-,p-	EPA 8260	mg/kg	0.0020 U	0.0020 U	0.0020 U	0.0020 U	--	--	--	--	--	--	--	0.0020 U	16,000
Xylene, o-	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	--	--	--	--	--	--	--	0.0010 U	16,000
Petroleum Hydrocarbons															
Gasoline-Range Hydrocarbons	NWTPH-G	mg/kg	4.4 U	4.6 U	4.5 U	4.4 U	--	--	--	--	--	--	--	--	30
Diesel-Range Hydrocarbons	NWTPH-Dx	mg/kg	14 U	16 U	15 U	16 U	--	--	--	--	--	--	--	--	260
Oil-Range Hydrocarbons	NWTPH-Dx	mg/kg	32	120 J	57 J	31 U	--	--	--	--	--	--	--	--	2,000
Total Diesel- and Oil-Range Hydrocarbons	NWTPH-Dx	mg/kg	32	120 J	57 J	31 U	--	--	--	--	--	--	--	--	260
Conventionals															
pH	N/A	N/A	9.0 J	8.5 J	8.5 J	8.6 J	8.5 J	7.6 J	8.2 J	7.2 J	7.1 J	8.5 J	8.6 J	8.7 J	NE

Table D-1

Remedial Investigation Chemical Analytical Results - Soil COPCs

Port of Seattle - North Terminal 115

Seattle, Washington

Notes:

- ¹ Sample locations are shown on Figures 3-1 and 3-3.
- ² Preliminary cleanup levels for soil are referenced from Table 4-1.
- ³ Total dioxin/furan Toxic Equivalency Quotients (TEQs) were calculated using United States Environmental Protection Agency (USEPA) Toxicity Equivalency Factor (TEF) values for human health (EPA 2003).
- ⁴ Total carcinogenic PAH (cPAH) TEQs were calculated using TEF values referenced from MTCA Table 708.2 (WAC 173-340-900).
- RL = Reporting limit
- EPA = Environmental Protection Agency
- mg/kg = milligram per kilogram
- NE = not established
- J = estimated result
- U = analyte not detected above the reporting limit
- = not analyzed
- AD = Native LDW alluvial deposit
- OS = Native organic silt (Aquitard) deposit
- FI = Initial (early 1900s) T115N fill deposit
- FD = Glacier NW Site dredged fill deposit
- FO = T115N operational (1960s) fill deposit
- FT = Terminal 115 fill deposit
- FP = Settling pond fill deposit
- COPC = Contaminant of Potential Concern
- KCHD = King County Health Department
- Landau = Landau Associates
- GEI = GeoEngineers
- ERM = Environmental Resources Management
- Shaw = Shaw Environmental & Infrastructure
- Bold** indicates analyte was detected.
- Yellow shading identifies the detected results greater than the preliminary cleanup level.
- Blue shading identifies the non-detected result greater than the preliminary cleanup level.

Table D-1
Remedial Investigation Chemical Analytical Results - Soil COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Sample Location ¹	Analytical Method	Units	B-4			B-5					B-6				Soil Preliminary Cleanup Level ² (PCUL)
Sample Identification			B4-4-5	B4-6-7	B4-10-11	B5-1-2	B5-6-7	B5-10-11	B5-10-11Dup	B5-13-14	B6-2-3	B6-4-5	B6-10-11	B6-17-18	
Sample Date			01/06/14	01/06/14	01/06/14	01/09/14	01/09/14	01/09/14	01/09/14	01/09/14	01/08/14	01/08/14	01/08/14	01/08/14	
Sample Depth			4 - 5 ft	6 - 7 ft	10 - 11 ft	1 - 2 ft	6 - 7 ft	10 - 11 ft	10 - 11 ft	13 - 14 ft	2 - 3 ft	4 - 5 ft	10 - 11 ft	17 - 18 ft	
Stratigraphic Horizon			FI	FI	FI	FO	FI	FI	FI	OS	FO	FI	FI	OS	
Sampled By			GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	
Polychlorinated Biphenyls (PCBs)															
PCB-Aroclor 1016	EPA 8082	mg/kg	--	--	--	0.027 U	--	--	--	--	--	0.030 U	--	--	NE
PCB-Aroclor 1221	EPA 8082	mg/kg	--	--	--	0.027 U	--	--	--	--	--	0.030 U	--	--	NE
PCB-Aroclor 1232	EPA 8082	mg/kg	--	--	--	0.027 U	--	--	--	--	--	0.030 U	--	--	NE
PCB-Aroclor 1242	EPA 8082	mg/kg	--	--	--	0.027 U	--	--	--	--	--	0.030 U	--	--	NE
PCB-Aroclor 1248	EPA 8082	mg/kg	--	--	--	0.027 U	--	--	--	--	--	0.030 U	--	--	NE
PCB-Aroclor 1254	EPA 8082	mg/kg	--	--	--	0.027 U	--	--	--	--	--	0.030 U	--	--	NE
PCB-Aroclor 1260	EPA 8082	mg/kg	--	--	--	0.027 U	--	--	--	--	--	0.030 U	--	--	NE
Total PCB Aroclors	EPA 8082	mg/kg	--	--	--	0.027 U	--	--	--	--	--	0.030 U	--	--	0.0000022
Dioxins and Furans															
1,2,3,4,6,7,8-HpCDD	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,4,6,7,8-HpCDF	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,4,7,8,9-HpCDF	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,4,7,8-HxCDD	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,4,7,8-HxCDF	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,6,7,8-HxCDD	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,6,7,8-HxCDF	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,7,8,9-HxCDD	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,7,8,9-HxCDF	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,7,8-PeCDD	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,7,8-PeCDF	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
2,3,4,6,7,8-HxCDF	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
2,3,4,7,8-PeCDF	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
2,3,7,8-TCDD	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
2,3,7,8-TCDF	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
OCDD	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
OCDF	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
Total Dioxin/Furan TEQ ³ (ND=0.5RL)	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	0.0000052
Total Dioxin/Furan TEQ ³ (ND=0.5RL)	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	0.0000052
Metals															
Antimony	EPA 6000/7000	mg/kg	--	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	--	4.1
Arsenic	EPA 6000/7000	mg/kg	--	3.5	3.8	2.2	3	4.2	3.1	7	4.9	5.6	3.8	--	7.0
Barium	EPA 6000/7000	mg/kg	--	70	140	35	78	85	94	36	28	48	92	--	8.3
Beryllium	EPA 6000/7000	mg/kg	--	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	--	3.5
Cadmium	EPA 6000/7000	mg/kg	--	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.23	0.20 U	--	1.0
Chromium III / Total	EPA 6000/7000	mg/kg	--	71	68	29	56	56	48	16	17	46	64	--	48
Chromium VI	EPA 6000/7000	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	18
Copper	EPA 6000/7000	mg/kg	--	36	42	52	27	32	28	27	29	29	37	--	36
Lead	EPA 6000/7000	mg/kg	--	5.1	5.6	4.9	4.1	4.9	3.8	6.6	45	14	5.1	--	50
Mercury	EPA 6000/7000	mg/kg	--	0.050 U	0.057	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	--	0.070
Nickel	EPA 6000/7000	mg/kg	--	65	71	35	60	66	57	11	16	49	75	--	48
Selenium	EPA 6000/7000	mg/kg	--	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	--	0.30

Table D-1
Remedial Investigation Chemical Analytical Results - Soil COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Sample Location ¹	Analytical Method	Units	B-4			B-5					B-6				Soil Preliminary Cleanup Level ² (PCUL)
Sample Identification			B4-4-5	B4-6-7	B4-10-11	B5-1-2	B5-6-7	B5-10-11	B5-10-11Dup	B5-13-14	B6-2-3	B6-4-5	B6-10-11	B6-17-18	
Sample Date			01/06/14	01/06/14	01/06/14	01/09/14	01/09/14	01/09/14	01/09/14	01/09/14	01/08/14	01/08/14	01/08/14	01/08/14	
Sample Depth			4 - 5 ft	6 - 7 ft	10 - 11 ft	1 - 2 ft	6 - 7 ft	10 - 11 ft	10 - 11 ft	13 - 14 ft	2 - 3 ft	4 - 5 ft	10 - 11 ft	17 - 18 ft	
Stratigraphic Horizon			FI	FI	FI	FO	FI	FI	FI	OS	FO	FI	FI	OS	
Sampled By			GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	
Silver	EPA 6000/7000	mg/kg	–	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	–	0.016
Thallium	EPA 6000/7000	mg/kg	–	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	–	0.0044
Tin	EPA 6000/7000	mg/kg	–	0.99 U	1.0 U	10	1.0 U	1.0 U	1.0 U	3.3	130	7.3	2.5	–	50
Zinc	EPA 6000/7000	mg/kg	–	66	80	43	47	51	56	49	79	59	70	–	85
Semi-Volatile Organic Compounds (SVOCs) - Polycyclic Aromatic Hydrocarbons (PAHs)															
Acenaphthene	EPA 8270/SIM	mg/kg	0.0067 U	0.0067 UJ	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0095	0.0067 U	0.0067 U	0.028
Acenaphthylene	EPA 8270/SIM	mg/kg	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	1.3
Anthracene	EPA 8270/SIM	mg/kg	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.051
Benzo(a)anthracene	EPA 8270/SIM	mg/kg	0.0067 U	0.0067 U	0.0067 U	0.017	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.007	0.0067 U	0.0067 U	0.000057
Benzo(b)fluoranthene	EPA 8270/SIM	mg/kg	0.0067 U	0.0067 U	0.0067 U	0.013	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.00020
Benzo(k)fluoranthene	EPA 8270/SIM	mg/kg	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0020
Benzofluoranthenes (Total)	EPA 8270/SIM	mg/kg	–	–	–	–	–	–	–	–	–	–	–	–	3.2
Benzo(g,h,i)perylene	EPA 8270/SIM	mg/kg	0.0067 U	0.0067 U	0.0067 U	0.013	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.67
Benzo(a)pyrene	EPA 8270/SIM	mg/kg	0.0067 U	0.0067 U	0.0067 U	0.011	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.000016
Chrysene	EPA 8270/SIM	mg/kg	0.0067 U	0.0067 U	0.0067 U	0.024	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0064
Dibenzo(a,h)anthracene	EPA 8270/SIM	mg/kg	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.000029
Dibenzofuran	EPA 8270/SIM	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.54
Fluoranthene	EPA 8270/SIM	mg/kg	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0098	0.045	0.0067 U	0.0067 U	0.090
Fluorene	EPA 8270/SIM	mg/kg	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.029
Indeno(1,2,3-c,d)pyrene	EPA 8270/SIM	mg/kg	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.00056
1-Methylnaphthalene	EPA 8270/SIM	mg/kg	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	29
2-Methylnaphthalene	EPA 8270/SIM	mg/kg	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.67
Naphthalene	EPA 8270/SIM	mg/kg	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0021
Phenanthrene	EPA 8270/SIM	mg/kg	0.0067 U	0.0067 U	0.0067 U	0.0069	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0086	0.014	0.0067 U	0.0067 U	1.5
Pyrene	EPA 8270/SIM	mg/kg	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.009	0.03	0.0067 U	0.0067 U	0.14
Total cPAH TEQ ⁴ (ND=0)	EPA 8270/SIM	mg/kg	0 U	0 U	0 U	0.014	0 U	0 U	0 U	0 U	0 U	0.0007	0 U	0 U	0.000016
Total cPAH TEQ ⁴ (ND=0.5RL)	EPA 8270/SIM	mg/kg	0.0051 U	0.0051 U	0.0051 U	0.015	0.0051 U	0.0051 U	0.0051 U	0.0051 U	0.0051 U	0.0054	0.0051 U	0.0051 U	0.000016
Other SVOCs															
Aniline	EPA 8270	mg/kg	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	150
Benzidine	EPA 8270	mg/kg	0.017 UJ	0.017 UJ	0.017 UJ	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.0037
Benzoic acid	EPA 8270	mg/kg	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.17
Benzyl alcohol	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.057
Bis(2-chloroethoxy)methane	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	NE
Bis(2-chloroethyl)ether	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.000022
Bis(2-chloroisopropyl)ether	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	3,200
Bis(2-ethylhexyl)phthalate	EPA 8270	mg/kg	0.017 U	0.017	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.022	0.017 U	0.017 U	0.017 U	0.0051
4-Bromophenyl phenyl ether	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	NE
Butyl benzyl phthalate	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.00018
Carbazole	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	NE
4-Chloroaniline	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.81
4-Chloro-3-methylphenol	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	NE
2-Chloronaphthalene	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	6,400
2-Chlorophenol	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.011
4-Chlorophenyl phenyl ether	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	NE

Table D-1
Remedial Investigation Chemical Analytical Results - Soil COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Sample Location ¹	Analytical Method	Units	B-4			B-5					B-6				Soil Preliminary Cleanup Level ² (PCUL)
Sample Identification			B4-4-5	B4-6-7	B4-10-11	B5-1-2	B5-6-7	B5-10-11	B5-10-11Dup	B5-13-14	B6-2-3	B6-4-5	B6-10-11	B6-17-18	
Sample Date			01/06/14	01/06/14	01/06/14	01/09/14	01/09/14	01/09/14	01/09/14	01/09/14	01/08/14	01/08/14	01/08/14	01/08/14	
Sample Depth			4 - 5 ft	6 - 7 ft	10 - 11 ft	1 - 2 ft	6 - 7 ft	10 - 11 ft	10 - 11 ft	13 - 14 ft	2 - 3 ft	4 - 5 ft	10 - 11 ft	17 - 18 ft	
Stratigraphic Horizon			FI	FI	FI	FO	FI	FI	FI	OS	FO	FI	FI	OS	
Sampled By			GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	
Decane	EPA 8270	mg/kg	0.017 UJ	0.017 UJ	0.017 UJ	0.017 UJ	0.017 UJ	0.017 UJ	0.017 UJ	0.017 UJ	0.017 UJ	0.017 UJ	0.017 UJ	0.017 UJ	NE
Dibutyl phthalate	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.015
2,3-Dichloroaniline	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	NE
1,2-Dichlorobenzene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0031
(o-Dichlorobenzene)	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.0031
1,3-Dichlorobenzene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	NE
(m-Dichlorobenzene)	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	NE
1,4-Dichlorobenzene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0081
(p-Dichlorobenzene)	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.0081
3,3'-Dichlorobenzidine	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.0000033
2,4-Dichlorophenol	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.0043
Bis(2-ethylhexyl)ester	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	710
Diethyl phthalate	EPA 8270	mg/kg	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.034
Dimethyl phthalate	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.071
2,4-Dimethylphenol	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.0031
1,2-Dinitrobenzene	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	8.0
1,3-Dinitrobenzene	EPA 8270	mg/kg	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	8.0
1,4-Dinitrobenzene	EPA 8270	mg/kg	0.017 UJ	0.017 UJ	0.017 UJ	0.017 UJ	0.017 UJ	0.017 UJ	0.017 UJ	0.017 UJ	0.017 UJ	0.017 UJ	0.017 UJ	0.017 UJ	8.0
4,6-Dinitro-2-methylphenol	EPA 8270	mg/kg	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	NE
2,4-Dinitrophenol	EPA 8270	mg/kg	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.029
2,4-Dinitrotoluene	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.000069
2,6-Dinitrotoluene	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.11
Di-n-octyl phthalate	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.33
1,2-Diphenylhydrazine	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	1.1
Hexachlorobenzene	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.00000040
Hexachlorobutadiene	EPA 8260	mg/kg	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.00054
	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.0050 U	0.0050 U	0.0050 U	0.00054
Hexachlorocyclopentadiene	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 UJ	0.017 U	0.017 U	0.017 U	0.20
Hexachloroethane	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.000041
Isophorone	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.037
2-Methylphenol (o-Cresol)	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.010
3 & 4 Methylphenol (m-, p-Cresol)	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	4,000
2-Nitroaniline	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	800
3-Nitroaniline	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	NE
4-Nitroaniline	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	NE
Nitrobenzene	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.041
2-Nitrophenol	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	NE
4-Nitrophenol (p-Nitrophenol)	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	7.0
n-Nitrosodimethylamine	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017
n-Nitrosodiphenylamine (as Diphenylamine)	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.0011
n-Nitrosodi-n-propylamine	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.000018
n-Octadecane	EPA 8270	mg/kg	0.017 UJ	0.017 UJ	0.017 UJ	0.017 UJ	0.017 UJ	0.017 UJ	0.017 UJ	0.017 UJ	0.017 UJ	0.017 UJ	0.017 UJ	0.017 UJ	NE
Pentachlorophenol	EPA 8270	mg/kg	0.083 UJ	0.083 UJ	0.083 UJ	0.083 UJ	0.083 UJ	0.083 UJ	0.083 UJ	0.083 UJ	0.083 UJ	0.083 UJ	0.083 UJ	0.083 UJ	0.0000018

Table D-1
Remedial Investigation Chemical Analytical Results - Soil COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Sample Location ¹	Analytical Method	Units	B-4			B-5					B-6				Soil Preliminary Cleanup Level ² (PCUL)
Sample Identification			B4-4-5	B4-6-7	B4-10-11	B5-1-2	B5-6-7	B5-10-11	B5-10-11Dup	B5-13-14	B6-2-3	B6-4-5	B6-10-11	B6-17-18	
Sample Date			01/06/14	01/06/14	01/06/14	01/09/14	01/09/14	01/09/14	01/09/14	01/09/14	01/08/14	01/08/14	01/08/14	01/08/14	
Sample Depth			4 - 5 ft	6 - 7 ft	10 - 11 ft	1 - 2 ft	6 - 7 ft	10 - 11 ft	10 - 11 ft	13 - 14 ft	2 - 3 ft	4 - 5 ft	10 - 11 ft	17 - 18 ft	
Stratigraphic Horizon			FI	FI	FI	FO	FI	FI	FI	OS	FO	FI	FI	OS	
Sampled By			GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	
Phenol	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.12
Pyridine	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	80
2,3,4,6-Tetrachlorophenol	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	490
2,3,5,6-Tetrachlorophenol	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	NE
1,2,4-Trichlorobenzene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.000072
	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.000072
2,4,5-Trichlorophenol	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	1.1
2,4,6-Trichlorophenol	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.00019
Volatile Organic Compounds (VOCs)															
Acetone	EPA 8260	mg/kg	0.029	0.035	0.019	0.0050 U	0.047	0.032 J	0.051 J	0.33	0.0050 U	0.0050 U	0.045	0.49	72,000
Benzene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.00056
Bromobenzene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	640
Bromochloromethane	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	NE
Bromoform (Tribromomethane)	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0050
Bromomethane	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.079
n-Butylbenzene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	4,000
sec-Butylbenzene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	8,000
tert-Butylbenzene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	8,000
Carbon disulfide	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.002	0.0010 U	0.0010 U	0.0010 U	0.0010 U	8,000
Carbon tetrachloride	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.00015
Chlorobenzene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.10
Chloroethane	EPA 8260	mg/kg	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	NE
2-Chloroethyl vinyl ether	EPA 8260	mg/kg	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	NE
Chloroform	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.052
Chloromethane	EPA 8260	mg/kg	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	NE
2-Chlorotoluene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	1,600
4-Chlorotoluene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	NE
Dibromochloromethane	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.00077
1,2-Dibromo-3-chloropropane	EPA 8260	mg/kg	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	1.3
Dibromomethane	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	800
Bromodichloromethane (Dichlorobromomethane)	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.00096
Dichlorodifluoromethane (CFC-12)	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	16,000
1,1-Dichloroethane	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	180
1,2-Dichloroethane	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.024
1,1-Dichloroethene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	1.4
cis-1,2-Dichloroethene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	160
trans-1,2-Dichloroethene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.32
1,2-Dichloropropane	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010
1,3-Dichloropropane	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	NE
2,2-Dichloropropane	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	NE
1,1-Dichloropropene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	NE
cis-1,3-Dichloropropene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.00063

Table D-1
Remedial Investigation Chemical Analytical Results - Soil COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Sample Location ¹	Analytical Method	Units	B-4			B-5					B-6				Soil Preliminary Cleanup Level ² (PCUL)
Sample Identification			B4-4-5	B4-6-7	B4-10-11	B5-1-2	B5-6-7	B5-10-11	B5-10-11Dup	B5-13-14	B6-2-3	B6-4-5	B6-10-11	B6-17-18	
Sample Date			01/06/14	01/06/14	01/06/14	01/09/14	01/09/14	01/09/14	01/09/14	01/09/14	01/08/14	01/08/14	01/08/14	01/08/14	
Sample Depth			4 - 5 ft	6 - 7 ft	10 - 11 ft	1 - 2 ft	6 - 7 ft	10 - 11 ft	10 - 11 ft	13 - 14 ft	2 - 3 ft	4 - 5 ft	10 - 11 ft	17 - 18 ft	
Stratigraphic Horizon			FI	FI	FI	FO	FI	FI	FI	OS	FO	FI	FI	OS	
Sampled By			GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	
trans-1,3-Dichloropropene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.00063
Ethylbenzene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.015
1,2-Dibromoethane (EDB)	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.50
2-Hexanone	EPA 8260	mg/kg	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	400
Isopropylbenzene (Cumene)	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	8,000
p-Isopropyltoluene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	NE
2-Butanone (MEK)	EPA 8260	mg/kg	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0061	0.0050 U	0.006	0.074	0.0050 U	0.0050 U	0.0066	0.13	48,000
Methyl iodide (Iodomethane)	EPA 8260	mg/kg	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	NE
4-Methyl-2-pentanone (Methyl Isobutyl Ketone)	EPA 8260	mg/kg	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	6,400
Methyl tert-butyl ether (MTBE)	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	560
Methylene chloride	EPA 8260	mg/kg	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.030
n-Propylbenzene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	8,000
Styrene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	300
1,1,1,2-Tetrachloroethane	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	38
1,1,2,2-Tetrachloroethane	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.00011
Tetrachloroethene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0016
Toluene	EPA 8260	mg/kg	0.0050 U	0.018 J	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.055
1,2,3-Trichlorobenzene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	20
1,1,1-Trichloroethane	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	21
1,1,2-Trichloroethane	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.00033
Trichloroethene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.00027
Trichlorofluoromethane (CFC-11)	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	24,000
1,2,3-Trichloropropane	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.033
1,2,4-Trimethylbenzene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	800
1,3,5-Trimethylbenzene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	800
Vinyl Acetate	EPA 8260	mg/kg	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	80,000
Vinyl Chloride	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.000055
Xylene, m-,p-	EPA 8260	mg/kg	0.0020 U	0.0020 U	0.0020 U	0.0020 U	0.0020 U	0.0020 U	0.0020 U	0.0020 U	0.0020 U	0.0020 U	0.0020 U	0.0020 U	16,000
Xylene, o-	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	16,000
Petroleum Hydrocarbons															
Gasoline-Range Hydrocarbons	NWTPH-G	mg/kg	--	--	--	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	6.6 U	30
Diesel-Range Hydrocarbons	NWTPH-Dx	mg/kg	--	--	--	14 U	16 U	17 U	16 U	18 U	35 U	15 U	17 U	20 U	260
Oil-Range Hydrocarbons	NWTPH-Dx	mg/kg	--	--	--	260	33 U	34 U	33 U	37 U	140	30 U	34 U	180	2,000
Total Diesel- and Oil-Range Hydrocarbons	NWTPH-Dx	mg/kg	--	--	--	260	33 U	34 U	33 U	37 U	140	30 U	34 U	180	260
Conventionals															
pH	N/A	N/A	7.9 J	8.0 J	8.2 J	8.3 J	7.7 J	7.0 J	7.0 J	6.7 J	9.8 J	9.0 J	7.5 J	6.9 J	NE

Table D-1

Remedial Investigation Chemical Analytical Results - Soil COPCs

Port of Seattle - North Terminal 115

Seattle, Washington

Notes:

- ¹ Sample locations are shown on Figures 3-1 and 3-3.
- ² Preliminary cleanup levels for soil are referenced from Table 4-1.
- ³ Total dioxin/furan Toxic Equivalency Quotients (TEQs) were calculated using United States Environmental Protection Agency (USEPA) Toxicity Equivalency Factor (TEF) values for human health (EPA 2003).
- ⁴ Total carcinogenic PAH (cPAH) TEQs were calculated using TEF values referenced from MTCA Table 708.2 (WAC 173-340-900).
- RL = Reporting limit
- EPA = Environmental Protection Agency
- mg/kg = milligram per kilogram
- NE = not established
- J = estimated result
- U = analyte not detected above the reporting limit
- = not analyzed
- AD = Native LDW alluvial deposit
- OS = Native organic silt (Aquitard) deposit
- FI = Initial (early 1900s) T115N fill deposit
- FD = Glacier NW Site dredged fill deposit
- FO = T115N operational (1960s) fill deposit
- FT = Terminal 115 fill deposit
- FP = Settling pond fill deposit
- COPC = Contaminant of Potential Concern
- KCHD = King County Health Department
- Landau = Landau Associates
- GEI = GeoEngineers
- ERM = Environmental Resources Management
- Shaw = Shaw Environmental & Infrastructure
- Bold** indicates analyte was detected.
- Yellow shading identifies the detected results greater than the preliminary cleanup level.
- Blue shading identifies the non-detected result greater than the preliminary cleanup level.

Table D-1
Remedial Investigation Chemical Analytical Results - Soil COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Sample Location ¹	Analytical Method	Units	B-7				B-8			B-10				B-11	Soil Preliminary Cleanup Level ² (PCUL)
Sample Identification			B7-3-4	B7-5-6	B7-10-11	B7-16-17	B8-4-5	B8-10-11	B8-15-16	B10-2-3	B10-6-7	B10-10-11	B10-16-17	B11-3-4	
Sample Date			01/10/14	01/10/14	01/10/14	01/10/14	01/10/14	01/10/14	01/10/14	01/09/14	01/09/14	01/09/14	01/09/14	01/07/14	
Sample Depth			3 - 4 ft	5 - 6 ft	10 - 11 ft	16 - 17 ft	4 - 5 ft	10 - 11 ft	15 - 16 ft	2 - 3 ft	6 - 7 ft	10 - 11 ft	16 - 17 ft	3 - 4 ft	
Stratigraphic Horizon			FO	FI	FI	OS	FO	FI	OS	FO	FI	FI	OS	FP	
Sampled By			GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	
Polychlorinated Biphenyls (PCBs)															
PCB-Aroclor 1016	EPA 8082	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
PCB-Aroclor 1221	EPA 8082	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
PCB-Aroclor 1232	EPA 8082	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
PCB-Aroclor 1242	EPA 8082	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
PCB-Aroclor 1248	EPA 8082	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
PCB-Aroclor 1254	EPA 8082	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
PCB-Aroclor 1260	EPA 8082	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
Total PCB Aroclors	EPA 8082	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	0.0000022
Dioxins and Furans															
1,2,3,4,6,7,8-HpCDD	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,4,6,7,8-HpCDF	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,4,7,8,9-HpCDF	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,4,7,8-HxCDD	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,4,7,8-HxCDF	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,6,7,8-HxCDD	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,6,7,8-HxCDF	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,7,8,9-HxCDD	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,7,8,9-HxCDF	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,7,8-PeCDD	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,7,8-PeCDF	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
2,3,4,6,7,8-HxCDF	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
2,3,4,7,8-PeCDF	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
2,3,7,8-TCDD	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
2,3,7,8-TCDF	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
OCDD	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
OCDF	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
Total Dioxin/Furan TEQ ³ (ND=0.5RL)	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	0.0000052
Total Dioxin/Furan TEQ ³ (ND=0.5RL)	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	0.0000052
Metals															
Antimony	EPA 6000/7000	mg/kg	5.0 U	5.0 U	5.0 U	--	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	--	16	4.1
Arsenic	EPA 6000/7000	mg/kg	1.8	8.5	3.1	--	2.2	2	10	1.4	2.7	3.9	--	26	7.0
Barium	EPA 6000/7000	mg/kg	49	110	88	--	52	56	33	24	70	85	--	120	8.3
Beryllium	EPA 6000/7000	mg/kg	0.50 U	0.50 U	0.50 U	--	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	--	0.50 U	3.5
Cadmium	EPA 6000/7000	mg/kg	0.36	0.32	0.20 U	--	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	--	0.36	1.0
Chromium III / Total	EPA 6000/7000	mg/kg	21	55	45	--	29	26	19	17	32	43	--	38	48
Chromium VI	EPA 6000/7000	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	18
Copper	EPA 6000/7000	mg/kg	21	37	27	--	15	12	36	31	20	25	--	39	36
Lead	EPA 6000/7000	mg/kg	23	21	3.9	--	14	3.7	4.4	2.4	4.3	4.1	--	170	50
Mercury	EPA 6000/7000	mg/kg	0.050 U	0.066	0.050 U	--	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	--	0.14	0.070
Nickel	EPA 6000/7000	mg/kg	20	67	61	--	38	34	18	15	42	52	--	27	48
Selenium	EPA 6000/7000	mg/kg	0.50 U	0.50 U	0.56	--	0.50 U	0.50 U	0.74	0.50 U	0.50 U	0.50 U	--	0.5	0.30

Table D-1
Remedial Investigation Chemical Analytical Results - Soil COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Sample Location ¹	Analytical Method	Units	B-7				B-8			B-10				B-11	Soil Preliminary Cleanup Level ² (PCUL)
Sample Identification			B7-3-4	B7-5-6	B7-10-11	B7-16-17	B8-4-5	B8-10-11	B8-15-16	B10-2-3	B10-6-7	B10-10-11	B10-16-17	B11-3-4	
Sample Date			01/10/14	01/10/14	01/10/14	01/10/14	01/10/14	01/10/14	01/10/14	01/09/14	01/09/14	01/09/14	01/09/14	01/07/14	
Sample Depth			3 - 4 ft	5 - 6 ft	10 - 11 ft	16 - 17 ft	4 - 5 ft	10 - 11 ft	15 - 16 ft	2 - 3 ft	6 - 7 ft	10 - 11 ft	16 - 17 ft	3 - 4 ft	
Stratigraphic Horizon			FO	FI	FI	OS	FO	FI	OS	FO	FI	FI	OS	FP	
Sampled By			GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	
Silver	EPA 6000/7000	mg/kg	0.50 U	0.50 U	0.50 U	--	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	--	0.50 U	0.016
Thallium	EPA 6000/7000	mg/kg	0.25 U	0.25 U	0.25 U	--	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	--	0.25 U	0.0044
Tin	EPA 6000/7000	mg/kg	1,100	46	11	--	130	15	1.0 U	0.99 U	1.3	1.0 U	--	250	50
Zinc	EPA 6000/7000	mg/kg	200	82	56	--	34	29	41	25	47	49	--	220	85
Semi-Volatile Organic Compounds (SVOCs) - Polycyclic Aromatic Hydrocarbons (PAHs)															
Acenaphthene	EPA 8270/SIM	mg/kg	0.022 U	0.0067 U	0.0067 U	0.0067 U	0.11	0.28 J	3.2	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.028
Acenaphthylene	EPA 8270/SIM	mg/kg	0.022 U	0.0067 U	0.0067 U	0.0067 U	0.018	0.0067 U	0.0092	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	1.3
Anthracene	EPA 8270/SIM	mg/kg	0.022 U	0.0067 U	0.0067 U	0.0067 U	0.14	0.0067 U	0.053	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.015	0.051
Benzo(a)anthracene	EPA 8270/SIM	mg/kg	0.022 U	0.0067 U	0.0067 U	0.0067 U	0.28	0.0067 U	0.0067 U	0.0067 U	0.011	0.0067 U	0.0067 U	0.097	0.000057
Benzo(b)fluoranthene	EPA 8270/SIM	mg/kg	0.022 U	0.0067 U	0.0067 U	0.0067 U	0.16	0.0067 U	0.0067 U	0.0067 U	0.011	0.0067 U	0.0067 U	0.19	0.00020
Benzo(k)fluoranthene	EPA 8270/SIM	mg/kg	0.022 U	0.0067 U	0.0067 U	0.0067 U	0.049	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.055	0.0020
Benzofluoranthenes (Total)	EPA 8270/SIM	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	3.2
Benzo(g,h,i)perylene	EPA 8270/SIM	mg/kg	0.022 U	0.0067 U	0.0067 U	0.0067 U	0.027	0.0067 U	0.0067 U	0.0067 U	0.0068	0.0067 U	0.0067 U	0.066	0.67
Benzo(a)pyrene	EPA 8270/SIM	mg/kg	0.022 U	0.0067 U	0.0067 U	0.0067 U	0.091	0.0067 U	0.0067 U	0.0067 U	0.0099	0.0067 U	0.0067 U	0.12	0.000016
Chrysene	EPA 8270/SIM	mg/kg	0.038	0.0067 U	0.0067 U	0.0067 U	0.28	0.0067 U	0.0067 U	0.0067 U	0.011	0.0067 U	0.0067 U	0.1	0.0064
Dibenzo(a,h)anthracene	EPA 8270/SIM	mg/kg	0.022 U	0.0067 U	0.0067 U	0.0067 U	0.011	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.019	0.000029
Dibenzofuran	EPA 8270/SIM	mg/kg	0.022 U	0.017 U	0.017 U	0.017 U	0.12	0.2	1.5	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.54
Fluoranthene	EPA 8270/SIM	mg/kg	0.026	0.0088	0.0067 U	0.0067 U	1.1	0.0067 U	0.046	0.0067 U	0.019	0.0067 U	0.0067 U	0.041	0.090
Fluorene	EPA 8270/SIM	mg/kg	0.022 U	0.0067 U	0.0067 U	0.0067 U	0.16	0.17	1.7	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.029
Indeno(1,2,3-c,d)pyrene	EPA 8270/SIM	mg/kg	0.022 U	0.0067 U	0.0067 U	0.0067 U	0.028	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.059	0.00056
1-Methylnaphthalene	EPA 8270/SIM	mg/kg	0.022 U	0.0067 U	0.0067 U	0.0067 U	0.022	0.25	3	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	29
2-Methylnaphthalene	EPA 8270/SIM	mg/kg	0.022 U	0.0067 U	0.0067 U	0.0067 U	0.037	0.42	5.9	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.67
Naphthalene	EPA 8270/SIM	mg/kg	0.022 U	0.0067 U	0.0067 U	0.0067 U	0.048	0.92	12	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0021
Phenanthrene	EPA 8270/SIM	mg/kg	0.022 U	0.009	0.0067 U	0.0067 U	0.95	0.044	1.2	0.0067 U	0.018	0.0067 U	0.0067 U	0.022	1.5
Pyrene	EPA 8270/SIM	mg/kg	0.035	0.0076	0.0067 U	0.0067 U	0.82	0.0067 U	0.025	0.0072	0.021	0.0067 U	0.0067 U	0.067	0.14
Total cPAH TEQ ⁴ (ND=0)	EPA 8270/SIM	mg/kg	0.00038	0 U	0 U	0 U	0.15	0 U	0 U	0 U	0.012	0 U	0 U	0.16	0.000016
Total cPAH TEQ ⁴ (ND=0.5RL)	EPA 8270/SIM	mg/kg	0.017	0.0051 U	0.0051 U	0.0051 U	0.15	0.0051 U	0.0051 U	0.0051 U	0.013	0.0051 U	0.0051 U	0.16	0.000016
Other SVOCs															
Aniline	EPA 8270	mg/kg	0.11 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	150
Benzidine	EPA 8270	mg/kg	0.022 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.0037
Benzoic acid	EPA 8270	mg/kg	0.11 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.17
Benzyl alcohol	EPA 8270	mg/kg	0.022 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.057
Bis(2-chloroethoxy)methane	EPA 8270	mg/kg	0.022 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	NE
Bis(2-chloroethyl)ether	EPA 8270	mg/kg	0.022 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.000022
Bis(2-chloroisopropyl)ether	EPA 8270	mg/kg	0.022 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	3,200
Bis(2-ethylhexyl)phthalate	EPA 8270	mg/kg	0.091	0.017 U	0.017 U	0.017 U	0.0084	0.017 U	0.017 U	0.066	0.017 U	0.017 U	0.017 U	0.024	0.0051
4-Bromophenyl phenyl ether	EPA 8270	mg/kg	0.022 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	NE
Butyl benzyl phthalate	EPA 8270	mg/kg	0.022 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.00018
Carbazole	EPA 8270	mg/kg	0.022 U	0.017 U	0.017 U	0.017 U	0.022	0.11	0.49	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	NE
4-Chloroaniline	EPA 8270	mg/kg	0.022 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.81
4-Chloro-3-methylphenol	EPA 8270	mg/kg	0.022 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	NE
2-Chloronaphthalene	EPA 8270	mg/kg	0.022 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	6,400
2-Chlorophenol	EPA 8270	mg/kg	0.022 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.011
4-Chlorophenyl phenyl ether	EPA 8270	mg/kg	0.022 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	NE

Table D-1
Remedial Investigation Chemical Analytical Results - Soil COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Sample Location ¹	Analytical Method	Units	B-7				B-8			B-10				B-11	Soil Preliminary Cleanup Level ² (PCUL)
Sample Identification			B7-3-4	B7-5-6	B7-10-11	B7-16-17	B8-4-5	B8-10-11	B8-15-16	B10-2-3	B10-6-7	B10-10-11	B10-16-17	B11-3-4	
Sample Date			01/10/14	01/10/14	01/10/14	01/10/14	01/10/14	01/10/14	01/10/14	01/09/14	01/09/14	01/09/14	01/09/14	01/07/14	
Sample Depth			3 - 4 ft	5 - 6 ft	10 - 11 ft	16 - 17 ft	4 - 5 ft	10 - 11 ft	15 - 16 ft	2 - 3 ft	6 - 7 ft	10 - 11 ft	16 - 17 ft	3 - 4 ft	
Stratigraphic Horizon			FO	FI	FI	OS	FO	FI	OS	FO	FI	FI	OS	FP	
Sampled By			GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	
Decane	EPA 8270	mg/kg	0.022 UJ	0.017 UJ	0.017 UJ	0.017 UJ	0.017 UJ	0.017 UJ	0.017 UJ	0.017 UJ	0.017 UJ	0.017 UJ	0.017 UJ	0.017 UJ	NE
Dibutyl phthalate	EPA 8270	mg/kg	0.022 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.015
2,3-Dichloroaniline	EPA 8270	mg/kg	0.022 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	NE
1,2-Dichlorobenzene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	--	--	--	--	0.0010 U	0.0031
(o-Dichlorobenzene)	EPA 8270	mg/kg	0.022 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.0031
1,3-Dichlorobenzene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	--	--	--	--	0.0010 U	NE
(m-Dichlorobenzene)	EPA 8270	mg/kg	0.022 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	NE
1,4-Dichlorobenzene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	--	--	--	--	0.0010 U	0.0081
(p-Dichlorobenzene)	EPA 8270	mg/kg	0.022 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.0081
3,3'-Dichlorobenzidine	EPA 8270	mg/kg	0.022 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.0000033
2,4-Dichlorophenol	EPA 8270	mg/kg	0.022 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.0043
Bis(2-ethylhexyl)ester	EPA 8270	mg/kg	0.022 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	710
Diethyl phthalate	EPA 8270	mg/kg	0.11 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.034
Dimethyl phthalate	EPA 8270	mg/kg	0.022 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.071
2,4-Dimethylphenol	EPA 8270	mg/kg	0.022 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.0031
1,2-Dinitrobenzene	EPA 8270	mg/kg	0.022 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	8.0
1,3-Dinitrobenzene	EPA 8270	mg/kg	0.11 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	8.0
1,4-Dinitrobenzene	EPA 8270	mg/kg	0.022 UJ	0.017 UJ	0.017 UJ	0.017 UJ	0.017 UJ	0.017 UJ	0.017 UJ	0.017 UJ	0.017 UJ	0.017 UJ	0.017 UJ	0.017 UJ	8.0
4,6-Dinitro-2-methylphenol	EPA 8270	mg/kg	0.11 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	NE
2,4-Dinitrophenol	EPA 8270	mg/kg	0.11 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.029
2,4-Dinitrotoluene	EPA 8270	mg/kg	0.022 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.000069
2,6-Dinitrotoluene	EPA 8270	mg/kg	0.022 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.11
Di-n-octyl phthalate	EPA 8270	mg/kg	0.022 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.33
1,2-Diphenylhydrazine	EPA 8270	mg/kg	0.022 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	1.1
Hexachlorobenzene	EPA 8270	mg/kg	0.022 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.00000040
Hexachlorobutadiene	EPA 8260	mg/kg	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 UJ	0.0050 U	0.0050 U	0.0050 UJ	0.0050 U	0.00054
	EPA 8270	mg/kg	0.022 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 UJ	0.017 U	0.017 U	0.017 UJ	0.017 U	0.00054
Hexachlorocyclopentadiene	EPA 8270	mg/kg	0.022 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.20
Hexachloroethane	EPA 8270	mg/kg	0.022 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.000041
Isophorone	EPA 8270	mg/kg	0.022 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.037
2-Methylphenol (o-Cresol)	EPA 8270	mg/kg	0.022 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.010
3 & 4 Methylphenol (m-, p-Cresol)	EPA 8270	mg/kg	0.022 U	0.035	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	4,000
2-Nitroaniline	EPA 8270	mg/kg	0.022 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	800
3-Nitroaniline	EPA 8270	mg/kg	0.022 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	NE
4-Nitroaniline	EPA 8270	mg/kg	0.022 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	NE
Nitrobenzene	EPA 8270	mg/kg	0.022 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.041
2-Nitrophenol	EPA 8270	mg/kg	0.022 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	NE
4-Nitrophenol (p-Nitrophenol)	EPA 8270	mg/kg	0.022 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	7.0
n-Nitrosodimethylamine	EPA 8270	mg/kg	0.022 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017
n-Nitrosodiphenylamine (as Diphenylamine)	EPA 8270	mg/kg	0.022 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.0011
n-Nitrosodi-n-propylamine	EPA 8270	mg/kg	0.022 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.000018
n-Octadecane	EPA 8270	mg/kg	0.022 UJ	0.020 J	0.017 UJ	0.017 UJ	0.12 J	0.017 UJ	0.017 UJ	0.030 J	0.017 UJ	0.017 UJ	0.017 UJ	0.017 UJ	NE
Pentachlorophenol	EPA 8270	mg/kg	0.11 UJ	0.083 UJ	0.083 UJ	0.083 UJ	0.083 UJ	0.083 UJ	0.083 UJ	0.083 UJ	0.083 UJ	0.083 UJ	0.083 UJ	0.083 UJ	0.0000018

Table D-1
Remedial Investigation Chemical Analytical Results - Soil COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Sample Location ¹	Analytical Method	Units	B-7				B-8			B-10				B-11	Soil Preliminary Cleanup Level ² (PCUL)
Sample Identification			B7-3-4	B7-5-6	B7-10-11	B7-16-17	B8-4-5	B8-10-11	B8-15-16	B10-2-3	B10-6-7	B10-10-11	B10-16-17	B11-3-4	
Sample Date			01/10/14	01/10/14	01/10/14	01/10/14	01/10/14	01/10/14	01/10/14	01/09/14	01/09/14	01/09/14	01/09/14	01/07/14	
Sample Depth			3 - 4 ft	5 - 6 ft	10 - 11 ft	16 - 17 ft	4 - 5 ft	10 - 11 ft	15 - 16 ft	2 - 3 ft	6 - 7 ft	10 - 11 ft	16 - 17 ft	3 - 4 ft	
Stratigraphic Horizon			FO	FI	FI	OS	FO	FI	OS	FO	FI	FI	OS	FP	
Sampled By			GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	
Phenol	EPA 8270	mg/kg	0.022 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.12
Pyridine	EPA 8270	mg/kg	0.022 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	80
2,3,4,6-Tetrachlorophenol	EPA 8270	mg/kg	0.022 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	490
2,3,5,6-Tetrachlorophenol	EPA 8270	mg/kg	0.022 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	NE
1,2,4-Trichlorobenzene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	--	--	--	--	0.0010 U	0.000072
	EPA 8270	mg/kg	0.022 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.000072
2,4,5-Trichlorophenol	EPA 8270	mg/kg	0.022 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	1.1
2,4,6-Trichlorophenol	EPA 8270	mg/kg	0.022 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.00019
Volatile Organic Compounds (VOCs)															
Acetone	EPA 8260	mg/kg	0.0050 U	0.24	0.013	0.69	0.0095	0.043	0.063	--	--	--	--	0.028	72,000
Benzene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	--	--	--	--	0.0010 U	0.00056
Bromobenzene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	--	--	--	--	0.0010 U	640
Bromochloromethane	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	--	--	--	--	0.0010 U	NE
Bromoform (Tribromomethane)	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	--	--	--	--	0.0010 U	0.0050
Bromomethane	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	--	--	--	--	0.0010 U	0.079
n-Butylbenzene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	--	--	--	--	0.0010 U	4,000
sec-Butylbenzene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	--	--	--	--	0.0010 U	8,000
tert-Butylbenzene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	--	--	--	--	0.0010 U	8,000
Carbon disulfide	EPA 8260	mg/kg	0.0010 U	0.0021	0.0010 U	0.0034	0.0010 U	0.0010 U	0.004	--	--	--	--	0.0015	8,000
Carbon tetrachloride	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	--	--	--	--	0.0010 U	0.00015
Chlorobenzene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	--	--	--	--	0.0010 U	0.10
Chloroethane	EPA 8260	mg/kg	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	--	--	--	--	0.0050 U	NE
2-Chloroethyl vinyl ether	EPA 8260	mg/kg	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	--	--	--	--	0.0050 U	NE
Chloroform	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	--	--	--	--	0.0010 U	0.052
Chloromethane	EPA 8260	mg/kg	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	--	--	--	--	0.0050 U	NE
2-Chlorotoluene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	--	--	--	--	0.0010 U	1,600
4-Chlorotoluene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	--	--	--	--	0.0010 U	NE
Dibromochloromethane	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	--	--	--	--	0.0010 U	0.00077
1,2-Dibromo-3-chloropropane	EPA 8260	mg/kg	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	--	--	--	--	0.0050 U	1.3
Dibromomethane	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	--	--	--	--	0.0010 U	800
Bromodichloromethane (Dichlorobromomethane)	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	--	--	--	--	0.0010 U	0.00096
Dichlorodifluoromethane (CFC-12)	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	--	--	--	--	0.0010 U	16,000
1,1-Dichloroethane	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	--	--	--	--	0.0010 U	180
1,2-Dichloroethane	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	--	--	--	--	0.0010 U	0.024
1,1-Dichloroethene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	--	--	--	--	0.0010 U	1.4
cis-1,2-Dichloroethene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	--	--	--	--	0.0010 U	160
trans-1,2-Dichloroethene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	--	--	--	--	0.0010 U	0.32
1,2-Dichloropropane	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	--	--	--	--	0.0010 U	0.0010
1,3-Dichloropropane	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	--	--	--	--	0.0010 U	NE
2,2-Dichloropropane	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	--	--	--	--	0.0010 U	NE
1,1-Dichloropropene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	--	--	--	--	0.0010 U	NE
cis-1,3-Dichloropropene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	--	--	--	--	0.0010 U	0.00063

Table D-1
Remedial Investigation Chemical Analytical Results - Soil COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Sample Location ¹	Analytical Method	Units	B-7				B-8			B-10				B-11	Soil Preliminary Cleanup Level ² (PCUL)
Sample Identification			B7-3-4	B7-5-6	B7-10-11	B7-16-17	B8-4-5	B8-10-11	B8-15-16	B10-2-3	B10-6-7	B10-10-11	B10-16-17	B11-3-4	
Sample Date			01/10/14	01/10/14	01/10/14	01/10/14	01/10/14	01/10/14	01/10/14	01/09/14	01/09/14	01/09/14	01/09/14	01/07/14	
Sample Depth			3 - 4 ft	5 - 6 ft	10 - 11 ft	16 - 17 ft	4 - 5 ft	10 - 11 ft	15 - 16 ft	2 - 3 ft	6 - 7 ft	10 - 11 ft	16 - 17 ft	3 - 4 ft	
Stratigraphic Horizon			FO	FI	FI	OS	FO	FI	OS	FO	FI	FI	OS	FP	
Sampled By			GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	
trans-1,3-Dichloropropene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	--	--	--	--	0.0010 U	0.00063
Ethylbenzene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0016	--	--	--	--	0.0010 U	0.015
1,2-Dibromoethane (EDB)	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	--	--	--	--	0.0010 U	0.50
2-Hexanone	EPA 8260	mg/kg	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	--	--	--	--	0.0050 U	400
Isopropylbenzene (Cumene)	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.001	--	--	--	--	0.0010 U	8,000
p-Isopropyltoluene	EPA 8260	mg/kg	0.0010 U	0.031	0.0010 U	0.0010 U	0.029	0.0013	0.0046	--	--	--	--	0.0010 U	NE
2-Butanone (MEK)	EPA 8260	mg/kg	0.0050 U	0.032	0.0050 U	0.15	0.0050 U	0.0054	0.019	--	--	--	--	0.006	48,000
Methyl iodide (Iodomethane)	EPA 8260	mg/kg	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	--	--	--	--	0.0050 U	NE
4-Methyl-2-pentanone (Methyl Isobutyl Ketone)	EPA 8260	mg/kg	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	--	--	--	--	0.0050 U	6,400
Methyl tert-butyl ether (MTBE)	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	--	--	--	--	0.0010 U	560
Methylene chloride	EPA 8260	mg/kg	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	--	--	--	--	0.0050 U	0.030
n-Propylbenzene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	--	--	--	--	0.0010 U	8,000
Styrene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	--	--	--	--	0.0010 U	300
1,1,1,2-Tetrachloroethane	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	--	--	--	--	0.0010 U	38
1,1,2,2-Tetrachloroethane	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	--	--	--	--	0.0010 U	0.00011
Tetrachloroethene	EPA 8260	mg/kg	0.0022	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	--	--	--	--	0.0010 U	0.0016
Toluene	EPA 8260	mg/kg	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	--	--	--	--	0.0050 U	0.055
1,2,3-Trichlorobenzene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	--	--	--	--	0.0010 U	20
1,1,1-Trichloroethane	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	--	--	--	--	0.0010 U	21
1,1,2-Trichloroethane	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	--	--	--	--	0.0010 U	0.00033
Trichloroethene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	--	--	--	--	0.0010 U	0.00027
Trichlorofluoromethane (CFC-11)	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	--	--	--	--	0.0010 U	24,000
1,2,3-Trichloropropane	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	--	--	--	--	0.0010 U	0.033
1,2,4-Trimethylbenzene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0021	0.013	--	--	--	--	0.0010 U	800
1,3,5-Trimethylbenzene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0065	--	--	--	--	0.0010 U	800
Vinyl Acetate	EPA 8260	mg/kg	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	--	--	--	--	0.0050 U	80,000
Vinyl Chloride	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	--	--	--	--	0.0010 U	0.000055
Xylene, m-,p-	EPA 8260	mg/kg	0.0020 U	0.0020 U	0.0020 U	0.0020 U	0.0020 U	0.0020 U	0.0041	--	--	--	--	0.0020 U	16,000
Xylene, o-	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0029	--	--	--	--	0.0010 U	16,000
Petroleum Hydrocarbons															
Gasoline-Range Hydrocarbons	NWTPH-G	mg/kg	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	7.5 J	57 J	--	--	--	--	--	30
Diesel-Range Hydrocarbons	NWTPH-Dx	mg/kg	68 U	15 U	15 U	19 U	15 U	15 U	46	--	--	--	--	--	260
Oil-Range Hydrocarbons	NWTPH-Dx	mg/kg	550	58	30 U	82	29 U	29 U	74	--	--	--	--	--	2,000
Total Diesel- and Oil-Range Hydrocarbons	NWTPH-Dx	mg/kg	550	58	30 U	82	29 U	29 U	120	--	--	--	--	--	260
Conventionals															
pH	N/A	N/A	11 J	9.3 J	7.6 J	6.8 J	10 J	8.0 J	7.9 J	9.2 J	8.7 J	8.1 J	7.1 J	9.9 J	NE

Table D-1

Remedial Investigation Chemical Analytical Results - Soil COPCs

Port of Seattle - North Terminal 115

Seattle, Washington

Notes:

- ¹ Sample locations are shown on Figures 3-1 and 3-3.
- ² Preliminary cleanup levels for soil are referenced from Table 4-1.
- ³ Total dioxin/furan Toxic Equivalency Quotients (TEQs) were calculated using United States Environmental Protection Agency (USEPA) Toxicity Equivalency Factor (TEF) values for human health (EPA 2003).
- ⁴ Total carcinogenic PAH (cPAH) TEQs were calculated using TEF values referenced from MTCA Table 708.2 (WAC 173-340-900).
- RL = Reporting limit
- EPA = Environmental Protection Agency
- mg/kg = milligram per kilogram
- NE = not established
- J = estimated result
- U = analyte not detected above the reporting limit
- = not analyzed
- AD = Native LDW alluvial deposit
- OS = Native organic silt (Aquitard) deposit
- FI = Initial (early 1900s) T115N fill deposit
- FD = Glacier NW Site dredged fill deposit
- FO = T115N operational (1960s) fill deposit
- FT = Terminal 115 fill deposit
- FP = Settling pond fill deposit
- COPC = Contaminant of Potential Concern
- KCHD = King County Health Department
- Landau = Landau Associates
- GEI = GeoEngineers
- ERM = Environmental Resources Management
- Shaw = Shaw Environmental & Infrastructure
- Bold** indicates analyte was detected.
- Yellow shading identifies the detected results greater than the preliminary cleanup level.
- Blue shading identifies the non-detected result greater than the preliminary cleanup level.

Table D-1
Remedial Investigation Chemical Analytical Results - Soil COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Sample Location ¹	Analytical Method	Units	B-11			B-12			B-13						Soil Preliminary Cleanup Level ² (PCUL)
Sample Identification			B11-7-8	B11-9-10	B11-14-15	B12-7-8	B12-9-10	B12-16-17	B13-1-2	B13-2-3	B13-5-6	B13-6-7	B13-9-10	B13-15-16	
Sample Date			01/07/14	01/07/14	01/07/14	01/10/14	01/10/14	01/10/14	01/07/14	01/07/14	01/07/14	01/07/14	01/07/14	01/07/14	
Sample Depth			7 - 8 ft	9 - 10 ft	14 - 15 ft	7 - 8 ft	9 - 10 ft	16 - 17 ft	1 - 2 ft	2 - 3 ft	5 - 6 ft	6 - 7 ft	9 - 10 ft	15 - 16 ft	
Stratigraphic Horizon			FP	FI	FI	FO	FI	OS	FP	FP	FP	FP	FI	OS	
Sampled By			GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	
Polychlorinated Biphenyls (PCBs)															
PCB-Aroclor 1016	EPA 8082	mg/kg	--	--	--	0.031 U	--	0.038 U	--	0.086 U	0.80 U	--	--	--	NE
PCB-Aroclor 1221	EPA 8082	mg/kg	--	--	--	0.031 U	--	0.038 U	--	0.086 U	0.80 U	--	--	--	NE
PCB-Aroclor 1232	EPA 8082	mg/kg	--	--	--	0.031 U	--	0.038 U	--	0.086 U	0.80 U	--	--	--	NE
PCB-Aroclor 1242	EPA 8082	mg/kg	--	--	--	0.031 U	--	0.038 U	--	0.74	4	--	--	--	NE
PCB-Aroclor 1248	EPA 8082	mg/kg	--	--	--	0.031 U	--	0.038 U	--	0.086 U	0.80 U	--	--	--	NE
PCB-Aroclor 1254	EPA 8082	mg/kg	--	--	--	0.031 U	--	0.038 U	--	0.4	3.1	--	--	--	NE
PCB-Aroclor 1260	EPA 8082	mg/kg	--	--	--	0.031 U	--	0.038 U	--	0.086 U	0.80 U	--	--	--	NE
Total PCB Aroclors	EPA 8082	mg/kg	--	--	--	0.031 U	--	0.038 U	--	1.1	7.1	--	--	--	0.0000022
Dioxins and Furans															
1,2,3,4,6,7,8-HpCDD	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,4,6,7,8-HpCDF	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,4,7,8,9-HpCDF	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,4,7,8-HxCDD	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,4,7,8-HxCDF	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,6,7,8-HxCDD	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,6,7,8-HxCDF	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,7,8,9-HxCDD	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,7,8,9-HxCDF	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,7,8-PeCDD	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,7,8-PeCDF	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
2,3,4,6,7,8-HxCDF	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
2,3,4,7,8-PeCDF	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
2,3,7,8-TCDD	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
2,3,7,8-TCDF	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
OCDD	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
OCDF	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
Total Dioxin/Furan TEQ ³ (ND=0.5RL)	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	0.0000052
Total Dioxin/Furan TEQ ³ (ND=0.5RL)	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	0.0000052
Metals															
Antimony	EPA 6000/7000	mg/kg	15 U	5.0 U	--	5.0 U	5.0 U	5.0 U	8.7	--	16 U	5.0 U	5.0 U	5.0 U	4.1
Arsenic	EPA 6000/7000	mg/kg	15 U	0.50 U	--	3.2	3.4	6.6	6.4 U	--	16 U	0.50 U	0.50 U	82	7.0
Barium	EPA 6000/7000	mg/kg	140	62	--	76	60	34	100	--	130	50	55	24	8.3
Beryllium	EPA 6000/7000	mg/kg	0.50 U	0.50 U	--	0.50 U	0.50 U	0.50 U	0.50 U	--	0.50 U	0.50 U	0.50 U	0.50 U	3.5
Cadmium	EPA 6000/7000	mg/kg	9.1	0.20 U	--	0.20 U	0.32	0.20 U	3.1	--	7.1	0.20 U	0.44	0.20 U	1.0
Chromium III / Total	EPA 6000/7000	mg/kg	650	37	--	48	44	19	180	--	2,200	52	84	23	48
Chromium VI	EPA 6000/7000	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	18
Copper	EPA 6000/7000	mg/kg	180	19	--	21	16	23	64	--	620	18	28	26	36
Lead	EPA 6000/7000	mg/kg	19,000	49	--	3.4	6.1	3.7	4,400	--	49,000	330	900	5.3	50
Mercury	EPA 6000/7000	mg/kg	0.17	0.050 UJ	--	0.050 U	0.050 U	0.050 U	0.065	--	0.3	0.050 U	0.050 U	0.050 U	0.070
Nickel	EPA 6000/7000	mg/kg	39	39	--	49	42	8.6	27	--	120	30	45	9.7	48
Selenium	EPA 6000/7000	mg/kg	3.8 U	0.50 U	--	0.50 U	0.56	0.50 U	1.6 U	--	4.0 U	0.50 U	0.50 U	0.50 U	0.30

Table D-1
Remedial Investigation Chemical Analytical Results - Soil COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Sample Location ¹	Analytical Method	Units	B-11			B-12			B-13						Soil Preliminary Cleanup Level ² (PCUL)
Sample Identification			B11-7-8	B11-9-10	B11-14-15	B12-7-8	B12-9-10	B12-16-17	B13-1-2	B13-2-3	B13-5-6	B13-6-7	B13-9-10	B13-15-16	
Sample Date			01/07/14	01/07/14	01/07/14	01/10/14	01/10/14	01/10/14	01/07/14	01/07/14	01/07/14	01/07/14	01/07/14	01/07/14	
Sample Depth			7 - 8 ft	9 - 10 ft	14 - 15 ft	7 - 8 ft	9 - 10 ft	16 - 17 ft	1 - 2 ft	2 - 3 ft	5 - 6 ft	6 - 7 ft	9 - 10 ft	15 - 16 ft	
Stratigraphic Horizon			FP	FI	FI	FO	FI	OS	FP	FP	FP	FP	FI	OS	
Sampled By			GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	
Silver	EPA 6000/7000	mg/kg	0.77	0.50 U	--	0.50 U	0.50 U	0.50 U	0.50 U	--	3.2	0.50 U	0.50 U	0.50 U	0.016
Thallium	EPA 6000/7000	mg/kg	1.9 U	0.25 U	--	0.25 U	0.25 U	0.25 U	0.25 U	--	2.0 U	0.25 U	0.25 U	0.25 U	0.0044
Tin	EPA 6000/7000	mg/kg	48,000	2,800	--	50 J	1.0 UJ	26 J	26,000	--	50,000	2,800	2,300	71	50
Zinc	EPA 6000/7000	mg/kg	6,800	170	--	51	49	28	2,000	--	33,000	410	590	14	85
Semi-Volatile Organic Compounds (SVOCs) - Polycyclic Aromatic Hydrocarbons (PAHs)															
Acenaphthene	EPA 8270/SIM	mg/kg	0.1	0.0067 UJ	0.0067 U	1.7	0.070 J	0.0089	0.017	--	0.45	0.076	0.0089	0.012	0.028
Acenaphthylene	EPA 8270/SIM	mg/kg	0.061 U	0.0067 UJ	0.0067 U	0.0069	0.0067 UJ	0.0067 U	0.010 U	--	0.064 U	0.0067 U	0.0067 U	0.0067 U	1.3
Anthracene	EPA 8270/SIM	mg/kg	0.12	0.0067 UJ	0.0067 U	0.031	0.0067 UJ	0.0067 U	0.017	--	0.35	0.025	0.0067 U	0.011	0.051
Benzo(a)anthracene	EPA 8270/SIM	mg/kg	0.17	0.0067 UJ	0.0067 U	0.0067 U	0.0067 UJ	0.0067 U	0.023	--	0.33	0.021	0.0067 U	0.013	0.000057
Benzo(b)fluoranthene	EPA 8270/SIM	mg/kg	0.14	0.0067 UJ	0.0067 U	0.0067 U	0.0067 UJ	0.0067 U	0.014	--	0.15	0.011	0.0067 U	0.0067 U	0.00020
Benzo(k)fluoranthene	EPA 8270/SIM	mg/kg	0.061 U	0.0067 UJ	0.0067 U	0.0067 U	0.0067 UJ	0.0067 U	0.010 U	--	0.16	0.0067 U	0.0067 U	0.0067 U	0.0020
Benzofluoranthenes (Total)	EPA 8270/SIM	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	3.2
Benzo(g,h,i)perylene	EPA 8270/SIM	mg/kg	0.11	0.0067 UJ	0.0067 U	0.0067 U	0.0067 UJ	0.0067 U	0.010 U	--	0.064 U	0.0067 U	0.0067 U	0.0067 U	0.67
Benzo(a)pyrene	EPA 8270/SIM	mg/kg	0.16	0.0067 UJ	0.0067 U	0.0067 U	0.0067 UJ	0.0067 U	0.014	--	0.21	0.013	0.0067 U	0.0067 U	0.000016
Chrysene	EPA 8270/SIM	mg/kg	0.2	0.0067 UJ	0.0067 U	0.0067 U	0.0067 UJ	0.0067 U	0.021	--	0.28	0.019	0.0067 U	0.0098	0.0064
Dibenzo(a,h)anthracene	EPA 8270/SIM	mg/kg	0.061 U	0.0067 UJ	0.0067 U	0.0067 U	0.0067 UJ	0.0067 U	0.010 U	--	0.064 U	0.0067 U	0.0067 U	0.0067 U	0.000029
Dibenzofuran	EPA 8270/SIM	mg/kg	0.15 U	0.017 UJ	0.017 U	1.3	0.017 J	0.017 U	0.026 U	--	0.53	0.052	0.017 U	0.017 U	0.54
Fluoranthene	EPA 8270/SIM	mg/kg	0.43	0.0067 UJ	0.0069	0.035	0.0067 UJ	0.011	0.071	--	1.5	0.12	0.018	0.053	0.090
Fluorene	EPA 8270/SIM	mg/kg	0.13	0.0067 UJ	0.0067 U	1.1	0.013 J	0.0067 U	0.019	--	0.66	0.071	0.0079	0.021	0.029
Indeno(1,2,3-c,d)pyrene	EPA 8270/SIM	mg/kg	0.061 U	0.0067 UJ	0.0067 U	0.0067 U	0.0067 UJ	0.0067 U	0.010 U	--	0.064 U	0.0067 U	0.0067 U	0.0067 U	0.00056
1-Methylnaphthalene	EPA 8270/SIM	mg/kg	0.066	0.0067 UJ	0.0067 U	0.53	0.085 J	0.0084	0.014	--	0.14	0.024	0.0067 U	0.0067 U	29
2-Methylnaphthalene	EPA 8270/SIM	mg/kg	0.13	0.0067 UJ	0.0067 U	1.1	0.12 J	0.015	0.026	--	0.27	0.043	0.0067 U	0.0067 U	0.67
Naphthalene	EPA 8270/SIM	mg/kg	0.28	0.0067 UJ	0.0067 U	0.7	0.41 J	0.24	0.046	--	0.37	0.042	0.0067 U	0.0072	0.0021
Phenanthrene	EPA 8270/SIM	mg/kg	0.69	0.014 J	0.0067 U	0.55	0.0067 UJ	0.019	0.088	--	2.5	0.21	0.031	0.078	1.5
Pyrene	EPA 8270/SIM	mg/kg	0.45	0.0067 UJ	0.0087	0.029	0.0067 UJ	0.011	0.055	--	1	0.091	0.017	0.036	0.14
Total cPAH TEQ ⁴ (ND=0)	EPA 8270/SIM	mg/kg	0.19	0 U	0 U	0 U	0 U	0 U	0.018	--	0.277	0.016	0 U	0.0014	0.000016
Total cPAH TEQ ⁴ (ND=0.5RL)	EPA 8270/SIM	mg/kg	0.2	0.0051 U	0.0051 U	0.0051 U	0.0051 U	0.0051 U	0.019	--	0.28	0.017	0.0051 U	0.0061	0.000016
Other SVOCs															
Aniline	EPA 8270	mg/kg	0.15 U	0.085 UJ	0.085 U	0.085 U	0.085 UJ	0.085 U	0.026 U	--	0.16 U	0.085 U	0.085 U	0.085 U	150
Benzidine	EPA 8270	mg/kg	0.15 U	0.017 UJ	0.017 U	0.017 U	0.017 UJ	0.017 U	0.026 U	--	0.16 U	0.017 U	0.017 U	0.017 U	0.0037
Benzoic acid	EPA 8270	mg/kg	0.15 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.026 UJ	--	0.16 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.17
Benzyl alcohol	EPA 8270	mg/kg	0.15 U	0.017 UJ	0.017 U	0.017 U	0.017 UJ	0.017 U	0.026 U	--	0.16 U	0.017 U	0.017 U	0.017 U	0.057
Bis(2-chloroethoxy)methane	EPA 8270	mg/kg	0.15 U	0.017 UJ	0.017 U	0.017 U	0.017 UJ	0.017 U	0.026 U	--	0.16 U	0.017 U	0.017 U	0.017 U	NE
Bis(2-chloroethyl)ether	EPA 8270	mg/kg	0.15 U	0.017 UJ	0.017 U	0.017 U	0.017 UJ	0.017 U	0.026 U	--	0.16 U	0.017 U	0.017 U	0.017 U	0.000022
Bis(2-chloroisopropyl)ether	EPA 8270	mg/kg	0.15 U	0.017 UJ	0.017 U	0.017 U	0.017 UJ	0.017 U	0.026 U	--	0.16 U	0.017 U	0.017 U	0.017 U	3,200
Bis(2-ethylhexyl)phthalate	EPA 8270	mg/kg	0.15 U	0.025 J	0.017 U	0.017 U	0.017 UJ	0.017 U	0.026 U	--	0.16 U	0.017 U	0.017 U	0.017 U	0.0051
4-Bromophenyl phenyl ether	EPA 8270	mg/kg	0.15 U	0.017 UJ	0.017 U	0.017 U	0.017 UJ	0.017 U	0.026 U	--	0.16 U	0.017 U	0.017 U	0.017 U	NE
Butyl benzyl phthalate	EPA 8270	mg/kg	0.15 U	0.017 UJ	0.017 U	0.017 U	0.017 UJ	0.017 U	0.026 U	--	0.16 U	0.017 U	0.017 U	0.017 U	0.00018
Carbazole	EPA 8270	mg/kg	0.15 U	0.017 UJ	0.017 U	0.22	0.017 UJ	0.017 U	0.026 U	--	0.16 U	0.017	0.017 U	0.017 U	NE
4-Chloroaniline	EPA 8270	mg/kg	0.15 U	0.017 UJ	0.017 U	0.017 U	0.017 UJ	0.017 U	0.026 U	--	0.16 U	0.017 U	0.017 U	0.017 U	0.81
4-Chloro-3-methylphenol	EPA 8270	mg/kg	0.15 U	0.017 UJ	0.017 U	0.017 U	0.017 UJ	0.017 U	0.026 U	--	0.16 U	0.017 U	0.017 U	0.017 U	NE
2-Chloronaphthalene	EPA 8270	mg/kg	0.15 U	0.017 UJ	0.017 U	0.017 U	0.017 UJ	0.017 U	0.026 U	--	0.16 U	0.017 U	0.017 U	0.017 U	6,400
2-Chlorophenol	EPA 8270	mg/kg	0.15 U	0.017 UJ	0.017 U	0.017 U	0.017 UJ	0.017 U	0.026 U	--	0.16 U	0.017 U	0.017 U	0.027	0.011
4-Chlorophenyl phenyl ether	EPA 8270	mg/kg	0.15 U	0.017 UJ	0.017 U	0.017 U	0.017 UJ	0.017 U	0.026 U	--	0.16 U	0.017 U	0.017 U	0.017 U	NE

Table D-1
Remedial Investigation Chemical Analytical Results - Soil COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Sample Location ¹	Analytical Method	Units	B-11			B-12			B-13						Soil Preliminary Cleanup Level ² (PCUL)
Sample Identification			B11-7-8	B11-9-10	B11-14-15	B12-7-8	B12-9-10	B12-16-17	B13-1-2	B13-2-3	B13-5-6	B13-6-7	B13-9-10	B13-15-16	
Sample Date			01/07/14	01/07/14	01/07/14	01/10/14	01/10/14	01/10/14	01/07/14	01/07/14	01/07/14	01/07/14	01/07/14	01/07/14	
Sample Depth			7 - 8 ft	9 - 10 ft	14 - 15 ft	7 - 8 ft	9 - 10 ft	16 - 17 ft	1 - 2 ft	2 - 3 ft	5 - 6 ft	6 - 7 ft	9 - 10 ft	15 - 16 ft	
Stratigraphic Horizon			FP	FI	FI	FO	FI	OS	FP	FP	FP	FP	FI	OS	
Sampled By			GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	
Decane	EPA 8270	mg/kg	0.15 UJ	0.017 UJ	0.017 UJ	0.017 UJ	0.017 UJ	0.017 UJ	0.026 UJ	--	0.16 UJ	0.017 UJ	0.017 UJ	0.017 UJ	NE
Dibutyl phthalate	EPA 8270	mg/kg	0.15 U	0.017 UJ	0.017 U	0.017 U	0.017 UJ	0.017 U	0.026 U	--	0.16 U	0.017 U	0.017 U	0.017 U	0.015
2,3-Dichloroaniline	EPA 8270	mg/kg	0.15 U	0.017 UJ	0.017 U	0.017 U	0.017 UJ	0.017 U	0.026 U	--	0.16 U	0.017 U	0.017 U	0.017 U	NE
1,2-Dichlorobenzene	EPA 8260	mg/kg	0.0017 J	0.0010 UJ	0.0010 U	0.0010 U	0.0010 UJ	0.0010 U	0.0010 U	--	0.0010 UJ	0.0010 U	0.0010 U	0.0012 UJ	0.0031
(o-Dichlorobenzene)	EPA 8270	mg/kg	0.15 U	0.017 UJ	0.017 U	0.017 U	0.017 UJ	0.017 U	0.026 U	--	0.16 U	0.017 U	0.017 U	0.017 U	0.0031
1,3-Dichlorobenzene	EPA 8260	mg/kg	0.0028 J	0.0010 UJ	0.0010 U	0.0010 U	0.0010 UJ	0.0010 U	0.0010 U	--	0.0045 J	0.0010 U	0.0010 U	0.0012 UJ	NE
(m-Dichlorobenzene)	EPA 8270	mg/kg	0.15 U	0.017 UJ	0.017 U	0.017 U	0.017 UJ	0.017 U	0.026 U	--	0.16 U	0.017 U	0.017 U	0.017 U	NE
1,4-Dichlorobenzene	EPA 8260	mg/kg	0.0010 UJ	0.0010 UJ	0.0010 U	0.0010 U	0.0010 UJ	0.0010 U	0.0010 U	--	0.0010 UJ	0.0010 U	0.0010 U	0.0012 UJ	0.0081
(p-Dichlorobenzene)	EPA 8270	mg/kg	0.15 U	0.017 UJ	0.017 U	0.017 U	0.017 UJ	0.017 U	0.026 U	--	0.16 U	0.017 U	0.017 U	0.017 U	0.0081
3,3'-Dichlorobenzidine	EPA 8270	mg/kg	0.41	0.017 UJ	0.017 U	0.017 U	0.017 UJ	0.017 U	0.067	--	0.82	0.017 U	0.017 U	0.017 U	0.0000033
2,4-Dichlorophenol	EPA 8270	mg/kg	0.15 U	0.017 UJ	0.017 U	0.017 U	0.017 UJ	0.017 U	0.026 U	--	0.16 U	0.017 U	0.017 U	0.017 U	0.0043
Bis(2-ethylhexyl)ester	EPA 8270	mg/kg	0.15 U	0.017 UJ	0.017 U	0.017 U	0.017 UJ	0.017 U	0.026 U	--	0.16 U	0.017 U	0.017 U	0.017 U	710
Diethyl phthalate	EPA 8270	mg/kg	0.15 U	0.085 UJ	0.085 U	0.085 U	0.085 UJ	0.085 U	0.026 U	--	0.16 U	0.085 U	0.085 U	0.085 U	0.034
Dimethyl phthalate	EPA 8270	mg/kg	0.15 U	0.017 UJ	0.017 U	0.017 U	0.017 UJ	0.017 U	0.026 U	--	0.16 U	0.017 U	0.017 U	0.017 U	0.071
2,4-Dimethylphenol	EPA 8270	mg/kg	0.15 U	0.017 UJ	0.017 U	0.017 U	0.028 J	0.029	0.026 U	--	0.16 U	0.017 U	0.017 U	0.017 U	0.0031
1,2-Dinitrobenzene	EPA 8270	mg/kg	0.15 U	0.017 UJ	0.017 U	0.017 U	0.017 UJ	0.017 U	0.026 U	--	0.16 U	0.017 U	0.017 U	0.017 U	8.0
1,3-Dinitrobenzene	EPA 8270	mg/kg	0.15 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.026 UJ	--	0.16 UJ	0.085 UJ	0.085 UJ	0.085 UJ	8.0
1,4-Dinitrobenzene	EPA 8270	mg/kg	0.15 UJ	0.017 UJ	0.017 UJ	0.017 UJ	0.017 UJ	0.017 UJ	0.026 UJ	--	0.16 UJ	0.017 UJ	0.017 UJ	0.017 UJ	8.0
4,6-Dinitro-2-methylphenol	EPA 8270	mg/kg	0.15 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.026 UJ	--	0.16 UJ	0.085 UJ	0.085 UJ	0.085 UJ	NE
2,4-Dinitrophenol	EPA 8270	mg/kg	0.15 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.026 UJ	--	0.16 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.029
2,4-Dinitrotoluene	EPA 8270	mg/kg	0.15 U	0.017 UJ	0.017 U	0.017 U	0.017 UJ	0.017 U	0.026 U	--	0.16 U	0.017 U	0.017 U	0.017 U	0.000069
2,6-Dinitrotoluene	EPA 8270	mg/kg	0.15 U	0.017 UJ	0.017 U	0.017 U	0.017 UJ	0.017 U	0.026 U	--	0.16 U	0.017 U	0.017 U	0.017 U	0.11
Di-n-octyl phthalate	EPA 8270	mg/kg	0.15 U	0.017 UJ	0.017 U	0.017 U	0.017 UJ	0.017 U	0.026 U	--	0.16 U	0.017 U	0.017 U	0.017 U	0.33
1,2-Diphenylhydrazine	EPA 8270	mg/kg	0.15 U	0.017 UJ	0.017 U	0.017 U	0.017 UJ	0.017 U	0.026 U	--	0.16 U	0.017 U	0.017 U	0.017 U	1.1
Hexachlorobenzene	EPA 8270	mg/kg	0.15 U	0.017 UJ	0.017 U	0.017 U	0.017 UJ	0.017 U	0.026 U	--	0.16 U	0.017 U	0.017 U	0.017 U	0.00000040
Hexachlorobutadiene	EPA 8260	mg/kg	0.0052 UJ	0.0050 UJ	0.0050 U	0.0050 U	0.0050 UJ	0.0050 U	0.0050 U	--	0.0050 UJ	0.0050 U	0.0050 U	0.0061 UJ	0.00054
	EPA 8270	mg/kg	0.15 U	0.017 UJ	0.017 U	0.017 U	0.017 UJ	0.017 U	0.026 U	--	0.16 U	0.017 U	0.017 U	0.017 U	0.00054
Hexachlorocyclopentadiene	EPA 8270	mg/kg	0.15 U	0.017 UJ	0.017 U	0.017 U	0.017 UJ	0.017 U	0.026 U	--	0.16 U	0.017 U	0.017 U	0.017 U	0.20
Hexachloroethane	EPA 8270	mg/kg	0.15 U	0.017 UJ	0.017 U	0.017 U	0.017 UJ	0.017 U	0.026 U	--	0.16 U	0.017 U	0.017 U	0.017 U	0.000041
Isophorone	EPA 8270	mg/kg	0.15 U	0.017 UJ	0.017 U	0.017 U	0.017 UJ	0.017 U	0.026 U	--	0.16 U	0.017 U	0.017 U	0.017 U	0.037
2-Methylphenol (o-Cresol)	EPA 8270	mg/kg	0.15 U	0.017 UJ	0.017 U	0.017 U	0.017 UJ	0.017 U	0.026 U	--	0.16 U	0.017 U	0.017 U	0.37	0.010
3 & 4 Methylphenol (m-, p-Cresol)	EPA 8270	mg/kg	0.15 U	0.017 UJ	0.81	0.017 U	0.017 UJ	0.017 U	0.12	--	0.16 U	0.017 U	0.017 U	16	4,000
2-Nitroaniline	EPA 8270	mg/kg	0.15 U	0.017 UJ	0.017 U	0.017 U	0.017 UJ	0.017 U	0.026 U	--	0.16 U	0.017 U	0.017 U	0.017 U	800
3-Nitroaniline	EPA 8270	mg/kg	0.15 U	0.017 UJ	0.017 U	0.017 U	0.017 UJ	0.017 U	0.026 U	--	0.16 U	0.017 U	0.017 U	0.017 U	NE
4-Nitroaniline	EPA 8270	mg/kg	0.15 U	0.017 UJ	0.017 U	0.017 U	0.017 UJ	0.017 U	0.026 U	--	0.16 U	0.017 U	0.017 U	0.017 U	NE
Nitrobenzene	EPA 8270	mg/kg	0.15 U	0.017 UJ	0.017 U	0.017 U	0.017 UJ	0.017 U	0.026 U	--	0.16 U	0.017 U	0.017 U	0.017 U	0.041
2-Nitrophenol	EPA 8270	mg/kg	0.15 U	0.017 UJ	0.017 U	0.017 U	0.017 UJ	0.017 U	0.026 U	--	0.16 U	0.017 U	0.017 U	0.017 U	NE
4-Nitrophenol (p-Nitrophenol)	EPA 8270	mg/kg	0.15 U	0.017 UJ	0.017 U	0.017 U	0.017 UJ	0.017 U	0.026 U	--	0.16 U	0.017 U	0.025	0.017 U	7.0
n-Nitrosodimethylamine	EPA 8270	mg/kg	0.15 U	0.017 UJ	0.017 U	0.017 U	0.017 UJ	0.017 U	0.026 U	--	0.16 U	0.017 U	0.017 U	0.017 U	0.017
n-Nitrosodiphenylamine (as Diphenylamine)	EPA 8270	mg/kg	0.15 U	0.017 UJ	0.017 U	0.017 U	0.017 UJ	0.017 U	0.026 U	--	0.16 U	0.017 U	0.017 U	0.017 U	0.0011
n-Nitrosodi-n-propylamine	EPA 8270	mg/kg	0.15 U	0.017 UJ	0.017 U	0.017 U	0.017 UJ	0.017 U	0.026 U	--	0.16 U	0.017 U	0.017 U	0.017 U	0.000018
n-Octadecane	EPA 8270	mg/kg	1.0 J	0.017 UJ	0.017 UJ	0.017 UJ	0.017 UJ	0.017 UJ	0.14 J	--	1.7 J	0.19 J	0.040 J	0.017 UJ	NE
Pentachlorophenol	EPA 8270	mg/kg	0.15 UJ	0.083 UJ	0.083 UJ	0.083 UJ	0.083 UJ	0.083 UJ	0.026 UJ	--	0.16 UJ	0.083 UJ	0.083 UJ	0.083 UJ	0.0000018

Table D-1
Remedial Investigation Chemical Analytical Results - Soil COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Sample Location ¹	Analytical Method	Units	B-11			B-12			B-13						Soil Preliminary Cleanup Level ² (PCUL)
Sample Identification			B11-7-8	B11-9-10	B11-14-15	B12-7-8	B12-9-10	B12-16-17	B13-1-2	B13-2-3	B13-5-6	B13-6-7	B13-9-10	B13-15-16	
Sample Date			01/07/14	01/07/14	01/07/14	01/10/14	01/10/14	01/10/14	01/07/14	01/07/14	01/07/14	01/07/14	01/07/14	01/07/14	
Sample Depth			7 - 8 ft	9 - 10 ft	14 - 15 ft	7 - 8 ft	9 - 10 ft	16 - 17 ft	1 - 2 ft	2 - 3 ft	5 - 6 ft	6 - 7 ft	9 - 10 ft	15 - 16 ft	
Stratigraphic Horizon			FP	FI	FI	FO	FI	OS	FP	FP	FP	FP	FI	OS	
Sampled By			GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	
Phenol	EPA 8270	mg/kg	0.15 U	0.017 UJ	0.27	0.017 U	0.017 UJ	0.017 U	0.048	--	0.16 U	0.017 U	0.017 U	7.1	0.12
Pyridine	EPA 8270	mg/kg	0.15 U	0.017 UJ	0.017 U	0.017 U	0.017 UJ	0.017 U	0.026 U	--	0.16 U	0.017 U	0.017 U	0.017 U	80
2,3,4,6-Tetrachlorophenol	EPA 8270	mg/kg	0.15 U	0.017 UJ	0.017 U	0.017 U	0.017 UJ	0.017 U	0.026 U	--	0.16 U	0.017 U	0.017 U	0.017 U	490
2,3,5,6-Tetrachlorophenol	EPA 8270	mg/kg	0.15 U	0.017 UJ	0.017 U	0.017 U	0.017 UJ	0.017 U	0.026 U	--	0.16 U	0.017 U	0.017 U	0.017 U	NE
1,2,4-Trichlorobenzene	EPA 8260	mg/kg	0.0010 UJ	0.0010 UJ	0.0010 U	0.0010 U	0.0010 UJ	0.0010 U	0.0010 U	--	0.0010 UJ	0.0010 U	0.0010 U	0.0012 UJ	0.000072
	EPA 8270	mg/kg	0.15 U	0.017 UJ	0.017 U	0.017 U	0.017 UJ	0.017 U	0.026 U	--	0.16 U	0.017 U	0.017 U	0.017 U	0.000072
2,4,5-Trichlorophenol	EPA 8270	mg/kg	0.15 U	0.017 UJ	0.017 U	0.017 U	0.017 UJ	0.017 U	0.026 U	--	0.16 U	0.017 U	0.017 U	0.017 U	1.1
2,4,6-Trichlorophenol	EPA 8270	mg/kg	0.15 U	0.017 UJ	0.017 U	0.017 U	0.017 UJ	0.017 U	0.026 U	--	0.16 U	0.017 U	0.017 U	0.017 U	0.00019
Volatile Organic Compounds (VOCs)															
Acetone	EPA 8260	mg/kg	0.086	0.049 J	0.41	0.01	0.028 J	0.29 J	0.014	--	0.15	0.05	0.057	3.3	72,000
Benzene	EPA 8260	mg/kg	0.022	0.0018 J	0.0015	0.0010 U	0.0010 UJ	0.0010 U	0.0010 U	--	0.019	0.0016	0.0011	0.0021	0.00056
Bromobenzene	EPA 8260	mg/kg	0.0010 UJ	0.0010 UJ	0.0010 U	0.0010 U	0.0010 UJ	0.0010 U	0.0010 U	--	0.0010 UJ	0.0010 U	0.0010 U	0.0012 UJ	640
Bromochloromethane	EPA 8260	mg/kg	0.0010 U	0.0010 UJ	0.0010 U	0.0010 U	0.0010 UJ	0.0010 U	0.0010 U	--	0.0010 U	0.0010 U	0.0010 U	0.0012 U	NE
Bromoform (Tribromomethane)	EPA 8260	mg/kg	0.0010 U	0.0010 UJ	0.0010 U	0.0010 U	0.0010 UJ	0.0010 U	0.0010 U	--	0.0010 UJ	0.0010 U	0.0010 U	0.0012 U	0.0050
Bromomethane	EPA 8260	mg/kg	0.0010 U	0.0010 UJ	0.0010 U	0.0010 U	0.0010 UJ	0.0010 U	0.0010 U	--	0.0010 U	0.0010 U	0.0010 U	0.0012 U	0.079
n-Butylbenzene	EPA 8260	mg/kg	0.0010 UJ	0.0010 UJ	0.0010 U	0.0010 U	0.0010 UJ	0.0010 U	0.0010 U	--	0.0033 J	0.0010 U	0.0010 U	0.0012 UJ	4,000
sec-Butylbenzene	EPA 8260	mg/kg	0.0094 J	0.0010 UJ	0.0010 U	0.0010 U	0.0010 UJ	0.0010 U	0.0010 U	--	0.0015 J	0.0010 U	0.0010 U	0.0012 UJ	8,000
tert-Butylbenzene	EPA 8260	mg/kg	0.0010 UJ	0.0010 UJ	0.0010 U	0.0010 U	0.0010 UJ	0.0010 U	0.0010 U	--	0.0010 UJ	0.0010 U	0.0010 U	0.0012 UJ	8,000
Carbon disulfide	EPA 8260	mg/kg	0.0044	0.0010 UJ	0.0084	0.0010 U	0.0010 UJ	0.0010 U	0.0010 U	--	0.0094	0.0015	0.0010 U	0.04	8,000
Carbon tetrachloride	EPA 8260	mg/kg	0.0010 U	0.0010 UJ	0.0010 U	0.0010 U	0.0010 UJ	0.0010 U	0.0010 U	--	0.0010 U	0.0010 U	0.0010 U	0.0012 U	0.00015
Chlorobenzene	EPA 8260	mg/kg	0.0010 U	0.0010 UJ	0.0010 U	0.0010 U	0.0010 UJ	0.0010 U	0.0010 U	--	0.0010 UJ	0.0010 U	0.0010 U	0.0012 U	0.10
Chloroethane	EPA 8260	mg/kg	0.0052 U	0.0050 UJ	0.0050 U	0.0050 U	0.0050 UJ	0.0050 U	0.0050 U	--	0.0050 U	0.0050 U	0.0050 U	0.0061 U	NE
2-Chloroethyl vinyl ether	EPA 8260	mg/kg	0.0052 U	0.0050 UJ	0.0050 U	0.0050 U	0.0050 UJ	0.0050 U	0.0050 U	--	0.0050 U	0.0050 U	0.0050 U	0.0061 U	NE
Chloroform	EPA 8260	mg/kg	0.0010 U	0.0010 UJ	0.0010 U	0.0010 U	0.0010 UJ	0.0010 U	0.0010 U	--	0.0010 U	0.0010 U	0.0010 U	0.0012 U	0.052
Chloromethane	EPA 8260	mg/kg	0.0052 U	0.0050 UJ	0.0050 U	0.0050 U	0.0050 UJ	0.0050 U	0.0050 U	--	0.0050 U	0.0050 U	0.0050 U	0.0061 U	NE
2-Chlorotoluene	EPA 8260	mg/kg	0.0010 UJ	0.0010 UJ	0.0010 U	0.0010 U	0.0010 UJ	0.0010 U	0.0010 U	--	0.0010 UJ	0.0010 U	0.0010 U	0.0012 UJ	1,600
4-Chlorotoluene	EPA 8260	mg/kg	0.0010 UJ	0.0010 UJ	0.0010 U	0.0010 U	0.0010 UJ	0.0010 U	0.0010 U	--	0.0010 UJ	0.0010 U	0.0010 U	0.0012 UJ	NE
Dibromochloromethane	EPA 8260	mg/kg	0.0010 U	0.0010 UJ	0.0010 U	0.0010 U	0.0010 UJ	0.0010 U	0.0010 U	--	0.0010 UJ	0.0010 U	0.0010 U	0.0012 U	0.00077
1,2-Dibromo-3-chloropropane	EPA 8260	mg/kg	0.0052 UJ	0.0050 UJ	0.0050 U	0.0050 U	0.0050 UJ	0.0050 U	0.0050 U	--	0.0050 UJ	0.0050 U	0.0050 U	0.0061 UJ	1.3
Dibromomethane	EPA 8260	mg/kg	0.0010 U	0.0010 UJ	0.0010 U	0.0010 U	0.0010 UJ	0.0010 U	0.0010 U	--	0.0010 U	0.0010 U	0.0010 U	0.0012 U	800
Bromodichloromethane (Dichlorobromomethane)	EPA 8260	mg/kg	0.0010 U	0.0010 UJ	0.0010 U	0.0010 U	0.0010 UJ	0.0010 U	0.0010 U	--	0.0010 U	0.0010 U	0.0010 U	0.0012 U	0.00096
Dichlorodifluoromethane (CFC-12)	EPA 8260	mg/kg	0.0010 U	0.0010 UJ	0.0010 U	0.0010 U	0.0010 UJ	0.0010 U	0.0010 U	--	0.0010 U	0.0010 U	0.0010 U	0.0012 U	16,000
1,1-Dichloroethane	EPA 8260	mg/kg	0.0010 U	0.0010 UJ	0.0010 U	0.0010 U	0.0010 UJ	0.0010 U	0.0010 U	--	0.0010 U	0.0010 U	0.0010 U	0.0012 U	180
1,2-Dichloroethane	EPA 8260	mg/kg	0.0010 U	0.0010 UJ	0.0010 U	0.0010 U	0.0010 UJ	0.0010 U	0.0010 U	--	0.0010 U	0.0010 U	0.0010 U	0.0012 U	0.024
1,1-Dichloroethene	EPA 8260	mg/kg	0.0010 U	0.0010 UJ	0.0010 U	0.0010 U	0.0010 UJ	0.0010 U	0.0010 U	--	0.0010 U	0.0010 U	0.0010 U	0.0012 U	1.4
cis-1,2-Dichloroethene	EPA 8260	mg/kg	0.0010 U	0.0010 UJ	0.0010 U	0.0010 U	0.0010 UJ	0.0010 U	0.0010 U	--	0.0010 U	0.0010 U	0.0010 U	0.0012 U	160
trans-1,2-Dichloroethene	EPA 8260	mg/kg	0.0010 U	0.0010 UJ	0.0010 U	0.0010 U	0.0010 UJ	0.0010 U	0.0010 U	--	0.0010 U	0.0010 U	0.0010 U	0.0012 U	0.32
1,2-Dichloropropane	EPA 8260	mg/kg	0.0010 U	0.0010 UJ	0.0010 U	0.0010 U	0.0010 UJ	0.0010 U	0.0010 U	--	0.0010 U	0.0010 U	0.0010 U	0.0012 U	0.0010
1,3-Dichloropropane	EPA 8260	mg/kg	0.0010 U	0.0010 UJ	0.0010 U	0.0010 U	0.0010 UJ	0.0010 U	0.0010 U	--	0.0010 UJ	0.0010 U	0.0010 U	0.0012 U	NE
2,2-Dichloropropane	EPA 8260	mg/kg	0.0010 U	0.0010 UJ	0.0010 U	0.0010 U	0.0010 UJ	0.0010 U	0.0010 U	--	0.0010 U	0.0010 U	0.0010 U	0.0012 U	NE
1,1-Dichloropropene	EPA 8260	mg/kg	0.0010 U	0.0010 UJ	0.0010 U	0.0010 U	0.0010 UJ	0.0010 U	0.0010 U	--	0.0010 U	0.0010 U	0.0010 U	0.0012 U	NE
cis-1,3-Dichloropropene	EPA 8260	mg/kg	0.0010 U	0.0010 UJ	0.0010 U	0.0010 U	0.0010 UJ	0.0010 U	0.0010 U	--	0.0010 U	0.0010 U	0.0010 U	0.0012 U	0.00063

Table D-1
Remedial Investigation Chemical Analytical Results - Soil COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Sample Location ¹	Analytical Method	Units	B-11			B-12			B-13						Soil Preliminary Cleanup Level ² (PCUL)
Sample Identification			B11-7-8	B11-9-10	B11-14-15	B12-7-8	B12-9-10	B12-16-17	B13-1-2	B13-2-3	B13-5-6	B13-6-7	B13-9-10	B13-15-16	
Sample Date			01/07/14	01/07/14	01/07/14	01/10/14	01/10/14	01/10/14	01/07/14	01/07/14	01/07/14	01/07/14	01/07/14	01/07/14	
Sample Depth			7 - 8 ft	9 - 10 ft	14 - 15 ft	7 - 8 ft	9 - 10 ft	16 - 17 ft	1 - 2 ft	2 - 3 ft	5 - 6 ft	6 - 7 ft	9 - 10 ft	15 - 16 ft	
Stratigraphic Horizon			FP	FI	FI	FO	FI	OS	FP	FP	FP	FP	FI	OS	
Sampled By			GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	
trans-1,3-Dichloropropene	EPA 8260	mg/kg	0.0010 U	0.0010 UJ	0.0010 U	0.0010 U	0.0010 UJ	0.0010 U	0.0010 U	--	0.0010 UJ	0.0010 U	0.0010 U	0.0012 U	0.00063
Ethylbenzene	EPA 8260	mg/kg	0.028	0.0010 UJ	0.0010 U	0.0010 U	0.0010 UJ	0.0023	0.0010 U	--	0.0040 J	0.0010 U	0.0010 U	0.0028	0.015
1,2-Dibromoethane (EDB)	EPA 8260	mg/kg	0.0010 U	0.0010 UJ	0.0010 U	0.0010 U	0.0010 UJ	0.0010 U	0.0010 U	--	0.0010 UJ	0.0010 U	0.0010 U	0.0012 U	0.50
2-Hexanone	EPA 8260	mg/kg	0.017	0.0050 UJ	0.0066	0.0050 U	0.0050 UJ	0.0050 U	0.0050 U	--	0.12 J	0.0050 U	0.01	0.046	400
Isopropylbenzene (Cumene)	EPA 8260	mg/kg	0.005	0.0010 UJ	0.0010 U	0.0010 U	0.0010 UJ	0.0010 U	0.0010 U	--	0.0010 UJ	0.0010 U	0.0010 U	0.0012 U	8,000
p-Isopropyltoluene	EPA 8260	mg/kg	0.0079 J	0.0059 J	0.0010 U	0.0027	0.0010 UJ	0.0010 U	0.0010 U	--	0.016 J	0.009	0.0023	0.0012 J	NE
2-Butanone (MEK)	EPA 8260	mg/kg	0.012	0.0058 J	0.085	0.0050 U	0.0050 UJ	0.085	0.0050 U	--	0.038	0.011	0.012	0.62	48,000
Methyl iodide (Iodomethane)	EPA 8260	mg/kg	0.0052 U	0.0050 UJ	0.0050 U	0.0050 U	0.0050 UJ	0.0050 U	0.0050 U	--	0.0050 U	0.0050 U	0.0050 U	0.0061 U	NE
4-Methyl-2-pentanone (Methyl Isobutyl Ketone)	EPA 8260	mg/kg	0.0061	0.0050 UJ	0.01	0.0050 U	0.0050 UJ	0.0050 U	0.0050 U	--	0.013	0.0050 U	0.0050 U	0.046	6,400
Methyl tert-butyl ether (MTBE)	EPA 8260	mg/kg	0.0010 U	0.0010 UJ	0.0010 U	0.0010 U	0.0010 UJ	0.0010 U	0.0010 U	--	0.0010 U	0.0010 U	0.0010 U	0.0012 U	560
Methylene chloride	EPA 8260	mg/kg	0.0052 U	0.0050 UJ	0.0050 U	0.0050 U	0.0050 UJ	0.0050 U	0.0050 U	--	0.0050 U	0.0050 U	0.0050 U	0.0061 U	0.030
n-Propylbenzene	EPA 8260	mg/kg	0.025 J	0.0010 UJ	0.0010 U	0.0010 U	0.0010 UJ	0.0010 U	0.0010 U	--	0.0033 J	0.0010 U	0.0010 U	0.0012 UJ	8,000
Styrene	EPA 8260	mg/kg	0.0010 U	0.0010 UJ	0.0010 U	0.0010 U	0.0010 UJ	0.0010 U	0.0010 U	--	0.0010 UJ	0.0010 U	0.0010 U	0.0012 U	300
1,1,1,2-Tetrachloroethane	EPA 8260	mg/kg	0.0010 U	0.0010 UJ	0.0010 U	0.0010 U	0.0010 UJ	0.0010 U	0.0010 U	--	0.0010 UJ	0.0010 U	0.0010 U	0.0012 U	38
1,1,2,2-Tetrachloroethane	EPA 8260	mg/kg	0.0010 UJ	0.0010 UJ	0.0010 U	0.0010 U	0.0010 UJ	0.0010 U	0.0010 U	--	0.0010 UJ	0.0010 U	0.0010 U	0.0012 UJ	0.00011
Tetrachloroethene	EPA 8260	mg/kg	0.0010 U	0.0010 UJ	0.0010 U	0.0010 U	0.0010 UJ	0.0010 U	0.0010 U	--	0.0010 UJ	0.0010 U	0.0010 U	0.0012 U	0.0016
Toluene	EPA 8260	mg/kg	0.11	0.0050 UJ	0.0061	0.0050 U	0.0050 UJ	0.0050 U	0.0050 U	--	0.038	0.0050 U	0.0050 U	0.024	0.055
1,2,3-Trichlorobenzene	EPA 8260	mg/kg	0.0010 UJ	0.0010 UJ	0.0010 U	0.0010 U	0.0010 UJ	0.0010 U	0.0010 U	--	0.0010 UJ	0.0010 U	0.0010 U	0.0012 UJ	20
1,1,1-Trichloroethane	EPA 8260	mg/kg	0.0010 U	0.0010 UJ	0.0010 U	0.0010 U	0.0010 UJ	0.0010 U	0.0010 U	--	0.0010 U	0.0010 U	0.0010 U	0.0012 U	21
1,1,2-Trichloroethane	EPA 8260	mg/kg	0.0010 U	0.0010 UJ	0.0010 U	0.0010 U	0.0010 UJ	0.0010 U	0.0010 U	--	0.0010 UJ	0.0010 U	0.0010 U	0.0012 U	0.00033
Trichloroethene	EPA 8260	mg/kg	0.0010 U	0.0010 UJ	0.0010 U	0.0010 U	0.0010 UJ	0.0010 U	0.0010 U	--	0.0010 U	0.0010 U	0.0010 U	0.0012 U	0.00027
Trichlorofluoromethane (CFC-11)	EPA 8260	mg/kg	0.0010 U	0.0010 UJ	0.0010 U	0.0010 U	0.0010 UJ	0.0010 U	0.0010 U	--	0.0010 U	0.0010 U	0.0010 U	0.0012 U	24,000
1,2,3-Trichloropropane	EPA 8260	mg/kg	0.0010 UJ	0.0010 UJ	0.0010 U	0.0010 U	0.0010 UJ	0.0010 U	0.0010 U	--	0.0010 UJ	0.0010 U	0.0010 U	0.0012 UJ	0.033
1,2,4-Trimethylbenzene	EPA 8260	mg/kg	0.20 J	0.0010 UJ	0.0014	0.0073	0.0032 J	0.011	0.0033	--	0.034 J	0.0027	0.0011	0.0012 J	800
1,3,5-Trimethylbenzene	EPA 8260	mg/kg	0.054 J	0.0010 UJ	0.0010 U	0.0039	0.0015 J	0.0065	0.0010 U	--	0.0092 J	0.0010 U	0.0010 U	0.0012 UJ	800
Vinyl Acetate	EPA 8260	mg/kg	0.0052 U	0.0050 UJ	0.0050 U	0.0050 U	0.0050 UJ	0.0050 U	0.0050 U	--	0.0050 U	0.0050 U	0.0050 U	0.0061 U	80,000
Vinyl Chloride	EPA 8260	mg/kg	0.0010 U	0.0010 UJ	0.0010 U	0.0010 U	0.0010 UJ	0.0010 U	0.0010 U	--	0.0010 U	0.0010 U	0.0010 U	0.0012 U	0.000055
Xylene, m-,p-	EPA 8260	mg/kg	0.14	0.0020 UJ	0.0020 U	0.0027	0.0020 UJ	0.0079	0.0032	--	0.017 J	0.0021	0.0020 U	0.0024 U	16,000
Xylene, o-	EPA 8260	mg/kg	0.065	0.0010 UJ	0.0010 U	0.0014	0.0011 J	0.0059	0.0017	--	0.0084 J	0.0011	0.0010 U	0.0012 U	16,000
Petroleum Hydrocarbons															
Gasoline-Range Hydrocarbons	NWTPH-G	mg/kg	--	--	--	6.2 J	9.9 J	5.0 U	--	--	--	--	--	--	30
Diesel-Range Hydrocarbons	NWTPH-Dx	mg/kg	--	--	--	25 J	15 UJ	19 U	--	--	--	--	--	--	260
Oil-Range Hydrocarbons	NWTPH-Dx	mg/kg	--	--	--	85	29 UJ	38 U	--	--	--	--	--	--	2,000
Total Diesel- and Oil-Range Hydrocarbons	NWTPH-Dx	mg/kg	--	--	--	110 J	29 UJ	38 U	--	--	--	--	--	--	260
Conventionals															
pH	N/A	N/A	11 J	11 J	11 J	10 J	9.2 J	7.7 J	11 J	--	12 J	12 J	12 J	9.6 J	NE

Table D-1

Remedial Investigation Chemical Analytical Results - Soil COPCs

Port of Seattle - North Terminal 115

Seattle, Washington

Notes:

- ¹ Sample locations are shown on Figures 3-1 and 3-3.
- ² Preliminary cleanup levels for soil are referenced from Table 4-1.
- ³ Total dioxin/furan Toxic Equivalency Quotients (TEQs) were calculated using United States Environmental Protection Agency (USEPA) Toxicity Equivalency Factor (TEF) values for human health (EPA 2003).
- ⁴ Total carcinogenic PAH (cPAH) TEQs were calculated using TEF values referenced from MTCA Table 708.2 (WAC 173-340-900).
- RL = Reporting limit
- EPA = Environmental Protection Agency
- mg/kg = milligram per kilogram
- NE = not established
- J = estimated result
- U = analyte not detected above the reporting limit
- = not analyzed
- AD = Native LDW alluvial deposit
- OS = Native organic silt (Aquitard) deposit
- FI = Initial (early 1900s) T115N fill deposit
- FD = Glacier NW Site dredged fill deposit
- FO = T115N operational (1960s) fill deposit
- FT = Terminal 115 fill deposit
- FP = Settling pond fill deposit
- COPC = Contaminant of Potential Concern
- KCHD = King County Health Department
- Landau = Landau Associates
- GEI = GeoEngineers
- ERM = Environmental Resources Management
- Shaw = Shaw Environmental & Infrastructure
- Bold** indicates analyte was detected.
- Yellow shading identifies the detected results greater than the preliminary cleanup level.
- Blue shading identifies the non-detected result greater than the preliminary cleanup level.

Table D-1
Remedial Investigation Chemical Analytical Results - Soil COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Sample Location ¹	Analytical Method	Units	B-14				B-15					B-16			Soil Preliminary Cleanup Level ² (PCUL)
Sample Identification			B14-2-3	B14-7-8	B14-11-12	B14-15-16	B15-2-3	B15-6-7	B15-6-7Dup	B15-9-10	B15-17-18	B16-2-3	B16-2-3Dup	B16-6-7	
Sample Date			01/08/14	01/08/14	01/08/14	01/08/14	01/08/14	01/08/14	01/08/14	01/08/14	01/08/14	01/07/14	01/07/14	01/07/14	
Sample Depth			2 - 3 ft	7 - 8 ft	11 - 12 ft	15 - 16 ft	2 - 3 ft	6 - 7 ft	6 - 7 ft	9 - 10 ft	17 - 18 ft	2 - 3 ft	2 - 3 ft	6 - 7 ft	
Stratigraphic Horizon			FO	FO	FO	AD	FP	FP	FP	FO	FI	FO	FO	FO	
Sampled By			GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	
Polychlorinated Biphenyls (PCBs)															
PCB-Aroclor 1016	EPA 8082	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
PCB-Aroclor 1221	EPA 8082	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
PCB-Aroclor 1232	EPA 8082	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
PCB-Aroclor 1242	EPA 8082	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
PCB-Aroclor 1248	EPA 8082	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
PCB-Aroclor 1254	EPA 8082	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
PCB-Aroclor 1260	EPA 8082	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
Total PCB Aroclors	EPA 8082	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	0.0000022
Dioxins and Furans															
1,2,3,4,6,7,8-HpCDD	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,4,6,7,8-HpCDF	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,4,7,8,9-HpCDF	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,4,7,8-HxCDD	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,4,7,8-HxCDF	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,6,7,8-HxCDD	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,6,7,8-HxCDF	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,7,8,9-HxCDD	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,7,8,9-HxCDF	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,7,8-PeCDD	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,7,8-PeCDF	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
2,3,4,6,7,8-HxCDF	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
2,3,4,7,8-PeCDF	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
2,3,7,8-TCDD	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
2,3,7,8-TCDF	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
OCDD	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
OCDF	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
Total Dioxin/Furan TEQ ³ (ND=0.5RL)	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	0.0000052
Total Dioxin/Furan TEQ ³ (ND=0.5RL)	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	0.0000052
Metals															
Antimony	EPA 6000/7000	mg/kg	5.0 U	5.0 U	5.0 U	--	12	5.0 U	5.0 U	5.0 U	--	5.0 U	5.0 U	5.0 U	4.1
Arsenic	EPA 6000/7000	mg/kg	5.4	5.1	6.3	--	3.0 U	0.50 U	0.5	2.3	--	0.91	0.81	2.6	7.0
Barium	EPA 6000/7000	mg/kg	39	50	69	--	140	43	58	64	--	53	49	47	8.3
Beryllium	EPA 6000/7000	mg/kg	0.50 U	0.50 U	0.50 U	--	0.50 U	0.50 U	0.50 U	0.50 U	--	0.50 U	0.50 U	0.50 U	3.5
Cadmium	EPA 6000/7000	mg/kg	0.20 U	0.20 U	0.26	--	8.2	0.20 U	0.20 U	0.20 U	--	0.27	0.20 U	0.20 U	1.0
Chromium III / Total	EPA 6000/7000	mg/kg	40	41	52	--	280	44	34	52	--	47 J	30 J	45	48
Chromium VI	EPA 6000/7000	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	
Copper	EPA 6000/7000	mg/kg	16	20	33	--	52	21	21	24	--	25	20	13	36
Lead	EPA 6000/7000	mg/kg	13	3	18	--	6,100	35 J	3.2 J	3.2	--	140 J	20 J	5	50
Mercury	EPA 6000/7000	mg/kg	0.057	0.050 U	0.14	--	0.050 U	0.050 U	0.050 U	0.050 U	--	0.050 U	0.050 U	0.050 U	0.070
Nickel	EPA 6000/7000	mg/kg	41	48	72	--	34	45	45	53	--	37	31	38	48
Selenium	EPA 6000/7000	mg/kg	0.50 U	0.50 U	0.50 U	--	3.0 U	0.50 U	0.50 U	0.50 U	--	0.50 U	0.50 U	0.50 U	0.30

Table D-1
Remedial Investigation Chemical Analytical Results - Soil COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Sample Location ¹	Analytical Method	Units	B-14				B-15					B-16			Soil Preliminary Cleanup Level ² (PCUL)
Sample Identification			B14-2-3	B14-7-8	B14-11-12	B14-15-16	B15-2-3	B15-6-7	B15-6-7Dup	B15-9-10	B15-17-18	B16-2-3	B16-2-3Dup	B16-6-7	
Sample Date			01/08/14	01/08/14	01/08/14	01/08/14	01/08/14	01/08/14	01/08/14	01/08/14	01/08/14	01/07/14	01/07/14	01/07/14	
Sample Depth			2 - 3 ft	7 - 8 ft	11 - 12 ft	15 - 16 ft	2 - 3 ft	6 - 7 ft	6 - 7 ft	9 - 10 ft	17 - 18 ft	2 - 3 ft	2 - 3 ft	6 - 7 ft	
Stratigraphic Horizon			FO	FO	FO	AD	FP	FP	FP	FO	FI	FO	FO	FO	
Sampled By			GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	
Silver	EPA 6000/7000	mg/kg	0.50 U	0.50 U	0.50 U	--	3.0 U	0.50 U	0.50 U	0.50 U	--	0.50 U	0.50 U	0.50 U	0.016
Thallium	EPA 6000/7000	mg/kg	0.25 U	0.25 U	0.25 U	--	0.30 U	0.25 U	0.25 U	0.25 U	--	0.25 U	0.25 U	0.25 U	0.0044
Tin	EPA 6000/7000	mg/kg	19	1.2	10	--	62,000	1,800 J	5,800 J	230	--	1,300 J	480 J	1.6	50
Zinc	EPA 6000/7000	mg/kg	38	42	88	--	3,200	66 J	44 J	50	--	210 J	52 J	37	85
Semi-Volatile Organic Compounds (SVOCs) - Polycyclic Aromatic Hydrocarbons (PAHs)															
Acenaphthene	EPA 8270/SIM	mg/kg	0.0082	0.0067 U	0.025 U	0.0067 U	0.0076	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.011 J	0.028
Acenaphthylene	EPA 8270/SIM	mg/kg	0.0067 U	0.0067 U	0.025 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	1.3
Anthracene	EPA 8270/SIM	mg/kg	0.0077	0.0067 U	0.025 U	0.0067 U	0.0079	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.051
Benzo(a)anthracene	EPA 8270/SIM	mg/kg	0.0067 U	0.0067 U	0.025 U	0.0074	0.013	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.011	0.000057
Benzo(b)fluoranthene	EPA 8270/SIM	mg/kg	0.0067 U	0.0067 U	0.025 U	0.0072	0.016	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0078	0.00020
Benzo(k)fluoranthene	EPA 8270/SIM	mg/kg	0.0067 U	0.0067 U	0.025 U	0.0067 U	0.01	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0020
Benzofluoranthenes (Total)	EPA 8270/SIM	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	3.2
Benzo(g,h,i)perylene	EPA 8270/SIM	mg/kg	0.0067 U	0.0067 U	0.025 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.67
Benzo(a)pyrene	EPA 8270/SIM	mg/kg	0.0067 U	0.0067 U	0.025 U	0.0069	0.017	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0089	0.000016
Chrysene	EPA 8270/SIM	mg/kg	0.0067 U	0.0067 U	0.032	0.0072	0.016	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0097	0.0064
Dibenzo(a,h)anthracene	EPA 8270/SIM	mg/kg	0.0067 U	0.0067 U	0.025 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.000029
Dibenzofuran	EPA 8270/SIM	mg/kg	0.017 U	0.017 U	0.063 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.54
Fluoranthene	EPA 8270/SIM	mg/kg	0.021	0.0067 U	0.025 U	0.016	0.037	0.0067 U	0.0067 U	0.0067 U	0.0084	0.0088	0.0067 U	0.022	0.090
Fluorene	EPA 8270/SIM	mg/kg	0.017	0.0067 U	0.025 U	0.0067 U	0.0095	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0076	0.029
Indeno(1,2,3-c,d)pyrene	EPA 8270/SIM	mg/kg	0.0067 U	0.0067 U	0.025 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.00056
1-Methylnaphthalene	EPA 8270/SIM	mg/kg	0.0067 U	0.0067 U	0.037	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	29
2-Methylnaphthalene	EPA 8270/SIM	mg/kg	0.0067 U	0.0067 U	0.037	0.0067 U	0.011	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0082	0.67
Naphthalene	EPA 8270/SIM	mg/kg	0.0067 U	0.0067 U	0.027	0.0067 U	0.015	0.0068	0.0073	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.02	0.0021
Phenanthrene	EPA 8270/SIM	mg/kg	0.067	0.0067 U	0.025 U	0.02	0.068	0.0067 U	0.0067 U	0.0067 U	0.0084	0.0067 U	0.0067 U	0.027	1.5
Pyrene	EPA 8270/SIM	mg/kg	0.015	0.0067 U	0.025 U	0.017	0.035	0.0067 U	0.0067 U	0.0067 U	0.0091	0.0081	0.0067 U	0.022	0.14
Total cPAH TEQ ⁴ (ND=0)	EPA 8270/SIM	mg/kg	0 U	0 U	0.00032	0.0084	0.021	0 U	0 U	0 U	0 U	0 U	0 U	0.011	0.000016
Total cPAH TEQ ⁴ (ND=0.5RL)	EPA 8270/SIM	mg/kg	0.0051 U	0.0051 U	0.019	0.0094	0.022	0.0051 U	0.0051 U	0.0051 U	0.0051 U	0.0051 U	0.0051 U	0.012	0.000016
Other SVOCs															
Aniline	EPA 8270	mg/kg	0.085 U	0.085 U	0.063 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	150
Benzidine	EPA 8270	mg/kg	0.017 U	0.017 U	0.063 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.0037
Benzoic acid	EPA 8270	mg/kg	0.085 UJ	0.085 UJ	0.063 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.17
Benzyl alcohol	EPA 8270	mg/kg	0.017 U	0.017 U	0.063 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.057
Bis(2-chloroethoxy)methane	EPA 8270	mg/kg	0.017 U	0.017 U	0.063 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	NE
Bis(2-chloroethyl)ether	EPA 8270	mg/kg	0.017 U	0.017 U	0.063 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.000022
Bis(2-chloroisopropyl)ether	EPA 8270	mg/kg	0.017 U	0.017 U	0.063 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	3,200
Bis(2-ethylhexyl)phthalate	EPA 8270	mg/kg	0.017 U	0.017 U	0.063 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.0051
4-Bromophenyl phenyl ether	EPA 8270	mg/kg	0.017 U	0.017 U	0.063 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	NE
Butyl benzyl phthalate	EPA 8270	mg/kg	0.017 U	0.017 U	0.063 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.00018
Carbazole	EPA 8270	mg/kg	0.017 U	0.017 U	0.063 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	NE
4-Chloroaniline	EPA 8270	mg/kg	0.017 U	0.017 U	0.063 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.81
4-Chloro-3-methylphenol	EPA 8270	mg/kg	0.017 U	0.017 U	0.063 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	NE
2-Chloronaphthalene	EPA 8270	mg/kg	0.017 U	0.017 U	0.063 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	6,400
2-Chlorophenol	EPA 8270	mg/kg	0.017 U	0.017 U	0.063 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.011
4-Chlorophenyl phenyl ether	EPA 8270	mg/kg	0.017 U	0.017 U	0.063 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	NE

Table D-1
Remedial Investigation Chemical Analytical Results - Soil COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Sample Location ¹	Analytical Method	Units	B-14				B-15					B-16			Soil Preliminary Cleanup Level ² (PCUL)
Sample Identification			B14-2-3	B14-7-8	B14-11-12	B14-15-16	B15-2-3	B15-6-7	B15-6-7Dup	B15-9-10	B15-17-18	B16-2-3	B16-2-3Dup	B16-6-7	
Sample Date			01/08/14	01/08/14	01/08/14	01/08/14	01/08/14	01/08/14	01/08/14	01/08/14	01/08/14	01/07/14	01/07/14	01/07/14	
Sample Depth			2 - 3 ft	7 - 8 ft	11 - 12 ft	15 - 16 ft	2 - 3 ft	6 - 7 ft	6 - 7 ft	9 - 10 ft	17 - 18 ft	2 - 3 ft	2 - 3 ft	6 - 7 ft	
Stratigraphic Horizon			FO	FO	FO	AD	FP	FP	FP	FO	FI	FO	FO	FO	
Sampled By			GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	
Decane	EPA 8270	mg/kg	0.017 UJ	0.017 UJ	0.063 UJ	0.017 UJ	0.017 UJ	0.017 UJ	0.017 UJ	0.017 UJ	0.017 UJ	0.017 UJ	0.017 UJ	0.017 UJ	NE
Dibutyl phthalate	EPA 8270	mg/kg	0.017 U	0.017 U	0.063 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.015
2,3-Dichloroaniline	EPA 8270	mg/kg	0.017 U	0.017 U	0.063 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	NE
1,2-Dichlorobenzene	EPA 8260	mg/kg	–	–	–	–	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0031
(o-Dichlorobenzene)	EPA 8270	mg/kg	0.017 U	0.017 U	0.063 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.0031
1,3-Dichlorobenzene	EPA 8260	mg/kg	–	–	–	–	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	NE
(m-Dichlorobenzene)	EPA 8270	mg/kg	0.017 U	0.017 U	0.063 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	NE
1,4-Dichlorobenzene	EPA 8260	mg/kg	–	–	–	–	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0081
(p-Dichlorobenzene)	EPA 8270	mg/kg	0.017 U	0.017 U	0.063 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.0081
3,3'-Dichlorobenzidine	EPA 8270	mg/kg	0.017 U	0.017 U	0.063 U	0.017 U	0.071	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.0000033
2,4-Dichlorophenol	EPA 8270	mg/kg	0.017 U	0.017 U	0.063 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.0043
Bis(2-ethylhexyl)ester	EPA 8270	mg/kg	0.017 U	0.017 U	0.063 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	710
Diethyl phthalate	EPA 8270	mg/kg	0.085 U	0.085 U	0.063 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.034
Dimethyl phthalate	EPA 8270	mg/kg	0.017 U	0.017 U	0.063 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.071
2,4-Dimethylphenol	EPA 8270	mg/kg	0.017 U	0.017 U	0.063 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.0031
1,2-Dinitrobenzene	EPA 8270	mg/kg	0.017 U	0.017 U	0.063 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	8.0
1,3-Dinitrobenzene	EPA 8270	mg/kg	0.085 UJ	0.085 UJ	0.063 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	8.0
1,4-Dinitrobenzene	EPA 8270	mg/kg	0.017 UJ	0.017 UJ	0.063 UJ	0.017 UJ	0.017 UJ	0.017 UJ	0.017 UJ	0.017 UJ	0.017 UJ	0.017 UJ	0.017 UJ	0.017 UJ	8.0
4,6-Dinitro-2-methylphenol	EPA 8270	mg/kg	0.085 UJ	0.085 UJ	0.063 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	NE
2,4-Dinitrophenol	EPA 8270	mg/kg	0.085 UJ	0.085 UJ	0.063 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.029
2,4-Dinitrotoluene	EPA 8270	mg/kg	0.017 U	0.017 U	0.063 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.000069
2,6-Dinitrotoluene	EPA 8270	mg/kg	0.017 U	0.017 U	0.063 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.11
Di-n-octyl phthalate	EPA 8270	mg/kg	0.017 U	0.017 U	0.063 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.33
1,2-Diphenylhydrazine	EPA 8270	mg/kg	0.017 U	0.017 U	0.063 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	1.1
Hexachlorobenzene	EPA 8270	mg/kg	0.017 U	0.017 U	0.063 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.00000040
Hexachlorobutadiene	EPA 8260	mg/kg	–	–	–	–	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.00054
	EPA 8270	mg/kg	0.017 U	0.017 U	0.063 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.00054
Hexachlorocyclopentadiene	EPA 8270	mg/kg	0.017 UJ	0.017 U	0.063 UJ	0.017 UJ	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 UJ	0.017 U	0.017 UJ	0.20
Hexachloroethane	EPA 8270	mg/kg	0.017 U	0.017 U	0.063 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.000041
Isophorone	EPA 8270	mg/kg	0.017 U	0.017 U	0.063 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.037
2-Methylphenol (o-Cresol)	EPA 8270	mg/kg	0.017 U	0.017 U	0.063 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.010
3 & 4 Methylphenol (m-, p-Cresol)	EPA 8270	mg/kg	0.017 U	0.046	0.063 U	0.017	0.017 U	0.017 U	0.017 U	0.017 U	0.04	0.017 U	0.017 U	0.21	4,000
2-Nitroaniline	EPA 8270	mg/kg	0.017 U	0.017 U	0.063 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	800
3-Nitroaniline	EPA 8270	mg/kg	0.017 U	0.017 U	0.063 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	NE
4-Nitroaniline	EPA 8270	mg/kg	0.017 U	0.017 U	0.063 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	NE
Nitrobenzene	EPA 8270	mg/kg	0.017 U	0.017 U	0.063 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.041
2-Nitrophenol	EPA 8270	mg/kg	0.017 U	0.017 U	0.063 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	NE
4-Nitrophenol (p-Nitrophenol)	EPA 8270	mg/kg	0.017 U	0.017 U	0.063 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	7.0
n-Nitrosodimethylamine	EPA 8270	mg/kg	0.017 U	0.017 U	0.063 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017
n-Nitrosodiphenylamine (as Diphenylamine)	EPA 8270	mg/kg	0.017 U	0.017 U	0.063 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.0011
n-Nitrosodi-n-propylamine	EPA 8270	mg/kg	0.017 U	0.017 U	0.063 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.000018
n-Octadecane	EPA 8270	mg/kg	0.017 UJ	0.017 UJ	0.063 UJ	0.017 UJ	0.19 J	0.017 UJ	0.017 UJ	0.017 UJ	0.017 J	0.017 UJ	0.017 UJ	0.017 UJ	NE
Pentachlorophenol	EPA 8270	mg/kg	0.083 UJ	0.083 UJ	0.063 UJ	0.083 UJ	0.083 UJ	0.083 UJ	0.083 UJ	0.083 UJ	0.083 UJ	0.083 UJ	0.083 UJ	0.083 UJ	0.0000018

Table D-1
Remedial Investigation Chemical Analytical Results - Soil COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Sample Location ¹	Analytical Method	Units	B-14				B-15					B-16			Soil Preliminary Cleanup Level ² (PCUL)
Sample Identification			B14-2-3	B14-7-8	B14-11-12	B14-15-16	B15-2-3	B15-6-7	B15-6-7Dup	B15-9-10	B15-17-18	B16-2-3	B16-2-3Dup	B16-6-7	
Sample Date			01/08/14	01/08/14	01/08/14	01/08/14	01/08/14	01/08/14	01/08/14	01/08/14	01/08/14	01/07/14	01/07/14	01/07/14	
Sample Depth			2 - 3 ft	7 - 8 ft	11 - 12 ft	15 - 16 ft	2 - 3 ft	6 - 7 ft	6 - 7 ft	9 - 10 ft	17 - 18 ft	2 - 3 ft	2 - 3 ft	6 - 7 ft	
Stratigraphic Horizon			FO	FO	FO	AD	FP	FP	FP	FO	FI	FO	FO	FO	
Sampled By			GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	
Phenol	EPA 8270	mg/kg	0.017 U	0.017 U	0.063 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.12
Pyridine	EPA 8270	mg/kg	0.017 U	0.017 U	0.063 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	80
2,3,4,6-Tetrachlorophenol	EPA 8270	mg/kg	0.017 U	0.017 U	0.063 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	490
2,3,5,6-Tetrachlorophenol	EPA 8270	mg/kg	0.017 U	0.017 U	0.063 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	NE
1,2,4-Trichlorobenzene	EPA 8260	mg/kg	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.000072
	EPA 8270	mg/kg	0.017 U	0.017 U	0.063 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.000072
2,4,5-Trichlorophenol	EPA 8270	mg/kg	0.017 U	0.017 U	0.063 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	1.1
2,4,6-Trichlorophenol	EPA 8270	mg/kg	0.017 U	0.017 U	0.063 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.00019
Volatile Organic Compounds (VOCs)															
Acetone	EPA 8260	mg/kg	--	--	--	--	0.076	0.038	0.035	0.0091	0.32	0.0052	0.012	0.062	72,000
Benzene	EPA 8260	mg/kg	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.00056
Bromobenzene	EPA 8260	mg/kg	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	640
Bromochloromethane	EPA 8260	mg/kg	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	NE
Bromoform (Tribromomethane)	EPA 8260	mg/kg	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0050
Bromomethane	EPA 8260	mg/kg	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.079
n-Butylbenzene	EPA 8260	mg/kg	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	4,000
sec-Butylbenzene	EPA 8260	mg/kg	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	8,000
tert-Butylbenzene	EPA 8260	mg/kg	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	8,000
Carbon disulfide	EPA 8260	mg/kg	--	--	--	--	0.0065	0.0066	0.0072	0.0017	0.0058	0.0010 U	0.0010 U	0.0010 U	8,000
Carbon tetrachloride	EPA 8260	mg/kg	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.00015
Chlorobenzene	EPA 8260	mg/kg	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.10
Chloroethane	EPA 8260	mg/kg	--	--	--	--	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	NE
2-Chloroethyl vinyl ether	EPA 8260	mg/kg	--	--	--	--	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	NE
Chloroform	EPA 8260	mg/kg	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.052
Chloromethane	EPA 8260	mg/kg	--	--	--	--	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	NE
2-Chlorotoluene	EPA 8260	mg/kg	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	1,600
4-Chlorotoluene	EPA 8260	mg/kg	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	NE
Dibromochloromethane	EPA 8260	mg/kg	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.00077
1,2-Dibromo-3-chloropropane	EPA 8260	mg/kg	--	--	--	--	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	1.3
Dibromomethane	EPA 8260	mg/kg	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	800
Bromodichloromethane (Dichlorobromomethane)	EPA 8260	mg/kg	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.00096
Dichlorodifluoromethane (CFC-12)	EPA 8260	mg/kg	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	16,000
1,1-Dichloroethane	EPA 8260	mg/kg	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	180
1,2-Dichloroethane	EPA 8260	mg/kg	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.024
1,1-Dichloroethene	EPA 8260	mg/kg	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	1.4
cis-1,2-Dichloroethene	EPA 8260	mg/kg	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	160
trans-1,2-Dichloroethene	EPA 8260	mg/kg	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.32
1,2-Dichloropropane	EPA 8260	mg/kg	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010
1,3-Dichloropropane	EPA 8260	mg/kg	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	NE
2,2-Dichloropropane	EPA 8260	mg/kg	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	NE
1,1-Dichloropropene	EPA 8260	mg/kg	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	NE
cis-1,3-Dichloropropene	EPA 8260	mg/kg	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.00063

Table D-1
Remedial Investigation Chemical Analytical Results - Soil COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Sample Location ¹	Analytical Method	Units	B-14				B-15					B-16			Soil Preliminary Cleanup Level ² (PCUL)
Sample Identification			B14-2-3	B14-7-8	B14-11-12	B14-15-16	B15-2-3	B15-6-7	B15-6-7Dup	B15-9-10	B15-17-18	B16-2-3	B16-2-3Dup	B16-6-7	
Sample Date			01/08/14	01/08/14	01/08/14	01/08/14	01/08/14	01/08/14	01/08/14	01/08/14	01/08/14	01/07/14	01/07/14	01/07/14	
Sample Depth			2 - 3 ft	7 - 8 ft	11 - 12 ft	15 - 16 ft	2 - 3 ft	6 - 7 ft	6 - 7 ft	9 - 10 ft	17 - 18 ft	2 - 3 ft	2 - 3 ft	6 - 7 ft	
Stratigraphic Horizon			FO	FO	FO	AD	FP	FP	FP	FO	FI	FO	FO	FO	
Sampled By			GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	
trans-1,3-Dichloropropene	EPA 8260	mg/kg	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.00063
Ethylbenzene	EPA 8260	mg/kg	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.015
1,2-Dibromoethane (EDB)	EPA 8260	mg/kg	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.50
2-Hexanone	EPA 8260	mg/kg	--	--	--	--	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	400
Isopropylbenzene (Cumene)	EPA 8260	mg/kg	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	8,000
p-Isopropyltoluene	EPA 8260	mg/kg	--	--	--	--	0.0010 U	0.0037	0.003	0.0010 U	0.0062	0.0010 U	0.0010 U	0.0010 U	NE
2-Butanone (MEK)	EPA 8260	mg/kg	--	--	--	--	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.02	0.0050 U	0.0050 U	0.0092	48,000
Methyl iodide (Iodomethane)	EPA 8260	mg/kg	--	--	--	--	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	NE
4-Methyl-2-pentanone (Methyl Isobutyl Ketone)	EPA 8260	mg/kg	--	--	--	--	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0057	0.0050 U	0.0050 U	0.0050 U	6,400
Methyl tert-butyl ether (MTBE)	EPA 8260	mg/kg	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	560
Methylene chloride	EPA 8260	mg/kg	--	--	--	--	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.030
n-Propylbenzene	EPA 8260	mg/kg	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	8,000
Styrene	EPA 8260	mg/kg	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	300
1,1,1,2-Tetrachloroethane	EPA 8260	mg/kg	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	38
1,1,2,2-Tetrachloroethane	EPA 8260	mg/kg	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.00011
Tetrachloroethene	EPA 8260	mg/kg	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0016
Toluene	EPA 8260	mg/kg	--	--	--	--	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.055
1,2,3-Trichlorobenzene	EPA 8260	mg/kg	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	20
1,1,1-Trichloroethane	EPA 8260	mg/kg	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	21
1,1,2-Trichloroethane	EPA 8260	mg/kg	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.00033
Trichloroethene	EPA 8260	mg/kg	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.00027
Trichlorofluoromethane (CFC-11)	EPA 8260	mg/kg	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	24,000
1,2,3-Trichloropropane	EPA 8260	mg/kg	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.033
1,2,4-Trimethylbenzene	EPA 8260	mg/kg	--	--	--	--	0.0041	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0011	800
1,3,5-Trimethylbenzene	EPA 8260	mg/kg	--	--	--	--	0.0011	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	800
Vinyl Acetate	EPA 8260	mg/kg	--	--	--	--	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	80,000
Vinyl Chloride	EPA 8260	mg/kg	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.000055
Xylene, m-,p-	EPA 8260	mg/kg	--	--	--	--	0.0020 U	0.0020 U	0.0020 U	0.0020 U	0.0020 U	0.0020 U	0.0020 U	0.0020 U	16,000
Xylene, o-	EPA 8260	mg/kg	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	16,000
Petroleum Hydrocarbons															
Gasoline-Range Hydrocarbons	NWTPH-G	mg/kg	--	--	--	--	--	--	--	--	--	5.0 U	5.0 U	5.0 U	30
Diesel-Range Hydrocarbons	NWTPH-Dx	mg/kg	--	--	--	--	--	--	--	--	--	15 U	14 U	14 U	260
Oil-Range Hydrocarbons	NWTPH-Dx	mg/kg	--	--	--	--	--	--	--	--	--	42	41	28 U	2,000
Total Diesel- and Oil-Range Hydrocarbons	NWTPH-Dx	mg/kg	--	--	--	--	--	--	--	--	--	42	41	28 U	260
Conventionals															
pH	N/A	N/A	11 J	11 J	11 J	12 J	10 J	11 J	11 J	11 J	12 J	11 J	11 J	9.7 J	NE

Table D-1

Remedial Investigation Chemical Analytical Results - Soil COPCs

Port of Seattle - North Terminal 115

Seattle, Washington

Notes:

- ¹ Sample locations are shown on Figures 3-1 and 3-3.
- ² Preliminary cleanup levels for soil are referenced from Table 4-1.
- ³ Total dioxin/furan Toxic Equivalency Quotients (TEQs) were calculated using United States Environmental Protection Agency (USEPA) Toxicity Equivalency Factor (TEF) values for human health (EPA 2003).
- ⁴ Total carcinogenic PAH (cPAH) TEQs were calculated using TEF values referenced from MTCA Table 708.2 (WAC 173-340-900).
- RL = Reporting limit
- EPA = Environmental Protection Agency
- mg/kg = milligram per kilogram
- NE = not established
- J = estimated result
- U = analyte not detected above the reporting limit
- = not analyzed
- AD = Native LDW alluvial deposit
- OS = Native organic silt (Aquitard) deposit
- FI = Initial (early 1900s) T115N fill deposit
- FD = Glacier NW Site dredged fill deposit
- FO = T115N operational (1960s) fill deposit
- FT = Terminal 115 fill deposit
- FP = Settling pond fill deposit
- COPC = Contaminant of Potential Concern
- KCHD = King County Health Department
- Landau = Landau Associates
- GEI = GeoEngineers
- ERM = Environmental Resources Management
- Shaw = Shaw Environmental & Infrastructure
- Bold** indicates analyte was detected.
- Yellow shading identifies the detected results greater than the preliminary cleanup level.
- Blue shading identifies the non-detected result greater than the preliminary cleanup level.

Table D-1
Remedial Investigation Chemical Analytical Results - Soil COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Sample Location ¹	Analytical Method	Units	B-16		B-17				MW-1			MW-2D			Soil Preliminary Cleanup Level ² (PCUL)
Sample Identification			B16-10-11	B16-17-18	B17-4-5	B17-8-9	B17-8-9Dup	B17-19-20	MW-1-(4-5)	MW-1-(7-8)	MW-1-(11-12)	MW2D-0.5-1.5	MW2D-4.5-5.5	MW2D-5.5-6.5	
Sample Date			01/07/14	01/07/14	01/09/14	01/09/14	01/09/14	01/09/14	10/29/09	10/29/09	10/29/09	12/17/13	12/17/13	12/17/13	
Sample Depth			10 - 11 ft	17 - 18 ft	4 - 5 ft	8 - 9 ft	8 - 9 ft	19 - 20 ft	4 - 5 ft	7 - 8 ft	11 - 12 ft	0.5 - 1.5 ft	4.5 - 5.5 ft	5.5 - 6.5 ft	
Stratigraphic Horizon			FI	OS	FO	FO	FO	AD	FO	FO	FI	FO	FO	FI	
Sampled By			GEI	GEI	GEI	GEI	GEI	GEI	Landau	Landau	Landau	GEI	GEI	GEI	
Polychlorinated Biphenyls (PCBs)															
PCB-Aroclor 1016	EPA 8082	mg/kg	--	--	--	--	--	--	0.062 U	0.063 U	0.067 U	--	--	--	NE
PCB-Aroclor 1221	EPA 8082	mg/kg	--	--	--	--	--	--	0.062 U	0.063 U	0.067 U	--	--	--	NE
PCB-Aroclor 1232	EPA 8082	mg/kg	--	--	--	--	--	--	0.062 U	0.063 U	0.067 U	--	--	--	NE
PCB-Aroclor 1242	EPA 8082	mg/kg	--	--	--	--	--	--	0.062 U	0.063 U	0.067 U	--	--	--	NE
PCB-Aroclor 1248	EPA 8082	mg/kg	--	--	--	--	--	--	0.062 U	0.063 U	0.067 U	--	--	--	NE
PCB-Aroclor 1254	EPA 8082	mg/kg	--	--	--	--	--	--	0.062 U	0.063 U	0.067 U	--	--	--	NE
PCB-Aroclor 1260	EPA 8082	mg/kg	--	--	--	--	--	--	0.062 U	0.063 U	0.067 U	--	--	--	NE
Total PCB Aroclors	EPA 8082	mg/kg	--	--	--	--	--	--	0.062 U	0.063 U	0.067 U	--	--	--	0.0000022
Dioxins and Furans															
1,2,3,4,6,7,8-HpCDD	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,4,6,7,8-HpCDF	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,4,7,8,9-HpCDF	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,4,7,8-HxCDD	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,4,7,8-HxCDF	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,6,7,8-HxCDD	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,6,7,8-HxCDF	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,7,8,9-HxCDD	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,7,8,9-HxCDF	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,7,8-PeCDD	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,7,8-PeCDF	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
2,3,4,6,7,8-HxCDF	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
2,3,4,7,8-PeCDF	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
2,3,7,8-TCDD	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
2,3,7,8-TCDF	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
OCDD	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
OCDF	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
Total Dioxin/Furan TEQ ³ (ND=0.5RL)	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	0.0000052
Total Dioxin/Furan TEQ ³ (ND=0.5RL)	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	0.0000052
Metals															
Antimony	EPA 6000/7000	mg/kg	5.0 U	--	5.0 U	5.0 U	5.0 U	5.0 U	6.2 U	6.3 U	6.6 U	5.0 U	5.0 U	--	4.1
Arsenic	EPA 6000/7000	mg/kg	1.9	--	2.5	2.3	2.7	2	6.2 U	6.3 U	6.6 U	4.8	3.9	--	7.0
Barium	EPA 6000/7000	mg/kg	43	--	45	52	51	14	--	--	--	51	120	--	8.3
Beryllium	EPA 6000/7000	mg/kg	0.50 U	--	0.50 U	0.50 U	0.50 U	0.50 U	0.62 U	0.63 U	0.66 U	0.50 U	0.50 U	--	3.5
Cadmium	EPA 6000/7000	mg/kg	0.20 U	--	0.20 U	0.20 U	0.20 U	0.20 U	0.62 U	0.63 U	0.66 U	0.38	0.20 U	--	1.0
Chromium III / Total	EPA 6000/7000	mg/kg	32	--	43	33	39	14	39	41	55	25	52	--	48
Chromium VI	EPA 6000/7000	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	18
Copper	EPA 6000/7000	mg/kg	18	--	15	16	17	11	22	28	33	36	38	--	36
Lead	EPA 6000/7000	mg/kg	2.8	--	2.5	2.7	2.8	1.7	19	44	5.5	36	11	--	50
Mercury	EPA 6000/7000	mg/kg	0.050 U	--	0.050 U	0.050 U	0.050 U	0.050 U	0.062 U	0.063 U	0.066 U	0.052	0.050 U	--	0.070
Nickel	EPA 6000/7000	mg/kg	37	--	41	42	47	8.2	44	51	60	28	96	--	48
Selenium	EPA 6000/7000	mg/kg	0.50 U	--	0.50 U	0.50 U	0.50 U	0.50 U	12 U	13 U	13 U	0.50 U	0.50 U	--	0.30

Table D-1
Remedial Investigation Chemical Analytical Results - Soil COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Sample Location ¹	Analytical Method	Units	B-16		B-17				MW-1			MW-2D			Soil Preliminary Cleanup Level ² (PCUL)
Sample Identification			B16-10-11	B16-17-18	B17-4-5	B17-8-9	B17-8-9Dup	B17-19-20	MW-1-(4-5)	MW-1-(7-8)	MW-1-(11-12)	MW2D-0.5-1.5	MW2D-4.5-5.5	MW2D-5.5-6.5	
Sample Date			01/07/14	01/07/14	01/09/14	01/09/14	01/09/14	01/09/14	10/29/09	10/29/09	10/29/09	12/17/13	12/17/13	12/17/13	
Sample Depth			10 - 11 ft	17 - 18 ft	4 - 5 ft	8 - 9 ft	8 - 9 ft	19 - 20 ft	4 - 5 ft	7 - 8 ft	11 - 12 ft	0.5 - 1.5 ft	4.5 - 5.5 ft	5.5 - 6.5 ft	
Stratigraphic Horizon			FI	OS	FO	FO	FO	AD	FO	FO	FI	FO	FO	FI	
Sampled By			GEI	GEI	GEI	GEI	GEI	GEI	Landau	Landau	Landau	GEI	GEI	GEI	
Silver	EPA 6000/7000	mg/kg	0.50 U	--	0.50 U	0.50 U	0.50 U	0.50 U	0.62 U	0.63 U	0.66 U	0.50 U	0.50 U	--	0.016
Thallium	EPA 6000/7000	mg/kg	0.25 U	--	0.25 U	0.25 U	0.25 U	0.25 U	6.2 U	6.3 U	6.6 U	0.25 U	0.25 U	--	0.0044
Tin	EPA 6000/7000	mg/kg	16	--	1.0 U	0.99 U	0.99 U	0.99 U	48	96	1.3 U	76	28	--	50
Zinc	EPA 6000/7000	mg/kg	35	--	30	33	33	21	52	77	62	69	74	--	85
Semi-Volatile Organic Compounds (SVOCs) - Polycyclic Aromatic Hydrocarbons (PAHs)															
Acenaphthene	EPA 8270/SIM	mg/kg	0.017	0.0067 U	0.0067 U	0.026	0.021	0.0067 U	0.015	0.13	0.0089 U	0.0067 U	0.0067 U	0.0067 U	0.028
Acenaphthylene	EPA 8270/SIM	mg/kg	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0082 U	0.0091	0.0089 U	0.0067 U	0.0067 U	0.0067 U	1.3
Anthracene	EPA 8270/SIM	mg/kg	0.012	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.01	0.0082 U	0.072	0.0089 U	0.0067 U	0.0067 U	0.0067 U	0.051
Benzo(a)anthracene	EPA 8270/SIM	mg/kg	0.02	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.016	0.0082 U	0.043	0.0089 U	0.0088	0.0067 U	0.0067 U	0.000057
Benzo(b)fluoranthene	EPA 8270/SIM	mg/kg	0.019	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.012	0.0082 U	0.023	0.0089 U	0.01	0.0067 U	0.0067 U	0.00020
Benzo(k)fluoranthene	EPA 8270/SIM	mg/kg	0.0073	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0082 U	0.0084 U	0.0089 U	0.0071	0.0067 U	0.0067 U	0.0020
Benzofluoranthenes (Total)	EPA 8270/SIM	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	3.2
Benzo(g,h,i)perylene	EPA 8270/SIM	mg/kg	0.012	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0072	0.0082 U	0.014	0.0089 U	0.0073	0.0067 U	0.0067 U	0.67
Benzo(a)pyrene	EPA 8270/SIM	mg/kg	0.017	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.013	0.0082 U	0.014	0.0089 U	0.0089	0.0067 U	0.0067 U	0.000016
Chrysene	EPA 8270/SIM	mg/kg	0.018	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.013	0.0082 U	0.034	0.0089 U	0.0095	0.0067 U	0.0067 U	0.0064
Dibenzo(a,h)anthracene	EPA 8270/SIM	mg/kg	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0082 U	0.0084 U	0.0089 U	0.0067 U	0.0067 U	0.0067 U	0.000029
Dibenzofuran	EPA 8270/SIM	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.041 U	0.087	0.044 U	0.017 U	0.017 U	0.017 U	0.54
Fluoranthene	EPA 8270/SIM	mg/kg	0.051	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.032	0.021	0.29	0.0089 U	0.017	0.0074	0.0067 U	0.090
Fluorene	EPA 8270/SIM	mg/kg	0.016	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0087	0.011	0.13	0.0089 U	0.0067 U	0.0067 U	0.0067 U	0.029
Indeno(1,2,3-c,d)pyrene	EPA 8270/SIM	mg/kg	0.0093	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0082 U	0.0085	0.0089 U	0.0067 U	0.0067 U	0.0067 U	0.00056
1-Methylnaphthalene	EPA 8270/SIM	mg/kg	0.0067 U	0.0067 U	0.0067 U	0.016	0.012	0.0067 U	0.0082 U	0.042	0.0089 U	0.0067 U	0.0067 U	0.0067 U	29
2-Methylnaphthalene	EPA 8270/SIM	mg/kg	0.0067	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067	0.0082 U	0.066	0.0089 U	0.0067 U	0.0067 U	0.0067 U	0.67
Naphthalene	EPA 8270/SIM	mg/kg	0.026	0.0067 U	0.0067 U	0.050 J	0.035 J	0.0067 U	0.0082 U	0.026	0.0089 U	0.0067 U	0.0067 U	0.0067 U	0.0021
Phenanthrene	EPA 8270/SIM	mg/kg	0.072	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.051	0.028	0.38	0.0089 U	0.0067 U	0.0067 U	0.0067 U	1.5
Pyrene	EPA 8270/SIM	mg/kg	0.041	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.035	0.019	0.18	0.0089 U	0.019	0.011	0.0067 U	0.14
Total cPAH TEQ ⁴ (ND=0)	EPA 8270/SIM	mg/kg	0.023	0 U	0 U	0 U	0 U	0.016	0 U	0.022	0 U	0.012	0 U	0 U	0.000016
Total cPAH TEQ ⁴ (ND=0.5RL)	EPA 8270/SIM	mg/kg	0.023	0.0051 U	0.0051 U	0.0051 U	0.0051 U	0.017	0.0062 U	0.023	0.0067 U	0.012	0.0051 U	0.0051 U	0.000016
Other SVOCs															
Aniline	EPA 8270	mg/kg	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.041 U	0.042 U	0.044 U	0.085 U	0.085 U	0.085 U	150
Benzidine	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.41 U	0.42 U	0.44 U	0.017 U	0.017 U	0.017 UJ	0.0037
Benzoic acid	EPA 8270	mg/kg	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	--	--	--	0.085 UJ	0.085 UJ	0.085 UJ	0.17
Benzyl alcohol	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.041 U	0.042 U	0.044 U	0.017 U	0.017 U	0.017 U	0.057
Bis(2-chloroethoxy)methane	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.041 U	0.042 U	0.044 U	0.017 U	0.017 U	0.017 U	NE
Bis(2-chloroethyl)ether	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.041 U	0.042 U	0.044 U	0.017 U	0.017 U	0.017 U	0.000022
Bis(2-chloroisopropyl)ether	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.041 U	0.042 U	0.044 U	0.017 U	0.017 U	0.017 U	3,200
Bis(2-ethylhexyl)phthalate	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.041 U	0.042	0.044 U	0.081	0.017 U	0.041	0.0051
4-Bromophenyl phenyl ether	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.041 U	0.042 U	0.044 U	0.017 U	0.017 U	0.017 U	NE
Butyl benzyl phthalate	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.041 U	0.042 U	0.044 U	0.017 U	0.072	0.017 U	0.00018
Carbazole	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.041 U	0.042 U	0.044 U	0.017 U	0.017 U	0.017 U	NE
4-Chloroaniline	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.041 U	0.042 U	0.044 U	0.017 U	0.017 U	0.017 U	0.81
4-Chloro-3-methylphenol	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.041 U	0.042 U	0.044 U	0.017 U	0.017 U	0.017 U	NE
2-Chloronaphthalene	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.041 U	0.042 U	0.044 U	0.017 U	0.017 U	0.017 U	6,400
2-Chlorophenol	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.041 U	0.042 U	0.044 U	0.017 U	0.017 U	0.017 U	0.011
4-Chlorophenyl phenyl ether	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.041 U	0.042 U	0.044 U	0.017 U	0.017 U	0.017 U	NE

Table D-1
Remedial Investigation Chemical Analytical Results - Soil COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Sample Location ¹	Analytical Method	Units	B-16		B-17				MW-1			MW-2D			Soil Preliminary Cleanup Level ² (PCUL)
Sample Identification			B16-10-11	B16-17-18	B17-4-5	B17-8-9	B17-8-9Dup	B17-19-20	MW-1-(4-5)	MW-1-(7-8)	MW-1-(11-12)	MW2D-0.5-1.5	MW2D-4.5-5.5	MW2D-5.5-6.5	
Sample Date			01/07/14	01/07/14	01/09/14	01/09/14	01/09/14	01/09/14	10/29/09	10/29/09	10/29/09	12/17/13	12/17/13	12/17/13	
Sample Depth			10 - 11 ft	17 - 18 ft	4 - 5 ft	8 - 9 ft	8 - 9 ft	19 - 20 ft	4 - 5 ft	7 - 8 ft	11 - 12 ft	0.5 - 1.5 ft	4.5 - 5.5 ft	5.5 - 6.5 ft	
Stratigraphic Horizon			FI	OS	FO	FO	FO	AD	FO	FO	FI	FO	FO	FI	
Sampled By			GEI	GEI	GEI	GEI	GEI	GEI	Landau	Landau	Landau	GEI	GEI	GEI	
Decane	EPA 8270	mg/kg	0.017 UJ	0.017 UJ	0.017 UJ	0.017 UJ	0.017 UJ	0.017 UJ	--	--	--	0.017 U	0.017 U	0.017 U	NE
Dibutyl phthalate	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.041 U	0.042 U	0.044 U	0.017 U	0.017 U	0.017 U	0.015
2,3-Dichloroaniline	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.041 U	0.042 U	0.044 U	0.017 U	0.017 U	0.017 U	NE
1,2-Dichlorobenzene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 UJ	0.0010 U	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0031
(o-Dichlorobenzene)	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.041 U	0.042 U	0.044 U	0.017 U	0.017 U	0.017 U	0.0031
1,3-Dichlorobenzene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 UJ	0.0010 U	--	--	--	0.0010 U	0.0010 U	0.0010 U	NE
(m-Dichlorobenzene)	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.041 U	0.042 U	0.044 U	0.017 U	0.017 U	0.017 U	NE
1,4-Dichlorobenzene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 UJ	0.0010 U	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0081
(p-Dichlorobenzene)	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.041 U	0.042 U	0.044 U	0.017 U	0.017 U	0.017 UJ	0.0081
3,3'-Dichlorobenzidine	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.41 U	0.42 U	0.44 U	0.017 U	0.017 U	0.017 U	0.0000033
2,4-Dichlorophenol	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.041 U	0.042 U	0.044 U	0.017 U	0.017 U	0.017 U	0.0043
Bis(2-ethylhexyl)ester	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.041 U	0.042 U	0.044 U	0.017 U	0.017 U	0.017 U	710
Diethyl phthalate	EPA 8270	mg/kg	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.041 U	0.042 U	0.044 U	0.085 U	0.085 U	0.085 U	0.034
Dimethyl phthalate	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.041 U	0.042 U	0.044 U	0.017 U	0.017 U	0.017 U	0.071
2,4-Dimethylphenol	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.041 U	0.042 U	0.044 U	0.017 U	0.017 U	0.017 U	0.0031
1,2-Dinitrobenzene	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.041 U	0.042 U	0.044 U	0.017 U	0.017 U	0.017 U	8.0
1,3-Dinitrobenzene	EPA 8270	mg/kg	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.041 U	0.042 U	0.044 U	0.085 U	0.085 U	0.085 UJ	8.0
1,4-Dinitrobenzene	EPA 8270	mg/kg	0.017 UJ	0.017 UJ	0.017 UJ	0.017 UJ	0.017 UJ	0.017 UJ	0.041 U	0.042 U	0.044 U	0.017 U	0.017 U	0.017 UJ	8.0
4,6-Dinitro-2-methylphenol	EPA 8270	mg/kg	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.21 U	0.21 U	0.22 U	0.085 UJ	0.085 UJ	0.085 UJ	NE
2,4-Dinitrophenol	EPA 8270	mg/kg	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.21 U	0.21 U	0.22 U	0.085 UJ	0.085 UJ	0.085 UJ	0.029
2,4-Dinitrotoluene	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.041 U	0.042 U	0.044 U	0.017 U	0.017 U	0.017 U	0.000069
2,6-Dinitrotoluene	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.041 U	0.042 U	0.044 U	0.017 U	0.017 U	0.017 U	0.11
Di-n-octyl phthalate	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.041 U	0.042 U	0.044 U	0.017 U	0.017 U	0.017 U	0.33
1,2-Diphenylhydrazine	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.041 U	0.042 U	0.044 U	0.017 U	0.017 U	0.017 U	1.1
Hexachlorobenzene	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.041 U	0.042 U	0.044 U	0.017 U	0.017 U	0.017 U	0.00000040
Hexachlorobutadiene	EPA 8260	mg/kg	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 UJ	0.0050 U	--	--	--	0.0050 U	0.0050 U	0.0050 U	0.00054
	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.041 U	0.042 U	0.044 U	0.017 U	0.017 U	0.017 U	0.00054
Hexachlorocyclopentadiene	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.09	0.042 U	0.044 U	0.017 U	0.017 U	0.017 U	0.20
Hexachloroethane	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.041 U	0.042 U	0.044 U	0.017 U	0.017 U	0.017 U	0.000041
Isophorone	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.041 U	0.042 U	0.044 U	0.017 U	0.017 U	0.017 U	0.037
2-Methylphenol (o-Cresol)	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.041 U	0.042 U	0.044 U	0.017 U	0.017 U	0.017 U	0.010
3 & 4 Methylphenol (m-, p-Cresol)	EPA 8270	mg/kg	0.019	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	--	--	--	0.017 U	0.017 U	0.017 U	4,000
2-Nitroaniline	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.041 U	0.042 U	0.044 U	0.017 U	0.017 U	0.017 U	800
3-Nitroaniline	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.041 U	0.042 U	0.044 U	0.017 U	0.017 U	0.017 U	NE
4-Nitroaniline	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.041 U	0.042 U	0.044 U	0.017 U	0.017 U	0.017 U	NE
Nitrobenzene	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.041 U	0.042 U	0.044 U	0.017 U	0.017 U	0.017 U	0.041
2-Nitrophenol	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.041 U	0.042 U	0.044 U	0.017 U	0.017 U	0.017 U	NE
4-Nitrophenol (p-Nitrophenol)	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.041 U	0.042 U	0.044 U	0.017 U	0.017 U	0.017 U	7.0
n-Nitrosodimethylamine	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.041 U	0.042 U	0.044 U	0.017 U	0.017 U	0.017 U	0.017
n-Nitrosodiphenylamine (as Diphenylamine)	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.041 U	0.042 U	0.044 U	0.017 U	0.017 U	0.017 U	0.0011
n-Nitrosodi-n-propylamine	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.041 U	0.042 U	0.044 U	0.017 U	0.017 U	0.017 U	0.000018
n-Octadecane	EPA 8270	mg/kg	0.017 UJ	0.017 UJ	0.017 UJ	0.017 UJ	0.017 UJ	0.017 UJ	--	--	--	0.017 UJ	0.017 UJ	0.017 UJ	NE
Pentachlorophenol	EPA 8270	mg/kg	0.083 UJ	0.083 UJ	0.083 UJ	0.083 UJ	0.083 UJ	0.083 UJ	0.21 U	0.21 U	0.22 U	0.083 UJ	0.083 UJ	0.083 UJ	0.0000018

Table D-1
Remedial Investigation Chemical Analytical Results - Soil COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Sample Location ¹	Analytical Method	Units	B-16		B-17				MW-1			MW-2D			Soil Preliminary Cleanup Level ² (PCUL)
Sample Identification			B16-10-11	B16-17-18	B17-4-5	B17-8-9	B17-8-9Dup	B17-19-20	MW-1-(4-5)	MW-1-(7-8)	MW-1-(11-12)	MW2D-0.5-1.5	MW2D-4.5-5.5	MW2D-5.5-6.5	
Sample Date			01/07/14	01/07/14	01/09/14	01/09/14	01/09/14	01/09/14	10/29/09	10/29/09	10/29/09	12/17/13	12/17/13	12/17/13	
Sample Depth			10 - 11 ft	17 - 18 ft	4 - 5 ft	8 - 9 ft	8 - 9 ft	19 - 20 ft	4 - 5 ft	7 - 8 ft	11 - 12 ft	0.5 - 1.5 ft	4.5 - 5.5 ft	5.5 - 6.5 ft	
Stratigraphic Horizon			FI	OS	FO	FO	FO	AD	FO	FO	FI	FO	FO	FI	
Sampled By			GEI	GEI	GEI	GEI	GEI	GEI	Landau	Landau	Landau	GEI	GEI	GEI	
Phenol	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.041 U	0.042 U	0.044 U	0.017 U	0.017 U	0.017 U	0.12
Pyridine	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.041 U	0.042 U	0.044 U	0.017 U	0.017 U	0.017 U	80
2,3,4,6-Tetrachlorophenol	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.041 U	0.042 U	0.044 U	0.017 U	0.017 U	0.017 U	490
2,3,5,6-Tetrachlorophenol	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.041 U	0.042 U	0.044 U	0.017 U	0.017 U	0.017 U	NE
1,2,4-Trichlorobenzene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 UJ	0.0010 U	–	–	–	0.0010 U	0.0010 U	0.0010 U	0.000072
	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.041 U	0.042 U	0.044 U	0.017 U	0.017 U	0.017 U	0.000072
2,4,5-Trichlorophenol	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.041 U	0.042 U	0.044 U	0.017 U	0.017 U	0.017 U	1.1
2,4,6-Trichlorophenol	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.041 U	0.042 U	0.044 U	0.017 U	0.017 U	0.017 U	0.00019
Volatile Organic Compounds (VOCs)															
Acetone	EPA 8260	mg/kg	0.042	0.059	0.009	0.0088	0.015 J	0.054	–	–	–	0.18	0.027	0.038	72,000
Benzene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 UJ	0.0010 U	–	–	–	0.0010 U	0.0010 U	0.0010 U	0.00056
Bromobenzene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 UJ	0.0010 U	–	–	–	0.0010 U	0.0010 U	0.0010 U	640
Bromochloromethane	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 UJ	0.0010 U	–	–	–	0.0010 U	0.0010 U	0.0010 U	NE
Bromoform (Tribromomethane)	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 UJ	0.0010 U	–	–	–	0.0010 U	0.0010 U	0.0010 U	0.0050
Bromomethane	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 UJ	0.0010 U	–	–	–	0.0010 U	0.0010 U	0.0010 U	0.079
n-Butylbenzene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 UJ	0.0010 U	–	–	–	0.0010 U	0.0010 U	0.0010 U	4,000
sec-Butylbenzene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 UJ	0.0010 U	–	–	–	0.0010 U	0.0010 U	0.0010 U	8,000
tert-Butylbenzene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 UJ	0.0010 U	–	–	–	0.0010 U	0.0010 U	0.0010 U	8,000
Carbon disulfide	EPA 8260	mg/kg	0.0058	0.0010 U	0.0010 U	0.0010 U	0.0010 UJ	0.0010 U	–	–	–	0.0014	0.0010 U	0.0010 U	8,000
Carbon tetrachloride	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 UJ	0.0010 U	–	–	–	0.0010 U	0.0010 U	0.0010 U	0.00015
Chlorobenzene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 UJ	0.0010 U	–	–	–	0.0010 U	0.0010 U	0.0010 U	0.10
Chloroethane	EPA 8260	mg/kg	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 UJ	0.0050 U	–	–	–	0.0050 U	0.0050 U	0.0050 U	NE
2-Chloroethyl vinyl ether	EPA 8260	mg/kg	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 UJ	0.0050 U	–	–	–	0.0050 U	0.0050 U	0.0050 U	NE
Chloroform	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 UJ	0.0010 U	–	–	–	0.0010 U	0.0010 U	0.0010 U	0.052
Chloromethane	EPA 8260	mg/kg	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 UJ	0.0050 U	–	–	–	0.0050 U	0.0050 U	0.0050 U	NE
2-Chlorotoluene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 UJ	0.0010 U	–	–	–	0.0010 U	0.0010 U	0.0010 U	1,600
4-Chlorotoluene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 UJ	0.0010 U	–	–	–	0.0010 U	0.0010 U	0.0010 U	NE
Dibromochloromethane	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 UJ	0.0010 U	–	–	–	0.0010 U	0.0010 U	0.0010 U	0.00077
1,2-Dibromo-3-chloropropane	EPA 8260	mg/kg	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 UJ	0.0050 U	–	–	–	0.0050 U	0.0050 U	0.0050 U	1.3
Dibromomethane	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 UJ	0.0010 U	–	–	–	0.0010 U	0.0010 U	0.0010 U	800
Bromodichloromethane (Dichlorobromomethane)	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 UJ	0.0010 U	–	–	–	0.0010 U	0.0010 U	0.0010 U	0.00096
Dichlorodifluoromethane (CFC-12)	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 UJ	0.0010 U	–	–	–	0.0010 U	0.0010 U	0.0010 U	16,000
1,1-Dichloroethane	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 UJ	0.0010 U	–	–	–	0.0010 U	0.0010 U	0.0010 U	180
1,2-Dichloroethane	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 UJ	0.0010 U	–	–	–	0.0010 U	0.0010 U	0.0010 U	0.024
1,1-Dichloroethene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 UJ	0.0010 U	–	–	–	0.0010 U	0.0010 U	0.0010 U	1.4
cis-1,2-Dichloroethene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 UJ	0.0010 U	–	–	–	0.0010 U	0.0010 U	0.0010 U	160
trans-1,2-Dichloroethene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 UJ	0.0010 U	–	–	–	0.0010 U	0.0010 U	0.0010 U	0.32
1,2-Dichloropropane	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 UJ	0.0010 U	–	–	–	0.0010 U	0.0010 U	0.0010 U	0.0010
1,3-Dichloropropane	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 UJ	0.0010 U	–	–	–	0.0010 U	0.0010 U	0.0010 U	NE
2,2-Dichloropropane	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 UJ	0.0010 U	–	–	–	0.0010 U	0.0010 U	0.0010 U	NE
1,1-Dichloropropene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 UJ	0.0010 U	–	–	–	0.0010 U	0.0010 U	0.0010 U	NE
cis-1,3-Dichloropropene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 UJ	0.0010 U	–	–	–	0.0010 U	0.0010 U	0.0010 U	0.00063

Table D-1
Remedial Investigation Chemical Analytical Results - Soil COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Sample Location ¹	Analytical Method	Units	B-16		B-17				MW-1			MW-2D			Soil Preliminary Cleanup Level ² (PCUL)
Sample Identification			B16-10-11	B16-17-18	B17-4-5	B17-8-9	B17-8-9Dup	B17-19-20	MW-1-(4-5)	MW-1-(7-8)	MW-1-(11-12)	MW2D-0.5-1.5	MW2D-4.5-5.5	MW2D-5.5-6.5	
Sample Date			01/07/14	01/07/14	01/09/14	01/09/14	01/09/14	01/09/14	10/29/09	10/29/09	10/29/09	12/17/13	12/17/13	12/17/13	
Sample Depth			10 - 11 ft	17 - 18 ft	4 - 5 ft	8 - 9 ft	8 - 9 ft	19 - 20 ft	4 - 5 ft	7 - 8 ft	11 - 12 ft	0.5 - 1.5 ft	4.5 - 5.5 ft	5.5 - 6.5 ft	
Stratigraphic Horizon			FI	OS	FO	FO	FO	AD	FO	FO	FI	FO	FO	FI	
Sampled By			GEI	GEI	GEI	GEI	GEI	GEI	Landau	Landau	Landau	GEI	GEI	GEI	
trans-1,3-Dichloropropene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 UJ	0.0010 U	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.00063
Ethylbenzene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 UJ	0.0010 U	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.015
1,2-Dibromoethane (EDB)	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 UJ	0.0010 U	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.50
2-Hexanone	EPA 8260	mg/kg	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 UJ	0.0050 U	--	--	--	0.0050 U	0.0050 U	0.0050 U	400
Isopropylbenzene (Cumene)	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 UJ	0.0010 U	--	--	--	0.0010 U	0.0010 U	0.0010 U	8,000
p-Isopropyltoluene	EPA 8260	mg/kg	0.037	0.0010 U	0.0010 U	0.0010 U	0.0010 UJ	0.0010 U	--	--	--	0.0032	0.0010 U	0.0010 U	NE
2-Butanone (MEK)	EPA 8260	mg/kg	0.0052	0.0085	0.0050 U	0.0050 U	0.0050 UJ	0.013	--	--	--	0.025	0.0050 U	0.0050 U	48,000
Methyl iodide (Iodomethane)	EPA 8260	mg/kg	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 UJ	0.0050 U	--	--	--	0.0050 U	0.0050 U	0.0050 U	NE
4-Methyl-2-pentanone (Methyl Isobutyl Ketone)	EPA 8260	mg/kg	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 UJ	0.0050 U	--	--	--	0.0050 U	0.0050 U	0.0050 U	6,400
Methyl tert-butyl ether (MTBE)	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 UJ	0.0010 U	--	--	--	0.0010 U	0.0010 U	0.0010 U	560
Methylene chloride	EPA 8260	mg/kg	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 UJ	0.0050 U	--	--	--	0.0050 U	0.0050 U	0.0050 U	0.030
n-Propylbenzene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 UJ	0.0010 U	--	--	--	0.0010 U	0.0010 U	0.0010 U	8,000
Styrene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 UJ	0.0010 U	--	--	--	0.0010 U	0.0010 U	0.0010 U	300
1,1,1,2-Tetrachloroethane	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 UJ	0.0010 U	--	--	--	0.0010 U	0.0010 U	0.0010 U	38
1,1,2,2-Tetrachloroethane	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 UJ	0.0010 U	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.00011
Tetrachloroethene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 UJ	0.0010 U	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0016
Toluene	EPA 8260	mg/kg	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 UJ	0.0050 U	--	--	--	0.0050 U	0.0050 U	0.0050 U	0.055
1,2,3-Trichlorobenzene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 UJ	0.0010 U	--	--	--	0.0010 U	0.0010 U	0.0010 U	20
1,1,1-Trichloroethane	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 UJ	0.0010 U	--	--	--	0.0010 U	0.0010 U	0.0010 U	21
1,1,2-Trichloroethane	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 UJ	0.0010 U	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.00033
Trichloroethene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 UJ	0.0010 U	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.00027
Trichlorofluoromethane (CFC-11)	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 UJ	0.0010 U	--	--	--	0.0010 U	0.0010 U	0.0010 U	24,000
1,2,3-Trichloropropane	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 UJ	0.0010 U	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.033
1,2,4-Trimethylbenzene	EPA 8260	mg/kg	0.0011	0.0010 U	0.0010 U	0.0010 U	0.0011 J	0.0010 U	--	--	--	0.0010 U	0.0010 U	0.0010 U	800
1,3,5-Trimethylbenzene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 UJ	0.0010 U	--	--	--	0.0010 U	0.0010 U	0.0010 U	800
Vinyl Acetate	EPA 8260	mg/kg	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 UJ	0.0050 U	--	--	--	0.0050 U	0.0050 U	0.0050 U	80,000
Vinyl Chloride	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 UJ	0.0010 U	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.000055
Xylene, m-,p-	EPA 8260	mg/kg	0.0020 U	0.0020 U	0.0020 U	0.0020 U	0.0020 UJ	0.0020 U	--	--	--	0.0020 U	0.0020 U	0.0020 U	16,000
Xylene, o-	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 UJ	0.0010 U	--	--	--	0.0010 U	0.0010 U	0.0010 U	16,000
Petroleum Hydrocarbons															
Gasoline-Range Hydrocarbons	NWTPH-G	mg/kg	5.0 U	5.0 U	--	--	--	--	4.4 U	4.7 U	5.7 U	2.9 U	4.4 U	5.0 U	30
Diesel-Range Hydrocarbons	NWTPH-Dx	mg/kg	17	15 U	--	--	--	--	31 U	32 U	33 U	15 U	16 U	16 U	260
Oil-Range Hydrocarbons	NWTPH-Dx	mg/kg	29 U	30 U	--	--	--	--	62 U	83	66 U	130	48	33 U	2,000
Total Diesel- and Oil-Range Hydrocarbons	NWTPH-Dx	mg/kg	17	30 U	--	--	--	--	62 U	83	66 U	130	48	33 U	260
Conventionals															
pH	N/A	N/A	11 J	8.6 J	8.4 J	8.6 J	8.6 J	8.2 J	--	--	--	8.2 J	7.9 J	8.4 J	NE

Table D-1

Remedial Investigation Chemical Analytical Results - Soil COPCs

Port of Seattle - North Terminal 115

Seattle, Washington

Notes:

- ¹ Sample locations are shown on Figures 3-1 and 3-3.
- ² Preliminary cleanup levels for soil are referenced from Table 4-1.
- ³ Total dioxin/furan Toxic Equivalency Quotients (TEQs) were calculated using United States Environmental Protection Agency (USEPA) Toxicity Equivalency Factor (TEF) values for human health (EPA 2003).
- ⁴ Total carcinogenic PAH (cPAH) TEQs were calculated using TEF values referenced from MTCA Table 708.2 (WAC 173-340-900).
- RL = Reporting limit
- EPA = Environmental Protection Agency
- mg/kg = milligram per kilogram
- NE = not established
- J = estimated result
- U = analyte not detected above the reporting limit
- = not analyzed
- AD = Native LDW alluvial deposit
- OS = Native organic silt (Aquitard) deposit
- FI = Initial (early 1900s) T115N fill deposit
- FD = Glacier NW Site dredged fill deposit
- FO = T115N operational (1960s) fill deposit
- FT = Terminal 115 fill deposit
- FP = Settling pond fill deposit
- COPC = Contaminant of Potential Concern
- KCHD = King County Health Department
- Landau = Landau Associates
- GEI = GeoEngineers
- ERM = Environmental Resources Management
- Shaw = Shaw Environmental & Infrastructure
- Bold** indicates analyte was detected.
- Yellow shading identifies the detected results greater than the preliminary cleanup level.
- Blue shading identifies the non-detected result greater than the preliminary cleanup level.

Table D-1
Remedial Investigation Chemical Analytical Results - Soil COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Sample Location ¹	Analytical Method	Units	MW-2D			MW-3			MW-4D						Soil Preliminary Cleanup Level ² (PCUL)
Sample Identification			MW2D-11.5-12.5	MW2D-13.5-14.5	MW2D-26-27	MW-3-(6.5-7)	MW-3-(10.5-11.5)	MW-3-(17-18)	MW4D-2-3	MW4D-7-8	MW4D-8-9	MW4D-8-9Dup	MW4D-10-11	MW4D-24-25	
Sample Date			12/17/13	12/17/13	12/17/13	10/29/09	10/29/09	10/29/09	12/19/13	12/19/13	12/19/13	12/19/13	12/19/13	12/19/13	
Sample Depth			11.5 - 12.5 ft	13.5 - 14.5 ft	26 - 27 ft	6.5 - 7 ft	10.5 -11.5 ft	17 - 18 ft	2 - 3 ft	7 - 8 ft	8 - 9 ft	8 - 9 ft	10 - 11 ft	24 - 25 ft	
Stratigraphic Horizon			FI	OS	AD	FO	FI	FI	FO	FO	FI	FI	OS	AD	
Sampled By	GEI	GEI	GEI	Landau	Landau	Landau	GEI	GEI	GEI	GEI	GEI	GEI	GEI		
Polychlorinated Biphenyls (PCBs)															
PCB-Aroclor 1016	EPA 8082	mg/kg	--	--	--	0.057 U	0.069 U	0.058 U	--	--	--	--	--	--	NE
PCB-Aroclor 1221	EPA 8082	mg/kg	--	--	--	0.057 U	0.069 U	0.058 U	--	--	--	--	--	--	NE
PCB-Aroclor 1232	EPA 8082	mg/kg	--	--	--	0.057 U	0.069 U	0.058 U	--	--	--	--	--	--	NE
PCB-Aroclor 1242	EPA 8082	mg/kg	--	--	--	0.057 U	0.069 U	0.058 U	--	--	--	--	--	--	NE
PCB-Aroclor 1248	EPA 8082	mg/kg	--	--	--	0.057 U	0.069 U	0.058 U	--	--	--	--	--	--	NE
PCB-Aroclor 1254	EPA 8082	mg/kg	--	--	--	0.057 U	0.069 U	0.058 U	--	--	--	--	--	--	NE
PCB-Aroclor 1260	EPA 8082	mg/kg	--	--	--	0.057 U	0.069 U	0.058 U	--	--	--	--	--	--	NE
Total PCB Aroclors	EPA 8082	mg/kg	--	--	--	0.057 U	0.069 U	0.058 U	--	--	--	--	--	--	0.0000022
Dioxins and Furans															
1,2,3,4,6,7,8-HpCDD	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,4,6,7,8-HpCDF	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,4,7,8,9-HpCDF	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,4,7,8-HxCDD	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,4,7,8-HxCDF	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,6,7,8-HxCDD	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,6,7,8-HxCDF	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,7,8,9-HxCDD	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,7,8,9-HxCDF	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,7,8-PeCDD	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,7,8-PeCDF	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
2,3,4,6,7,8-HxCDF	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
2,3,4,7,8-PeCDF	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
2,3,7,8-TCDD	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
2,3,7,8-TCDF	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
OCDD	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
OCDF	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
Total Dioxin/Furan TEQ ³ (ND=0.5RL)	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	0.0000052
Total Dioxin/Furan TEQ ³ (ND=0.5RL)	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	0.0000052
Metals															
Antimony	EPA 6000/7000	mg/kg	--	5.0 U	5.0 U	5.7 U	6.9 U	5.8 U	5.0 U	--	5.0 U	5.0 U	5.0 U	5.0 U	4.1
Arsenic	EPA 6000/7000	mg/kg	--	5.2	2	5.7 U	11	5.8 U	2.9	--	460 J	260 J	76	1.9	7.0
Barium	EPA 6000/7000	mg/kg	--	34	29	--	--	--	42	--	74	55	53	18	8.3
Beryllium	EPA 6000/7000	mg/kg	--	0.50 U	0.50 U	0.57 U	0.69 U	0.58 U	0.50 U	--	0.50 U	0.50 U	0.50 U	0.50 U	3.5
Cadmium	EPA 6000/7000	mg/kg	--	0.20 U	0.20 U	0.57 U	0.69 U	0.58 U	0.20 U	--	0.31	0.36	0.20 U	0.20 U	1.0
Chromium III / Total	EPA 6000/7000	mg/kg	--	19	11	38	55	42	37	--	42 J	29 J	26	10	48
Chromium VI	EPA 6000/7000	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	18
Copper	EPA 6000/7000	mg/kg	--	23	9.1	19	33	38	16	--	42	42	25	8.7	36
Lead	EPA 6000/7000	mg/kg	--	16	0.98	9.8	46	17	4.5	--	26	34	9.8	1.1	50
Mercury	EPA 6000/7000	mg/kg	--	0.050 U	0.050 U	0.057 U	0.086	0.058 U	0.050 U	--	0.075	0.084	0.056	0.050 U	0.070
Nickel	EPA 6000/7000	mg/kg	--	11	8.4	37	72	40	35	--	46	37	30	7.4	48
Selenium	EPA 6000/7000	mg/kg	--	0.57	0.50 U	11 U	14 U	12 U	0.50 U	--	0.50 U	0.50 U	0.50 U	0.50 U	0.30

Table D-1
Remedial Investigation Chemical Analytical Results - Soil COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Sample Location ¹	Analytical Method	Units	MW-2D			MW-3			MW-4D						Soil Preliminary Cleanup Level ² (PCUL)
Sample Identification			MW2D-11.5-12.5	MW2D-13.5-14.5	MW2D-26-27	MW-3-(6.5-7)	MW-3-(10.5-11.5)	MW-3-(17-18)	MW4D-2-3	MW4D-7-8	MW4D-8-9	MW4D-8-9Dup	MW4D-10-11	MW4D-24-25	
Sample Date			12/17/13	12/17/13	12/17/13	10/29/09	10/29/09	10/29/09	12/19/13	12/19/13	12/19/13	12/19/13	12/19/13	12/19/13	
Sample Depth			11.5 - 12.5 ft	13.5 - 14.5 ft	26 - 27 ft	6.5 - 7 ft	10.5 -11.5 ft	17 - 18 ft	2 - 3 ft	7 - 8 ft	8 - 9 ft	8 - 9 ft	10 - 11 ft	24 - 25 ft	
Stratigraphic Horizon			FI	OS	AD	FO	FI	FI	FO	FO	FI	FI	OS	AD	
Sampled By			GEI	GEI	GEI	Landau	Landau	Landau	GEI	GEI	GEI	GEI	GEI	GEI	
Silver	EPA 6000/7000	mg/kg	–	0.50 U	0.50 U	0.57 U	0.69 U	0.58 U	0.50 U	–	0.50 U	0.50 U	0.50 U	0.50 U	0.016
Thallium	EPA 6000/7000	mg/kg	–	0.25 U	0.25 U	5.7 U	6.9 U	5.8 U	0.25 U	–	0.25 U	0.25 U	0.25 U	0.25 U	0.0044
Tin	EPA 6000/7000	mg/kg	–	5.4	1.0 U	1.1 U	12	77	2.6	–	1.4	2.5	1.0 U	1.0 U	50
Zinc	EPA 6000/7000	mg/kg	–	27	23	34	83	52	33	–	74	62	36	21	85
Semi-Volatile Organic Compounds (SVOCs) - Polycyclic Aromatic Hydrocarbons (PAHs)															
Acenaphthene	EPA 8270/SIM	mg/kg	0.0067 U	0.0067 U	0.0067 U	0.18	0.0093 U	0.41	0.0067 U	0.0067 U	0.0067 U	0.018	0.0067 U	0.0067 U	0.028
Acenaphthylene	EPA 8270/SIM	mg/kg	0.0067 U	0.0067 U	0.0067 U	0.008 U	0.0093 U	0.0082 U	0.0023 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	1.3
Anthracene	EPA 8270/SIM	mg/kg	0.0067 U	0.0067 U	0.0067 U	0.008 U	0.0093 U	0.14	0.028	0.0067 U	0.014 J	0.058 J	0.0067 U	0.0067 U	0.051
Benzo(a)anthracene	EPA 8270/SIM	mg/kg	0.0067 U	0.0067 U	0.0067 U	–	0.0093 U	–	0.011	0.0098	0.028 J	0.11 J	0.0072	0.0067 U	0.000057
Benzo(b)fluoranthene	EPA 8270/SIM	mg/kg	0.0067 U	0.0067 U	0.0067 U	–	0.0093 U	–	0.0067 U	0.025 U	0.026 J	0.086 J	0.0067 U	0.0067 U	0.00020
Benzo(k)fluoranthene	EPA 8270/SIM	mg/kg	0.0067 U	0.0067 U	0.0067 U	–	0.0093 U	–	0.0067 U	0.025 U	0.017 J	0.066 J	0.0067 U	0.0067 U	0.0020
Benzofluoranthenes (Total)	EPA 8270/SIM	mg/kg	–	–	–	–	–	–	–	–	–	–	–	–	3.2
Benzo(g,h,i)perylene	EPA 8270/SIM	mg/kg	0.0067 U	0.0067 U	0.0067 U	0.008 U	0.0093 U	0.0082 U	0.0067 U	0.025 U	0.018 J	0.048 J	0.0067 U	0.0067 U	0.67
Benzo(a)pyrene	EPA 8270/SIM	mg/kg	0.0067 U	0.0067 U	0.0067 U	–	0.0093 U	–	0.0074	0.025 U	0.026 J	0.095 J	0.0069	0.0067 U	0.000016
Chrysene	EPA 8270/SIM	mg/kg	0.0067 U	0.0067 U	0.0067 U	–	0.0093 U	–	0.0093	0.021	0.028 J	0.095 J	0.0067 U	0.0067 U	0.0064
Dibenzo(a,h)anthracene	EPA 8270/SIM	mg/kg	0.0067 U	0.0067 U	0.0067 U	–	0.0093 U	–	0.0067 U	0.025 U	0.0067 UJ	0.028 UJ	0.0067 U	0.0067 U	0.000029
Dibenzofuran	EPA 8270/SIM	mg/kg	0.017 U	0.017 U	0.017 U	0.096	0.046 U	0.31	0.017 U	0.025 U	0.017 U	0.028 U	0.017 U	0.017 U	0.54
Fluoranthene	EPA 8270/SIM	mg/kg	0.0067 U	0.0067 U	0.0067 U	0.021	0.011	0.93	0.035	0.021	0.055 J	0.24 J	0.015	0.0067 U	0.090
Fluorene	EPA 8270/SIM	mg/kg	0.0067 U	0.0067 U	0.0067 U	0.099	0.0093 U	0.47	0.013	0.0094	0.0085 J	0.023 J	0.0067 U	0.0067 U	0.029
Indeno(1,2,3-c,d)pyrene	EPA 8270/SIM	mg/kg	0.0067 U	0.0067 U	0.0067 U	–	0.0093 U	–	0.0067 U	0.025 U	0.014 J	0.044 J	0.0067 U	0.0067 U	0.00056
1-Methylnaphthalene	EPA 8270/SIM	mg/kg	0.0067 U	0.0067 U	0.0067 U	0.11	0.0093 U	0.094	0.0067 U	0.0081	0.0067 U	0.0075	0.0067 U	0.0067 U	29
2-Methylnaphthalene	EPA 8270/SIM	mg/kg	0.0067 U	0.0067 U	0.0067 U	0.17	0.0093 U	0.2	0.0067 U	0.01	0.0067 U	0.0099	0.0067 U	0.0067 U	0.67
Naphthalene	EPA 8270/SIM	mg/kg	0.0067 U	0.0067 U	0.0067 U	0.28	0.0093 U	0.081	0.0067 U	0.012	0.0067 U	0.008	0.0067 U	0.0067 U	0.0021
Phenanthrene	EPA 8270/SIM	mg/kg	0.0067 U	0.0067 U	0.0067 U	0.098	0.01	1.5	0.086	0.029	0.057 J	0.18 J	0.011	0.0067 U	1.5
Pyrene	EPA 8270/SIM	mg/kg	0.0067 U	0.0067 U	0.0067 U	0.013	0.0093 U	0.52	0.031	0.03	0.049 J	0.27 J	0.017	0.0067 U	0.14
Total cPAH TEQ ⁴ (ND=0)	EPA 8270/SIM	mg/kg	0 U	0 U	0 U	–	0 U	–	0.0086	0.0012	0.035	0.13	0.0076	0 U	0.000016
Total cPAH TEQ ⁴ (ND=0.5RL)	EPA 8270/SIM	mg/kg	0.0051 U	0.0051 U	0.0051 U	–	0.0070 U	–	0.0099	0.019	0.035	0.13	0.009	0.0051 U	0.000016
Other SVOCs															
Aniline	EPA 8270	mg/kg	0.085 U	0.085 U	0.085 U	0.038 U	0.046 U	0.19 U	0.085 U	0.13 U	0.085 UJ	0.70 UJ	0.085 U	0.085 U	150
Benzidine	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.38 U	0.46 U	1.9 U	0.017 U	0.025 UJ	0.017 U	0.028 U	0.017 U	0.017 U	0.0037
Benzoic acid	EPA 8270	mg/kg	0.085 UJ	0.085 UJ	0.085 UJ	–	–	–	0.085 UJ	0.13 UJ	0.085 UJ	0.028 UJ	0.085 UJ	0.085 UJ	0.17
Benzyl alcohol	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.038 U	0.046 U	0.19 U	0.017 U	0.025 U	0.017 UJ	0.70 UJ	0.017 U	0.017 U	0.057
Bis(2-chloroethoxy)methane	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.038 U	0.046 U	0.19 U	0.017 U	0.025 U	0.017 UJ	0.14 UJ	0.017 U	0.017 U	NE
Bis(2-chloroethyl)ether	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.038 U	0.046 U	0.19 U	0.017 U	0.025 U	0.017 UJ	0.14 UJ	0.017 U	0.017 U	0.000022
Bis(2-chloroisopropyl)ether	EPA 8270	mg/kg	0.017 UJ	0.017 U	0.017 U	0.038 U	0.046 U	0.19 U	0.017 UJ	0.025 U	0.017 UJ	0.14 UJ	0.017 UJ	0.017 UJ	3,200
Bis(2-ethylhexyl)phthalate	EPA 8270	mg/kg	0.045	0.017	0.041	0.038 U	0.046 U	0.19 U	0.06	0.071	0.029	0.042	0.018	0.018	0.0051
4-Bromophenyl phenyl ether	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.038 U	0.046 U	0.19 U	0.017 U	0.025 U	0.017 U	0.028 U	0.017 U	0.017 U	NE
Butyl benzyl phthalate	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.038 U	0.046 U	0.19 U	0.017 U	0.025 U	0.017 U	0.028 U	0.017 U	0.017 U	0.00018
Carbazole	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.069	0.046 U	0.19 U	0.017 U	0.025 U	0.017 U	0.028 U	0.017 U	0.017 U	NE
4-Chloroaniline	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.038 U	0.046 U	0.19 U	0.017 U	0.025 U	0.017 UJ	0.70 UJ	0.017 U	0.017 U	0.81
4-Chloro-3-methylphenol	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.038 U	0.046 U	0.19 U	0.017 U	0.025 U	0.017 UJ	0.14 UJ	0.017 U	0.017 U	NE
2-Chloronaphthalene	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.038 U	0.046 U	0.19 U	0.017 U	0.025 U	0.017 UJ	0.14 UJ	0.017 U	0.017 U	6,400
2-Chlorophenol	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.038 U	0.046 U	0.19 U	0.017 U	0.025 U	0.017 UJ	0.14 UJ	0.017 U	0.017 U	0.011
4-Chlorophenyl phenyl ether	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.038 U	0.046 U	0.19 U	0.017 U	0.025 U	0.017 U	0.028 U	0.017 U	0.017 U	NE

Table D-1
Remedial Investigation Chemical Analytical Results - Soil COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Sample Location ¹	Analytical Method	Units	MW-2D			MW-3			MW-4D						Soil Preliminary Cleanup Level ² (PCUL)
Sample Identification			MW2D-11.5-12.5	MW2D-13.5-14.5	MW2D-26-27	MW-3-(6.5-7)	MW-3-(10.5-11.5)	MW-3-(17-18)	MW4D-2-3	MW4D-7-8	MW4D-8-9	MW4D-8-9Dup	MW4D-10-11	MW4D-24-25	
Sample Date			12/17/13	12/17/13	12/17/13	10/29/09	10/29/09	10/29/09	12/19/13	12/19/13	12/19/13	12/19/13	12/19/13	12/19/13	
Sample Depth			11.5 - 12.5 ft	13.5 - 14.5 ft	26 - 27 ft	6.5 - 7 ft	10.5 -11.5 ft	17 - 18 ft	2 - 3 ft	7 - 8 ft	8 - 9 ft	8 - 9 ft	10 - 11 ft	24 - 25 ft	
Stratigraphic Horizon			FI	OS	AD	FO	FI	FI	FO	FO	FI	FI	OS	AD	
Sampled By			GEI	GEI	GEI	Landau	Landau	Landau	GEI	GEI	GEI	GEI	GEI	GEI	
Decane	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	--	--	--	0.017 U	0.025 U	0.017 UJ	0.14 UJ	0.017 U	0.017 U	NE
Dibutyl phthalate	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.038 U	0.046 U	0.19 U	0.017 U	0.025 U	0.017 U	0.028 U	0.017 U	0.017 U	0.015
2,3-Dichloroaniline	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.038 U	0.046 U	0.19 U	0.017 U	0.025 U	0.017 UJ	0.14 UJ	0.017 U	0.017 U	NE
1,2-Dichlorobenzene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0031
(o-Dichlorobenzene)	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.038 U	0.046 U	0.19 U	0.017 U	0.025 U	0.017 UJ	0.14 UJ	0.017 U	0.017 U	0.0031
1,3-Dichlorobenzene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	NE
(m-Dichlorobenzene)	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.038 U	0.046 U	0.19 U	0.017 U	0.025 U	0.017 UJ	0.14 UJ	0.017 U	0.017 U	NE
1,4-Dichlorobenzene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0081
(p-Dichlorobenzene)	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.038 U	0.046 U	0.19 U	0.017 U	0.025 UJ	0.017 UJ	0.14 UJ	0.017 U	0.017 U	0.0081
3,3'-Dichlorobenzidine	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.38 U	0.46 U	1.9 U	0.017 U	0.025 U	0.017 U	0.028 U	0.017 U	0.017 U	0.0000033
2,4-Dichlorophenol	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.038 U	0.046 U	0.19 U	0.017 U	0.025 U	0.017 UJ	0.70 UJ	0.017 U	0.017 U	0.0043
Bis(2-ethylhexyl)ester	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.038 U	0.046 U	0.19 U	0.017 U	0.025 U	0.017 U	0.028 U	0.017 U	0.017 U	710
Diethyl phthalate	EPA 8270	mg/kg	0.085 U	0.085 U	0.085 U	0.038 U	0.046 U	0.19 U	0.085 U	0.13 U	0.085 U	0.028 U	0.085 U	0.085 U	0.034
Dimethyl phthalate	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.038 U	0.046 U	0.19 U	0.017 U	0.025 U	0.017 UJ	0.14 UJ	0.017 U	0.017 U	0.071
2,4-Dimethylphenol	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.038 U	0.046 U	0.19 U	0.017 U	0.025 U	0.017 UJ	0.14 UJ	0.017 U	0.017 U	0.0031
1,2-Dinitrobenzene	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.038 U	0.046 U	0.19 U	0.017 U	0.025 U	0.017 U	0.028 U	0.017 U	0.017 U	8.0
1,3-Dinitrobenzene	EPA 8270	mg/kg	0.085 U	0.085 U	0.085 U	0.038 U	0.046 U	0.19 U	0.085 U	0.13 UJ	0.085 U	0.14 U	0.085 U	0.085 U	8.0
1,4-Dinitrobenzene	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.038 U	0.046 U	0.19 U	0.017 U	0.025 UJ	0.017 UJ	0.14 UJ	0.017 U	0.017 U	8.0
4,6-Dinitro-2-methylphenol	EPA 8270	mg/kg	0.085 UJ	0.085 UJ	0.085 UJ	0.19 U	0.23 U	0.97 U	0.085 UJ	0.13 UJ	0.085 UJ	0.028 UJ	0.085 UJ	0.085 UJ	NE
2,4-Dinitrophenol	EPA 8270	mg/kg	0.085 UJ	0.085 UJ	0.085 UJ	0.19 U	0.23 U	0.97 U	0.085 UJ	0.13 UJ	0.085 UJ	0.028 UJ	0.085 UJ	0.085 UJ	0.029
2,4-Dinitrotoluene	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.038 U	0.046 U	0.19 U	0.017 U	0.025 U	0.017 U	0.028 U	0.017 U	0.017 U	0.000069
2,6-Dinitrotoluene	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.038 U	0.046 U	0.19 U	0.017 U	0.025 U	0.017 UJ	0.14 UJ	0.017 U	0.017 U	0.11
Di-n-octyl phthalate	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.038 U	0.046 U	0.19 U	0.017 U	0.025 U	0.017 U	0.028 U	0.017 U	0.017 U	0.33
1,2-Diphenylhydrazine	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.038 U	0.046 U	0.19 U	0.017 U	0.025 U	0.017 U	0.028 U	0.017 U	0.017 U	1.1
Hexachlorobenzene	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.038 U	0.046 U	0.19 U	0.017 U	0.025 U	0.017 U	0.028 U	0.017 U	0.017 U	0.00000040
Hexachlorobutadiene	EPA 8260	mg/kg	0.0050 U	0.0050 U	0.0050 U	--	--	--	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.00054
	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.038 U	0.046 U	0.19 U	0.017 U	0.025 U	0.017 UJ	0.017 UJ	0.14 UJ	0.017 U	0.00054
Hexachlorocyclopentadiene	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.084	0.1	0.42	0.017 U	0.025 U	0.017 UJ	0.14 UJ	0.017 U	0.017 U	0.20
Hexachloroethane	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.038 U	0.046 U	0.19 U	0.017 U	0.025 U	0.017 UJ	0.14 UJ	0.017 U	0.017 U	0.000041
Isophorone	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.038 U	0.046 U	0.19 U	0.017 U	0.025 U	0.017 UJ	0.14 UJ	0.017 U	0.017 U	0.037
2-Methylphenol (o-Cresol)	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.038 U	0.046 U	0.19 U	0.017 U	0.025 U	0.017 UJ	0.14 UJ	0.017 U	0.017 U	0.010
3 & 4 Methylphenol (m-, p-Cresol)	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	--	--	--	0.017 U	0.088	0.025 J	0.14 UJ	0.017 U	0.017 U	4,000
2-Nitroaniline	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.038 U	0.046 U	0.19 U	0.017 U	0.025 U	0.017 UJ	0.14 UJ	0.017 U	0.017 U	800
3-Nitroaniline	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.038 U	0.046 U	0.19 U	0.017 U	0.025 U	0.017 U	0.028 U	0.017 U	0.017 U	NE
4-Nitroaniline	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.038 U	0.046 U	0.19 U	0.017 U	0.025 U	0.017 U	0.028 U	0.017 U	0.017 U	NE
Nitrobenzene	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.038 U	0.046 U	0.19 U	0.017 U	0.025 U	0.017 UJ	0.14 UJ	0.017 U	0.017 U	0.041
2-Nitrophenol	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.038 U	0.046 U	0.19 U	0.017 U	0.025 U	0.017 UJ	0.14 UJ	0.017 U	0.017 U	NE
4-Nitrophenol (p-Nitrophenol)	EPA 8270	mg/kg	0.017 U	0.023	0.017 U	0.038 U	0.046 U	0.19 U	0.017 U	0.025 U	0.017 U	0.028 U	0.017 U	0.017 U	7.0
n-Nitrosodimethylamine	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.038 U	0.046 U	0.19 U	0.017 U	0.025 U	0.017 UJ	0.14 UJ	0.017 U	0.017 U	0.017
n-Nitrosodiphenylamine (as Diphenylamine)	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.038 U	0.046 U	0.19 U	0.017 U	0.025 U	0.017 U	0.028 U	0.017 U	0.017 U	0.0011
n-Nitrosodi-n-propylamine	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.038 U	0.046 U	0.19 U	0.017 U	0.025 U	0.017 UJ	0.14 UJ	0.017 U	0.017 U	0.000018
n-Octadecane	EPA 8270	mg/kg	0.017 UJ	0.017 UJ	0.017 UJ	--	--	--	0.040 J	0.025 UJ	0.017 UJ	0.028 UJ	0.017 UJ	0.017 UJ	NE
Pentachlorophenol	EPA 8270	mg/kg	0.083 UJ	0.083 UJ	0.083 UJ	0.19 U	0.23 U	0.97 U	0.083 UJ	0.13 UJ	0.083 UJ	0.028 UJ	0.083 UJ	0.083 UJ	0.0000018

Table D-1
Remedial Investigation Chemical Analytical Results - Soil COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Sample Location ¹	Analytical Method	Units	MW-2D			MW-3			MW-4D						Soil Preliminary Cleanup Level ² (PCUL)
Sample Identification			MW2D-11.5-12.5	MW2D-13.5-14.5	MW2D-26-27	MW-3-(6.5-7)	MW-3-(10.5-11.5)	MW-3-(17-18)	MW4D-2-3	MW4D-7-8	MW4D-8-9	MW4D-8-9Dup	MW4D-10-11	MW4D-24-25	
Sample Date			12/17/13	12/17/13	12/17/13	10/29/09	10/29/09	10/29/09	12/19/13	12/19/13	12/19/13	12/19/13	12/19/13	12/19/13	
Sample Depth			11.5 - 12.5 ft	13.5 - 14.5 ft	26 - 27 ft	6.5 - 7 ft	10.5 -11.5 ft	17 - 18 ft	2 - 3 ft	7 - 8 ft	8 - 9 ft	8 - 9 ft	10 - 11 ft	24 - 25 ft	
Stratigraphic Horizon			FI	OS	AD	FO	FI	FI	FO	FO	FI	FI	OS	AD	
Sampled By			GEI	GEI	GEI	Landau	Landau	Landau	GEI	GEI	GEI	GEI	GEI	GEI	
Phenol	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.038 U	0.046 U	0.19 U	0.017 U	0.025 U	0.017 UJ	0.14 UJ	0.017 U	0.017 U	0.12
Pyridine	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.038 U	0.046 U	0.19 U	0.017 U	0.025 U	0.017 UJ	1.4 UJ	0.017 U	0.017 U	80
2,3,4,6-Tetrachlorophenol	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.038 U	0.046 U	0.19 U	0.017 U	0.025 U	0.017 UJ	0.028 U	0.017 U	0.017 U	490
2,3,5,6-Tetrachlorophenol	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.038 U	0.046 U	0.19 U	0.017 U	0.025 U	0.017 U	0.028 U	0.017 U	0.017 U	NE
1,2,4-Trichlorobenzene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.000072
	EPA 8270	mg/kg	0.017 U	0.017 UJ	0.017 UJ	0.038 U	0.046 U	0.19 U	0.017 U	0.025 U	0.017 UJ	0.14 UJ	0.017 U	0.017 U	0.000072
2,4,5-Trichlorophenol	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.038 U	0.046 U	0.19 U	0.017 U	0.025 U	0.017 UJ	0.14 UJ	0.017 U	0.017 U	1.1
2,4,6-Trichlorophenol	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.038 U	0.046 U	0.19 U	0.017 U	0.025 U	0.017 UJ	0.14 UJ	0.017 U	0.017 U	0.00019
Volatile Organic Compounds (VOCs)															
Acetone	EPA 8260	mg/kg	0.029	0.36	0.011	--	--	--	0.047	0.13	0.14	0.18	0.15	0.012	72,000
Benzene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	--	--	--	0.024	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.00056
Bromobenzene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	640
Bromochloromethane	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	NE
Bromoform (Tribromomethane)	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0050
Bromomethane	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.079
n-Butylbenzene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	4,000
sec-Butylbenzene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	8,000
tert-Butylbenzene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	8,000
Carbon disulfide	EPA 8260	mg/kg	0.0010 U	0.0013	0.0010 U	--	--	--	0.0013	0.0019	0.0017	0.0022	0.0015	0.0010 U	8,000
Carbon tetrachloride	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.00015
Chlorobenzene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.10
Chloroethane	EPA 8260	mg/kg	0.0050 U	0.0050 U	0.0050 U	--	--	--	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	NE
2-Chloroethyl vinyl ether	EPA 8260	mg/kg	0.0050 U	0.0050 U	0.0050 U	--	--	--	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	NE
Chloroform	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.052
Chloromethane	EPA 8260	mg/kg	0.0050 U	0.0050 U	0.0050 U	--	--	--	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	NE
2-Chlorotoluene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	1,600
4-Chlorotoluene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	NE
Dibromochloromethane	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.00077
1,2-Dibromo-3-chloropropane	EPA 8260	mg/kg	0.0050 U	0.0050 U	0.0050 U	--	--	--	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	1.3
Dibromomethane	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	800
Bromodichloromethane (Dichlorobromomethane)	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.00096
Dichlorodifluoromethane (CFC-12)	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	16,000
1,1-Dichloroethane	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	180
1,2-Dichloroethane	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.024
1,1-Dichloroethene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	1.4
cis-1,2-Dichloroethene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	160
trans-1,2-Dichloroethene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.32
1,2-Dichloropropane	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010
1,3-Dichloropropane	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	NE
2,2-Dichloropropane	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	NE
1,1-Dichloropropene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	NE
cis-1,3-Dichloropropene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.00063

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Port of Seattle - North Terminal 115
Seattle, Washington

Sample Location ¹	Analytical Method	Units	MW-2D			MW-3			MW-4D						Soil Preliminary Cleanup Level ² (PCUL)
Sample Identification			MW2D-11.5-12.5	MW2D-13.5-14.5	MW2D-26-27	MW-3-(6.5-7)	MW-3-(10.5-11.5)	MW-3-(17-18)	MW4D-2-3	MW4D-7-8	MW4D-8-9	MW4D-8-9Dup	MW4D-10-11	MW4D-24-25	
Sample Date			12/17/13	12/17/13	12/17/13	10/29/09	10/29/09	10/29/09	12/19/13	12/19/13	12/19/13	12/19/13	12/19/13	12/19/13	
Sample Depth			11.5 - 12.5 ft	13.5 - 14.5 ft	26 - 27 ft	6.5 - 7 ft	10.5 -11.5 ft	17 - 18 ft	2 - 3 ft	7 - 8 ft	8 - 9 ft	8 - 9 ft	10 - 11 ft	24 - 25 ft	
Stratigraphic Horizon			FI	OS	AD	FO	FI	FI	FO	FO	FI	FI	OS	AD	
Sampled By			GEI	GEI	GEI	Landau	Landau	Landau	GEI	GEI	GEI	GEI	GEI	GEI	
trans-1,3-Dichloropropene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.00063
Ethylbenzene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.015
1,2-Dibromoethane (EDB)	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.50
2-Hexanone	EPA 8260	mg/kg	0.0050 U	0.0050 U	0.0050 U	--	--	--	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	400
Isopropylbenzene (Cumene)	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	8,000
p-Isopropyltoluene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	NE
2-Butanone (MEK)	EPA 8260	mg/kg	0.0050 U	0.05	0.0050 U	--	--	--	0.0078	0.029	0.034	0.046	0.04	0.0050 U	48,000
Methyl iodide (Iodomethane)	EPA 8260	mg/kg	0.0050 U	0.0050 U	0.0050 U	--	--	--	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	NE
4-Methyl-2-pentanone (Methyl Isobutyl Ketone)	EPA 8260	mg/kg	0.0050 U	0.0050 U	0.0050 U	--	--	--	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	6,400
Methyl tert-butyl ether (MTBE)	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	560
Methylene chloride	EPA 8260	mg/kg	0.0050 U	0.0050 U	0.0050 U	--	--	--	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.030
n-Propylbenzene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	8,000
Styrene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	300
1,1,1,2-Tetrachloroethane	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	38
1,1,2,2-Tetrachloroethane	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.00011
Tetrachloroethene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0016
Toluene	EPA 8260	mg/kg	0.0050 U	0.0050 U	0.0050 U	--	--	--	0.008	0.0072	0.0050 U	0.006	0.0050 U	0.0050 U	0.055
1,2,3-Trichlorobenzene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	20
1,1,1-Trichloroethane	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	21
1,1,2-Trichloroethane	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.00033
Trichloroethene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.00027
Trichlorofluoromethane (CFC-11)	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	24,000
1,2,3-Trichloropropane	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.033
1,2,4-Trimethylbenzene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	--	--	--	0.0010 U	0.003	0.0010 U	0.0023	0.0010 U	0.0010 U	800
1,3,5-Trimethylbenzene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	--	--	--	0.0010 U	0.0018	0.0010 U	0.0013	0.0010 U	0.0010 U	800
Vinyl Acetate	EPA 8260	mg/kg	0.0050 U	0.0050 U	0.0050 U	--	--	--	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	80,000
Vinyl Chloride	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.000055
Xylene, m-,p-	EPA 8260	mg/kg	0.0020 U	0.0020 U	0.0020 U	--	--	--	0.0020 U	0.0020 U	0.0020 U	0.0020 U	0.0020 U	0.0020 U	16,000
Xylene, o-	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	16,000
Petroleum Hydrocarbons															
Gasoline-Range Hydrocarbons	NWTPH-G	mg/kg	4.6 UJ	4.6 U	3.5 U	--	--	--	--	--	--	--	--	--	30
Diesel-Range Hydrocarbons	NWTPH-Dx	mg/kg	16 U	18 U	14 U	--	--	--	--	--	--	--	--	--	260
Oil-Range Hydrocarbons	NWTPH-Dx	mg/kg	33 U	79	29 U	--	--	--	--	--	--	--	--	--	2,000
Total Diesel- and Oil-Range Hydrocarbons	NWTPH-Dx	mg/kg	33 U	79	29 U	--	--	--	--	--	--	--	--	--	260
Conventionals															
pH	N/A	N/A	7.7 J	7.3 J	8.1 J	--	--	--	10 J	9.6 J	9.3 J	9.3 J	8.5 J	8.4 J	NE

Table D-1

Remedial Investigation Chemical Analytical Results - Soil COPCs

Port of Seattle - North Terminal 115

Seattle, Washington

Notes:

- ¹ Sample locations are shown on Figures 3-1 and 3-3.
- ² Preliminary cleanup levels for soil are referenced from Table 4-1.
- ³ Total dioxin/furan Toxic Equivalency Quotients (TEQs) were calculated using United States Environmental Protection Agency (USEPA) Toxicity Equivalency Factor (TEF) values for human health (EPA 2003).
- ⁴ Total carcinogenic PAH (cPAH) TEQs were calculated using TEF values referenced from MTCA Table 708.2 (WAC 173-340-900).
- RL = Reporting limit
- EPA = Environmental Protection Agency
- mg/kg = milligram per kilogram
- NE = not established
- J = estimated result
- U = analyte not detected above the reporting limit
- = not analyzed
- AD = Native LDW alluvial deposit
- OS = Native organic silt (Aquitard) deposit
- FI = Initial (early 1900s) T115N fill deposit
- FD = Glacier NW Site dredged fill deposit
- FO = T115N operational (1960s) fill deposit
- FT = Terminal 115 fill deposit
- FP = Settling pond fill deposit
- COPC = Contaminant of Potential Concern
- KCHD = King County Health Department
- Landau = Landau Associates
- GEI = GeoEngineers
- ERM = Environmental Resources Management
- Shaw = Shaw Environmental & Infrastructure
- Bold** indicates analyte was detected.
- Yellow shading identifies the detected results greater than the preliminary cleanup level.
- Blue shading identifies the non-detected result greater than the preliminary cleanup level.

Table D-1
Remedial Investigation Chemical Analytical Results - Soil COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Sample Location ¹	Analytical Method	Units	MW-5			MW-10		MW-10D					MW-11		Soil Preliminary Cleanup Level ² (PCUL)
Sample Identification			MW-5(4-5)	MW-5(10-11)	MW-5(16-17)	MW-10(3-8)	MW-10(10-12)	MW10D-2-3	MW10D-6.5-7.5	MW10D-17-18	MW10D-23-24	MW10D-28-29	MW11-1-2	MW11-3-4	
Sample Date			10/29/09	10/29/09	10/29/09	10/30/09	10/30/09	12/30/13	12/30/13	12/30/13	12/30/13	12/30/13	12/16/13	12/16/13	
Sample Depth			4 - 5 ft	10 - 11 ft	16 - 17 ft	3 - 8 ft	10 - 12 ft	2 - 3 ft	6.5 - 7.5 ft	17 - 18 ft	23 - 24 ft	28 - 29 ft	1 - 2 ft	3 - 4 ft	
Stratigraphic Horizon			FO	FO	FI	FO	FO	FO	FO	FO	AD	AD	FO	FO	
Sampled By	Landau	Landau	Landau	Landau	Landau	Landau	Landau	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI
Polychlorinated Biphenyls (PCBs)															
PCB-Aroclor 1016	EPA 8082	mg/kg	0.062 U	0.057 U	0.06 U	--	--	0.027 U	--	--	--	--	--	--	NE
PCB-Aroclor 1221	EPA 8082	mg/kg	0.062 U	0.057 U	0.06 U	--	--	0.027 U	--	--	--	--	--	--	NE
PCB-Aroclor 1232	EPA 8082	mg/kg	0.062 U	0.057 U	0.06 U	--	--	0.027 U	--	--	--	--	--	--	NE
PCB-Aroclor 1242	EPA 8082	mg/kg	0.062 U	0.057 U	0.06 U	--	--	0.027 U	--	--	--	--	--	--	NE
PCB-Aroclor 1248	EPA 8082	mg/kg	0.062 U	0.057 U	0.06 U	--	--	0.027 U	--	--	--	--	--	--	NE
PCB-Aroclor 1254	EPA 8082	mg/kg	0.062 U	0.057 U	0.06 U	--	--	0.027 U	--	--	--	--	--	--	NE
PCB-Aroclor 1260	EPA 8082	mg/kg	0.062 U	0.057 U	0.06 U	--	--	0.027 U	--	--	--	--	--	--	NE
Total PCB Aroclors	EPA 8082	mg/kg	0.062 U	0.057 U	0.060 U	--	--	0.027 U	--	--	--	--	--	--	0.0000022
Dioxins and Furans															
1,2,3,4,6,7,8-HpCDD	EPA 1613	mg/kg	--	--	--	--	--	0.000042	--	--	--	--	0.00000163 U	--	NE
1,2,3,4,6,7,8-HpCDF	EPA 1613	mg/kg	--	--	--	--	--	0.0000111	--	--	--	--	0.000000215 U	--	NE
1,2,3,4,7,8,9-HpCDF	EPA 1613	mg/kg	--	--	--	--	--	0.00000227 J	--	--	--	--	0.000000867 U	--	NE
1,2,3,4,7,8-HxCDD	EPA 1613	mg/kg	--	--	--	--	--	0.000000780 U	--	--	--	--	0.000000240 U	--	NE
1,2,3,4,7,8-HxCDF	EPA 1613	mg/kg	--	--	--	--	--	0.00000452	--	--	--	--	0.000000755 U	--	NE
1,2,3,6,7,8-HxCDD	EPA 1613	mg/kg	--	--	--	--	--	0.00000155 J	--	--	--	--	0.000000261 U	--	NE
1,2,3,6,7,8-HxCDF	EPA 1613	mg/kg	--	--	--	--	--	0.000000747 J	--	--	--	--	0.000000862 U	--	NE
1,2,3,7,8,9-HxCDD	EPA 1613	mg/kg	--	--	--	--	--	0.000000850 U	--	--	--	--	0.000000289 U	--	NE
1,2,3,7,8,9-HxCDF	EPA 1613	mg/kg	--	--	--	--	--	0.000000306 J	--	--	--	--	0.000000130 U	--	NE
1,2,3,7,8-PeCDD	EPA 1613	mg/kg	--	--	--	--	--	0.000000203 U	--	--	--	--	0.000000116 U	--	NE
1,2,3,7,8-PeCDF	EPA 1613	mg/kg	--	--	--	--	--	0.000000239 J	--	--	--	--	0.000000116 U	--	NE
2,3,4,6,7,8-HxCDF	EPA 1613	mg/kg	--	--	--	--	--	0.00000114 J	--	--	--	--	0.000000954 U	--	NE
2,3,4,7,8-PeCDF	EPA 1613	mg/kg	--	--	--	--	--	0.000000616 J	--	--	--	--	0.000000113 U	--	NE
2,3,7,8-TCDD	EPA 1613	mg/kg	--	--	--	--	--	0.000000233 J	--	--	--	--	0.000000190 U	--	NE
2,3,7,8-TCDF	EPA 1613	mg/kg	--	--	--	--	--	0.000000622 U	--	--	--	--	0.000000138 U	--	NE
OCDD	EPA 1613	mg/kg	--	--	--	--	--	0.00086	--	--	--	--	0.0000291 J	--	NE
OCDF	EPA 1613	mg/kg	--	--	--	--	--	0.0000387	--	--	--	--	0.000000550 U	--	NE
Total Dioxin/Furan TEQ ³ (ND=0.5RL)	EPA 1613	mg/kg	--	--	--	--	--	0.00000207	--	--	--	--	0.000000025	--	0.0000052
Total Dioxin/Furan TEQ ³ (ND=0.5RL)	EPA 1613	mg/kg	--	--	--	--	--	0.00000229	--	--	--	--	0.000000264	--	0.0000052
Metals															
Antimony	EPA 6000/7000	mg/kg	6.1 U	5.7 U	6 U	0.25	0.78	5.0 U	5.0 U	--	5.0 U	--	5.0 U	5.0 U	4.1
Arsenic	EPA 6000/7000	mg/kg	6.1 U	5.7 U	6 U	7.62	11.6	1.2	4.1	--	2.4	--	0.50 U	4.5	7.0
Barium	EPA 6000/7000	mg/kg	--	--	--	--	--	17	68	--	15	--	7.3	130	8.3
Beryllium	EPA 6000/7000	mg/kg	0.61 U	0.57 U	0.6 U	0.21	0.19	0.50 U	0.50 U	--	0.50 U	--	0.50 U	0.50 U	3.5
Cadmium	EPA 6000/7000	mg/kg	0.61 U	0.57 U	0.6 U	0.16	0.1 U	0.20 U	0.28	--	0.20 U	--	0.20 U	0.20 U	1.0
Chromium III / Total	EPA 6000/7000	mg/kg	55	34	34	31	28.1	16	40	--	9.2	--	10	57	48
Chromium VI	EPA 6000/7000	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	18
Copper	EPA 6000/7000	mg/kg	31	19	20	34.7	20.5	79	26	--	9	--	100	38	36
Lead	EPA 6000/7000	mg/kg	7.8	13	27	141	16.2	8.5	21	--	2.5	--	1.4	6	50
Mercury	EPA 6000/7000	mg/kg	0.061 U	0.057 U	0.06 U	0.0313	0.0217	0.050 U	0.051	--	0.050 U	--	0.050 U	0.050 U	0.070
Nickel	EPA 6000/7000	mg/kg	65	38	35	33	35.3	26	37	--	7.5	--	24	75	48
Selenium	EPA 6000/7000	mg/kg	12 U	11 U	12 U	0.5 U	0.5 U	0.50 U	0.50 U	--	0.50 U	--	0.50 U	0.50 U	0.30

Table D-1
Remedial Investigation Chemical Analytical Results - Soil COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Sample Location ¹	Analytical Method	Units	MW-5			MW-10		MW-10D					MW-11		Soil Preliminary Cleanup Level ² (PCUL)
Sample Identification			MW-5(4-5)	MW-5(10-11)	MW-5(16-17)	MW-10(3-8)	MW-10(10-12)	MW10D-2-3	MW10D-6.5-7.5	MW10D-17-18	MW10D-23-24	MW10D-28-29	MW11-1-2	MW11-3-4	
Sample Date			10/29/09	10/29/09	10/29/09	10/30/09	10/30/09	12/30/13	12/30/13	12/30/13	12/30/13	12/30/13	12/16/13	12/16/13	
Sample Depth			4 - 5 ft	10 - 11 ft	16 - 17 ft	3 - 8 ft	10 - 12 ft	2 - 3 ft	6.5 - 7.5 ft	17 - 18 ft	23 - 24 ft	28 - 29 ft	1 - 2 ft	3 - 4 ft	
Stratigraphic Horizon			FO	FO	FI	FO	FO	FO	FO	FO	AD	AD	FO	FO	
Sampled By			Landau	Landau	Landau	Landau	Landau	GEI	GEI	GEI	GEI	GEI	GEI	GEI	
Silver	EPA 6000/7000	mg/kg	0.61 U	0.57 U	0.6 U	0.1 U	0.1 U	0.50 U	0.50 U	--	0.50 U	--	0.50 U	0.50 U	0.016
Thallium	EPA 6000/7000	mg/kg	6.1 U	5.7 U	6 U	--	--	0.25 U	0.25 U	--	0.25 U	--	0.25 U	0.25 U	0.0044
Tin	EPA 6000/7000	mg/kg	7.7	28	170		--	52 J	110 J	--	16 J	--	2.9	1.0 U	50
Zinc	EPA 6000/7000	mg/kg	59	42	50	--	--	48	49	--	25	--	27	70	85
Semi-Volatile Organic Compounds (SVOCs) - Polycyclic Aromatic Hydrocarbons (PAHs)															
Acenaphthene	EPA 8270/SIM	mg/kg	0.0082 U	0.05	0.0099	--	--	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.61	0.028
Acenaphthylene	EPA 8270/SIM	mg/kg	0.0082 U	0.038 U	0.008 U	--	--	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.059	1.3
Anthracene	EPA 8270/SIM	mg/kg	0.0082 U	0.13	0.019	--	--	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.68	0.051
Benzo(a)anthracene	EPA 8270/SIM	mg/kg	0.0082 U	0.17	0.025	--	--	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.013	0.21	0.000057
Benzo(b)fluoranthene	EPA 8270/SIM	mg/kg	0.0082 U	0.16	0.028	--	--	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.022 U	0.083	0.00020
Benzo(k)fluoranthene	EPA 8270/SIM	mg/kg	0.0082 U	0.06	0.008 U	--	--	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.022 U	0.053	0.0020
Benzofluoranthenes (Total)	EPA 8270/SIM	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	3.2
Benzo(g,h,i)perylene	EPA 8270/SIM	mg/kg	0.0082 U	0.079	0.015	--	--	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.022 U	0.014	0.67
Benzo(a)pyrene	EPA 8270/SIM	mg/kg	0.0082 U	0.14	0.023	--	--	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.022 U	0.065	0.000016
Chrysene	EPA 8270/SIM	mg/kg	0.0082 U	0.16	0.027	--	--	0.0067 U	0.015	0.0067 U	0.0067 U	0.0067 U	0.053	0.17	0.0064
Dibenzo(a,h)anthracene	EPA 8270/SIM	mg/kg	0.0082 U	0.038 U	0.008 U	--	--	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.022 U	0.0067 U	0.000029
Dibenzofuran	EPA 8270/SIM	mg/kg	0.041 U	0.038 U	0.04 U	--	--	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.022 U	0.31	0.54
Fluoranthene	EPA 8270/SIM	mg/kg	0.0082 U	0.46	0.087	--	--	0.0067 U	0.018	0.0067 U	0.0067 U	0.0067 U	0.0067 U	1.1	0.090
Fluorene	EPA 8270/SIM	mg/kg	0.0082 U	0.06	0.011	--	--	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.58	0.029
Indeno(1,2,3-c,d)pyrene	EPA 8270/SIM	mg/kg	0.0082 U	0.074	0.011	--	--	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.022 U	0.015	0.00056
1-Methylnaphthalene	EPA 8270/SIM	mg/kg	0.0082 U	0.038 U	0.008 U	--	--	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0097	0.28	29
2-Methylnaphthalene	EPA 8270/SIM	mg/kg	0.0082 U	0.038 U	0.008 U	--	--	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.017	0.61	0.67
Naphthalene	EPA 8270/SIM	mg/kg	0.0082 U	0.038 U	0.008 U	--	--	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.059	0.0021
Phenanthrene	EPA 8270/SIM	mg/kg	0.0082 U	0.53	0.1	--	--	0.0067 U	0.0075	0.011	0.0067 U	0.0067 U	0.016	2	1.5
Pyrene	EPA 8270/SIM	mg/kg	0.0082 U	0.37	0.086	--	--	0.0067 U	0.0067 U	0.0077	0.0067 U	0.0067 U	0.017	0.76	0.14
Total cPAH TEQ ⁴ (ND=0)	EPA 8270/SIM	mg/kg	0 U	0.19	0.03	--	--	0 U	0.00015	0 U	0 U	0 U	0.0018	0.103	0.000016
Total cPAH TEQ ⁴ (ND=0.5RL)	EPA 8270/SIM	mg/kg	0.0062 U	0.19	0.03	--	--	0.0051 U	0.0052	0.0051 U	0.0051 U	0.0051 U	0.017	0.1	0.000016
Other SVOCs															
Aniline	EPA 8270	mg/kg	0.041 U	0.038 U	0.04 U	--	--	0.085 U	0.085 U	0.085 U	0.085 U	0.085	0.11 U	0.085 U	150
Benzidine	EPA 8270	mg/kg	0.41 U	0.38 U	0.4 U	--	--	0.017 U	0.017 UJ	0.017 U	0.017 U	0.017	0.022 U	0.017 U	0.0037
Benzoic acid	EPA 8270	mg/kg	--	--	--	--	--	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.11 UJ	0.085 UJ	0.17
Benzyl alcohol	EPA 8270	mg/kg	0.041 U	0.038 U	0.04 U	--	--	0.017 U	0.017 U	0.017 U	0.017 U	0.017	0.022 U	0.017 U	0.057
Bis(2-chloroethoxy)methane	EPA 8270	mg/kg	0.041 U	0.038 U	0.04 U	--	--	0.017 U	0.017 U	0.017 U	0.017 U	0.017	0.022 U	0.017 U	NE
Bis(2-chloroethyl)ether	EPA 8270	mg/kg	0.041 U	0.038 U	0.04 U	--	--	0.017 U	0.017 U	0.017 U	0.017 U	0.017	0.022 U	0.017 U	0.000022
Bis(2-chloroisopropyl)ether	EPA 8270	mg/kg	0.041 U	0.038 U	0.04 U	--	--	0.017 U	0.017 UJ	0.017 U	0.017 U	0.017	0.022 U	0.017 U	3,200
Bis(2-ethylhexyl)phthalate	EPA 8270	mg/kg	0.041 U	0.038 U	0.04 U	--	--	0.04	0.017 U	0.017 U	0.017 U	0.017	0.022 U	0.017 U	0.0051
4-Bromophenyl phenyl ether	EPA 8270	mg/kg	0.041 U	0.038 U	0.04 U	--	--	0.017 U	0.017 U	0.017 U	0.017 U	0.017	0.022 U	0.017 U	NE
Butyl benzyl phthalate	EPA 8270	mg/kg	0.041 U	0.038 U	0.04 U	--	--	0.017 U	0.017 U	0.017 U	0.017 U	0.017	0.022 U	0.017 U	0.00018
Carbazole	EPA 8270	mg/kg	0.041 U	0.052	0.04 U	--	--	0.017 U	0.017 U	0.017 U	0.017 U	0.017	0.022 U	0.23	NE
4-Chloroaniline	EPA 8270	mg/kg	0.041 U	0.038 U	0.04 U	--	--	0.017 U	0.017 U	0.017 U	0.017 U	0.017	0.022 U	0.017 U	0.81
4-Chloro-3-methylphenol	EPA 8270	mg/kg	0.041 U	0.038 U	0.04 U	--	--	0.017 U	0.017 U	0.017 U	0.017 U	0.017	0.022 U	0.017 U	NE
2-Chloronaphthalene	EPA 8270	mg/kg	0.041 U	0.038 U	0.04 U	--	--	0.017 U	0.017 U	0.017 U	0.017 U	0.017	0.022 U	0.017 U	6,400
2-Chlorophenol	EPA 8270	mg/kg	0.041 U	0.038 U	0.04 U	--	--	0.017 U	0.017 U	0.017 U	0.017 U	0.017	0.022 U	0.017 U	0.011
4-Chlorophenyl phenyl ether	EPA 8270	mg/kg	0.041 U	0.038 U	0.04 U	--	--	0.017 U	0.017 U	0.017 U	0.017 U	0.017	0.022 U	0.017 U	NE

Table D-1
Remedial Investigation Chemical Analytical Results - Soil COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Sample Location ¹	Analytical Method	Units	MW-5			MW-10		MW-10D					MW-11		Soil Preliminary Cleanup Level ² (PCUL)
Sample Identification			MW-5-(4-5)	MW-5-(10-11)	MW-5-(16-17)	MW-10-(3-8)	MW-10-(10-12)	MW10D-2-3	MW10D-6.5-7.5	MW10D-17-18	MW10D-23-24	MW10D-28-29	MW11-1-2	MW11-3-4	
Sample Date			10/29/09	10/29/09	10/29/09	10/30/09	10/30/09	12/30/13	12/30/13	12/30/13	12/30/13	12/30/13	12/16/13	12/16/13	
Sample Depth			4 - 5 ft	10 - 11 ft	16 - 17 ft	3 - 8 ft	10 - 12 ft	2 - 3 ft	6.5 - 7.5 ft	17 - 18 ft	23 - 24 ft	28 - 29 ft	1 - 2 ft	3 - 4 ft	
Stratigraphic Horizon			FO	FO	FI	FO	FO	FO	FO	FO	AD	AD	FO	FO	
Sampled By			Landau	Landau	Landau	Landau	Landau	GEI	GEI	GEI	GEI	GEI	GEI	GEI	
Decane	EPA 8270	mg/kg	--	--	--	--	--	0.017 UJ	0.017 UJ	0.017 UJ	0.017 UJ	0.017 UJ	0.022 U	0.017 U	NE
Dibutyl phthalate	EPA 8270	mg/kg	0.041 U	0.038 U	0.04 U	--	--	0.017 U	0.017 U	0.017 U	0.017 U	0.017	0.022 U	0.017 U	0.015
2,3-Dichloroaniline	EPA 8270	mg/kg	0.041 U	0.038 U	0.04 U	--	--	0.017 U	0.017 U	0.017 U	0.017 U	0.017	0.022 U	0.017 U	NE
1,2-Dichlorobenzene	EPA 8260	mg/kg	--	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 UJ	0.0010 UJ	0.0010 UJ	0.0010 U	0.0031
(o-Dichlorobenzene)	EPA 8270	mg/kg	0.041 U	0.038 U	0.04 U	--	--	0.017 U	0.017 U	0.017 U	0.017 U	0.017	0.022 U	0.017 U	0.0031
1,3-Dichlorobenzene	EPA 8260	mg/kg	--	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 UJ	0.0010 UJ	0.0010 UJ	0.0010 U	NE
(m-Dichlorobenzene)	EPA 8270	mg/kg	0.041 U	0.038 U	0.04 U	--	--	0.017 U	0.017 U	0.017 U	0.017 U	0.017	0.022 U	0.017 U	NE
1,4-Dichlorobenzene	EPA 8260	mg/kg	--	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 UJ	0.0010 UJ	0.0010 UJ	0.0010 U	0.0081
(p-Dichlorobenzene)	EPA 8270	mg/kg	0.041 U	0.038 U	0.04 U	--	--	0.017 U	0.017 UJ	0.017 U	0.017 U	0.017	0.022 U	0.017 U	0.0081
3,3'-Dichlorobenzidine	EPA 8270	mg/kg	0.41 U	0.38 U	0.4 U	--	--	0.017 U	0.017 U	0.017 U	0.017 U	0.017	0.022 U	0.017 U	0.0000033
2,4-Dichlorophenol	EPA 8270	mg/kg	0.041 U	0.038 U	0.04 U	--	--	0.017 U	0.017 U	0.017 U	0.017 U	0.017	0.022 U	0.017 U	0.0043
Bis(2-ethylhexyl)ester	EPA 8270	mg/kg	0.041 U	0.038 U	0.04 U	--	--	0.017 U	0.017 UJ	0.017 U	0.017 U	0.017	0.022 U	0.017 U	710
Diethyl phthalate	EPA 8270	mg/kg	0.041 U	0.038 U	0.04 U	--	--	0.085 U	0.085 U	0.085 U	0.085 U	0.085	0.11 U	0.085 U	0.034
Dimethyl phthalate	EPA 8270	mg/kg	0.041 U	0.038 U	0.04 U	--	--	0.017 U	0.017 U	0.017 U	0.017 U	0.017	0.022 U	0.017 U	0.071
2,4-Dimethylphenol	EPA 8270	mg/kg	0.041 U	0.038 U	0.04 U	--	--	0.017 U	0.017 U	0.017 U	0.017 U	0.017	0.022 U	0.017 U	0.0031
1,2-Dinitrobenzene	EPA 8270	mg/kg	0.041 U	0.038 U	0.04 U	--	--	0.017 U	0.017 U	0.017 U	0.017 U	0.017	0.022 U	0.017 U	8.0
1,3-Dinitrobenzene	EPA 8270	mg/kg	0.041 U	0.038 U	0.04 U	--	--	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.11 U	0.085 U	8.0
1,4-Dinitrobenzene	EPA 8270	mg/kg	0.041 U	0.038 U	0.04 U	--	--	0.017 UJ	0.017 UJ	0.017 UJ	0.017 UJ	0.017 UJ	0.022 U	0.017 U	8.0
4,6-Dinitro-2-methylphenol	EPA 8270	mg/kg	0.21 U	0.19 U	0.2 U	--	--	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.11 UJ	0.085 UJ	NE
2,4-Dinitrophenol	EPA 8270	mg/kg	0.21 U	0.19 U	0.2 U	--	--	0.085 UJ	0.085 UJ	0.0010 U	0.0010 U	0.085 UJ	0.11 UJ	0.085 UJ	0.029
2,4-Dinitrotoluene	EPA 8270	mg/kg	0.041 U	0.038 U	0.04 U	--	--	0.017 U	0.017 U	0.017 U	0.017 U	0.017	0.022 U	0.017 U	0.000069
2,6-Dinitrotoluene	EPA 8270	mg/kg	0.041 U	0.038 U	0.04 U	--	--	0.017 U	0.017 U	0.017 U	0.017 U	0.017	0.022 U	0.017 U	0.11
Di-n-octyl phthalate	EPA 8270	mg/kg	0.041 U	0.038 U	0.04 U	--	--	0.017 U	0.017 U	0.017 U	0.017 U	0.017	0.022 U	0.017 U	0.33
1,2-Diphenylhydrazine	EPA 8270	mg/kg	0.041 U	0.038 U	0.04 U	--	--	0.017 U	0.017 U	0.017 U	0.017 U	0.017	0.022 U	0.017 U	1.1
Hexachlorobenzene	EPA 8270	mg/kg	0.041 U	0.038 U	0.04 U	--	--	0.017 U	0.017 U	0.017 U	0.017 U	0.017	0.022 U	0.017 U	0.00000040
Hexachlorobutadiene	EPA 8260	mg/kg	--	--	--	--	--	0.0050 U	0.0050 U	0.0050 U	0.0050 UJ	0.0050 UJ	0.0050 UJ	0.0050 U	0.00054
	EPA 8270	mg/kg	0.041 U	0.038 U	0.04 U	--	--	0.017 U	0.017 U	0.017 U	0.017 U	0.0050 UJ	0.0050 UJ	0.0050 U	0.00054
Hexachlorocyclopentadiene	EPA 8270	mg/kg	0.09	0.038 U	0.088	--	--	0.017 U	0.017 U	0.017 U	0.017 U	0.017	0.022 U	0.017 U	0.20
Hexachloroethane	EPA 8270	mg/kg	0.041 U	0.038 U	0.04 U	--	--	0.017 U	0.017 U	0.017 U	0.017 U	0.017	0.022 U	0.017 U	0.000041
Isophorone	EPA 8270	mg/kg	0.041 U	0.038 U	0.04 U	--	--	0.017 U	0.017 U	0.017 U	0.017 U	0.017	0.022 U	0.017 U	0.037
2-Methylphenol (o-Cresol)	EPA 8270	mg/kg	0.041 U	0.038 U	0.04 U	--	--	0.017 U	0.017 U	0.017 U	0.017 U	0.017	0.022 U	0.017 U	0.010
3 & 4 Methylphenol (m-, p-Cresol)	EPA 8270	mg/kg	--	--	--	--	--	0.017 U	0.017 U	0.04	0.017 U	0.017	0.022 U	0.017 U	4,000
2-Nitroaniline	EPA 8270	mg/kg	0.041 U	0.038 U	0.04 U	--	--	0.017 U	0.017 U	0.017 U	0.017 U	0.017	0.022 U	0.017 U	800
3-Nitroaniline	EPA 8270	mg/kg	0.041 U	0.038 U	0.04 U	--	--	0.017 U	0.017 U	0.017 U	0.017 U	0.017	0.022 U	0.017 U	NE
4-Nitroaniline	EPA 8270	mg/kg	0.041 U	0.038 U	0.04 U	--	--	0.017 U	0.017 U	0.017 U	0.017 U	0.017	0.022 U	0.017 U	NE
Nitrobenzene	EPA 8270	mg/kg	0.041 U	0.038 U	0.04 U	--	--	0.017 U	0.017 U	0.017 U	0.017 U	0.017	0.022 U	0.017 U	0.041
2-Nitrophenol	EPA 8270	mg/kg	0.041 U	0.038 U	0.04 U	--	--	0.017 U	0.017 U	0.017 U	0.017 U	0.017	0.022 U	0.017 U	NE
4-Nitrophenol (p-Nitrophenol)	EPA 8270	mg/kg	0.041 U	0.038 U	0.04 U	--	--	0.017 U	0.017 UJ	0.017 U	0.017 U	0.017	0.022 U	0.017 U	7.0
n-Nitrosodimethylamine	EPA 8270	mg/kg	0.041 U	0.038 U	0.04 U	--	--	0.017 U	0.017 U	0.017 U	0.017 U	0.017	0.022 U	0.017 U	0.017
n-Nitrosodiphenylamine (as Diphenylamine)	EPA 8270	mg/kg	0.041 U	0.038 U	0.04 U	--	--	0.017 U	0.017 U	0.017 U	0.017 U	0.017	0.022 U	0.017 U	0.0011
n-Nitrosodi-n-propylamine	EPA 8270	mg/kg	0.041 U	0.038 U	0.04 U	--	--	0.017 U	0.017 U	0.017 U	0.017 U	0.017	0.022 U	0.017 U	0.000018
n-Octadecane	EPA 8270	mg/kg	--	--	--	--	--	0.017 UJ	0.017 UJ	0.055 J	0.017 UJ	0.017 UJ	0.022 UJ	0.017 UJ	NE
Pentachlorophenol	EPA 8270	mg/kg	0.21 U	0.19 U	0.2 U	--	--	0.083 UJ	0.083 UJ	0.083 UJ	0.083 UJ	0.083 UJ	0.11 UJ	0.083 UJ	0.0000018

Table D-1
Remedial Investigation Chemical Analytical Results - Soil COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Sample Location ¹	Analytical Method	Units	MW-5			MW-10		MW-10D					MW-11		Soil Preliminary Cleanup Level ² (PCUL)
Sample Identification			MW-5(4-5)	MW-5(10-11)	MW-5(16-17)	MW-10(3-8)	MW-10(10-12)	MW10D-2-3	MW10D-6.5-7.5	MW10D-17-18	MW10D-23-24	MW10D-28-29	MW11-1-2	MW11-3-4	
Sample Date			10/29/09	10/29/09	10/29/09	10/30/09	10/30/09	12/30/13	12/30/13	12/30/13	12/30/13	12/30/13	12/16/13	12/16/13	
Sample Depth			4 - 5 ft	10 - 11 ft	16 - 17 ft	3 - 8 ft	10 - 12 ft	2 - 3 ft	6.5 - 7.5 ft	17 - 18 ft	23 - 24 ft	28 - 29 ft	1 - 2 ft	3 - 4 ft	
Stratigraphic Horizon			FO	FO	FI	FO	FO	FO	FO	FO	AD	AD	FO	FO	
Sampled By			Landau	Landau	Landau	Landau	Landau	GEI	GEI	GEI	GEI	GEI	GEI	GEI	
Phenol	EPA 8270	mg/kg	0.041 U	0.038 U	0.04 U	--	--	0.017 U	0.017 U	0.017 U	0.017 U	0.017	0.022 U	0.017 U	0.12
Pyridine	EPA 8270	mg/kg	0.041 U	0.038 U	0.04 U	--	--	0.017 U	0.017 U	0.017 U	0.017 U	0.017	0.022 U	0.017 U	80
2,3,4,6-Tetrachlorophenol	EPA 8270	mg/kg	0.041 U	0.038 U	0.04 U	--	--	0.017 U	0.017 U	0.017 U	0.017 U	0.017	0.022 U	0.017 U	490
2,3,5,6-Tetrachlorophenol	EPA 8270	mg/kg	0.041 U	0.038 U	0.04 U	--	--	0.017 U	0.017 U	0.017 U	0.017 U	0.017	0.022 U	0.017 U	NE
1,2,4-Trichlorobenzene	EPA 8260	mg/kg	--	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 UJ	0.0010 UJ	0.0010 UJ	0.0010 U	0.000072
	EPA 8270	mg/kg	0.041 U	0.038 U	0.04 U	--	--	0.017 U	0.017 U	0.017 U	0.017 U	0.017	0.022 U	0.017 U	0.000072
2,4,5-Trichlorophenol	EPA 8270	mg/kg	0.041 U	0.038 U	0.04 U	--	--	0.017 U	0.017 U	0.017 U	0.017 U	0.017	0.022 U	0.017 U	1.1
2,4,6-Trichlorophenol	EPA 8270	mg/kg	0.041 U	0.038 U	0.04 U	--	--	0.017 U	0.017 U	0.017 U	0.017 U	0.017	0.022 U	0.017 U	0.00019
Volatile Organic Compounds (VOCs)															
Acetone	EPA 8260	mg/kg	--	--	--	--	--	0.0050 U	0.025	0.031	0.027 J	0.025 J	0.003	0.0050 U	72,000
Benzene	EPA 8260	mg/kg	--	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 UJ	0.0010 UJ	0.0011	0.0010 U	0.00056
Bromobenzene	EPA 8260	mg/kg	--	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 UJ	0.0010 UJ	0.0010 UJ	0.0010 U	640
Bromochloromethane	EPA 8260	mg/kg	--	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 UJ	0.0010 UJ	0.0010 U	0.0010 U	NE
Bromoform (Tribromomethane)	EPA 8260	mg/kg	--	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 UJ	0.0010 UJ	0.0010 U	0.0010 U	0.0050
Bromomethane	EPA 8260	mg/kg	--	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 UJ	0.0010 UJ	0.0010 U	0.0010 U	0.079
n-Butylbenzene	EPA 8260	mg/kg	--	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 UJ	0.0010 UJ	0.0010 UJ	0.0010 U	4,000
sec-Butylbenzene	EPA 8260	mg/kg	--	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 UJ	0.0010 UJ	0.0010 UJ	0.0010 U	8,000
tert-Butylbenzene	EPA 8260	mg/kg	--	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 UJ	0.0010 UJ	0.0010 UJ	0.0010 U	8,000
Carbon disulfide	EPA 8260	mg/kg	--	--	--	--	--	0.0010 U	0.0019	0.002	0.0010 UJ	0.0013 J	0.0010 U	0.0010 U	8,000
Carbon tetrachloride	EPA 8260	mg/kg	--	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 UJ	0.0010 UJ	0.0010 U	0.0010 U	0.00015
Chlorobenzene	EPA 8260	mg/kg	--	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 UJ	0.0010 UJ	0.0010 U	0.0010 U	0.10
Chloroethane	EPA 8260	mg/kg	--	--	--	--	--	0.0050 U	0.0050 U	0.0050 U	0.0050 UJ	0.0050 UJ	0.0050 U	0.0050 U	NE
2-Chloroethyl vinyl ether	EPA 8260	mg/kg	--	--	--	--	--	0.0050 U	0.0050 U	0.0050 U	0.0050 UJ	0.0050 UJ	0.0050 U	0.0050 U	NE
Chloroform	EPA 8260	mg/kg	--	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 UJ	0.0010 UJ	0.0010 U	0.0010 U	0.052
Chloromethane	EPA 8260	mg/kg	--	--	--	--	--	0.0050 U	0.0050 U	0.0050 U	0.0050 UJ	0.0050 UJ	0.0050 U	0.0050 U	NE
2-Chlorotoluene	EPA 8260	mg/kg	--	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 UJ	0.0010 UJ	0.0010 UJ	0.0010 U	1,600
4-Chlorotoluene	EPA 8260	mg/kg	--	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 UJ	0.0010 UJ	0.0010 UJ	0.0010 U	NE
Dibromochloromethane	EPA 8260	mg/kg	--	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 UJ	0.0010 UJ	0.0010 U	0.0010 U	0.00077
1,2-Dibromo-3-chloropropane	EPA 8260	mg/kg	--	--	--	--	--	0.0050 U	0.0050 U	0.0050 U	0.0050 UJ	0.0050 UJ	0.0050 UJ	0.0050 U	1.3
Dibromomethane	EPA 8260	mg/kg	--	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 UJ	0.0010 UJ	0.0010 U	0.0010 U	800
Bromodichloromethane (Dichlorobromomethane)	EPA 8260	mg/kg	--	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 UJ	0.0010 UJ	0.0010 U	0.0010 U	0.00096
Dichlorodifluoromethane (CFC-12)	EPA 8260	mg/kg	--	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 UJ	0.0010 UJ	0.0010 U	0.0010 U	16,000
1,1-Dichloroethane	EPA 8260	mg/kg	--	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 UJ	0.0010 UJ	0.0010 U	0.0010 U	180
1,2-Dichloroethane	EPA 8260	mg/kg	--	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 UJ	0.0010 UJ	0.0010 U	0.0010 U	0.024
1,1-Dichloroethene	EPA 8260	mg/kg	--	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 UJ	0.0010 UJ	0.0010 U	0.0010 U	1.4
cis-1,2-Dichloroethene	EPA 8260	mg/kg	--	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 UJ	0.0010 UJ	0.0010 U	0.0010 U	160
trans-1,2-Dichloroethene	EPA 8260	mg/kg	--	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 UJ	0.0010 UJ	0.0010 U	0.0010 U	0.32
1,2-Dichloropropane	EPA 8260	mg/kg	--	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 UJ	0.0010 UJ	0.0010 U	0.0010 U	0.0010
1,3-Dichloropropane	EPA 8260	mg/kg	--	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 UJ	0.0010 UJ	0.0010 U	0.0010 U	NE
2,2-Dichloropropane	EPA 8260	mg/kg	--	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 UJ	0.0010 UJ	0.0010 U	0.0010 U	NE
1,1-Dichloropropene	EPA 8260	mg/kg	--	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 UJ	0.0010 UJ	0.0010 U	0.0010 U	NE
cis-1,3-Dichloropropene	EPA 8260	mg/kg	--	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 UJ	0.0010 UJ	0.0010 U	0.0010 U	0.00063

Table D-1
Remedial Investigation Chemical Analytical Results - Soil COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Sample Location ¹	Analytical Method	Units	MW-5			MW-10		MW-10D					MW-11		Soil Preliminary Cleanup Level ² (PCUL)
Sample Identification			MW-5-(4-5)	MW-5-(10-11)	MW-5-(16-17)	MW-10-(3-8)	MW-10-(10-12)	MW10D-2-3	MW10D-6.5-7.5	MW10D-17-18	MW10D-23-24	MW10D-28-29	MW11-1-2	MW11-3-4	
Sample Date			10/29/09	10/29/09	10/29/09	10/30/09	10/30/09	12/30/13	12/30/13	12/30/13	12/30/13	12/30/13	12/16/13	12/16/13	
Sample Depth			4 - 5 ft	10 - 11 ft	16 - 17 ft	3 - 8 ft	10 - 12 ft	2 - 3 ft	6.5 - 7.5 ft	17 - 18 ft	23 - 24 ft	28 - 29 ft	1 - 2 ft	3 - 4 ft	
Stratigraphic Horizon			FO	FO	FI	FO	FO	FO	FO	FO	AD	AD	FO	FO	
Sampled By			Landau	Landau	Landau	Landau	Landau	GEI	GEI	GEI	GEI	GEI	GEI	GEI	
trans-1,3-Dichloropropene	EPA 8260	mg/kg	--	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 UJ	0.0010 UJ	0.0010 U	0.0010 U	0.00063
Ethylbenzene	EPA 8260	mg/kg	--	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 UJ	0.0010 UJ	0.0010 U	0.0010 U	0.015
1,2-Dibromoethane (EDB)	EPA 8260	mg/kg	--	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 UJ	0.0010 UJ	0.0010 U	0.0010 U	0.50
2-Hexanone	EPA 8260	mg/kg	--	--	--	--	--	0.0050 U	0.0050 U	0.0050 U	0.0050 UJ	0.0050 UJ	0.0050 U	0.0050 U	400
Isopropylbenzene (Cumene)	EPA 8260	mg/kg	--	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 UJ	0.0010 UJ	0.0010 U	0.0010 U	8,000
p-Isopropyltoluene	EPA 8260	mg/kg	--	--	--	--	--	0.0010 U	0.0010 U	0.0014	0.0010 UJ	0.0010 UJ	0.0010 UJ	0.0010 U	NE
2-Butanone (MEK)	EPA 8260	mg/kg	--	--	--	--	--	0.0050 U	0.0050 U	0.0050 U	0.0050 UJ	0.0050 UJ	0.0050 U	0.0050 U	48,000
Methyl iodide (Iodomethane)	EPA 8260	mg/kg	--	--	--	--	--	0.0050 U	0.0050 UJ	0.0050 U	0.0050 UJ	0.0050 UJ	0.0050 U	0.0050 U	NE
4-Methyl-2-pentanone (Methyl Isobutyl Ketone)	EPA 8260	mg/kg	--	--	--	--	--	0.0050 U	0.0050 U	0.0050 U	0.0050 UJ	0.0050 UJ	0.0050 U	0.0050 U	6,400
Methyl tert-butyl ether (MTBE)	EPA 8260	mg/kg	--	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 UJ	0.0010 UJ	0.0010 U	0.0010 U	560
Methylene chloride	EPA 8260	mg/kg	--	--	--	--	--	0.0050 U	0.0050 U	0.0050 U	0.0068 J	0.0074 J	0.0050 U	0.0050 U	0.030
n-Propylbenzene	EPA 8260	mg/kg	--	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 UJ	0.0010 UJ	0.0010 UJ	0.0010 U	8,000
Styrene	EPA 8260	mg/kg	--	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 UJ	0.0010 UJ	0.0010 U	0.0010 U	300
1,1,1,2-Tetrachloroethane	EPA 8260	mg/kg	--	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 UJ	0.0010 UJ	0.0010 U	0.0010 U	38
1,1,2,2-Tetrachloroethane	EPA 8260	mg/kg	--	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 UJ	0.0010 UJ	0.0010 UJ	0.0010 U	0.00011
Tetrachloroethene	EPA 8260	mg/kg	--	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 UJ	0.0010 UJ	0.0010 U	0.0010 U	0.0016
Toluene	EPA 8260	mg/kg	--	--	--	--	--	0.0050 U	0.0050 U	0.0050 U	0.0050 UJ	0.0050 UJ	0.0050 U	0.0050 U	0.055
1,2,3-Trichlorobenzene	EPA 8260	mg/kg	--	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 UJ	0.0010 UJ	0.0010 UJ	0.0010 U	20
1,1,1-Trichloroethane	EPA 8260	mg/kg	--	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 UJ	0.0010 UJ	0.0010 U	0.0010 U	21
1,1,2-Trichloroethane	EPA 8260	mg/kg	--	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 UJ	0.0010 UJ	0.0010 U	0.0010 U	0.00033
Trichloroethene	EPA 8260	mg/kg	--	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 UJ	0.0010 UJ	0.0010 U	0.0010 U	0.00027
Trichlorofluoromethane (CFC-11)	EPA 8260	mg/kg	--	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 UJ	0.0010 UJ	0.0010 U	0.0010 U	24,000
1,2,3-Trichloropropane	EPA 8260	mg/kg	--	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 UJ	0.0010 UJ	0.0010 UJ	0.0010 U	0.033
1,2,4-Trimethylbenzene	EPA 8260	mg/kg	--	--	--	--	--	0.0010 U	0.0012	0.0010 U	0.0010 UJ	0.0010 UJ	0.0010 UJ	0.0010 U	800
1,3,5-Trimethylbenzene	EPA 8260	mg/kg	--	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 UJ	0.0010 UJ	0.0010 UJ	0.0010 U	800
Vinyl Acetate	EPA 8260	mg/kg	--	--	--	--	--	0.0050 U	0.0050 U	0.0050 U	0.0050 UJ	0.0050 UJ	0.0050 U	0.0050 U	80,000
Vinyl Chloride	EPA 8260	mg/kg	--	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 UJ	0.0010 UJ	0.0010 U	0.0010 U	0.000055
Xylene, m-,p-	EPA 8260	mg/kg	--	--	--	--	--	0.0020 U	0.0020 U	0.0020 U	0.0020 UJ	0.0020 UJ	0.0020 U	0.0020 U	16,000
Xylene, o-	EPA 8260	mg/kg	--	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 UJ	0.0010 UJ	0.0010 U	0.0010 U	16,000
Petroleum Hydrocarbons															
Gasoline-Range Hydrocarbons	NWTPH-G	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	30
Diesel-Range Hydrocarbons	NWTPH-Dx	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	260
Oil-Range Hydrocarbons	NWTPH-Dx	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	2,000
Total Diesel- and Oil-Range Hydrocarbons	NWTPH-Dx	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	260
Conventionals															
pH	N/A	N/A	--	--	--	--	--	9.1 J	11 J	10 J	8.9 J	9.0 J	8.3 J	7.9 J	NE

Table D-1

Remedial Investigation Chemical Analytical Results - Soil COPCs

Port of Seattle - North Terminal 115

Seattle, Washington

Notes:

- ¹ Sample locations are shown on Figures 3-1 and 3-3.
- ² Preliminary cleanup levels for soil are referenced from Table 4-1.
- ³ Total dioxin/furan Toxic Equivalency Quotients (TEQs) were calculated using United States Environmental Protection Agency (USEPA) Toxicity Equivalency Factor (TEF) values for human health (EPA 2003).
- ⁴ Total carcinogenic PAH (cPAH) TEQs were calculated using TEF values referenced from MTCA Table 708.2 (WAC 173-340-900).
- RL = Reporting limit
- EPA = Environmental Protection Agency
- mg/kg = milligram per kilogram
- NE = not established
- J = estimated result
- U = analyte not detected above the reporting limit
- = not analyzed
- AD = Native LDW alluvial deposit
- OS = Native organic silt (Aquitard) deposit
- FI = Initial (early 1900s) T115N fill deposit
- FD = Glacier NW Site dredged fill deposit
- FO = T115N operational (1960s) fill deposit
- FT = Terminal 115 fill deposit
- FP = Settling pond fill deposit
- COPC = Contaminant of Potential Concern
- KCHD = King County Health Department
- Landau = Landau Associates
- GEI = GeoEngineers
- ERM = Environmental Resources Management
- Shaw = Shaw Environmental & Infrastructure
- Bold** indicates analyte was detected.
- Yellow shading identifies the detected results greater than the preliminary cleanup level.
- Blue shading identifies the non-detected result greater than the preliminary cleanup level.

Table D-1
Remedial Investigation Chemical Analytical Results - Soil COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Sample Location ¹	Analytical Method	Units	MW-11			MW-12				MW-13					Soil Preliminary Cleanup Level ² (PCUL)
Sample Identification			MW11-9-10	MW11-13-14	MW11-13-14Dup	MW12-4-5	MW12-8-9	MW12-8-9Dup	MW12-11-12	MW13-1-2	MW13-5-6	MW13-7-8	MW13-9-10	MW13-11-12	
Sample Date			12/16/13	12/16/13	12/16/13	12/30/13	12/30/13	12/30/13	12/30/13	12/18/13	12/18/13	12/18/13	12/18/13	12/18/13	
Sample Depth			9 - 10 ft	13 - 14 ft	13 - 14 ft	4 - 5 ft	8 - 9 ft	8 - 9 ft	11 - 12 ft	1 - 2 ft	5 - 6 ft	7 - 8 ft	9 - 10 ft	11 - 12 ft	
Stratigraphic Horizon			FI	OS	OS	FO	FO	FO	OS	FO	FO	FI	FI	OS	
Sampled By			GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	
Polychlorinated Biphenyls (PCBs)															
PCB-Aroclor 1016	EPA 8082	mg/kg	--	--	--	--	--	--	--	--	0.028 U	--	--	--	NE
PCB-Aroclor 1221	EPA 8082	mg/kg	--	--	--	--	--	--	--	--	0.028 U	--	--	--	NE
PCB-Aroclor 1232	EPA 8082	mg/kg	--	--	--	--	--	--	--	--	0.028 U	--	--	--	NE
PCB-Aroclor 1242	EPA 8082	mg/kg	--	--	--	--	--	--	--	--	0.028 U	--	--	--	NE
PCB-Aroclor 1248	EPA 8082	mg/kg	--	--	--	--	--	--	--	--	0.028 U	--	--	--	NE
PCB-Aroclor 1254	EPA 8082	mg/kg	--	--	--	--	--	--	--	--	0.028 U	--	--	--	NE
PCB-Aroclor 1260	EPA 8082	mg/kg	--	--	--	--	--	--	--	--	0.028 U	--	--	--	NE
Total PCB Aroclors	EPA 8082	mg/kg	--	--	--	--	--	--	--	--	0.028 U	--	--	--	0.0000022
Dioxins and Furans															
1,2,3,4,6,7,8-HpCDD	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	0.00000919	--	--	--	NE
1,2,3,4,6,7,8-HpCDF	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	0.00000188 J	--	--	--	NE
1,2,3,4,7,8,9-HpCDF	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	0.000000403 U	--	--	--	NE
1,2,3,4,7,8-HxCDD	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	0.000000479 U	--	--	--	NE
1,2,3,4,7,8-HxCDF	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	0.000000890 J	--	--	--	NE
1,2,3,6,7,8-HxCDD	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	0.000000566 U	--	--	--	NE
1,2,3,6,7,8-HxCDF	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	0.000000188 U	--	--	--	NE
1,2,3,7,8,9-HxCDD	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	0.000000539 U	--	--	--	NE
1,2,3,7,8,9-HxCDF	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	0.000000194 U	--	--	--	NE
1,2,3,7,8-PeCDD	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	0.000000296 J	--	--	--	NE
1,2,3,7,8-PeCDF	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	0.000000174 U	--	--	--	NE
2,3,4,6,7,8-HxCDF	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	0.000000238 U	--	--	--	NE
2,3,4,7,8-PeCDF	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	0.000000254 U	--	--	--	NE
2,3,7,8-TCDD	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	0.000000268	--	--	--	NE
2,3,7,8-TCDF	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	0.000000156 U	--	--	--	NE
OCDD	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	0.000184	--	--	--	NE
OCDF	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	0.00000517	--	--	--	NE
Total Dioxin/Furan TEQ ³ (ND=0.5RL)	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	0.00000323	--	--	--	0.0000052
Total Dioxin/Furan TEQ ³ (ND=0.5RL)	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	0.00000339	--	--	--	0.0000052
Metals															
Antimony	EPA 6000/7000	mg/kg	--	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	--	4.1
Arsenic	EPA 6000/7000	mg/kg	--	11	11	1.8	2.3	3.1	11	3.2	0.72	2.6	5.2	--	7.0
Barium	EPA 6000/7000	mg/kg	--	56	50	18	32	38	24	30	18	82	120	--	8.3
Beryllium	EPA 6000/7000	mg/kg	--	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	--	3.5
Cadmium	EPA 6000/7000	mg/kg	--	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	--	1.0
Chromium III / Total	EPA 6000/7000	mg/kg	--	24	25	9.6	16	18	18	26	26	120	50	--	48
Chromium VI	EPA 6000/7000	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	18
Copper	EPA 6000/7000	mg/kg	--	35	37	16	12	17	27	40	86	28	34	--	36
Lead	EPA 6000/7000	mg/kg	--	5	6	2.2	2.7	2.8	5	22	39	3.8	7.8	--	50
Mercury	EPA 6000/7000	mg/kg	--	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	--	0.070
Nickel	EPA 6000/7000	mg/kg	--	19	16	8.4	20	22	12	35	39	68	56	--	48
Selenium	EPA 6000/7000	mg/kg	--	1.1	1.5	0.50 U	0.50 U	0.50 U	0.58	0.50 U	0.50 U	0.72	0.59	--	0.30

Table D-1
Remedial Investigation Chemical Analytical Results - Soil COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Sample Location ¹	Analytical Method	Units	MW-11			MW-12				MW-13					Soil Preliminary Cleanup Level ² (PCUL)
Sample Identification			MW11-9-10	MW11-13-14	MW11-13-14Dup	MW12-4-5	MW12-8-9	MW12-8-9Dup	MW12-11-12	MW13-1-2	MW13-5-6	MW13-7-8	MW13-9-10	MW13-11-12	
Sample Date			12/16/13	12/16/13	12/16/13	12/30/13	12/30/13	12/30/13	12/30/13	12/18/13	12/18/13	12/18/13	12/18/13	12/18/13	
Sample Depth			9 - 10 ft	13 - 14 ft	13 - 14 ft	4 - 5 ft	8 - 9 ft	8 - 9 ft	11 - 12 ft	1 - 2 ft	5 - 6 ft	7 - 8 ft	9 - 10 ft	11 - 12 ft	
Stratigraphic Horizon			FI	OS	OS	FO	FO	FO	OS	FO	FO	FI	FI	OS	
Sampled By			GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	
Silver	EPA 6000/7000	mg/kg	–	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	–	0.016
Thallium	EPA 6000/7000	mg/kg	–	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	–	0.0044
Tin	EPA 6000/7000	mg/kg	–	1.0 U	1.0 U	4.7 J	1.6 J	2.2 J	1.0 UJ	91 J	310	1,100	110 J	–	50
Zinc	EPA 6000/7000	mg/kg	–	35	32	23	22	28	25	44	55	48	66	–	85
Semi-Volatile Organic Compounds (SVOCs) - Polycyclic Aromatic Hydrocarbons (PAHs)															
Acenaphthene	EPA 8270/SIM	mg/kg	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.028
Acenaphthylene	EPA 8270/SIM	mg/kg	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	1.3
Anthracene	EPA 8270/SIM	mg/kg	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.051
Benzo(a)anthracene	EPA 8270/SIM	mg/kg	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.000057
Benzo(b)fluoranthene	EPA 8270/SIM	mg/kg	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.00020
Benzo(k)fluoranthene	EPA 8270/SIM	mg/kg	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0020
Benzofluoranthenes (Total)	EPA 8270/SIM	mg/kg	–	–	–	–	–	–	–	–	–	–	–	–	3.2
Benzo(g,h,i)perylene	EPA 8270/SIM	mg/kg	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.67
Benzo(a)pyrene	EPA 8270/SIM	mg/kg	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.000016
Chrysene	EPA 8270/SIM	mg/kg	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0064
Dibenzo(a,h)anthracene	EPA 8270/SIM	mg/kg	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.000029
Dibenzofuran	EPA 8270/SIM	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.54
Fluoranthene	EPA 8270/SIM	mg/kg	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.090
Fluorene	EPA 8270/SIM	mg/kg	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.029
Indeno(1,2,3-c,d)pyrene	EPA 8270/SIM	mg/kg	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.00056
1-Methylnaphthalene	EPA 8270/SIM	mg/kg	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	29
2-Methylnaphthalene	EPA 8270/SIM	mg/kg	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.67
Naphthalene	EPA 8270/SIM	mg/kg	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0021
Phenanthrene	EPA 8270/SIM	mg/kg	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	1.5
Pyrene	EPA 8270/SIM	mg/kg	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.14
Total cPAH TEQ ⁴ (ND=0)	EPA 8270/SIM	mg/kg	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0.000016
Total cPAH TEQ ⁴ (ND=0.5RL)	EPA 8270/SIM	mg/kg	0.0051 U	0.0051 U	0.0051 U	0.0051 U	0.0051 U	0.0051 U	0.0051 U	0.0051 U	0.0051 U	0.0051 U	0.0051 U	0.0051 U	0.000016
Other SVOCs															
Aniline	EPA 8270	mg/kg	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	150
Benzidine	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.0037
Benzoic acid	EPA 8270	mg/kg	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.17
Benzyl alcohol	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.057
Bis(2-chloroethoxy)methane	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	NE
Bis(2-chloroethyl)ether	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.000022
Bis(2-chloroisopropyl)ether	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 UJ	0.017 UJ	0.017 UJ	0.017 U	0.017 UJ	3,200
Bis(2-ethylhexyl)phthalate	EPA 8270	mg/kg	0.028	0.046	0.041	0.017 U	0.083 J	0.14 J	0.017 U	0.12	0.32	0.017 U	0.057	0.017 U	0.0051
4-Bromophenyl phenyl ether	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	NE
Butyl benzyl phthalate	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.00018
Carbazole	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	NE
4-Chloroaniline	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.81
4-Chloro-3-methylphenol	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	NE
2-Chloronaphthalene	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	6,400
2-Chlorophenol	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.011
4-Chlorophenyl phenyl ether	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	NE

Table D-1
Remedial Investigation Chemical Analytical Results - Soil COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Sample Location ¹	Analytical Method	Units	MW-11			MW-12				MW-13					Soil Preliminary Cleanup Level ² (PCUL)
Sample Identification			MW11-9-10	MW11-13-14	MW11-13-14Dup	MW12-4-5	MW12-8-9	MW12-8-9Dup	MW12-11-12	MW13-1-2	MW13-5-6	MW13-7-8	MW13-9-10	MW13-11-12	
Sample Date			12/16/13	12/16/13	12/16/13	12/30/13	12/30/13	12/30/13	12/30/13	12/18/13	12/18/13	12/18/13	12/18/13	12/18/13	
Sample Depth			9 - 10 ft	13 - 14 ft	13 - 14 ft	4 - 5 ft	8 - 9 ft	8 - 9 ft	11 - 12 ft	1 - 2 ft	5 - 6 ft	7 - 8 ft	9 - 10 ft	11 - 12 ft	
Stratigraphic Horizon			FI	OS	OS	FO	FO	FO	OS	FO	FO	FI	FI	OS	
Sampled By			GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	
Decane	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 UJ	0.017 UJ	0.017 UJ	0.017 UJ	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	NE
Dibutyl phthalate	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.015
2,3-Dichloroaniline	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	NE
1,2-Dichlorobenzene	EPA 8260	mg/kg	0.0010 U	0.0014 U	0.0015 U	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0011 U	0.0031
(o-Dichlorobenzene)	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.0031
1,3-Dichlorobenzene	EPA 8260	mg/kg	0.0010 U	0.0014 U	0.0015 U	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0011 U	NE
(m-Dichlorobenzene)	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	NE
1,4-Dichlorobenzene	EPA 8260	mg/kg	0.0010 U	0.0014 U	0.0015 U	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0011 U	0.0081
(p-Dichlorobenzene)	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.0081
3,3'-Dichlorobenzidine	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.0000033
2,4-Dichlorophenol	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.0043
Bis(2-ethylhexyl)ester	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	710
Diethyl phthalate	EPA 8270	mg/kg	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.034
Dimethyl phthalate	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.071
2,4-Dimethylphenol	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.0031
1,2-Dinitrobenzene	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	8.0
1,3-Dinitrobenzene	EPA 8270	mg/kg	0.085 U	0.085 U	0.085 U	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	8.0
1,4-Dinitrobenzene	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 UJ	0.017 UJ	0.017 UJ	0.017 UJ	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	8.0
4,6-Dinitro-2-methylphenol	EPA 8270	mg/kg	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	NE
2,4-Dinitrophenol	EPA 8270	mg/kg	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.029
2,4-Dinitrotoluene	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.000069
2,6-Dinitrotoluene	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.11
Di-n-octyl phthalate	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.33
1,2-Diphenylhydrazine	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	1.1
Hexachlorobenzene	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.00000040
Hexachlorobutadiene	EPA 8260	mg/kg	0.0050 U	0.0071 U	0.0074 U	--	--	--	--	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0053 U	0.00054
	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.00054
Hexachlorocyclopentadiene	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.20
Hexachloroethane	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.000041
Isophorone	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.037
2-Methylphenol (o-Cresol)	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.010
3 & 4 Methylphenol (m-, p-Cresol)	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.053	0.017 U	4,000
2-Nitroaniline	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	800
3-Nitroaniline	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	NE
4-Nitroaniline	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	NE
Nitrobenzene	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.041
2-Nitrophenol	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	NE
4-Nitrophenol (p-Nitrophenol)	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	7.0
n-Nitrosodimethylamine	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017
n-Nitrosodiphenylamine (as Diphenylamine)	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.0011
n-Nitrosodi-n-propylamine	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.000018
n-Octadecane	EPA 8270	mg/kg	0.017 UJ	0.017 UJ	0.017 UJ	0.017 UJ	0.017 UJ	0.017 UJ	0.017 UJ	0.017 UJ	0.017 UJ	0.017 UJ	0.017 UJ	0.017 UJ	NE
Pentachlorophenol	EPA 8270	mg/kg	0.083 UJ	0.083 UJ	0.083 UJ	0.083 UJ	0.083 UJ	0.083 UJ	0.083 UJ	0.083 UJ	0.083 UJ	0.083 UJ	0.083 UJ	0.083 UJ	0.0000018

Table D-1
Remedial Investigation Chemical Analytical Results - Soil COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Sample Location ¹	Analytical Method	Units	MW-11			MW-12				MW-13					Soil Preliminary Cleanup Level ² (PCUL)
Sample Identification			MW11-9-10	MW11-13-14	MW11-13-14Dup	MW12-4-5	MW12-8-9	MW12-8-9Dup	MW12-11-12	MW13-1-2	MW13-5-6	MW13-7-8	MW13-9-10	MW13-11-12	
Sample Date			12/16/13	12/16/13	12/16/13	12/30/13	12/30/13	12/30/13	12/30/13	12/18/13	12/18/13	12/18/13	12/18/13	12/18/13	
Sample Depth			9 - 10 ft	13 - 14 ft	13 - 14 ft	4 - 5 ft	8 - 9 ft	8 - 9 ft	11 - 12 ft	1 - 2 ft	5 - 6 ft	7 - 8 ft	9 - 10 ft	11 - 12 ft	
Stratigraphic Horizon			FI	OS	OS	FO	FO	FO	OS	FO	FO	FI	FI	OS	
Sampled By			GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	
Phenol	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.12
Pyridine	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	80
2,3,4,6-Tetrachlorophenol	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	490
2,3,5,6-Tetrachlorophenol	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	NE
1,2,4-Trichlorobenzene	EPA 8260	mg/kg	0.0010 U	0.0014 U	0.0015 U	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0011 U	0.000072
	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 UJ	0.017 UJ	0.017 UJ	0.017 U	0.017 UJ	0.000072
2,4,5-Trichlorophenol	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	1.1
2,4,6-Trichlorophenol	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.00019
Volatile Organic Compounds (VOCs)															
Acetone	EPA 8260	mg/kg	0.0098	0.25 J	0.83 J	--	--	--	--	0.023	0.07	0.051	0.013	1.2	72,000
Benzene	EPA 8260	mg/kg	0.0010 U	0.0014 U	0.0015 U	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0011 U	0.00056
Bromobenzene	EPA 8260	mg/kg	0.0010 U	0.0014 U	0.0015 U	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0011 U	640
Bromochloromethane	EPA 8260	mg/kg	0.0010 U	0.0014 U	0.0015 U	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0011 U	NE
Bromoform (Tribromomethane)	EPA 8260	mg/kg	0.0010 U	0.0014 U	0.0015 U	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0011 U	0.0050
Bromomethane	EPA 8260	mg/kg	0.0010 U	0.0014 U	0.0015 U	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0011 U	0.079
n-Butylbenzene	EPA 8260	mg/kg	0.0010 U	0.0014 U	0.0015 U	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0011 U	4,000
sec-Butylbenzene	EPA 8260	mg/kg	0.0010 U	0.0014 U	0.0015 U	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0011 U	8,000
tert-Butylbenzene	EPA 8260	mg/kg	0.0010 U	0.0014 U	0.0015 U	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0011 U	8,000
Carbon disulfide	EPA 8260	mg/kg	0.0010 U	0.0021	0.0015 U	--	--	--	--	0.0010 U	0.0015	0.0012	0.0010 U	0.0015	8,000
Carbon tetrachloride	EPA 8260	mg/kg	0.0010 U	0.0014 U	0.0015 U	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0011 U	0.00015
Chlorobenzene	EPA 8260	mg/kg	0.0010 U	0.0014 U	0.0015 U	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0011 U	0.10
Chloroethane	EPA 8260	mg/kg	0.0050 U	0.0071 U	0.0074 U	--	--	--	--	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0053 U	NE
2-Chloroethyl vinyl ether	EPA 8260	mg/kg	0.0050 U	0.0071 U	0.0074 U	--	--	--	--	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0053 U	NE
Chloroform	EPA 8260	mg/kg	0.0010 U	0.0014 U	0.0015 U	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0011 U	0.052
Chloromethane	EPA 8260	mg/kg	0.0050 U	0.0071 U	0.0074 U	--	--	--	--	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0053 U	NE
2-Chlorotoluene	EPA 8260	mg/kg	0.0010 U	0.0014 U	0.0015 U	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0011 U	1,600
4-Chlorotoluene	EPA 8260	mg/kg	0.0010 U	0.0014 U	0.0015 U	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0011 U	NE
Dibromochloromethane	EPA 8260	mg/kg	0.0010 U	0.0014 U	0.0015 U	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0011 U	0.00077
1,2-Dibromo-3-chloropropane	EPA 8260	mg/kg	0.0050 U	0.0071 U	0.0074 U	--	--	--	--	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0053 U	1.3
Dibromomethane	EPA 8260	mg/kg	0.0010 U	0.0014 U	0.0015 U	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0011 U	800
Bromodichloromethane (Dichlorobromomethane)	EPA 8260	mg/kg	0.0010 U	0.0014 U	0.0015 U	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0011 U	0.00096
Dichlorodifluoromethane (CFC-12)	EPA 8260	mg/kg	0.0010 U	0.0014 U	0.0015 U	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0011 U	16,000
1,1-Dichloroethane	EPA 8260	mg/kg	0.0010 U	0.0014 U	0.0015 U	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0011 U	180
1,2-Dichloroethane	EPA 8260	mg/kg	0.0010 U	0.0014 U	0.0015 U	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0011 U	0.024
1,1-Dichloroethene	EPA 8260	mg/kg	0.0010 U	0.0014 U	0.0015 U	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0011 U	1.4
cis-1,2-Dichloroethene	EPA 8260	mg/kg	0.0010 U	0.0014 U	0.0015 U	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0011 U	160
trans-1,2-Dichloroethene	EPA 8260	mg/kg	0.0010 U	0.0014 U	0.0015 U	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0011 U	0.32
1,2-Dichloropropane	EPA 8260	mg/kg	0.0010 U	0.0014 U	0.0015 U	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0011 U	0.0010
1,3-Dichloropropane	EPA 8260	mg/kg	0.0010 U	0.0014 U	0.0015 U	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0011 U	NE
2,2-Dichloropropane	EPA 8260	mg/kg	0.0010 U	0.0014 U	0.0015 U	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0011 U	NE
1,1-Dichloropropene	EPA 8260	mg/kg	0.0010 U	0.0014 U	0.0015 U	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0011 U	NE
cis-1,3-Dichloropropene	EPA 8260	mg/kg	0.0010 U	0.0014 U	0.0015 U	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0011 U	0.00063

Table D-1
Remedial Investigation Chemical Analytical Results - Soil COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Sample Location ¹	Analytical Method	Units	MW-11			MW-12				MW-13					Soil Preliminary Cleanup Level ² (PCUL)
Sample Identification			MW11-9-10	MW11-13-14	MW11-13-14Dup	MW12-4-5	MW12-8-9	MW12-8-9Dup	MW12-11-12	MW13-1-2	MW13-5-6	MW13-7-8	MW13-9-10	MW13-11-12	
Sample Date			12/16/13	12/16/13	12/16/13	12/30/13	12/30/13	12/30/13	12/30/13	12/18/13	12/18/13	12/18/13	12/18/13	12/18/13	
Sample Depth			9 - 10 ft	13 - 14 ft	13 - 14 ft	4 - 5 ft	8 - 9 ft	8 - 9 ft	11 - 12 ft	1 - 2 ft	5 - 6 ft	7 - 8 ft	9 - 10 ft	11 - 12 ft	
Stratigraphic Horizon			FI	OS	OS	FO	FO	FO	OS	FO	FO	FI	FI	OS	
Sampled By			GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	
trans-1,3-Dichloropropene	EPA 8260	mg/kg	0.0010 U	0.0014 U	0.0015 U	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0011 U	0.00063
Ethylbenzene	EPA 8260	mg/kg	0.0010 U	0.0014 U	0.0015 U	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0011 U	0.015
1,2-Dibromoethane (EDB)	EPA 8260	mg/kg	0.0010 U	0.0014 U	0.0015 U	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0011 U	0.50
2-Hexanone	EPA 8260	mg/kg	0.0050 U	0.0071 U	0.0074 U	--	--	--	--	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0053 U	400
Isopropylbenzene (Cumene)	EPA 8260	mg/kg	0.0010 U	0.0014 U	0.0015 U	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0011 U	8,000
p-Isopropyltoluene	EPA 8260	mg/kg	0.0010 U	0.0026	0.0051	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0011 U	NE
2-Butanone (MEK)	EPA 8260	mg/kg	0.0050 U	0.086	0.095	--	--	--	--	0.0050 U	0.0095	0.0074	0.0050 U	0.14	48,000
Methyl iodide (Iodomethane)	EPA 8260	mg/kg	0.0050 U	0.0071 U	0.0074 U	--	--	--	--	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0053 U	NE
4-Methyl-2-pentanone (Methyl Isobutyl Ketone)	EPA 8260	mg/kg	0.0050 U	0.0071 U	0.0074 U	--	--	--	--	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0053 U	6,400
Methyl tert-butyl ether (MTBE)	EPA 8260	mg/kg	0.0010 U	0.0014 U	0.0015 U	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0011 U	560
Methylene chloride	EPA 8260	mg/kg	0.0050 U	0.0071 U	0.0074 U	--	--	--	--	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0053 U	0.030
n-Propylbenzene	EPA 8260	mg/kg	0.0010 U	0.0014 U	0.0015 U	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0011 U	8,000
Styrene	EPA 8260	mg/kg	0.0010 U	0.0014 U	0.0015 U	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0011 U	300
1,1,1,2-Tetrachloroethane	EPA 8260	mg/kg	0.0010 U	0.0014 U	0.0015 U	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0011 U	38
1,1,2,2-Tetrachloroethane	EPA 8260	mg/kg	0.0010 U	0.0014 U	0.0015 U	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0011 U	0.00011
Tetrachloroethene	EPA 8260	mg/kg	0.0010 U	0.0014 U	0.0015 U	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0011 U	0.0016
Toluene	EPA 8260	mg/kg	0.0050 U	0.0071 U	0.0074 U	--	--	--	--	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0053 U	0.055
1,2,3-Trichlorobenzene	EPA 8260	mg/kg	0.0010 U	0.0014 U	0.0015 U	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0011 U	20
1,1,1-Trichloroethane	EPA 8260	mg/kg	0.0010 U	0.0014 U	0.0015 U	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0011 U	21
1,1,2-Trichloroethane	EPA 8260	mg/kg	0.0010 U	0.0014 U	0.0015 U	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0011 U	0.00033
Trichloroethene	EPA 8260	mg/kg	0.0010 U	0.0014 U	0.0015 U	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0011 U	0.00027
Trichlorofluoromethane (CFC-11)	EPA 8260	mg/kg	0.0010 U	0.0014 U	0.0015 U	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0011 U	24,000
1,2,3-Trichloropropane	EPA 8260	mg/kg	0.0010 U	0.0014 U	0.0015 U	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0011 U	0.033
1,2,4-Trimethylbenzene	EPA 8260	mg/kg	0.0010 U	0.0014 U	0.0015 U	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0011 U	800
1,3,5-Trimethylbenzene	EPA 8260	mg/kg	0.0010 U	0.0014 U	0.0015 U	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0011 U	800
Vinyl Acetate	EPA 8260	mg/kg	0.0050 U	0.0071 U	0.0074 U	--	--	--	--	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0053 U	80,000
Vinyl Chloride	EPA 8260	mg/kg	0.0010 U	0.0014 U	0.0015 U	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0011 U	0.000055
Xylene, m-,p-	EPA 8260	mg/kg	0.0020 U	0.0028 U	0.0029 U	--	--	--	--	0.0020 U	0.0020 U	0.0020 U	0.0020 U	0.0021 U	16,000
Xylene, o-	EPA 8260	mg/kg	0.0010 U	0.0014 U	0.0015 U	--	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0011 U	16,000
Petroleum Hydrocarbons															
Gasoline-Range Hydrocarbons	NWTPH-G	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	30
Diesel-Range Hydrocarbons	NWTPH-Dx	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	260
Oil-Range Hydrocarbons	NWTPH-Dx	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	2,000
Total Diesel- and Oil-Range Hydrocarbons	NWTPH-Dx	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	260
Conventionals															
pH	N/A	N/A	8.0 J	6.7 J	6.7 J	7.9 J	7.7 J	7.6 J	7.4 J	9.2 J	9.3 J	8.8 J	8.9 J	7.2 J	NE

Table D-1

Remedial Investigation Chemical Analytical Results - Soil COPCs

Port of Seattle - North Terminal 115

Seattle, Washington

Notes:

- ¹ Sample locations are shown on Figures 3-1 and 3-3.
- ² Preliminary cleanup levels for soil are referenced from Table 4-1.
- ³ Total dioxin/furan Toxic Equivalency Quotients (TEQs) were calculated using United States Environmental Protection Agency (USEPA) Toxicity Equivalency Factor (TEF) values for human health (EPA 2003).
- ⁴ Total carcinogenic PAH (cPAH) TEQs were calculated using TEF values referenced from MTCA Table 708.2 (WAC 173-340-900).
- RL = Reporting limit
- EPA = Environmental Protection Agency
- mg/kg = milligram per kilogram
- NE = not established
- J = estimated result
- U = analyte not detected above the reporting limit
- = not analyzed
- AD = Native LDW alluvial deposit
- OS = Native organic silt (Aquitard) deposit
- FI = Initial (early 1900s) T115N fill deposit
- FD = Glacier NW Site dredged fill deposit
- FO = T115N operational (1960s) fill deposit
- FT = Terminal 115 fill deposit
- FP = Settling pond fill deposit
- COPC = Contaminant of Potential Concern
- KCHD = King County Health Department
- Landau = Landau Associates
- GEI = GeoEngineers
- ERM = Environmental Resources Management
- Shaw = Shaw Environmental & Infrastructure
- Bold** indicates analyte was detected.
- Yellow shading identifies the detected results greater than the preliminary cleanup level.
- Blue shading identifies the non-detected result greater than the preliminary cleanup level.

Table D-1
Remedial Investigation Chemical Analytical Results - Soil COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Sample Location ¹	Analytical Method	Units	MW-14				MW-15			MW-16						Soil Preliminary Cleanup Level ² (PCUL)
Sample Identification			MW14-2-3	MW14-5-6	MW14-7-8	MW14-10-11	MW15-3-4	MW15-7-8	MW15-13-14	MW16-3-4	MW16-5-6	MW16-7.5-8.5	MW16-11.5-12.5	MW16-11.5-12.5Dup		
Sample Date			12/18/13	12/18/13	12/18/13	12/18/13	12/27/13	12/27/13	12/27/13	12/27/13	12/27/13	12/27/13	12/27/13	12/27/13		
Sample Depth			2 - 3 ft	5 - 6 ft	7 - 8 ft	10 - 11 ft	3 - 4 ft	7 - 8 ft	13 - 14 ft	3 - 4 ft	5 - 6 ft	7.5 - 8.5 ft	11.5 - 12.5 ft	11.5 - 12.5 ft		
Stratigraphic Horizon			FD	FD	FD	OS	FO	FO	OS	FP	FP	FI	OS	OS		
Sampled By			GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	
Polychlorinated Biphenyls (PCBs)																
PCB-Aroclor 1016	EPA 8082	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE	
PCB-Aroclor 1221	EPA 8082	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE	
PCB-Aroclor 1232	EPA 8082	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE	
PCB-Aroclor 1242	EPA 8082	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE	
PCB-Aroclor 1248	EPA 8082	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE	
PCB-Aroclor 1254	EPA 8082	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE	
PCB-Aroclor 1260	EPA 8082	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE	
Total PCB Aroclors	EPA 8082	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	0.0000022	
Dioxins and Furans																
1,2,3,4,6,7,8-HpCDD	EPA 1613	mg/kg	--	--	--	--	0.00000524	0.00000479	--	--	--	--	--	--	NE	
1,2,3,4,6,7,8-HpCDF	EPA 1613	mg/kg	--	--	--	--	0.000000191 U	0.000000581 J	--	--	--	--	--	--	NE	
1,2,3,4,7,8,9-HpCDF	EPA 1613	mg/kg	--	--	--	--	0.000000144 U	0.000000140 U	--	--	--	--	--	--	NE	
1,2,3,4,7,8-HxCDD	EPA 1613	mg/kg	--	--	--	--	0.000000330 U	0.000000346 U	--	--	--	--	--	--	NE	
1,2,3,4,7,8-HxCDF	EPA 1613	mg/kg	--	--	--	--	0.000000131 U	0.000000151 J	--	--	--	--	--	--	NE	
1,2,3,6,7,8-HxCDD	EPA 1613	mg/kg	--	--	--	--	0.000000444 U	0.000000412 U	--	--	--	--	--	--	NE	
1,2,3,6,7,8-HxCDF	EPA 1613	mg/kg	--	--	--	--	0.000000137 U	0.000000123 U	--	--	--	--	--	--	NE	
1,2,3,7,8,9-HxCDD	EPA 1613	mg/kg	--	--	--	--	0.000000527 J	0.000000451 U	--	--	--	--	--	--	NE	
1,2,3,7,8,9-HxCDF	EPA 1613	mg/kg	--	--	--	--	0.000000203 U	0.000000817 U	--	--	--	--	--	--	NE	
1,2,3,7,8-PeCDD	EPA 1613	mg/kg	--	--	--	--	0.000000295 U	0.000000476 U	--	--	--	--	--	--	NE	
1,2,3,7,8-PeCDF	EPA 1613	mg/kg	--	--	--	--	0.000000113 U	0.000000187 U	--	--	--	--	--	--	NE	
2,3,4,6,7,8-HxCDF	EPA 1613	mg/kg	--	--	--	--	0.000000148 U	0.000000128 U	--	--	--	--	--	--	NE	
2,3,4,7,8-PeCDF	EPA 1613	mg/kg	--	--	--	--	0.000000134 U	0.000000219 U	--	--	--	--	--	--	NE	
2,3,7,8-TCDD	EPA 1613	mg/kg	--	--	--	--	0.000000207 U	0.000000359 J	--	--	--	--	--	--	NE	
2,3,7,8-TCDF	EPA 1613	mg/kg	--	--	--	--	0.000000105 U	0.000000222 U	--	--	--	--	--	--	NE	
OCDD	EPA 1613	mg/kg	--	--	--	--	0.0000615	0.0000445	--	--	--	--	--	--	NE	
OCDF	EPA 1613	mg/kg	--	--	--	--	0.000000403 U	0.00000109 J	--	--	--	--	--	--	NE	
Total Dioxin/Furan TEQ ³ (ND=0.5RL)	EPA 1613	mg/kg	--	--	--	--	0.000000124	0.000000442	--	--	--	--	--	--	0.0000052	
Total Dioxin/Furan TEQ ³ (ND=0.5RL)	EPA 1613	mg/kg	--	--	--	--	0.000000473	0.000000804	--	--	--	--	--	--	0.0000052	
Metals																
Antimony	EPA 6000/7000	mg/kg	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	4.1	
Arsenic	EPA 6000/7000	mg/kg	22	43	460	13	1.3	4.6	140	0.50 U	0.50 U	0.50 U	20 J	12 J	7.0	
Barium	EPA 6000/7000	mg/kg	24	31	15	33	130	55	43	72	55	54	39	39	8.3	
Beryllium	EPA 6000/7000	mg/kg	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	3.5	
Cadmium	EPA 6000/7000	mg/kg	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.38	1.6	0.29	0.20 U	0.20 U	0.20 U	1.0	
Chromium III / Total	EPA 6000/7000	mg/kg	24	11	10	18	34	50	60	140	30	31	20 J	17 J	48	
Chromium VI	EPA 6000/7000	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	18	
Copper	EPA 6000/7000	mg/kg	26	25	18	29	33	12	32	40	24	17	26	25	36	
Lead	EPA 6000/7000	mg/kg	10	10	7.3	4.5	57	19	63	4,100	1,200	100	19 J	140 J	50	
Mercury	EPA 6000/7000	mg/kg	0.050 U	0.057	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.050 U	0.057	0.050 U	0.070	
Nickel	EPA 6000/7000	mg/kg	23	9.8	7.7	15	38	48	42	32	28	37	17	12	48	
Selenium	EPA 6000/7000	mg/kg	0.50 U	0.50 U	0.50 U	1.2	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.30	

Table D-1
Remedial Investigation Chemical Analytical Results - Soil COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Sample Location ¹	Analytical Method	Units	MW-14				MW-15			MW-16					Soil Preliminary Cleanup Level ² (PCUL)
Sample Identification			MW14-2-3	MW14-5-6	MW14-7-8	MW14-10-11	MW15-3-4	MW15-7-8	MW15-13-14	MW16-3-4	MW16-5-6	MW16-7.5-8.5	MW16-11.5-12.5	MW16-11.5-12.5Dup	
Sample Date			12/18/13	12/18/13	12/18/13	12/18/13	12/27/13	12/27/13	12/27/13	12/27/13	12/27/13	12/27/13	12/27/13	12/27/13	
Sample Depth			2 - 3 ft	5 - 6 ft	7 - 8 ft	10 - 11 ft	3 - 4 ft	7 - 8 ft	13 - 14 ft	3 - 4 ft	5 - 6 ft	7.5 - 8.5 ft	11.5 - 12.5 ft	11.5 - 12.5 ft	
Stratigraphic Horizon			FD	FD	FD	OS	FO	FO	OS	FP	FP	FI	OS	OS	
Sampled By			GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	
Silver	EPA 6000/7000	mg/kg	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.016
Thallium	EPA 6000/7000	mg/kg	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.25 U	0.0044
Tin	EPA 6000/7000	mg/kg	28 J	25 J	34 J	1.3 J	1,500	89	89	11,000	3,500	3,000	61 J	180 J	50
Zinc	EPA 6000/7000	mg/kg	35	24	85	47	61	28	57	1,200	240	130	44	42	85
Semi-Volatile Organic Compounds (SVOCs) - Polycyclic Aromatic Hydrocarbons (PAHs)															
Acenaphthene	EPA 8270/SIM	mg/kg	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.23	0.024	0.0067 U	0.0095	0.0077	0.028
Acenaphthylene	EPA 8270/SIM	mg/kg	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	1.3
Anthracene	EPA 8270/SIM	mg/kg	0.0067 U	0.0067 U	0.018	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.075	0.015	0.0067 U	0.0067 U	0.0067 U	0.051
Benzo(a)anthracene	EPA 8270/SIM	mg/kg	0.019	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.059	0.019	0.0067 U	0.0067 UJ	0.0067 UJ	0.000057
Benzo(b)fluoranthene	EPA 8270/SIM	mg/kg	0.022 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.015	0.014	0.0067 U	0.0067 UJ	0.0067 UJ	0.00020
Benzo(k)fluoranthene	EPA 8270/SIM	mg/kg	0.022 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.017	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0020
Benzofluoranthenes (Total)	EPA 8270/SIM	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	3.2
Benzo(g,h,i)perylene	EPA 8270/SIM	mg/kg	0.022 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0099	0.014	0.0067 U	0.0067 U	0.0067 U	0.67
Benzo(a)pyrene	EPA 8270/SIM	mg/kg	0.022 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.017	0.012	0.0067 U	0.0067 U	0.0067 U	0.000016
Chrysene	EPA 8270/SIM	mg/kg	0.052	0.014	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.051	0.018	0.0067 U	0.0067 U	0.0067 U	0.0064
Dibenzo(a,h)anthracene	EPA 8270/SIM	mg/kg	0.022 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.000029
Dibenzofuran	EPA 8270/SIM	mg/kg	0.11 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.18	0.021	0.017 U	0.017 U	0.017 U	0.54
Fluoranthene	EPA 8270/SIM	mg/kg	0.011	0.0067 U	0.022	0.0067 U	0.0067 U	0.015	0.0067 U	0.33	0.062	0.01	0.0067 U	0.0067 U	0.090
Fluorene	EPA 8270/SIM	mg/kg	0.0084	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067	0.0067 U	0.24	0.027	0.0067 U	0.0067 U	0.0067 U	0.029
Indeno(1,2,3-c,d)pyrene	EPA 8270/SIM	mg/kg	0.022 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0069	0.0069	0.0067 U	0.0067 U	0.0067 U	0.00056
1-Methylnaphthalene	EPA 8270/SIM	mg/kg	0.009	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.068	0.0082	0.0067 U	0.0067 U	0.0067 U	29
2-Methylnaphthalene	EPA 8270/SIM	mg/kg	0.013	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.15	0.018	0.0067 U	0.0067 U	0.0067 U	0.67
Naphthalene	EPA 8270/SIM	mg/kg	0.0073	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.091	0.016	0.0067 U	0.0067 U	0.0067 U	0.0021
Phenanthrene	EPA 8270/SIM	mg/kg	0.029	0.0084	0.05	0.0067 U	0.0067 U	0.033	0.0067 U	0.74	0.13	0.029	0.0091	0.011	1.5
Pyrene	EPA 8270/SIM	mg/kg	0.024	0.01	0.016	0.0067 U	0.0067 U	0.0097	0.0067 U	0.2	0.047	0.0091	0.0067 U	0.0067 U	0.14
Total cPAH TEQ ⁴ (ND=0)	EPA 8270/SIM	mg/kg	0.0024	0.00014	0 U	0 U	0 U	0 U	0 U	0.027	0.016	0 U	0 U	0 U	0.000016
Total cPAH TEQ ⁴ (ND=0.5RL)	EPA 8270/SIM	mg/kg	0.018	0.0052	0.0051 U	0.0051 U	0.0051 U	0.0051 U	0.0051 U	0.028	0.017	0.0051 U	0.0051 U	0.0051 U	0.000016
Other SVOCs															
Aniline	EPA 8270	mg/kg	0.56 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 UJ	0.085 UJ	150
Benzidine	EPA 8270	mg/kg	0.56 U	0.017 U	0.017 U	0.017 U	0.017 UJ	0.017 UJ	0.017 UJ	0.017 UJ	0.017 UJ	0.017 UJ	0.017 UJ	0.017 UJ	0.0037
Benzoic acid	EPA 8270	mg/kg	--	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.17
Benzyl alcohol	EPA 8270	mg/kg	0.56 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.057
Bis(2-chloroethoxy)methane	EPA 8270	mg/kg	0.11 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	NE
Bis(2-chloroethyl)ether	EPA 8270	mg/kg	0.11 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.000022
Bis(2-chloroisopropyl)ether	EPA 8270	mg/kg	0.11 UJ	0.017 UJ	0.017 UJ	0.017 UJ	0.017 UJ	0.017 UJ	0.017 UJ	0.017 U	0.017 U	0.017 U	0.017 UJ	0.017 UJ	3,200
Bis(2-ethylhexyl)phthalate	EPA 8270	mg/kg	0.11 U	0.35	0.023	0.017 U	0.048	0.076	0.019	0.017 U	0.032	0.017 U	0.034	0.034	0.0051
4-Bromophenyl phenyl ether	EPA 8270	mg/kg	0.11 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	NE
Butyl benzyl phthalate	EPA 8270	mg/kg	0.11 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.00018
Carbazole	EPA 8270	mg/kg	0.11 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.035	0.017 U	0.017 U	0.017 U	0.017 U	NE
4-Chloroaniline	EPA 8270	mg/kg	0.56 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.81
4-Chloro-3-methylphenol	EPA 8270	mg/kg	0.11 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	NE
2-Chloronaphthalene	EPA 8270	mg/kg	0.11 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	6,400
2-Chlorophenol	EPA 8270	mg/kg	0.11 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.011
4-Chlorophenyl phenyl ether	EPA 8270	mg/kg	0.11 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	NE

Table D-1
Remedial Investigation Chemical Analytical Results - Soil COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Sample Location ¹	Analytical Method	Units	MW-14				MW-15			MW-16					Soil Preliminary Cleanup Level ² (PCUL)
Sample Identification			MW14-2-3	MW14-5-6	MW14-7-8	MW14-10-11	MW15-3-4	MW15-7-8	MW15-13-14	MW16-3-4	MW16-5-6	MW16-7.5-8.5	MW16-11.5-12.5	MW16-11.5-12.5Dup	
Sample Date			12/18/13	12/18/13	12/18/13	12/18/13	12/27/13	12/27/13	12/27/13	12/27/13	12/27/13	12/27/13	12/27/13	12/27/13	
Sample Depth			2 - 3 ft	5 - 6 ft	7 - 8 ft	10 - 11 ft	3 - 4 ft	7 - 8 ft	13 - 14 ft	3 - 4 ft	5 - 6 ft	7.5 - 8.5 ft	11.5 - 12.5 ft	11.5 - 12.5 ft	
Stratigraphic Horizon			FD	FD	FD	OS	FO	FO	OS	FP	FP	FI	OS	OS	
Sampled By			GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	
Decane	EPA 8270	mg/kg	–	0.017 U	0.017 U	0.017 U	0.017 UJ	0.017 UJ	0.017 UJ	0.017 U	0.017 U	0.017 U	0.017 UJ	0.017 UJ	NE
Dibutyl phthalate	EPA 8270	mg/kg	0.11 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.015
2,3-Dichloroaniline	EPA 8270	mg/kg	0.11 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	NE
1,2-Dichlorobenzene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0012 U	–	–	–	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0031
(o-Dichlorobenzene)	EPA 8270	mg/kg	0.11 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.0031
1,3-Dichlorobenzene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0012 U	–	–	–	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	NE
(m-Dichlorobenzene)	EPA 8270	mg/kg	0.11 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	NE
1,4-Dichlorobenzene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0012 U	–	–	–	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0081
(p-Dichlorobenzene)	EPA 8270	mg/kg	0.11 U	0.017 U	0.017 U	0.017 U	0.017 UJ	0.017 UJ	0.017 UJ	0.017 UJ	0.017 UJ	0.017 UJ	0.017 UJ	0.017 UJ	0.0081
3,3'-Dichlorobenzidine	EPA 8270	mg/kg	0.56 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.026	0.017 U	0.017 UJ	0.017 UJ	0.0000033
2,4-Dichlorophenol	EPA 8270	mg/kg	0.56 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.0043
Bis(2-ethylhexyl)ester	EPA 8270	mg/kg	0.11 U	0.017 U	0.017 U	0.017 U	0.017 UJ	0.017 UJ	0.017 UJ	0.017 U	0.017 U	0.017 U	0.017 UJ	0.017 UJ	710
Diethyl phthalate	EPA 8270	mg/kg	0.56 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 UJ	0.085 UJ	0.034
Dimethyl phthalate	EPA 8270	mg/kg	0.11 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.071
2,4-Dimethylphenol	EPA 8270	mg/kg	0.11 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.0031
1,2-Dinitrobenzene	EPA 8270	mg/kg	0.11 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	8.0
1,3-Dinitrobenzene	EPA 8270	mg/kg	0.11 U	0.085 U	0.085 U	0.085 U	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	8.0
1,4-Dinitrobenzene	EPA 8270	mg/kg	0.11 U	0.017 U	0.017 U	0.017 U	0.017 UJ	0.017 UJ	0.017 UJ	0.017 UJ	0.017 UJ	0.017 UJ	0.017 UJ	0.017 UJ	8.0
4,6-Dinitro-2-methylphenol	EPA 8270	mg/kg	0.56 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	NE
2,4-Dinitrophenol	EPA 8270	mg/kg	0.11 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.029
2,4-Dinitrotoluene	EPA 8270	mg/kg	0.11 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.000069
2,6-Dinitrotoluene	EPA 8270	mg/kg	0.11 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.11
Di-n-octyl phthalate	EPA 8270	mg/kg	0.11 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.33
1,2-Diphenylhydrazine	EPA 8270	mg/kg	0.11 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	1.1
Hexachlorobenzene	EPA 8270	mg/kg	0.11 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.00000040
Hexachlorobutadiene	EPA 8260	mg/kg	0.0050 U	0.0050 U	0.0050 U	0.0060 U	–	–	–	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.00054
	EPA 8270	mg/kg	0.11 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 UJ	0.017 UJ	0.00054
Hexachlorocyclopentadiene	EPA 8270	mg/kg	0.11 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.20
Hexachloroethane	EPA 8270	mg/kg	0.11 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 UJ	0.017 UJ	0.000041
Isophorone	EPA 8270	mg/kg	0.11 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 UJ	0.017 UJ	0.037
2-Methylphenol (o-Cresol)	EPA 8270	mg/kg	0.11 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.025	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.010
3 & 4 Methylphenol (m-, p-Cresol)	EPA 8270	mg/kg	0.11 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.74	0.017 U	0.017 U	0.017 U	2.5 J	1.6 J	4,000
2-Nitroaniline	EPA 8270	mg/kg	0.11 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	800
3-Nitroaniline	EPA 8270	mg/kg	0.11 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	NE
4-Nitroaniline	EPA 8270	mg/kg	0.11 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	NE
Nitrobenzene	EPA 8270	mg/kg	0.11 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.041
2-Nitrophenol	EPA 8270	mg/kg	0.11 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	NE
4-Nitrophenol (p-Nitrophenol)	EPA 8270	mg/kg	0.11 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	7.0
n-Nitrosodimethylamine	EPA 8270	mg/kg	0.11 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017
n-Nitrosodiphenylamine (as Diphenylamine)	EPA 8270	mg/kg	0.11 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.0011
n-Nitrosodi-n-propylamine	EPA 8270	mg/kg	0.11 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.000018
n-Octadecane	EPA 8270	mg/kg	–	0.019 J	0.034 J	0.017 UJ	0.017 UJ	0.017 UJ	0.017 UJ	0.17 J	0.067 J	0.029 J	0.017 UJ	0.017 UJ	NE
Pentachlorophenol	EPA 8270	mg/kg	0.56 UJ	0.083 UJ	0.083 UJ	0.083 UJ	0.083 UJ	0.083 UJ	0.083 UJ	0.083 UJ	0.083 UJ	0.083 UJ	0.083 UJ	0.083 UJ	0.0000018

Table D-1
Remedial Investigation Chemical Analytical Results - Soil COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Sample Location ¹	Analytical Method	Units	MW-14				MW-15			MW-16					Soil Preliminary Cleanup Level ² (PCUL)
Sample Identification			MW14-2-3	MW14-5-6	MW14-7-8	MW14-10-11	MW15-3-4	MW15-7-8	MW15-13-14	MW16-3-4	MW16-5-6	MW16-7.5-8.5	MW16-11.5-12.5	MW16-11.5-12.5Dup	
Sample Date			12/18/13	12/18/13	12/18/13	12/18/13	12/27/13	12/27/13	12/27/13	12/27/13	12/27/13	12/27/13	12/27/13	12/27/13	
Sample Depth			2 - 3 ft	5 - 6 ft	7 - 8 ft	10 - 11 ft	3 - 4 ft	7 - 8 ft	13 - 14 ft	3 - 4 ft	5 - 6 ft	7.5 - 8.5 ft	11.5 - 12.5 ft	11.5 - 12.5 ft	
Stratigraphic Horizon			FD	FD	FD	OS	FO	FO	OS	FP	FP	FI	OS	OS	
Sampled By			GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	
Phenol	EPA 8270	mg/kg	0.11 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.12	0.017 U	0.017 U	0.017 U	1.8 J	1.1 J	0.12
Pyridine	EPA 8270	mg/kg	1.1 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	80
2,3,4,6-Tetrachlorophenol	EPA 8270	mg/kg	0.11 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	490
2,3,5,6-Tetrachlorophenol	EPA 8270	mg/kg	0.11 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	NE
1,2,4-Trichlorobenzene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0012 U	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.000072
	EPA 8270	mg/kg	0.11 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.000072
2,4,5-Trichlorophenol	EPA 8270	mg/kg	0.11 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	1.1
2,4,6-Trichlorophenol	EPA 8270	mg/kg	0.11 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.00019
Volatile Organic Compounds (VOCs)															
Acetone	EPA 8260	mg/kg	0.0086	0.0071	0.022	1.3	--	--	--	0.037	0.018	0.034	0.74	0.52	72,000
Benzene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0012 U	--	--	--	0.0015	0.0010 U	0.0015	0.0010 U	0.0010 U	0.00056
Bromobenzene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0012 U	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	640
Bromochloromethane	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0012 U	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	NE
Bromoform (Tribromomethane)	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0012 U	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0050
Bromomethane	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0012 U	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.079
n-Butylbenzene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0012 U	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	4,000
sec-Butylbenzene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0012 U	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	8,000
tert-Butylbenzene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0012 U	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	8,000
Carbon disulfide	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0081	--	--	--	0.0056	0.0011	0.0010 U	0.01	0.0091	8,000
Carbon tetrachloride	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0012 U	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.00015
Chlorobenzene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0012 U	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.10
Chloroethane	EPA 8260	mg/kg	0.0050 U	0.0050 U	0.0050 U	0.0060 U	--	--	--	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	NE
2-Chloroethyl vinyl ether	EPA 8260	mg/kg	0.0050 U	0.0050 U	0.0050 U	0.0060 U	--	--	--	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	NE
Chloroform	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0012 U	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.052
Chloromethane	EPA 8260	mg/kg	0.0050 U	0.0050 U	0.0050 U	0.0060 U	--	--	--	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	NE
2-Chlorotoluene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0012 U	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	1,600
4-Chlorotoluene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0012 U	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	NE
Dibromochloromethane	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0012 U	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.00077
1,2-Dibromo-3-chloropropane	EPA 8260	mg/kg	0.0050 U	0.0050 U	0.0050 U	0.0060 U	--	--	--	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	1.3
Dibromomethane	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0012 U	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	800
Bromodichloromethane (Dichlorobromomethane)	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0012 U	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.00096
Dichlorodifluoromethane (CFC-12)	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0012 U	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	16,000
1,1-Dichloroethane	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0012 U	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	180
1,2-Dichloroethane	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0012 U	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.024
1,1-Dichloroethene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0012 U	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	1.4
cis-1,2-Dichloroethene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0012 U	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	160
trans-1,2-Dichloroethene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0012 U	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.32
1,2-Dichloropropane	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0012 U	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010
1,3-Dichloropropane	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0012 U	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	NE
2,2-Dichloropropane	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0012 U	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	NE
1,1-Dichloropropene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0012 U	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	NE
cis-1,3-Dichloropropene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0012 U	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.00063

Table D-1
Remedial Investigation Chemical Analytical Results - Soil COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Sample Location ¹	Analytical Method	Units	MW-14				MW-15			MW-16					Soil Preliminary Cleanup Level ² (PCUL)
Sample Identification			MW14-2-3	MW14-5-6	MW14-7-8	MW14-10-11	MW15-3-4	MW15-7-8	MW15-13-14	MW16-3-4	MW16-5-6	MW16-7.5-8.5	MW16-11.5-12.5	MW16-11.5-12.5Dup	
Sample Date			12/18/13	12/18/13	12/18/13	12/18/13	12/27/13	12/27/13	12/27/13	12/27/13	12/27/13	12/27/13	12/27/13	12/27/13	
Sample Depth			2 - 3 ft	5 - 6 ft	7 - 8 ft	10 - 11 ft	3 - 4 ft	7 - 8 ft	13 - 14 ft	3 - 4 ft	5 - 6 ft	7.5 - 8.5 ft	11.5 - 12.5 ft	11.5 - 12.5 ft	
Stratigraphic Horizon			FD	FD	FD	OS	FO	FO	OS	FP	FP	FI	OS	OS	
Sampled By			GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	
trans-1,3-Dichloropropene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0012 U	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.00063
Ethylbenzene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0012 U	--	--	--	0.0018	0.001	0.0011	0.0010 U	0.0010 U	0.015
1,2-Dibromoethane (EDB)	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0012 U	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.50
2-Hexanone	EPA 8260	mg/kg	0.0050 U	0.0050 U	0.0050 U	0.0060 U	--	--	--	0.0050 U	0.0050 U	0.0063	0.0050 U	0.0050 U	400
Isopropylbenzene (Cumene)	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0012 U	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	8,000
p-Isopropyltoluene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0012 U	--	--	--	0.0036	0.092	0.072	0.0070 J	0.0039 J	NE
2-Butanone (MEK)	EPA 8260	mg/kg	0.0050 U	0.0050 U	0.006	0.13	--	--	--	0.0050 U	0.0050 U	0.0050 U	0.086 J	0.047 J	48,000
Methyl iodide (Iodomethane)	EPA 8260	mg/kg	0.0050 U	0.0050 U	0.0050 U	0.0060 U	--	--	--	0.0050 U	0.0050 UJ	0.0050 UJ	0.0050 U	0.0050 U	NE
4-Methyl-2-pentanone (Methyl Isobutyl Ketone)	EPA 8260	mg/kg	0.0050 U	0.0050 U	0.0050 U	0.0060 U	--	--	--	0.0050 U	0.0050 U	0.0050 U	0.0079	0.005	6,400
Methyl tert-butyl ether (MTBE)	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0012 U	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	560
Methylene chloride	EPA 8260	mg/kg	0.0050 U	0.0050 U	0.0050 U	0.0060 U	--	--	--	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.030
n-Propylbenzene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0012 U	--	--	--	0.0014	0.0010 U	0.0010 U	0.0010 U	0.0010 U	8,000
Styrene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0012 U	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	300
1,1,1,2-Tetrachloroethane	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0012 U	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	38
1,1,2,2-Tetrachloroethane	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0012 U	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.00011
Tetrachloroethene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0012 U	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0016
Toluene	EPA 8260	mg/kg	0.0050 U	0.0050 U	0.0050 U	0.0060 U	--	--	--	0.0084	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.055
1,2,3-Trichlorobenzene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0012 U	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	20
1,1,1-Trichloroethane	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0012 U	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	21
1,1,2-Trichloroethane	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0012 U	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.00033
Trichloroethene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0012 U	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.00027
Trichlorofluoromethane (CFC-11)	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0012 U	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	24,000
1,2,3-Trichloropropane	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0012 U	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.033
1,2,4-Trimethylbenzene	EPA 8260	mg/kg	0.001	0.0010 U	0.0010 U	0.0012 U	--	--	--	0.016	0.0066	0.0057	0.0019	0.0013	800
1,3,5-Trimethylbenzene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0012 U	--	--	--	0.0047	0.0017	0.0015	0.001	0.0010 U	800
Vinyl Acetate	EPA 8260	mg/kg	0.0050 U	0.0050 U	0.0050 U	0.0060 U	--	--	--	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	80,000
Vinyl Chloride	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0012 U	--	--	--	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.000055
Xylene, m-,p-	EPA 8260	mg/kg	0.0020 U	0.0020 U	0.0020 U	0.0024 U	--	--	--	0.0077	0.006	0.0054	0.0020 U	0.0020 U	16,000
Xylene, o-	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0012 U	--	--	--	0.0045	0.0028	0.0035	0.0010 U	0.0010 U	16,000
Petroleum Hydrocarbons															
Gasoline-Range Hydrocarbons	NWTPH-G	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	30
Diesel-Range Hydrocarbons	NWTPH-Dx	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	260
Oil-Range Hydrocarbons	NWTPH-Dx	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	2,000
Total Diesel- and Oil-Range Hydrocarbons	NWTPH-Dx	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	260
Conventionals															
pH	N/A	N/A	8.1 J	8.3 J	6.5 J	6.2 J	11 J	10 J	9.4 J	11 J	11 J	11 J	11 J	11 J	NE

Table D-1

Remedial Investigation Chemical Analytical Results - Soil COPCs

Port of Seattle - North Terminal 115

Seattle, Washington

Notes:

- ¹ Sample locations are shown on Figures 3-1 and 3-3.
- ² Preliminary cleanup levels for soil are referenced from Table 4-1.
- ³ Total dioxin/furan Toxic Equivalency Quotients (TEQs) were calculated using United States Environmental Protection Agency (USEPA) Toxicity Equivalency Factor (TEF) values for human health (EPA 2003).
- ⁴ Total carcinogenic PAH (cPAH) TEQs were calculated using TEF values referenced from MTCA Table 708.2 (WAC 173-340-900).
- RL = Reporting limit
- EPA = Environmental Protection Agency
- mg/kg = milligram per kilogram
- NE = not established
- J = estimated result
- U = analyte not detected above the reporting limit
- = not analyzed
- AD = Native LDW alluvial deposit
- OS = Native organic silt (Aquitard) deposit
- FI = Initial (early 1900s) T115N fill deposit
- FD = Glacier NW Site dredged fill deposit
- FO = T115N operational (1960s) fill deposit
- FT = Terminal 115 fill deposit
- FP = Settling pond fill deposit
- COPC = Contaminant of Potential Concern
- KCHD = King County Health Department
- Landau = Landau Associates
- GEI = GeoEngineers
- ERM = Environmental Resources Management
- Shaw = Shaw Environmental & Infrastructure
- Bold** indicates analyte was detected.
- Yellow shading identifies the detected results greater than the preliminary cleanup level.
- Blue shading identifies the non-detected result greater than the preliminary cleanup level.

Table D-1
Remedial Investigation Chemical Analytical Results - Soil COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Sample Location ¹	Analytical Method	Units	MW-17				MW-18				MW-19D				Soil Preliminary Cleanup Level ² (PCUL)
Sample Identification			MW17-2.5-3.5	MW17-5.5-6.5	MW17-7.5-8.5	MW17-19-20	MW18-2-3	MW18-5-6	MW18-10-11	MW18-18-19	MW19D-3-4	MW19D-3-4Dup	MW19D-7-8	MW19D-10-11	
Sample Date			12/26/13	12/26/13	12/26/13	12/26/13	12/18/13	12/18/13	12/18/13	12/18/13	12/26/13	12/26/13	12/26/13	12/26/13	
Sample Depth			2.5 - 3.5 ft	5.5. - 6.5 ft	7.5 - 8.5 ft	19 - 20 ft	2 - 3 ft	5 - 6 ft	10 - 11 ft	18 - 19 ft	3 - 4 ft	3 - 4 ft	7 - 8 ft	10 - 11 ft	
Stratigraphic Horizon			FO	FO	FO	AD	FO	FO	FO	AD	FO	FO	FO	FO	
Sampled By			GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	
Polychlorinated Biphenyls (PCBs)															
PCB-Aroclor 1016	EPA 8082	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
PCB-Aroclor 1221	EPA 8082	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
PCB-Aroclor 1232	EPA 8082	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
PCB-Aroclor 1242	EPA 8082	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
PCB-Aroclor 1248	EPA 8082	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
PCB-Aroclor 1254	EPA 8082	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
PCB-Aroclor 1260	EPA 8082	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
Total PCB Aroclors	EPA 8082	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	0.0000022
Dioxins and Furans															
1,2,3,4,6,7,8-HpCDD	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	0.0000337	--	--	--	NE
1,2,3,4,6,7,8-HpCDF	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	0.00000461	--	--	--	NE
1,2,3,4,7,8,9-HpCDF	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	0.000000522 J	--	--	--	NE
1,2,3,4,7,8-HxCDD	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	0.000000308 J	--	--	--	NE
1,2,3,4,7,8-HxCDF	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	0.000000838 J	--	--	--	NE
1,2,3,6,7,8-HxCDD	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	0.00000129 J	--	--	--	NE
1,2,3,6,7,8-HxCDF	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	0.000000415 J	--	--	--	NE
1,2,3,7,8,9-HxCDD	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	0.00000106 J	--	--	--	NE
1,2,3,7,8,9-HxCDF	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	0.000000262 U	--	--	--	NE
1,2,3,7,8-PeCDD	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	0.000000678 J	--	--	--	NE
1,2,3,7,8-PeCDF	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	0.000000302 U	--	--	--	NE
2,3,4,6,7,8-HxCDF	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	0.000000512 U	--	--	--	NE
2,3,4,7,8-PeCDF	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	0.000000226 U	--	--	--	NE
2,3,7,8-TCDD	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	0.00000141	--	--	--	NE
2,3,7,8-TCDF	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	0.000000186 U	--	--	--	NE
OCDD	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	0.000294	--	--	--	NE
OCDF	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	0.0000162	--	--	--	NE
Total Dioxin/Furan TEQ ³ (ND=0.5RL)	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	0.00000296	--	--	--	0.0000052
Total Dioxin/Furan TEQ ³ (ND=0.5RL)	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	0.00000305	--	--	--	0.0000052
Metals															
Antimony	EPA 6000/7000	mg/kg	20	14	5.0 U	--	9.2	5.0 U	5.0 U	--	5.0 U	5.0 U	5.0 U	--	4.1
Arsenic	EPA 6000/7000	mg/kg	91	54	2.4	--	0.59	3	4.2	--	2.2 J	1.1 J	1.4	--	7.0
Barium	EPA 6000/7000	mg/kg	60	50	39	--	93	73	58	--	26	26	42	--	8.3
Beryllium	EPA 6000/7000	mg/kg	0.50 U	0.50 U	0.50 U	--	0.50 U	0.50 U	0.50 U	--	0.50 U	0.50 U	0.50 U	--	3.5
Cadmium	EPA 6000/7000	mg/kg	1.2	0.84	0.20 U	--	7.7	0.20 U	0.20 U	--	0.20 U	0.20 U	0.20 U	--	1.0
Chromium III / Total	EPA 6000/7000	mg/kg	12	9.4	6.1	--	690	54	41	--	7.9 J	5.2 J	6.7	--	48
Chromium VI	EPA 6000/7000	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	18
Copper	EPA 6000/7000	mg/kg	48	43	15	--	220	23	21	--	12	9.5	11	--	36
Lead	EPA 6000/7000	mg/kg	340	210	10	--	22,000	300	40	--	57	42	32	--	50
Mercury	EPA 6000/7000	mg/kg	0.050 U	0.050 U	0.050 U	--	0.099	0.050 U	0.050 U	--	0.050 U	0.050 U	0.050 U	--	0.070
Nickel	EPA 6000/7000	mg/kg	14	12	13	--	51	47	52	--	10	8.6	7.9	--	48
Selenium	EPA 6000/7000	mg/kg	1.2	0.8	0.50 U	--	3.1 U	0.50 U	0.50 U	--	0.50 U	0.50 U	0.50 U	--	0.30

Table D-1
Remedial Investigation Chemical Analytical Results - Soil COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Sample Location ¹	Analytical Method	Units	MW-17				MW-18				MW-19D				Soil Preliminary Cleanup Level ² (PCUL)
Sample Identification			MW17-2.5-3.5	MW17-5.5-6.5	MW17-7.5-8.5	MW17-19-20	MW18-2-3	MW18-5-6	MW18-10-11	MW18-18-19	MW19D-3-4	MW19D-3-4Dup	MW19D-7-8	MW19D-10-11	
Sample Date			12/26/13	12/26/13	12/26/13	12/26/13	12/18/13	12/18/13	12/18/13	12/18/13	12/26/13	12/26/13	12/26/13	12/26/13	
Sample Depth			2.5 - 3.5 ft	5.5. - 6.5 ft	7.5 - 8.5 ft	19 - 20 ft	2 - 3 ft	5 - 6 ft	10 - 11 ft	18 - 19 ft	3 - 4 ft	3 - 4 ft	7 - 8 ft	10 - 11 ft	
Stratigraphic Horizon			FO	FO	FO	AD	FO	FO	FO	AD	FO	FO	FO	FO	
Sampled By			GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	
Silver	EPA 6000/7000	mg/kg	0.72	0.50 U	0.50 U	--	1.2	0.50 U	0.50 U	--	0.50 U	0.50 U	0.50 U	--	0.016
Thallium	EPA 6000/7000	mg/kg	0.47	0.32	0.25 U	--	0.25 U	0.25 U	0.25 U	--	0.25 U	0.25 U	0.25 U	--	0.0044
Tin	EPA 6000/7000	mg/kg	74	59	2.6	--	27,000	2,700	40 J	--	380	270	190	--	50
Zinc	EPA 6000/7000	mg/kg	390	240	50	--	9,200	190	62	--	77	62	62	--	85
Semi-Volatile Organic Compounds (SVOCs) - Polycyclic Aromatic Hydrocarbons (PAHs)															
Acenaphthene	EPA 8270/SIM	mg/kg	0.027	0.016	0.0067 U	0.0067 U	0.028	0.0077	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.028
Acenaphthylene	EPA 8270/SIM	mg/kg	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	1.3
Anthracene	EPA 8270/SIM	mg/kg	0.0073	0.0067 U	0.0067 U	0.0094	0.024	0.01	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.051
Benzo(a)anthracene	EPA 8270/SIM	mg/kg	0.0067 U	0.0075	0.0067 U	0.021	0.027	0.0067 U	0.0067 U	0.0082	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.000057
Benzo(b)fluoranthene	EPA 8270/SIM	mg/kg	0.0067 U	0.0067 U	0.0067 U	0.019	0.011	0.0067 U	0.0067 U	0.0081	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.00020
Benzo(k)fluoranthene	EPA 8270/SIM	mg/kg	0.0067 U	0.0067 U	0.0067 U	0.01	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0020
Benzofluoranthenes (Total)	EPA 8270/SIM	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	3.2
Benzo(g,h,i)perylene	EPA 8270/SIM	mg/kg	0.0067 U	0.0067 U	0.0067 U	0.017	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 UJ	0.0067 UJ	0.0067 U	0.0067 U	0.67
Benzo(a)pyrene	EPA 8270/SIM	mg/kg	0.0067 U	0.0067 U	0.0067 U	0.02	0.01	0.0067 U	0.0067 U	0.007	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.000016
Chrysene	EPA 8270/SIM	mg/kg	0.0067 U	0.0097	0.0067 U	0.02	0.027	0.0081	0.0067 U	0.0074	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0064
Dibenzo(a,h)anthracene	EPA 8270/SIM	mg/kg	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.000029
Dibenzofuran	EPA 8270/SIM	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.022	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.54
Fluoranthene	EPA 8270/SIM	mg/kg	0.034	0.025	0.0067 U	0.036	0.093	0.016	0.013	0.012	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.090
Fluorene	EPA 8270/SIM	mg/kg	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.033	0.0098	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.029
Indeno(1,2,3-c,d)pyrene	EPA 8270/SIM	mg/kg	0.0067 U	0.0067 U	0.0067 U	0.013	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.00056
1-Methylnaphthalene	EPA 8270/SIM	mg/kg	0.013	0.0096	0.0067 U	0.0067 U	0.01	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	29
2-Methylnaphthalene	EPA 8270/SIM	mg/kg	0.029	0.02	0.0067 U	0.0067 U	0.029	0.0093	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.67
Naphthalene	EPA 8270/SIM	mg/kg	0.037	0.037	0.0067 U	0.0067 U	0.028	0.0099	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0021
Phenanthrene	EPA 8270/SIM	mg/kg	0.085	0.05	0.0067 U	0.046	0.14	0.055	0.017	0.0073	0.0067 U	0.0067 U	0.0067 U	0.0067 U	1.5
Pyrene	EPA 8270/SIM	mg/kg	0.026	0.021	0.0067 U	0.043	0.078	0.018	0.014	0.015	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.14
Total cPAH TEQ ⁴ (ND=0)	EPA 8270/SIM	mg/kg	0 U	0.00085	0 U	0.027	0.014	0.000081	0 U	0.0087	0 U	0 U	0 U	0 U	0.000016
Total cPAH TEQ ⁴ (ND=0.5RL)	EPA 8270/SIM	mg/kg	0.0051 U	0.0055	0.0051 U	0.027	0.015	0.0051	0.0051 U	0.0097	0.0051 U	0.0051 U	0.0051 U	0.0051 U	0.000016
Other SVOCs															
Aniline	EPA 8270	mg/kg	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 UJ	0.085 UJ	0.085 U	0.085 U	150
Benzidine	EPA 8270	mg/kg	0.017 UJ	0.017 UJ	0.017 UJ	0.017 UJ	0.017 U	0.017 U	0.017 U	0.017 U	0.017 UJ	0.017 UJ	0.017 UJ	0.017 UJ	0.0037
Benzoic acid	EPA 8270	mg/kg	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.17
Benzyl alcohol	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.057
Bis(2-chloroethoxy)methane	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	NE
Bis(2-chloroethyl)ether	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.000022
Bis(2-chloroisopropyl)ether	EPA 8270	mg/kg	0.017 UJ	0.017 UJ	0.017 UJ	0.017 UJ	0.017 UJ	0.017 UJ	0.017 UJ	0.017 UJ	0.017 U	0.017 U	0.017 U	0.017 U	3,200
Bis(2-ethylhexyl)phthalate	EPA 8270	mg/kg	0.069	0.55	0.08	0.037	0.017 U	0.074	0.052	0.019	0.056 J	0.12 J	0.046	0.15	0.0051
4-Bromophenyl phenyl ether	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	NE
Butyl benzyl phthalate	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.00018
Carbazole	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	NE
4-Chloroaniline	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.81
4-Chloro-3-methylphenol	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 UJ	0.017 UJ	0.017 U	0.017 U	NE
2-Chloronaphthalene	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	6,400
2-Chlorophenol	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.011
4-Chlorophenyl phenyl ether	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 UJ	0.017 UJ	0.017 U	0.017 U	NE

Table D-1
Remedial Investigation Chemical Analytical Results - Soil COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Sample Location ¹	Analytical Method	Units	MW-17				MW-18				MW-19D				Soil Preliminary Cleanup Level ² (PCUL)
Sample Identification			MW17-2.5-3.5	MW17-5.5-6.5	MW17-7.5-8.5	MW17-19-20	MW18-2-3	MW18-5-6	MW18-10-11	MW18-18-19	MW19D-3-4	MW19D-3-4Dup	MW19D-7-8	MW19D-10-11	
Sample Date			12/26/13	12/26/13	12/26/13	12/26/13	12/18/13	12/18/13	12/18/13	12/18/13	12/26/13	12/26/13	12/26/13	12/26/13	
Sample Depth			2.5 - 3.5 ft	5.5. - 6.5 ft	7.5 - 8.5 ft	19 - 20 ft	2 - 3 ft	5 - 6 ft	10 - 11 ft	18 - 19 ft	3 - 4 ft	3 - 4 ft	7 - 8 ft	10 - 11 ft	
Stratigraphic Horizon			FO	FO	FO	AD	FO	FO	FO	AD	FO	FO	FO	FO	
Sampled By			GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	
Decane	EPA 8270	mg/kg	0.017 UJ	0.017 UJ	0.017 UJ	0.017 UJ	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	NE
Dibutyl phthalate	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.015
2,3-Dichloroaniline	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	NE
1,2-Dichlorobenzene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 UJ	0.0010 UJ	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0031
(o-Dichlorobenzene)	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.0031
1,3-Dichlorobenzene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 UJ	0.0033 J	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	NE
(m-Dichlorobenzene)	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 UJ	0.017 UJ	0.017 U	0.017 U	NE
1,4-Dichlorobenzene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 UJ	0.0010 UJ	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0081
(p-Dichlorobenzene)	EPA 8270	mg/kg	0.017 UJ	0.017 UJ	0.017 UJ	0.017 UJ	0.017 U	0.017 U	0.017 U	0.017 U	0.017 UJ	0.017 UJ	0.017 UJ	0.017 UJ	0.0081
3,3'-Dichlorobenzidine	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.0000033
2,4-Dichlorophenol	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 UJ	0.017 UJ	0.017 U	0.017 U	0.0043
Bis(2-ethylhexyl)ester	EPA 8270	mg/kg	0.017 UJ	0.017 UJ	0.017 UJ	0.017 UJ	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	710
Diethyl phthalate	EPA 8270	mg/kg	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 U	0.085 UJ	0.085 UJ	0.085 U	0.085 U	0.034
Dimethyl phthalate	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.071
2,4-Dimethylphenol	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.0031
1,2-Dinitrobenzene	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	8.0
1,3-Dinitrobenzene	EPA 8270	mg/kg	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 U	0.085 U	0.085 U	0.085 U	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	8.0
1,4-Dinitrobenzene	EPA 8270	mg/kg	0.017 UJ	0.017 UJ	0.017 UJ	0.017 UJ	0.017 U	0.017 U	0.017 U	0.017 U	0.017 UJ	0.017 UJ	0.017 UJ	0.017 UJ	8.0
4,6-Dinitro-2-methylphenol	EPA 8270	mg/kg	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	NE
2,4-Dinitrophenol	EPA 8270	mg/kg	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.085 UJ	0.029
2,4-Dinitrotoluene	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.000069
2,6-Dinitrotoluene	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.11
Di-n-octyl phthalate	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.33
1,2-Diphenylhydrazine	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	1.1
Hexachlorobenzene	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.00000040
Hexachlorobutadiene	EPA 8260	mg/kg	0.0050 U	0.0050 U	0.0050 U	0.0050 UJ	0.0050 UJ	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.00054
	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.00054
Hexachlorocyclopentadiene	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.20
Hexachloroethane	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.000041
Isophorone	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.043	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.037
2-Methylphenol (o-Cresol)	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.010
3 & 4 Methylphenol (m-, p-Cresol)	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	4,000
2-Nitroaniline	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	800
3-Nitroaniline	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	NE
4-Nitroaniline	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	NE
Nitrobenzene	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.041
2-Nitrophenol	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 UJ	0.017 UJ	0.017 U	0.017 U	NE
4-Nitrophenol (p-Nitrophenol)	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	7.0
n-Nitrosodimethylamine	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017
n-Nitrosodiphenylamine (as Diphenylamine)	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 UJ	0.017 UJ	0.017 U	0.017 U	0.0011
n-Nitrosodi-n-propylamine	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.000018
n-Octadecane	EPA 8270	mg/kg	0.026 J	0.024 J	0.017 UJ	0.017 UJ	0.29 J	0.10 J	0.017 UJ	0.017 UJ	0.017 UJ	0.017 UJ	0.017 UJ	0.017 UJ	NE
Pentachlorophenol	EPA 8270	mg/kg	0.083 UJ	0.083 UJ	0.083 UJ	0.083 UJ	0.083 UJ	0.083 UJ	0.083 UJ	0.083 UJ	0.083 UJ	0.083 UJ	0.083 UJ	0.083 UJ	0.0000018

Table D-1
Remedial Investigation Chemical Analytical Results - Soil COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Sample Location ¹	Analytical Method	Units	MW-17				MW-18				MW-19D				Soil Preliminary Cleanup Level ² (PCUL)
Sample Identification			MW17-2.5-3.5	MW17-5.5-6.5	MW17-7.5-8.5	MW17-19-20	MW18-2-3	MW18-5-6	MW18-10-11	MW18-18-19	MW19D-3-4	MW19D-3-4Dup	MW19D-7-8	MW19D-10-11	
Sample Date			12/26/13	12/26/13	12/26/13	12/26/13	12/18/13	12/18/13	12/18/13	12/18/13	12/26/13	12/26/13	12/26/13	12/26/13	
Sample Depth			2.5 - 3.5 ft	5.5. - 6.5 ft	7.5 - 8.5 ft	19 - 20 ft	2 - 3 ft	5 - 6 ft	10 - 11 ft	18 - 19 ft	3 - 4 ft	3 - 4 ft	7 - 8 ft	10 - 11 ft	
Stratigraphic Horizon			FO	FO	FO	AD	FO	FO	FO	AD	FO	FO	FO	FO	
Sampled By			GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	
Phenol	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.12
Pyridine	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	80
2,3,4,6-Tetrachlorophenol	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	490
2,3,5,6-Tetrachlorophenol	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	NE
1,2,4-Trichlorobenzene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 UJ	0.0010 UJ	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.000072
	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.000072
2,4,5-Trichlorophenol	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	1.1
2,4,6-Trichlorophenol	EPA 8270	mg/kg	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.017 U	0.00019
Volatile Organic Compounds (VOCs)															
Acetone	EPA 8260	mg/kg	0.027	0.014	0.0094	0.26 J	0.11	0.032	0.031	0.058	0.0050 U	0.0050 U	0.07	0.045	72,000
Benzene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0023	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.00056
Bromobenzene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 UJ	0.0010 UJ	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	640
Bromochloromethane	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	NE
Bromoform (Tribromomethane)	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0050
Bromomethane	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.079
n-Butylbenzene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 UJ	0.0055 J	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	4,000
sec-Butylbenzene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 UJ	0.0025 J	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	8,000
tert-Butylbenzene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 UJ	0.0010 UJ	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	8,000
Carbon disulfide	EPA 8260	mg/kg	0.0043	0.0036	0.0010 U	0.0025	0.01	0.001	0.0021	0.0012	0.0010 U	0.0010 U	0.0010 U	0.0010 U	8,000
Carbon tetrachloride	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.00015
Chlorobenzene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.10
Chloroethane	EPA 8260	mg/kg	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	NE
2-Chloroethyl vinyl ether	EPA 8260	mg/kg	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	NE
Chloroform	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.052
Chloromethane	EPA 8260	mg/kg	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	NE
2-Chlorotoluene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 UJ	0.0010 UJ	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	1,600
4-Chlorotoluene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 UJ	0.0010 UJ	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	NE
Dibromochloromethane	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.00077
1,2-Dibromo-3-chloropropane	EPA 8260	mg/kg	0.0050 U	0.0050 U	0.0050 U	0.0050 UJ	0.0050 UJ	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	1.3
Dibromomethane	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	800
Bromodichloromethane (Dichlorobromomethane)	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.00096
Dichlorodifluoromethane (CFC-12)	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	16,000
1,1-Dichloroethane	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	180
1,2-Dichloroethane	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.024
1,1-Dichloroethene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	1.4
cis-1,2-Dichloroethene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	160
trans-1,2-Dichloroethene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.32
1,2-Dichloropropane	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010
1,3-Dichloropropane	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	NE
2,2-Dichloropropane	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	NE
1,1-Dichloropropene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	NE
cis-1,3-Dichloropropene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.00063

Table D-1
Remedial Investigation Chemical Analytical Results - Soil COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Sample Location ¹	Analytical Method	Units	MW-17				MW-18				MW-19D				Soil Preliminary Cleanup Level ² (PCUL)
Sample Identification			MW17-2.5-3.5	MW17-5.5-6.5	MW17-7.5-8.5	MW17-19-20	MW18-2-3	MW18-5-6	MW18-10-11	MW18-18-19	MW19D-3-4	MW19D-3-4Dup	MW19D-7-8	MW19D-10-11	
Sample Date			12/26/13	12/26/13	12/26/13	12/26/13	12/18/13	12/18/13	12/18/13	12/18/13	12/26/13	12/26/13	12/26/13	12/26/13	
Sample Depth			2.5 - 3.5 ft	5.5. - 6.5 ft	7.5 - 8.5 ft	19 - 20 ft	2 - 3 ft	5 - 6 ft	10 - 11 ft	18 - 19 ft	3 - 4 ft	3 - 4 ft	7 - 8 ft	10 - 11 ft	
Stratigraphic Horizon			FO	FO	FO	AD	FO	FO	FO	AD	FO	FO	FO	FO	
Sampled By			GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	
trans-1,3-Dichloropropene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.00063
Ethylbenzene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0038	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.015
1,2-Dibromoethane (EDB)	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.50
2-Hexanone	EPA 8260	mg/kg	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	400
Isopropylbenzene (Cumene)	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0019	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	8,000
p-Isopropyltoluene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 UJ	0.0059	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	NE
2-Butanone (MEK)	EPA 8260	mg/kg	0.0050 U	0.0050 U	0.0050 U	0.0055	0.01	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0093	0.0050 U	48,000
Methyl iodide (Iodomethane)	EPA 8260	mg/kg	0.0050 UJ	0.0050 UJ	0.0050 UJ	0.0050 UJ	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 UJ	0.0050 UJ	0.0050 UJ	0.0050 UJ	NE
4-Methyl-2-pentanone (Methyl Isobutyl Ketone)	EPA 8260	mg/kg	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	6,400
Methyl tert-butyl ether (MTBE)	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	560
Methylene chloride	EPA 8260	mg/kg	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.030
n-Propylbenzene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 UJ	0.0070 J	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	8,000
Styrene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	300
1,1,1,2-Tetrachloroethane	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	38
1,1,2,2-Tetrachloroethane	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 UJ	0.0010 UJ	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.00011
Tetrachloroethene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0016
Toluene	EPA 8260	mg/kg	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0084	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.055
1,2,3-Trichlorobenzene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 UJ	0.0010 UJ	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	20
1,1,1-Trichloroethane	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	21
1,1,2-Trichloroethane	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.00033
Trichloroethene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.00027
Trichlorofluoromethane (CFC-11)	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	24,000
1,2,3-Trichloropropane	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 UJ	0.0010 UJ	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.033
1,2,4-Trimethylbenzene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 UJ	0.072 J	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	800
1,3,5-Trimethylbenzene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 UJ	0.019 J	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	800
Vinyl Acetate	EPA 8260	mg/kg	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	80,000
Vinyl Chloride	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.000055
Xylene, m-,p-	EPA 8260	mg/kg	0.0020 U	0.0020 U	0.0020 U	0.0020 U	0.021	0.0020 U	0.0020 U	0.0020 U	0.0020 U	0.0020 U	0.0020 U	0.0020 U	16,000
Xylene, o-	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.013	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	16,000
Petroleum Hydrocarbons															
Gasoline-Range Hydrocarbons	NWTPH-G	mg/kg	5.0 U	5.0 U	5.0 U	5.0 U	4.4 UJ	3.6 U	3.2 U	3.8 U	5.0 U	5.0 U	5.0 U	5.0 U	30
Diesel-Range Hydrocarbons	NWTPH-Dx	mg/kg	18 U	21	15 U	33	330 J	130 J	17 J	53 J	14 U	14 U	15 U	15 U	260
Oil-Range Hydrocarbons	NWTPH-Dx	mg/kg	96	150	31 U	110	2,300	750	140	180	29 U	28 U	29 U	29 U	2,000
Total Diesel- and Oil-Range Hydrocarbons	NWTPH-Dx	mg/kg	96	171	31 U	143	2,630 J	880 J	157 J	233 J	29 U	28 U	29 U	29 U	260
Conventionals															
pH	N/A	N/A	11 J	11 J	9.1 J	8.2 J	9.5 J	9.8 J	9.7 J	8.7 J	9.2 J	9.3 J	8.6 J	5.6 J	NE

Table D-1

Remedial Investigation Chemical Analytical Results - Soil COPCs

Port of Seattle - North Terminal 115

Seattle, Washington

Notes:

- ¹ Sample locations are shown on Figures 3-1 and 3-3.
- ² Preliminary cleanup levels for soil are referenced from Table 4-1.
- ³ Total dioxin/furan Toxic Equivalency Quotients (TEQs) were calculated using United States Environmental Protection Agency (USEPA) Toxicity Equivalency Factor (TEF) values for human health (EPA 2003).
- ⁴ Total carcinogenic PAH (cPAH) TEQs were calculated using TEF values referenced from MTCA Table 708.2 (WAC 173-340-900).
- RL = Reporting limit
- EPA = Environmental Protection Agency
- mg/kg = milligram per kilogram
- NE = not established
- J = estimated result
- U = analyte not detected above the reporting limit
- = not analyzed
- AD = Native LDW alluvial deposit
- OS = Native organic silt (Aquitard) deposit
- FI = Initial (early 1900s) T115N fill deposit
- FD = Glacier NW Site dredged fill deposit
- FO = T115N operational (1960s) fill deposit
- FT = Terminal 115 fill deposit
- FP = Settling pond fill deposit
- COPC = Contaminant of Potential Concern
- KCHD = King County Health Department
- Landau = Landau Associates
- GEI = GeoEngineers
- ERM = Environmental Resources Management
- Shaw = Shaw Environmental & Infrastructure
- Bold** indicates analyte was detected.
- Yellow shading identifies the detected results greater than the preliminary cleanup level.
- Blue shading identifies the non-detected result greater than the preliminary cleanup level.

Table D-1
Remedial Investigation Chemical Analytical Results - Soil COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Sample Location ¹	Analytical Method	Units	MW-19D	MW-20					GP-10	GP-11	GP-14	GP-15		GP-18	GP-19	Soil Preliminary Cleanup Level ² (PCUL)
Sample Identification			MW19D-26-27	MW20-2-3	MW20-4-5	MW20-9-10	MW20-13-14	GP-10-3261996	GP-11-3261996	GP-14-3261996	GP-15-3-4:12071995	GP-15-3261996	GP-18-3261996	GP-19-3261996		
Sample Date			12/26/13	12/16/13	12/16/13	12/16/13	12/16/13	03/26/96	03/26/96	03/26/96	12/07/95	03/26/96	03/26/96	03/26/96		
Sample Depth			26 - 27 ft	2 - 3 ft	4 - 5 ft	9 - 10 ft	13 - 14 ft	7 - 9 ft	7 - 9 ft	7 - 9 ft	3 - 4 ft	7-9 ft	7 - 9 ft	7 - 9 ft		
Stratigraphic Horizon			AD	FO	FO	FI	OS	FD	FD	FD	FD	FD	FD	FD		
Sampled By	GEI	GEI	GEI	GEI	GEI	RETEC	RETEC	RETEC	RETEC	RETEC	RETEC	RETEC	RETEC	RETEC	RETEC	
Polychlorinated Biphenyls (PCBs)																
PCB-Aroclor 1016	EPA 8082	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	NE
PCB-Aroclor 1221	EPA 8082	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	NE
PCB-Aroclor 1232	EPA 8082	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	NE
PCB-Aroclor 1242	EPA 8082	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	NE
PCB-Aroclor 1248	EPA 8082	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	NE
PCB-Aroclor 1254	EPA 8082	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	NE
PCB-Aroclor 1260	EPA 8082	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	NE
Total PCB Aroclors	EPA 8082	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	0.0000022
Dioxins and Furans																
1,2,3,4,6,7,8-HpCDD	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,4,6,7,8-HpCDF	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,4,7,8,9-HpCDF	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,4,7,8-HxCDD	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,4,7,8-HxCDF	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,6,7,8-HxCDD	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,6,7,8-HxCDF	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,7,8,9-HxCDD	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,7,8,9-HxCDF	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,7,8-PeCDD	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,7,8-PeCDF	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	NE
2,3,4,6,7,8-HxCDF	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	NE
2,3,4,7,8-PeCDF	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	NE
2,3,7,8-TCDD	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	NE
2,3,7,8-TCDF	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	NE
OCDD	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	NE
OCDF	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	NE
Total Dioxin/Furan TEQ ³ (ND=0.5RL)	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	0.0000052
Total Dioxin/Furan TEQ ³ (ND=0.5RL)	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	0.0000052
Metals																
Antimony	EPA 6000/7000	mg/kg	5.0 U	5.0 U	5.0 U	--	5.0 U	--	--	--	--	--	--	--	--	4.1
Arsenic	EPA 6000/7000	mg/kg	4.8	5.6	5.1	--	6.3	320	99	28	140	--	21.0 U	93	--	7.0
Barium	EPA 6000/7000	mg/kg	22	100	110	--	37	--	--	--	--	--	--	--	--	8.3
Beryllium	EPA 6000/7000	mg/kg	0.50 U	0.50 U	0.50 U	--	0.50 U	--	--	--	--	--	--	--	--	3.5
Cadmium	EPA 6000/7000	mg/kg	0.44	0.20 U	0.20 U	--	0.20 U	--	--	--	--	--	--	--	--	1.0
Chromium III / Total	EPA 6000/7000	mg/kg	11	52	51	--	22	--	--	--	--	--	--	--	--	48
Chromium VI	EPA 6000/7000	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	--	18
Copper	EPA 6000/7000	mg/kg	24	42	41	--	24	--	--	--	--	--	--	--	--	36
Lead	EPA 6000/7000	mg/kg	14	7.3	9.6	--	4.9	--	--	--	--	--	--	--	--	50
Mercury	EPA 6000/7000	mg/kg	0.17	0.050 U	0.050 U	--	0.055	--	--	--	--	--	--	--	--	0.070
Nickel	EPA 6000/7000	mg/kg	8.5	62	68	--	19	--	--	--	--	--	--	--	--	48
Selenium	EPA 6000/7000	mg/kg	0.50 U	0.50 U	0.50 U	--	0.69	--	--	--	--	--	--	--	--	0.30

Table D-1
Remedial Investigation Chemical Analytical Results - Soil COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Sample Location ¹	Analytical Method	Units	MW-19D	MW-20				GP-10	GP-11	GP-14	GP-15		GP-18	GP-19	Soil Preliminary Cleanup Level ² (PCUL)
Sample Identification			MW19D-26-27	MW20-2-3	MW20-4-5	MW20-9-10	MW20-13-14	GP-10-3261996	GP-11-3261996	GP-14-3261996	GP-15-3-4:12071995	GP-15-3261996	GP-18-3261996	GP-19-3261996	
Sample Date			12/26/13	12/16/13	12/16/13	12/16/13	12/16/13	03/26/96	03/26/96	03/26/96	12/07/95	03/26/96	03/26/96	03/26/96	
Sample Depth			26 - 27 ft	2 - 3 ft	4 - 5 ft	9 - 10 ft	13 - 14 ft	7 - 9 ft	7 - 9 ft	7 - 9 ft	3 - 4 ft	7-9 ft	7 - 9 ft	7 - 9 ft	
Stratigraphic Horizon			AD	FO	FO	FI	OS	FD	FD	FD	FD	FD	FD	FD	
Sampled By			GEI	GEI	GEI	GEI	GEI	RETEC	RETEC	RETEC	RETEC	RETEC	RETEC	RETEC	
Silver	EPA 6000/7000	mg/kg	0.50 U	0.50 U	0.50 U	--	0.50 U	--	--	--	--	--	--	--	0.016
Thallium	EPA 6000/7000	mg/kg	0.25 U	0.25 U	0.25 U	--	0.25 U	--	--	--	--	--	--	--	0.0044
Tin	EPA 6000/7000	mg/kg	2.8	25	31	--	1.2	--	--	--	--	--	--	--	50
Zinc	EPA 6000/7000	mg/kg	62	330	81	--	35	--	--	--	--	--	--	--	85
Semi-Volatile Organic Compounds (SVOCs) - Polycyclic Aromatic Hydrocarbons (PAHs)															
Acenaphthene	EPA 8270/SIM	mg/kg	0.24	0.0067 U	0.0067 U	0.0067 U	0.0067 U	--	--	--	--	--	--	--	0.028
Acenaphthylene	EPA 8270/SIM	mg/kg	0.0067 U	0.0067 U	0.0067 U	0.0067 U	0.0067 U	--	--	--	--	--	--	--	1.3
Anthracene	EPA 8270/SIM	mg/kg	0.084	0.0067 U	0.0067 U	0.0067 U	0.0067 U	--	--	--	--	--	--	--	0.051
Benzo(a)anthracene	EPA 8270/SIM	mg/kg	0.026	0.0079	0.0067 U	0.0067 U	0.0067 U	--	--	--	--	--	--	--	0.000057
Benzo(b)fluoranthene	EPA 8270/SIM	mg/kg	0.027	0.026 U	0.0067 U	0.0067 U	0.0067 U	--	--	--	--	--	--	--	0.00020
Benzo(k)fluoranthene	EPA 8270/SIM	mg/kg	0.0086	0.026 U	0.0067 U	0.0067 U	0.0067 U	--	--	--	--	--	--	--	0.0020
Benzofluoranthenes (Total)	EPA 8270/SIM	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	3.2
Benzo(g,h,i)perylene	EPA 8270/SIM	mg/kg	0.0067 U	0.026 U	0.0067 U	0.0067 U	0.0067 U	--	--	--	--	--	--	--	0.67
Benzo(a)pyrene	EPA 8270/SIM	mg/kg	0.018	0.026 U	0.0067 U	0.0067 U	0.0067 U	--	--	--	--	--	--	--	0.000016
Chrysene	EPA 8270/SIM	mg/kg	0.03	0.033	0.0067 U	0.0067 U	0.0067 U	--	--	--	--	--	--	--	0.0064
Dibenzo(a,h)anthracene	EPA 8270/SIM	mg/kg	0.0067 U	0.026 U	0.0067 U	0.0067 U	0.0067 U	--	--	--	--	--	--	--	0.000029
Dibenzofuran	EPA 8270/SIM	mg/kg	0.26	0.026 U	0.017 U	0.017 U	0.017 U	--	--	--	--	--	--	--	0.54
Fluoranthene	EPA 8270/SIM	mg/kg	0.13	0.0067 U	0.0067 U	0.0067 U	0.0067 U	--	--	--	--	--	--	--	0.090
Fluorene	EPA 8270/SIM	mg/kg	0.32	0.0067 U	0.0067 U	0.0067 U	0.0067 U	--	--	--	--	--	--	--	0.029
Indeno(1,2,3-c,d)pyrene	EPA 8270/SIM	mg/kg	0.0067 U	0.026 U	0.0067 U	0.0067 U	0.0067 U	--	--	--	--	--	--	--	0.00056
1-Methylnaphthalene	EPA 8270/SIM	mg/kg	0.027	0.0067 U	0.0067 U	0.0067 U	0.0067 U	--	--	--	--	--	--	--	29
2-Methylnaphthalene	EPA 8270/SIM	mg/kg	0.059	0.0067 U	0.0067 U	0.0067 U	0.0067 U	--	--	--	--	--	--	--	0.67
Naphthalene	EPA 8270/SIM	mg/kg	0.047	0.0067 U	0.0067 U	0.0067 U	0.0067 U	--	--	--	--	--	--	--	0.0021
Phenanthrene	EPA 8270/SIM	mg/kg	0.63	0.0067 U	0.0067 U	0.0067 U	0.0067 U	--	--	--	--	--	--	--	1.5
Pyrene	EPA 8270/SIM	mg/kg	0.082	0.012	0.03	0.008	0.0067 U	--	--	--	--	--	--	--	0.14
Total cPAH TEQ ⁴ (ND=0)	EPA 8270/SIM	mg/kg	0.024	0.0011	0 U	0 U	0 U	--	--	--	--	--	--	--	0.000016
Total cPAH TEQ ⁴ (ND=0.5RL)	EPA 8270/SIM	mg/kg	0.025	0.019	0.0051 U	0.0051 U	0.0051 U	--	--	--	--	--	--	--	0.000016
Other SVOCs															
Aniline	EPA 8270	mg/kg	0.085 U	0.026 U	0.085 U	0.085 U	0.085 U	--	--	--	--	--	--	--	150
Benzidine	EPA 8270	mg/kg	0.017 UJ	0.026 U	0.017 U	0.017 U	0.017 U	--	--	--	--	--	--	--	0.0037
Benzoic acid	EPA 8270	mg/kg	0.085 UJ	0.026 UJ	0.085 UJ	0.085 UJ	0.085 UJ	--	--	--	--	--	--	--	0.17
Benzyl alcohol	EPA 8270	mg/kg	0.017 U	0.026 U	0.017 U	0.017 U	0.017 U	--	--	--	--	--	--	--	0.057
Bis(2-chloroethoxy)methane	EPA 8270	mg/kg	0.017 U	0.026 U	0.017 U	0.017 U	0.017 U	--	--	--	--	--	--	--	NE
Bis(2-chloroethyl)ether	EPA 8270	mg/kg	0.017 U	0.026 U	0.017 U	0.017 U	0.017 U	--	--	--	--	--	--	--	0.000022
Bis(2-chloroisopropyl)ether	EPA 8270	mg/kg	0.017 U	0.026 U	0.017 U	0.017 U	0.017 U	--	--	--	--	--	--	--	3,200
Bis(2-ethylhexyl)phthalate	EPA 8270	mg/kg	0.06	0.23	0.017 U	0.028	0.026	--	--	--	--	--	--	--	0.0051
4-Bromophenyl phenyl ether	EPA 8270	mg/kg	0.017 U	0.026 U	0.017 U	0.017 U	0.017 U	--	--	--	--	--	--	--	NE
Butyl benzyl phthalate	EPA 8270	mg/kg	0.017 U	0.026 U	0.017 U	0.017 U	0.017 U	--	--	--	--	--	--	--	0.00018
Carbazole	EPA 8270	mg/kg	0.082	0.026 U	0.017 U	0.017 U	0.017 U	--	--	--	--	--	--	--	NE
4-Chloroaniline	EPA 8270	mg/kg	0.017 U	0.026 U	0.017 U	0.017 U	0.017 U	--	--	--	--	--	--	--	0.81
4-Chloro-3-methylphenol	EPA 8270	mg/kg	0.017 U	0.026 U	0.017 U	0.017 U	0.017 U	--	--	--	--	--	--	--	NE
2-Chloronaphthalene	EPA 8270	mg/kg	0.017 U	0.026 U	0.017 U	0.017 U	0.017 U	--	--	--	--	--	--	--	6,400
2-Chlorophenol	EPA 8270	mg/kg	0.017 U	0.026 U	0.017 U	0.017 U	0.017 U	--	--	--	0.23 U	--	--	--	0.011
4-Chlorophenyl phenyl ether	EPA 8270	mg/kg	0.017 U	0.026 U	0.017 U	0.017 U	0.017 U	--	--	--	--	--	--	--	NE

Table D-1
Remedial Investigation Chemical Analytical Results - Soil COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Sample Location ¹	Analytical Method	Units	MW-19D	MW-20				GP-10	GP-11	GP-14	GP-15		GP-18	GP-19	Soil Preliminary Cleanup Level ² (PCUL)
Sample Identification			MW19D-26-27	MW20-2-3	MW20-4-5	MW20-9-10	MW20-13-14	GP-10-3261996	GP-11-3261996	GP-14-3261996	GP-15-3-4:12071995	GP-15-3261996	GP-18-3261996	GP-19-3261996	
Sample Date			12/26/13	12/16/13	12/16/13	12/16/13	12/16/13	03/26/96	03/26/96	03/26/96	12/07/95	03/26/96	03/26/96	03/26/96	
Sample Depth			26 - 27 ft	2 - 3 ft	4 - 5 ft	9 - 10 ft	13 - 14 ft	7 - 9 ft	7 - 9 ft	7 - 9 ft	3 - 4 ft	7-9 ft	7 - 9 ft	7 - 9 ft	
Stratigraphic Horizon			AD	FO	FO	FI	OS	FD	FD	FD	FD	FD	FD	FD	
Sampled By			GEI	GEI	GEI	GEI	GEI	RETEC	RETEC	RETEC	RETEC	RETEC	RETEC	RETEC	
Decane	EPA 8270	mg/kg	0.017 U	0.026 U	0.017 U	0.017 U	0.017 U	–	–	–	–	–	–	–	NE
Dibutyl phthalate	EPA 8270	mg/kg	0.017 U	0.026 U	0.017 U	0.017 U	0.019	–	–	–	–	–	–	–	0.015
2,3-Dichloroaniline	EPA 8270	mg/kg	0.017 U	0.026 U	0.017 U	0.017 U	0.017 U	–	–	–	–	–	–	–	NE
1,2-Dichlorobenzene	EPA 8260	mg/kg	0.0010 UJ	0.0010 U	0.0010 U	0.0010 U	0.0010 U	–	–	–	–	–	–	–	0.0031
(o-Dichlorobenzene)	EPA 8270	mg/kg	0.017 U	0.026 U	0.017 U	0.017 U	0.017 U	–	–	–	–	–	–	–	0.0031
1,3-Dichlorobenzene	EPA 8260	mg/kg	0.0010 UJ	0.0010 U	0.0010 U	0.0010 U	0.0010 U	–	–	–	–	–	–	–	NE
(m-Dichlorobenzene)	EPA 8270	mg/kg	0.017 U	0.026 U	0.017 U	0.017 U	0.017 U	–	–	–	–	–	–	–	NE
1,4-Dichlorobenzene	EPA 8260	mg/kg	0.0010 UJ	0.0010 U	0.0010 U	0.0010 U	0.0010 U	–	–	–	–	–	–	–	0.0081
(p-Dichlorobenzene)	EPA 8270	mg/kg	0.017 UJ	0.026 U	0.017 U	0.017 U	0.017 U	–	–	–	–	–	–	–	0.0081
3,3'-Dichlorobenzidine	EPA 8270	mg/kg	0.017 U	0.026 U	0.017 U	0.017 U	0.017 U	–	–	–	–	–	–	–	0.0000033
2,4-Dichlorophenol	EPA 8270	mg/kg	0.017 U	0.026 U	0.017 U	0.017 U	0.017 U	–	–	–	–	–	–	–	0.0043
Bis(2-ethylhexyl)ester	EPA 8270	mg/kg	0.017 U	0.026 U	0.017 U	0.017 U	0.017 U	–	–	–	–	–	–	–	710
Diethyl phthalate	EPA 8270	mg/kg	0.085 U	0.026 U	0.085 U	0.085 U	0.085 U	–	–	–	–	–	–	–	0.034
Dimethyl phthalate	EPA 8270	mg/kg	0.017 U	0.026 U	0.017 U	0.017 U	0.017 U	–	–	–	–	–	–	–	0.071
2,4-Dimethylphenol	EPA 8270	mg/kg	0.017 U	0.026 U	0.017 U	0.017 U	0.017 U	–	–	–	–	–	–	–	0.0031
1,2-Dinitrobenzene	EPA 8270	mg/kg	0.017 U	0.026 U	0.017 U	0.017 U	0.017 U	–	–	–	–	–	–	–	8.0
1,3-Dinitrobenzene	EPA 8270	mg/kg	0.085 UJ	0.026 U	0.085 U	0.085 U	0.085 U	–	–	–	–	–	–	–	8.0
1,4-Dinitrobenzene	EPA 8270	mg/kg	0.017 UJ	0.026 U	0.017 U	0.017 U	0.017 U	–	–	–	–	–	–	–	8.0
4,6-Dinitro-2-methylphenol	EPA 8270	mg/kg	0.085 UJ	0.026 UJ	0.085 UJ	0.085 UJ	0.085 UJ	–	–	–	–	–	–	–	NE
2,4-Dinitrophenol	EPA 8270	mg/kg	0.085 UJ	0.026 UJ	0.085 UJ	0.085 UJ	0.085 UJ	–	–	–	–	–	–	–	0.029
2,4-Dinitrotoluene	EPA 8270	mg/kg	0.017 U	0.026 U	0.017 U	0.017 U	0.017 U	–	–	–	–	–	–	–	0.000069
2,6-Dinitrotoluene	EPA 8270	mg/kg	0.017 U	0.026 U	0.017 U	0.017 U	0.017 U	–	–	–	–	–	–	–	0.11
Di-n-octyl phthalate	EPA 8270	mg/kg	0.017 U	0.026 U	0.017 U	0.017 U	0.017 U	–	–	–	–	–	–	–	0.33
1,2-Diphenylhydrazine	EPA 8270	mg/kg	0.017 U	0.026 U	0.017 U	0.017 U	0.017 U	–	–	–	–	–	–	–	1.1
Hexachlorobenzene	EPA 8270	mg/kg	0.017 U	0.026 U	0.017 U	0.017 U	0.017 U	–	–	–	–	–	–	–	0.00000040
Hexachlorobutadiene	EPA 8260	mg/kg	0.0050 UJ	0.0050 U	0.0050 U	0.0050 U	0.0050 U	–	–	–	–	–	–	–	0.00054
	EPA 8270	mg/kg	0.017 U	0.026 U	0.017 U	0.017 U	0.017 U	–	–	–	–	–	–	–	0.00054
Hexachlorocyclopentadiene	EPA 8270	mg/kg	0.017 U	0.026 U	0.017 U	0.017 U	0.017 U	–	–	–	–	–	–	–	0.20
Hexachloroethane	EPA 8270	mg/kg	0.017 U	0.026 U	0.017 U	0.017 U	0.017 U	–	–	–	–	–	–	–	0.000041
Isophorone	EPA 8270	mg/kg	0.017 U	0.026 U	0.017 U	0.017 U	0.017 U	–	–	–	–	–	–	–	0.037
2-Methylphenol (o-Cresol)	EPA 8270	mg/kg	0.017 U	0.026 U	0.017 U	0.017 U	0.017 U	–	–	–	–	–	–	–	0.010
3 & 4 Methylphenol (m-, p-Cresol)	EPA 8270	mg/kg	0.017 U	0.026 U	0.017 U	0.017 U	0.017 U	–	–	–	–	–	–	–	4,000
2-Nitroaniline	EPA 8270	mg/kg	0.017 U	0.026 U	0.017 U	0.017 U	0.017 U	–	–	–	–	–	–	–	800
3-Nitroaniline	EPA 8270	mg/kg	0.017 U	0.026 U	0.017 U	0.017 U	0.017 U	–	–	–	–	–	–	–	NE
4-Nitroaniline	EPA 8270	mg/kg	0.017 U	0.026 U	0.017 U	0.017 U	0.017 U	–	–	–	–	–	–	–	NE
Nitrobenzene	EPA 8270	mg/kg	0.017 U	0.026 U	0.017 U	0.017 U	0.017 U	–	–	–	–	–	–	–	0.041
2-Nitrophenol	EPA 8270	mg/kg	0.017 U	0.026 U	0.017 U	0.017 U	0.017 U	–	–	–	–	–	–	–	NE
4-Nitrophenol (p-Nitrophenol)	EPA 8270	mg/kg	0.017 U	0.026 U	0.017 U	0.023	0.017	–	–	–	–	–	–	–	7.0
n-Nitrosodimethylamine	EPA 8270	mg/kg	0.017 U	0.026 U	0.017 U	0.017 U	0.017 U	–	–	–	–	–	–	–	0.017
n-Nitrosodiphenylamine (as Diphenylamine)	EPA 8270	mg/kg	0.017 U	0.026 U	0.017 U	0.017 U	0.017 U	–	–	–	–	–	–	–	0.0011
n-Nitrosodi-n-propylamine	EPA 8270	mg/kg	0.017 U	0.026 U	0.017 U	0.017 U	0.017 U	–	–	–	–	–	–	–	0.000018
n-Octadecane	EPA 8270	mg/kg	0.017 UJ	0.026 UJ	0.017 UJ	0.017 UJ	0.017 UJ	–	–	–	1.2 U	–	–	–	NE
Pentachlorophenol	EPA 8270	mg/kg	0.083 UJ	0.026 UJ	0.083 UJ	0.083 UJ	0.083 UJ	–	–	–	–	–	–	–	0.0000018

Table D-1
Remedial Investigation Chemical Analytical Results - Soil COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Sample Location ¹	Analytical Method	Units	MW-19D	MW-20				GP-10	GP-11	GP-14	GP-15		GP-18	GP-19	Soil Preliminary Cleanup Level ² (PCUL)
Sample Identification			MW19D-26-27	MW20-2-3	MW20-4-5	MW20-9-10	MW20-13-14	GP-10-3261996	GP-11-3261996	GP-14-3261996	GP-15-3-4:12071995	GP-15-3261996	GP-18-3261996	GP-19-3261996	
Sample Date			12/26/13	12/16/13	12/16/13	12/16/13	12/16/13	03/26/96	03/26/96	03/26/96	12/07/95	03/26/96	03/26/96	03/26/96	
Sample Depth			26 - 27 ft	2 - 3 ft	4 - 5 ft	9 - 10 ft	13 - 14 ft	7 - 9 ft	7 - 9 ft	7 - 9 ft	3 - 4 ft	7-9 ft	7 - 9 ft	7 - 9 ft	
Stratigraphic Horizon			AD	FO	FO	FI	OS	FD	FD	FD	FD	FD	FD	FD	
Sampled By			GEI	GEI	GEI	GEI	GEI	RETEC	RETEC	RETEC	RETEC	RETEC	RETEC	RETEC	
Phenol	EPA 8270	mg/kg	0.017 U	0.026 U	0.017 U	0.017 U	0.017 U	--	--	--	--	--	--	--	0.12
Pyridine	EPA 8270	mg/kg	0.017 U	0.026 U	0.017 U	0.017 U	0.017 U	--	--	--	0.23 U	--	--	--	80
2,3,4,6-Tetrachlorophenol	EPA 8270	mg/kg	0.017 U	0.026 U	0.017 U	0.017 U	0.017 U	--	--	--	0.23 U	--	--	--	490
2,3,5,6-Tetrachlorophenol	EPA 8270	mg/kg	0.017 U	0.026 U	0.017 U	0.017 U	0.017 U	--	--	--	0.23 U	--	--	--	NE
1,2,4-Trichlorobenzene	EPA 8260	mg/kg	0.0010 UJ	0.0010 U	0.0010 U	0.0010 U	0.0010 U	--	--	--	--	--	--	--	0.000072
	EPA 8270	mg/kg	0.017 U	0.026 U	0.017 U	0.017 U	0.017 U	--	--	--	--	--	--	--	0.000072
2,4,5-Trichlorophenol	EPA 8270	mg/kg	0.017 U	0.026 U	0.017 U	0.017 U	0.017 U	--	--	--	0.23 U	--	--	--	1.1
2,4,6-Trichlorophenol	EPA 8270	mg/kg	0.017 U	0.026 U	0.017 U	0.017 U	0.017 U	--	--	--	--	--	--	--	0.00019
Volatile Organic Compounds (VOCs)															
Acetone	EPA 8260	mg/kg	0.19 J	0.028	0.061	0.027	0.12	--	--	--	--	--	--	--	72,000
Benzene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	--	--	--	--	--	--	--	0.00056
Bromobenzene	EPA 8260	mg/kg	0.0010 UJ	0.0010 U	0.0010 U	0.0010 U	0.0010 U	--	--	--	--	--	--	--	640
Bromochloromethane	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	--	--	--	--	--	--	--	NE
Bromoform (Tribromomethane)	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	--	--	--	--	--	--	--	0.0050
Bromomethane	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	--	--	--	--	--	--	--	0.079
n-Butylbenzene	EPA 8260	mg/kg	0.0010 UJ	0.0010 U	0.0010 U	0.0010 U	0.0010 U	--	--	--	--	--	--	--	4,000
sec-Butylbenzene	EPA 8260	mg/kg	0.0010 UJ	0.0010 U	0.0010 U	0.0010 U	0.0010 U	--	--	--	--	--	--	--	8,000
tert-Butylbenzene	EPA 8260	mg/kg	0.0010 UJ	0.0010 U	0.0010 U	0.0010 U	0.0010 U	--	--	--	--	--	--	--	8,000
Carbon disulfide	EPA 8260	mg/kg	0.0031	0.0010 U	0.0010 U	0.0010 U	0.0010 U	--	--	--	--	--	--	--	8,000
Carbon tetrachloride	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	--	--	--	--	--	--	--	0.00015
Chlorobenzene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	--	--	--	--	--	--	--	0.10
Chloroethane	EPA 8260	mg/kg	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	--	--	--	--	--	--	--	NE
2-Chloroethyl vinyl ether	EPA 8260	mg/kg	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	--	--	--	--	--	--	--	NE
Chloroform	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	--	--	--	--	--	--	--	0.052
Chloromethane	EPA 8260	mg/kg	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	--	--	--	--	--	--	--	NE
2-Chlorotoluene	EPA 8260	mg/kg	0.0010 UJ	0.0010 U	0.0010 U	0.0010 U	0.0010 U	--	--	--	--	--	--	--	1,600
4-Chlorotoluene	EPA 8260	mg/kg	0.0010 UJ	0.0010 U	0.0010 U	0.0010 U	0.0010 U	--	--	--	--	--	--	--	NE
Dibromochloromethane	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	--	--	--	--	--	--	--	0.00077
1,2-Dibromo-3-chloropropane	EPA 8260	mg/kg	0.0050 UJ	0.0050 U	0.0050 U	0.0050 U	0.0050 U	--	--	--	--	--	--	--	1.3
Dibromomethane	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	--	--	--	--	--	--	--	800
Bromodichloromethane (Dichlorobromomethane)	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	--	--	--	--	--	--	--	0.00096
Dichlorodifluoromethane (CFC-12)	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	--	--	--	--	--	--	--	16,000
1,1-Dichloroethane	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	--	--	--	--	--	--	--	180
1,2-Dichloroethane	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	--	--	--	--	--	--	--	0.024
1,1-Dichloroethene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	--	--	--	--	--	--	--	1.4
cis-1,2-Dichloroethene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	--	--	--	--	--	--	--	160
trans-1,2-Dichloroethene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	--	--	--	--	--	--	--	0.32
1,2-Dichloropropane	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	--	--	--	--	--	--	--	0.0010
1,3-Dichloropropane	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	--	--	--	--	--	--	--	NE
2,2-Dichloropropane	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	--	--	--	--	--	--	--	NE
1,1-Dichloropropene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	--	--	--	--	--	--	--	NE
cis-1,3-Dichloropropene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	--	--	--	--	--	--	--	0.00063

Table D-1
Remedial Investigation Chemical Analytical Results - Soil COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Sample Location ¹	Analytical Method	Units	MW-19D	MW-20				GP-10	GP-11	GP-14	GP-15		GP-18	GP-19	Soil Preliminary Cleanup Level ² (PCUL)
Sample Identification			MW19D-26-27	MW20-2-3	MW20-4-5	MW20-9-10	MW20-13-14	GP-10-3261996	GP-11-3261996	GP-14-3261996	GP-15-3-4:12071995	GP-15-3261996	GP-18-3261996	GP-19-3261996	
Sample Date			12/26/13	12/16/13	12/16/13	12/16/13	12/16/13	03/26/96	03/26/96	03/26/96	12/07/95	03/26/96	03/26/96	03/26/96	
Sample Depth			26 - 27 ft	2 - 3 ft	4 - 5 ft	9 - 10 ft	13 - 14 ft	7 - 9 ft	7 - 9 ft	7 - 9 ft	3 - 4 ft	7-9 ft	7 - 9 ft	7 - 9 ft	
Stratigraphic Horizon			AD	FO	FO	FI	OS	FD	FD	FD	FD	FD	FD	FD	
Sampled By			GEI	GEI	GEI	GEI	GEI	RETEC	RETEC	RETEC	RETEC	RETEC	RETEC	RETEC	
trans-1,3-Dichloropropene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	--	--	--	--	--	--	--	0.00063
Ethylbenzene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	--	--	--	--	--	--	--	0.015
1,2-Dibromoethane (EDB)	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	--	--	--	--	--	--	--	0.50
2-Hexanone	EPA 8260	mg/kg	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	--	--	--	--	--	--	--	400
Isopropylbenzene (Cumene)	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	--	--	--	--	--	--	--	8,000
p-Isopropyltoluene	EPA 8260	mg/kg	0.0010 UJ	0.0010 U	0.0010 U	0.0010 U	0.0010 U	--	--	--	--	--	--	--	NE
2-Butanone (MEK)	EPA 8260	mg/kg	0.038	0.0050 U	0.0089	0.0050 U	0.039	--	--	--	--	--	--	--	48,000
Methyl iodide (Iodomethane)	EPA 8260	mg/kg	0.0050 UJ	0.0050 U	0.0050 U	0.0050 U	0.0050 U	--	--	--	--	--	--	--	NE
4-Methyl-2-pentanone (Methyl Isobutyl Ketone)	EPA 8260	mg/kg	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	--	--	--	--	--	--	--	6,400
Methyl tert-butyl ether (MTBE)	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	--	--	--	--	--	--	--	560
Methylene chloride	EPA 8260	mg/kg	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	--	--	--	--	--	--	--	0.030
n-Propylbenzene	EPA 8260	mg/kg	0.0010 UJ	0.0010 U	0.0010 U	0.0010 U	0.0010 U	--	--	--	--	--	--	--	8,000
Styrene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	--	--	--	--	--	--	--	300
1,1,1,2-Tetrachloroethane	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	--	--	--	--	--	--	--	38
1,1,2,2-Tetrachloroethane	EPA 8260	mg/kg	0.0010 UJ	0.0010 U	0.0010 U	0.0010 U	0.0010 U	--	--	--	--	--	--	--	0.00011
Tetrachloroethene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	--	--	--	--	--	--	--	0.0016
Toluene	EPA 8260	mg/kg	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	--	--	--	--	--	--	--	0.055
1,2,3-Trichlorobenzene	EPA 8260	mg/kg	0.0010 UJ	0.0010 U	0.0010 U	0.0010 U	0.0010 U	--	--	--	--	--	--	--	20
1,1,1-Trichloroethane	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	--	--	--	--	--	--	--	21
1,1,2-Trichloroethane	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	--	--	--	--	--	--	--	0.00033
Trichloroethene	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	--	--	--	--	--	--	--	0.00027
Trichlorofluoromethane (CFC-11)	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	--	--	--	--	--	--	--	24,000
1,2,3-Trichloropropane	EPA 8260	mg/kg	0.0010 UJ	0.0010 U	0.0010 U	0.0010 U	0.0010 U	--	--	--	--	--	--	--	0.033
1,2,4-Trimethylbenzene	EPA 8260	mg/kg	0.0030 J	0.0010 U	0.0010 U	0.0010 U	0.0010 U	--	--	--	--	--	--	--	800
1,3,5-Trimethylbenzene	EPA 8260	mg/kg	0.0010 UJ	0.0010 U	0.0010 U	0.0010 U	0.0010 U	--	--	--	--	--	--	--	800
Vinyl Acetate	EPA 8260	mg/kg	0.0050 U	0.0050 U	0.0050 U	0.0050 U	0.0050 U	--	--	--	--	--	--	--	80,000
Vinyl Chloride	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	--	--	--	--	--	--	--	0.000055
Xylene, m-,p-	EPA 8260	mg/kg	0.0020 U	0.0020 U	0.0020 U	0.0020 U	0.0020 U	--	--	--	--	--	--	--	16,000
Xylene, o-	EPA 8260	mg/kg	0.0010 U	0.0010 U	0.0010 U	0.0010 U	0.0010 U	--	--	--	--	--	--	--	16,000
Petroleum Hydrocarbons															
Gasoline-Range Hydrocarbons	NWTPH-G	mg/kg	5.0 U	4.8 U	4.6 UJ	4.9 UJ	4.7 UJ	--	--	--	--	--	--	--	30
Diesel-Range Hydrocarbons	NWTPH-Dx	mg/kg	37	32 U	18 U	18 U	18 U	--	--	--	--	--	--	--	260
Oil-Range Hydrocarbons	NWTPH-Dx	mg/kg	120	750	35 U	36 U	44	--	--	--	--	--	--	--	2,000
Total Diesel- and Oil-Range Hydrocarbons	NWTPH-Dx	mg/kg	157	750	35 U	36 U	44	--	--	--	--	--	--	--	260
Conventionals															
pH	N/A	N/A	8.2 J	8.7 J	7.9 J	8.0 J	7.4 J	--	--	--	--	--	--	--	NE

Table D-1

Remedial Investigation Chemical Analytical Results - Soil COPCs

Port of Seattle - North Terminal 115

Seattle, Washington

Notes:

- ¹ Sample locations are shown on Figures 3-1 and 3-3.
- ² Preliminary cleanup levels for soil are referenced from Table 4-1.
- ³ Total dioxin/furan Toxic Equivalency Quotients (TEQs) were calculated using United States Environmental Protection Agency (USEPA) Toxicity Equivalency Factor (TEF) values for human health (EPA 2003).
- ⁴ Total carcinogenic PAH (cPAH) TEQs were calculated using TEF values referenced from MTCA Table 708.2 (WAC 173-340-900).
- RL = Reporting limit
- EPA = Environmental Protection Agency
- mg/kg = milligram per kilogram
- NE = not established
- J = estimated result
- U = analyte not detected above the reporting limit
- = not analyzed
- AD = Native LDW alluvial deposit
- OS = Native organic silt (Aquitard) deposit
- FI = Initial (early 1900s) T115N fill deposit
- FD = Glacier NW Site dredged fill deposit
- FO = T115N operational (1960s) fill deposit
- FT = Terminal 115 fill deposit
- FP = Settling pond fill deposit
- COPC = Contaminant of Potential Concern
- KCHD = King County Health Department
- Landau = Landau Associates
- GEI = GeoEngineers
- ERM = Environmental Resources Management
- Shaw = Shaw Environmental & Infrastructure
- Bold** indicates analyte was detected.
- Yellow shading identifies the detected results greater than the preliminary cleanup level.
- Blue shading identifies the non-detected result greater than the preliminary cleanup level.

Table D-1
Remedial Investigation Chemical Analytical Results - Soil COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Sample Location ¹	Analytical Method	Units	GP-22	GP-23	GP-57					GP-58			GP-59		Soil Preliminary Cleanup Level ² (PCUL)
Sample Identification			GP-22-3261996	GP-23-3261996	GP-57-1.5-3.5	GP-57-4-6.25	GP-57-6.25-6.8	GP-57-8.8-10.8	GP-57-10.8-12	GP-58-1.75-3.75	GP-58-4.25-6.25	GP-58-8.25-10.5	GP-59-2.3-3.9	GP-59-4.25-6.25	
Sample Date			03/26/96	03/26/96	08/31/12	10/10/12	10/10/12	10/10/12	10/10/12	08/31/12	10/08/12	10/08/12	08/31/12	10/10/12	
Sample Depth			7 - 9 ft	7 - 9 ft	1.5 - 3.5 ft	4 - 6.25 ft	6.25 - 6.8 ft	8.8 - 10.8 ft	10.8 - 12 ft	1.75 - 3.75 ft	4.25 - 6.25 ft	8.25 - 10.5 ft	2.3 - 3.9 ft	4.25 - 6.25 ft	
Stratigraphic Horizon			FD	FD	FD	FD	FD	FD	OS	FD	FD	FD	FD	FD	
Sampled By			RETEC	RETEC	ERM	ERM	ERM	ERM	ERM	ERM	ERM	ERM	ERM	ERM	
Polychlorinated Biphenyls (PCBs)															
PCB-Aroclor 1016	EPA 8082	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
PCB-Aroclor 1221	EPA 8082	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
PCB-Aroclor 1232	EPA 8082	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
PCB-Aroclor 1242	EPA 8082	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
PCB-Aroclor 1248	EPA 8082	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
PCB-Aroclor 1254	EPA 8082	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
PCB-Aroclor 1260	EPA 8082	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
Total PCB Aroclors	EPA 8082	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	0.0000022
Dioxins and Furans															
1,2,3,4,6,7,8-HpCDD	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,4,6,7,8-HpCDF	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,4,7,8,9-HpCDF	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,4,7,8-HxCDD	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,4,7,8-HxCDF	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,6,7,8-HxCDD	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,6,7,8-HxCDF	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,7,8,9-HxCDD	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,7,8,9-HxCDF	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,7,8-PeCDD	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,7,8-PeCDF	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
2,3,4,6,7,8-HxCDF	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
2,3,4,7,8-PeCDF	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
2,3,7,8-TCDD	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
2,3,7,8-TCDF	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
OCDD	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
OCDF	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
Total Dioxin/Furan TEQ ³ (ND=0.5RL)	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	0.0000052
Total Dioxin/Furan TEQ ³ (ND=0.5RL)	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	0.0000052
Metals															
Antimony	EPA 6000/7000	mg/kg	--	--	--	0.2 UJ	0.3 UJ	0.2 UJ	0.3 UJ	--	0.2 UJ	0.3 UJ	--	0.2 UJ	4.1
Arsenic	EPA 6000/7000	mg/kg	21.0 U	24.0 U	6.2	78.7	24	8.4	4	4.6	86.3	203	20.7	33.2	7.0
Barium	EPA 6000/7000	mg/kg	--	--	49.8	28.8	67.5	16.1	26.1	9	26	22	39.5	26.6	8.3
Beryllium	EPA 6000/7000	mg/kg	--	--	--	0.2 U	0.5	0.2 U	0.3 U	--	0.2 U	0.3 U	--	0.2 U	3.5
Cadmium	EPA 6000/7000	mg/kg	--	--	0.1	0.1 U	0.3	0.1 U	0.1 U	0.2 U	0.1 U	0.1 U	0.1 U	0.1 U	1.0
Chromium III / Total	EPA 6000/7000	mg/kg	--	--	25.5	12.7	23.5	10.1	10.4	3	10.2	11.4	32.1	18.6	48
Chromium VI	EPA 6000/7000	mg/kg	--	--	0.405 U	0.414 U	1.00	0.497 U	0.965	20.8	0.607	0.503 U	0.424 U	0.758	18
Copper	EPA 6000/7000	mg/kg	--	--	22.4	22.1 J	37.9 J	9.0 J	14.0 J	14.9	68.8	15.7	39.1	158 J	36
Lead	EPA 6000/7000	mg/kg	--	--	26.6	3.9	10	1	2.2	1.9	4.9	3.4	20.3	11.7 J	50
Mercury	EPA 6000/7000	mg/kg	--	--	0.030 U	0.020 U	0.11	0.030 U	0.060 U	0.040 U	0.03	0.03	0.020 U	0.03	0.070
Nickel	EPA 6000/7000	mg/kg	--	--	30	8	23	7	8	2.0 U	7	10	39	11	48
Selenium	EPA 6000/7000	mg/kg	--	--	--	0.5 U	0.7 U	0.6 U	0.6 U	--	0.5 U	0.6 U	--	0.6 U	0.30

Table D-1
Remedial Investigation Chemical Analytical Results - Soil COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Sample Location ¹	Analytical Method	Units	GP-22	GP-23	GP-57					GP-58			GP-59		Soil Preliminary Cleanup Level ² (PCUL)
Sample Identification			GP-22-3261996	GP-23-3261996	GP-57-1.5-3.5	GP-57-4-6.25	GP-57-6.25-6.8	GP-57-8.8-10.8	GP-57-10.8-12	GP-58-1.75-3.75	GP-58-4.25-6.25	GP-58-8.25-10.5	GP-59-2.3-3.9	GP-59-4.25-6.25	
Sample Date			03/26/96	03/26/96	08/31/12	10/10/12	10/10/12	10/10/12	10/10/12	08/31/12	10/08/12	10/08/12	08/31/12	10/10/12	
Sample Depth			7 - 9 ft	7 - 9 ft	1.5 - 3.5 ft	4 - 6.25 ft	6.25 - 6.8 ft	8.8 - 10.8 ft	10.8 - 12 ft	1.75 - 3.75 ft	4.25 - 6.25 ft	8.25 - 10.5 ft	2.3 - 3.9 ft	4.25 - 6.25 ft	
Stratigraphic Horizon			FD	FD	FD	FD	FD	FD	OS	FD	FD	FD	FD	FD	
Sampled By			RETEC	RETEC	ERM	ERM	ERM	ERM	ERM	ERM	ERM	ERM	ERM	ERM	
Silver	EPA 6000/7000	mg/kg	–	–	0.3 U	0.3 U	0.4 U	0.4 U	0.4 U	0.6 U	0.3 U	0.4 U	0.3 U	0.3 U	0.016
Thallium	EPA 6000/7000	mg/kg	–	–	–	0.2 U	0.3 U	0.2 U	0.3 U	–	0.2 U	0.3 U	–	0.2 U	0.0044
Tin	EPA 6000/7000	mg/kg	–	–	–	–	–	–	–	–	–	–	–	–	50
Zinc	EPA 6000/7000	mg/kg	–	–	56	31	59	21	23	12	40	63	45	40	85
Semi-Volatile Organic Compounds (SVOCs) - Polycyclic Aromatic Hydrocarbons (PAHs)															
Acenaphthene	EPA 8270/SIM	mg/kg	–	–	–	–	–	–	–	–	0.0012 U	0.0013 U	–	0.0013 U	0.028
Acenaphthylene	EPA 8270/SIM	mg/kg	–	–	–	–	–	–	–	–	0.0011 U	0.0012 U	–	0.0047 J	1.3
Anthracene	EPA 8270/SIM	mg/kg	–	–	–	–	–	–	–	–	0.0013 U	0.0014 U	–	0.0042 J	0.051
Benzo(a)anthracene	EPA 8270/SIM	mg/kg	–	–	–	–	–	–	–	–	0.0044	0.0015 U	–	0.0054	0.000057
Benzo(b)fluoranthene	EPA 8270/SIM	mg/kg	–	–	–	–	–	–	–	–	–	–	–	–	0.00020
Benzo(k)fluoranthene	EPA 8270/SIM	mg/kg	–	–	–	–	–	–	–	–	–	–	–	–	0.0020
Benzo(a)fluoranthene (Total)	EPA 8270/SIM	mg/kg	–	–	–	–	–	–	–	–	0.011	0.0018 U	–	0.012	3.2
Benzo(g,h,i)perylene	EPA 8270/SIM	mg/kg	–	–	–	–	–	–	–	–	0.0037 J	0.0029 U	–	0.0030 U	0.67
Benzo(a)pyrene	EPA 8270/SIM	mg/kg	–	–	–	–	–	–	–	–	0.0035 J	0.0017 U	–	0.0037 J	0.000016
Chrysene	EPA 8270/SIM	mg/kg	–	–	–	–	–	–	–	–	0.0077	0.0027 J	–	0.012	0.0064
Dibenzo(a,h)anthracene	EPA 8270/SIM	mg/kg	–	–	–	–	–	–	–	–	0.0021 U	0.0023 U	–	0.0023 U	0.000029
Dibenzofuran	EPA 8270/SIM	mg/kg	–	–	–	–	–	–	–	–	0.0043 J	0.0014 U	–	0.012	0.54
Fluoranthene	EPA 8270/SIM	mg/kg	–	–	–	–	–	–	–	–	0.023	0.0084	–	0.022	0.090
Fluorene	EPA 8270/SIM	mg/kg	–	–	–	–	–	–	–	–	0.0028 J	0.0012 U	–	0.0058	0.029
Indeno(1,2,3-c,d)pyrene	EPA 8270/SIM	mg/kg	–	–	–	–	–	–	–	–	0.0031 U	0.0033 U	–	0.0034 U	0.00056
1-Methylnaphthalene	EPA 8270/SIM	mg/kg	–	–	–	–	–	–	–	–	0.015	0.0016 U	–	0.023	29
2-Methylnaphthalene	EPA 8270/SIM	mg/kg	–	–	–	–	–	–	–	–	0.012	0.0014 U	–	0.034	0.67
Naphthalene	EPA 8270/SIM	mg/kg	–	–	–	–	–	–	–	–	0.022	0.0044 J	–	0.057	0.0021
Phenanthrene	EPA 8270/SIM	mg/kg	–	–	–	–	–	–	–	–	0.021	0.006	–	0.037	1.5
Pyrene	EPA 8270/SIM	mg/kg	–	–	–	–	–	–	–	–	0.017	0.0074	–	0.021	0.14
Total cPAH TEQ ⁴ (ND=0)	EPA 8270/SIM	mg/kg	–	–	–	–	–	–	–	–	0.0051	0	–	0.0056	0.000016
Total cPAH TEQ ⁴ (ND=0.5RL)	EPA 8270/SIM	mg/kg	–	–	–	–	–	–	–	–	0.0054	0.0013	–	0.0058	0.000016
Other SVOCs															
Aniline	EPA 8270	mg/kg	–	–	–	–	–	–	–	–	–	–	–	–	150
Benzidine	EPA 8270	mg/kg	–	–	–	–	–	–	–	–	–	–	–	–	0.0037
Benzoic acid	EPA 8270	mg/kg	–	–	–	–	–	–	–	–	0.094 U	0.1 U	–	0.13 J	0.17
Benzyl alcohol	EPA 8270	mg/kg	–	–	–	–	–	–	–	–	0.0056 U	0.0060 U	–	0.0059 U	0.057
Bis(2-chloroethoxy)methane	EPA 8270	mg/kg	–	–	–	–	–	–	–	–	0.0019 U	0.0020 U	–	0.0020 U	NE
Bis(2-chloroethyl)ether	EPA 8270	mg/kg	–	–	–	–	–	–	–	–	0.0031 U	0.0033 U	–	0.0033 U	0.000022
Bis(2-chloroisopropyl)ether	EPA 8270	mg/kg	–	–	–	–	–	–	–	–	0.0035 U	0.0037 U	–	0.0037 U	3,200
Bis(2-ethylhexyl)phthalate	EPA 8270	mg/kg	–	–	–	–	–	–	–	–	0.024 U	0.025 U	–	0.025 U	0.0051
4-Bromophenyl phenyl ether	EPA 8270	mg/kg	–	–	–	–	–	–	–	–	0.0047 U	0.0050 U	–	0.0049 U	NE
Butyl benzyl phthalate	EPA 8270	mg/kg	–	–	–	–	–	–	–	–	0.0057 U	0.0061 U	–	0.0060 U	0.00018
Carbazole	EPA 8270	mg/kg	–	–	–	–	–	–	–	–	0.0025 U	0.0027 U	–	0.0026 U	NE
4-Chloroaniline	EPA 8270	mg/kg	–	–	–	–	–	–	–	–	0.021 U	0.022 U	–	0.022 U	0.81
4-Chloro-3-methylphenol	EPA 8270	mg/kg	–	–	–	–	–	–	–	–	0.014 U	0.015 U	–	0.015 U	NE
2-Chloronaphthalene	EPA 8270	mg/kg	–	–	–	–	–	–	–	–	0.0024 U	0.0026 U	–	0.0026 U	6,400
2-Chlorophenol	EPA 8270	mg/kg	–	–	–	–	–	–	–	0.0070 U	0.0022 U	0.0024 U	0.0022 U	0.0023 U	0.011
4-Chlorophenyl phenyl ether	EPA 8270	mg/kg	–	–	–	–	–	–	–	–	0.0049 UJ	0.0052 UJ	–	0.0052 U	NE

Table D-1
Remedial Investigation Chemical Analytical Results - Soil COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Sample Location ¹	Analytical Method	Units	GP-22	GP-23	GP-57					GP-58			GP-59		Soil Preliminary Cleanup Level ² (PCUL)
Sample Identification			GP-22-3261996	GP-23-3261996	GP-57-1.5-3.5	GP-57-4-6.25	GP-57-6.25-6.8	GP-57-8.8-10.8	GP-57-10.8-12	GP-58-1.75-3.75	GP-58-4.25-6.25	GP-58-8.25-10.5	GP-59-2.3-3.9	GP-59-4.25-6.25	
Sample Date			03/26/96	03/26/96	08/31/12	10/10/12	10/10/12	10/10/12	10/10/12	08/31/12	10/08/12	10/08/12	08/31/12	10/10/12	
Sample Depth			7 - 9 ft	7 - 9 ft	1.5 - 3.5 ft	4 - 6.25 ft	6.25 - 6.8 ft	8.8 - 10.8 ft	10.8 - 12 ft	1.75 - 3.75 ft	4.25 - 6.25 ft	8.25 - 10.5 ft	2.3 - 3.9 ft	4.25 - 6.25 ft	
Stratigraphic Horizon			FD	FD	FD	FD	FD	FD	OS	FD	FD	FD	FD	FD	
Sampled By			RETEC	RETEC	ERM	ERM	ERM	ERM	ERM	ERM	ERM	ERM	ERM	ERM	
Decane	EPA 8270	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
Dibutyl phthalate	EPA 8270	mg/kg	--	--	--	--	--	--	--	--	0.0076 U	0.0081 U	--	0.0080 U	0.015
2,3-Dichloroaniline	EPA 8270	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2-Dichlorobenzene	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	0.0031
(o-Dichlorobenzene)	EPA 8270	mg/kg	--	--	--	--	--	--	--	--	0.0023 U	0.0025 U	--	0.0024 U	0.0031
1,3-Dichlorobenzene	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
(m-Dichlorobenzene)	EPA 8270	mg/kg	--	--	--	--	--	--	--	--	0.0024 U	0.0026 U	--	0.0026 U	NE
1,4-Dichlorobenzene	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	0.0081
(p-Dichlorobenzene)	EPA 8270	mg/kg	--	--	--	--	--	--	--	--	0.0026 U	0.0028 U	--	0.0028 U	0.0081
3,3'-Dichlorobenzidine	EPA 8270	mg/kg	--	--	--	--	--	--	--	--	0.016 U	0.018 U	--	0.017 U	0.0000033
2,4-Dichlorophenol	EPA 8270	mg/kg	--	--	--	--	--	--	--	0.063 U	0.02 U	0.021 U	0.02 U	0.021 U	0.0043
Bis(2-ethylhexyl)ester	EPA 8270	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	710
Diethyl phthalate	EPA 8270	mg/kg	--	--	--	--	--	--	--	--	0.034 U	0.036 U	--	0.036 U	0.034
Dimethyl phthalate	EPA 8270	mg/kg	--	--	--	--	--	--	--	--	0.0027 U	0.0029 U	--	0.0028 U	0.071
2,4-Dimethylphenol	EPA 8270	mg/kg	--	--	--	--	--	--	--	--	0.0032 U	0.0034 U	--	0.0034 U	0.0031
1,2-Dinitrobenzene	EPA 8270	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	8.0
1,3-Dinitrobenzene	EPA 8270	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	8.0
1,4-Dinitrobenzene	EPA 8270	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	8.0
4,6-Dinitro-2-methylphenol	EPA 8270	mg/kg	--	--	--	--	--	--	--	--	0.02 U	0.021 U	--	0.021 U	NE
2,4-Dinitrophenol	EPA 8270	mg/kg	--	--	--	--	--	--	--	--	0.1 U	0.11 U	--	0.11 U	0.029
2,4-Dinitrotoluene	EPA 8270	mg/kg	--	--	--	--	--	--	--	--	0.018 U	0.019 U	--	0.019 U	0.000069
2,6-Dinitrotoluene	EPA 8270	mg/kg	--	--	--	--	--	--	--	--	0.028 U	0.03 U	--	0.03 U	0.11
Di-n-octyl phthalate	EPA 8270	mg/kg	--	--	--	--	--	--	--	--	0.0054 U	0.0058 U	--	0.0057 U	0.33
1,2-Diphenylhydrazine	EPA 8270	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	1.1
Hexachlorobenzene	EPA 8270	mg/kg	--	--	--	--	--	--	--	--	0.0040 U	0.0042 U	--	0.0042 U	0.00000040
Hexachlorobutadiene	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	0.00054
	EPA 8270	mg/kg	--	--	--	--	--	--	--	--	0.0042 U	0.0045 U	--	0.0045 U	0.00054
Hexachlorocyclopentadiene	EPA 8270	mg/kg	--	--	--	--	--	--	--	--	0.061 U	0.066 U	--	0.065 U	0.20
Hexachloroethane	EPA 8270	mg/kg	--	--	--	--	--	--	--	--	0.0027 U	0.0029 U	--	0.0029 U	0.000041
Isophorone	EPA 8270	mg/kg	--	--	--	--	--	--	--	--	0.0026 U	0.0028 U	--	0.0028 U	0.037
2-Methylphenol (o-Cresol)	EPA 8270	mg/kg	--	--	--	--	--	--	--	--	0.0049 U	0.0052 U	--	0.0051 U	0.010
3 & 4 Methylphenol (m-, p-Cresol)	EPA 8270	mg/kg	--	--	--	--	--	--	--	--	0.067	0.038 J	--	0.39	4,000
2-Nitroaniline	EPA 8270	mg/kg	--	--	--	--	--	--	--	--	0.017 U	0.018 U	--	0.018 U	800
3-Nitroaniline	EPA 8270	mg/kg	--	--	--	--	--	--	--	--	0.021 U	0.022 U	--	0.022 U	NE
4-Nitroaniline	EPA 8270	mg/kg	--	--	--	--	--	--	--	--	0.035 U	0.037 U	--	0.037 U	NE
Nitrobenzene	EPA 8270	mg/kg	--	--	--	--	--	--	--	--	0.036 U	0.038 U	--	0.038 U	0.041
2-Nitrophenol	EPA 8270	mg/kg	--	--	--	--	--	--	--	--	0.032 U	0.034 U	--	0.034 UJ	NE
4-Nitrophenol (p-Nitrophenol)	EPA 8270	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	7.0
n-Nitrosodimethylamine	EPA 8270	mg/kg	--	--	--	--	--	--	--	--	0.0050 U	0.0053 U	--	0.0053 U	0.017
n-Nitrosodiphenylamine (as Diphenylamine)	EPA 8270	mg/kg	--	--	--	--	--	--	--	--	0.0031 U	0.0033 U	--	0.0033 U	0.0011
n-Nitrosodi-n-propylamine	EPA 8270	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	0.000018
n-Octadecane	EPA 8270	mg/kg	--	--	--	--	--	--	--	0.14 U	0.045 U	0.048 U	0.085 J	0.079 J	NE
Pentachlorophenol	EPA 8270	mg/kg	--	--	--	--	--	--	--	0.84	0.0080 U	0.012 J	0.043	0.21	0.0000018

Table D-1
Remedial Investigation Chemical Analytical Results - Soil COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Sample Location ¹	Analytical Method	Units	GP-22	GP-23	GP-57					GP-58			GP-59		Soil Preliminary Cleanup Level ² (PCUL)
Sample Identification			GP-22-3261996	GP-23-3261996	GP-57-1.5-3.5	GP-57-4-6.25	GP-57-6.25-6.8	GP-57-8.8-10.8	GP-57-10.8-12	GP-58-1.75-3.75	GP-58-4.25-6.25	GP-58-8.25-10.5	GP-59-2.3-3.9	GP-59-4.25-6.25	
Sample Date			03/26/96	03/26/96	08/31/12	10/10/12	10/10/12	10/10/12	10/10/12	08/31/12	10/08/12	10/08/12	08/31/12	10/10/12	
Sample Depth			7 - 9 ft	7 - 9 ft	1.5 - 3.5 ft	4 - 6.25 ft	6.25 - 6.8 ft	8.8 - 10.8 ft	10.8 - 12 ft	1.75 - 3.75 ft	4.25 - 6.25 ft	8.25 - 10.5 ft	2.3 - 3.9 ft	4.25 - 6.25 ft	
Stratigraphic Horizon			FD	FD	FD	FD	FD	FD	OS	FD	FD	FD	FD	FD	
Sampled By			RETEC	RETEC	ERM	ERM	ERM	ERM	ERM	ERM	ERM	ERM	ERM	ERM	
Phenol	EPA 8270	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	0.12
Pyridine	EPA 8270	mg/kg	--	--	--	--	--	--	--	0.014 U	--	--	0.0091 J	--	80
2,3,4,6-Tetrachlorophenol	EPA 8270	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	490
2,3,5,6-Tetrachlorophenol	EPA 8270	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,4-Trichlorobenzene	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	0.000072
	EPA 8270	mg/kg	--	--	--	--	--	--	--	--	0.0032 U	0.0034 U	--	0.0034 U	0.000072
2,4,5-Trichlorophenol	EPA 8270	mg/kg	--	--	--	--	--	--	--	0.063 U	0.02 U	0.021 U	0.02 U	0.021 U	1.1
2,4,6-Trichlorophenol	EPA 8270	mg/kg	--	--	--	--	--	--	--	0.066 U	0.021 U	0.022 U	0.02 U	0.022 U	0.00019
Volatile Organic Compounds (VOCs)															
Acetone	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	72,000
Benzene	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	0.00056
Bromobenzene	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	640
Bromochloromethane	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
Bromoform (Tribromomethane)	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	0.0050
Bromomethane	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	0.079
n-Butylbenzene	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	4,000
sec-Butylbenzene	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	8,000
tert-Butylbenzene	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	8,000
Carbon disulfide	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	8,000
Carbon tetrachloride	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	0.00015
Chlorobenzene	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	0.10
Chloroethane	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
2-Chloroethyl vinyl ether	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
Chloroform	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	0.052
Chloromethane	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
2-Chlorotoluene	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	1,600
4-Chlorotoluene	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
Dibromochloromethane	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	0.00077
1,2-Dibromo-3-chloropropane	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	1.3
Dibromomethane	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	800
Bromodichloromethane (Dichlorobromomethane)	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	0.00096
Dichlorodifluoromethane (CFC-12)	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	16,000
1,1-Dichloroethane	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	180
1,2-Dichloroethane	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	0.024
1,1-Dichloroethene	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	1.4
cis-1,2-Dichloroethene	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	160
trans-1,2-Dichloroethene	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	0.32
1,2-Dichloropropane	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	0.0010
1,3-Dichloropropane	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
2,2-Dichloropropane	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,1-Dichloropropene	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
cis-1,3-Dichloropropene	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	0.00063

Table D-1
Remedial Investigation Chemical Analytical Results - Soil COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Sample Location ¹	Analytical Method	Units	GP-22	GP-23	GP-57					GP-58			GP-59		Soil Preliminary Cleanup Level ² (PCUL)
Sample Identification			GP-22-3261996	GP-23-3261996	GP-57-1.5-3.5	GP-57-4-6.25	GP-57-6.25-6.8	GP-57-8.8-10.8	GP-57-10.8-12	GP-58-1.75-3.75	GP-58-4.25-6.25	GP-58-8.25-10.5	GP-59-2.3-3.9	GP-59-4.25-6.25	
Sample Date			03/26/96	03/26/96	08/31/12	10/10/12	10/10/12	10/10/12	10/10/12	08/31/12	10/08/12	10/08/12	08/31/12	10/10/12	
Sample Depth			7 - 9 ft	7 - 9 ft	1.5 - 3.5 ft	4 - 6.25 ft	6.25 - 6.8 ft	8.8 - 10.8 ft	10.8 - 12 ft	1.75 - 3.75 ft	4.25 - 6.25 ft	8.25 - 10.5 ft	2.3 - 3.9 ft	4.25 - 6.25 ft	
Stratigraphic Horizon			FD	FD	FD	FD	FD	FD	OS	FD	FD	FD	FD	FD	
Sampled By			RETEC	RETEC	ERM	ERM	ERM	ERM	ERM	ERM	ERM	ERM	ERM	ERM	
trans-1,3-Dichloropropene	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	0.00063
Ethylbenzene	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	0.015
1,2-Dibromoethane (EDB)	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	0.50
2-Hexanone	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	400
Isopropylbenzene (Cumene)	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	8,000
p-Isopropyltoluene	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
2-Butanone (MEK)	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	48,000
Methyl iodide (Iodomethane)	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
4-Methyl-2-pentanone (Methyl Isobutyl Ketone)	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	6,400
Methyl tert-butyl ether (MTBE)	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	560
Methylene chloride	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	0.030
n-Propylbenzene	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	8,000
Styrene	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	300
1,1,1,2-Tetrachloroethane	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	38
1,1,2,2-Tetrachloroethane	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	0.00011
Tetrachloroethene	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	0.0016
Toluene	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	0.055
1,2,3-Trichlorobenzene	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	20
1,1,1-Trichloroethane	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	21
1,1,2-Trichloroethane	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	0.00033
Trichloroethene	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	0.00027
Trichlorofluoromethane (CFC-11)	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	24,000
1,2,3-Trichloropropane	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	0.033
1,2,4-Trimethylbenzene	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	800
1,3,5-Trimethylbenzene	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	800
Vinyl Acetate	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	80,000
Vinyl Chloride	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	0.000055
Xylene, m-,p-	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	16,000
Xylene, o-	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	16,000
Petroleum Hydrocarbons															
Gasoline-Range Hydrocarbons	NWTPH-G	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	30
Diesel-Range Hydrocarbons	NWTPH-Dx	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	260
Oil-Range Hydrocarbons	NWTPH-Dx	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	2,000
Total Diesel- and Oil-Range Hydrocarbons	NWTPH-Dx	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	260
Conventionals															
pH	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	NE

Table D-1

Remedial Investigation Chemical Analytical Results - Soil COPCs

Port of Seattle - North Terminal 115

Seattle, Washington

Notes:

- ¹ Sample locations are shown on Figures 3-1 and 3-3.
- ² Preliminary cleanup levels for soil are referenced from Table 4-1.
- ³ Total dioxin/furan Toxic Equivalency Quotients (TEQs) were calculated using United States Environmental Protection Agency (USEPA) Toxicity Equivalency Factor (TEF) values for human health (EPA 2003).
- ⁴ Total carcinogenic PAH (cPAH) TEQs were calculated using TEF values referenced from MTCA Table 708.2 (WAC 173-340-900).

RL = Reporting limit

EPA = Environmental Protection Agency

mg/kg = milligram per kilogram

NE = not established

J = estimated result

U = analyte not detected above the reporting limit

-- = not analyzed

AD = Native LDW alluvial deposit

OS = Native organic silt (Aquitard) deposit

FI = Initial (early 1900s) T115N fill deposit

FD = Glacier NW Site dredged fill deposit

FO = T115N operational (1960s) fill deposit

FT = Terminal 115 fill deposit

FP = Settling pond fill deposit

COPC = Contaminant of Potential Concern

KCHD = King County Health Department

Landau = Landau Associates

GEI = GeoEngineers

ERM = Environmental Resources Management

Shaw = Shaw Environmental & Infrastructure

Bold indicates analyte was detected.

Yellow shading identifies the detected results greater than the preliminary cleanup level.

Blue shading identifies the non-detected result greater than the preliminary cleanup level.

Table D-1
Remedial Investigation Chemical Analytical Results - Soil COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Sample Location ¹	Analytical Method	Units	GP-59		GMW-18		GMW-20		GMW-24			GMW-25			Soil Preliminary Cleanup Level ² (PCUL)
Sample Identification			GP-59-8.25-10.25	GP-59-10.25-11.5	MW-18:5.5-6.5	MW-18:13-13.5	MW-20:5.5-6.5	MW-20:13-13.5	MW-24:5-5.5	MW-24:8.5-9	MW-24:13-13.5	MW-25:3.5-4	MW-25:8-8.5	MW-25:13-13.5	
Sample Date			10/10/12	10/10/12	10/14/98	10/14/98	10/14/98	10/14/98	07/23/03	07/23/03	07/23/03	07/23/03	07/23/03	07/23/03	
Sample Depth			8.25 - 10.25 ft	10.25 - 11.5 ft	5.5 - 6.5 ft	13 - 13.5 ft	5.5 - 6.5 ft	13 - 13.5 ft	5 - 5.5 ft	8.5 - 9 ft	13 - 13.5 ft	3.5 - 4 ft	8 - 8.5 ft	13 - 13.5 ft	
Stratigraphic Horizon			FD	OS	FD	OS	FD	OS	FD	FD	OS	FD	FD	OS	
Sampled By			ERM	ERM	RETEC	RETEC	RETEC	RETEC	Shaw	Shaw	Shaw	Shaw	Shaw	Shaw	
Polychlorinated Biphenyls (PCBs)															
PCB-Aroclor 1016	EPA 8082	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
PCB-Aroclor 1221	EPA 8082	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
PCB-Aroclor 1232	EPA 8082	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
PCB-Aroclor 1242	EPA 8082	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
PCB-Aroclor 1248	EPA 8082	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
PCB-Aroclor 1254	EPA 8082	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
PCB-Aroclor 1260	EPA 8082	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
Total PCB Aroclors	EPA 8082	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	0.0000022
Dioxins and Furans															
1,2,3,4,6,7,8-HpCDD	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,4,6,7,8-HpCDF	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,4,7,8,9-HpCDF	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,4,7,8-HxCDD	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,4,7,8-HxCDF	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,6,7,8-HxCDD	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,6,7,8-HxCDF	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,7,8,9-HxCDD	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,7,8,9-HxCDF	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,7,8-PeCDD	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,7,8-PeCDF	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
2,3,4,6,7,8-HxCDF	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
2,3,4,7,8-PeCDF	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
2,3,7,8-TCDD	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
2,3,7,8-TCDF	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
OCDD	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
OCDF	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
Total Dioxin/Furan TEQ ³ (ND=0.5RL)	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	0.0000052
Total Dioxin/Furan TEQ ³ (ND=0.5RL)	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	0.0000052
Metals															
Antimony	EPA 6000/7000	mg/kg	0.2 UJ	0.3 UJ	--	--	--	--	--	--	--	--	--	--	4.1
Arsenic	EPA 6000/7000	mg/kg	868	3,070	46.8	4.33	13.5	2.6	4.20 U	4.00 U	5.90 U	2.70 U	11	7.80 U	7.0
Barium	EPA 6000/7000	mg/kg	18.5	45.5	--	--	--	--	--	--	--	--	--	--	8.3
Beryllium	EPA 6000/7000	mg/kg	0.2 U	0.7	--	--	--	--	--	--	--	--	--	--	3.5
Cadmium	EPA 6000/7000	mg/kg	0.1 U	0.2 U	--	--	--	--	--	--	--	--	--	--	1.0
Chromium III / Total	EPA 6000/7000	mg/kg	10.9	20.2	--	--	--	--	--	--	--	--	--	--	48
Chromium VI	EPA 6000/7000	mg/kg	0.849	0.788	--	--	--	--	--	--	--	--	--	--	18
Copper	EPA 6000/7000	mg/kg	31.9 J	80.3 J	--	--	--	--	--	--	--	--	--	--	36
Lead	EPA 6000/7000	mg/kg	4.5	11	--	--	--	--	--	--	--	--	--	--	50
Mercury	EPA 6000/7000	mg/kg	0.020 U	0.05	--	--	--	--	--	--	--	--	--	--	0.070
Nickel	EPA 6000/7000	mg/kg	7	21	--	--	--	--	--	--	--	--	--	--	48
Selenium	EPA 6000/7000	mg/kg	0.6 U	0.8 U	--	--	--	--	--	--	--	--	--	--	0.30

Table D-1
Remedial Investigation Chemical Analytical Results - Soil COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Sample Location ¹	Analytical Method	Units	GP-59		GMW-18		GMW-20		GMW-24			GMW-25			Soil Preliminary Cleanup Level ² (PCUL)
Sample Identification			GP-59-8.25-10.25	GP-59-10.25-11.5	MW-18:5.5-6.5	MW-18:13-13.5	MW-20:5.5-6.5	MW-20:13-13.5	MW-24:5-5.5	MW-24:8.5-9	MW-24:13-13.5	MW-25:3.5-4	MW-25:8-8.5	MW-25:13-13.5	
Sample Date			10/10/12	10/10/12	10/14/98	10/14/98	10/14/98	10/14/98	07/23/03	07/23/03	07/23/03	07/23/03	07/23/03	07/23/03	
Sample Depth			8.25 - 10.25 ft	10.25 - 11.5 ft	5.5 - 6.5 ft	13 - 13.5 ft	5.5 - 6.5 ft	13 - 13.5 ft	5 - 5.5 ft	8.5 - 9 ft	13 - 13.5 ft	3.5 - 4 ft	8 - 8.5 ft	13 - 13.5 ft	
Stratigraphic Horizon			FD	OS	FD	OS	FD	OS	FD	FD	OS	FD	FD	OS	
Sampled By			ERM	ERM	RETEC	RETEC	RETEC	RETEC	Shaw	Shaw	Shaw	Shaw	Shaw	Shaw	
Silver	EPA 6000/7000	mg/kg	0.4 U	0.5 U	--	--	--	--	--	--	--	--	--	--	0.016
Thallium	EPA 6000/7000	mg/kg	0.2 U	0.3 U	--	--	--	--	--	--	--	--	--	--	0.0044
Tin	EPA 6000/7000	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	50
Zinc	EPA 6000/7000	mg/kg	89	2,080	--	--	--	--	--	--	--	--	--	--	85
Semi-Volatile Organic Compounds (SVOCs) - Polycyclic Aromatic Hydrocarbons (PAHs)															
Acenaphthene	EPA 8270/SIM	mg/kg	0.0027 J	0.037	--	--	--	--	--	--	--	--	--	--	0.028
Acenaphthylene	EPA 8270/SIM	mg/kg	0.0039 J	0.031	--	--	--	--	--	--	--	--	--	--	1.3
Anthracene	EPA 8270/SIM	mg/kg	0.0028 J	0.014	--	--	--	--	--	--	--	--	--	--	0.051
Benzo(a)anthracene	EPA 8270/SIM	mg/kg	0.0037 J	0.013	--	--	--	--	--	--	--	--	--	--	0.000057
Benzo(b)fluoranthene	EPA 8270/SIM	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	0.00020
Benzo(k)fluoranthene	EPA 8270/SIM	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	0.0020
Benzo(a)fluoranthenes (Total)	EPA 8270/SIM	mg/kg	0.0069	0.029	--	--	--	--	--	--	--	--	--	--	3.2
Benzo(g,h,i)perylene	EPA 8270/SIM	mg/kg	0.0028 U	0.014	--	--	--	--	--	--	--	--	--	--	0.67
Benzo(a)pyrene	EPA 8270/SIM	mg/kg	0.0036 J	0.013	--	--	--	--	--	--	--	--	--	--	0.000016
Chrysene	EPA 8270/SIM	mg/kg	0.0045 J	0.019	--	--	--	--	--	--	--	--	--	--	0.0064
Dibenzo(a,h)anthracene	EPA 8270/SIM	mg/kg	0.0022 U	0.0024 J	--	--	--	--	--	--	--	--	--	--	0.000029
Dibenzofuran	EPA 8270/SIM	mg/kg	0.0039 J	0.027	--	--	--	--	--	--	--	--	--	--	0.54
Fluoranthene	EPA 8270/SIM	mg/kg	0.015	0.078	--	--	--	--	--	--	--	--	--	--	0.090
Fluorene	EPA 8270/SIM	mg/kg	0.0037 J	0.029	--	--	--	--	--	--	--	--	--	--	0.029
Indeno(1,2,3-c,d)pyrene	EPA 8270/SIM	mg/kg	0.0032 U	0.011	--	--	--	--	--	--	--	--	--	--	0.00056
1-Methylnaphthalene	EPA 8270/SIM	mg/kg	0.0049	0.0016 U	--	--	--	--	--	--	--	--	--	--	29
2-Methylnaphthalene	EPA 8270/SIM	mg/kg	0.007	0.03	--	--	--	--	--	--	--	--	--	--	0.67
Naphthalene	EPA 8270/SIM	mg/kg	0.024	0.16	--	--	--	--	--	--	--	--	--	--	0.0021
Phenanthrene	EPA 8270/SIM	mg/kg	0.018	0.094	--	--	--	--	--	--	--	--	--	--	1.5
Pyrene	EPA 8270/SIM	mg/kg	0.014	0.076	--	--	--	--	--	--	--	--	--	--	0.14
Total cPAH TEQ ⁴ (ND=0)	EPA 8270/SIM	mg/kg	0.0047	0.019	--	--	--	--	--	--	--	--	--	--	0.000016
Total cPAH TEQ ⁴ (ND=0.5RL)	EPA 8270/SIM	mg/kg	0.005	0.019	--	--	--	--	--	--	--	--	--	--	0.000016
Other SVOCs															
Aniline	EPA 8270	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	150
Benzidine	EPA 8270	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	0.0037
Benzoic acid	EPA 8270	mg/kg	0.094 U	0.18 J	--	--	--	--	--	--	--	--	--	--	0.17
Benzyl alcohol	EPA 8270	mg/kg	0.0057 U	0.0058 U	--	--	--	--	--	--	--	--	--	--	0.057
Bis(2-chloroethoxy)methane	EPA 8270	mg/kg	0.0019 U	0.0019 U	--	--	--	--	--	--	--	--	--	--	NE
Bis(2-chloroethyl)ether	EPA 8270	mg/kg	0.0031 U	0.0032 U	--	--	--	--	--	--	--	--	--	--	0.000022
Bis(2-chloroisopropyl)ether	EPA 8270	mg/kg	0.0035 U	0.0036 U	--	--	--	--	--	--	--	--	--	--	3,200
Bis(2-ethylhexyl)phthalate	EPA 8270	mg/kg	0.014 U	0.063 U	--	--	--	--	--	--	--	--	--	--	0.0051
4-Bromophenyl phenyl ether	EPA 8270	mg/kg	0.0047 U	0.0048 U	--	--	--	--	--	--	--	--	--	--	NE
Butyl benzyl phthalate	EPA 8270	mg/kg	0.0057 U	0.0059 U	--	--	--	--	--	--	--	--	--	--	0.00018
Carbazole	EPA 8270	mg/kg	0.0025 U	0.0026 U	--	--	--	--	--	--	--	--	--	--	NE
4-Chloroaniline	EPA 8270	mg/kg	0.021 U	0.021 U	--	--	--	--	--	--	--	--	--	--	0.81
4-Chloro-3-methylphenol	EPA 8270	mg/kg	0.014 U	0.014 U	--	--	--	--	--	--	--	--	--	--	NE
2-Chloronaphthalene	EPA 8270	mg/kg	0.0025 U	0.0025 U	--	--	--	--	--	--	--	--	--	--	6,400
2-Chlorophenol	EPA 8270	mg/kg	0.0022 U	0.51	--	--	--	--	--	--	--	--	--	--	0.011
4-Chlorophenyl phenyl ether	EPA 8270	mg/kg	0.0049 U	0.0051 U	--	--	--	--	--	--	--	--	--	--	NE

Table D-1
Remedial Investigation Chemical Analytical Results - Soil COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Sample Location ¹	Analytical Method	Units	GP-59		GMW-18		GMW-20		GMW-24			GMW-25			Soil Preliminary Cleanup Level ² (PCUL)
Sample Identification			GP-59-8.25-10.25	GP-59-10.25-11.5	MW-18:5.5-6.5	MW-18:13-13.5	MW-20:5.5-6.5	MW-20:13-13.5	MW-24:5-5.5	MW-24:8.5-9	MW-24:13-13.5	MW-25:3.5-4	MW-25:8-8.5	MW-25:13-13.5	
Sample Date			10/10/12	10/10/12	10/14/98	10/14/98	10/14/98	10/14/98	07/23/03	07/23/03	07/23/03	07/23/03	07/23/03	07/23/03	
Sample Depth			8.25 - 10.25 ft	10.25 - 11.5 ft	5.5 - 6.5 ft	13 - 13.5 ft	5.5 - 6.5 ft	13 - 13.5 ft	5 - 5.5 ft	8.5 - 9 ft	13 - 13.5 ft	3.5 - 4 ft	8 - 8.5 ft	13 - 13.5 ft	
Stratigraphic Horizon			FD	OS	FD	OS	FD	OS	FD	FD	OS	FD	FD	OS	
Sampled By			ERM	ERM	RETEC	RETEC	RETEC	RETEC	Shaw	Shaw	Shaw	Shaw	Shaw	Shaw	
Decane	EPA 8270	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
Dibutyl phthalate	EPA 8270	mg/kg	0.0076 U	0.0078 U	--	--	--	--	--	--	--	--	--	--	0.015
2,3-Dichloroaniline	EPA 8270	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2-Dichlorobenzene	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	0.0031
(o-Dichlorobenzene)	EPA 8270	mg/kg	0.0023 U	0.0024 U	--	--	--	--	--	--	--	--	--	--	0.0031
1,3-Dichlorobenzene	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
(m-Dichlorobenzene)	EPA 8270	mg/kg	0.0024 U	0.0025 U	--	--	--	--	--	--	--	--	--	--	NE
1,4-Dichlorobenzene	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	0.0081
(p-Dichlorobenzene)	EPA 8270	mg/kg	0.0027 U	0.0027 U	--	--	--	--	--	--	--	--	--	--	0.0081
3,3'-Dichlorobenzidine	EPA 8270	mg/kg	0.017 U	0.017 U	--	--	--	--	--	--	--	--	--	--	0.0000033
2,4-Dichlorophenol	EPA 8270	mg/kg	0.02 U	0.021 U	--	--	--	--	--	--	--	--	--	--	0.0043
Bis(2-ethylhexyl)ester	EPA 8270	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	710
Diethyl phthalate	EPA 8270	mg/kg	0.034 U	0.035 U	--	--	--	--	--	--	--	--	--	--	0.034
Dimethyl phthalate	EPA 8270	mg/kg	0.0027 U	0.0028 U	--	--	--	--	--	--	--	--	--	--	0.071
2,4-Dimethylphenol	EPA 8270	mg/kg	0.0032 U	0.0033 U	--	--	--	--	--	--	--	--	--	--	0.0031
1,2-Dinitrobenzene	EPA 8270	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	8.0
1,3-Dinitrobenzene	EPA 8270	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	8.0
1,4-Dinitrobenzene	EPA 8270	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	8.0
4,6-Dinitro-2-methylphenol	EPA 8270	mg/kg	0.02 U	0.02 U	--	--	--	--	--	--	--	--	--	--	NE
2,4-Dinitrophenol	EPA 8270	mg/kg	0.1 U	0.11 U	--	--	--	--	--	--	--	--	--	--	0.029
2,4-Dinitrotoluene	EPA 8270	mg/kg	0.018 U	0.019 U	--	--	--	--	--	--	--	--	--	--	0.000069
2,6-Dinitrotoluene	EPA 8270	mg/kg	0.028 U	0.029 U	--	--	--	--	--	--	--	--	--	--	0.11
Di-n-octyl phthalate	EPA 8270	mg/kg	0.0054 U	0.0056 U	--	--	--	--	--	--	--	--	--	--	0.33
1,2-Diphenylhydrazine	EPA 8270	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	1.1
Hexachlorobenzene	EPA 8270	mg/kg	0.0040 U	0.0041 U	--	--	--	--	--	--	--	--	--	--	0.00000040
Hexachlorobutadiene	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	0.00054
	EPA 8270	mg/kg	0.0042 U	0.0044 U	--	--	--	--	--	--	--	--	--	--	0.00054
Hexachlorocyclopentadiene	EPA 8270	mg/kg	0.062 U	0.063 U	--	--	--	--	--	--	--	--	--	--	0.20
Hexachloroethane	EPA 8270	mg/kg	0.0027 U	0.0028 U	--	--	--	--	--	--	--	--	--	--	0.000041
Isophorone	EPA 8270	mg/kg	0.0027 U	0.0027 U	--	--	--	--	--	--	--	--	--	--	0.037
2-Methylphenol (o-Cresol)	EPA 8270	mg/kg	0.0049 U	0.0050 U	--	--	--	--	--	--	--	--	--	--	0.010
3 & 4 Methylphenol (m-, p-Cresol)	EPA 8270	mg/kg	0.084	0.5	--	--	--	--	--	--	--	--	--	--	4,000
2-Nitroaniline	EPA 8270	mg/kg	0.017 U	0.018 U	--	--	--	--	--	--	--	--	--	--	800
3-Nitroaniline	EPA 8270	mg/kg	0.021 U	0.021 U	--	--	--	--	--	--	--	--	--	--	NE
4-Nitroaniline	EPA 8270	mg/kg	0.035 U	0.036 U	--	--	--	--	--	--	--	--	--	--	NE
Nitrobenzene	EPA 8270	mg/kg	0.036 U	0.037 U	--	--	--	--	--	--	--	--	--	--	0.041
2-Nitrophenol	EPA 8270	mg/kg	0.032 UJ	0.033 UJ	--	--	--	--	--	--	--	--	--	--	NE
4-Nitrophenol (p-Nitrophenol)	EPA 8270	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	7.0
n-Nitrosodimethylamine	EPA 8270	mg/kg	0.0050 U	0.0051 U	--	--	--	--	--	--	--	--	--	--	0.017
n-Nitrosodiphenylamine (as Diphenylamine)	EPA 8270	mg/kg	0.0031 U	0.0032 U	--	--	--	--	--	--	--	--	--	--	0.0011
n-Nitrosodi-n-propylamine	EPA 8270	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	0.000018
n-Octadecane	EPA 8270	mg/kg	0.045 U	0.046 U	--	--	--	--	--	--	--	--	--	--	NE
Pentachlorophenol	EPA 8270	mg/kg	0.045 U	0.046 U	--	--	--	--	--	--	--	--	--	--	0.0000018

Table D-1
Remedial Investigation Chemical Analytical Results - Soil COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Sample Location ¹	Analytical Method	Units	GP-59		GMW-18		GMW-20		GMW-24			GMW-25			Soil Preliminary Cleanup Level ² (PCUL)
Sample Identification			GP-59-8.25-10.25	GP-59-10.25-11.5	MW-18:5.5-6.5	MW-18:13-13.5	MW-20:5.5-6.5	MW-20:13-13.5	MW-24:5-5.5	MW-24:8.5-9	MW-24:13-13.5	MW-25:3.5-4	MW-25:8-8.5	MW-25:13-13.5	
Sample Date			10/10/12	10/10/12	10/14/98	10/14/98	10/14/98	10/14/98	07/23/03	07/23/03	07/23/03	07/23/03	07/23/03	07/23/03	
Sample Depth			8.25 - 10.25 ft	10.25 - 11.5 ft	5.5 - 6.5 ft	13 - 13.5 ft	5.5 - 6.5 ft	13 - 13.5 ft	5 - 5.5 ft	8.5 - 9 ft	13 - 13.5 ft	3.5 - 4 ft	8 - 8.5 ft	13 - 13.5 ft	
Stratigraphic Horizon			FD	OS	FD	OS	FD	OS	FD	FD	OS	FD	FD	OS	
Sampled By			ERM	ERM	RETEC	RETEC	RETEC	RETEC	Shaw	Shaw	Shaw	Shaw	Shaw	Shaw	
Phenol	EPA 8270	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	0.12
Pyridine	EPA 8270	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	80
2,3,4,6-Tetrachlorophenol	EPA 8270	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	490
2,3,5,6-Tetrachlorophenol	EPA 8270	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,4-Trichlorobenzene	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	0.000072
	EPA 8270	mg/kg	0.0032 U	0.0033 U	--	--	--	--	--	--	--	--	--	--	0.000072
2,4,5-Trichlorophenol	EPA 8270	mg/kg	0.02 U	0.02 U	--	--	--	--	--	--	--	--	--	--	1.1
2,4,6-Trichlorophenol	EPA 8270	mg/kg	0.021 U	0.021 U	--	--	--	--	--	--	--	--	--	--	0.00019
Volatile Organic Compounds (VOCs)															
Acetone	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	72,000
Benzene	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	0.00056
Bromobenzene	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	640
Bromochloromethane	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
Bromoform (Tribromomethane)	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	0.0050
Bromomethane	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	0.079
n-Butylbenzene	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	4,000
sec-Butylbenzene	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	8,000
tert-Butylbenzene	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	8,000
Carbon disulfide	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	8,000
Carbon tetrachloride	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	0.00015
Chlorobenzene	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	0.10
Chloroethane	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
2-Chloroethyl vinyl ether	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
Chloroform	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	0.052
Chloromethane	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
2-Chlorotoluene	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	1,600
4-Chlorotoluene	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
Dibromochloromethane	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	0.00077
1,2-Dibromo-3-chloropropane	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	1.3
Dibromomethane	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	800
Bromodichloromethane (Dichlorobromomethane)	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	0.00096
Dichlorodifluoromethane (CFC-12)	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	16,000
1,1-Dichloroethane	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	180
1,2-Dichloroethane	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	0.024
1,1-Dichloroethene	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	1.4
cis-1,2-Dichloroethene	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	160
trans-1,2-Dichloroethene	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	0.32
1,2-Dichloropropane	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	0.0010
1,3-Dichloropropane	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
2,2-Dichloropropane	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,1-Dichloropropene	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
cis-1,3-Dichloropropene	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	0.00063

Table D-1
Remedial Investigation Chemical Analytical Results - Soil COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Sample Location ¹	Analytical Method	Units	GP-59		GMW-18		GMW-20		GMW-24			GMW-25			Soil Preliminary Cleanup Level ² (PCUL)
Sample Identification			GP-59-8.25-10.25	GP-59-10.25-11.5	MW-18:5.5-6.5	MW-18:13-13.5	MW-20:5.5-6.5	MW-20:13-13.5	MW-24:5-5.5	MW-24:8.5-9	MW-24:13-13.5	MW-25:3.5-4	MW-25:8-8.5	MW-25:13-13.5	
Sample Date			10/10/12	10/10/12	10/14/98	10/14/98	10/14/98	10/14/98	07/23/03	07/23/03	07/23/03	07/23/03	07/23/03	07/23/03	
Sample Depth			8.25 - 10.25 ft	10.25 - 11.5 ft	5.5 - 6.5 ft	13 - 13.5 ft	5.5 - 6.5 ft	13 - 13.5 ft	5 - 5.5 ft	8.5 - 9 ft	13 - 13.5 ft	3.5 - 4 ft	8 - 8.5 ft	13 - 13.5 ft	
Stratigraphic Horizon			FD	OS	FD	OS	FD	OS	FD	FD	OS	FD	FD	OS	
Sampled By			ERM	ERM	RETEC	RETEC	RETEC	RETEC	Shaw	Shaw	Shaw	Shaw	Shaw	Shaw	
trans-1,3-Dichloropropene	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	0.00063
Ethylbenzene	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	0.015
1,2-Dibromoethane (EDB)	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	0.50
2-Hexanone	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	400
Isopropylbenzene (Cumene)	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	8,000
p-Isopropyltoluene	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
2-Butanone (MEK)	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	48,000
Methyl iodide (Iodomethane)	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	NE
4-Methyl-2-pentanone (Methyl Isobutyl Ketone)	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	6,400
Methyl tert-butyl ether (MTBE)	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	560
Methylene chloride	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	0.030
n-Propylbenzene	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	8,000
Styrene	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	300
1,1,1,2-Tetrachloroethane	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	38
1,1,2,2-Tetrachloroethane	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	0.00011
Tetrachloroethene	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	0.0016
Toluene	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	0.055
1,2,3-Trichlorobenzene	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	20
1,1,1-Trichloroethane	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	21
1,1,2-Trichloroethane	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	0.00033
Trichloroethene	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	0.00027
Trichlorofluoromethane (CFC-11)	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	24,000
1,2,3-Trichloropropane	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	0.033
1,2,4-Trimethylbenzene	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	800
1,3,5-Trimethylbenzene	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	800
Vinyl Acetate	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	80,000
Vinyl Chloride	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	0.000055
Xylene, m-,p-	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	16,000
Xylene, o-	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	16,000
Petroleum Hydrocarbons															
Gasoline-Range Hydrocarbons	NWTPH-G	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	30
Diesel-Range Hydrocarbons	NWTPH-Dx	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	260
Oil-Range Hydrocarbons	NWTPH-Dx	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	2,000
Total Diesel- and Oil-Range Hydrocarbons	NWTPH-Dx	mg/kg	--	--	--	--	--	--	--	--	--	--	--	--	260
Conventionals															
pH	N/A	N/A	--	--	--	--	--	--	--	--	--	--	--	--	NE

Table D-1

Remedial Investigation Chemical Analytical Results - Soil COPCs

Port of Seattle - North Terminal 115

Seattle, Washington

Notes:

- ¹ Sample locations are shown on Figures 3-1 and 3-3.
- ² Preliminary cleanup levels for soil are referenced from Table 4-1.
- ³ Total dioxin/furan Toxic Equivalency Quotients (TEQs) were calculated using United States Environmental Protection Agency (USEPA) Toxicity Equivalency Factor (TEF) values for human health (EPA 2003).
- ⁴ Total carcinogenic PAH (cPAH) TEQs were calculated using TEF values referenced from MTCA Table 708.2 (WAC 173-340-900).
- RL = Reporting limit
- EPA = Environmental Protection Agency
- mg/kg = milligram per kilogram
- NE = not established
- J = estimated result
- U = analyte not detected above the reporting limit
- = not analyzed
- AD = Native LDW alluvial deposit
- OS = Native organic silt (Aquitard) deposit
- FI = Initial (early 1900s) T115N fill deposit
- FD = Glacier NW Site dredged fill deposit
- FO = T115N operational (1960s) fill deposit
- FT = Terminal 115 fill deposit
- FP = Settling pond fill deposit
- COPC = Contaminant of Potential Concern
- KCHD = King County Health Department
- Landau = Landau Associates
- GEI = GeoEngineers
- ERM = Environmental Resources Management
- Shaw = Shaw Environmental & Infrastructure
- Bold** indicates analyte was detected.
- Yellow shading identifies the detected results greater than the preliminary cleanup level.
- Blue shading identifies the non-detected result greater than the preliminary cleanup level.

Table D-1
Remedial Investigation Chemical Analytical Results - Soil COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Sample Location ¹	Analytical Method	Units	GMW-26				GMW-27				Soil Preliminary Cleanup Level ² (PCUL)
Sample Identification			MW-26:5.5-6	MW-26:8-8.5	MW-26:10.5-11	MW-26:13-13.5	MW-27:5.5-6	MW-27:8-8.5	MW-27:10.5-11	MW-27:13-13.5	
Sample Date			07/23/03	07/23/03	07/23/03	07/23/03	07/23/03	07/23/03	07/23/03	07/23/03	
Sample Depth			5.5 - 6 ft	8 - 8.5 ft	10.5 - 11 ft	13 - 13.5 ft	5.5 - 6 ft	8 - 8.5 ft	10.5 - 11 ft	13 - 13.5 ft	
Stratigraphic Horizon			FD	FD	FD	OS	FD	FD	FD	OS	
Sampled By			Shaw	Shaw	Shaw	Shaw	Shaw	Shaw	Shaw	Shaw	
Polychlorinated Biphenyls (PCBs)											
PCB-Aroclor 1016	EPA 8082	mg/kg	--	--	--	--	--	--	--	--	NE
PCB-Aroclor 1221	EPA 8082	mg/kg	--	--	--	--	--	--	--	--	NE
PCB-Aroclor 1232	EPA 8082	mg/kg	--	--	--	--	--	--	--	--	NE
PCB-Aroclor 1242	EPA 8082	mg/kg	--	--	--	--	--	--	--	--	NE
PCB-Aroclor 1248	EPA 8082	mg/kg	--	--	--	--	--	--	--	--	NE
PCB-Aroclor 1254	EPA 8082	mg/kg	--	--	--	--	--	--	--	--	NE
PCB-Aroclor 1260	EPA 8082	mg/kg	--	--	--	--	--	--	--	--	NE
Total PCB Aroclors	EPA 8082	mg/kg	--	--	--	--	--	--	--	--	0.0000022
Dioxins and Furans											
1,2,3,4,6,7,8-HpCDD	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	NE
1,2,3,4,6,7,8-HpCDF	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	NE
1,2,3,4,7,8,9-HpCDF	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	NE
1,2,3,4,7,8-HxCDD	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	NE
1,2,3,4,7,8-HxCDF	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	NE
1,2,3,6,7,8-HxCDD	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	NE
1,2,3,6,7,8-HxCDF	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	NE
1,2,3,7,8,9-HxCDD	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	NE
1,2,3,7,8,9-HxCDF	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	NE
1,2,3,7,8-PeCDD	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	NE
1,2,3,7,8-PeCDF	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	NE
2,3,4,6,7,8-HxCDF	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	NE
2,3,4,7,8-PeCDF	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	NE
2,3,7,8-TCDD	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	NE
2,3,7,8-TCDF	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	NE
OCDD	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	NE
OCDF	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	NE
Total Dioxin/Furan TEQ ³ (ND=0.5RL)	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	0.0000052
Total Dioxin/Furan TEQ ³ (ND=0.5RL)	EPA 1613	mg/kg	--	--	--	--	--	--	--	--	0.0000052
Metals											
Antimony	EPA 6000/7000	mg/kg	--	--	--	--	--	--	--	--	4.1
Arsenic	EPA 6000/7000	mg/kg	180	9.1	250	24	3.60 U	3.70 U	4.40 U	3.60 U	7.0
Barium	EPA 6000/7000	mg/kg	--	--	--	--	--	--	--	--	8.3
Beryllium	EPA 6000/7000	mg/kg	--	--	--	--	--	--	--	--	3.5
Cadmium	EPA 6000/7000	mg/kg	--	--	--	--	--	--	--	--	1.0
Chromium III / Total	EPA 6000/7000	mg/kg	--	--	--	--	--	--	--	--	48
Chromium VI	EPA 6000/7000	mg/kg	--	--	--	--	--	--	--	--	18
Copper	EPA 6000/7000	mg/kg	--	--	--	--	--	--	--	--	36
Lead	EPA 6000/7000	mg/kg	--	--	--	--	--	--	--	--	50
Mercury	EPA 6000/7000	mg/kg	--	--	--	--	--	--	--	--	0.070
Nickel	EPA 6000/7000	mg/kg	--	--	--	--	--	--	--	--	48
Selenium	EPA 6000/7000	mg/kg	--	--	--	--	--	--	--	--	0.30

Table D-1
Remedial Investigation Chemical Analytical Results - Soil COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Sample Location ¹	Analytical Method	Units	GMW-26				GMW-27				Soil Preliminary Cleanup Level ² (PCUL)
Sample Identification			MW-26:5.5-6	MW-26:8-8.5	MW-26:10.5-11	MW-26:13-13.5	MW-27:5.5-6	MW-27:8-8.5	MW-27:10.5-11	MW-27:13-13.5	
Sample Date			07/23/03	07/23/03	07/23/03	07/23/03	07/23/03	07/23/03	07/23/03	07/23/03	
Sample Depth			5.5 - 6 ft	8 - 8.5 ft	10.5 - 11 ft	13 - 13.5 ft	5.5 - 6 ft	8 - 8.5 ft	10.5 - 11 ft	13 - 13.5 ft	
Stratigraphic Horizon			FD	FD	FD	OS	FD	FD	FD	OS	
Sampled By			Shaw	Shaw	Shaw	Shaw	Shaw	Shaw	Shaw	Shaw	
Silver	EPA 6000/7000	mg/kg	--	--	--	--	--	--	--	--	0.016
Thallium	EPA 6000/7000	mg/kg	--	--	--	--	--	--	--	--	0.0044
Tin	EPA 6000/7000	mg/kg	--	--	--	--	--	--	--	--	50
Zinc	EPA 6000/7000	mg/kg	--	--	--	--	--	--	--	--	85
Semi-Volatile Organic Compounds (SVOCs) - Polycyclic Aromatic Hydrocarbons (PAHs)											
Acenaphthene	EPA 8270/SIM	mg/kg	--	--	--	--	--	--	--	--	0.028
Acenaphthylene	EPA 8270/SIM	mg/kg	--	--	--	--	--	--	--	--	1.3
Anthracene	EPA 8270/SIM	mg/kg	--	--	--	--	--	--	--	--	0.051
Benzo(a)anthracene	EPA 8270/SIM	mg/kg	--	--	--	--	--	--	--	--	0.000057
Benzo(b)fluoranthene	EPA 8270/SIM	mg/kg	--	--	--	--	--	--	--	--	0.00020
Benzo(k)fluoranthene	EPA 8270/SIM	mg/kg	--	--	--	--	--	--	--	--	0.0020
Benzofluoranthenes (Total)	EPA 8270/SIM	mg/kg	--	--	--	--	--	--	--	--	3.2
Benzo(g,h,i)perylene	EPA 8270/SIM	mg/kg	--	--	--	--	--	--	--	--	0.67
Benzo(a)pyrene	EPA 8270/SIM	mg/kg	--	--	--	--	--	--	--	--	0.000016
Chrysene	EPA 8270/SIM	mg/kg	--	--	--	--	--	--	--	--	0.0064
Dibenzo(a,h)anthracene	EPA 8270/SIM	mg/kg	--	--	--	--	--	--	--	--	0.000029
Dibenzofuran	EPA 8270/SIM	mg/kg	--	--	--	--	--	--	--	--	0.54
Fluoranthene	EPA 8270/SIM	mg/kg	--	--	--	--	--	--	--	--	0.090
Fluorene	EPA 8270/SIM	mg/kg	--	--	--	--	--	--	--	--	0.029
Indeno(1,2,3-c,d)pyrene	EPA 8270/SIM	mg/kg	--	--	--	--	--	--	--	--	0.00056
1-Methylnaphthalene	EPA 8270/SIM	mg/kg	--	--	--	--	--	--	--	--	29
2-Methylnaphthalene	EPA 8270/SIM	mg/kg	--	--	--	--	--	--	--	--	0.67
Naphthalene	EPA 8270/SIM	mg/kg	--	--	--	--	--	--	--	--	0.0021
Phenanthrene	EPA 8270/SIM	mg/kg	--	--	--	--	--	--	--	--	1.5
Pyrene	EPA 8270/SIM	mg/kg	--	--	--	--	--	--	--	--	0.14
Total cPAH TEQ ⁴ (ND=0)	EPA 8270/SIM	mg/kg	--	--	--	--	--	--	--	--	0.000016
Total cPAH TEQ ⁴ (ND=0.5RL)	EPA 8270/SIM	mg/kg	--	--	--	--	--	--	--	--	0.000016
Other SVOCs											
Aniline	EPA 8270	mg/kg	--	--	--	--	--	--	--	--	150
Benzidine	EPA 8270	mg/kg	--	--	--	--	--	--	--	--	0.0037
Benzoic acid	EPA 8270	mg/kg	--	--	--	--	--	--	--	--	0.17
Benzyl alcohol	EPA 8270	mg/kg	--	--	--	--	--	--	--	--	0.057
Bis(2-chloroethoxy)methane	EPA 8270	mg/kg	--	--	--	--	--	--	--	--	NE
Bis(2-chloroethyl)ether	EPA 8270	mg/kg	--	--	--	--	--	--	--	--	0.000022
Bis(2-chloroisopropyl)ether	EPA 8270	mg/kg	--	--	--	--	--	--	--	--	3,200
Bis(2-ethylhexyl)phthalate	EPA 8270	mg/kg	--	--	--	--	--	--	--	--	0.0051
4-Bromophenyl phenyl ether	EPA 8270	mg/kg	--	--	--	--	--	--	--	--	NE
Butyl benzyl phthalate	EPA 8270	mg/kg	--	--	--	--	--	--	--	--	0.00018
Carbazole	EPA 8270	mg/kg	--	--	--	--	--	--	--	--	NE
4-Chloroaniline	EPA 8270	mg/kg	--	--	--	--	--	--	--	--	0.81
4-Chloro-3-methylphenol	EPA 8270	mg/kg	--	--	--	--	--	--	--	--	NE
2-Chloronaphthalene	EPA 8270	mg/kg	--	--	--	--	--	--	--	--	6,400
2-Chlorophenol	EPA 8270	mg/kg	--	--	--	--	--	--	--	--	0.011
4-Chlorophenyl phenyl ether	EPA 8270	mg/kg	--	--	--	--	--	--	--	--	NE

Table D-1
Remedial Investigation Chemical Analytical Results - Soil COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Sample Location ¹	Analytical Method	Units	GMW-26				GMW-27				Soil Preliminary Cleanup Level ² (PCUL)
Sample Identification			MW-26:5.5-6	MW-26:8-8.5	MW-26:10.5-11	MW-26:13-13.5	MW-27:5.5-6	MW-27:8-8.5	MW-27:10.5-11	MW-27:13-13.5	
Sample Date			07/23/03	07/23/03	07/23/03	07/23/03	07/23/03	07/23/03	07/23/03	07/23/03	
Sample Depth			5.5 - 6 ft	8 - 8.5 ft	10.5 - 11 ft	13 - 13.5 ft	5.5 - 6 ft	8 - 8.5 ft	10.5 - 11 ft	13 - 13.5 ft	
Stratigraphic Horizon			FD	FD	FD	OS	FD	FD	FD	OS	
Sampled By			Shaw	Shaw	Shaw	Shaw	Shaw	Shaw	Shaw	Shaw	
Decane	EPA 8270	mg/kg	--	--	--	--	--	--	--	--	NE
Dibutyl phthalate	EPA 8270	mg/kg	--	--	--	--	--	--	--	--	0.015
2,3-Dichloroaniline	EPA 8270	mg/kg	--	--	--	--	--	--	--	--	NE
1,2-Dichlorobenzene	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	0.0031
(o-Dichlorobenzene)	EPA 8270	mg/kg	--	--	--	--	--	--	--	--	0.0031
1,3-Dichlorobenzene	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	NE
(m-Dichlorobenzene)	EPA 8270	mg/kg	--	--	--	--	--	--	--	--	NE
1,4-Dichlorobenzene	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	0.0081
(p-Dichlorobenzene)	EPA 8270	mg/kg	--	--	--	--	--	--	--	--	0.0081
3,3'-Dichlorobenzidine	EPA 8270	mg/kg	--	--	--	--	--	--	--	--	0.0000033
2,4-Dichlorophenol	EPA 8270	mg/kg	--	--	--	--	--	--	--	--	0.0043
Bis(2-ethylhexyl)ester	EPA 8270	mg/kg	--	--	--	--	--	--	--	--	710
Diethyl phthalate	EPA 8270	mg/kg	--	--	--	--	--	--	--	--	0.034
Dimethyl phthalate	EPA 8270	mg/kg	--	--	--	--	--	--	--	--	0.071
2,4-Dimethylphenol	EPA 8270	mg/kg	--	--	--	--	--	--	--	--	0.0031
1,2-Dinitrobenzene	EPA 8270	mg/kg	--	--	--	--	--	--	--	--	8.0
1,3-Dinitrobenzene	EPA 8270	mg/kg	--	--	--	--	--	--	--	--	8.0
1,4-Dinitrobenzene	EPA 8270	mg/kg	--	--	--	--	--	--	--	--	8.0
4,6-Dinitro-2-methylphenol	EPA 8270	mg/kg	--	--	--	--	--	--	--	--	NE
2,4-Dinitrophenol	EPA 8270	mg/kg	--	--	--	--	--	--	--	--	0.029
2,4-Dinitrotoluene	EPA 8270	mg/kg	--	--	--	--	--	--	--	--	0.000069
2,6-Dinitrotoluene	EPA 8270	mg/kg	--	--	--	--	--	--	--	--	0.11
Di-n-octyl phthalate	EPA 8270	mg/kg	--	--	--	--	--	--	--	--	0.33
1,2-Diphenylhydrazine	EPA 8270	mg/kg	--	--	--	--	--	--	--	--	1.1
Hexachlorobenzene	EPA 8270	mg/kg	--	--	--	--	--	--	--	--	0.00000040
Hexachlorobutadiene	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	0.00054
	EPA 8270	mg/kg	--	--	--	--	--	--	--	--	0.00054
Hexachlorocyclopentadiene	EPA 8270	mg/kg	--	--	--	--	--	--	--	--	0.20
Hexachloroethane	EPA 8270	mg/kg	--	--	--	--	--	--	--	--	0.000041
Isophorone	EPA 8270	mg/kg	--	--	--	--	--	--	--	--	0.037
2-Methylphenol (o-Cresol)	EPA 8270	mg/kg	--	--	--	--	--	--	--	--	0.010
3 & 4 Methylphenol (m-, p-Cresol)	EPA 8270	mg/kg	--	--	--	--	--	--	--	--	4,000
2-Nitroaniline	EPA 8270	mg/kg	--	--	--	--	--	--	--	--	800
3-Nitroaniline	EPA 8270	mg/kg	--	--	--	--	--	--	--	--	NE
4-Nitroaniline	EPA 8270	mg/kg	--	--	--	--	--	--	--	--	NE
Nitrobenzene	EPA 8270	mg/kg	--	--	--	--	--	--	--	--	0.041
2-Nitrophenol	EPA 8270	mg/kg	--	--	--	--	--	--	--	--	NE
4-Nitrophenol (p-Nitrophenol)	EPA 8270	mg/kg	--	--	--	--	--	--	--	--	7.0
n-Nitrosodimethylamine	EPA 8270	mg/kg	--	--	--	--	--	--	--	--	0.017
n-Nitrosodiphenylamine (as Diphenylamine)	EPA 8270	mg/kg	--	--	--	--	--	--	--	--	0.0011
n-Nitrosodi-n-propylamine	EPA 8270	mg/kg	--	--	--	--	--	--	--	--	0.000018
n-Octadecane	EPA 8270	mg/kg	--	--	--	--	--	--	--	--	NE
Pentachlorophenol	EPA 8270	mg/kg	--	--	--	--	--	--	--	--	0.0000018

Table D-1
Remedial Investigation Chemical Analytical Results - Soil COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Sample Location ¹	Analytical Method	Units	GMW-26				GMW-27				Soil Preliminary Cleanup Level ² (PCUL)
Sample Identification			MW-26:5.5-6	MW-26:8-8.5	MW-26:10.5-11	MW-26:13-13.5	MW-27:5.5-6	MW-27:8-8.5	MW-27:10.5-11	MW-27:13-13.5	
Sample Date			07/23/03	07/23/03	07/23/03	07/23/03	07/23/03	07/23/03	07/23/03	07/23/03	
Sample Depth			5.5 - 6 ft	8 - 8.5 ft	10.5 - 11 ft	13 - 13.5 ft	5.5 - 6 ft	8 - 8.5 ft	10.5 - 11 ft	13 - 13.5 ft	
Stratigraphic Horizon			FD	FD	FD	OS	FD	FD	FD	OS	
Sampled By			Shaw	Shaw	Shaw	Shaw	Shaw	Shaw	Shaw	Shaw	
Phenol	EPA 8270	mg/kg	--	--	--	--	--	--	--	--	0.12
Pyridine	EPA 8270	mg/kg	--	--	--	--	--	--	--	--	80
2,3,4,6-Tetrachlorophenol	EPA 8270	mg/kg	--	--	--	--	--	--	--	--	490
2,3,5,6-Tetrachlorophenol	EPA 8270	mg/kg	--	--	--	--	--	--	--	--	NE
1,2,4-Trichlorobenzene	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	0.000072
	EPA 8270	mg/kg	--	--	--	--	--	--	--	--	0.000072
2,4,5-Trichlorophenol	EPA 8270	mg/kg	--	--	--	--	--	--	--	--	1.1
2,4,6-Trichlorophenol	EPA 8270	mg/kg	--	--	--	--	--	--	--	--	0.00019
Volatile Organic Compounds (VOCs)											
Acetone	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	72,000
Benzene	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	0.00056
Bromobenzene	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	640
Bromochloromethane	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	NE
Bromoform (Tribromomethane)	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	0.0050
Bromomethane	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	0.079
n-Butylbenzene	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	4,000
sec-Butylbenzene	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	8,000
tert-Butylbenzene	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	8,000
Carbon disulfide	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	8,000
Carbon tetrachloride	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	0.00015
Chlorobenzene	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	0.10
Chloroethane	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	NE
2-Chloroethyl vinyl ether	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	NE
Chloroform	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	0.052
Chloromethane	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	NE
2-Chlorotoluene	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	1,600
4-Chlorotoluene	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	NE
Dibromochloromethane	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	0.00077
1,2-Dibromo-3-chloropropane	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	1.3
Dibromomethane	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	800
Bromodichloromethane (Dichlorobromomethane)	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	0.00096
Dichlorodifluoromethane (CFC-12)	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	16,000
1,1-Dichloroethane	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	180
1,2-Dichloroethane	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	0.024
1,1-Dichloroethene	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	1.4
cis-1,2-Dichloroethene	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	160
trans-1,2-Dichloroethene	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	0.32
1,2-Dichloropropane	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	0.0010
1,3-Dichloropropane	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	NE
2,2-Dichloropropane	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	NE
1,1-Dichloropropene	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	NE
cis-1,3-Dichloropropene	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	0.00063

Table D-1
Remedial Investigation Chemical Analytical Results - Soil COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Sample Location ¹	Analytical Method	Units	GMW-26				GMW-27				Soil Preliminary Cleanup Level ² (PCUL)
Sample Identification			MW-26:5.5-6	MW-26:8-8.5	MW-26:10.5-11	MW-26:13-13.5	MW-27:5.5-6	MW-27:8-8.5	MW-27:10.5-11	MW-27:13-13.5	
Sample Date			07/23/03	07/23/03	07/23/03	07/23/03	07/23/03	07/23/03	07/23/03	07/23/03	
Sample Depth			5.5 - 6 ft	8 - 8.5 ft	10.5 - 11 ft	13 - 13.5 ft	5.5 - 6 ft	8 - 8.5 ft	10.5 - 11 ft	13 - 13.5 ft	
Stratigraphic Horizon			FD	FD	FD	OS	FD	FD	FD	OS	
Sampled By			Shaw	Shaw	Shaw	Shaw	Shaw	Shaw	Shaw	Shaw	
trans-1,3-Dichloropropene	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	0.00063
Ethylbenzene	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	0.015
1,2-Dibromoethane (EDB)	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	0.50
2-Hexanone	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	400
Isopropylbenzene (Cumene)	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	8,000
p-Isopropyltoluene	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	NE
2-Butanone (MEK)	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	48,000
Methyl iodide (Iodomethane)	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	NE
4-Methyl-2-pentanone (Methyl Isobutyl Ketone)	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	6,400
Methyl tert-butyl ether (MTBE)	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	560
Methylene chloride	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	0.030
n-Propylbenzene	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	8,000
Styrene	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	300
1,1,1,2-Tetrachloroethane	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	38
1,1,2,2-Tetrachloroethane	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	0.00011
Tetrachloroethene	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	0.0016
Toluene	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	0.055
1,2,3-Trichlorobenzene	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	20
1,1,1-Trichloroethane	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	21
1,1,2-Trichloroethane	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	0.00033
Trichloroethene	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	0.00027
Trichlorofluoromethane (CFC-11)	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	24,000
1,2,3-Trichloropropane	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	0.033
1,2,4-Trimethylbenzene	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	800
1,3,5-Trimethylbenzene	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	800
Vinyl Acetate	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	80,000
Vinyl Chloride	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	0.000055
Xylene, m-,p-	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	16,000
Xylene, o-	EPA 8260	mg/kg	--	--	--	--	--	--	--	--	16,000
Petroleum Hydrocarbons											
Gasoline-Range Hydrocarbons	NWTPH-G	mg/kg	--	--	--	--	--	--	--	--	30
Diesel-Range Hydrocarbons	NWTPH-Dx	mg/kg	--	--	--	--	--	--	--	--	260
Oil-Range Hydrocarbons	NWTPH-Dx	mg/kg	--	--	--	--	--	--	--	--	2,000
Total Diesel- and Oil-Range Hydrocarbons	NWTPH-Dx	mg/kg	--	--	--	--	--	--	--	--	260
Conventional											
pH	N/A	N/A	--	--	--	--	--	--	--	--	NE

Table D-1

Remedial Investigation Chemical Analytical Results - Soil COPCs

Port of Seattle - North Terminal 115

Seattle, Washington

Notes:

- ¹ Sample locations are shown on Figures 3-1 and 3-3.
- ² Preliminary cleanup levels for soil are referenced from Table 4-1.
- ³ Total dioxin/furan Toxic Equivalency Quotients (TEQs) were calculated using United States Environmental Protection Agency (USEPA) Toxicity Equivalency Factor (TEF) values for human health (EPA 2003).
- ⁴ Total carcinogenic PAH (cPAH) TEQs were calculated using TEF values referenced from MTCA Table 708.2 (WAC 173-340-900).
- RL = Reporting limit
- EPA = Environmental Protection Agency
- mg/kg = milligram per kilogram
- NE = not established
- J = estimated result
- U = analyte not detected above the reporting limit
- = not analyzed
- AD = Native LDW alluvial deposit
- OS = Native organic silt (Aquitard) deposit
- FI = Initial (early 1900s) T115N fill deposit
- FD = Glacier NW Site dredged fill deposit
- FO = T115N operational (1960s) fill deposit
- FT = Terminal 115 fill deposit
- FP = Settling pond fill deposit
- COPC = Contaminant of Potential Concern
- KCHD = King County Health Department
- Landau = Landau Associates
- GEI = GeoEngineers
- ERM = Environmental Resources Management
- Shaw = Shaw Environmental & Infrastructure
- Bold** indicates analyte was detected.
- Yellow shading identifies the detected results greater than the preliminary cleanup level.
- Blue shading identifies the non-detected result greater than the preliminary cleanup level.

Table D-2
Remedial Investigation Chemical Analytical Results - Groundwater COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Monitoring Well ¹	Analytical Method	Units	DP-1	MW-1	MW-1 ²	MW-1 ²	MW-1 ²	MW-1 ²	MW-2	MW-2 ²	MW-2 ²	MW-2	MW-2 ²	MW-2D	Groundwater Preliminary Cleanup Level ³ (PCUL)
Sample Date			10/29/09	11/05/09	06/10/14	09/22/14	01/23/15	04/21/15	11/05/09	06/13/14	09/22/14	01/19/15	04/21/15	06/13/14	
Monitoring Event			Oct-09	Nov-09	Jun-14	Sep-14	Jan-15	Apr-15	Nov-09	Jun-14	Sep-14	Jan-15	Apr-15	Jun-14	
Sampled By			Landau	Landau	GEI	GEI	GEI	GEI	Landau	GEI	GEI	GEI	GEI	GEI	
Polychlorinated Biphenyls (PCBs)															
PCB-Aroclor 1016	EPA 8082	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
PCB-Aroclor 1221	EPA 8082	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
PCB-Aroclor 1232	EPA 8082	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
PCB-Aroclor 1242	EPA 8082	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
PCB-Aroclor 1248	EPA 8082	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
PCB-Aroclor 1254	EPA 8082	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
PCB-Aroclor 1260	EPA 8082	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
Total PCB Aroclors	EPA 8082	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	0.000007
Total PCB Congeners	EPA 1668	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	0.000007
Dioxins and Furans															
1,2,3,4,6,7,8-HpCDD	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,4,6,7,8-HpCDF	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,4,7,8,9-HpCDF	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,4,7,8-HxCDD	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,4,7,8-HxCDF	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,6,7,8-HxCDD	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,6,7,8-HxCDF	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,7,8,9-HxCDD	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,7,8,9-HxCDF	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,7,8-PeCDD	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,7,8-PeCDF	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
2,3,4,6,7,8-HxCDF	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
2,3,4,7,8-PeCDF	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
2,3,7,8-TCDD	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
2,3,7,8-TCDF	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
OCDD	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
OCDF	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
Total Dioxin/Furan TEQ ⁴ (ND=0)	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	0.0000000051
Total Dioxin/Furan TEQ ⁴ (ND=0.5RL)	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	0.0000000051
Total Metals															
Antimony	EPA 200.8/7470	µg/L	1.6	1.4	--	--	--	--	1 U	--	--	5.4 U	--	5.4 U	90
Arsenic	EPA 200.8/7470	µg/L	10	19	--	--	--	--	20	--	--	46	--	3.6	8.0
Barium	EPA 200.8/7470	µg/L	--	--	--	--	--	--	--	--	--	150	--	92	200
Beryllium	EPA 200.8/7470	µg/L	11 U	11 U	--	--	--	--	11 U	--	--	10 U	--	10 U	4.4
Cadmium	EPA 200.8/7470	µg/L	4.4 U	4.4 U	--	--	--	--	4.4 U	--	--	0.20 U	--	0.20 U	1.2
Chromium III / Total	EPA 200.8/7470	µg/L	44	11	--	--	--	--	13	--	--	12	--	2.2	27
Chromium VI	EPA 200.8/7470	µg/L	10 U	10 U	--	--	--	--	10 U	--	--	--	--	--	50
Copper	EPA 200.8/7470	µg/L	170	22	--	--	--	--	59	--	--	7.3	--	2.0 U	3.1
Lead	EPA 200.8/7470	µg/L	180	68	--	--	--	--	9.4	--	--	1.5	--	1.0 U	8.1
Mercury	EPA 200.8/7470	µg/L	0.1 U	0.1 U	--	--	--	--	0.1 U	--	--	0.50 U	--	0.50 U	0.025
Nickel	EPA 200.8/7470	µg/L	78	22 U	--	--	--	--	54	--	--	24	--	4.4	8.2

Table D-2
Remedial Investigation Chemical Analytical Results - Groundwater COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Monitoring Well ¹	Analytical Method	Units	DP-1	MW-1	MW-1 ²	MW-1 ²	MW-1 ²	MW-1 ²	MW-2	MW-2 ²	MW-2 ²	MW-2	MW-2 ²	MW-2D	Groundwater Preliminary Cleanup Level ³ (PCUL)
Sample Date			10/29/09	11/05/09	06/10/14	09/22/14	01/23/15	04/21/15	11/05/09	06/13/14	09/22/14	01/19/15	04/21/15	06/13/14	
Monitoring Event			Oct-09	Nov-09	Jun-14	Sep-14	Jan-15	Apr-15	Nov-09	Jun-14	Sep-14	Jan-15	Apr-15	Jun-14	
Sampled By			Landau	Landau	GEI	GEI	GEI	GEI	Landau	GEI	GEI	GEI	GEI	GEI	
Selenium	EPA 200.8/7470	µg/L	5.6 U	5.6 U	--	--	--	--	5.6 U	--	--	6.0 U	--	6.0 U	71
Silver	EPA 200.8/7470	µg/L	11 U	11 U	--	--	--	--	11 U	--	--	1.0 U	--	1.0 U	1.9
Thallium	EPA 200.8/7470	µg/L	5.6 U	5.6 U	--	--	--	--	5.6 U	--	--	2.0 U	--	2.0 U	0.062
Tin	EPA 200.8/7470	µg/L	49	160	--	--	--	--	10 U	--	--	5.0 U	--	5.0 U	9,600
Zinc	EPA 200.8/7470	µg/L	480	78	--	--	--	--	69	--	--	56 U	--	56 U	81
Dissolved Metals															
Antimony	EPA 200.8/7470	µg/L	2.6	1.5	--	--	--	--	1 U	--	--	5.5 U	--	5.5 U	90
Arsenic	EPA 200.8/7470	µg/L	5.1	17	--	--	--	--	19	--	--	13	--	3.3 U	8.0
Barium	EPA 200.8/7470	µg/L	--	--	--	--	--	--	--	--	--	120	--	78	200
Beryllium	EPA 200.8/7470	µg/L	10 U	10 U	--	--	--	--	10 U	--	--	10 U	--	10 U	4.4
Cadmium	EPA 200.8/7470	µg/L	4 U	4 U	--	--	--	--	4 U	--	--	0.20 U	--	0.20 U	1.2
Chromium III / Total	EPA 200.8/7470	µg/L	2 U	6.6	--	--	--	--	2 U	--	--	2.0 U	--	2.0 U	27
Copper	EPA 200.8/7470	µg/L	5.9	4	--	--	--	--	1 U	--	--	2.0 U	--	2.0 U	3.1
Lead	EPA 200.8/7470	µg/L	1.1	3	--	--	--	--	1 U	--	--	1.0 U	--	1.0 U	8.1
Mercury	EPA 200.8/7470	µg/L	0.1 U	0.1 U	--	--	--	--	0.1 U	--	--	0.50 U	--	0.50 U	0.025
Nickel	EPA 200.8/7470	µg/L	20 U	20 U	--	--	--	--	20 U	--	--	9.4	--	3.1	8.2
Selenium	EPA 200.8/7470	µg/L	5 U	5 U	--	--	--	--	5 U	--	--	6.0 U	--	6.0 U	71
Silver	EPA 200.8/7470	µg/L	10 U	10 U	--	--	--	--	10 U	--	--	1.0 U	--	1.0 U	1.9
Thallium	EPA 200.8/7470	µg/L	5 U	5 U	--	--	--	--	5 U	--	--	2.0 U	--	2.0 U	0.062
Tin	EPA 200.8/7470	µg/L	10 U	10 U	--	--	--	--	10 U	--	--	5.0 U	--	5.0 U	9,600
Zinc	EPA 200.8/7470	µg/L	12	7.8	--	--	--	--	7.8	--	--	56 U	--	56 U	81
Semi-Volatile Organic Compounds (SVOCs) - Polycyclic Aromatic Hydrocarbons (PAHs)															
Acenaphthene	EPA 8270/SIM	µg/L	0.42	2.2	--	--	--	--	0.1 U	--	--	0.10 U	--	0.47 U	5.3
Acenaphthylene	EPA 8270/SIM	µg/L	0.095 U	0.1 U	--	--	--	--	0.1 U	--	--	0.10 U	--	0.47 U	NE
Anthracene	EPA 8270/SIM	µg/L	0.24	0.1 U	--	--	--	--	0.1 U	--	--	0.10 U	--	0.47 U	2.1
Benzo(a)anthracene	EPA 8270/SIM	µg/L	0.14	0.012	--	--	--	--	0.01 U	--	--	0.010 U	--	0.047 U	0.00016
Benzo(b)fluoranthene	EPA 8270/SIM	µg/L	0.24	0.01 U	--	--	--	--	0.01 U	--	--	0.010 U	--	0.047 U	0.00016
Benzo(j,k)fluoranthene	EPA 8270/SIM	µg/L	0.062	0.01 U	--	--	--	--	0.01 U	--	--	0.010 U	--	0.047 U	0.0016
Benzo(g,h,i)perylene	EPA 8270/SIM	µg/L	0.14	0.01 U	--	--	--	--	0.01 U	--	--	0.010 U	--	0.047 U	NE
Benzo(a)pyrene	EPA 8270/SIM	µg/L	0.11	0.01 U	--	--	--	--	0.01 U	--	--	0.010 U	--	0.047 U	0.000016
Chrysene	EPA 8270/SIM	µg/L	0.25	0.01 U	--	--	--	--	0.01 U	--	--	0.010 U	--	0.047 U	0.016
Dibenzo(a,h)anthracene	EPA 8270/SIM	µg/L	0.044	0.01 U	--	--	--	--	0.01 U	--	--	0.010 U	--	0.047 U	0.000016
Dibenzofuran	EPA 8270/SIM	µg/L	0.95 U	1 U	--	--	--	--	1 U	--	--	0.11 U	--	0.94 U	16
Fluoranthene	EPA 8270/SIM	µg/L	0.67	0.16	--	--	--	--	0.1 U	--	--	0.10 U	--	0.47 U	1.8
Fluorene	EPA 8270/SIM	µg/L	0.31	0.12	--	--	--	--	0.1 U	--	--	0.10 U	--	0.47 U	3.7
Indeno(1,2,3-c,d)pyrene	EPA 8270/SIM	µg/L	0.085	0.01 U	--	--	--	--	0.01 U	--	--	0.010 U	--	0.047 U	0.00016
1-Methylnaphthalene	EPA 8270/SIM	µg/L	0.095 U	0.1 U	--	--	--	--	0.1 U	--	--	0.10 U	--	0.47 U	1.5
2-Methylnaphthalene	EPA 8270/SIM	µg/L	0.095 U	0.1 U	--	--	--	--	0.1 U	--	--	0.10 U	--	0.47 U	32
Naphthalene	EPA 8270/SIM	µg/L	0.095 U	0.1 U	--	--	--	--	0.1	--	--	0.10 U	--	0.47 U	1.4
Phenanthrene	EPA 8270/SIM	µg/L	0.63	0.1 U	--	--	--	--	0.1 U	--	--	0.10 U	--	0.47 U	NE
Pyrene	EPA 8270/SIM	µg/L	0.56	0.1 U	--	--	--	--	0.1 U	--	--	0.10 U	--	0.47 U	2
Total cPAH TEQ ⁵ (ND=0)	EPA 8270/SIM	µg/L	0.1696	0.0012	--	--	--	--	0 U	--	--	0 U	--	0 U	0.000016
Total cPAH TEQ ⁵ (ND=0.5RL)	EPA 8270/SIM	µg/L	0.1696	0.0083	--	--	--	--	0.0076 U	--	--	0.0076 U	--	0.0350 U	0.000016

Table D-2
Remedial Investigation Chemical Analytical Results - Groundwater COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Monitoring Well ¹	Analytical Method	Units	DP-1	MW-1	MW-1 ²	MW-1 ²	MW-1 ²	MW-1 ²	MW-2	MW-2 ²	MW-2 ²	MW-2	MW-2 ²	MW-2D	Groundwater Preliminary Cleanup Level ³ (PCUL)
Sample Date			10/29/09	11/05/09	06/10/14	09/22/14	01/23/15	04/21/15	11/05/09	06/13/14	09/22/14	01/19/15	04/21/15	06/13/14	
Monitoring Event			Oct-09	Nov-09	Jun-14	Sep-14	Jan-15	Apr-15	Nov-09	Jun-14	Sep-14	Jan-15	Apr-15	Jun-14	
Sampled By			Landau	Landau	GEI	GEI	GEI	GEI	Landau	GEI	GEI	GEI	GEI	GEI	
Other SVOCs (mg/kg)															
Aniline	EPA 8270	µg/L	4.8 U	5 U	--	--	--	--	5 U	--	--	0.11 U	--	0.94 U	7.7
Benzidine	EPA 8270	µg/L	9.5 U	10 U	--	--	--	--	10 U	--	--	0.11 U	--	0.94 U	0.000023
Benzoic acid	EPA 8270	µg/L	--	--	--	--	--	--	--	--	--	0.54 U	--	0.94 U	590
Benzyl alcohol	EPA 8270	µg/L	0.95 U	1 U	--	--	--	--	1 U	--	--	0.11 UJ	--	0.94 U	800
Bis(2-chloroethoxy)methane	EPA 8270	µg/L	0.95 U	1 U	--	--	--	--	1 U	--	--	0.11 U	--	0.94 U	NE
Bis(2-chloroethyl)ether	EPA 8270	µg/L	0.95 U	1 U	--	--	--	--	1 U	--	--	0.11 U	--	0.94 U	0.06
Bis(2-chloroisopropyl)ether	EPA 8270	µg/L	0.95 U	1 U	--	--	--	--	1 U	--	--	0.11 U	--	0.94 U	900
Bis(2-ethylhexyl)phthalate	EPA 8270	µg/L	4.2	1 U	--	--	--	--	1 U	--	--	0.24 U	--	0.94 U	0.046
4-Bromophenyl phenyl ether	EPA 8270	µg/L	0.95 U	1 U	--	--	--	--	1 U	--	--	0.11 U	--	0.94 U	NE
Butyl benzyl phthalate	EPA 8270	µg/L	0.95 U	1 U	--	--	--	--	1 U	--	--	0.11 U	--	0.94 U	0.013
Carbazole	EPA 8270	µg/L	0.95 U	1 U	--	--	--	--	1 U	--	--	0.11 U	--	0.94 U	NE
4-Chloroaniline	EPA 8270	µg/L	9.5 U	10 U	--	--	--	--	10 U	--	--	0.11 U	--	0.94 U	2,300
4-Chloro-3-methylphenol	EPA 8270	µg/L	0.95 U	1 U	--	--	--	--	1 U	--	--	0.11 UJ	--	0.94 U	36
2-Chloronaphthalene	EPA 8270	µg/L	0.95 U	1 U	--	--	--	--	1 U	--	--	0.11 U	--	0.94 U	100
2-Chlorophenol	EPA 8270	µg/L	0.95 U	1 U	--	--	--	--	1 U	--	--	0.11 UJ	--	0.94 U	17
4-Chlorophenyl phenyl ether	EPA 8270	µg/L	0.95 U	1 U	--	--	--	--	1 U	--	--	0.11 U	--	0.94 U	NE
Decane	EPA 8270	µg/L	--	--	--	--	--	--	--	--	--	2.2 U	--	0.94 U	NE
Dibutyl phthalate	EPA 8270	µg/L	0.95 U	1 U	--	--	--	--	1 U	--	--	0.41 U	--	0.94 U	8
2,3-Dichloroaniline	EPA 8270	µg/L	0.95 U	1 U	--	--	--	--	1 U	--	--	0.11 U	--	0.94 U	NE
1,2-Dichlorobenzene (o-Dichlorobenzene)	EPA 8260	µg/L	0.2 U	0.2 U	--	--	--	--	0.2 U	--	--	0.20 U	--	0.20 U	4.6
	EPA 8270	µg/L	0.95 U	1 U	--	--	--	--	1 U	--	--	0.11 U	--	0.94 U	4.6
1,3-Dichlorobenzene (m-Dichlorobenzene)	EPA 8260	µg/L	0.2 U	0.2 U	--	--	--	--	0.2 U	--	--	0.20 U	--	0.20 U	2.0
	EPA 8270	µg/L	0.95 U	1 U	--	--	--	--	1 U	--	--	0.11 U	--	0.94 U	2.0
1,4-Dichlorobenzene (p-Dichlorobenzene)	EPA 8260	µg/L	0.2 U	0.2 U	--	--	--	--	0.2 U	--	--	0.20 U	--	0.20 U	4.9
	EPA 8270	µg/L	0.95 U	1 U	--	--	--	--	1 U	--	--	0.11 U	--	0.94 U	4.9
3,3'-Dichlorobenzidine	EPA 8270	µg/L	9.5 U	10 U	--	--	--	--	10 U	--	--	0.11 U	--	0.94 U	0.0033
2,4-Dichlorophenol	EPA 8270	µg/L	0.95 U	1 U	--	--	--	--	1 U	--	--	0.11 UJ	--	0.94 U	10
Bis(2-ethylhexyl)ester	EPA 8270	µg/L	0.95 U	1 U	--	--	--	--	1 U	--	--	0.11 U	--	0.94 U	400
Diethyl phthalate	EPA 8270	µg/L	0.98	1.2	--	--	--	--	1 U	--	--	0.52	--	0.94 U	93
Dimethyl phthalate	EPA 8270	µg/L	0.95 U	1 U	--	--	--	--	1 U	--	--	0.11 U	--	0.94 U	600
2,4-Dimethylphenol	EPA 8270	µg/L	0.95 U	1 U	--	--	--	--	1 U	--	--	0.11 UJ	--	0.94 U	6.30
1,2-Dinitrobenzene	EPA 8270	µg/L	0.95 U	1 U	--	--	--	--	1 U	--	--	0.11 U	--	0.94 U	1.6
1,3-Dinitrobenzene	EPA 8270	µg/L	0.95 U	1 U	--	--	--	--	1 U	--	--	0.11 U	--	0.94 U	1.6
1,4-Dinitrobenzene	EPA 8270	µg/L	0.95 U	1 U	--	--	--	--	1 U	--	--	0.11 U	--	0.94 U	1.6
4,6-Dinitro-2-methylphenol	EPA 8270	µg/L	4.8 U	5 U	--	--	--	--	5 U	--	--	0.54 UJ	--	0.94 U	NE
2,4-Dinitrophenol	EPA 8270	µg/L	9.5 U	10 U	--	--	--	--	10 U	--	--	1.1 UJ	--	0.94 U	100
2,4-Dinitrotoluene	EPA 8270	µg/L	0.95 U	1 U	--	--	--	--	1 U	--	--	0.27 U	--	0.94 U	0.18
2,6-Dinitrotoluene	EPA 8270	µg/L	0.95 U	1 U	--	--	--	--	1 U	--	--	0.11 U	--	0.94 U	300
Di-n-octyl phthalate	EPA 8270	µg/L	0.95 U	1 U	--	--	--	--	1 U	--	--	0.11 U	--	0.94 U	0.0039
1,2-Diphenylhydrazine	EPA 8270	µg/L	0.95 U	1 U	--	--	--	--	1 U	--	--	0.11 U	--	0.94 U	0.02
Hexachlorobenzene	EPA 8270	µg/L	0.95 U	1 U	--	--	--	--	1 U	--	--	0.11 U	--	0.94 U	0.000005
Hexachlorobutadiene	EPA 8260	µg/L	0.2 U	0.2 U	--	--	--	--	0.2 U	--	--	0.20 U	--	0.20 U	0.01
	EPA 8270	µg/L	0.95 U	1 U	--	--	--	--	1 U	--	--	0.11 U	--	0.94 U	0.01

Table D-2
Remedial Investigation Chemical Analytical Results - Groundwater COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Monitoring Well ¹	Analytical Method	Units	DP-1	MW-1	MW-1 ²	MW-1 ²	MW-1 ²	MW-1 ²	MW-2	MW-2 ²	MW-2 ²	MW-2	MW-2 ²	MW-2D	Groundwater Preliminary Cleanup Level ³ (PCUL)
Sample Date			10/29/09	11/05/09	06/10/14	09/22/14	01/23/15	04/21/15	11/05/09	06/13/14	09/22/14	01/19/15	04/21/15	06/13/14	
Monitoring Event			Oct-09	Nov-09	Jun-14	Sep-14	Jan-15	Apr-15	Nov-09	Jun-14	Sep-14	Jan-15	Apr-15	Jun-14	
Sampled By			Landau	Landau	GEI	GEI	GEI	GEI	Landau	GEI	GEI	GEI	GEI	GEI	
Hexachlorocyclopentadiene	EPA 8270	µg/L	0.95 U	1 U	--	--	--	--	1 U	--	--	0.11 U	--	0.94 U	1.00
Hexachloroethane	EPA 8270	µg/L	0.95 U	1 U	--	--	--	--	1 U	--	--	0.11 U	--	0.94 U	0.02
Isophorone	EPA 8270	µg/L	0.95 U	1 U	--	--	--	--	1 U	--	--	0.11 U	--	0.94 U	110
2-Methylphenol (o-Cresol)	EPA 8270	µg/L	0.95 U	1 U	--	--	--	--	1 U	--	--	0.11 U	--	0.94 U	27
3 & 4 Methylphenol (m & p-Cresol)	EPA 8270	µg/L	--	--	--	--	--	--	--	--	--	0.11 UJ	--	0.94 U	400
2-Nitroaniline	EPA 8270	µg/L	0.95 U	1 U	--	--	--	--	1 U	--	--	0.11 U	--	0.94 U	160
3-Nitroaniline	EPA 8270	µg/L	0.95 U	1 U	--	--	--	--	1 U	--	--	0.11 U	--	0.94 U	NE
4-Nitroaniline	EPA 8270	µg/L	0.95 U	1 U	--	--	--	--	1 U	--	--	0.11 U	--	0.94 U	NE
Nitrobenzene	EPA 8270	µg/L	0.95 U	1 U	--	--	--	--	1 U	--	--	0.11 U	--	0.94 U	100
2-Nitrophenol	EPA 8270	µg/L	0.95 U	1 U	--	--	--	--	1 U	--	--	0.11 UJ	--	0.94 U	NE
4-Nitrophenol (p-Nitrophenol)	EPA 8270	µg/L	0.95 U	1 U	--	--	--	--	1 U	--	--	0.11 U	--	0.94 U	NE
n-Nitrosodimethylamine	EPA 8270	µg/L	0.95 U	1 U	--	--	--	--	1 U	--	--	0.11 U	--	0.94 U	0.34
n-Nitrosodiphenylamine (as Diphenylamine)	EPA 8270	µg/L	9.5 U	10 U	--	--	--	--	10 U	--	--	0.11 U	--	0.94 U	0.69
n-Nitrosodi-n-propylamine	EPA 8270	µg/L	0.95 U	1 U	--	--	--	--	1 U	--	--	0.11 U	--	0.94 U	0.058
n-Octadecane	EPA 8270	µg/L	--	--	--	--	--	--	--	--	--	0.11 U	--	0.94 U	NE
Pentachlorophenol	EPA 8270	µg/L	4.8 U	5 U	--	--	--	--	5 U	--	--	0.54 UJ	--	0.94 UJ	0.002
Phenol	EPA 8270	µg/L	0.95 U	1 U	--	--	--	--	1 U	--	--	0.11 UJ	--	0.94 U	370
Pyridine	EPA 8270	µg/L	9.5 U	10 U	--	--	--	--	10 U	--	--	0.11 U	--	0.94 U	8
2,3,4,6-Tetrachlorophenol	EPA 8270	µg/L	0.95 U	1 U	--	--	--	--	1 U	--	--	0.11 UJ	--	0.94 U	480
2,3,5,6-Tetrachlorophenol	EPA 8270	µg/L	0.95 U	1 U	--	--	--	--	1 U	--	--	0.11 UJ	--	0.94 U	NE
1,2,4-Trichlorobenzene	EPA 8260	µg/L	0.2 U	0.2 U	--	--	--	--	0.2 U	--	--	0.20 U	--	0.20 U	0.037
	EPA 8270	µg/L	0.95 U	1 U	--	--	--	--	1 U	--	--	0.11 U	--	0.94 U	0.037
2,4,5-Trichlorophenol	EPA 8270	µg/L	0.95 U	1 U	--	--	--	--	1 U	--	--	0.11 UJ	--	0.94 U	600
2,4,6-Trichlorophenol	EPA 8270	µg/L	0.95 U	1 U	--	--	--	--	1 U	--	--	0.11 UJ	--	0.94 U	0.28
Volatile Organic Compounds (VOCs)															
Acetone	EPA 8260	µg/L	47	17	--	--	--	--	9.8	--	--	5.0 U	--	5.0 U	NE
Benzene	EPA 8260	µg/L	0.2 U	0.2 U	--	--	--	--	0.2 U	--	--	0.20 U	--	0.20 U	1.6
Bromobenzene	EPA 8260	µg/L	0.2 U	0.2 U	--	--	--	--	0.2 U	--	--	0.20 U	--	0.20 U	NE
Bromochloromethane	EPA 8260	µg/L	0.2 U	0.2 U	--	--	--	--	0.2 U	--	--	0.20 U	--	0.20 U	NE
Bromoform (Tribromomethane)	EPA 8260	µg/L	1 U	1 U	--	--	--	--	1 U	--	--	1.0 U	--	1.0 U	12
Bromomethane	EPA 8260	µg/L	0.2 U	0.2 U	--	--	--	--	0.2 U	--	--	0.20 U	--	0.39 UJ	13
n-Butylbenzene	EPA 8260	µg/L	0.2 U	0.2 U	--	--	--	--	0.2 U	--	--	0.20 U	--	0.20 U	400
sec-Butylbenzene	EPA 8260	µg/L	0.2 U	0.2 U	--	--	--	--	0.2 U	--	--	0.20 U	--	0.20 U	800
tert-Butylbenzene	EPA 8260	µg/L	0.2 U	0.2 U	--	--	--	--	0.2 U	--	--	0.20 U	--	0.20 U	800
Carbon disulfide	EPA 8260	µg/L	0.2 U	0.2 U	--	--	--	--	0.22	--	--	0.20 U	--	0.20 U	400
Carbon tetrachloride	EPA 8260	µg/L	0.2 U	0.2 U	--	--	--	--	0.2 U	--	--	0.20 U	--	0.20 U	0.35
Chlorobenzene	EPA 8260	µg/L	0.2 U	0.2 U	--	--	--	--	0.2 U	--	--	0.20 U	--	0.20 U	200
Chloroethane	EPA 8260	µg/L	1 U	1 U	--	--	--	--	1 U	--	--	1.0 U	--	1.0 U	19,000
2-Chloroethyl vinyl ether	EPA 8260	µg/L	1 U	1 U	--	--	--	--	1 U	--	--	3.0 U	--	1.0 U	NE
Chloroform	EPA 8260	µg/L	0.2 U	0.2 U	--	--	--	--	0.2 U	--	--	0.20 U	--	0.20 U	1.2
Chloromethane	EPA 8260	µg/L	1 U	1 U	--	--	--	--	1 U	--	--	1.0 U	--	1.0 U	150
2-Chlorotoluene	EPA 8260	µg/L	0.2 U	0.2 U	--	--	--	--	0.2 U	--	--	0.20 U	--	0.20 U	160
4-Chlorotoluene	EPA 8260	µg/L	0.2 U	0.2 U	--	--	--	--	0.2 U	--	--	0.20 U	--	0.20 U	NE

Table D-2
Remedial Investigation Chemical Analytical Results - Groundwater COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Monitoring Well ¹	Analytical Method	Units	DP-1	MW-1	MW-1 ²	MW-1 ²	MW-1 ²	MW-1 ²	MW-2	MW-2 ²	MW-2 ²	MW-2	MW-2 ²	MW-2D	Groundwater Preliminary Cleanup Level ³ (PCUL)
Sample Date			10/29/09	11/05/09	06/10/14	09/22/14	01/23/15	04/21/15	11/05/09	06/13/14	09/22/14	01/19/15	04/21/15	06/13/14	
Monitoring Event			Oct-09	Nov-09	Jun-14	Sep-14	Jan-15	Apr-15	Nov-09	Jun-14	Sep-14	Jan-15	Apr-15	Jun-14	
Sampled By			Landau	Landau	GEI	GEI	GEI	GEI	Landau	GEI	GEI	GEI	GEI	GEI	
Dibromochloromethane	EPA 8260	µg/L	0.2 U	0.2 U	--	--	--	--	0.2 U	--	--	0.20 U	--	0.20 U	2.2
1,2-Dibromo-3-chloropropane	EPA 8260	µg/L	1 U	1 U	--	--	--	--	1 U	--	--	1.0 U	--	1.0 U	0.2
Dibromomethane	EPA 8260	µg/L	0.2 U	0.2 U	--	--	--	--	0.2 U	--	--	0.20 U	--	0.20 U	80
Bromodichloromethane	EPA 8260	µg/L	0.2 U	0.2 U	--	--	--	--	0.2 U	--	--	0.20 U	--	0.20 U	1.8
Dichlorodifluoromethane (CFC-12)	EPA 8260	µg/L	0.2 U	0.2 U	--	--	--	--	0.2 U	--	--	0.20 U	--	0.20 U	5.6
1,1-Dichloroethane	EPA 8260	µg/L	0.2 U	0.2 U	--	--	--	--	0.2 U	--	--	0.20 U	--	0.20 U	11
1,2-Dichloroethane	EPA 8260	µg/L	0.2 U	0.2 U	--	--	--	--	0.2 U	--	--	0.20 U	--	0.20 U	4.2
1,1-Dichloroethene	EPA 8260	µg/L	0.02 U	0.02 U	--	--	--	--	0.02 U	--	--	0.20 U	--	0.20 U	130
cis-1,2-Dichloroethene	EPA 8260	µg/L	0.2 U	0.2 U	--	--	--	--	0.2 U	--	--	0.20 U	--	0.20 U	16
trans-1,2-Dichloroethene	EPA 8260	µg/L	0.2 U	0.2 U	--	--	--	--	0.2 U	--	--	0.20 U	--	0.20 U	1,000
1,2-Dichloropropane	EPA 8260	µg/L	0.2 U	0.2 U	--	--	--	--	0.2 U	--	--	0.20 U	--	0.20 U	3.1
1,3-Dichloropropane	EPA 8260	µg/L	0.2 U	0.2 U	--	--	--	--	0.2 U	--	--	0.20 U	--	0.20 U	NE
2,2-Dichloropropane	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	0.20 U	--	0.20 U	NE
1,1-Dichloropropene	EPA 8260	µg/L	0.2 U	0.2 U	--	--	--	--	0.2 U	--	--	0.20 U	--	0.20 U	NE
cis-1,3-Dichloropropene	EPA 8260	µg/L	0.2 U	0.2 U	--	--	--	--	0.2 U	--	--	0.20 U	--	0.20 U	2
trans-1,3-Dichloropropene	EPA 8260	µg/L	0.2 U	0.2 U	--	--	--	--	0.2 U	--	--	0.20 U	--	0.20 U	2
Ethylbenzene	EPA 8260	µg/L	0.2 U	0.2 U	--	--	--	--	0.2 U	--	--	0.20 U	--	0.20 U	31
1,2-Dibromoethane (EDB)	EPA 8260	µg/L	0.2 U	0.2 U	--	--	--	--	0.2 U	--	--	0.20 U	--	0.20 U	0.27
2-Hexanone	EPA 8260	µg/L	2 U	2 U	--	--	--	--	2 U	--	--	2.0 U	--	2.0 U	40
Isopropylbenzene (Cumene)	EPA 8260	µg/L	0.2 U	0.2 U	--	--	--	--	0.2 U	--	--	0.20 U	--	0.20 U	800
p-Isopropyltoluene	EPA 8260	µg/L	0.28	0.26	--	--	--	--	0.2 U	--	--	0.20 U	--	0.20 U	NE
2-Butanone (MEK)	EPA 8260	µg/L	5 U	5 U	--	--	--	--	5 U	--	--	5.0 U	--	5.0 U	1,700,000
Methyl iodide (Iodomethane)	EPA 8260	µg/L	1 U	1 U	--	--	--	--	1 U	--	--	1.0 U	--	2.1 UJ	NE
4-Methyl-2-pentanone (Methyl isobutyl ketone)	EPA 8260	µg/L	2 U	2 U	--	--	--	--	2 U	--	--	2.0 U	--	2.0 U	470,000
Methyl t-butyl ether (MTBE)	EPA 8260	µg/L	0.2 U	0.2 U	--	--	--	--	0.2 U	--	--	0.20 U	--	0.20 U	600
Methylene chloride	EPA 8260	µg/L	1 U	1 U	--	--	--	--	1 U	--	--	1.0 U	--	1.0 U	100
n-Propylbenzene	EPA 8260	µg/L	0.2 U	0.2 U	--	--	--	--	0.2 U	--	--	0.20 U	--	0.20 U	800
Styrene	EPA 8260	µg/L	0.2 U	0.2 U	--	--	--	--	0.2 U	--	--	0.20 U	--	0.20 U	8,200
1,1,1,2-Tetrachloroethane	EPA 8260	µg/L	0.2 U	0.2 U	--	--	--	--	0.2 U	--	--	0.20 U	--	0.20 U	7.4
1,1,2,2-Tetrachloroethane	EPA 8260	µg/L	0.2 U	0.2 U	--	--	--	--	0.2 U	--	--	0.20 U	--	0.20 U	0.3
Tetrachloroethene	EPA 8260	µg/L	0.2 U	0.2 U	--	--	--	--	0.2 U	--	--	0.20 U	--	0.20 U	2.9
Toluene	EPA 8260	µg/L	1 U	1 U	--	--	--	--	1 U	--	--	1.0 U	--	1.0 U	130
1,2,3-Trichlorobenzene	EPA 8260	µg/L	0.2 U	0.2 U	--	--	--	--	0.2 U	--	--	0.20 U	--	0.20 U	NE
1,1,1-Trichloroethane	EPA 8260	µg/L	0.2 U	0.2 U	--	--	--	--	0.2 U	--	--	0.20 U	--	0.20 U	5,500
1,1,2-Trichloroethane	EPA 8260	µg/L	0.2 U	0.2 U	--	--	--	--	0.2 U	--	--	0.20 U	--	0.20 U	0.9
Trichloroethene	EPA 8260	µg/L	0.2 U	0.2 U	--	--	--	--	0.2 U	--	--	0.20 U	--	0.20 U	0.7
Trichlorofluoromethane (CFC-11)	EPA 8260	µg/L	0.2 U	0.2 U	--	--	--	--	0.2 U	--	--	0.20 U	--	0.20 U	120
1,2,3-Trichloropropane	EPA 8260	µg/L	0.2 U	0.2 U	--	--	--	--	0.2 U	--	--	0.20 U	--	0.20 U	1,500
1,2,4-Trimethylbenzene	EPA 8260	µg/L	0.2 U	0.22	--	--	--	--	0.22	--	--	0.20 U	--	0.20 U	240
1,3,5-Trimethylbenzene	EPA 8260	µg/L	0.2 U	0.2 U	--	--	--	--	0.2 U	--	--	0.20 U	--	0.20 U	80
Vinyl acetate	EPA 8260	µg/L	2 U	2 U	--	--	--	--	2 U	--	--	1.0 U	--	1.0 UJ	7,800

Table D-2
Remedial Investigation Chemical Analytical Results - Groundwater COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Monitoring Well ¹	Analytical Method	Units	DP-1	MW-1	MW-1 ²	MW-1 ²	MW-1 ²	MW-1 ²	MW-2	MW-2 ²	MW-2 ²	MW-2	MW-2 ²	MW-2D	Groundwater Preliminary Cleanup Level ³ (PCUL)
Sample Date			10/29/09	11/05/09	06/10/14	09/22/14	01/23/15	04/21/15	11/05/09	06/13/14	09/22/14	01/19/15	04/21/15	06/13/14	
Monitoring Event			Oct-09	Nov-09	Jun-14	Sep-14	Jan-15	Apr-15	Nov-09	Jun-14	Sep-14	Jan-15	Apr-15	Jun-14	
Sampled By			Landau	Landau	GEI	GEI	GEI	GEI	Landau	GEI	GEI	GEI	GEI	GEI	
Vinyl chloride	EPA 8260	µg/L	0.02 U	0.02 U	--	--	--	--	0.02 U	--	--	0.20 U	--	0.20 U	0.18
Xylene, m-,p-	EPA 8260	µg/L	0.4 U	0.4 U	--	--	--	--	0.4 U	--	--	0.40 U	--	0.40 U	290
Xylene, o-	EPA 8260	µg/L	0.2 U	0.2 U	--	--	--	--	0.2 U	--	--	0.20 U	--	0.20 U	430
Petroleum Hydrocarbons															
Gasoline-range hydrocarbons	NWTPH-G	µg/L	100 U	100 U	--	--	--	--	--	--	--	100 U	--	--	800
Diesel-range hydrocarbons	NWTPH-Dx	µg/L	260 U	220 U	--	--	--	--	--	--	--	270	--	--	500
Oil-range hydrocarbons	NWTPH-Dx	µg/L	1,800	350 U	--	--	--	--	--	--	--	400 U	--	--	500
Total diesel- and oil-range hydrocarbons	NWTPH-Dx	µg/L	1,800	350 U	--	--	--	--	--	--	--	270	--	--	500
Diesel-range hydrocarbons	NWTPH-Dx Si/Gel	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	500
Oil-range hydrocarbons	NWTPH-Dx Si/Gel	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	500
Total diesel- and oil-range hydrocarbons	NWTPH-Dx Si/Gel	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	500
Conventional Parameters															
Total organic carbon (TOC)	SM 5310B	mg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
Field Measured Parameters															
pH	N/A	N/A	--	8.06	--	--	--	--	6.55	--	--	6.54	--	5.49	NE

Notes:

¹ Monitoring well locations are shown on Figures 3-2 and 3-4.

² Insufficient water to collect groundwater sample for chemical analysis.

³ Groundwater screening levels referenced from Table 4-2.

⁴ Total dioxin/furan Toxic Equivalency Quotients (TEQs) were calculated using United States Environmental Protection Agency (USEPA) Toxicity Equivalency Factor (TEF) values for human health (EPA 2003).

⁵ Total carcinogenic PAH (cPAH) TEQs were calculated using TEF values referenced from MTCA Table 708.2 (WAC 173-340-900).

mg/L = milligram per liter

µg/L = microgram per liter

NE = not established

Landau = Landau Associates

GEI = GeoEngineers

NE = not established

J = estimated result

U = analyte not detected above the reporting limit

-- = not analyzed

COPC = Contaminant of Potential Concern

Bold indicates analyte was detected.

Yellow shading identifies the detected results greater than the preliminary cleanup level.

Blue shading identifies the non-detected result greater than the preliminary cleanup level.

Table D-2
Remedial Investigation Chemical Analytical Results - Groundwater COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Monitoring Well ¹	Analytical Method	Units	MW-2D	MW-2D	MW-2D	MW-3	MW-3	MW-3 ²	MW-3	MW-3	MW-3	MW-3	MW-4	MW-4	Groundwater Preliminary Cleanup Level ³ (PCUL)
Sample Date			09/22/14	01/19/15	04/21/15	11/6/2009	06/11/14	09/25/14	01/19/15	04/22/15	03/17/17	11/5/2009	06/11/14	09/25/14	
Monitoring Event			Sep-14	Jan-15	Apr-15	Nov-09	Jun-14	Sep-14	Jan-15	Apr-15	Mar-17	Nov-09	Jun-14	Sep-14	
Sampled By			GEI	GEI	GEI	Landau	GEI	GEI	GEI	GEI	Ecology	Landau	GEI	GEI	
Polychlorinated Biphenyls (PCBs)															
PCB-Aroclor 1016	EPA 8082	µg/L	--	--	--	--	--	--	--	--	n/a	--	--	--	NE
PCB-Aroclor 1221	EPA 8082	µg/L	--	--	--	--	--	--	--	--	n/a	--	--	--	NE
PCB-Aroclor 1232	EPA 8082	µg/L	--	--	--	--	--	--	--	--	n/a	--	--	--	NE
PCB-Aroclor 1242	EPA 8082	µg/L	--	--	--	--	--	--	--	--	n/a	--	--	--	NE
PCB-Aroclor 1248	EPA 8082	µg/L	--	--	--	--	--	--	--	--	n/a	--	--	--	NE
PCB-Aroclor 1254	EPA 8082	µg/L	--	--	--	--	--	--	--	--	n/a	--	--	--	NE
PCB-Aroclor 1260	EPA 8082	µg/L	--	--	--	--	--	--	--	--	n/a	--	--	--	NE
Total PCB Aroclors	EPA 8082	µg/L	--	--	--	--	--	--	--	--	0.010 U	--	--	--	0.000007
Total PCB Congeners	EPA 1668	µg/L	--	--	--	--	--	--	--	--	0.0012 J	--	--	--	0.000007
Dioxins and Furans															
1,2,3,4,6,7,8-HpCDD	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,4,6,7,8-HpCDF	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,4,7,8,9-HpCDF	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,4,7,8-HxCDD	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,4,7,8-HxCDF	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,6,7,8-HxCDD	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,6,7,8-HxCDF	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,7,8,9-HxCDD	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,7,8,9-HxCDF	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,7,8-PeCDD	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,7,8-PeCDF	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
2,3,4,6,7,8-HxCDF	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
2,3,4,7,8-PeCDF	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
2,3,7,8-TCDD	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
2,3,7,8-TCDF	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
OCDD	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
OCDF	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
Total Dioxin/Furan TEQ ⁴ (ND=0)	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	0.0000000051
Total Dioxin/Furan TEQ ⁴ (ND=0.5RL)	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	0.0000000051
Total Metals															
Antimony	EPA 200.8/7470	µg/L	5.4 U	5.4 U	5.6 U	1 U	5.5 U	--	5.5 U	5.4 U	--	38	27	27	90
Arsenic	EPA 200.8/7470	µg/L	3.3 U	3.3 U	3.3 U	11	32	--	43	20	--	1,900	1,400	1,700	8.0
Barium	EPA 200.8/7470	µg/L	77	76	62	--	530	--	640	280	--	--	320	340	200
Beryllium	EPA 200.8/7470	µg/L	10 U	10 U	10 U	11 U	10 U	--	10 U	10 U	--	11 U	10 U	10 U	4.4
Cadmium	EPA 200.8/7470	µg/L	0.20 U	0.20 U	0.20 U	11 U	0.20 U	--	0.20 U	0.20 U	--	7.3	4.7	5.1	1.2
Chromium III / Total	EPA 200.8/7470	µg/L	3.2	2.0 U	2.0 U	8.2	4.1	--	5.4	2.5 J	--	1,100	1,000	1,200	27
Chromium VI	EPA 200.8/7470	µg/L	--	--	--	10 U	--	--	--	--	--	50 U	--	--	50
Copper	EPA 200.8/7470	µg/L	2.0 U	2.0 U	2.0 U	5.7	2.0 U	--	2.0 U	3.6	--	310	230	250	3.1
Lead	EPA 200.8/7470	µg/L	1.0 U	1.0 U	1.0 U	5.5	1.0 U	--	2.9	1.2	--	460	400	480	8.1
Mercury	EPA 200.8/7470	µg/L	0.50 U	0.50 U	0.50 U	0.1 U	2.5 U	--	0.50 U	0.50 U	--	0.94	0.49	0.87	0.025
Nickel	EPA 200.8/7470	µg/L	3.9	2.7	3.3	26	19	--	21	6.5	--	500	390	400	8.2

Table D-2
Remedial Investigation Chemical Analytical Results - Groundwater COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Monitoring Well ¹	Analytical Method	Units	MW-2D	MW-2D	MW-2D	MW-3	MW-3	MW-3 ²	MW-3	MW-3	MW-3	MW-4	MW-4	MW-4	Groundwater Preliminary Cleanup Level ³ (PCUL)
Sample Date			09/22/14	01/19/15	04/21/15	11/6/2009	06/11/14	09/25/14	01/19/15	04/22/15	03/17/17	11/5/2009	06/11/14	09/25/14	
Monitoring Event			Sep-14	Jan-15	Apr-15	Nov-09	Jun-14	Sep-14	Jan-15	Apr-15	Mar-17	Nov-09	Jun-14	Sep-14	
Sampled By			GEI	GEI	GEI	Landau	GEI	GEI	GEI	GEI	Ecology	Landau	GEI	GEI	
Selenium	EPA 200.8/7470	µg/L	6.0 U	6.0 U	5.4 U	10 U	10 U	--	6.0 U	6.0 U	--	33 U	30 U	40 U	71
Silver	EPA 200.8/7470	µg/L	1.0 U	1.0 U	1.0 U	11 U	1.0 U	--	1.0 U	1.0 U	--	11 U	5	4.5	1.9
Thallium	EPA 200.8/7470	µg/L	2.0 U	2.0 U	2.0 U	5.6 U	2.0 U	--	2.0 U	2.0 U	--	5.6 U	2.0 U	2.0 U	0.062
Tin	EPA 200.8/7470	µg/L	5.0 U	5.0 U	5.0 U	32	5.0 U	--	13	5.0 U	--	390	390	460	9,600
Zinc	EPA 200.8/7470	µg/L	56 U	56 U	56 U	40	56 U	--	55 U	140	--	760	410	540	81
Dissolved Metals															
Antimony	EPA 200.8/7470	µg/L	5.5 U	5.5 U	5.5 U	1 U	5.5 U	--	5.5 U	5.5 U	--	13	25	30	90
Arsenic	EPA 200.8/7470	µg/L	1.6	3.3 U	3.3 U	15	29	--	25	27	--	1,400	1,600	1,700 J	8.0
Barium	EPA 200.8/7470	µg/L	71	70	70	--	510	--	520	270	--	--	350	350	200
Beryllium	EPA 200.8/7470	µg/L	10 U	10 U	10 U	10 U	10 U	--	10 U	10 U	--	10 U	10 U	10 U	4.4
Cadmium	EPA 200.8/7470	µg/L	0.20 U	0.20 U	0.20 U	4 U	0.20 U	--	0.20 U	0.20 U	--	4.2	4.4	5.8	1.2
Chromium III / Total	EPA 200.8/7470	µg/L	2.0 U	2.0 U	2.0 U	11	3.6	--	4	2.6	--	520	1,100	1,200	27
Copper	EPA 200.8/7470	µg/L	2.0 U	2.0 U	2.0 U	1.7	2.0 U	--	2.0 U	2.0 U	--	120	210	250	3.1
Lead	EPA 200.8/7470	µg/L	1.0 U	1.0 U	1.0 U	1 U	1.0 U	--	1.0 U	1.0 U	--	470	410	490	8.1
Mercury	EPA 200.8/7470	µg/L	0.50 U	0.50 U	0.50 U	0.1 U	0.50 U	--	0.50 U	0.50 U	--	0.79	0.66	1	0.025
Nickel	EPA 200.8/7470	µg/L	2.8	2.4	2.0 U	26	18	--	22	6.8	--	410	420	410	8.2
Selenium	EPA 200.8/7470	µg/L	6.0 U	6.0 U	6.0 U	11 U	10 U	--	6.0 U	6.3 U	--	20 U	35 U	40 U	71
Silver	EPA 200.8/7470	µg/L	1.0 U	2.5 U	1.0 U	10 U	1.0 U	--	1.0 U	1.0 U	--	10 U	5.2	5.4	1.9
Thallium	EPA 200.8/7470	µg/L	2.0 U	2.0 U	2.0 U	5 U	2.0 U	--	2.0 U	2.0 U	--	5 U	2.0 U	2.0 U	0.062
Tin	EPA 200.8/7470	µg/L	5.0 U	5.0 U	5.0 U	10 U	5.0 U	--	5.0 U	5.0 U	--	57	410	470	9,600
Zinc	EPA 200.8/7470	µg/L	56 U	56 U	56 U	39	56 U	--	55 U	150	--	460	420	570	81
Semi-Volatile Organic Compounds (SVOCs) - Polycyclic Aromatic Hydrocarbons (PAHs)															
Acenaphthene	EPA 8270/SIM	µg/L	0.10 U	0.10 U	0.10 U	10 U	0.48 U	--	0.47 U	0.97 U	--	10 U	2.0 U	0.48 U	5.3
Acenaphthylene	EPA 8270/SIM	µg/L	0.10 U	0.10 U	0.10 U	10 U	0.48 U	--	0.47 U	0.97 U	--	10 U	2.0 U	0.48 U	NE
Anthracene	EPA 8270/SIM	µg/L	0.10 U	0.10 U	0.10 U	10 U	0.48 U	--	0.47 U	0.97 U	--	10 U	2.0 U	0.48 U	2.1
Benzo(a)anthracene	EPA 8270/SIM	µg/L	0.010 U	0.012	0.010 U	1.3	0.077	--	0.047 U	0.049 U	--	1 U	0.47	0.14	0.00016
Benzo(b)fluoranthene	EPA 8270/SIM	µg/L	0.010 U	0.010 U	0.010 U	2.1	0.048 U	--	0.047 U	0.049 U	--	1 U	0.20 U	0.13	0.00016
Benzo(j,k)fluoranthene	EPA 8270/SIM	µg/L	0.010 U	0.010 U	0.010 U	1 U	0.048 U	--	0.047 U	0.049 U	--	1 U	0.20 U	0.13	0.0016
Benzo(g,h,i)perylene	EPA 8270/SIM	µg/L	0.010 U	0.010 U	0.010 U	1 U	0.048 U	--	0.047 U	0.049 U	--	1 U	0.20 U	0.066	NE
Benzo(a)pyrene	EPA 8270/SIM	µg/L	0.010 U	0.010 U	0.010 U	1 U	0.048 U	--	0.047 U	0.049 U	--	1 U	0.20 U	0.086	0.000016
Chrysene	EPA 8270/SIM	µg/L	0.010 U	0.010 U	0.010 U	1 U	0.048 U	--	0.047 U	0.049 U	--	1 U	0.52	0.31	0.016
Dibenzo(a,h)anthracene	EPA 8270/SIM	µg/L	0.010 U	0.010 U	0.010 U	1 U	0.048 U	--	0.047 U	0.049 U	--	1 U	0.20 U	0.048 U	0.000016
Dibenzofuran	EPA 8270/SIM	µg/L	0.10 U	0.10 U	0.10 U	100 U	0.96 U	--	0.93 U	0.97 U	--	100 U	4.0 U	0.96 U	16
Fluoranthene	EPA 8270/SIM	µg/L	0.10 U	0.050 U	0.10 U	10 U	0.48 U	--	0.47 U	0.97 U	--	10 U	2.0 U	0.48 U	1.8
Fluorene	EPA 8270/SIM	µg/L	0.10 U	0.10 U	0.10 U	11	0.48 U	--	0.47 U	0.97 U	--	10 U	2.0 U	0.48 U	3.7
Indeno(1,2,3-c,d)pyrene	EPA 8270/SIM	µg/L	0.010 U	0.010 U	0.010 U	1 U	0.048 U	--	0.047 U	0.049 U	--	1 U	0.20 U	0.048	0.00016
1-Methylnaphthalene	EPA 8270/SIM	µg/L	0.10 U	0.10 U	0.10 U	10 U	0.48 U	--	0.47 U	0.97 U	--	10 U	2.0 U	0.48 U	1.5
2-Methylnaphthalene	EPA 8270/SIM	µg/L	0.10 U	0.10 U	0.10 U	13	0.48 U	--	0.47 U	0.97 U	--	10 U	2.0 U	0.48	32
Naphthalene	EPA 8270/SIM	µg/L	0.10 U	0.10 U	0.10 U	17	0.48 U	--	0.47 U	0.97 U	--	10 U	2.0 U	0.64	1.4
Phenanthrene	EPA 8270/SIM	µg/L	0.10 U	0.10 U	0.10 U	10 U	0.48 U	--	0.47 U	0.97 U	--	10 U	2.0 U	0.94	NE
Pyrene	EPA 8270/SIM	µg/L	0.10 U	0.10 U	0.10 U	10 U	0.48 U	--	0.48	0.49 U	--	10 U	2.0 U	0.48 U	2
Total cPAH TEQ ⁵ (ND=0)	EPA 8270/SIM	µg/L	0 U	0.0012	0 U	0.3400	0.0077	--	0 U	0 U	--	0 U	0.0522	0.1339	0.000016
Total cPAH TEQ ⁵ (ND=0.5RL)	EPA 8270/SIM	µg/L	0.0076 U	0.0083	0.0076 U	0.9950	0.0420	--	0.0355 U	0.037 U	--	0.755 U	0.1900	0.1400	0.000016

Table D-2
Remedial Investigation Chemical Analytical Results - Groundwater COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Monitoring Well ¹	Analytical Method	Units	MW-2D	MW-2D	MW-2D	MW-3	MW-3	MW-3 ²	MW-3	MW-3	MW-3	MW-3	MW-4	MW-4	MW-4	Groundwater Preliminary Cleanup Level ³ (PCUL)
Sample Date			09/22/14	01/19/15	04/21/15	11/6/2009	06/11/14	09/25/14	01/19/15	04/22/15	03/17/17	11/5/2009	06/11/14	09/25/14		
Monitoring Event			Sep-14	Jan-15	Apr-15	Nov-09	Jun-14	Sep-14	Jan-15	Apr-15	Mar-17	Nov-09	Jun-14	Sep-14		
Sampled By			GEI	GEI	GEI	Landau	GEI	GEI	GEI	GEI	Ecology	Landau	GEI	GEI		
Other SVOCs (mg/kg)																
Aniline	EPA 8270	µg/L	0.10 U	0.10 U	0.10 U	500 U	0.96 U	--	0.93 U	0.97 U	--	500 U	4.0 U	0.96 U	7.7	
Benzidine	EPA 8270	µg/L	0.10 U	0.10 U	0.10 U	1000 U	0.96 U	--	0.93 U	0.97 U	--	1000 U	4.0 U	0.96 U	0.000023	
Benzoic acid	EPA 8270	µg/L	0.50 U	0.50 U	0.50 U	--	0.96 U	--	4.7 U	0.97 U	--	--	4.0 U	0.96 U	590	
Benzyl alcohol	EPA 8270	µg/L	0.25 U	0.10 U	0.10 U	100 U	0.96 U	--	0.93 U	0.97 U	--	100 U	4.0 U	0.96 U	800	
Bis(2-chloroethoxy)methane	EPA 8270	µg/L	0.10 U	0.10 U	0.10 U	100 U	0.96 U	--	0.93 U	0.97 U	--	100 U	4.0 U	0.96 U	NE	
Bis(2-chloroethyl)ether	EPA 8270	µg/L	0.10 U	0.10 U	0.10 U	100 U	0.96 U	--	0.93 U	0.97 U	--	100 U	4.0 U	0.96 U	0.06	
Bis(2-chloroisopropyl)ether	EPA 8270	µg/L	0.10 U	0.10 U	0.10 U	100 U	0.96 U	--	0.93 U	0.97 U	--	100 U	4.0 U	0.96 U	900	
Bis(2-ethylhexyl)phthalate	EPA 8270	µg/L	0.26 U	0.72 U	0.57 U	100 U	0.96 U	--	2.5 U	0.97 U	--	100 U	4.0 U	0.96 U	0.046	
4-Bromophenyl phenyl ether	EPA 8270	µg/L	0.10 U	0.10 U	0.10 U	100 U	0.96 U	--	0.93 U	0.97 U	--	100 U	4.0 U	0.96 U	NE	
Butyl benzyl phthalate	EPA 8270	µg/L	0.10 U	0.10 U	0.10 U	100 U	0.96 U	--	0.93 U	0.97 U	--	100 U	4.0 U	0.96 U	0.013	
Carbazole	EPA 8270	µg/L	0.10 U	0.10 U	0.10 U	100 U	0.96 U	--	0.93 U	0.97 U	--	100 U	4.0 U	0.96 U	NE	
4-Chloroaniline	EPA 8270	µg/L	0.10 U	0.10 U	0.10 U	1000 U	0.96 U	--	0.93 U	0.97 U	--	1000 U	4.0 U	0.96 U	2,300	
4-Chloro-3-methylphenol	EPA 8270	µg/L	0.10 U	0.10 U	0.10 U	100 U	0.96 U	--	0.93 U	0.97 U	--	100 U	4.0 U	0.96 U	36	
2-Chloronaphthalene	EPA 8270	µg/L	0.10 U	0.10 U	0.10 U	100 U	0.96 U	--	0.93 U	0.97 U	--	100 U	4.0 U	0.96 U	100	
2-Chlorophenol	EPA 8270	µg/L	0.10 U	0.10 U	0.10 U	100 U	0.96 U	--	0.93 U	0.97 U	--	100 U	4.0 U	2.6	17	
4-Chlorophenyl phenyl ether	EPA 8270	µg/L	0.10 U	0.10 U	0.10 U	100 U	0.96 U	--	0.93 U	0.97 U	--	100 U	4.0 U	0.96 U	NE	
Decane	EPA 8270	µg/L	2.0 U	2.0 U	2.0 U	--	0.96 U	--	19 U	0.97 U	--	--	4.0 U	0.96 U	NE	
Dibutyl phthalate	EPA 8270	µg/L	0.28	0.57 U	1.5 U	100 U	0.96 U	--	4.0 U	0.97 U	--	100 U	4.0 U	1.1	8	
2,3-Dichloroaniline	EPA 8270	µg/L	0.10 U	0.10 U	0.10 U	100 U	0.96 U	--	0.93 U	0.97 U	--	100 U	4.0 U	0.96 U	NE	
1,2-Dichlorobenzene (o-Dichlorobenzene)	EPA 8260	µg/L	0.20 U	0.20 U	0.20 U	0.2 U	2.0 UJ	--	2.0 U	2.0 U	--	0.4 U	4.0 UJ	4.0 U	4.6	
	EPA 8270	µg/L	0.10 U	0.10 U	0.10 U	100 U	0.96 U	--	0.93 U	0.97 U	--	100 U	4.0 U	0.96 U	4.6	
1,3-Dichlorobenzene (m-Dichlorobenzene)	EPA 8260	µg/L	0.20 U	0.20 U	0.20 U	0.2 U	2.0 UJ	--	2.0 U	2.0 U	--	0.4 U	4.0 UJ	4.0 U	2.0	
	EPA 8270	µg/L	0.10 U	0.10 U	0.10 U	100 U	0.96 U	--	0.93 U	0.97 U	--	100 U	4.0 U	0.96 U	2.0	
1,4-Dichlorobenzene (p-Dichlorobenzene)	EPA 8260	µg/L	0.20 U	0.20 U	0.20 U	0.2 U	2.0 UJ	--	2.0 U	2.0 U	--	0.4 U	4.0 UJ	4.0 U	4.9	
	EPA 8270	µg/L	0.10 U	0.10 U	0.10 U	100 U	0.96 U	--	0.93 U	0.97 U	--	100 U	4.0 U	0.96 U	4.9	
3,3'-Dichlorobenzidine	EPA 8270	µg/L	0.10 U	0.10 U	0.10 U	1000 U	0.96 U	--	0.93 U	0.97 U	--	1000 U	4.0 U	0.96 U	0.0033	
2,4-Dichlorophenol	EPA 8270	µg/L	0.10 U	0.10 U	0.10 U	100 U	0.96 U	--	0.93 U	0.97 U	--	100 U	4.0 U	0.96 U	10	
Bis(2-ethylhexyl)ester	EPA 8270	µg/L	0.10 U	0.10 U	0.10 U	100 U	0.96 U	--	0.93 U	0.97 U	--	100 U	4.0 U	0.96 U	400	
Diethyl phthalate	EPA 8270	µg/L	0.10 U	0.12	0.10 U	190	0.96 U	--	0.93 U	0.97 U	--	100 U	4.0 U	0.96 U	93	
Dimethyl phthalate	EPA 8270	µg/L	0.10 U	0.10 U	0.10 U	100 U	0.96 U	--	0.93 U	0.97 U	--	100 U	4.0 U	0.96 U	600	
2,4-Dimethylphenol	EPA 8270	µg/L	0.10 U	0.10 U	0.10 U	100 U	0.96 U	--	0.93 U	0.97 U	--	100 U	9.1	0.96 U	6.30	
1,2-Dinitrobenzene	EPA 8270	µg/L	0.10 U	0.10 U	0.10 U	100 U	0.96 U	--	0.93 U	0.97 U	--	100 U	4.0 U	0.96 U	1.6	
1,3-Dinitrobenzene	EPA 8270	µg/L	0.10 U	0.10 U	0.10 U	100 U	0.96 U	--	0.93 U	0.97 U	--	100 U	4.0 U	0.96 U	1.6	
1,4-Dinitrobenzene	EPA 8270	µg/L	0.10 U	0.10 U	0.10 U	100 U	0.96 U	--	0.93 U	0.97 U	--	100 U	4.0 U	0.96 U	1.6	
4,6-Dinitro-2-methylphenol	EPA 8270	µg/L	0.50 U	0.50 U	0.50 U	500 U	0.96 U	--	4.7 U	0.97 U	--	500 U	4.0 U	0.96 U	NE	
2,4-Dinitrophenol	EPA 8270	µg/L	1.0 U	1.0 U	1.0 U	1000 U	3.6	--	9.3 U	0.97 U	--	1000 U	4.0 U	0.96 U	100	
2,4-Dinitrotoluene	EPA 8270	µg/L	0.10 U	0.25 U	0.10 U	100 U	0.96 U	--	2.3 U	0.97 U	--	100 U	4.0 U	0.96 U	0.18	
2,6-Dinitrotoluene	EPA 8270	µg/L	0.10 U	0.10 U	0.10 U	100 U	0.96 U	--	0.93 U	0.97 U	--	100 U	4.0 U	0.96 U	300	
Di-n-octyl phthalate	EPA 8270	µg/L	0.10 U	0.10 U	0.10 U	100 U	0.96 U	--	0.93 U	0.97 U	--	100 U	4.0 U	0.96 U	0.0039	
1,2-Diphenylhydrazine	EPA 8270	µg/L	0.10 U	0.10 U	0.10 U	100 U	0.96 U	--	0.93 U	0.97 U	--	100 U	4.0 U	0.96 U	0.02	
Hexachlorobenzene	EPA 8270	µg/L	0.10 U	0.10 U	0.10 U	100 U	0.96 U	--	0.93 U	0.97 U	--	100 U	4.0 U	0.96 U	0.000005	
Hexachlorobutadiene	EPA 8260	µg/L	0.20 U	0.20 U	0.20 U	0.2 U	2.0 UJ	--	2.0 U	2.0 U	--	0.4 U	4.0 UJ	4.0 U	0.01	
	EPA 8270	µg/L	0.10 U	0.10 U	0.10 U	100 U	0.96 U	--	0.93 U	0.97 U	--	100 U	4.0 U	0.96 U	0.01	

Table D-2
Remedial Investigation Chemical Analytical Results - Groundwater COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Monitoring Well ¹	Analytical Method	Units	MW-2D	MW-2D	MW-2D	MW-3	MW-3	MW-3 ²	MW-3	MW-3	MW-3	MW-4	MW-4	MW-4	Groundwater Preliminary Cleanup Level ³ (PCUL)
Sample Date			09/22/14	01/19/15	04/21/15	11/6/2009	06/11/14	09/25/14	01/19/15	04/22/15	03/17/17	11/5/2009	06/11/14	09/25/14	
Monitoring Event			Sep-14	Jan-15	Apr-15	Nov-09	Jun-14	Sep-14	Jan-15	Apr-15	Mar-17	Nov-09	Jun-14	Sep-14	
Sampled By			GEI	GEI	GEI	Landau	GEI	GEI	GEI	GEI	Ecology	Landau	GEI	GEI	
Hexachlorocyclopentadiene	EPA 8270	µg/L	0.10 U	0.10 U	0.10 U	100 U	0.96 U	--	0.93 U	0.97 U	--	100 U	4.0 U	0.96 U	1.00
Hexachloroethane	EPA 8270	µg/L	0.10 U	0.10 U	0.10 U	100 U	0.96 U	--	0.93 U	0.97 U	--	100 U	4.0 U	0.96 U	0.02
Isophorone	EPA 8270	µg/L	0.10 U	0.10 U	0.10 U	100 U	0.96 U	--	0.93 U	0.97 U	--	100 U	4.0 U	0.96 U	110
2-Methylphenol (o-Cresol)	EPA 8270	µg/L	0.10 U	0.10 U	0.10 U	100 U	0.96 U	--	0.93 U	0.97 U	--	120	77	96	27
3 & 4 Methylphenol (m & p-Cresol)	EPA 8270	µg/L	0.10 U	0.10 U	0.10 U	--	0.96 U	--	0.93 U	0.97 U	--	--	430	410	400
2-Nitroaniline	EPA 8270	µg/L	0.10 U	0.10 U	0.10 U	100 U	0.96 U	--	0.93 U	0.97 U	--	100 U	4.0 U	0.96 U	160
3-Nitroaniline	EPA 8270	µg/L	0.10 U	0.10 U	0.10 U	100 U	0.96 U	--	0.93 U	0.97 U	--	100 U	4.0 U	0.96 U	NE
4-Nitroaniline	EPA 8270	µg/L	0.10 U	0.10 U	0.10 U	100 U	0.96 U	--	0.93 U	0.97 U	--	100 U	4.0 U	0.96 U	NE
Nitrobenzene	EPA 8270	µg/L	0.10 U	0.10 U	0.10 U	100 U	0.96 U	--	0.93 U	0.97 U	--	100 U	4.0 U	0.96 U	100
2-Nitrophenol	EPA 8270	µg/L	0.10 U	0.10 U	0.10 U	100 U	0.96 U	--	0.93 U	0.97 U	--	100 U	4.0 U	0.96 U	NE
4-Nitrophenol (p-Nitrophenol)	EPA 8270	µg/L	0.10 U	0.10 U	0.10 U	100 U	0.96 U	--	0.93 U	0.97 U	--	100 U	4.0 U	0.96 U	NE
n-Nitrosodimethylamine	EPA 8270	µg/L	0.10 U	0.10 U	0.10 U	100 U	0.96 U	--	0.93 U	0.97 U	--	100 U	4.0 U	0.96 U	0.34
n-Nitrosodiphenylamine (as Diphenylamine)	EPA 8270	µg/L	0.10 U	0.10 U	0.10 U	1000 U	0.96 U	--	0.93 U	0.97 U	--	1000 U	4.0 U	0.96 U	0.69
n-Nitrosodi-n-propylamine	EPA 8270	µg/L	0.10 U	0.10 UJ	0.1	100 U	0.96 U	--	0.93 U	0.97 U	--	100 U	4.0 U	0.96 U	0.058
n-Octadecane	EPA 8270	µg/L	0.10 U	0.10 U	0.10 U	--	0.96 U	--	0.93 U	0.97 U	--	--	4.0 U	0.96 U	NE
Pentachlorophenol	EPA 8270	µg/L	0.50 U	0.50 U	0.50 U	500 U	0.96 U	--	4.7 U	0.97 U	--	500 U	4.0 U	0.96 U	0.002
Phenol	EPA 8270	µg/L	0.10 U	0.10 U	0.10 U	100 U	0.96 U	--	0.93 U	0.97 U	--	120	4.0 U	0.96 U	370
Pyridine	EPA 8270	µg/L	0.10 U	0.10 U	0.10 U	1000 U	0.96 U	--	0.93 U	0.97 U	--	1000 U	4.0 U	0.96 U	8
2,3,4,6-Tetrachlorophenol	EPA 8270	µg/L	0.10 U	0.10 U	0.10 U	100 U	0.96 U	--	0.93 U	0.97 U	--	100 U	4.0 U	0.96 U	480
2,3,5,6-Tetrachlorophenol	EPA 8270	µg/L	0.10 U	0.10 U	0.10 U	100 U	0.96 U	--	0.93 U	0.97 U	--	100 U	4.0 U	0.96 U	NE
1,2,4-Trichlorobenzene	EPA 8260	µg/L	0.20 U	0.20 U	0.20 U	0.2 U	2.0 UJ	--	2.0 U	2.0 U	--	0.4 U	4.0 UJ	6.0 UJ	0.037
	EPA 8270	µg/L	0.10 U	0.10 U	0.10 U	100 U	0.96 U	--	0.93 U	0.97 U	--	100 U	4.0 U	0.96 U	0.037
2,4,5-Trichlorophenol	EPA 8270	µg/L	0.10 U	0.10 U	0.10 U	100 U	0.96 U	--	0.93 U	0.97 U	--	100 U	4.0 U	0.96 U	600
2,4,6-Trichlorophenol	EPA 8270	µg/L	0.10 U	0.10 U	0.10 U	100 U	0.96 U	--	0.93 U	0.97 U	--	100 U	4.0 U	0.96 U	0.28
Volatile Organic Compounds (VOCs)															
Acetone	EPA 8260	µg/L	5.0 U	5.0 U	5.0 U	18	50 UJ	--	50 U	50 U	--	2,400	740 J	880	NE
Benzene	EPA 8260	µg/L	0.20 U	0.20 U	0.20 U	0.2 U	2.0 UJ	--	2.0 U	2.0 U	--	1.7	4.0 UJ	4.0 U	1.6
Bromobenzene	EPA 8260	µg/L	0.20 U	0.20 U	0.20 U	0.2 U	2.0 UJ	--	2.0 U	2.0 U	--	0.4 U	4.0 UJ	4.0 U	NE
Bromochloromethane	EPA 8260	µg/L	0.20 U	0.20 U	0.20 U	0.2 U	2.0 UJ	--	2.0 U	2.0 U	--	0.4 U	4.0 UJ	4.0 U	NE
Bromoform (Tribromomethane)	EPA 8260	µg/L	1.0 U	1.0 U	1.0 U	1 U	10 UJ	--	10 U	10 U	--	2 U	20 UJ	20 U	12
Bromomethane	EPA 8260	µg/L	0.20 U	0.20 U	0.20 U	0.2 U	5.1 UJ	--	2.0 U	2.0 U	--	0.4 U	10 UJ	11 UJ	13
n-Butylbenzene	EPA 8260	µg/L	0.20 U	0.20 U	0.20 U	0.2 U	2.0 UJ	--	2.0 U	2.0 U	--	0.4 U	4.0 UJ	4.0 U	400
sec-Butylbenzene	EPA 8260	µg/L	0.20 U	0.20 U	0.20 U	0.2 U	2.0 UJ	--	2.0 U	2.0 U	--	0.4 U	4.0 UJ	4.0 U	800
tert-Butylbenzene	EPA 8260	µg/L	0.20 U	0.20 U	0.20 U	0.2 U	2.0 UJ	--	2.0 U	2.0 U	--	0.4 U	4.0 UJ	4.0 U	800
Carbon disulfide	EPA 8260	µg/L	0.20 U	0.20 U	0.20 U	0.2 U	2.0 UJ	--	2.0 U	2.0 U	--	0.4 U	4.0 UJ	4.0 U	400
Carbon tetrachloride	EPA 8260	µg/L	0.20 U	0.20 U	0.20 U	0.2 U	2.0 UJ	--	2.0 U	2.0 U	--	0.4 U	4.0 UJ	4.0 U	0.35
Chlorobenzene	EPA 8260	µg/L	0.20 U	0.20 U	0.20 U	0.2 U	2.0 UJ	--	2.0 U	2.0 U	--	0.4 U	4.0 UJ	4.0 U	200
Chloroethane	EPA 8260	µg/L	1.0 U	1.0 U	1.0 U	1 U	10 UJ	--	10 U	10 U	--	2 U	20 UJ	20 U	19,000
2-Chloroethyl vinyl ether	EPA 8260	µg/L	1.0 UJ	3.0 U	1.0 U	1 U	10 UJ	--	30 U	10 U	--	2 U	20 UJ	28 UJ	NE
Chloroform	EPA 8260	µg/L	0.20 U	0.20 U	0.20 U	0.2 U	2.0 UJ	--	2.0 U	2.0 U	--	0.4 U	4.0 UJ	4.0 U	1.2
Chloromethane	EPA 8260	µg/L	1.0 U	1.0 U	1.0 U	1 U	10 UJ	--	10 U	10 U	--	2 U	20 UJ	20 U	150
2-Chlorotoluene	EPA 8260	µg/L	0.20 U	0.20 U	0.20 U	0.2 U	2.0 UJ	--	2.0 U	2.0 U	--	0.4 U	4.0 UJ	4.0 U	160
4-Chlorotoluene	EPA 8260	µg/L	0.20 U	0.20 U	0.20 U	0.2 U	2.0 UJ	--	2.0 U	2.0 U	--	0.4 U	4.0 UJ	4.0 U	NE

Table D-2
Remedial Investigation Chemical Analytical Results - Groundwater COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Monitoring Well ¹	Analytical Method	Units	MW-2D	MW-2D	MW-2D	MW-3	MW-3	MW-3 ²	MW-3	MW-3	MW-3	MW-4	MW-4	MW-4	Groundwater Preliminary Cleanup Level ³ (PCUL)
Sample Date			09/22/14	01/19/15	04/21/15	11/6/2009	06/11/14	09/25/14	01/19/15	04/22/15	03/17/17	11/5/2009	06/11/14	09/25/14	
Monitoring Event			Sep-14	Jan-15	Apr-15	Nov-09	Jun-14	Sep-14	Jan-15	Apr-15	Mar-17	Nov-09	Jun-14	Sep-14	
Sampled By			GEI	GEI	GEI	Landau	GEI	GEI	GEI	GEI	Ecology	Landau	GEI	GEI	
Dibromochloromethane	EPA 8260	µg/L	0.20 U	0.20 U	0.20 U	0.2 U	2.0 UJ	--	2.0 U	2.0 U	--	0.4 U	4.0 UJ	4.0 U	2.2
1,2-Dibromo-3-chloropropane	EPA 8260	µg/L	1.0 U	1.0 U	1.0 U	1 U	10 UJ	--	10 U	10 U	--	2 U	20 UJ	20 U	0.2
Dibromomethane	EPA 8260	µg/L	0.20 U	0.20 U	0.20 U	0.2 U	2.0 UJ	--	2.0 U	2.0 U	--	0.4 U	4.0 UJ	4.0 U	80
Bromodichloromethane	EPA 8260	µg/L	0.20 U	0.20 U	0.20 U	0.2 U	2.0 UJ	--	2.0 U	2.0 U	--	0.4 U	4.0 UJ	4.0 U	1.8
Dichlorodifluoromethane (CFC-12)	EPA 8260	µg/L	0.20 U	0.20 U	0.20 U	0.2 U	2.0 UJ	--	2.0 U	2.0 U	--	0.4 U	4.0 UJ	4.0 U	5.6
1,1-Dichloroethane	EPA 8260	µg/L	0.20 U	0.20 U	0.20 U	0.2 U	2.0 UJ	--	2.0 U	2.0 U	--	0.4 U	4.0 UJ	4.0 U	11
1,2-Dichloroethane	EPA 8260	µg/L	0.20 U	0.20 U	0.20 U	0.2 U	2.0 UJ	--	2.0 U	2.0 U	--	0.4 U	4.0 UJ	4.0 U	4.2
1,1-Dichloroethene	EPA 8260	µg/L	0.20 U	0.20 U	0.20 U	0.02 U	2.0 UJ	--	2.0 U	2.0 U	--	0.04 U	4.0 UJ	4.0 U	130
cis-1,2-Dichloroethene	EPA 8260	µg/L	0.20 U	0.20 U	0.20 U	0.2 U	2.0 UJ	--	2.0 U	2.0 U	--	0.4 U	4.0 UJ	4.0 U	16
trans-1,2-Dichloroethene	EPA 8260	µg/L	0.20 U	0.20 U	0.20 U	0.2 U	2.0 UJ	--	2.0 U	2.0 U	--	0.4 U	4.0 UJ	4.0 U	1,000
1,2-Dichloropropane	EPA 8260	µg/L	0.20 U	0.20 U	0.20 U	0.2 U	2.0 UJ	--	2.0 U	2.0 U	--	0.4 U	4.0 UJ	4.0 U	3.1
1,3-Dichloropropane	EPA 8260	µg/L	0.20 U	0.20 U	0.20 U	0.2 U	2.0 UJ	--	2.0 U	2.0 U	--	0.4 U	4.0 UJ	4.0 U	NE
2,2-Dichloropropane	EPA 8260	µg/L	0.20 U	0.20 U	0.20 U	--	2.0 UJ	--	2.0 U	2.0 U	--	--	4.0 UJ	4.0 U	NE
1,1-Dichloropropene	EPA 8260	µg/L	0.20 U	0.20 U	0.20 U	0.2 U	2.0 UJ	--	2.0 U	2.0 U	--	0.4 U	4.0 UJ	4.0 U	NE
cis-1,3-Dichloropropene	EPA 8260	µg/L	0.20 U	0.20 U	0.20 U	0.2 U	2.0 UJ	--	2.0 U	2.0 U	--	0.4 U	4.0 UJ	4.0 U	2
trans-1,3-Dichloropropene	EPA 8260	µg/L	0.20 U	0.20 U	0.20 U	0.2 U	2.0 UJ	--	2.0 U	2.0 U	--	0.4 U	4.0 UJ	4.0 U	2
Ethylbenzene	EPA 8260	µg/L	0.20 U	0.20 U	0.20 U	0.2 U	2.0 UJ	--	2.0 U	2.0 U	--	0.4 U	4.0 UJ	4.0 U	31
1,2-Dibromoethane (EDB)	EPA 8260	µg/L	0.20 U	0.20 U	0.20 U	0.2 U	2.0 UJ	--	2.0 U	2.0 U	--	0.4 U	4.0 UJ	4.0 U	0.27
2-Hexanone	EPA 8260	µg/L	2.0 U	2.0 U	2.0 U	2 U	20 UJ	--	20 U	20 U	--	20	40 UJ	40 U	40
Isopropylbenzene (Cumene)	EPA 8260	µg/L	0.20 U	0.20 U	0.20 U	0.2 U	2.0 UJ	--	2.0 U	2.0 U	--	0.4 U	4.0 UJ	4.0 U	800
p-Isopropyltoluene	EPA 8260	µg/L	0.20 U	0.20 U	0.20 U	0.2 U	2.0 UJ	--	2.0 U	2.0 U	--	0.67	4.0 UJ	4.0 U	NE
2-Butanone (MEK)	EPA 8260	µg/L	5.0 U	5.0 U	5.0 U	5 U	50 UJ	--	50 U	50 U	--	240	120 J	170	1,700,000
Methyl iodide (Iodomethane)	EPA 8260	µg/L	1.0 U	1.0 U	1.0 U	1 U	27 UJ	--	10 U	10 U	--	2 U	54 UJ	38 UJ	NE
4-Methyl-2-pentanone (Methyl isobutyl ketone)	EPA 8260	µg/L	2.0 U	2.0 U	2.0 U	2 U	20 UJ	--	20 U	20 U	--	46	40 UJ	40 U	470,000
Methyl t-butyl ether (MTBE)	EPA 8260	µg/L	0.20 U	0.20 U	0.20 U	0.2 U	2.0 UJ	--	2.0 U	2.0 U	--	0.4 U	4.0 UJ	4.0 U	600
Methylene chloride	EPA 8260	µg/L	1.0 U	1.0 U	1.0 U	1 U	10 UJ	--	10 U	10 U	--	2 U	20 UJ	20 U	100
n-Propylbenzene	EPA 8260	µg/L	0.20 U	0.20 U	0.20 U	0.2 U	2.0 UJ	--	2.0 U	2.0 U	--	0.4 U	4.0 UJ	4.0 U	800
Styrene	EPA 8260	µg/L	0.20 U	0.20 U	0.20 U	0.2 U	2.0 UJ	--	2.0 U	2.0 U	--	0.4 U	4.0 UJ	4.0 U	8,200
1,1,1,2-Tetrachloroethane	EPA 8260	µg/L	0.20 U	0.20 U	0.20 U	0.2 U	2.0 UJ	--	2.0 U	2.0 U	--	0.4 U	4.0 UJ	4.0 U	7.4
1,1,2,2-Tetrachloroethane	EPA 8260	µg/L	0.20 U	0.20 U	0.20 U	0.2 U	2.0 UJ	--	2.0 U	2.0 U	--	0.4 U	4.0 UJ	4.0 U	0.3
Tetrachloroethene	EPA 8260	µg/L	0.20 U	0.20 U	0.20 U	0.2 U	2.0 UJ	--	2.0 U	2.0 U	--	0.4 U	4.0 UJ	4.0 U	2.9
Toluene	EPA 8260	µg/L	1.0 U	1.0 U	1.0 U	1 U	10 UJ	--	10 U	10 U	--	8	20 UJ	20 U	130
1,2,3-Trichlorobenzene	EPA 8260	µg/L	0.20 U	0.20 U	0.20 U	0.2 U	2.0 UJ	--	2.0 U	2.0 U	--	0.4 U	4.0 UJ	7.8 UJ	NE
1,1,1-Trichloroethane	EPA 8260	µg/L	0.20 U	0.20 U	0.20 U	0.2 U	2.0 UJ	--	2.0 U	2.0 U	--	0.4 U	4.0 UJ	4.0 U	5,500
1,1,2-Trichloroethane	EPA 8260	µg/L	0.20 U	0.20 U	0.20 U	0.2 U	2.0 UJ	--	2.0 U	2.0 U	--	0.4 U	4.0 UJ	4.0 U	0.9
Trichloroethene	EPA 8260	µg/L	0.20 U	0.20 U	0.20 U	0.2 U	2.0 UJ	--	2.0 U	2.0 U	--	0.4 U	4.0 UJ	4.0 U	0.7
Trichlorofluoromethane (CFC-11)	EPA 8260	µg/L	0.20 U	0.20 U	0.20 U	0.2 U	2.0 UJ	--	2.0 U	2.0 U	--	0.4 U	4.0 UJ	4.0 U	120
1,2,3-Trichloropropane	EPA 8260	µg/L	0.20 U	0.20 U	0.20 U	0.2 U	2.0 UJ	--	2.0 U	2.0 U	--	0.4 U	4.0 UJ	4.0 U	1,500
1,2,4-Trimethylbenzene	EPA 8260	µg/L	0.20 U	0.20 U	0.20 U	0.2 U	2.0 UJ	--	2.0 U	2.0 U	--	0.74	4.0 UJ	4.0 U	240
1,3,5-Trimethylbenzene	EPA 8260	µg/L	0.20 U	0.20 U	0.20 U	0.2 U	2.0 UJ	--	2.0 U	2.0 U	--	0.47	4.0 UJ	4.0 U	80
Vinyl acetate	EPA 8260	µg/L	1.0 U	1.0 U	1.0 U	2 U	10 UJ	--	10 U	10 U	--	4 U	20 UJ	20 U	7,800

Table D-2
Remedial Investigation Chemical Analytical Results - Groundwater COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Monitoring Well ¹	Analytical Method	Units	MW-2D	MW-2D	MW-2D	MW-3	MW-3	MW-3 ²	MW-3	MW-3	MW-3	MW-4	MW-4	MW-4	Groundwater Preliminary Cleanup Level ³ (PCUL)
Sample Date			09/22/14	01/19/15	04/21/15	11/6/2009	06/11/14	09/25/14	01/19/15	04/22/15	03/17/17	11/5/2009	06/11/14	09/25/14	
Monitoring Event			Sep-14	Jan-15	Apr-15	Nov-09	Jun-14	Sep-14	Jan-15	Apr-15	Mar-17	Nov-09	Jun-14	Sep-14	
Sampled By			GEI	GEI	GEI	Landau	GEI	GEI	GEI	GEI	Ecology	Landau	GEI	GEI	
Vinyl chloride	EPA 8260	µg/L	0.20 U	0.20 U	0.20 U	0.02 U	2.0 UJ	--	2.0 U	2.0 U	--	0.04 U	4.0 UJ	4.0 U	0.18
Xylene, m-,p-	EPA 8260	µg/L	0.40 U	0.40 U	0.40 U	0.4 U	4.0 UJ	--	4.0 U	4.0 U	--	0.8 U	8.0 UJ	8.0 U	290
Xylene, o-	EPA 8260	µg/L	0.20 U	0.20 U	0.20 U	0.2 U	2.0 UJ	--	2.0 U	2.0 U	--	0.4 U	4.0 UJ	4.0 U	430
Petroleum Hydrocarbons															
Gasoline-range hydrocarbons	NWTPH-G	µg/L	--	--	--	--	100 U	--	100 U	100 U	--	--	--	--	800
Diesel-range hydrocarbons	NWTPH-Dx	µg/L	--	--	--	--	4,100	--	4,600	2,000	--	--	--	9,100 J	500
Oil-range hydrocarbons	NWTPH-Dx	µg/L	--	--	--	--	3,700	--	5,500	2,700	--	--	--	26,000 J	500
Total diesel- and oil-range hydrocarbons	NWTPH-Dx	µg/L	--	--	--	--	7,800	--	10,100	4,700	--	--	--	35,100 J	500
Diesel-range hydrocarbons	NWTPH-Dx Si/Gel	µg/L	--	--	--	--	--	--	250 U	250 U	--	--	--	--	500
Oil-range hydrocarbons	NWTPH-Dx Si/Gel	µg/L	--	--	--	--	--	--	400 U	400 U	--	--	--	--	500
Total diesel- and oil-range hydrocarbons	NWTPH-Dx Si/Gel	µg/L	--	--	--	--	--	--	400 U	400 U	--	--	--	--	500
Conventional Parameters															
Total organic carbon (TOC)	SM 5310B	mg/L	--	--	--	--	250	--	110	--		--	--	--	NE
Field Measured Parameters															
pH	N/A	N/A	6.55	5.52	6.59	6.56	6.79	--	6.69	6.73	--	8.37	7.70	7.75	NE

Notes:

¹ Monitoring well locations are shown on Figures 3-2 and 3-4.

² Insufficient water to collect groundwater sample for chemical analysis.

³ Groundwater screening levels referenced from Table 4-2.

⁴ Total dioxin/furan Toxic Equivalency Quotients (TEQs) were calculated using United States Environmental Protection Agency (USEPA) Toxicity Equivalency Factor (TEF) values for human health (EPA 2003).

⁵ Total carcinogenic PAH (cPAH) TEQs were calculated using TEF values referenced from MTCA Table 708.2 (WAC 173-340-900).

mg/L = milligram per liter

µg/L = microgram per liter

NE = not established

Landau = Landau Associates

GEI = GeoEngineers

NE = not established

J = estimated result

U = analyte not detected above the reporting limit

-- = not analyzed

COPC = Contaminant of Potential Concern

Bold indicates analyte was detected.

Yellow shading identifies the detected results greater than the preliminary cleanup level.

Blue shading identifies the non-detected result greater than the preliminary cleanup level.

Table D-2
Remedial Investigation Chemical Analytical Results - Groundwater COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Monitoring Well ¹	Analytical Method	Units	MW-4	MW-4	MW-4D	MW-4D	MW-4D	MW-4D	MW-4D	MW-4D	MW-4D	MW-4D	MW-5	MW-5	Groundwater Preliminary Cleanup Level ³ (PCUL)
Sample Date			01/22/15	04/22/15	06/11/14	06/11/14	09/23/14	09/23/14	01/22/15	01/22/15	04/22/15	04/22/15	11/5/2009	11/5/2009	
Monitoring Event			Jan-15	Apr-15	Jun-14	Jun-14 (Dup)	Sep-14	Sep-14 (Dup)	Jan-15	Jan-15 (Dup)	Apr-15	Apr-15 (Dup)	Nov-09	Nov-09 (Dup)	
Sampled By			GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	Landau	Landau	
Polychlorinated Biphenyls (PCBs)															
PCB-Aroclor 1016	EPA 8082	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
PCB-Aroclor 1221	EPA 8082	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
PCB-Aroclor 1232	EPA 8082	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
PCB-Aroclor 1242	EPA 8082	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
PCB-Aroclor 1248	EPA 8082	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
PCB-Aroclor 1254	EPA 8082	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
PCB-Aroclor 1260	EPA 8082	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
Total PCB Aroclors	EPA 8082	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	0.000007
Total PCB Congeners	EPA 1668	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	0.000007
Dioxins and Furans															
1,2,3,4,6,7,8-HpCDD	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,4,6,7,8-HpCDF	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,4,7,8,9-HpCDF	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,4,7,8-HxCDD	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,4,7,8-HxCDF	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,6,7,8-HxCDD	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,6,7,8-HxCDF	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,7,8,9-HxCDD	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,7,8,9-HxCDF	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,7,8-PeCDD	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,7,8-PeCDF	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
2,3,4,6,7,8-HxCDF	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
2,3,4,7,8-PeCDF	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
2,3,7,8-TCDD	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
2,3,7,8-TCDF	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
OCDD	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
OCDF	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
Total Dioxin/Furan TEQ ⁴ (ND=0)	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	0.0000000051
Total Dioxin/Furan TEQ ⁴ (ND=0.5RL)	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	0.0000000051
Total Metals															
Antimony	EPA 200.8/7470	µg/L	23	28	5.5 U	5.5 U	5.5 U	5.5 U	5.5 U	5.5 U	5.6 U	5.6 U	12	13	90
Arsenic	EPA 200.8/7470	µg/L	1,500	1,600	7.8 J	3.6 J	6.6	7	8	8.2	6.5	5.8	760	790	8.0
Barium	EPA 200.8/7470	µg/L	360	340	25	26	22	21	21	23	17	19	--	--	200
Beryllium	EPA 200.8/7470	µg/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	11 U	11 U	4.4
Cadmium	EPA 200.8/7470	µg/L	4.7	4.9	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	11 U	11 U	1.2
Chromium III / Total	EPA 200.8/7470	µg/L	1,100	1,200 J	15	15	15	15	16	17	13	14	410	430	27
Chromium VI	EPA 200.8/7470	µg/L	--	--	--	--	--	--	--	--	--	--	50 UJ	50 U	50
Copper	EPA 200.8/7470	µg/L	210	240	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 UJ	6.0 J	53	55	3.1
Lead	EPA 200.8/7470	µg/L	370	470	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	32	34	8.1
Mercury	EPA 200.8/7470	µg/L	0.50 U	0.96	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.27	0.31	0.025
Nickel	EPA 200.8/7470	µg/L	420	430	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	1,000	1,200	8.2

Table D-2
Remedial Investigation Chemical Analytical Results - Groundwater COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Monitoring Well ¹	Analytical Method	Units	MW-4	MW-4	MW-4D	MW-4D	MW-4D	MW-4D	MW-4D	MW-4D	MW-4D	MW-4D	MW-5	MW-5	Groundwater Preliminary Cleanup Level ³ (PCUL)
Sample Date			01/22/15	04/22/15	06/11/14	06/11/14	09/23/14	09/23/14	01/22/15	01/22/15	04/22/15	04/22/15	11/5/2009	11/5/2009	
Monitoring Event			Jan-15	Apr-15	Jun-14	Jun-14 (Dup)	Sep-14	Sep-14 (Dup)	Jan-15	Jan-15 (Dup)	Apr-15	Apr-15 (Dup)	Nov-09	Nov-09 (Dup)	
Sampled By			GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	Landau	Landau	
Selenium	EPA 200.8/7470	µg/L	20 U	30 U	6.0 U	6.0 U	6.0 U	6.0 U	6.0 U	6.0 U	6.0 U	6.0 U	25 U	25 U	71
Silver	EPA 200.8/7470	µg/L	6	5.1	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	11 U	28 U	1.9
Thallium	EPA 200.8/7470	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	5.6 U	14 U	0.062
Tin	EPA 200.8/7470	µg/L	400	520	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	990	1,300	9,600
Zinc	EPA 200.8/7470	µg/L	600	590	56 U	56 U	56 U	56 U	55 U	55 U	58 U	58 U	63	75	81
Dissolved Metals															
Antimony	EPA 200.8/7470	µg/L	27	26	5.5 U	5.5 U	5.5 U	5.5 U	5.5 U	5.5 U	5.5 U	5.5 U	11	6.9	90
Arsenic	EPA 200.8/7470	µg/L	1,400	1,400	8.4	7.4	6.5	7.1	7	6.8	6.7	6.1	820	640	8.0
Barium	EPA 200.8/7470	µg/L	340	300	24	24	20	21	20	20	19	18	--	--	200
Beryllium	EPA 200.8/7470	µg/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	4.4
Cadmium	EPA 200.8/7470	µg/L	4.8	5.3	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	4 U	4 U	1.2
Chromium III / Total	EPA 200.8/7470	µg/L	1,000	1,100	14	14	14	14	15	15	13	13	410	460	27
Copper	EPA 200.8/7470	µg/L	200	220	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	49	77	3.1
Lead	EPA 200.8/7470	µg/L	370	410	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	32	27	8.1
Mercury	EPA 200.8/7470	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.26	0.19	0.025
Nickel	EPA 200.8/7470	µg/L	390	430	2.7	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.2	2.0 U	1400	970	8.2
Selenium	EPA 200.8/7470	µg/L	35 U	20 U	6.0 U	6.0 U	6.0 U	6.0 U	6.0 U	6.0 U	6.0 U	6.0 U	25 U	25 U	71
Silver	EPA 200.8/7470	µg/L	5.4	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	10 U	10 U	1.9
Thallium	EPA 200.8/7470	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	5 U	5 U	0.062
Tin	EPA 200.8/7470	µg/L	420	400	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	640	400	9,600
Zinc	EPA 200.8/7470	µg/L	650	540	56 U	56 U	56 U	56 U	55 U	55 U	56 U	56 U	61	81	81
Semi-Volatile Organic Compounds (SVOCs) - Polycyclic Aromatic Hydrocarbons (PAHs)															
Acenaphthene	EPA 8270/SIM	µg/L	0.46 U	0.97 U	0.47 U	0.47 U	0.67	0.66	1	0.62	0.59	0.53	10 U	10 U	5.3
Acenaphthylene	EPA 8270/SIM	µg/L	4.2	0.97 U	0.47 U	0.47 U	0.10 U	0.22	0.10 U	0.10 U	0.10 U	0.10 U	10 U	10 U	NE
Anthracene	EPA 8270/SIM	µg/L	0.46 U	0.97 U	0.47 U	0.47 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	10 U	10 U	2.1
Benzo(a)anthracene	EPA 8270/SIM	µg/L	0.14	0.17	0.047 U	0.047 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	2	1.5	0.00016
Benzo(b)fluoranthene	EPA 8270/SIM	µg/L	0.046 U	0.5	0.047 U	0.047 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	1.1	1 U	0.00016
Benzo(j,k)fluoranthene	EPA 8270/SIM	µg/L	0.046 U	0.44	0.047 U	0.047 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	1 U	1 U	0.0016
Benzo(g,h,i)perylene	EPA 8270/SIM	µg/L	0.046 U	0.2	0.047 U	0.047 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	1 U	1 U	NE
Benzo(a)pyrene	EPA 8270/SIM	µg/L	0.046 U	0.12	0.047 U	0.047 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	1 U	1 U	0.000016
Chrysene	EPA 8270/SIM	µg/L	0.1	0.39	0.047 U	0.047 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	1.8	1.3	0.016
Dibenzo(a,h)anthracene	EPA 8270/SIM	µg/L	0.046 U	0.056	0.047 U	0.047 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	1 U	1 U	0.000016
Dibenzofuran	EPA 8270/SIM	µg/L	0.92 U	0.97 U	0.94 UJ	0.94 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	100 U	100 U	16
Fluoranthene	EPA 8270/SIM	µg/L	0.51	0.97 U	0.47 U	0.47 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	10 U	10 U	1.8
Fluorene	EPA 8270/SIM	µg/L	0.46 U	0.97 U	0.47 U	0.47 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	10 U	10 U	3.7
Indeno(1,2,3-c,d)pyrene	EPA 8270/SIM	µg/L	0.046 U	0.076	0.047 U	0.047 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	0.010 U	1 U	1 U	0.00016
1-Methylnaphthalene	EPA 8270/SIM	µg/L	0.46 U	0.48 U	0.47 U	0.47 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	10 U	10 U	1.5
2-Methylnaphthalene	EPA 8270/SIM	µg/L	0.46 U	0.48 U	0.47 U	0.47 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	10 U	10 U	32
Naphthalene	EPA 8270/SIM	µg/L	0.59	1.0	0.47 U	0.47 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	10 U	10 U	1.4
Phenanthrene	EPA 8270/SIM	µg/L	0.49	2.0	0.47 U	0.47 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	18	10	NE
Pyrene	EPA 8270/SIM	µg/L	0.46 U	0.97 U	0.47 U	0.47 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	10 U	10 U	2
Total cPAH TEQ ⁵ (ND=0)	EPA 8270/SIM	µg/L	0.0150	0.2481	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0.3280	0.1630	0.000016
Total cPAH TEQ ⁵ (ND=0.5RL)	EPA 8270/SIM	µg/L	0.0472	0.2481	0.035 U	0.035 U	0.0076 U	0.0076 U	0.0076 U	0.0076 U	0.0076 U	0.0076 U	0.9780	0.8630	0.000016

Table D-2
Remedial Investigation Chemical Analytical Results - Groundwater COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Monitoring Well ¹	Analytical Method	Units	MW-4	MW-4	MW-4D	MW-4D	MW-4D	MW-4D	MW-4D	MW-4D	MW-4D	MW-4D	MW-5	MW-5	Groundwater Preliminary Cleanup Level ³ (PCUL)
Sample Date			01/22/15	04/22/15	06/11/14	06/11/14	09/23/14	09/23/14	01/22/15	01/22/15	04/22/15	04/22/15	11/5/2009	11/5/2009	
Monitoring Event			Jan-15	Apr-15	Jun-14	Jun-14 (Dup)	Sep-14	Sep-14 (Dup)	Jan-15	Jan-15 (Dup)	Apr-15	Apr-15 (Dup)	Nov-09	Nov-09 (Dup)	
Sampled By			GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	Landau	Landau	
Other SVOCs (mg/kg)															
Aniline	EPA 8270	µg/L	0.92 U	0.97 U	0.94 UJ	0.94 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	500 U	500 U	7.7
Benzidine	EPA 8270	µg/L	0.92 U	4.8 U	0.94 UJ	0.94 U	0.10 U	0.10 U	0.10 U	0.10 U	0.50 U	0.50 U	1000 U	1000 U	0.000023
Benzoic acid	EPA 8270	µg/L	4.6 U	32	0.94 U	0.94 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	--	--	590
Benzyl alcohol	EPA 8270	µg/L	0.92 U	0.97 U	0.94 U	0.94 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	100 U	100 U	800
Bis(2-chloroethoxy)methane	EPA 8270	µg/L	0.92 U	0.97 U	0.94 UJ	0.94 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	100 U	100 U	NE
Bis(2-chloroethyl)ether	EPA 8270	µg/L	0.92 U	0.97 U	0.94 UJ	0.94 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	100 U	100 U	0.06
Bis(2-chloroisopropyl)ether	EPA 8270	µg/L	0.92 U	0.97 U	0.94 UJ	0.94 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	100 U	100 U	900
Bis(2-ethylhexyl)phthalate	EPA 8270	µg/L	0.92 U	0.97 U	0.94 UJ	0.94 U	0.22 U	0.22 U	0.55 U	0.41 U	0.62 U	0.41 U	100 U	100 U	0.046
4-Bromophenyl phenyl ether	EPA 8270	µg/L	0.92 U	0.97 U	0.94 UJ	0.94 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	100 U	100 U	NE
Butyl benzyl phthalate	EPA 8270	µg/L	0.92 U	0.97 U	0.94 UJ	0.94 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	100 U	100 U	0.013
Carbazole	EPA 8270	µg/L	0.92 U	0.97 U	0.94 UJ	0.94 U	0.10 U	0.10 U	0.10 U	0.10 U	0.12	0.10 U	100 U	100 U	NE
4-Chloroaniline	EPA 8270	µg/L	0.92 U	0.97 U	0.94 UJ	0.94 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	1000 U	1000 U	2,300
4-Chloro-3-methylphenol	EPA 8270	µg/L	0.92 U	0.97 U	0.94 U	0.94 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	100 U	100 U	36
2-Chloronaphthalene	EPA 8270	µg/L	0.92 U	0.97 U	0.94 UJ	0.94 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	100 U	100 U	100
2-Chlorophenol	EPA 8270	µg/L	2.1	2.8	0.94 U	0.94 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	100 U	100 U	17
4-Chlorophenyl phenyl ether	EPA 8270	µg/L	0.92 U	0.97 U	0.94 UJ	0.94 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	100 U	100 U	NE
Decane	EPA 8270	µg/L	18 U	0.97 U	0.94 UJ	0.94 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	--	--	NE
Dibutyl phthalate	EPA 8270	µg/L	1.3 U	0.97 U	0.94 UJ	0.94 U	0.63	0.73	1.3 U	1.2 U	1.6 U	1.1 U	100 U	100 U	8
2,3-Dichloroaniline	EPA 8270	µg/L	0.92 U	0.97 U	0.94 UJ	0.94 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	100 U	100 U	NE
1,2-Dichlorobenzene (o-Dichlorobenzene)	EPA 8260	µg/L	4.0 U	4.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1 U	1 U	4.6
	EPA 8270	µg/L	0.92 U	0.97 U	0.94 UJ	0.94 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	100 U	100 U	4.6
1,3-Dichlorobenzene (m-Dichlorobenzene)	EPA 8260	µg/L	4.0 U	4.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1 U	1 U	2.0
	EPA 8270	µg/L	0.92 U	0.97 U	0.94 UJ	0.94 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	100 U	100 U	2.0
1,4-Dichlorobenzene (p-Dichlorobenzene)	EPA 8260	µg/L	4.0 U	4.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1 U	1 U	4.9
	EPA 8270	µg/L	0.92 U	0.97 U	0.94 UJ	0.94 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	100 U	100 U	4.9
3,3'-Dichlorobenzidine	EPA 8270	µg/L	0.92 U	0.97 U	0.94 UJ	0.94 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	1000 U	1000 U	0.0033
2,4-Dichlorophenol	EPA 8270	µg/L	0.92 U	0.97 U	0.94 U	0.94 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	100 U	100 U	10
Bis(2-ethylhexyl)ester	EPA 8270	µg/L	0.92 U	0.97 U	0.94 UJ	0.94 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	100 U	100 U	400
Diethyl phthalate	EPA 8270	µg/L	0.92 U	0.97 U	0.94 UJ	0.94 U	0.10 U	0.10 U	0.10 U	0.10 U	0.43	0.43	100 U	100 U	93
Dimethyl phthalate	EPA 8270	µg/L	0.92 U	0.97 U	0.94 UJ	0.94 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	100 U	100 U	600
2,4-Dimethylphenol	EPA 8270	µg/L	6.5	12	0.94 U	0.94 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	100 U	100 U	6.30
1,2-Dinitrobenzene	EPA 8270	µg/L	0.92 U	0.97 U	0.94 UJ	0.94 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	100 U	100 U	1.6
1,3-Dinitrobenzene	EPA 8270	µg/L	0.92 U	0.97 U	0.94 UJ	0.94 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	100 U	100 U	1.6
1,4-Dinitrobenzene	EPA 8270	µg/L	0.92 U	0.97 U	0.94 UJ	0.94 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	100 U	100 U	1.6
4,6-Dinitro-2-methylphenol	EPA 8270	µg/L	4.6 U	2.4 U	0.94 U	0.94 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	500 U	500 U	NE
2,4-Dinitrophenol	EPA 8270	µg/L	9.2 U	0.97 U	0.94 U	0.94 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1000 U	1000 U	100
2,4-Dinitrotoluene	EPA 8270	µg/L	2.3 U	2.4 U	0.94 UJ	0.94 U	0.10 U	0.10 U	0.25 U	0.25 U	0.25 U	0.25 U	100 U	100 U	0.18
2,6-Dinitrotoluene	EPA 8270	µg/L	0.92 U	0.97 U	0.94 UJ	0.94 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	100 U	100 U	300
Di-n-octyl phthalate	EPA 8270	µg/L	0.92 U	0.97 U	0.94 UJ	0.94 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	100 U	100 U	0.0039
1,2-Diphenylhydrazine	EPA 8270	µg/L	0.92 U	0.97 U	0.94 UJ	0.94 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	100 U	100 U	0.02
Hexachlorobenzene	EPA 8270	µg/L	0.92 U	0.97 U	0.94 UJ	0.94 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	100 U	100 U	0.000005
Hexachlorobutadiene	EPA 8260	µg/L	4.0 U	4.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1 U	1 U	0.01
	EPA 8270	µg/L	0.92 U	0.97 U	0.94 UJ	0.94 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	100 U	100 U	0.01

Table D-2
Remedial Investigation Chemical Analytical Results - Groundwater COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Monitoring Well ¹	Analytical Method	Units	MW-4	MW-4	MW-4D	MW-4D	MW-4D	MW-4D	MW-4D	MW-4D	MW-4D	MW-4D	MW-5	MW-5	Groundwater Preliminary Cleanup Level ³ (PCUL)
Sample Date			01/22/15	04/22/15	06/11/14	06/11/14	09/23/14	09/23/14	01/22/15	01/22/15	04/22/15	04/22/15	11/5/2009	11/5/2009	
Monitoring Event			Jan-15	Apr-15	Jun-14	Jun-14 (Dup)	Sep-14	Sep-14 (Dup)	Jan-15	Jan-15 (Dup)	Apr-15	Apr-15 (Dup)	Nov-09	Nov-09 (Dup)	
Sampled By			GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	Landau	Landau	
Hexachlorocyclopentadiene	EPA 8270	µg/L	0.92 U	0.97 U	0.94 UJ	0.94 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	100 U	100 U	1.00
Hexachloroethane	EPA 8270	µg/L	0.92 U	0.97 U	0.94 UJ	0.94 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	100 U	100 U	0.02
Isophorone	EPA 8270	µg/L	0.92 U	0.97 U	0.94 UJ	0.94 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	100 U	100 U	110
2-Methylphenol (o-Cresol)	EPA 8270	µg/L	77	99	0.94 U	0.94 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	100 U	100 U	27
3 & 4 Methylphenol (m & p-Cresol)	EPA 8270	µg/L	160	330	0.94 U	0.94 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	--	--	400
2-Nitroaniline	EPA 8270	µg/L	0.92 U	0.97 U	0.94 UJ	0.94 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	100 U	100 U	160
3-Nitroaniline	EPA 8270	µg/L	0.92 U	0.97 U	0.94 UJ	0.94 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	100 U	100 U	NE
4-Nitroaniline	EPA 8270	µg/L	0.92 U	0.97 U	0.94 UJ	0.94 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	100 U	100 U	NE
Nitrobenzene	EPA 8270	µg/L	0.92 U	0.97 U	0.94 UJ	0.94 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	100 U	100 U	100
2-Nitrophenol	EPA 8270	µg/L	0.92 U	0.97 U	0.94 U	0.94 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	100 U	100 U	NE
4-Nitrophenol (p-Nitrophenol)	EPA 8270	µg/L	0.92 U	0.97 U	0.94 U	0.94 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	100 U	100 U	NE
n-Nitrosodimethylamine	EPA 8270	µg/L	0.92 U	0.97 U	0.94 UJ	0.94 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	100 U	100 U	0.34
n-Nitrosodiphenylamine (as Diphenylamine)	EPA 8270	µg/L	0.92 U	0.97 U	0.94 UJ	0.94 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	1000 U	1000 U	0.69
n-Nitrosodi-n-propylamine	EPA 8270	µg/L	0.92 U	0.97 U	0.94 UJ	0.94 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	100 U	100 U	0.058
n-Octadecane	EPA 8270	µg/L	0.92 U	0.97 U	0.94 UJ	0.94 U	0.28	0.24	0.10 U	0.10 U	0.37 J	0.10 UJ	--	--	NE
Pentachlorophenol	EPA 8270	µg/L	4.6 U	0.97 U	0.94 U	0.94 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	500 U	500 U	0.002
Phenol	EPA 8270	µg/L	0.92 U	0.97 U	0.94 U	0.94 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	100 U	100 U	370
Pyridine	EPA 8270	µg/L	0.92 U	0.97 U	0.94 UJ	0.94 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	1000 U	1000 U	8
2,3,4,6-Tetrachlorophenol	EPA 8270	µg/L	0.92 U	0.97 U	0.94 U	0.94 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	100 U	100 U	480
2,3,5,6-Tetrachlorophenol	EPA 8270	µg/L	0.92 U	0.97 U	0.94 U	0.94 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	100 U	100 U	NE
1,2,4-Trichlorobenzene	EPA 8260	µg/L	4.0 U	4.0 U	1.0 U	1.0 U	1.0 U	1.4 U	1.0 U	1.0 U	1.0 U	1.0 U	1 U	1 U	0.037
	EPA 8270	µg/L	0.92 U	0.97 U	0.94 UJ	0.94 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	100 U	100 U	0.037
2,4,5-Trichlorophenol	EPA 8270	µg/L	0.92 U	0.97 U	0.94 U	0.94 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	100 U	100 U	600
2,4,6-Trichlorophenol	EPA 8270	µg/L	0.92 U	1.2	0.94 U	0.94 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	0.10 U	100 U	100 U	0.28
Volatile Organic Compounds (VOCs)															
Acetone	EPA 8260	µg/L	660	390	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	650	530	NE
Benzene	EPA 8260	µg/L	4.0 U	4.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1 U	1 U	1.6
Bromobenzene	EPA 8260	µg/L	4.0 U	4.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1 U	1 U	NE
Bromochloromethane	EPA 8260	µg/L	4.0 U	4.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1 U	1 U	NE
Bromoform (Tribromomethane)	EPA 8260	µg/L	20 U	20 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5 U	5 U	12
Bromomethane	EPA 8260	µg/L	7.6 UJ	4.0 U	2.6 UJ	2.6 UJ	1.0 U	1.4 U	1.9 UJ	1.9 UJ	1.0 U	1.0 U	1 U	1 U	13
n-Butylbenzene	EPA 8260	µg/L	4.0 U	4.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1 U	1 U	400
sec-Butylbenzene	EPA 8260	µg/L	4.0 U	4.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1 U	1 U	800
tert-Butylbenzene	EPA 8260	µg/L	4.0 U	4.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1 U	1 U	800
Carbon disulfide	EPA 8260	µg/L	4.0 U	4.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1 U	1	400
Carbon tetrachloride	EPA 8260	µg/L	4.0 U	4.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1 U	1 U	0.35
Chlorobenzene	EPA 8260	µg/L	4.0 U	4.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1 U	1 U	200
Chloroethane	EPA 8260	µg/L	20 U	20 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5 U	5 U	19,000
2-Chloroethyl vinyl ether	EPA 8260	µg/L	40 U	20 U	5.0 U	5.0 U	5.0 U	5.0 U	10 U	10 U	5.0 U	5.0 U	5 U	5 U	NE
Chloroform	EPA 8260	µg/L	4.0 U	4.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1 U	1 U	1.2
Chloromethane	EPA 8260	µg/L	20 U	20 U	5.0 UJ	5.0 UJ	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5 U	5 U	150
2-Chlorotoluene	EPA 8260	µg/L	4.0 U	4.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1 U	1 U	160
4-Chlorotoluene	EPA 8260	µg/L	4.0 U	4.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1 U	1 U	NE

Table D-2
Remedial Investigation Chemical Analytical Results - Groundwater COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Monitoring Well ¹	Analytical Method	Units	MW-4	MW-4	MW-4D	MW-4D	MW-4D	MW-4D	MW-4D	MW-4D	MW-4D	MW-4D	MW-5	MW-5	Groundwater Preliminary Cleanup Level ³ (PCUL)
Sample Date			01/22/15	04/22/15	06/11/14	06/11/14	09/23/14	09/23/14	01/22/15	01/22/15	04/22/15	04/22/15	11/5/2009	11/5/2009	
Monitoring Event			Jan-15	Apr-15	Jun-14	Jun-14 (Dup)	Sep-14	Sep-14 (Dup)	Jan-15	Jan-15 (Dup)	Apr-15	Apr-15 (Dup)	Nov-09	Nov-09 (Dup)	
Sampled By			GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	Landau	Landau	
Dibromochloromethane	EPA 8260	µg/L	4.0 U	4.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1 U	1 U	2.2
1,2-Dibromo-3-chloropropane	EPA 8260	µg/L	20 U	20 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5 U	5 U	0.2
Dibromomethane	EPA 8260	µg/L	4.0 U	4.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1 U	1 U	80
Bromodichloromethane	EPA 8260	µg/L	4.0 U	4.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1 U	1 U	1.8
Dichlorodifluoromethane (CFC-12)	EPA 8260	µg/L	4.0 U	4.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1 U	1 U	5.6
1,1-Dichloroethane	EPA 8260	µg/L	4.0 U	4.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1 U	1 U	11
1,2-Dichloroethane	EPA 8260	µg/L	4.0 U	4.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1 U	1 U	4.2
1,1-Dichloroethene	EPA 8260	µg/L	4.0 U	4.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	0.1 U	0.1 U	130
cis-1,2-Dichloroethene	EPA 8260	µg/L	4.0 U	4.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1 U	1 U	16
trans-1,2-Dichloroethene	EPA 8260	µg/L	4.0 U	4.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1 U	1 U	1,000
1,2-Dichloropropane	EPA 8260	µg/L	4.0 U	4.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1 U	1 U	3.1
1,3-Dichloropropane	EPA 8260	µg/L	4.0 U	4.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1 U	1 U	NE
2,2-Dichloropropane	EPA 8260	µg/L	4.0 U	4.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	–	–	NE
1,1-Dichloropropene	EPA 8260	µg/L	4.0 U	4.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1 U	1 U	NE
cis-1,3-Dichloropropene	EPA 8260	µg/L	4.0 U	4.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1 U	1 U	2
trans-1,3-Dichloropropene	EPA 8260	µg/L	4.0 U	4.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1 U	1 U	2
Ethylbenzene	EPA 8260	µg/L	4.0 U	4.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1 U	1 U	31
1,2-Dibromoethane (EDB)	EPA 8260	µg/L	4.0 U	4.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1 U	1 U	0.27
2-Hexanone	EPA 8260	µg/L	40 U	40 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	11	10	40
Isopropylbenzene (Cumene)	EPA 8260	µg/L	4.0 U	4.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.3	1.3	800
p-Isopropyltoluene	EPA 8260	µg/L	4.0 U	4.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	6.1	5.5	NE
2-Butanone (MEK)	EPA 8260	µg/L	100 J	190	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	50	51	1,700,000
Methyl iodide (Iodomethane)	EPA 8260	µg/L	26 U	20 U	14 UJ	14 UJ	5.0 U	5.0 U	6.5 U	6.5 U	5.0 U	5.0 U	5 U	5 U	NE
4-Methyl-2-pentanone (Methyl isobutyl ketone)	EPA 8260	µg/L	40 U	40 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	17	17	470,000
Methyl t-butyl ether (MTBE)	EPA 8260	µg/L	4.0 U	4.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1 U	1 U	600
Methylene chloride	EPA 8260	µg/L	20 U	20 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5 U	5 U	100
n-Propylbenzene	EPA 8260	µg/L	4.0 U	4.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1 U	1 U	800
Styrene	EPA 8260	µg/L	4.0 U	4.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1 U	1 U	8,200
1,1,1,2-Tetrachloroethane	EPA 8260	µg/L	4.0 U	4.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1 U	1 U	7.4
1,1,2,2-Tetrachloroethane	EPA 8260	µg/L	4.0 U	4.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1 U	1 U	0.3
Tetrachloroethene	EPA 8260	µg/L	4.0 U	4.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1 U	1 U	2.9
Toluene	EPA 8260	µg/L	20 U	20 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5 U	5 U	130
1,2,3-Trichlorobenzene	EPA 8260	µg/L	4.0 U	4.0 U	1.0 U	1.0 U	1.0 UJ	1.8 U	1.0 U	1.0 U	1.0 U	1.0 U	1 U	1 U	NE
1,1,1-Trichloroethane	EPA 8260	µg/L	4.0 U	4.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1 U	1 U	5,500
1,1,2-Trichloroethane	EPA 8260	µg/L	4.0 U	4.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1 U	1 U	0.9
Trichloroethene	EPA 8260	µg/L	4.0 U	4.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1 U	1 U	0.7
Trichlorofluoromethane (CFC-11)	EPA 8260	µg/L	4.0 U	4.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1 U	1 U	120
1,2,3-Trichloropropane	EPA 8260	µg/L	4.0 U	4.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1 U	1 U	1,500
1,2,4-Trimethylbenzene	EPA 8260	µg/L	4.0 U	4.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1 U	1 U	240
1,3,5-Trimethylbenzene	EPA 8260	µg/L	4.0 U	4.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1 U	1 U	80
Vinyl acetate	EPA 8260	µg/L	20 U	20 U	5.0 UJ	5.0 UJ	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	10 U	10 U	7,800

Table D-2
Remedial Investigation Chemical Analytical Results - Groundwater COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Monitoring Well ¹	Analytical Method	Units	MW-4	MW-4	MW-4D	MW-4D	MW-4D	MW-4D	MW-4D	MW-4D	MW-4D	MW-4D	MW-5	MW-5	Groundwater Preliminary Cleanup Level ³ (PCUL)
Sample Date			01/22/15	04/22/15	06/11/14	06/11/14	09/23/14	09/23/14	01/22/15	01/22/15	04/22/15	04/22/15	11/5/2009	11/5/2009	
Monitoring Event			Jan-15	Apr-15	Jun-14	Jun-14 (Dup)	Sep-14	Sep-14 (Dup)	Jan-15	Jan-15 (Dup)	Apr-15	Apr-15 (Dup)	Nov-09	Nov-09 (Dup)	
Sampled By			GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	Landau	Landau	
Vinyl chloride	EPA 8260	µg/L	4.0 U	4.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	0.1 U	0.1 U	0.18
Xylene, m-,p-	EPA 8260	µg/L	8.0 U	8.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2 U	2 U	290
Xylene, o-	EPA 8260	µg/L	4.0 U	4.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1 U	1 U	430
Petroleum Hydrocarbons															
Gasoline-range hydrocarbons	NWTPH-G	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	800
Diesel-range hydrocarbons	NWTPH-Dx	µg/L	16,000	18,000	--	--	260	290	260	290	250 U	280	--	--	500
Oil-range hydrocarbons	NWTPH-Dx	µg/L	17,000	39,000	--	--	330 U	330 U	400 U	400 U	400 U	400 U	--	--	500
Total diesel- and oil-range hydrocarbons	NWTPH-Dx	µg/L	33,000	57,000	--	--	260	290	260	290	400 U	280	--	--	500
Diesel-range hydrocarbons	NWTPH-Dx Si/Gel	µg/L	--	250 U	--	--	--	--	--	--	--	--	--	--	500
Oil-range hydrocarbons	NWTPH-Dx Si/Gel	µg/L	--	400 U	--	--	--	--	--	--	--	--	--	--	500
Total diesel- and oil-range hydrocarbons	NWTPH-Dx Si/Gel	µg/L	--	400 U	--	--	--	--	--	--	--	--	--	--	500
Conventional Parameters															
Total organic carbon (TOC)	SM 5310B	mg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
Field Measured Parameters															
pH	N/A	N/A	7.80	7.84	7.01	7.01	6.92	6.92	6.79	6.79	6.83	6.83	10.08	10.08	NE

Notes:

¹ Monitoring well locations are shown on Figures 3-2 and 3-4.

² Insufficient water to collect groundwater sample for chemical analysis.

³ Groundwater screening levels referenced from Table 4-2.

⁴ Total dioxin/furan Toxic Equivalency Quotients (TEQs) were calculated using United States Environmental Protection Agency (USEPA) Toxicity Equivalency Factor (TEF) values for human health (EPA 2003).

⁵ Total carcinogenic PAH (cPAH) TEQs were calculated using TEF values referenced from MTCA Table 708.2 (WAC 173-340-900).

mg/L = milligram per liter

µg/L = microgram per liter

NE = not established

Landau = Landau Associates

GEI = GeoEngineers

NE = not established

J = estimated result

U = analyte not detected above the reporting limit

-- = not analyzed

COPC = Contaminant of Potential Concern

Bold indicates analyte was detected.

Yellow shading identifies the detected results greater than the preliminary cleanup level.

Blue shading identifies the non-detected result greater than the preliminary cleanup level.

Table D-2
Remedial Investigation Chemical Analytical Results - Groundwater COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Monitoring Well ¹	Analytical Method	Units	MW-5	MW-5 ²	MW-5	MW-5 ²	MW-6	MW-6 ²	MW-6	MW-6	MW-6	MW-7	MW-7	MW-7	Groundwater Preliminary Cleanup Level ³ (PCUL)
Sample Date			06/10/14	09/25/14	01/20/15	04/22/15	11/5/2009	06/10/14	09/25/14	01/19/15	04/23/15	11/4/2009	06/12/14	09/24/14	
Monitoring Event			Jun-14	Sep-14	Jan-15	Apr-15	Nov-09	Jun-14	Sep-14	Jan-15	Apr-15	Nov-09	Jun-14	Sep-14	
Sampled By			GEI	GEI	GEI	GEI	Landau	GEI	GEI	GEI	GEI	Landau	GEI	GEI	
Polychlorinated Biphenyls (PCBs)															
PCB-Aroclor 1016	EPA 8082	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
PCB-Aroclor 1221	EPA 8082	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
PCB-Aroclor 1232	EPA 8082	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
PCB-Aroclor 1242	EPA 8082	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
PCB-Aroclor 1248	EPA 8082	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
PCB-Aroclor 1254	EPA 8082	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
PCB-Aroclor 1260	EPA 8082	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
Total PCB Aroclors	EPA 8082	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	0.000007
Total PCB Congeners	EPA 1668	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	0.000007
Dioxins and Furans															
1,2,3,4,6,7,8-HpCDD	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,4,6,7,8-HpCDF	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,4,7,8,9-HpCDF	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,4,7,8-HxCDD	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,4,7,8-HxCDF	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,6,7,8-HxCDD	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,6,7,8-HxCDF	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,7,8,9-HxCDD	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,7,8,9-HxCDF	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,7,8-PeCDD	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,7,8-PeCDF	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
2,3,4,6,7,8-HxCDF	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
2,3,4,7,8-PeCDF	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
2,3,7,8-TCDD	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
2,3,7,8-TCDF	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
OCDD	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
OCDF	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
Total Dioxin/Furan TEQ ⁴ (ND=0)	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	0.0000000051
Total Dioxin/Furan TEQ ⁴ (ND=0.5RL)	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	0.0000000051
Total Metals															
Antimony	EPA 200.8/7470	µg/L	15	--	15	--	1 U	--	5.5 U	5.5 U	5.4 U	39	80	100	90
Arsenic	EPA 200.8/7470	µg/L	930	--	940	--	21	--	9.3	8.3	6.6	620	940	1,100	8.0
Barium	EPA 200.8/7470	µg/L	320	--	380	--	--	--	50	52	48	--	53	45	200
Beryllium	EPA 200.8/7470	µg/L	10 U	--	10 U	--	11 U	--	10 U	10 U	10 U	11 U	10 U	10 U	4.4
Cadmium	EPA 200.8/7470	µg/L	1	--	0.8	--	4.4 U	--	0.20 U	0.20 U	0.20 U	4.4 U	1	1.7	1.2
Chromium III / Total	EPA 200.8/7470	µg/L	740	--	840	--	44	--	17	13	13	100	170	180	27
Chromium VI	EPA 200.8/7470	µg/L	--	--	--	--	10 U	--	--	--	--	50 U	--	--	50
Copper	EPA 200.8/7470	µg/L	61	--	36	--	6.2	--	12	7.7	7.7	40	27	44	3.1
Lead	EPA 200.8/7470	µg/L	52	--	25	--	22	--	4.1	3.4	3	220	94	180	8.1
Mercury	EPA 200.8/7470	µg/L	0.50 U	--	0.50 U	--	0.1 U	--	0.50 U	0.50 U	0.50 U	0.1 U	0.50 U	0.50 U	0.025
Nickel	EPA 200.8/7470	µg/L	850	--	780	--	41	--	11	10	9.1	64	55	84	8.2

Table D-2
Remedial Investigation Chemical Analytical Results - Groundwater COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Monitoring Well ¹	Analytical Method	Units	MW-5	MW-5 ²	MW-5	MW-5 ²	MW-6	MW-6 ²	MW-6	MW-6	MW-6	MW-6	MW-7	MW-7	MW-7	Groundwater Preliminary Cleanup Level ³ (PCUL)
Sample Date			06/10/14	09/25/14	01/20/15	04/22/15	11/5/2009	06/10/14	09/25/14	01/19/15	04/23/15	11/4/2009	06/12/14	09/24/14		
Monitoring Event			Jun-14	Sep-14	Jan-15	Apr-15	Nov-09	Jun-14	Sep-14	Jan-15	Apr-15	Nov-09	Jun-14	Sep-14		
Sampled By			GEI	GEI	GEI	GEI	Landau	GEI	GEI	GEI	GEI	Landau	GEI	GEI		
Selenium	EPA 200.8/7470	µg/L	40 U	--	35 U	--	5.6 U	--	6.0 U	6.0 U	6.0 U	8.9 U	6.0 U	6.0 U	71	
Silver	EPA 200.8/7470	µg/L	5.3	--	6.5	--	11 U	--	1.0 U	1.0 U	1.0 U	11 U	1.5	1.0 U	1.9	
Thallium	EPA 200.8/7470	µg/L	2.0 U	--	2.0 U	--	5.6 U	--	2.0 U	2.0 U	2.0 U	5.6 U	2.0 U	2.0 U	0.062	
Tin	EPA 200.8/7470	µg/L	1,500	--	1,500	--	10 U	--	5.0 U	5.0 U	5.0 U	8.1	50	41	9,600	
Zinc	EPA 200.8/7470	µg/L	56 U	--	55 U	--	140	--	56 U	55 U	56 U	230	110	180	81	
Dissolved Metals																
Antimony	EPA 200.8/7470	µg/L	13	--	12	--	1 U	--	5.5 U	5.5 U	5.6 U	37	6.3	110	90	
Arsenic	EPA 200.8/7470	µg/L	960	--	720	--	18	--	8.3 J	7.7	6.9	590	280	1100	8.0	
Barium	EPA 200.8/7470	µg/L	340	--	370	--	--	--	23	23	22	--	48	45	200	
Beryllium	EPA 200.8/7470	µg/L	10 U	--	10 U	--	10 U	--	10 U	10 U	10 U	10 U	10 U	10 U	4.4	
Cadmium	EPA 200.8/7470	µg/L	0.80 U	--	0.63	--	4 U	--	0.20 U	0.20 U	0.20 U	4 U	0.20 U	2	1.2	
Chromium III / Total	EPA 200.8/7470	µg/L	770	--	850	--	13	--	5.4	4.8	3.7	69	79	180	27	
Copper	EPA 200.8/7470	µg/L	31	--	24	--	8.9	--	2.0 U	3	2.0 U	4.8	4.2	39	3.1	
Lead	EPA 200.8/7470	µg/L	22	--	3.5	--	4.1	--	1.0 U	1.4	1.0 U	40	7.6	170	8.1	
Mercury	EPA 200.8/7470	µg/L	0.50 U	--	0.50 U	--	0.1 U	--	0.50 U	0.50 U	0.50 U	0.1 U	0.50 U	0.50 U	0.025	
Nickel	EPA 200.8/7470	µg/L	800	--	630	--	16	--	2.0 U	2.0 U	2.0 U	52	47	83	8.2	
Selenium	EPA 200.8/7470	µg/L	40 U	--	25 U	--	5 U	--	6.0 U	6.0 U	6.0 U	7.2 U	6.0 U	6.0 U	71	
Silver	EPA 200.8/7470	µg/L	5.1	--	7.1	--	10 U	--	1.0 U	1.0 U	1.0 U	10 U	1.0 U	1.0 U	1.9	
Thallium	EPA 200.8/7470	µg/L	2.0 U	--	2.0 U	--	5 U	--	2.0 U	2.0 U	2.0 U	5 U	2.0 U	2.0 U	0.062	
Tin	EPA 200.8/7470	µg/L	1400	--	1600	--	10 U	--	5.0 U	5.0 U	5.0 U	10 U	6.3	40	9,600	
Zinc	EPA 200.8/7470	µg/L	56 U	--	56 U	--	26	--	56 U	55 U	56 U	66	67	160	81	
Semi-Volatile Organic Compounds (SVOCs) - Polycyclic Aromatic Hydrocarbons (PAHs)																
Acenaphthene	EPA 8270/SIM	µg/L	1.0 U	--	1.5	--	13	--	1.3 J	1.6	4.5	0.7	0.49	1.1	5.3	
Acenaphthylene	EPA 8270/SIM	µg/L	1.0 U	--	1.5 U	--	0.1 U	--	0.10 UJ	0.10 U	0.10 U	0.1 U	0.47 U	0.48 U	NE	
Anthracene	EPA 8270/SIM	µg/L	1.0 U	--	1.5 U	--	0.1 U	--	0.10 UJ	0.10 U	0.10 U	0.12	0.47 U	0.48 U	2.1	
Benzo(a)anthracene	EPA 8270/SIM	µg/L	0.26	--	0.099	--	0.014	--	0.010 UJ	0.010 U	0.10 U	0.061	0.1	0.17	0.00016	
Benzo(b)fluoranthene	EPA 8270/SIM	µg/L	0.16	--	0.15	--	0.014	--	0.010 UJ	0.010 U	0.10 U	0.071	0.06	0.12	0.00016	
Benzo(j,k)fluoranthene	EPA 8270/SIM	µg/L	0.11	--	0.075 U	--	0.01 U	--	0.010 UJ	0.010 U	0.10 U	0.017	0.047 U	0.11	0.0016	
Benzo(g,h,i)perylene	EPA 8270/SIM	µg/L	0.1	--	0.098	--	0.011	--	0.010 UJ	0.010 U	0.10 U	0.041	0.047 U	0.078	NE	
Benzo(a)pyrene	EPA 8270/SIM	µg/L	0.13	--	0.075 U	--	0.01 U	--	0.010 UJ	0.010 U	0.10 U	0.037	0.047 U	0.1	0.000016	
Chrysene	EPA 8270/SIM	µg/L	0.25	--	0.075 U	--	0.014	--	0.010 UJ	0.010 U	0.10 U	0.061	0.091	0.15	0.016	
Dibenzo(a,h)anthracene	EPA 8270/SIM	µg/L	0.10 U	--	0.075 U	--	0.01 U	--	0.010 UJ	0.010 U	0.10 U	0.012	0.047 U	0.048 U	0.000016	
Dibenzofuran	EPA 8270/SIM	µg/L	2.0 U	--	1.5 U	--	2.5	--	0.10 UJ	0.15	0.28	1 U	0.95 U	0.97 U	16	
Fluoranthene	EPA 8270/SIM	µg/L	1.0 U	--	1.5 U	--	0.1 U	--	0.10 UJ	0.050 U	0.10 U	0.23	0.47 U	0.48 U	1.8	
Fluorene	EPA 8270/SIM	µg/L	1.0 U	--	1.5 U	--	2.5	--	0.10 UJ	0.16	0.35	0.29	0.47 U	0.48 U	3.7	
Indeno(1,2,3-c,d)pyrene	EPA 8270/SIM	µg/L	0.10 U	--	0.075 U	--	0.01 U	--	0.010 UJ	0.010 U	0.10 U	0.024	0.047 U	0.062	0.00016	
1-Methylnaphthalene	EPA 8270/SIM	µg/L	1.0 U	--	1.5 U	--	7.4	--	0.10 UJ	0.58	2	0.9	0.47 U	0.99	1.5	
2-Methylnaphthalene	EPA 8270/SIM	µg/L	1.0 U	--	1.5 U	--	1.5	--	0.10 UJ	0.10 U	0.22	1.2	0.47 U	1.1	32	
Naphthalene	EPA 8270/SIM	µg/L	1.0 U		1.5 U		3.4		0.10 UJ	11	3.8	12	170 J	10	1.4	
Phenanthrene	EPA 8270/SIM	µg/L	1.8		1.5 U		0.21		0.10 UJ	0.10 U	0.069	0.3	0.47 U	0.48 U	NE	
Pyrene	EPA 8270/SIM	µg/L	1.0 U		1.5 U		0.1 U		0.10 UJ	0.10 U	0.10 U	0.28	0.47 U	0.62	2	
Total cPAH TEQ ⁵ (ND=0)	EPA 8270/SIM	µg/L	0.1855	--	0.0249	--	0.0029	--	0 U	0 U	0 U	0.0561	0.0169	0.1477	0.000016	
Total cPAH TEQ ⁵ (ND=0.5RL)	EPA 8270/SIM	µg/L	0.2000	--	0.0740	--	0.0094	--	0.0076 U	0.0076 U	0.0076 U	0.0561	0.0470	0.1500	0.000016	

Table D-2
Remedial Investigation Chemical Analytical Results - Groundwater COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Monitoring Well ¹	Analytical Method	Units	MW-5	MW-5 ²	MW-5	MW-5 ²	MW-6	MW-6 ²	MW-6	MW-6	MW-6	MW-6	MW-7	MW-7	MW-7	Groundwater Preliminary Cleanup Level ³ (PCUL)
Sample Date			06/10/14	09/25/14	01/20/15	04/22/15	11/5/2009	06/10/14	09/25/14	01/19/15	04/23/15	11/4/2009	06/12/14	09/24/14		
Monitoring Event			Jun-14	Sep-14	Jan-15	Apr-15	Nov-09	Jun-14	Sep-14	Jan-15	Apr-15	Nov-09	Jun-14	Sep-14		
Sampled By			GEI	GEI	GEI	GEI	Landau	GEI	GEI	GEI	GEI	Landau	GEI	GEI		
Other SVOCs (mg/kg)																
Aniline	EPA 8270	µg/L	2.0 U	--	1.5 U	--	5 U	--	0.10 UJ	0.10 U	0.10 U	5 U	0.95 U	0.97	7.7	
Benzidine	EPA 8270	µg/L	2.0 U	--	1.5 U	--	10 U	--	0.10 UJ	0.10 U	0.10 U	10 U	0.95 U	0.97 U	0.000023	
Benzoic acid	EPA 8270	µg/L	2.0 U	--	7.5 U	--	--	--	0.50 UJ	0.50 U	0.50 U	--	0.95 U	0.97 U	590	
Benzyl alcohol	EPA 8270	µg/L	2.0 U	--	1.5 U	--	1 U	--	0.10 UJ	0.10 U	0.10 U	1.1	0.95 U	1	800	
Bis(2-chloroethoxy)methane	EPA 8270	µg/L	2.0 U	--	1.5 U	--	1 U	--	0.10 UJ	0.10 U	0.10 U	1 U	0.95 U	0.97 U	NE	
Bis(2-chloroethyl)ether	EPA 8270	µg/L	2.0 U	--	1.5 U	--	1 U	--	0.10 UJ	0.10 U	0.10 U	1 U	0.95 U	0.97 U	0.06	
Bis(2-chloroisopropyl)ether	EPA 8270	µg/L	2.0 U	--	1.5 U	--	1 U	--	0.10 UJ	0.10 U	0.10 U	1 U	0.95 U	0.97 U	900	
Bis(2-ethylhexyl)phthalate	EPA 8270	µg/L	2.0 U	--	17 U	--	1.3	--	0.23 UJ	0.53 U	0.21 U	1.6	1.2 U	0.97 U	0.046	
4-Bromophenyl phenyl ether	EPA 8270	µg/L	2.0 U	--	1.5 U	--	1 U	--	0.10 UJ	0.10 U	0.10 U	1 U	0.95 U	0.97 U	NE	
Butyl benzyl phthalate	EPA 8270	µg/L	2.0 U	--	1.5 U	--	1 U	--	0.10 UJ	0.10 U	0.10 U	1 U	0.95 U	0.97 U	0.013	
Carbazole	EPA 8270	µg/L	2.0 U	--	1.5 U	--	2.2	--	0.13 J	0.13	0.2	1 U	0.95 U	0.97 U	NE	
4-Chloroaniline	EPA 8270	µg/L	2.0 U	--	1.5 U	--	10 U	--	0.10 UJ	0.10 U	0.10 U	10 U	0.95 U	0.97 U	2,300	
4-Chloro-3-methylphenol	EPA 8270	µg/L	2.0 U	--	1.5 U	--	1 U	--	0.10 U	0.10 U	0.10 U	1 U	0.95 U	0.97 U	36	
2-Chloronaphthalene	EPA 8270	µg/L	2.0 U	--	1.5 U	--	1 U	--	0.10 UJ	0.10 U	0.10 U	1 U	0.95 U	0.97 U	100	
2-Chlorophenol	EPA 8270	µg/L	4.6	--	1.7	--	1 U	--	0.10 U	0.10 U	0.10 U	1 U	0.95 U	0.97 U	17	
4-Chlorophenyl phenyl ether	EPA 8270	µg/L	2.0 U	--	1.5 U	--	1 U	--	0.10 UJ	0.10 U	0.10 U	1 U	0.95 U	0.97 U	NE	
Decane	EPA 8270	µg/L	2.0 U	--	30 U	--	--	--	2.0 UJ	2.0 U	2.0 U	--	0.95 U	0.97 U	NE	
Dibutyl phthalate	EPA 8270	µg/L	2.9	--	30 U	--	1 U	--	0.29 J	0.82 U	0.16	1 U	1.1	4.9	8	
2,3-Dichloroaniline	EPA 8270	µg/L	2.0 U	--	1.5 U	--	1 U	--	0.10 UJ	0.10 U	0.10 U	1 U	0.95 U	0.97 U	NE	
1,2-Dichlorobenzene (o-Dichlorobenzene)	EPA 8260	µg/L	2.0 UJ	--	2.0 U	--	0.2 U	--	0.20 U	0.20 U	0.20 U	0.2 U	0.40 U	2.0 U	4.6	
	EPA 8270	µg/L	2.0 U	--	1.5 U	--	1 U	--	0.10 UJ	0.10 U	0.10 U	1 U	0.95 U	0.97 U	4.6	
1,3-Dichlorobenzene (m-Dichlorobenzene)	EPA 8260	µg/L	2.0 UJ	--	2.0 U	--	0.2 U	--	0.20 U	0.20 U	0.20 U	0.2 U	0.40 U	2.0 U	2.0	
	EPA 8270	µg/L	2.0 U	--	1.5 U	--	1 U	--	0.10 UJ	0.10 U	0.10 U	1 U	0.95 U	0.97 U	2.0	
1,4-Dichlorobenzene (p-Dichlorobenzene)	EPA 8260	µg/L	2.0 UJ	--	2.0 U	--	0.2 U	--	0.20 U	0.20 U	0.20 U	0.2 U	0.40 U	2.0 U	4.9	
	EPA 8270	µg/L	2.0 U	--	1.5 U	--	1 U	--	0.10 UJ	0.10 U	0.10 U	1 U	0.95 U	0.97 U	4.9	
3,3'-Dichlorobenzidine	EPA 8270	µg/L	2.0 U	--	1.5 U	--	10 U	--	0.10 UJ	0.10 U	0.10 U	10 U	0.95 U	0.97 U	0.0033	
2,4-Dichlorophenol	EPA 8270	µg/L	2.0 U	--	1.5 U	--	1 U	--	0.10 U	0.10 U	0.10 U	1 U	0.95 U	0.97 U	10	
Bis(2-ethylhexyl)ester	EPA 8270	µg/L	2.0 U	--	1.5 U	--	1 U	--	0.10 UJ	0.10 U	0.10 U	1 U	0.95 U	0.97 U	400	
Diethyl phthalate	EPA 8270	µg/L	2.0 U	--	1.5 U	--	1 U	--	5.1 J	0.8	2.7	1 U	0.95 U	0.97 U	93	
Dimethyl phthalate	EPA 8270	µg/L	2.0 U	--	1.5 U	--	1 U	--	0.10 UJ	0.10 U	0.10 U	1 U	0.95 U	0.97 U	600	
2,4-Dimethylphenol	EPA 8270	µg/L	2.0 U	--	1.5 U	--	11	--	0.10 U	0.10 U	0.10 U	2.9	1.8	2.1	6.30	
1,2-Dinitrobenzene	EPA 8270	µg/L	2.0 U	--	1.5 U	--	1 U	--	0.10 UJ	0.10 U	0.10 U	1 U	0.95 U	0.97 U	1.6	
1,3-Dinitrobenzene	EPA 8270	µg/L	2.0 U	--	1.5 U	--	1 U	--	0.10 UJ	0.10 U	0.10 U	1 U	0.95 U	0.97 U	1.6	
1,4-Dinitrobenzene	EPA 8270	µg/L	2.0 U	--	1.5 U	--	1 U	--	0.10 UJ	0.10 U	0.10 U	1 U	0.95 U	0.97 U	1.6	
4,6-Dinitro-2-methylphenol	EPA 8270	µg/L	2.0 U	--	7.5 U	--	5 U	--	0.50 U	0.50 U	0.50 U	5 U	0.95 U	0.97 U	NE	
2,4-Dinitrophenol	EPA 8270	µg/L	2.0 U	--	15 U	--	10 U	--	1.0 U	1.0 U	1.0 U	10 U	0.95 U	0.97 U	100	
2,4-Dinitrotoluene	EPA 8270	µg/L	2.0 U	--	3.8 U	--	1 U	--	0.10 UJ	0.25 U	0.10 U	1 U	0.95 U	0.97 U	0.18	
2,6-Dinitrotoluene	EPA 8270	µg/L	2.0 U	--	1.5 U	--	1 U	--	0.10 UJ	0.10 U	0.10 U	1 U	0.95 U	0.97 U	300	
Di-n-octyl phthalate	EPA 8270	µg/L	2.0 U	--	1.5 U	--	1 U	--	0.10 UJ	0.10 U	0.10 U	1 U	0.95 U	0.97 U	0.0039	
1,2-Diphenylhydrazine	EPA 8270	µg/L	2.0 U	--	1.5 U	--	1 U	--	0.10 UJ	0.10 U	0.10 U	1 U	0.95 U	0.97 U	0.02	
Hexachlorobenzene	EPA 8270	µg/L	2.0 U	--	1.5 U	--	1 U	--	0.10 UJ	0.10 U	0.10 U	1 U	0.95 U	0.97 U	0.000005	
Hexachlorobutadiene	EPA 8260	µg/L	2.0 UJ	--	2.0 U	--	0.2 U	--	0.20 U	0.25 U	0.25 U	0.2 U	0.40 U	2.0 U	0.01	
	EPA 8270	µg/L	2.0 U		1.5 U		1 U		0.10 U	0.10 U	0.10 U	1 U	0.95 U	0.97 U	0.01	

Table D-2
Remedial Investigation Chemical Analytical Results - Groundwater COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Monitoring Well ¹	Analytical Method	Units	MW-5	MW-5 ²	MW-5	MW-5 ²	MW-6	MW-6 ²	MW-6	MW-6	MW-6	MW-6	MW-7	MW-7	MW-7	Groundwater Preliminary Cleanup Level ³ (PCUL)
Sample Date			06/10/14	09/25/14	01/20/15	04/22/15	11/5/2009	06/10/14	09/25/14	01/19/15	04/23/15	11/4/2009	06/12/14	09/24/14		
Monitoring Event			Jun-14	Sep-14	Jan-15	Apr-15	Nov-09	Jun-14	Sep-14	Jan-15	Apr-15	Nov-09	Jun-14	Sep-14		
Sampled By			GEI	GEI	GEI	GEI	Landau	GEI	GEI	GEI	GEI	Landau	GEI	GEI		
Hexachlorocyclopentadiene	EPA 8270	µg/L	2.0 U	--	1.5 U	--	1 U	--	0.10 UJ	0.10 U	0.10 U	1 U	0.95 U	0.97 U	1.00	
Hexachloroethane	EPA 8270	µg/L	2.0 U	--	1.5 U	--	1 U	--	0.10 UJ	0.10 U	0.10 U	1 U	0.95 U	0.97 U	0.02	
Isophorone	EPA 8270	µg/L	2.0 U	--	1.5 U	--	1 U	--	0.10 UJ	0.10 U	0.10 U	1 U	0.95 U	0.97 U	110	
2-Methylphenol (o-Cresol)	EPA 8270	µg/L	28	--	14	--	1	--	0.10 U	0.10 U	0.10 U	1 U	0.95 U	0.97 U	27	
3 & 4 Methylphenol (m & p-Cresol)	EPA 8270	µg/L	7.4	--	1.5 U	--	--	--	0.10 UJ	0.10 U	0.10 U	--	1.8	4.7	400	
2-Nitroaniline	EPA 8270	µg/L	2.0 U	--	1.5 U	--	1 U	--	0.10 UJ	0.10 U	0.10 U	1 U	0.95 U	0.97 U	160	
3-Nitroaniline	EPA 8270	µg/L	2.0 U	--	1.5 U	--	1 U	--	0.10 UJ	0.10 U	0.10 U	1 U	0.95 U	0.97 U	NE	
4-Nitroaniline	EPA 8270	µg/L	2.0 U	--	1.5 U	--	1 U	--	0.10 UJ	0.10 U	0.10 U	1 U	0.95 U	0.97 U	NE	
Nitrobenzene	EPA 8270	µg/L	2.0 U	--	1.5 U	--	1 U	--	0.10 UJ	0.10 U	0.10 U	1 U	0.95 U	0.97 U	100	
2-Nitrophenol	EPA 8270	µg/L	2.0 U	--	1.5 U	--	1 U	--	0.10 U	0.10 U	0.10 U	1 U	0.95 U	0.97 U	NE	
4-Nitrophenol (p-Nitrophenol)	EPA 8270	µg/L	2.0 U	--	1.5 U	--	1 U	--	0.10 U	0.10 U	0.10 U	1 U	0.95 U	0.97 U	NE	
n-Nitrosodimethylamine	EPA 8270	µg/L	2.0 U	--	1.5 U	--	1 U	--	0.10 UJ	0.10 U	0.10 U	1 U	0.95 U	0.97 U	0.34	
n-Nitrosodiphenylamine (as Diphenylamine)	EPA 8270	µg/L	2.0 U	--	1.5 U	--	10 U	--	0.10 UJ	0.10 U	0.10 U	10 U	0.95 U	0.97 U	0.69	
n-Nitrosodi-n-propylamine	EPA 8270	µg/L	2.0 U	--	1.5 U	--	1 U	--	0.10 UJ	0.10 U	0.10 U	1 U	0.95 U	0.97 U	0.058	
n-Octadecane	EPA 8270	µg/L	2.0 U	--	1.5 U	--	--	--	0.10 UJ	0.10 U	0.10 U	--	0.95 U	0.97 U	NE	
Pentachlorophenol	EPA 8270	µg/L	2.0 U	--	7.5 U	--	5 U	--	0.50 U	0.50 U	0.50 U	5 U	0.95 UJ	0.97 U	0.002	
Phenol	EPA 8270	µg/L	2.0 U	--	1.5 U	--	1 U	--	0.10 U	0.10 U	0.10 U	51	7.4	16	370	
Pyridine	EPA 8270	µg/L	2.0 U	--	1.5 U	--	10 U	--	0.10 UJ	0.10 U	0.10 U	10 U	0.95 U	0.97 U	8	
2,3,4,6-Tetrachlorophenol	EPA 8270	µg/L	2.0 U	--	1.5 U	--	1 U	--	0.10 U	0.10 U	0.10 U	1 U	0.95 U	0.97 U	480	
2,3,5,6-Tetrachlorophenol	EPA 8270	µg/L	2.0 U	--	1.5 U	--	1 U	--	0.10 U	0.10 U	0.10 U	1 U	0.95 U	0.97 U	NE	
1,2,4-Trichlorobenzene	EPA 8260	µg/L	2.0 UJ	--	2.0 U	--	0.2 U	--	0.30 UJ	0.20 U	0.27 U	0.2 U	0.40 U	2.8 U	0.037	
	EPA 8270	µg/L	2.0 U	--	1.5 U	--	1 U	--	0.10 UJ	0.10 U	0.10 U	1 U	0.95 U	0.97 U	0.037	
2,4,5-Trichlorophenol	EPA 8270	µg/L	2.0 U	--	1.5 U	--	1 U	--	0.10 U	0.10 U	0.10 U	1 U	0.95 U	0.97 U	600	
2,4,6-Trichlorophenol	EPA 8270	µg/L	2.0 U	--	1.5 U	--	1 U	--	0.10 U	0.10 U	0.10 U	1 U	0.95 U	0.97 U	0.28	
Volatile Organic Compounds (VOCs)																
Acetone	EPA 8260	µg/L	50 UJ	--	50 U	--	5 U	--	5.0 U	5.0 U	5.0 U	160	53	78	NE	
Benzene	EPA 8260	µg/L	2.0 UJ	--	2.0 U	--	0.29	--	0.20 U	0.20 U	0.20 U	0.24	0.55	2.0 U	1.6	
Bromobenzene	EPA 8260	µg/L	2.0 UJ	--	2.0 U	--	0.2 U	--	0.20 U	0.20 U	0.20 U	0.2 U	0.40 U	2.0 U	NE	
Bromochloromethane	EPA 8260	µg/L	2.0 UJ	--	2.0 U	--	0.2 U	--	0.20 U	0.20 U	0.20 U	0.2 U	0.40 U	2.0 U	NE	
Bromoform (Tribromomethane)	EPA 8260	µg/L	10 UJ	--	10 U	--	1 U	--	1.0 U	1.0 U	1.0 U	1 U	2.0 U	10 U	12	
Bromomethane	EPA 8260	µg/L	5.1 UJ	--	2.0 U	--	0.2 U	--	0.55 UJ	0.20 U	0.38 UJ	0.2 U	0.78 UJ	2.8 U	13	
n-Butylbenzene	EPA 8260	µg/L	2.0 UJ	--	2.0 U	--	0.2 U	--	0.20 U	0.20 U	0.20 U	0.2 U	0.40 U	2.0 U	400	
sec-Butylbenzene	EPA 8260	µg/L	2.0 UJ	--	2.0 U	--	0.2 U	--	0.20 U	0.20 U	0.20 U	0.2 U	0.40 U	2.0 U	800	
tert-Butylbenzene	EPA 8260	µg/L	2.0 UJ	--	2.0 U	--	0.2 U	--	0.20 U	0.20 U	0.20 U	0.2 U	0.40 U	2.0 U	800	
Carbon disulfide	EPA 8260	µg/L	2.0 UJ	--	2.0 U	--	0.2 U	--	0.20 U	0.20 U	0.20 U	71	13	6.3	400	
Carbon tetrachloride	EPA 8260	µg/L	2.0 UJ	--	2.0 U	--	0.2 U	--	0.20 U	0.20 U	0.20 U	0.2 U	0.40 U	2.0 U	0.35	
Chlorobenzene	EPA 8260	µg/L	2.0 UJ	--	2.0 U	--	0.2 U	--	0.20 U	0.20 U	0.20 U	0.2 U	0.40 U	2.0 U	200	
Chloroethane	EPA 8260	µg/L	10 UJ	--	10 U	--	1 U	--	1.0 U	1.0 U	1.0 U	1 U	2.0 U	10 U	19,000	
2-Chloroethyl vinyl ether	EPA 8260	µg/L	10 UJ	--	30 UJ	--	1 U	--	1.4 UJ	3.0 U	1.7 UJ	1 U	2.0 U	10 U	NE	
Chloroform	EPA 8260	µg/L	2.0 UJ	--	2.0 U	--	0.2 U	--	0.20 U	0.20 U	0.20 U	0.2 U	0.40 U	2.0 U	1.2	
Chloromethane	EPA 8260	µg/L	10 UJ	--	10 U	--	1 U	--	1.0 U	1.0 U	1.0 U	1 U	2.0 UJ	10 U	150	
2-Chlorotoluene	EPA 8260	µg/L	2.0 UJ	--	2.0 U	--	0.2 U	--	0.20 U	0.20 U	0.20 U	0.2 U	0.40 U	2.0 U	160	
4-Chlorotoluene	EPA 8260	µg/L	2.0 UJ	--	2.0 U	--	0.2 U	--	0.20 U	0.20 U	0.20 U	0.2 U	0.40 U	2.0 U	NE	

Table D-2
Remedial Investigation Chemical Analytical Results - Groundwater COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Monitoring Well ¹	Analytical Method	Units	MW-5	MW-5 ²	MW-5	MW-5 ²	MW-6	MW-6 ²	MW-6	MW-6	MW-6	MW-6	MW-7	MW-7	MW-7	Groundwater Preliminary Cleanup Level ³ (PCUL)
Sample Date			06/10/14	09/25/14	01/20/15	04/22/15	11/5/2009	06/10/14	09/25/14	01/19/15	04/23/15	11/4/2009	06/12/14	09/24/14		
Monitoring Event			Jun-14	Sep-14	Jan-15	Apr-15	Nov-09	Jun-14	Sep-14	Jan-15	Apr-15	Nov-09	Jun-14	Sep-14		
Sampled By			GEI	GEI	GEI	GEI	Landau	GEI	GEI	GEI	GEI	Landau	GEI	GEI		
Dibromochloromethane	EPA 8260	µg/L	2.0 UJ	--	2.0 U	--	0.2 U	--	0.20 U	0.20 U	0.20 U	0.2 U	0.40 U	2.0 U	2.2	
1,2-Dibromo-3-chloropropane	EPA 8260	µg/L	10 UJ	--	10 U	--	1 U	--	1.0 U	1.0 U	1.3 U	1 U	2.0 U	10 U	0.2	
Dibromomethane	EPA 8260	µg/L	2.0 UJ	--	2.0 U	--	0.2 U	--	0.20 U	0.20 U	0.20 U	0.2 U	0.40 U	2.0 U	80	
Bromodichloromethane	EPA 8260	µg/L	2.0 UJ	--	2.0 U	--	0.2 U	--	0.20 U	0.20 U	0.20 U	0.2 U	0.40 U	2.0 U	1.8	
Dichlorodifluoromethane (CFC-12)	EPA 8260	µg/L	2.0 UJ	--	2.0 U	--	0.2 U	--	0.20 U	0.20 U	0.20 U	0.2 U	0.40 U	2.0 U	5.6	
1,1-Dichloroethane	EPA 8260	µg/L	2.0 UJ	--	2.0 U	--	0.2 U	--	0.20 U	0.20 U	0.20 U	0.2 U	0.40 U	2.0 U	11	
1,2-Dichloroethane	EPA 8260	µg/L	2.0 UJ	--	2.0 U	--	0.2 U	--	0.20 U	0.20 U	0.20 U	0.2 U	0.40 U	2.0 U	4.2	
1,1-Dichloroethene	EPA 8260	µg/L	2.0 UJ	--	2.0 U	--	0.02 U	--	0.20 U	0.20 U	0.20 U	0.02 U	0.40 U	2.0 U	130	
cis-1,2-Dichloroethene	EPA 8260	µg/L	2.0 UJ	--	2.0 U	--	0.2 U	--	0.20 U	0.20 U	0.20 U	0.2 U	0.40 U	2.0 U	16	
trans-1,2-Dichloroethene	EPA 8260	µg/L	2.0 UJ	--	2.0 U	--	0.2 U	--	0.20 U	0.20 U	0.20 U	0.2 U	0.40 U	2.0 U	1,000	
1,2-Dichloropropane	EPA 8260	µg/L	2.0 UJ	--	2.0 U	--	0.2 U	--	0.20 U	0.20 U	0.20 U	0.2 U	0.40 U	2.0 U	3.1	
1,3-Dichloropropane	EPA 8260	µg/L	2.0 UJ	--	2.0 U	--	0.2 U	--	0.20 U	0.20 U	0.20 U	0.2 U	0.40 U	2.0 U	NE	
2,2-Dichloropropane	EPA 8260	µg/L	2.0 UJ	--	2.0 U	--	--	--	0.20 U	0.20 U	0.20 U	--	0.40 U	2.0 U	NE	
1,1-Dichloropropene	EPA 8260	µg/L	2.0 UJ	--	2.0 U	--	0.2 U	--	0.20 U	0.20 U	0.20 U	0.2 U	0.40 U	2.0 U	NE	
cis-1,3-Dichloropropene	EPA 8260	µg/L	2.0 UJ	--	2.0 U	--	0.2 U	--	0.20 U	0.20 U	0.20 U	0.2 U	0.40 U	2.0 U	2	
trans-1,3-Dichloropropene	EPA 8260	µg/L	2.0 UJ	--	2.0 U	--	0.2 U	--	0.20 U	0.20 U	0.20 U	0.2 U	0.40 U	2.0 U	2	
Ethylbenzene	EPA 8260	µg/L	2.0 UJ	--	2.0 U	--	0.2 U	--	0.20 U	0.20 U	0.20 U	0.2 U	0.40 U	2.0 U	31	
1,2-Dibromoethane (EDB)	EPA 8260	µg/L	2.0 UJ	--	2.0 U	--	0.2 U	--	0.20 U	0.20 U	0.20 U	0.2 U	0.40 U	2.0 U	0.27	
2-Hexanone	EPA 8260	µg/L	20 UJ	--	20 U	--	2 U	--	2.0 U	2.0 U	2.0 U	2 U	4.0 U	20 U	40	
Isopropylbenzene (Cumene)	EPA 8260	µg/L	2.0 UJ	--	2.0 U	--	0.2 U	--	0.20 U	0.20 U	0.20 U	0.2 U	0.40 U	2.0 U	800	
p-Isopropyltoluene	EPA 8260	µg/L	3.1 J	--	2.0 U	--	0.36	--	0.20 U	0.20 U	0.20 U	0.32	0.56	2.0 U	NE	
2-Butanone (MEK)	EPA 8260	µg/L	50 UJ	--	50 U	--	5 U	--	5.0 U	5.0 U	5.0 U	11	19	50 U	1,700,000	
Methyl iodide (Iodomethane)	EPA 8260	µg/L	27 UJ	--	10 U	--	1 U	--	1.9 UJ	1.0 U	2.4 UJ	1 U	4.2 UJ	10 U	NE	
4-Methyl-2-pentanone (Methyl isobutyl ketone)	EPA 8260	µg/L	20 UJ	--	20 U	--	2 U	--	2.0 U	2.0 U	2.0 U	2 U	4.0 U	20 U	470,000	
Methyl t-butyl ether (MTBE)	EPA 8260	µg/L	2.0 UJ	--	2.0 U	--	0.2 U	--	0.20 U	0.20 U	0.20 U	0.2 U	0.40 U	2.0 U	600	
Methylene chloride	EPA 8260	µg/L	10 UJ	--	10 U	--	1 U	--	1.0 U	1.0 U	1.0 U	1 U	2.0 U	10 U	100	
n-Propylbenzene	EPA 8260	µg/L	2.0 UJ	--	2.0 U	--	0.2 U	--	0.20 U	0.20 U	0.20 U	0.2 U	0.40 U	2.0 U	800	
Styrene	EPA 8260	µg/L	2.0 UJ	--	2.0 U	--	0.2 U	--	0.20 U	0.20 U	0.20 U	0.2 U	0.40 U	2.0 U	8,200	
1,1,1,2-Tetrachloroethane	EPA 8260	µg/L	2.0 UJ	--	2.0 U	--	0.2 U	--	0.20 U	0.20 U	0.20 U	0.2 U	0.40 U	2.0 U	7.4	
1,1,2,2-Tetrachloroethane	EPA 8260	µg/L	2.0 UJ	--	2.0 U	--	0.2 U	--	0.20 U	0.20 U	0.20 U	0.2 U	0.40 U	2.0 U	0.3	
Tetrachloroethene	EPA 8260	µg/L	2.0 UJ	--	2.0 U	--	0.2 U	--	0.20 U	0.20 U	0.20 U	0.2 U	0.40 U	2.0 U	2.9	
Toluene	EPA 8260	µg/L	10 UJ	--	10 U	--	1 U	--	1.0 U	1.0 U	1.0 U	1 U	2.0 U	10 U	130	
1,2,3-Trichlorobenzene	EPA 8260	µg/L	2.0 UJ	--	2.0 U	--	0.2 U	--	0.39 UJ	0.20 U	0.31 U	0.2 U	0.40 U	3.6 UJ	NE	
1,1,1-Trichloroethane	EPA 8260	µg/L	2.0 UJ	--	2.0 U	--	0.2 U	--	0.20 U	0.20 U	0.20 U	0.2 U	0.40 U	2.0 U	5,500	
1,1,2-Trichloroethane	EPA 8260	µg/L	2.0 UJ	--	2.0 U	--	0.2 U	--	0.20 U	0.20 U	0.20 U	0.2 U	0.40 U	2.0 U	0.9	
Trichloroethene	EPA 8260	µg/L	2.0 UJ	--	2.0 U	--	0.2 U	--	0.20 U	0.20 U	0.20 U	0.2 U	0.40 U	2.0 U	0.7	
Trichlorofluoromethane (CFC-11)	EPA 8260	µg/L	2.0 UJ	--	2.0 U	--	0.2 U	--	0.20 U	0.20 U	0.20 U	0.2 U	0.40 U	2.0 U	120	
1,2,3-Trichloropropane	EPA 8260	µg/L	2.0 UJ	--	2.0 U	--	0.2 U	--	0.20 U	0.20 U	0.20 U	0.2 U	0.40 U	2.0 U	1,500	
1,2,4-Trimethylbenzene	EPA 8260	µg/L	2.0 UJ	--	2.0 U	--	0.54	--	0.32	0.46	0.48	0.28	0.63	2.0 U	240	
1,3,5-Trimethylbenzene	EPA 8260	µg/L	2.0 UJ	--	2.0 U	--	0.38	--	0.20 U	0.20 U	0.20 U	0.2 U	0.40 U	2.0 U	80	
Vinyl acetate	EPA 8260	µg/L	10 UJ	--	10 U	--	2 U	--	1.0 U	1.0 U	1.0 U	2 U	2.0 UJ	10 U	7,800	

Table D-2
Remedial Investigation Chemical Analytical Results - Groundwater COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Monitoring Well ¹	Analytical Method	Units	MW-5	MW-5 ²	MW-5	MW-5 ²	MW-6	MW-6 ²	MW-6	MW-6	MW-6	MW-7	MW-7	MW-7	Groundwater Preliminary Cleanup Level ³ (PCUL)
Sample Date			06/10/14	09/25/14	01/20/15	04/22/15	11/5/2009	06/10/14	09/25/14	01/19/15	04/23/15	11/4/2009	06/12/14	09/24/14	
Monitoring Event			Jun-14	Sep-14	Jan-15	Apr-15	Nov-09	Jun-14	Sep-14	Jan-15	Apr-15	Nov-09	Jun-14	Sep-14	
Sampled By			GEI	GEI	GEI	GEI	Landau	GEI	GEI	GEI	GEI	Landau	GEI	GEI	
Vinyl chloride	EPA 8260	µg/L	2.0 UJ	--	2.0 U	--	0.02 U	--	0.20 U	0.20 U	0.20 U	0.02 U	0.40 U	2.0 U	0.18
Xylene, m-,p-	EPA 8260	µg/L	4.0 UJ	--	4.0 U	--	0.47	--	0.40 U	0.40 U	0.40 U	0.4 U	0.80 U	4.0 U	290
Xylene, o-	EPA 8260	µg/L	2.0 UJ	--	2.0 U	--	0.47	--	0.27	0.29	0.29	0.2 U	0.44	2.0 U	430
Petroleum Hydrocarbons															
Gasoline-range hydrocarbons	NWTPH-G	µg/L	130	--	100 U	--	--	--	100 U	100 U	100 U	--	100 U	100 U	800
Diesel-range hydrocarbons	NWTPH-Dx	µg/L	7,200	--	12,000	--	--	--	310	340	250	--	580	400 J	500
Oil-range hydrocarbons	NWTPH-Dx	µg/L	15,000	--	19,000	--	--	--	340 U	400 U	400 U	--	750	400 UJ	500
Total diesel- and oil-range hydrocarbons	NWTPH-Dx	µg/L	22,200	--	31,000	--	--	--	310	340	250	--	1,330	400 J	500
Diesel-range hydrocarbons	NWTPH-Dx Si/Gel	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	500
Oil-range hydrocarbons	NWTPH-Dx Si/Gel	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	500
Total diesel- and oil-range hydrocarbons	NWTPH-Dx Si/Gel	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	500
Conventional Parameters															
Total organic carbon (TOC)	SM 5310B	mg/L	--	--	--	--	--	--	--	--	--	--	--	160	NE
Field Measured Parameters															
pH	N/A	N/A	10.05	--	9.63	--	22.36	--	6.42	6.80	6.96	10.99	11.07	11.03	NE

Notes:

¹ Monitoring well locations are shown on Figures 3-2 and 3-4.

² Insufficient water to collect groundwater sample for chemical analysis.

³ Groundwater screening levels referenced from Table 4-2.

⁴ Total dioxin/furan Toxic Equivalency Quotients (TEQs) were calculated using United States Environmental Protection Agency (USEPA) Toxicity Equivalency Factor (TEF) values for human health (EPA 2003).

⁵ Total carcinogenic PAH (cPAH) TEQs were calculated using TEF values referenced from MTCA Table 708.2 (WAC 173-340-900).

mg/L = milligram per liter

µg/L = microgram per liter

NE = not established

Landau = Landau Associates

GEI = GeoEngineers

NE = not established

J = estimated result

U = analyte not detected above the reporting limit

-- = not analyzed

COPC = Contaminant of Potential Concern

Bold indicates analyte was detected.

Yellow shading identifies the detected results greater than the preliminary cleanup level.

Blue shading identifies the non-detected result greater than the preliminary cleanup level.

Table D-2
Remedial Investigation Chemical Analytical Results - Groundwater COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Monitoring Well ¹	Analytical Method	Units	MW-7	MW-7	MW-8	MW-8	MW-8	MW-8	MW-8	MW-9	MW-9	MW-9	MW-9	MW-9	Groundwater Preliminary Cleanup Level ³ (PCUL)
Sample Date			01/21/15	04/23/15	11/4/2009	06/12/14	09/26/14	01/21/15	04/23/15	11/4/2009	06/13/14	09/25/14	01/20/15	04/20/15	
Monitoring Event			Jan-15	Apr-15	Nov-09	Jun-14	Sep-14	Jan-15	Apr-15	Nov-09	Jun-14	Sep-14	Jan-15	Apr-15	
Sampled By			GEI	GEI	Landau	GEI	GEI	GEI	GEI	Landau	GEI	GEI	GEI	GEI	
Polychlorinated Biphenyls (PCBs)															
PCB-Aroclor 1016	EPA 8082	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
PCB-Aroclor 1221	EPA 8082	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
PCB-Aroclor 1232	EPA 8082	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
PCB-Aroclor 1242	EPA 8082	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
PCB-Aroclor 1248	EPA 8082	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
PCB-Aroclor 1254	EPA 8082	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
PCB-Aroclor 1260	EPA 8082	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
Total PCB Aroclors	EPA 8082	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	0.000007
Total PCB Congeners	EPA 1668	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	0.000007
Dioxins and Furans															
1,2,3,4,6,7,8-HpCDD	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,4,6,7,8-HpCDF	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,4,7,8,9-HpCDF	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,4,7,8-HxCDD	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,4,7,8-HxCDF	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,6,7,8-HxCDD	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,6,7,8-HxCDF	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,7,8,9-HxCDD	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,7,8,9-HxCDF	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,7,8-PeCDD	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,7,8-PeCDF	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
2,3,4,6,7,8-HxCDF	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
2,3,4,7,8-PeCDF	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
2,3,7,8-TCDD	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
2,3,7,8-TCDF	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
OCDD	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
OCDF	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
Total Dioxin/Furan TEQ ⁴ (ND=0)	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	0.0000000051
Total Dioxin/Furan TEQ ⁴ (ND=0.5RL)	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	0.0000000051
Total Metals															
Antimony	EPA 200.8/7470	µg/L	70	51	1 U	5.4 U	5.4 U	5.4 U	5.4 U	1 U	5.4 U	5.4 U	5.4 U	5.4 U	90
Arsenic	EPA 200.8/7470	µg/L	880	750	11	7.9	5.6	6.3	5.1	160	190	170	350	510	8.0
Barium	EPA 200.8/7470	µg/L	70	82	--	17	6.6	7	6.9	--	18	37	18	29	200
Beryllium	EPA 200.8/7470	µg/L	10 U	10 U	11 U	10 U	10 U	10 U	10 U	11 U	10 U	10 U	10 U	10 U	4.4
Cadmium	EPA 200.8/7470	µg/L	1.3	0.88	4.4 U	0.20 U	0.20 U	0.20 U	0.20 U	4.4 U	0.20 U	0.20 U	0.20 U	0.20 U	1.2
Chromium III / Total	EPA 200.8/7470	µg/L	180	140	2.8	4	2.3	2.0 U	2.0 U	2 U	2.0 U	2.0 U	2.0 U	2.0 U	27
Chromium VI	EPA 200.8/7470	µg/L	--	--	10 U	--	--	--	--	10 UJ	--	--	--	--	50
Copper	EPA 200.8/7470	µg/L	31	20	2.1	6.2	2.0 U	2.0 U	2.0 U	1.3	8.3	2.0 U	2.0 U	2.0 U	3.1
Lead	EPA 200.8/7470	µg/L	110	76	2.8	5.6	1.3	1.0 U	1.0 U	1 U	1.0 U	1.0 U	1.0 U	1.0 U	8.1
Mercury	EPA 200.8/7470	µg/L	0.50 U	0.50 U	0.1 U	0.50 U	0.50 U	0.50 U	0.50 U	0.1 U	0.50 U	0.50 U	0.50 U	0.50 U	0.025
Nickel	EPA 200.8/7470	µg/L	61	46	22 U	3.1	2.0 U	2.0 U	2.0 U	22 U	10	11	3.7	4.2	8.2

Table D-2
Remedial Investigation Chemical Analytical Results - Groundwater COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Monitoring Well ¹	Analytical Method	Units	MW-7	MW-7	MW-8	MW-8	MW-8	MW-8	MW-8	MW-9	MW-9	MW-9	MW-9	MW-9	Groundwater Preliminary Cleanup Level ³ (PCUL)
Sample Date			01/21/15	04/23/15	11/4/2009	06/12/14	09/26/14	01/21/15	04/23/15	11/4/2009	06/13/14	09/25/14	01/20/15	04/20/15	
Monitoring Event			Jan-15	Apr-15	Nov-09	Jun-14	Sep-14	Jan-15	Apr-15	Nov-09	Jun-14	Sep-14	Jan-15	Apr-15	
Sampled By			GEI	GEI	Landau	GEI	GEI	GEI	GEI	Landau	GEI	GEI	GEI	GEI	
Selenium	EPA 200.8/7470	µg/L	8.6	6.0 U	5.6 U	6.0 U	6.0 U	6.0 U	6.0 U	5.6 U	6.0 U	6.0 U	6.0 U	6.0 U	71
Silver	EPA 200.8/7470	µg/L	1.0 U	1.0 U	11 U	1.0 U	1.0 U	1.0 U	1.0 U	11 U	1.0 U	1.0 U	1.0 U	1.0 U	1.9
Thallium	EPA 200.8/7470	µg/L	2.0 U	2.0 U	5.6 U	2.0 U	2.0 U	2.0 U	2.0 U	5.6 U	2.0 U	2.0 U	2.0 U	2.0 U	0.062
Tin	EPA 200.8/7470	µg/L	54	45	10 U	5.0 U	5.0 U	5.0 U	5.0 U	10 U	5.0 U	5.0 U	5.0 U	5.0 U	9,600
Zinc	EPA 200.8/7470	µg/L	140	100	32	56 U	56 U	56 U	56 U	13	56 U	56 U	56 U	56 U	81
Dissolved Metals															
Antimony	EPA 200.8/7470	µg/L	65	77	1 U	5.5 U	5.5 U	5.5 U	5.6 U	1 U	5.5 U	5.5 U	5.5 U	5.5 U	90
Arsenic	EPA 200.8/7470	µg/L	890	880	12	5.3	4.7	7.3	4.6	180	180	180 J	290	480	8.0
Barium	EPA 200.8/7470	µg/L	59	81	–	5.1	5.0 U	7.2	6.7	–	18	37	18	26	200
Beryllium	EPA 200.8/7470	µg/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	4.4
Cadmium	EPA 200.8/7470	µg/L	0.99	0.85	4 U	0.20 U	0.20 U	0.20 U	0.20 U	4 U	0.20 U	0.20 U	0.20 U	0.20 U	1.2
Chromium III / Total	EPA 200.8/7470	µg/L	180	190	3.2	2.0 U	2.0 U	2.0 U	2.0 U	2.5	2.0 U	2.0 U	2.0 U	2.0 U	27
Copper	EPA 200.8/7470	µg/L	26	27	1 U	2.0 U	2.0 U	2.0 U	2.0 U	1 U	2.0 U	2.0 U	2.0 U	2.0 U	3.1
Lead	EPA 200.8/7470	µg/L	95	89	1 U	1.0 U	1.0 U	1.0 U	1.0 U	1 U	1.0 U	1.0 U	1.0 U	1.0 U	8.1
Mercury	EPA 200.8/7470	µg/L	0.50 U	0.50 U	0.1 U	0.50 U	0.50 U	0.50 U	0.50 U	0.1 U	0.50 U	0.50 U	0.50 U	0.50 U	0.025
Nickel	EPA 200.8/7470	µg/L	59	50	20 U	2.0 U	2.0 U	2.0 U	2.0 U	20 U	10	12	3.9	4.1	8.2
Selenium	EPA 200.8/7470	µg/L	7.3	6.0 U	5 U	6.0 U	6.0 U	6.0 U	6.0 U	5 U	6.0 U	6.0 U	6.0 U	6.0 U	71
Silver	EPA 200.8/7470	µg/L	1.0 U	1.0 U	10 U	1.0 U	1.0 U	1.0 U	1.0 U	10 U	1.0 U	1.0 U	1.0 U	1.0 U	1.9
Thallium	EPA 200.8/7470	µg/L	2.0 U	2.0 U	5 U	2.0 U	2.0 U	2.0 U	2.0 U	5 U	2.0 U	2.0 U	2.0 U	2.0 U	0.062
Tin	EPA 200.8/7470	µg/L	49	60	10 U	5.0 U	5.0 U	5.0 U	5.0 U	10 U	5.0 U	5.0 U	5.0 U	5.0 U	9,600
Zinc	EPA 200.8/7470	µg/L	120	110	10	56 U	56 U	56 U	56 U	5 U	56 U	56 U	56 U	56 U	81
Semi-Volatile Organic Compounds (SVOCs) - Polycyclic Aromatic Hydrocarbons (PAHs)															
Acenaphthene	EPA 8270/SIM	µg/L	0.95 U	0.97 U	0.1 U	0.54 U	0.10 UJ	0.10 U	0.10 U	0.1 U	0.51 U	0.10 U	0.10 U	0.10 U	5.3
Acenaphthylene	EPA 8270/SIM	µg/L	0.95 U	0.97 U	0.1 U	0.54 U	0.10 UJ	0.10 U	0.10 U	0.1 U	0.51 U	0.10 U	0.10 U	0.10 U	NE
Anthracene	EPA 8270/SIM	µg/L	0.95 U	0.97 U	0.1 U	0.54 U	0.10 UJ	0.10 U	0.10 U	0.1 U	0.51 U	0.10 U	0.10 U	0.10 U	2.1
Benzo(a)anthracene	EPA 8270/SIM	µg/L	0.18	0.15	0.01 U	0.054 U	0.010 J	0.010 U	0.10 U	0.01 U	0.051 U	0.010 U	0.010 U	0.010 U	0.00016
Benzo(b)fluoranthene	EPA 8270/SIM	µg/L	0.11	0.97 U	0.01 U	0.054 U	0.010 UJ	0.010 U	0.10 U	0.01 U	0.051 U	0.010 U	0.010 U	0.010 U	0.00016
Benzo(j,k)fluoranthene	EPA 8270/SIM	µg/L	0.06	0.97 U	0.01 U	0.054 U	0.010 UJ	0.010 U	0.10 U	0.01 U	0.051 U	0.010 U	0.010 U	0.010 U	0.0016
Benzo(g,h,i)perylene	EPA 8270/SIM	µg/L	0.063	0.97 U	0.01 U	0.054 U	0.010 UJ	0.010 U	0.10 U	0.01 U	0.051 U	0.010 U	0.010 U	0.010 U	NE
Benzo(a)pyrene	EPA 8270/SIM	µg/L	0.079	0.97 U	0.01 U	0.054 U	0.010 UJ	0.010 U	0.10 U	0.01 U	0.051 U	0.010 U	0.010 U	0.010 U	0.000016
Chrysene	EPA 8270/SIM	µg/L	0.14	0.14	0.01 U	0.054 U	0.010 UJ	0.010 U	0.10 U	0.01 U	0.051 U	0.010 U	0.010 U	0.010 U	0.016
Dibenzo(a,h)anthracene	EPA 8270/SIM	µg/L	0.047 U	0.97 U	0.01 U	0.054 U	0.010 UJ	0.010 U	0.10 U	0.01 U	0.051 U	0.010 U	0.010 U	0.010 U	0.000016
Dibenzofuran	EPA 8270/SIM	µg/L	0.94 U	0.97 U	1 U	1.1 U	0.10 UJ	0.10 U	0.10 U	1 U	1.0 U	0.10 U	0.10 U	0.10 U	16
Fluoranthene	EPA 8270/SIM	µg/L	0.95 U	0.97 U	0.1 U	0.54 U	0.10 UJ	0.10 U	0.10 U	0.1 U	0.51 U	0.10 U	0.10 U	0.10 U	1.8
Fluorene	EPA 8270/SIM	µg/L	0.95 U	0.97 U	0.1 U	0.54 U	0.10 UJ	0.10 U	0.10 U	0.1 U	0.51 U	0.10 U	0.10 U	0.10 U	3.7
Indeno(1,2,3-c,d)pyrene	EPA 8270/SIM	µg/L	0.047 U	0.97 U	0.01 U	0.054 U	0.010 UJ	0.010 U	0.10 U	0.01 U	0.051 U	0.010 U	0.010 U	0.010 U	0.00016
1-Methylnaphthalene	EPA 8270/SIM	µg/L	0.95 U	0.97 U	0.1 U	0.54 U	0.10 UJ	0.10 U	0.10 U	0.1 U	0.51 U	0.10 U	0.10 U	0.10 U	1.5
2-Methylnaphthalene	EPA 8270/SIM	µg/L	0.95 U	0.97 U	0.1 U	0.54 U	0.10 UJ	0.10 U	0.10 U	0.1 U	0.51 U	0.10 U	0.10 U	0.10 U	32
Naphthalene	EPA 8270/SIM	µg/L	5.2	3.4	0.1 U	0.54 U	0.10 UJ	0.10 U	0.063	0.1 U	0.51 U	0.10 U	0.10 U	0.10 U	1.4
Phenanthrene	EPA 8270/SIM	µg/L	0.95 U	0.97 U	0.1 U	0.54 U	0.10 UJ	0.10 U	0.10 U	0.1 U	0.51 U	0.10 U	0.10 U	0.10 U	NE
Pyrene	EPA 8270/SIM	µg/L	0.95 U	0.97 U	0.1 U	0.54 U	0.10 UJ	0.10 U	0.10 U	0.1 U	0.51 U	0.10 U	0.050 U	0.10 U	2
Total cPAH TEQ ⁵ (ND=0)	EPA 8270/SIM	µg/L	0.1154	0.0164	0 U	0 U	0.001	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0.000016
Total cPAH TEQ ⁵ (ND=0.5RL)	EPA 8270/SIM	µg/L	0.1201	0.6954	0.0076 U	0.041 U	0.0081	0.0076 U	0.0076 U	0.0076 U	0.0390 U	0.0076 U	0.0076 U	0.0076 U	0.000016

Table D-2
Remedial Investigation Chemical Analytical Results - Groundwater COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Monitoring Well ¹	Analytical Method	Units	MW-7	MW-7	MW-8	MW-8	MW-8	MW-8	MW-8	MW-8	MW-9	MW-9	MW-9	MW-9	MW-9	Groundwater Preliminary Cleanup Level ³ (PCUL)
Sample Date			01/21/15	04/23/15	11/4/2009	06/12/14	09/26/14	01/21/15	04/23/15	11/4/2009	06/13/14	09/25/14	01/20/15	04/20/15		
Monitoring Event			Jan-15	Apr-15	Nov-09	Jun-14	Sep-14	Jan-15	Apr-15	Nov-09	Jun-14	Sep-14	Jan-15	Apr-15		
Sampled By			GEI	GEI	Landau	GEI	GEI	GEI	GEI	Landau	GEI	GEI	GEI	GEI		
Other SVOCs (mg/kg)																
Aniline	EPA 8270	µg/L	0.94 U	0.97 U	5 U	1.1 U	0.10 UJ	0.10 U	0.10 U	5 U	1.0 U	0.10 U	0.10 U	0.10 U	0.10 U	7.7
Benzidine	EPA 8270	µg/L	0.94 U	0.97 U	10 U	1.1 U	0.10 UJ	0.10 U	0.10 U	10 U	1.0 U	0.10 U	0.10 U	0.10 U	0.10 U	0.000023
Benzoic acid	EPA 8270	µg/L	4.7 U	0.97 U	--	1.1 U	0.50 UJ	0.50 U	0.50 U	--	1.0 U	0.50 U	0.50 U	0.50 U	0.50 U	590
Benzyl alcohol	EPA 8270	µg/L	0.94 U	1.4	1 U	1.1 U	0.10 UJ	0.10 U	0.10 U	1 U	1.0 U	0.10 U	0.10 U	0.10 U	0.10 U	800
Bis(2-chloroethoxy)methane	EPA 8270	µg/L	0.94 U	0.97 U	1 U	1.1 U	0.10 UJ	0.10 U	0.10 U	1 U	1.0 U	0.10 U	0.10 U	0.10 U	0.10 U	NE
Bis(2-chloroethyl)ether	EPA 8270	µg/L	0.94 U	0.97 U	1 U	1.1 U	0.10 UJ	0.10 U	0.10 U	1 U	1.0 U	0.10 U	0.10 U	0.10 U	0.10 U	0.06
Bis(2-chloroisopropyl)ether	EPA 8270	µg/L	0.94 U	0.97 U	1 U	1.1 U	0.10 UJ	0.10 U	0.10 U	1 U	1.0 U	0.10 U	0.10 U	0.10 U	0.10 U	900
Bis(2-ethylhexyl)phthalate	EPA 8270	µg/L	5.3 U	1.6 U	1 U	1.1 U	0.10 UJ	0.49 U	0.21 U	1 U	1.0 U	0.12 U	0.28 U	0.14	0.046	0.046
4-Bromophenyl phenyl ether	EPA 8270	µg/L	0.94 U	0.97 U	1 U	1.1 U	0.10 UJ	0.10 U	0.10 U	1 U	1.0 U	0.10 U	0.10 U	0.10 U	0.10 U	NE
Butyl benzyl phthalate	EPA 8270	µg/L	0.94 U	0.97 U	1 U	1.1 U	0.10 UJ	0.10 U	0.10 U	1 U	1.0 U	0.10 U	0.10 U	0.10 U	0.10 U	0.013
Carbazole	EPA 8270	µg/L	0.94 U	0.97 U	1 U	1.1 U	0.10 UJ	0.10 U	0.10 U	1 U	1.0 U	0.10 U	0.10 U	0.10 U	0.10 U	NE
4-Chloroaniline	EPA 8270	µg/L	0.94 U	0.97 U	10 U	1.1 U	0.10 UJ	0.10 U	0.10 U	10 U	1.0 U	0.10 U	0.10 U	0.10 U	0.10 U	2,300
4-Chloro-3-methylphenol	EPA 8270	µg/L	0.94 U	0.97 U	1 U	1.1 U	0.10 UJ	0.10 U	0.10 U	1 U	1.0 U	0.10 U	0.10 U	0.10 U	0.10 U	36
2-Chloronaphthalene	EPA 8270	µg/L	0.94 U	0.97 U	1 U	1.1 U	0.10 UJ	0.10 U	0.10 U	1 U	1.0 U	0.10 U	0.10 U	0.10 U	0.10 U	100
2-Chlorophenol	EPA 8270	µg/L	0.94 U	0.97 U	1 U	1.1 U	0.10 UJ	0.10 U	0.10 U	1 U	1.0 U	0.10 U	0.10 U	0.10 U	0.10 U	17
4-Chlorophenyl phenyl ether	EPA 8270	µg/L	0.94 U	0.97 U	1 U	1.1 U	0.10 UJ	0.10 U	0.10 U	1 U	1.0 U	0.10 U	0.10 U	0.10 U	0.10 U	NE
Decane	EPA 8270	µg/L	19 U	0.97 U	--	1.1 U	2.0 UJ	2.0 U	2.0 U	--	1.0 U	2.0 U	2.0 U	2.0 U	2.0 U	NE
Dibutyl phthalate	EPA 8270	µg/L	7.3 U	1.3	1 U	1.1 U	0.10 UJ	0.53 U	0.14	1 U	1.0 U	0.10 U	0.53 U	0.10 U	0.10 U	8
2,3-Dichloroaniline	EPA 8270	µg/L	0.94 U	0.97 U	1 U	1.1 U	0.10 UJ	0.10 U	0.10 U	1 U	1.0 U	0.10 U	0.10 U	0.10 U	0.10 U	NE
1,2-Dichlorobenzene (o-Dichlorobenzene)	EPA 8260	µg/L	0.40 U	0.40 U	0.2 U	0.20 U	0.20 U	0.20 U	0.20 U	0.2 U	--	0.20 U	0.20 U	0.20 U	0.20 U	4.6
	EPA 8270	µg/L	0.94 U	0.97 U	1 U	1.1 U	0.10 UJ	0.10 U	0.10 U	1 U	1.0 U	0.10 U	0.10 U	0.10 U	0.10 U	4.6
1,3-Dichlorobenzene (m-Dichlorobenzene)	EPA 8260	µg/L	0.40 U	0.40 U	0.2 U	0.20 U	0.20 U	0.20 U	0.20 U	0.2 U	--	0.20 U	0.20 U	0.20 U	0.20 U	2.0
	EPA 8270	µg/L	0.94 U	0.97 U	1 U	1.1 U	0.10 UJ	0.10 U	0.10 U	1 U	1.0 U	0.10 U	0.10 U	0.10 U	0.10 U	2.0
1,4-Dichlorobenzene (p-Dichlorobenzene)	EPA 8260	µg/L	0.40 U	0.40 U	0.2 U	0.20 U	0.20 U	0.20 U	0.20 U	0.2 U	--	0.20 U	0.20 U	0.20 U	0.20 U	4.9
	EPA 8270	µg/L	0.94 U	0.97 U	1 U	1.1 U	0.10 UJ	0.10 U	0.10 U	1 U	1.0 U	0.10 U	0.10 U	0.10 U	0.10 U	4.9
3,3'-Dichlorobenzidine	EPA 8270	µg/L	0.94 U	0.97 U	10 U	1.1 U	0.10 UJ	0.10 U	0.10 U	10 U	1.0 U	0.10 U	0.10 U	0.10 U	0.10 U	0.0033
2,4-Dichlorophenol	EPA 8270	µg/L	0.94 U	0.97 U	1 U	1.1 U	0.10 UJ	0.10 U	0.32	1 U	1.0 U	0.10 U	0.10 U	0.10 U	0.10 U	10
Bis(2-ethylhexyl)ester	EPA 8270	µg/L	0.94 U	0.97 U	1 U	1.1 U	0.10 UJ	0.10 U	0.10 U	1 U	1.0 U	0.10 U	0.10 U	0.10 U	0.10 U	400
Diethyl phthalate	EPA 8270	µg/L	0.94 U	0.97 U	1 U	1.1 U	0.19 J	0.10 U	1.9	1 U	1.0 U	0.16	0.10 U	0.10 U	0.10 U	93
Dimethyl phthalate	EPA 8270	µg/L	0.94 U	0.97 U	1 U	1.1 U	0.10 UJ	0.10 U	0.10 U	1 U	1.0 U	0.10 U	0.10 U	0.10 U	0.10 U	600
2,4-Dimethylphenol	EPA 8270	µg/L	0.94 U	2.4	1 U	1.1 U	0.10 UJ	0.10 U	0.10 U	1 U	1.0 U	0.10 U	0.10 U	0.10 U	0.10 U	6.30
1,2-Dinitrobenzene	EPA 8270	µg/L	0.94 U	0.97 U	1 U	1.1 U	0.10 UJ	0.10 U	0.10 U	1 U	1.0 U	0.10 U	0.10 U	0.10 U	0.10 U	1.6
1,3-Dinitrobenzene	EPA 8270	µg/L	0.94 U	0.97 U	1 U	1.1 U	0.10 UJ	0.10 U	0.10 U	1 U	1.0 U	0.10 U	0.10 U	0.10 U	0.10 U	1.6
1,4-Dinitrobenzene	EPA 8270	µg/L	0.94 U	0.97 U	1 U	1.1 U	0.10 UJ	0.10 U	0.10 U	1 U	1.0 U	0.10 U	0.10 U	0.10 U	0.10 U	1.6
4,6-Dinitro-2-methylphenol	EPA 8270	µg/L	4.7 U	0.97 U	5 U	1.1 U	0.50 UJ	0.50 U	0.50 U	5 U	1.0 U	0.50 U	0.50 U	0.50 U	0.50 U	NE
2,4-Dinitrophenol	EPA 8270	µg/L	9.4 U	0.97 U	10 U	1.1 U	1.0 UJ	1.0 U	1.0 U	10 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	100
2,4-Dinitrotoluene	EPA 8270	µg/L	2.4 U	0.97 U	1 U	1.1 U	0.10 UJ	0.25 U	0.10 U	1 U	1.0 U	0.10 U	0.25 U	0.10 U	0.10 U	0.18
2,6-Dinitrotoluene	EPA 8270	µg/L	0.94 U	0.97 U	1 U	1.1 U	0.10 UJ	0.10 U	0.10 U	1 U	1.0 U	0.10 U	0.10 U	0.10 U	0.10 U	300
Di-n-octyl phthalate	EPA 8270	µg/L	0.94 U	0.97 U	1 U	1.1 U	0.10 UJ	0.10 U	0.10 U	1 U	1.0 U	0.10 U	0.10 U	0.10 U	0.10 U	0.0039
1,2-Diphenylhydrazine	EPA 8270	µg/L	0.94 U	0.97 U	1 U	1.1 U	0.10 UJ	0.10 U	0.10 U	1 U	1.0 U	0.10 U	0.10 U	0.10 U	0.10 U	0.02
Hexachlorobenzene	EPA 8270	µg/L	0.94 U	0.97 U	1 U	1.1 U	0.10 UJ	0.10 U	0.10 U	1 U	1.0 U	0.10 U	0.10 U	0.10 U	0.10 U	0.000005
Hexachlorobutadiene	EPA 8260	µg/L	0.40 U	0.50 U	0.2 U	0.20 U	0.20 U	0.20 U	0.25 U	0.2 U	--	0.20 U	0.20 U	0.20 U	0.20 U	0.01
	EPA 8270	µg/L	0.94 U	0.97 U	1 U	1.1 U	0.10 UJ	0.10 U	0.10 U	1 U	1.0 U	0.10 U	0.10 U	0.10 U	0.10 U	0.01

Table D-2
Remedial Investigation Chemical Analytical Results - Groundwater COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Monitoring Well ¹	Analytical Method	Units	MW-7	MW-7	MW-8	MW-8	MW-8	MW-8	MW-8	MW-9	MW-9	MW-9	MW-9	MW-9	Groundwater Preliminary Cleanup Level ³ (PCUL)
Sample Date			01/21/15	04/23/15	11/4/2009	06/12/14	09/26/14	01/21/15	04/23/15	11/4/2009	06/13/14	09/25/14	01/20/15	04/20/15	
Monitoring Event			Jan-15	Apr-15	Nov-09	Jun-14	Sep-14	Jan-15	Apr-15	Nov-09	Jun-14	Sep-14	Jan-15	Apr-15	
Sampled By			GEI	GEI	Landau	GEI	GEI	GEI	GEI	Landau	GEI	GEI	GEI	GEI	
Hexachlorocyclopentadiene	EPA 8270	µg/L	0.94 U	0.97 U	1 U	1.1 U	0.10 UJ	0.10 U	0.10 U	1 U	1.0 U	0.10 U	0.10 U	0.10 U	1.00
Hexachloroethane	EPA 8270	µg/L	0.94 U	0.97 U	1 U	1.1 U	0.10 UJ	0.10 U	0.10 U	1 U	1.0 U	0.10 U	0.10 U	0.10 U	0.02
Isophorone	EPA 8270	µg/L	0.94 U	0.97 U	1 U	1.1 U	0.10 UJ	0.10 U	0.10 U	1 U	1.0 U	0.10 U	0.10 U	0.10 U	110
2-Methylphenol (o-Cresol)	EPA 8270	µg/L	0.94 U	0.97 U	1 U	1.1 U	0.10 UJ	0.10 U	0.10 U	1 U	1.0 U	0.10 U	0.10 U	0.10 U	27
3 & 4 Methylphenol (m & p-Cresol)	EPA 8270	µg/L	2.4	2.1	–	1.1 U	0.10 UJ	0.10 U	0.10 U	–	1.0 U	0.10 U	0.10 U	0.10 U	400
2-Nitroaniline	EPA 8270	µg/L	0.94 U	0.97 U	1 U	1.1 U	0.10 UJ	0.10 U	0.10 U	1 U	1.0 U	0.10 U	0.10 U	0.10 U	160
3-Nitroaniline	EPA 8270	µg/L	0.94 U	0.97 U	1 U	1.1 U	0.10 UJ	0.10 U	0.10 U	1 U	1.0 U	0.10 U	0.10 U	0.10 U	NE
4-Nitroaniline	EPA 8270	µg/L	0.94 U	0.97 U	1 U	1.1 U	0.10 UJ	0.10 U	0.10 U	1 U	1.0 U	0.10 U	0.10 U	0.10 U	NE
Nitrobenzene	EPA 8270	µg/L	0.94 U	0.97 U	1 U	1.1 U	0.10 UJ	0.10 U	0.10 U	1 U	1.0 U	0.10 U	0.10 U	0.10 U	100
2-Nitrophenol	EPA 8270	µg/L	0.94 U	0.97 U	1 U	1.1 U	0.10 UJ	0.10 U	0.10 U	1 U	1.0 U	0.10 U	0.10 U	0.10 U	NE
4-Nitrophenol (p-Nitrophenol)	EPA 8270	µg/L	0.94 U	0.97 U	1 U	1.1 U	0.10 UJ	0.10 U	0.10 U	1 U	1.0 U	0.10 U	0.10 U	0.10 U	NE
n-Nitrosodimethylamine	EPA 8270	µg/L	0.94 U	0.97 U	1 U	1.1 U	0.10 UJ	0.10 U	0.10 U	1 U	1.0 U	0.10 U	0.10 U	0.10 U	0.34
n-Nitrosodiphenylamine (as Diphenylamine)	EPA 8270	µg/L	0.94 U	0.97 U	10 U	1.1 U	0.10 UJ	0.10 U	0.10 U	10 U	1.0 U	0.10 U	0.10 U	0.10 U	0.69
n-Nitrosodi-n-propylamine	EPA 8270	µg/L	0.94 U	0.97 U	1 U	1.1 U	0.10 UJ	0.10 U	0.10 U	1 U	1.0 U	0.10 U	0.10 U	0.17	0.058
n-Octadecane	EPA 8270	µg/L	0.94 U	0.97 U	–	1.1 U	0.10 UJ	0.11	0.10 U	–	1.0 U	0.22	0.10 U	0.10 U	NE
Pentachlorophenol	EPA 8270	µg/L	4.7 U	0.97 U	5 U	1.1 UJ	0.50 UJ	0.50 U	0.50 U	5 U	1.0 UJ	0.50 U	0.50 U	0.50 U	0.002
Phenol	EPA 8270	µg/L	7.7	5.9	1 U	1.1 U	0.10 UJ	0.10 U	0.10 U	1 U	1.0 U	0.10 U	0.10 U	0.10 U	370
Pyridine	EPA 8270	µg/L	0.94 U	0.97 U	10 U	1.1 U	0.10 UJ	0.10 U	0.10 U	10 U	1.0 U	0.10 U	0.10 U	0.10 U	8
2,3,4,6-Tetrachlorophenol	EPA 8270	µg/L	0.94 U	0.97 U	1 U	1.1 U	0.10 UJ	0.10 U	0.10 U	1 U	1.0 U	0.10 U	0.10 U	0.10 U	480
2,3,5,6-Tetrachlorophenol	EPA 8270	µg/L	0.94 U	0.97 U	1 U	1.1 U	0.10 UJ	0.10 U	0.10 U	1 U	1.0 U	0.10 U	0.10 U	0.10 U	NE
1,2,4-Trichlorobenzene	EPA 8260	µg/L	0.40 U	0.54 U	0.2 U	0.20 U	0.28 U	0.20 U	0.27 U	0.2 U	–	0.30 UJ	0.20 U	0.20 U	0.037
	EPA 8270	µg/L	0.95 U	0.97 U	1 U	1.1 U	0.10 UJ	0.10 U	0.10 U	1 U	1.0 U	0.10 U	0.10 U	0.10 U	0.037
2,4,5-Trichlorophenol	EPA 8270	µg/L	0.94 U	0.97 U	1 U	1.1 U	0.10 UJ	0.10 U	0.10 U	1 U	1.0 U	0.10 U	0.10 U	0.10 U	600
2,4,6-Trichlorophenol	EPA 8270	µg/L	0.94 U	0.97 U	1 U	1.1 U	0.10 UJ	0.10 U	0.10 U	1 U	1.0 U	0.10 U	0.10 U	0.10 U	0.28
Volatile Organic Compounds (VOCs)															
Acetone	EPA 8260	µg/L	20	19	8.8	19	5.0 U	5.0 U	5.0 U	5 U	–	5.0 U	5.0 U	5.0 U	NE
Benzene	EPA 8260	µg/L	0.40 U	0.40 U	0.22	0.20 U	0.20 U	0.20 U	0.20 U	0.2 U	–	0.20 U	0.20 U	0.20 U	1.6
Bromobenzene	EPA 8260	µg/L	0.40 U	0.40 U	0.2 U	0.20 U	0.20 U	0.20 U	0.20 U	0.2 U	–	0.20 U	0.20 U	0.20 U	NE
Bromochloromethane	EPA 8260	µg/L	0.40 U	0.40 U	0.2 U	0.20 U	0.20 U	0.20 U	0.20 U	0.2 U	–	0.20 U	0.20 U	0.20 U	NE
Bromoform (Tribromomethane)	EPA 8260	µg/L	2.0 U	2.0 U	1 U	1.0 U	1.0 U	1.0 U	1.0 U	1 U	–	1.0 U	1.0 U	1.0 U	12
Bromomethane	EPA 8260	µg/L	0.40 U	0.76 UJ	0.2 U	0.39 UJ	0.28 U	0.20 U	0.38 UJ	0.2 U	–	0.55 UJ	0.20 U	0.20 U	13
n-Butylbenzene	EPA 8260	µg/L	0.40 U	0.40 U	0.2 U	0.20 U	0.20 U	0.20 U	0.20 U	0.2 U	–	0.20 U	0.20 U	0.20 U	400
sec-Butylbenzene	EPA 8260	µg/L	0.40 U	0.40 U	0.2 U	0.20 U	0.20 U	0.20 U	0.20 U	0.2 U	–	0.20 U	0.20 U	0.20 U	800
tert-Butylbenzene	EPA 8260	µg/L	0.40 U	0.40 U	0.2 U	0.20 U	0.20 U	0.20 U	0.20 U	0.2 U	–	0.20 U	0.20 U	0.20 U	800
Carbon disulfide	EPA 8260	µg/L	3.7	3	5.2	0.20 U	0.20 U	0.20 U	0.20 U	0.2 U	–	0.20 U	0.20 U	0.20 U	400
Carbon tetrachloride	EPA 8260	µg/L	0.40 U	0.40 U	0.2 U	0.20 U	0.20 U	0.20 U	0.20 U	0.2 U	–	0.20 U	0.20 U	0.20 U	0.35
Chlorobenzene	EPA 8260	µg/L	0.40 U	0.40 U	0.2 U	0.20 U	0.20 U	0.20 U	0.20 U	0.2 U	–	0.20 U	0.20 U	0.20 U	200
Chloroethane	EPA 8260	µg/L	2.0 U	2.0 U	1 U	1.0 U	1.0 U	1.0 U	1.0 U	1 U	–	1.0 U	1.0 U	1.0 U	19,000
2-Chloroethyl vinyl ether	EPA 8260	µg/L	6.0 UJ	3.4 UJ	1 U	1.0 U	1.0 U	3.0 UJ	1.7 UJ	1 U	–	1.4 UJ	3.0 UJ	1.0 U	NE
Chloroform	EPA 8260	µg/L	0.40 U	0.40 U	0.2 U	0.20 U	0.20 U	0.20 U	0.20 U	0.2 U	–	0.20 U	0.20 U	0.20 U	1.2
Chloromethane	EPA 8260	µg/L	2.0 U	2.0 U	1 U	1.0 U	1.0 U	1.0 U	1.0 U	1 U	–	1.0 U	1.0 U	1.0 U	150
2-Chlorotoluene	EPA 8260	µg/L	0.40 U	0.40 U	0.2 U	0.20 U	0.20 U	0.20 U	0.20 U	0.2 U	–	0.20 U	0.20 U	0.20 U	160
4-Chlorotoluene	EPA 8260	µg/L	0.40 U	0.40 U	0.2 U	0.20 U	0.20 U	0.20 U	0.20 U	0.2 U	–	0.20 U	0.20 U	0.20 U	NE

Table D-2
Remedial Investigation Chemical Analytical Results - Groundwater COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Monitoring Well ¹	Analytical Method	Units	MW-7	MW-7	MW-8	MW-8	MW-8	MW-8	MW-8	MW-9	MW-9	MW-9	MW-9	MW-9	Groundwater Preliminary Cleanup Level ³ (PCUL)
Sample Date			01/21/15	04/23/15	11/4/2009	06/12/14	09/26/14	01/21/15	04/23/15	11/4/2009	06/13/14	09/25/14	01/20/15	04/20/15	
Monitoring Event			Jan-15	Apr-15	Nov-09	Jun-14	Sep-14	Jan-15	Apr-15	Nov-09	Jun-14	Sep-14	Jan-15	Apr-15	
Sampled By			GEI	GEI	Landau	GEI	GEI	GEI	GEI	Landau	GEI	GEI	GEI	GEI	
Dibromochloromethane	EPA 8260	µg/L	0.40 U	0.40 U	0.2 U	0.20 U	0.20 U	0.20 U	0.20 U	0.2 U	--	0.20 U	0.20 U	0.20 U	2.2
1,2-Dibromo-3-chloropropane	EPA 8260	µg/L	2.0 U	2.6 U	1 U	1.0 U	1.0 U	1.0 U	1.3 U	1 U	--	1.0 U	1.0 U	1.0 U	0.2
Dibromomethane	EPA 8260	µg/L	0.40 U	0.40 U	0.2 U	0.20 U	0.20 U	0.20 U	0.20 U	0.2 U	--	0.20 U	0.20 U	0.20 U	80
Bromodichloromethane	EPA 8260	µg/L	0.40 U	0.40 U	0.2 U	0.20 U	0.20 U	0.20 U	0.20 U	0.2 U	--	0.20 U	0.20 U	0.20 U	1.8
Dichlorodifluoromethane (CFC-12)	EPA 8260	µg/L	0.40 U	0.40 U	0.2 U	0.20 U	0.20 U	0.20 U	0.20 U	0.2 U	--	0.20 U	0.20 U	0.20 U	5.6
1,1-Dichloroethane	EPA 8260	µg/L	0.40 U	0.40 U	0.2 U	0.20 U	0.20 U	0.20 U	0.20 U	0.2 U	--	0.20 U	0.20 U	0.20 U	11
1,2-Dichloroethane	EPA 8260	µg/L	0.40 U	0.40 U	0.2 U	0.20 U	0.20 U	0.20 U	0.20 U	0.2 U	--	0.20 U	0.20 U	0.20 U	4.2
1,1-Dichloroethene	EPA 8260	µg/L	0.40 U	0.40 U	0.02 U	0.20 U	0.20 U	0.20 U	0.20 U	0.02 U	--	0.20 U	0.20 U	0.20 U	130
cis-1,2-Dichloroethene	EPA 8260	µg/L	0.40 U	0.40 U	0.2 U	0.20 U	0.20 U	0.20 U	0.20 U	0.2 U	--	0.20 U	0.20 U	0.20 U	16
trans-1,2-Dichloroethene	EPA 8260	µg/L	0.40 U	0.40 U	0.2 U	0.20 U	0.20 U	0.20 U	0.20 U	0.2 U	--	0.20 U	0.20 U	0.20 U	1,000
1,2-Dichloropropane	EPA 8260	µg/L	0.40 U	0.40 U	0.2 U	0.20 U	0.20 U	0.20 U	0.20 U	0.2 U	--	0.20 U	0.20 U	0.20 U	3.1
1,3-Dichloropropane	EPA 8260	µg/L	0.40 U	0.40 U	0.2 U	0.20 U	0.20 U	0.20 U	0.20 U	0.2 U	--	0.20 U	0.20 U	0.20 U	NE
2,2-Dichloropropane	EPA 8260	µg/L	0.40 U	0.40 U	--	0.20 U	0.20 U	0.20 U	0.20 U	--	--	0.20 U	0.20 U	0.20 U	NE
1,1-Dichloropropene	EPA 8260	µg/L	0.40 U	0.40 U	0.2 U	0.20 U	0.20 U	0.20 U	0.20 U	0.2 U	--	0.20 U	0.20 U	0.20 U	NE
cis-1,3-Dichloropropene	EPA 8260	µg/L	0.40 U	0.40 U	0.2 U	0.20 U	0.20 U	0.20 U	0.20 U	0.2 U	--	0.20 U	0.20 U	0.20 U	2
trans-1,3-Dichloropropene	EPA 8260	µg/L	0.40 U	0.40 U	0.2 U	0.20 U	0.20 U	0.20 U	0.20 U	0.2 U	--	0.20 U	0.20 U	0.20 U	2
Ethylbenzene	EPA 8260	µg/L	0.40 U	0.40 U	0.2 U	0.20 U	0.20 U	0.20 U	0.67	0.2 U	--	0.20 U	0.20 U	0.20 U	31
1,2-Dibromoethane (EDB)	EPA 8260	µg/L	0.40 U	0.40 U	0.2 U	0.20 U	0.20 U	0.20 U	0.20 U	0.2 U	--	0.20 U	0.20 U	0.20 U	0.27
2-Hexanone	EPA 8260	µg/L	4.0 U	4.0 U	2 U	2.0 U	2.0 U	2.0 U	2.0 U	2 U	--	2.0 U	2.0 U	2.0 U	40
Isopropylbenzene (Cumene)	EPA 8260	µg/L	0.40 U	0.40 U	0.2 U	0.20 U	0.20 U	0.20 U	0.20 U	0.2 U	--	0.20 U	0.20 U	0.20 U	800
p-Isopropyltoluene	EPA 8260	µg/L	0.40 U	0.40 U	0.2 U	0.20 U	0.20 U	0.20 U	0.20 U	0.2 U	--	0.20 U	0.20 U	0.20 U	NE
2-Butanone (MEK)	EPA 8260	µg/L	10 U	10 U	5 U	5.0 U	5.0 U	5.0 U	5.0 U	5 U	--	5.0 U	5.0 U	5.0 U	1,700,000
Methyl iodide (Iodomethane)	EPA 8260	µg/L	2.0 U	4.8 UJ	1 U	2.1 UJ	1.0 U	1.0 U	2.4 UJ	1 U	--	1.9 UJ	1.0 U	1.0 U	NE
4-Methyl-2-pentanone (Methyl isobutyl ketone)	EPA 8260	µg/L	4.0 U	4.0 U	2 U	2.0 U	2.0 U	2.0 U	2.0 U	2 U	--	2.0 U	2.0 U	2.0 U	470,000
Methyl t-butyl ether (MTBE)	EPA 8260	µg/L	0.40 U	0.40 U	0.2 U	0.20 U	0.20 U	0.20 U	0.20 U	0.2 U	--	0.20 U	0.20 U	0.20 U	600
Methylene chloride	EPA 8260	µg/L	2.0 U	2.0 U	1 U	1.0 U	1.0 U	1.0 U	1.0 U	1 U	--	1.0 U	1.0 U	1.0 U	100
n-Propylbenzene	EPA 8260	µg/L	0.40 U	0.40 U	0.2 U	0.20 U	0.20 U	0.20 U	0.20 U	0.2 U	--	0.20 U	0.20 U	0.20 U	800
Styrene	EPA 8260	µg/L	0.40 U	0.40 U	0.2 U	0.20 U	0.20 U	0.20 U	0.20 U	0.2 U	--	0.20 U	0.20 U	0.20 U	8,200
1,1,1,2-Tetrachloroethane	EPA 8260	µg/L	0.40 U	0.40 U	0.2 U	0.20 U	0.20 U	0.20 U	0.20 U	0.2 U	--	0.20 U	0.20 U	0.20 U	7.4
1,1,2,2-Tetrachloroethane	EPA 8260	µg/L	0.40 U	0.40 U	0.2 U	0.20 U	0.20 U	0.20 U	0.20 U	0.2 U	--	0.20 U	0.20 U	0.20 U	0.3
Tetrachloroethene	EPA 8260	µg/L	0.40 U	0.40 U	0.2 U	0.20 U	0.20 U	0.20 U	0.20 U	0.2 U	--	0.20 U	0.20 U	0.20 U	2.9
Toluene	EPA 8260	µg/L	2.0 U	2.0 U	1 U	1.0 U	1.0 U	1.0 U	2	1 U	--	1.0 U	1.0 U	1.0 U	130
1,2,3-Trichlorobenzene	EPA 8260	µg/L	0.40 U	0.62 U	0.2 U	0.20 U	0.36 UJ	0.20 U	0.31 U	0.2 U	--	0.39 UJ	0.20 U	0.20 U	NE
1,1,1-Trichloroethane	EPA 8260	µg/L	0.40 U	0.40 U	0.2 U	0.20 U	0.20 U	0.20 U	0.20 U	0.2 U	--	0.20 U	0.20 U	0.20 U	5,500
1,1,2-Trichloroethane	EPA 8260	µg/L	0.40 U	0.40 U	0.2 U	0.20 U	0.20 U	0.20 U	0.20 U	0.2 U	--	0.20 U	0.20 U	0.20 U	0.9
Trichloroethene	EPA 8260	µg/L	0.40 U	0.40 U	0.2 U	0.20 U	0.20 U	0.20 U	0.20 U	0.2 U	--	0.20 U	0.20 U	0.20 U	0.7
Trichlorofluoromethane (CFC-11)	EPA 8260	µg/L	0.40 U	0.40 U	0.2 U	0.20 U	0.20 U	0.20 U	0.20 U	0.2 U	--	0.20 U	0.20 U	0.20 U	120
1,2,3-Trichloropropane	EPA 8260	µg/L	0.40 U	0.40 U	0.2 U	0.20 U	0.20 U	0.20 U	0.20 U	0.2 U	--	0.20 U	0.20 U	0.20 U	1,500
1,2,4-Trimethylbenzene	EPA 8260	µg/L	0.40 U	0.42	0.23	0.20 U	0.20 U	0.20 U	2.1	0.2 U	--	0.20 U	0.20 U	0.20 U	240
1,3,5-Trimethylbenzene	EPA 8260	µg/L	0.40 U	0.40 U	0.2 U	0.20 U	0.20 U	0.20 U	0.43	0.2 U	--	0.20 U	0.20 U	0.20 U	80
Vinyl acetate	EPA 8260	µg/L	2.0 U	2.0 U	2 U	1.0 UJ	1.0 U	1.0 U	1.0 U	2 U	--	1.0 U	1.0 U	1.0 U	7,800

Table D-2

Remedial Investigation Chemical Analytical Results - Groundwater COPCs

Port of Seattle - North Terminal 115

Seattle, Washington

Monitoring Well ¹	Analytical Method	Units	MW-7	MW-7	MW-8	MW-8	MW-8	MW-8	MW-8	MW-8	MW-9	MW-9	MW-9	MW-9	MW-9	Groundwater Preliminary Cleanup Level ³ (PCUL)
Sample Date			01/21/15	04/23/15	11/4/2009	06/12/14	09/26/14	01/21/15	04/23/15	11/4/2009	06/13/14	09/25/14	01/20/15	04/20/15		
Monitoring Event			Jan-15	Apr-15	Nov-09	Jun-14	Sep-14	Jan-15	Apr-15	Nov-09	Jun-14	Sep-14	Jan-15	Apr-15		
Sampled By			GEI	GEI	Landau	GEI	GEI	GEI	GEI	Landau	GEI	GEI	GEI	GEI	GEI	
Vinyl chloride	EPA 8260	µg/L	0.40 U	0.40 U	0.02 U	0.20 U	0.20 U	0.20 U	0.20 U	0.02 U	--	0.20 U	0.20 U	0.20 U	0.18	
Xylene, m-,p-	EPA 8260	µg/L	0.80 U	1.2	0.49	0.40 U	0.40 U	0.40 U	3.4	0.4 U	--	0.40 U	0.40 U	0.40 U	290	
Xylene, o-	EPA 8260	µg/L	0.40 U	0.49	0.2 U	0.20 U	0.20 U	0.20 U	1.5	0.2 U	--	0.20 U	0.20 U	0.20 U	430	
Petroleum Hydrocarbons																
Gasoline-range hydrocarbons	NWTPH-G	µg/L	100 U	100 U	--	--	--	--	--	--	--	100 U	--	--	800	
Diesel-range hydrocarbons	NWTPH-Dx	µg/L	700	590 J	--	--	210 U	250 U	250 U	--	--	200 U	250 U	250 U	500	
Oil-range hydrocarbons	NWTPH-Dx	µg/L	1,000	820 J	--	--	340 U	400 U	400 U	--	--	330 U	400 U	400 U	500	
Total diesel- and oil-range hydrocarbons	NWTPH-Dx	µg/L	1,700	1,410 J	--	--	340 U	400 U	400 U	--	--	330 U	400 U	400 U	500	
Diesel-range hydrocarbons	NWTPH-Dx Si/Gel	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	500	
Oil-range hydrocarbons	NWTPH-Dx Si/Gel	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	500	
Total diesel- and oil-range hydrocarbons	NWTPH-Dx Si/Gel	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	500	
Conventional Parameters																
Total organic carbon (TOC)	SM 5310B	mg/L	120	130	--	--	--	--	--	--	--	2.7	4.9	5.7	NE	
Field Measured Parameters																
pH	N/A	N/A	11.23	11.08	8.38	7.31	7.56	7.66	7.79	6.33	6.17	6.31	6.51	6.08	NE	

Notes:

¹ Monitoring well locations are shown on Figures 3-2 and 3-4.

² Insufficient water to collect groundwater sample for chemical analysis.

³ Groundwater screening levels referenced from Table 4-2.

⁴ Total dioxin/furan Toxic Equivalency Quotients (TEQs) were calculated using United States Environmental Protection Agency (USEPA) Toxicity Equivalency Factor (TEF) values for human health (EPA 2003).

⁵ Total carcinogenic PAH (cPAH) TEQs were calculated using TEF values referenced from MTCA Table 708.2 (WAC 173-340-900).

mg/L = milligram per liter

µg/L = microgram per liter

NE = not established

Landau = Landau Associates

GEI = GeoEngineers

NE = not established

J = estimated result

U = analyte not detected above the reporting limit

-- = not analyzed

COPC = Contaminant of Potential Concern

Bold indicates analyte was detected.

Yellow shading identifies the detected results greater than the preliminary cleanup level.

Blue shading identifies the non-detected result greater than the preliminary cleanup level.

Table D-2
Remedial Investigation Chemical Analytical Results - Groundwater COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Monitoring Well ¹	Analytical Method	Units	MW-10	MW-10	MW-10	MW-10	MW-10	MW-10	MW-10D	MW-10D	MW-10D	MW-10D	MW-11	MW-11 ²	Groundwater Preliminary Cleanup Level ³ (PCUL)
Sample Date			11/4/2009	06/09/14	09/23/14	01/20/15	04/23/15	03/17/17	06/09/14	09/23/14	01/20/15	04/23/15	06/13/14	09/24/14	
Monitoring Event			Nov-09	Jun-14	Sep-14	Jan-15	Apr-15	Mar-17	Jun-14	Sep-14	Jan-15	Apr-15	Jun-14	Sep-14	
Sampled By			Landau	GEI	GEI	GEI	GEI	Ecology	GEI	GEI	GEI	GEI	GEI	GEI	
Polychlorinated Biphenyls (PCBs)															
PCB-Aroclor 1016	EPA 8082	µg/L	--	--	--	--	--	n/a	--	--	--	--	--	--	NE
PCB-Aroclor 1221	EPA 8082	µg/L	--	--	--	--	--	n/a	--	--	--	--	--	--	NE
PCB-Aroclor 1232	EPA 8082	µg/L	--	--	--	--	--	n/a	--	--	--	--	--	--	NE
PCB-Aroclor 1242	EPA 8082	µg/L	--	--	--	--	--	n/a	--	--	--	--	--	--	NE
PCB-Aroclor 1248	EPA 8082	µg/L	--	--	--	--	--	n/a	--	--	--	--	--	--	NE
PCB-Aroclor 1254	EPA 8082	µg/L	--	--	--	--	--	n/a	--	--	--	--	--	--	NE
PCB-Aroclor 1260	EPA 8082	µg/L	--	--	--	--	--	n/a	--	--	--	--	--	--	NE
Total PCB Aroclors	EPA 8082	µg/L	--	--	--	--	--	0.010 U	--	--	--	--	--	--	0.000007
Total PCB Congeners	EPA 1668	µg/L	--	--	--	--	--	0.0018 J	--	--	--	--	--	--	0.000007
Dioxins and Furans															
1,2,3,4,6,7,8-HpCDD	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,4,6,7,8-HpCDF	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,4,7,8,9-HpCDF	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,4,7,8-HxCDD	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,4,7,8-HxCDF	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,6,7,8-HxCDD	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,6,7,8-HxCDF	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,7,8,9-HxCDD	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,7,8,9-HxCDF	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,7,8-PeCDD	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,7,8-PeCDF	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
2,3,4,6,7,8-HxCDF	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
2,3,4,7,8-PeCDF	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
2,3,7,8-TCDD	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
2,3,7,8-TCDF	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
OCDD	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
OCDF	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
Total Dioxin/Furan TEQ ⁴ (ND=0)	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	0.0000000051
Total Dioxin/Furan TEQ ⁴ (ND=0.5RL)	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	0.0000000051
Total Metals															
Antimony	EPA 200.8/7470	µg/L	1 U	5.4 U	5.5 U	5.4 U	5.6 U	--	5.5 U	5.5 U	5.4 U	5.6 U	5.4 U	--	90
Arsenic	EPA 200.8/7470	µg/L	6.9	7.3	6.9	3.3 U	3.3 U	--	31	25	32	34	5.9	--	8.0
Barium	EPA 200.8/7470	µg/L	--	16	19	11	7.6	--	21	19	25	21	170	--	200
Beryllium	EPA 200.8/7470	µg/L	11 U	10 U	10 U	10 U	10 U	--	10 U	10 U	10 U	10 U	10 U	--	4.4
Cadmium	EPA 200.8/7470	µg/L	4.4 U	0.20 U	0.20 U	0.20 U	0.20 U	--	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	--	1.2
Chromium III / Total	EPA 200.8/7470	µg/L	5.4	2.0 U	2.0 U	2.0 U	2.0 U	--	20	12	25	26	2.1	--	27
Chromium VI	EPA 200.8/7470	µg/L	10 U	--	--	--	--	--	--	--	--	--	--	--	50
Copper	EPA 200.8/7470	µg/L	13	2.0 U	2	2.1	2.0 U	--	2.0 U	2.0 U	2.7	2.0 U	3.3	--	3.1
Lead	EPA 200.8/7470	µg/L	86	5.3	3.3	3.5	6.7	--	1.7	1.7	6	1.0 U	1.1	--	8.1
Mercury	EPA 200.8/7470	µg/L	0.1 U	0.50 U	0.50 U	0.50 U	0.50 U	--	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	--	0.025
Nickel	EPA 200.8/7470	µg/L	22 U	2.0 U	2.0 U	2.0 U	2.0 U	--	2.8	2.6	4.1	2.5	11	--	8.2

Table D-2
Remedial Investigation Chemical Analytical Results - Groundwater COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Monitoring Well ¹	Analytical Method	Units	MW-10	MW-10	MW-10	MW-10	MW-10	MW-10	MW-10D	MW-10D	MW-10D	MW-10D	MW-11	MW-11 ²	Groundwater Preliminary Cleanup Level ³ (PCUL)
Sample Date			11/4/2009	06/09/14	09/23/14	01/20/15	04/23/15	03/17/17	06/09/14	09/23/14	01/20/15	04/23/15	06/13/14	09/24/14	
Monitoring Event			Nov-09	Jun-14	Sep-14	Jan-15	Apr-15	Mar-17	Jun-14	Sep-14	Jan-15	Apr-15	Jun-14	Sep-14	
Sampled By			Landau	GEI	GEI	GEI	GEI	Ecology	GEI	GEI	GEI	GEI	GEI	GEI	
Selenium	EPA 200.8/7470	µg/L	5.6 U	6.0 U	6.0 U	6.0 U	6.0 U	--	6.0 U	6.0 U	6.0 U	6.0 U	6.0 U	--	71
Silver	EPA 200.8/7470	µg/L	11 U	1.0 U	1.0 U	1.0 U	1.0 U	--	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	--	1.9
Thallium	EPA 200.8/7470	µg/L	5.6 U	2.0 U	2.0 U	2.0 U	2.0 U	--	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	--	0.062
Tin	EPA 200.8/7470	µg/L	480	50	31	18	74	--	23	17	77	22	5.0 U	--	9,600
Zinc	EPA 200.8/7470	µg/L	53	56 U	56 U	56 U	56 U	--	56 U	56 U	56 U	56 U	56 U	--	81
Dissolved Metals															
Antimony	EPA 200.8/7470	µg/L	1.5	5.5 U	5.5 U	5.5 U	5.6 U	--	5.5 U	5.5 U	5.5 U	5.6 U	5.5 U	--	90
Arsenic	EPA 200.8/7470	µg/L	6	6.9	7.2	3.3 U	3.3 U	--	26	26	27	35	5.4	--	8.0
Barium	EPA 200.8/7470	µg/L	--	15	19	10	9.4	--	19	18	18	19	160	--	200
Beryllium	EPA 200.8/7470	µg/L	10 U	10 U	10 U	10 U	10 U	--	10 U	10 U	10 U	10 U	10 U	--	4.4
Cadmium	EPA 200.8/7470	µg/L	4 U	0.20 U	0.20 U	0.20 U	0.20 U	--	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	--	1.2
Chromium III / Total	EPA 200.8/7470	µg/L	2 U	2.0 U	2.0 U	2.0 U	2.0 U	--	15	13	22	27	2.0 U	--	27
Copper	EPA 200.8/7470	µg/L	5.9	2.0 U	2.0 U	2.0 U	2.0 U	--	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	--	3.1
Lead	EPA 200.8/7470	µg/L	2.5	1.0 U	1.1	1	2.2	--	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	--	8.1
Mercury	EPA 200.8/7470	µg/L	0.1 U	0.50 U	0.50 U	0.50 U	0.50 U	--	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	--	0.025
Nickel	EPA 200.8/7470	µg/L	20 U	2.0 U	2.0 U	2.0 U	2.0 U	--	2.4	2	3.1	3.6	7.6	--	8.2
Selenium	EPA 200.8/7470	µg/L	5 U	6.0 U	6.0 U	6.0 U	6.0 U	--	7.5 U	6.0 U	6.0 U	6.0 U	6.0 U	--	71
Silver	EPA 200.8/7470	µg/L	10 U	1.0 U	1.0 U	1.0 U	1.0 U	--	0.50 U	1.0 U	1.0 U	1.0 U	1.0 U	--	1.9
Thallium	EPA 200.8/7470	µg/L	5 U	2.0 U	2.0 U	2.0 U	2.0 U	--	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	--	0.062
Tin	EPA 200.8/7470	µg/L	12	6.7	12	5.0 U	7.7	--	6.8	5.0 U	7	13	5.0 U	--	9,600
Zinc	EPA 200.8/7470	µg/L	5 U	56 U	56 U	56 U	56 U	--	56 U	56 U	56 U	56 U	56 U	--	81
Semi-Volatile Organic Compounds (SVOCs) - Polycyclic Aromatic Hydrocarbons (PAHs)															
Acenaphthene	EPA 8270/SIM	µg/L	0.1 U	0.48 U	0.15 J	0.10 U	0.10 U	--	0.50 U	0.10 U	0.10 U	0.053 J	0.47 U	--	5.3
Acenaphthylene	EPA 8270/SIM	µg/L	0.1 U	0.48 U	0.10 UJ	0.10 U	0.10 U	--	0.50 U	0.10 U	0.10 U	0.10 U	0.47 U	--	NE
Anthracene	EPA 8270/SIM	µg/L	0.1 U	0.48 U	0.10 UJ	0.10 U	0.10 U	--	0.50 U	0.10 U	0.10 U	0.10 U	0.47 U	--	2.1
Benzo(a)anthracene	EPA 8270/SIM	µg/L	0.01 U	0.073	0.010 UJ	0.010 U	0.10 U	--	0.093	0.010 U	0.010 U	0.10 U	0.047 U	--	0.00016
Benzo(b)fluoranthene	EPA 8270/SIM	µg/L	0.01 U	0.048 U	0.010 UJ	0.010 U	0.10 U	--	0.067	0.010 U	0.010 U	0.010 U	0.047 U	--	0.00016
Benzo(j,k)fluoranthene	EPA 8270/SIM	µg/L	0.01 U	0.048 U	0.010 UJ	0.010 U	0.10 U	--	0.081	0.010 U	0.010 U	0.010 U	0.047 U	--	0.0016
Benzo(g,h,i)perylene	EPA 8270/SIM	µg/L	0.01 U	0.048 U	0.010 UJ	0.010 U	0.10 U	--	0.077	0.010 U	0.010 U	0.010 U	0.047 U	--	NE
Benzo(a)pyrene	EPA 8270/SIM	µg/L	0.01 U	0.048 U	0.010 UJ	0.010 U	0.10 U	--	0.052	0.010 U	0.010 U	0.010 U	0.047 U	--	0.000016
Chrysene	EPA 8270/SIM	µg/L	0.01 U	0.048 U	0.010 UJ	0.010 U	0.10 U	--	0.066	0.010 U	0.010 U	0.10 U	0.047 U	--	0.016
Dibenzo(a,h)anthracene	EPA 8270/SIM	µg/L	0.01 U	0.048 U	0.010 UJ	0.010 U	0.10 U	--	0.06	0.010 U	0.010 U	0.010 U	0.047 U	--	0.000016
Dibenzofuran	EPA 8270/SIM	µg/L	1 U	0.96 U	0.10 UJ	0.10 U	0.10 U	--	0.99 U	0.10 U	0.10 U	0.10 U	0.94 U	--	16
Fluoranthene	EPA 8270/SIM	µg/L	0.1 U	0.48 U	0.10 UJ	0.10 U	0.10 U	--	0.50 U	0.10 U	0.10 U	0.10 U	0.47 U	--	1.8
Fluorene	EPA 8270/SIM	µg/L	0.1 U	0.48 U	0.10 UJ	0.10 U	0.10 U	--	0.50 U	0.10 U	0.10 U	0.10 U	0.47 U	--	3.7
Indeno(1,2,3-c,d)pyrene	EPA 8270/SIM	µg/L	0.01 U	0.048 U	0.010 UJ	0.010 U	0.10 U	--	0.065	0.010 U	0.010 U	0.010 U	0.047 U	--	0.00016
1-Methylnaphthalene	EPA 8270/SIM	µg/L	0.1 U	0.48 U	0.10 UJ	0.10 U	0.10 U	--	0.50 U	0.10 U	0.10 U	0.10 U	0.47 U	--	1.5
2-Methylnaphthalene	EPA 8270/SIM	µg/L	0.1 U	0.48 U	0.10 UJ	0.10 U	0.10 U	--	0.50 U	0.10 U	0.10 U	0.10 U	0.47 U	--	32
Naphthalene	EPA 8270/SIM	µg/L	0.1 U	0.48 U	0.10 UJ	0.10 U	0.10 U	--	0.50 U	0.10 U	0.10 U	0.10 U	0.47 U	--	1.4
Phenanthrene	EPA 8270/SIM	µg/L	0.1 U	0.48 U	0.10 UJ	0.10 U	0.10 U	--	0.50 U	0.10 U	0.10 U	0.10 U	0.47 U	--	NE
Pyrene	EPA 8270/SIM	µg/L	0.1 U	0.48 U	0.10 UJ	0.050 U	0.10 U	--	0.50 U	0.10 U	0.050 U	0.10 UJ	0.47 U	--	2
Total cPAH TEQ ⁵ (ND=0)	EPA 8270/SIM	µg/L	0 U	0.007	0 U	0 U	0 U	--	0.089	0 U	0 U	0 U	0 U	--	0.000016
Total cPAH TEQ ⁵ (ND=0.5RL)	EPA 8270/SIM	µg/L	0.0076 U	0.041	0.0076 U	0.0076 U	0.0076 U	--	0.089	0.0076 U	0.0076 U	0.013 U	0.035 U	--	0.000016

Table D-2
Remedial Investigation Chemical Analytical Results - Groundwater COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Monitoring Well ¹	Analytical Method	Units	MW-10	MW-10	MW-10	MW-10	MW-10	MW-10	MW-10D	MW-10D	MW-10D	MW-10D	MW-11	MW-11 ²	Groundwater Preliminary Cleanup Level ³ (PCUL)
Sample Date			11/4/2009	06/09/14	09/23/14	01/20/15	04/23/15	03/17/17	06/09/14	09/23/14	01/20/15	04/23/15	06/13/14	09/24/14	
Monitoring Event			Nov-09	Jun-14	Sep-14	Jan-15	Apr-15	Mar-17	Jun-14	Sep-14	Jan-15	Apr-15	Jun-14	Sep-14	
Sampled By			Landau	GEI	GEI	GEI	GEI	Ecology	GEI	GEI	GEI	GEI	GEI	GEI	
Other SVOCs (mg/kg)															
Aniline	EPA 8270	µg/L	5 U	0.96 U	0.10 UJ	0.10 U	0.10 U	--	0.99 U	0.10 U	0.10 U	0.10 U	0.94 U	--	7.7
Benzidine	EPA 8270	µg/L	10 U	0.96 U	0.10 UJ	0.10 U	0.10 U	--	0.99 U	0.10 U	0.10 U	0.10 U	0.94 U	--	0.000023
Benzoic acid	EPA 8270	µg/L	--	0.96 U	0.50 UJ	0.50 U	0.50 U	--	0.99 U	0.50 U	0.50 U	0.50 U	0.94 U	--	590
Benzyl alcohol	EPA 8270	µg/L	1 U	0.96 U	0.10 UJ	0.10 U	0.24	--	0.99 U	0.10 U	0.10 U	0.16	0.94 U	--	800
Bis(2-chloroethoxy)methane	EPA 8270	µg/L	1 U	0.96 U	0.10 UJ	0.10 U	0.10 U	--	0.99 U	0.10 U	0.10 U	0.10 U	0.94 U	--	NE
Bis(2-chloroethyl)ether	EPA 8270	µg/L	1 U	0.96 U	0.10 UJ	0.10 U	0.10 U	--	0.99 U	0.10 U	0.10 U	0.10 U	0.94 U	--	0.06
Bis(2-chloroisopropyl)ether	EPA 8270	µg/L	1 U	0.96 U	0.10 UJ	0.10 U	0.10 U	--	0.99 U	0.10 U	0.10 U	0.10 U	0.94 U	--	900
Bis(2-ethylhexyl)phthalate	EPA 8270	µg/L	1 U	0.96 U	0.10 UJ	0.43 U	0.21 U	--	0.99 U	0.23 U	0.39 U	0.30 U	0.94	--	0.046
4-Bromophenyl phenyl ether	EPA 8270	µg/L	1 U	0.96 U	0.10 UJ	0.10 U	0.10 U	--	0.99 U	0.10 U	0.10 U	0.10 U	0.94 U	--	NE
Butyl benzyl phthalate	EPA 8270	µg/L	1 U	0.96 U	0.10 UJ	0.10 U	0.10 U	--	0.99 U	0.10 U	0.10 U	0.10 U	0.94 U	--	0.013
Carbazole	EPA 8270	µg/L	1 U	0.96 U	0.10 UJ	0.10 U	0.10 U	--	0.99 U	0.10 U	0.10 U	0.10 U	0.94 U	--	NE
4-Chloroaniline	EPA 8270	µg/L	10 U	0.96 U	0.10 UJ	0.10 U	0.10 U	--	0.99 U	0.10 U	0.10 U	0.10 U	0.94 U	--	2,300
4-Chloro-3-methylphenol	EPA 8270	µg/L	1 U	0.96 U	0.10 UJ	0.10 U	0.10 U	--	0.99 U	0.10 U	0.10 U	0.10 U	0.94 U	--	36
2-Chloronaphthalene	EPA 8270	µg/L	1 U	0.96 U	0.10 UJ	0.10 U	0.10 U	--	0.99 U	0.10 U	0.10 U	0.10 U	0.94 U	--	100
2-Chlorophenol	EPA 8270	µg/L	1 U	0.96 U	0.10 UJ	0.10 U	0.10 U	--	0.99 U	0.10 U	0.10 U	0.10 U	0.94 U	--	17
4-Chlorophenyl phenyl ether	EPA 8270	µg/L	1 U	0.96 U	0.10 UJ	0.10 U	0.10 U	--	0.99 U	0.10 U	0.10 U	0.10 U	0.94 U	--	NE
Decane	EPA 8270	µg/L	--	0.96 U	2.0 UJ	2.0 U	2.0 U	--	0.99 U	2.0 U	2.0 U	2.0 U	0.94 U	--	NE
Dibutyl phthalate	EPA 8270	µg/L	1 U	0.96 U	0.10 UJ	0.97 U	0.21	--	0.99 U	0.47	1.6 U	0.4	0.94 U	--	8
2,3-Dichloroaniline	EPA 8270	µg/L	1 U	0.96 U	0.10 UJ	0.10 U	0.10 U	--	0.99 U	0.10 U	0.10 U	0.10 U	0.94 U	--	NE
1,2-Dichlorobenzene (o-Dichlorobenzene)	EPA 8260	µg/L	0.2 U	0.20 U	0.20 U	0.20 U	0.20 U	--	0.20 U	0.20 U	0.20 U	0.20 U	--	--	4.6
	EPA 8270	µg/L	1 U	0.96 U	0.10 UJ	0.10 U	0.10 U	--	0.99 U	0.10 U	0.10 U	0.10 U	0.94 U	--	4.6
1,3-Dichlorobenzene (m-Dichlorobenzene)	EPA 8260	µg/L	0.2 U	0.20 U	0.20 U	0.20 U	0.20 U	--	0.20 U	0.20 U	0.20 U	0.20 U	--	--	2.0
	EPA 8270	µg/L	1 U	0.96 U	0.10 UJ	0.10 U	0.10 U	--	0.99 U	0.10 U	0.10 U	0.10 U	0.94 U	--	2.0
1,4-Dichlorobenzene (p-Dichlorobenzene)	EPA 8260	µg/L	0.2 U	0.20 U	0.20 U	0.20 U	0.20 U	--	0.20 U	0.20 U	0.20 U	0.20 U	--	--	4.9
	EPA 8270	µg/L	1 U	0.96 U	0.10 UJ	0.10 U	0.10 U	--	0.99 U	0.10 U	0.10 U	0.10 U	0.94 U	--	4.9
3,3'-Dichlorobenzidine	EPA 8270	µg/L	10 U	0.96 U	0.10 UJ	0.10 U	0.10 U	--	0.99 U	0.10 U	0.10 U	0.10 U	0.94 U	--	0.0033
2,4-Dichlorophenol	EPA 8270	µg/L	1 U	0.96 U	0.10 UJ	0.10 U	0.13	--	0.99 U	0.10 U	0.10 U	0.10 U	0.94 U	--	10
Bis(2-ethylhexyl)ester	EPA 8270	µg/L	1 U	0.96 U	0.10 UJ	0.10 U	0.10 U	--	0.99 U	0.10 U	0.10 U	0.10 U	0.94 U	--	400
Diethyl phthalate	EPA 8270	µg/L	1 U	0.96 U	0.52 J	0.10 U	0.10 U	--	0.99 U	0.10 U	0.10 U	0.10 U	0.94 U	--	93
Dimethyl phthalate	EPA 8270	µg/L	1 U	0.96 U	0.10 UJ	0.10 U	0.10 U	--	0.99 U	0.10 U	0.10 U	0.10 U	0.94 U	--	600
2,4-Dimethylphenol	EPA 8270	µg/L	1 U	0.96 U	0.10 UJ	0.10 U	0.10 U	--	0.99 U	0.10 U	0.10 U	0.10 U	0.94 U	--	6.30
1,2-Dinitrobenzene	EPA 8270	µg/L	1 U	0.96 U	0.10 UJ	0.10 U	0.10 U	--	0.99 U	0.10 U	0.10 U	0.10 U	0.94 U	--	1.6
1,3-Dinitrobenzene	EPA 8270	µg/L	1 U	0.96 U	0.10 UJ	0.10 U	0.10 U	--	0.99 U	0.10 U	0.10 U	0.10 U	0.94 U	--	1.6
1,4-Dinitrobenzene	EPA 8270	µg/L	1 U	0.96 U	0.10 UJ	0.10 U	0.10 U	--	0.99 U	0.10 U	0.10 U	0.10 U	0.94 U	--	1.6
4,6-Dinitro-2-methylphenol	EPA 8270	µg/L	5 U	0.96 U	0.50 UJ	0.50 U	0.50 U	--	0.99 U	0.50 U	0.50 U	0.50 U	0.94 U	--	NE
2,4-Dinitrophenol	EPA 8270	µg/L	10 U	0.96 U	1.0 UJ	1.0 U	1.0 U	--	0.99 U	1.0 U	1.0 U	1.0 U	0.94 U	--	100
2,4-Dinitrotoluene	EPA 8270	µg/L	1 U	0.96 U	0.10 UJ	0.25 U	0.10 U	--	0.99 U	0.10 U	0.25 U	0.10 UJ	0.94 U	--	0.18
2,6-Dinitrotoluene	EPA 8270	µg/L	1 U	0.96 U	0.10 UJ	0.10 U	0.10 U	--	0.99 U	0.10 U	0.10 U	0.10 U	0.94 U	--	300
Di-n-octyl phthalate	EPA 8270	µg/L	1 U	0.96 U	0.10 UJ	0.10 U	0.10 U	--	0.99 U	0.10 U	0.10 U	0.10 U	0.94 U	--	0.0039
1,2-Diphenylhydrazine	EPA 8270	µg/L	1 U	0.96 U	0.10 UJ	0.10 U	0.10 U	--	0.99 U	0.10 U	0.10 U	0.10 U	0.94 U	--	0.02
Hexachlorobenzene	EPA 8270	µg/L	1 U	0.96 U	0.10 UJ	0.10 U	0.10 U	--	0.99 U	0.10 U	0.10 U	0.10 U	0.94 U	--	0.000005
Hexachlorobutadiene	EPA 8260	µg/L	0.2 U	0.20 U	0.20 U	0.20 U	0.25 U	--	0.20 U	0.20 U	0.20 U	0.25 U	--	--	0.01
	EPA 8270	µg/L	1 U	0.96 U	0.10 UJ	0.10 U	0.10 U	--	0.99 U	0.10 U	0.10 U	0.10 U	0.94 U	--	0.01

Table D-2
Remedial Investigation Chemical Analytical Results - Groundwater COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Monitoring Well ¹	Analytical Method	Units	MW-10	MW-10	MW-10	MW-10	MW-10	MW-10	MW-10D	MW-10D	MW-10D	MW-10D	MW-11	MW-11 ²	Groundwater Preliminary Cleanup Level ³ (PCUL)
Sample Date			11/4/2009	06/09/14	09/23/14	01/20/15	04/23/15	03/17/17	06/09/14	09/23/14	01/20/15	04/23/15	06/13/14	09/24/14	
Monitoring Event			Nov-09	Jun-14	Sep-14	Jan-15	Apr-15	Mar-17	Jun-14	Sep-14	Jan-15	Apr-15	Jun-14	Sep-14	
Sampled By			Landau	GEI	GEI	GEI	GEI	Ecology	GEI	GEI	GEI	GEI	GEI	GEI	
Hexachlorocyclopentadiene	EPA 8270	µg/L	1 U	0.96 U	0.10 UJ	0.10 U	0.10 U	--	0.99 U	0.10 U	0.10 U	0.10 U	0.94 U	--	1.00
Hexachloroethane	EPA 8270	µg/L	1 U	0.96 U	0.10 UJ	0.10 U	0.10 U	--	0.99 U	0.10 U	0.10 U	0.10 U	0.94 U	--	0.02
Isophorone	EPA 8270	µg/L	1 U	0.96 U	0.10 UJ	0.10 U	0.10 U	--	0.99 U	0.10 U	0.10 U	0.10 U	0.94 U	--	110
2-Methylphenol (o-Cresol)	EPA 8270	µg/L	1 U	0.96 U	0.10 UJ	0.10 U	0.10 U	--	0.99 U	0.10 U	0.10 U	0.10 U	0.94 U	--	27
3 & 4 Methylphenol (m & p-Cresol)	EPA 8270	µg/L	--	0.96 U	0.10 UJ	0.10 U	0.10 U	--	0.99 U	0.10 U	0.10 U	0.10 U	0.94 U	--	400
2-Nitroaniline	EPA 8270	µg/L	1 U	0.96 U	0.10 UJ	0.10 U	0.10 U	--	0.99 U	0.10 U	0.10 U	0.10 U	0.94 U	--	160
3-Nitroaniline	EPA 8270	µg/L	1 U	0.96 U	0.10 UJ	0.10 U	0.10 U	--	0.99 U	0.10 U	0.10 U	0.10 U	0.94 U	--	NE
4-Nitroaniline	EPA 8270	µg/L	1 U	0.96 U	0.10 UJ	0.10 U	0.10 U	--	0.99 U	0.10 U	0.10 U	0.10 U	0.94 U	--	NE
Nitrobenzene	EPA 8270	µg/L	1 U	0.96 U	0.10 UJ	0.10 U	0.10 U	--	0.99 U	0.10 U	0.10 U	0.10 U	0.94 U	--	100
2-Nitrophenol	EPA 8270	µg/L	1 U	0.96 U	0.10 UJ	0.10 U	0.10 U	--	0.99 U	0.10 U	0.10 U	0.10 U	0.94 U	--	NE
4-Nitrophenol (p-Nitrophenol)	EPA 8270	µg/L	1 U	0.96 U	0.10 UJ	0.10 U	0.10 U	--	0.99 U	0.10 U	0.10 U	0.10 UJ	0.94 U	--	NE
n-Nitrosodimethylamine	EPA 8270	µg/L	1 U	0.96 U	0.10 UJ	0.10 U	0.10 U	--	0.99 U	0.10 U	0.10 U	0.10 U	0.94 U	--	0.34
n-Nitrosodiphenylamine (as Diphenylamine)	EPA 8270	µg/L	10 U	0.96 U	0.10 UJ	0.10 U	0.10 U	--	0.99 U	0.10 U	0.10 U	0.10 U	0.94 U	--	0.69
n-Nitrosodi-n-propylamine	EPA 8270	µg/L	1 U	0.96 U	0.10 UJ	0.10 U	0.10 U	--	0.99 U	0.10 U	0.10 U	0.10 U	0.94 U	--	0.058
n-Octadecane	EPA 8270	µg/L	--	0.96 U	0.10 UJ	0.10 U	0.10 U	--	0.99 U	0.10 U	0.10 U	0.10 U	0.94 U	--	NE
Pentachlorophenol	EPA 8270	µg/L	5 U	0.96 U	0.50 UJ	0.73	0.50 U	--	0.99 U	0.50 U	0.50 U	0.50 U	0.94 UJ	--	0.002
Phenol	EPA 8270	µg/L	1 U	0.96 U	0.10 UJ	0.10 U	0.10 U	--	0.99 U	0.10 U	0.10 U	0.10 U	0.94 U	--	370
Pyridine	EPA 8270	µg/L	10 U	0.96 U	0.10 UJ	0.10 U	0.10 U	--	0.99 U	0.10 U	0.10 U	0.10 U	0.94 U	--	8
2,3,4,6-Tetrachlorophenol	EPA 8270	µg/L	1 U	0.96 U	0.10 UJ	0.10 U	0.10 U	--	0.99 U	0.10 U	0.10 U	0.10 U	0.94 U	--	480
2,3,5,6-Tetrachlorophenol	EPA 8270	µg/L	1 U	0.96 U	0.10 UJ	0.10 U	0.10 U	--	0.99 U	0.10 U	0.10 U	0.10 U	0.94 U	--	NE
1,2,4-Trichlorobenzene	EPA 8260	µg/L	0.2 U	0.20 U	0.20 U	0.20 U	0.27 U	--	0.20 U	0.20 U	0.20 U	0.27 U	--	--	0.037
	EPA 8270	µg/L	1 U	0.96 U	0.10 UJ	0.10 U	0.10 U	--	0.99 U	0.10 U	0.10 U	0.10 U	0.94 U	--	0.037
2,4,5-Trichlorophenol	EPA 8270	µg/L	1 U	0.96 U	0.10 UJ	0.10 U	0.10 U	--	0.99 U	0.10 U	0.10 U	0.10 U	0.94 U	--	600
2,4,6-Trichlorophenol	EPA 8270	µg/L	1 U	0.96 U	0.10 UJ	0.10 U	0.10 U	--	0.99 U	0.10 U	0.10 U	0.10 U	0.94 U	--	0.28
Volatile Organic Compounds (VOCs)															
Acetone	EPA 8260	µg/L	5 U	5.0 U	5.0 U	5.0 U	5.0 U	--	5.0 U	5.0 U	5.0 U	5.0 U	--	--	NE
Benzene	EPA 8260	µg/L	0.2 U	0.20 U	0.20 U	0.20 U	0.20 U	--	0.20 U	0.20 U	0.20 U	0.20 U	--	--	1.6
Bromobenzene	EPA 8260	µg/L	0.2 U	0.20 U	0.20 U	0.20 U	0.20 U	--	0.20 U	0.20 U	0.20 U	0.20 U	--	--	NE
Bromochloromethane	EPA 8260	µg/L	0.2 U	0.20 U	0.20 U	0.20 U	0.20 U	--	0.20 U	0.20 U	0.20 U	0.20 U	--	--	NE
Bromoform (Tribromomethane)	EPA 8260	µg/L	1 U	1.0 U	1.0 U	1.0 U	1.0 U	--	1.0 U	1.0 U	1.0 U	1.0 U	--	--	12
Bromomethane	EPA 8260	µg/L	0.2 U	0.39 UJ	0.20 U	0.20 U	0.38 UJ	--	0.39 UJ	0.20 U	0.20 U	0.38 UJ	--	--	13
n-Butylbenzene	EPA 8260	µg/L	0.2 U	0.20 U	0.20 U	0.20 U	0.20 U	--	0.20 U	0.20 U	0.20 U	0.20 U	--	--	400
sec-Butylbenzene	EPA 8260	µg/L	0.2 U	0.20 U	0.20 U	0.20 U	0.20 U	--	0.20 U	0.20 U	0.20 U	0.20 U	--	--	800
tert-Butylbenzene	EPA 8260	µg/L	0.2 U	0.20 U	0.20 U	0.20 U	0.20 U	--	0.20 U	0.20 U	0.20 U	0.20 U	--	--	800
Carbon disulfide	EPA 8260	µg/L	0.2 U	0.20 U	0.20 U	0.20 U	0.20 U	--	0.20 U	0.20 U	0.20 U	0.20 U	--	--	400
Carbon tetrachloride	EPA 8260	µg/L	0.2 U	0.20 U	0.20 U	0.20 U	0.20 U	--	0.20 U	0.20 U	0.20 U	0.20 U	--	--	0.35
Chlorobenzene	EPA 8260	µg/L	0.2 U	0.20 U	0.20 U	0.20 U	0.20 U	--	0.20 U	0.20 U	0.20 U	0.20 U	--	--	200
Chloroethane	EPA 8260	µg/L	1 U	1.0 U	1.0 U	1.0 U	1.0 U	--	1.0 U	1.0 U	1.0 U	1.0 U	--	--	19,000
2-Chloroethyl vinyl ether	EPA 8260	µg/L	1 U	1.0 U	1.0 UJ	3.0 UJ	1.7 UJ	--	1.0 U	1.0 U	3.0 UJ	1.7 UJ	--	--	NE
Chloroform	EPA 8260	µg/L	0.2 U	0.20 U	0.20 U	2.1	3.4	--	0.20 U	0.20 U	0.20 U	0.20 U	--	--	1.2
Chloromethane	EPA 8260	µg/L	1 U	1.0 U	1.0 U	1.0 U	1.0 U	--	1.0 U	1.0 U	1.0 U	1.0 U	--	--	150
2-Chlorotoluene	EPA 8260	µg/L	0.2 U	0.20 U	0.20 U	0.20 U	0.20 U	--	0.20 U	0.20 U	0.20 U	0.20 U	--	--	160
4-Chlorotoluene	EPA 8260	µg/L	0.2 U	0.20 U	0.20 U	0.20 U	0.20 U	--	0.20 U	0.20 U	0.20 U	0.20 U	--	--	NE

Table D-2
Remedial Investigation Chemical Analytical Results - Groundwater COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Monitoring Well ¹	Analytical Method	Units	MW-10	MW-10	MW-10	MW-10	MW-10	MW-10	MW-10D	MW-10D	MW-10D	MW-10D	MW-11	MW-11 ²	Groundwater Preliminary Cleanup Level ³ (PCUL)
Sample Date			11/4/2009	06/09/14	09/23/14	01/20/15	04/23/15	03/17/17	06/09/14	09/23/14	01/20/15	04/23/15	06/13/14	09/24/14	
Monitoring Event			Nov-09	Jun-14	Sep-14	Jan-15	Apr-15	Mar-17	Jun-14	Sep-14	Jan-15	Apr-15	Jun-14	Sep-14	
Sampled By			Landau	GEI	GEI	GEI	GEI	Ecology	GEI	GEI	GEI	GEI	GEI	GEI	
Dibromochloromethane	EPA 8260	µg/L	0.2 U	0.20 U	0.20 U	0.20 U	0.20 U	--	0.20 U	0.20 U	0.20 U	0.20 U	--	--	2.2
1,2-Dibromo-3-chloropropane	EPA 8260	µg/L	1 U	1.0 U	1.0 U	1.0 U	1.3 U	--	1.0 U	1.0 U	1.0 U	1.3 U	--	--	0.2
Dibromomethane	EPA 8260	µg/L	0.2 U	0.20 U	0.20 U	0.20 U	0.20 U	--	0.20 U	0.20 U	0.20 U	0.20 U	--	--	80
Bromodichloromethane	EPA 8260	µg/L	0.2 U	0.20 U	0.20 U	0.20 U	0.20 U	--	0.20 U	0.20 U	0.20 U	0.20 U	--	--	1.8
Dichlorodifluoromethane (CFC-12)	EPA 8260	µg/L	0.2 U	0.20 U	0.20 U	0.20 U	0.20 U	--	0.20 U	0.20 U	0.20 U	0.20 U	--	--	5.6
1,1-Dichloroethane	EPA 8260	µg/L	0.2 U	0.20 U	0.20 U	0.20 U	0.20 U	--	0.20 U	0.20 U	0.20 U	0.20 U	--	--	11
1,2-Dichloroethane	EPA 8260	µg/L	0.2 U	0.20 U	0.20 U	0.20 U	0.20 U	--	0.20 U	0.20 U	0.20 U	0.20 U	--	--	4.2
1,1-Dichloroethene	EPA 8260	µg/L	0.02 U	0.20 U	0.20 U	0.20 U	0.20 U	--	0.20 U	0.20 U	0.20 U	0.20 U	--	--	130
cis-1,2-Dichloroethene	EPA 8260	µg/L	0.2 U	0.20 U	0.20 U	0.20 U	0.20 U	--	0.20 U	0.20 U	0.20 U	0.20 U	--	--	16
trans-1,2-Dichloroethene	EPA 8260	µg/L	0.2 U	0.20 U	0.20 U	0.20 U	0.20 U	--	0.20 U	0.20 U	0.20 U	0.20 U	--	--	1,000
1,2-Dichloropropane	EPA 8260	µg/L	0.2 U	0.20 U	0.20 U	0.20 U	0.20 U	--	0.20 U	0.20 U	0.20 U	0.20 U	--	--	3.1
1,3-Dichloropropane	EPA 8260	µg/L	0.2 U	0.20 U	0.20 U	0.20 U	0.20 U	--	0.20 U	0.20 U	0.20 U	0.20 U	--	--	NE
2,2-Dichloropropane	EPA 8260	µg/L	--	0.20 U	0.20 U	0.20 U	0.20 U	--	0.20 U	0.20 U	0.20 U	0.20 U	--	--	NE
1,1-Dichloropropene	EPA 8260	µg/L	0.2 U	0.20 U	0.20 U	0.20 U	0.20 U	--	0.20 U	0.20 U	0.20 U	0.20 U	--	--	NE
cis-1,3-Dichloropropene	EPA 8260	µg/L	0.2 U	0.20 U	0.20 U	0.20 U	0.20 U	--	0.20 U	0.20 U	0.20 U	0.20 U	--	--	2
trans-1,3-Dichloropropene	EPA 8260	µg/L	0.2 U	0.20 U	0.20 U	0.20 U	0.20 U	--	0.20 U	0.20 U	0.20 U	0.20 U	--	--	2
Ethylbenzene	EPA 8260	µg/L	0.2 U	0.20 U	0.20 U	0.20 U	0.20 U	--	0.20 U	0.20 U	0.20 U	0.20 U	--	--	31
1,2-Dibromoethane (EDB)	EPA 8260	µg/L	0.2 U	0.20 U	0.20 U	0.20 U	0.20 U	--	0.20 U	0.20 U	0.20 U	0.20 U	--	--	0.27
2-Hexanone	EPA 8260	µg/L	2 U	2.0 U	2.0 U	2.0 U	2.0 U	--	2.0 U	2.0 U	2.0 U	2.0 U	--	--	40
Isopropylbenzene (Cumene)	EPA 8260	µg/L	0.2 U	0.20 U	0.20 U	0.20 U	0.20 U	--	0.20 U	0.20 U	0.20 U	0.20 U	--	--	800
p-Isopropyltoluene	EPA 8260	µg/L	0.2 U	0.20 U	0.20 U	0.20 U	0.20 U	--	0.20 U	0.20 U	0.20 U	0.20 U	--	--	NE
2-Butanone (MEK)	EPA 8260	µg/L	5 U	5.0 U	5.0 U	5.0 U	5.0 U	--	5.0 U	5.0 U	5.0 U	5.0 U	--	--	1,700,000
Methyl iodide (Iodomethane)	EPA 8260	µg/L	1 U	2.1 UJ	1.0 U	1.0 U	2.4 UJ	--	2.1 UJ	1.0 U	1.0 U	2.4 UJ	--	--	NE
4-Methyl-2-pentanone (Methyl isobutyl ketone)	EPA 8260	µg/L	2 U	2.0 U	2.0 U	2.0 U	2.0 U	--	2.0 U	2.0 U	2.0 U	2.0 U	--	--	470,000
Methyl t-butyl ether (MTBE)	EPA 8260	µg/L	0.2 U	0.20 U	0.20 U	0.20 U	0.20 U	--	0.20 U	0.20 U	0.20 U	0.20 U	--	--	600
Methylene chloride	EPA 8260	µg/L	1 U	1.0 U	1.0 U	1.0 U	1.0 U	--	1.0 U	1.0 U	1.0 U	1.0 U	--	--	100
n-Propylbenzene	EPA 8260	µg/L	0.2 U	0.20 U	0.20 U	0.20 U	0.20 U	--	0.20 U	0.20 U	0.20 U	0.20 U	--	--	800
Styrene	EPA 8260	µg/L	0.2 U	0.20 U	0.20 U	0.20 U	0.20 U	--	0.20 U	0.20 U	0.20 U	0.20 U	--	--	8,200
1,1,1,2-Tetrachloroethane	EPA 8260	µg/L	0.2 U	0.20 U	0.20 U	0.20 U	0.20 U	--	0.20 U	0.20 U	0.20 U	0.20 U	--	--	7.4
1,1,2,2-Tetrachloroethane	EPA 8260	µg/L	0.2 U	0.20 U	0.20 U	0.20 U	0.20 U	--	0.20 U	0.20 U	0.20 U	0.20 U	--	--	0.3
Tetrachloroethene	EPA 8260	µg/L	0.2 U	0.20 U	0.20 U	0.20 U	0.20 U	--	0.20 U	0.20 U	0.20 U	0.20 U	--	--	2.9
Toluene	EPA 8260	µg/L	1 U	1.0 U	1.0 U	1.0 U	1.0 U	--	1.0 U	1.0 U	1.0 U	1.0 U	--	--	130
1,2,3-Trichlorobenzene	EPA 8260	µg/L	0.2 U	0.20 U	0.20 U	0.20 U	0.31 U	--	0.20 U	0.20 U	0.20 U	0.31 U	--	--	NE
1,1,1-Trichloroethane	EPA 8260	µg/L	0.2 U	0.20 U	0.20 U	0.20 U	0.20 U	--	0.20 U	0.20 U	0.20 U	0.20 U	--	--	5,500
1,1,2-Trichloroethane	EPA 8260	µg/L	0.2 U	0.20 U	0.20 U	0.20 U	0.20 U	--	0.20 U	0.20 U	0.20 U	0.20 U	--	--	0.9
Trichloroethene	EPA 8260	µg/L	0.2 U	0.20 U	0.20 U	0.20 U	0.20 U	--	0.20 U	0.20 U	0.20 U	0.20 U	--	--	0.7
Trichlorofluoromethane (CFC-11)	EPA 8260	µg/L	0.2 U	0.20 U	0.20 U	0.20 U	0.20 U	--	0.20 U	0.20 U	0.20 U	0.20 U	--	--	120
1,2,3-Trichloropropane	EPA 8260	µg/L	0.2 U	0.20 U	0.20 U	0.20 U	0.20 U	--	0.20 U	0.20 U	0.20 U	0.20 U	--	--	1,500
1,2,4-Trimethylbenzene	EPA 8260	µg/L	0.2 U	0.20 U	0.20 U	0.20 U	0.20 U	--	0.20 U	0.20 U	0.20 U	0.20 U	--	--	240
1,3,5-Trimethylbenzene	EPA 8260	µg/L	0.2 U	0.20 U	0.20 U	0.20 U	0.20 U	--	0.20 U	0.20 U	0.20 U	0.20 U	--	--	80
Vinyl acetate	EPA 8260	µg/L	2 U	1.0 UJ	1.0 U	1.0 U	1.0 U	--	1.0 UJ	1.0 U	1.0 U	1.0 U	--	--	7,800

Table D-2

Remedial Investigation Chemical Analytical Results - Groundwater COPCs

Port of Seattle - North Terminal 115

Seattle, Washington

Monitoring Well ¹	Analytical Method	Units	MW-10	MW-10	MW-10	MW-10	MW-10	MW-10	MW-10D	MW-10D	MW-10D	MW-10D	MW-11	MW-11 ²	Groundwater Preliminary Cleanup Level ³ (PCUL)
Sample Date			11/4/2009	06/09/14	09/23/14	01/20/15	04/23/15	03/17/17	06/09/14	09/23/14	01/20/15	04/23/15	06/13/14	09/24/14	
Monitoring Event			Nov-09	Jun-14	Sep-14	Jan-15	Apr-15	Mar-17	Jun-14	Sep-14	Jan-15	Apr-15	Jun-14	Sep-14	
Sampled By			Landau	GEI	GEI	GEI	GEI	Ecology	GEI	GEI	GEI	GEI	GEI	GEI	
Vinyl chloride	EPA 8260	µg/L	0.02 U	0.20 U	0.20 U	0.20 U	0.20 U	--	0.20 U	0.20 U	0.20 U	0.20 U	--	--	0.18
Xylene, m-,p-	EPA 8260	µg/L	0.4 U	0.40 U	0.40 U	0.40 U	0.40 U	--	0.40 U	0.40 U	0.40 U	0.40 U	--	--	290
Xylene, o-	EPA 8260	µg/L	0.2 U	0.20 U	0.20 U	0.20 U	0.20 U	--	0.20 U	0.20 U	0.20 U	0.20 U	--	--	430
Petroleum Hydrocarbons															
Gasoline-range hydrocarbons	NWTPH-G	µg/L	--	--	100 U	100 U	100 U	--	--	100 U	100 U	100 U	--	--	800
Diesel-range hydrocarbons	NWTPH-Dx	µg/L	--	--	200 U	250 U	250 U	--	--	270	250 U	250 U	--	--	500
Oil-range hydrocarbons	NWTPH-Dx	µg/L	--	--	330 U	400 U	400 U	--	--	330 U	400 U	400 U	--	--	500
Total diesel- and oil-range hydrocarbons	NWTPH-Dx	µg/L	--	--	330 U	400 U	400 U	--	--	270	400 U	400 U	--	--	500
Diesel-range hydrocarbons	NWTPH-Dx Si/Gel	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	500
Oil-range hydrocarbons	NWTPH-Dx Si/Gel	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	500
Total diesel- and oil-range hydrocarbons	NWTPH-Dx Si/Gel	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	500
Conventional Parameters															
Total organic carbon (TOC)	SM 5310B	mg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
Field Measured Parameters															
pH	N/A	N/A	6.89	6.96	7.29	6.99	7.21	--	9.00	7.07	6.97	7.14	7.40	--	NE

Notes:

¹ Monitoring well locations are shown on Figures 3-2 and 3-4.

² Insufficient water to collect groundwater sample for chemical analysis.

³ Groundwater screening levels referenced from Table 4-2.

⁴ Total dioxin/furan Toxic Equivalency Quotients (TEQs) were calculated using United States Environmental Protection Agency (USEPA) Toxicity Equivalency Factor (TEF) values for human health (EPA 2003).

⁵ Total carcinogenic PAH (cPAH) TEQs were calculated using TEF values referenced from MTCA Table 708.2 (WAC 173-340-900).

mg/L = milligram per liter

µg/L = microgram per liter

NE = not established

Landau = Landau Associates

GEI = GeoEngineers

NE = not established

J = estimated result

U = analyte not detected above the reporting limit

-- = not analyzed

COPC = Contaminant of Potential Concern

Bold indicates analyte was detected.

Yellow shading identifies the detected results greater than the preliminary cleanup level.

Blue shading identifies the non-detected result greater than the preliminary cleanup level.

Table D-2
Remedial Investigation Chemical Analytical Results - Groundwater COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Monitoring Well ¹	Analytical Method	Units	MW-11	MW-11	MW-12	MW-12	MW-12	MW-12	MW-12	MW-13	MW-13	MW-13	MW-13	MW-13	Groundwater Preliminary Cleanup Level ³ (PCUL)
Sample Date			01/22/15	04/20/15	06/12/14	09/24/14	01/22/15	04/20/15	06/12/14	09/25/14	09/25/14	01/22/15	01/22/15	04/20/15	
Monitoring Event			Jan-15	Apr-15	Jun-14	Sep-14	Jan-15	Apr-15	Jun-14	Sep-14	Sep-14 (Dup)	Jan-15	Jan-15 (Dup)	Apr-15	
Sampled By			GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	
Polychlorinated Biphenyls (PCBs)															
PCB-Aroclor 1016	EPA 8082	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
PCB-Aroclor 1221	EPA 8082	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
PCB-Aroclor 1232	EPA 8082	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
PCB-Aroclor 1242	EPA 8082	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
PCB-Aroclor 1248	EPA 8082	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
PCB-Aroclor 1254	EPA 8082	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
PCB-Aroclor 1260	EPA 8082	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
Total PCB Aroclors	EPA 8082	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	0.000007
Total PCB Congeners	EPA 1668	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	0.000007
Dioxins and Furans															
1,2,3,4,6,7,8-HpCDD	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,4,6,7,8-HpCDF	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,4,7,8,9-HpCDF	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,4,7,8-HxCDD	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,4,7,8-HxCDF	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,6,7,8-HxCDD	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,6,7,8-HxCDF	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,7,8,9-HxCDD	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,7,8,9-HxCDF	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,7,8-PeCDD	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,7,8-PeCDF	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
2,3,4,6,7,8-HxCDF	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
2,3,4,7,8-PeCDF	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
2,3,7,8-TCDD	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
2,3,7,8-TCDF	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
OCDD	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
OCDF	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
Total Dioxin/Furan TEQ ⁴ (ND=0)	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	0.0000000051
Total Dioxin/Furan TEQ ⁴ (ND=0.5RL)	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	0.0000000051
Total Metals															
Antimony	EPA 200.8/7470	µg/L	5.4 U	5.4 U	5.4 U	5.4 U	5.4 U	5.0 U	5.5 U	5.5 U	5.5 U	5.5 U	5.5 U	5.0 U	90
Arsenic	EPA 200.8/7470	µg/L	3.3 U	4.1	5.5	3.3 U	3.3 U	3.0 U	18	20	22	15	14	11	8.0
Barium	EPA 200.8/7470	µg/L	110	120	26	10	22	9.2	50	43	39	45	47	40	200
Beryllium	EPA 200.8/7470	µg/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	4.4
Cadmium	EPA 200.8/7470	µg/L	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	1.2
Chromium III / Total	EPA 200.8/7470	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	4.1	4.6	5.1	2.7	2.6	2.2	27
Chromium VI	EPA 200.8/7470	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	50
Copper	EPA 200.8/7470	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	3	10	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	3.1
Lead	EPA 200.8/7470	µg/L	1.0 U	1.2	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	8.1
Mercury	EPA 200.8/7470	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.025
Nickel	EPA 200.8/7470	µg/L	5	6.1	2.6	10	10	2.5	2.0 U	2.3	2.3	2.0 U	2.2	2.0 U	8.2

Table D-2
Remedial Investigation Chemical Analytical Results - Groundwater COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Monitoring Well ¹	Analytical Method	Units	MW-11	MW-11	MW-12	MW-12	MW-12	MW-12	MW-13	MW-13	MW-13	MW-13	MW-13	MW-13	Groundwater Preliminary Cleanup Level ³ (PCUL)
Sample Date			01/22/15	04/20/15	06/12/14	09/24/14	01/22/15	04/20/15	06/12/14	09/25/14	09/25/14	01/22/15	01/22/15	04/20/15	
Monitoring Event			Jan-15	Apr-15	Jun-14	Sep-14	Jan-15	Apr-15	Jun-14	Sep-14	Sep-14 (Dup)	Jan-15	Jan-15 (Dup)	Apr-15	
Sampled By			GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	
Selenium	EPA 200.8/7470	µg/L	6.0 U	6.0 U	6.0 U	6.0 U	6.0 U	6.0 U	6.0 U	6.0 U	6.0 U	6.0 U	6.0 U	6.0 U	71
Silver	EPA 200.8/7470	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.9
Thallium	EPA 200.8/7470	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	0.062
Tin	EPA 200.8/7470	µg/L	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	12	11	13	13	12	7.3	9,600
Zinc	EPA 200.8/7470	µg/L	56 U	56 U	56 U	56 U	56 U	56 U	56 U	56 U	56 U	55 U	55 U	56 U	81
Dissolved Metals															
Antimony	EPA 200.8/7470	µg/L	5.5 U	5.5 U	5.5 U	5.5 U	5.5 U	5.5 U	5.5 U	5.5 U	5.5 U	5.5 U	5.5 U	5.5 U	90
Arsenic	EPA 200.8/7470	µg/L	3.3 U	4.1	5.4	8.3 U	3.3 U	12	16	22 J	22 J	15	15	9.4	8.0
Barium	EPA 200.8/7470	µg/L	88	100	25	9.3	18	41	48	37	45	43	44	38	200
Beryllium	EPA 200.8/7470	µg/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	4.4
Cadmium	EPA 200.8/7470	µg/L	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	1.2
Chromium III / Total	EPA 200.8/7470	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	4.1	4.4	4.4	3.3	2.7	2.0 U	27
Copper	EPA 200.8/7470	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	8	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	3.1
Lead	EPA 200.8/7470	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	8.1
Mercury	EPA 200.8/7470	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.025
Nickel	EPA 200.8/7470	µg/L	3.9	3.3	2.6	9.9	7.7	3.8	2.4	2.6	2.2	2.1	2.0 U	3.3	8.2
Selenium	EPA 200.8/7470	µg/L	6.0 U	6.0 U	6.0 U	6.0 U	6.0 U	6.0 U	6.0 U	6.0 U	6.0 U	6.0 U	6.0 U	6.0 U	71
Silver	EPA 200.8/7470	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.9
Thallium	EPA 200.8/7470	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	0.062
Tin	EPA 200.8/7470	µg/L	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	7.7	6.8	7	6.7	11	11	6.1	9,600
Zinc	EPA 200.8/7470	µg/L	56 U	56 U	56 U	56 U	56 U	56 U	56 U	56 U	56 U	55 U	55 U	56 U	81
Semi-Volatile Organic Compounds (SVOCs) - Polycyclic Aromatic Hydrocarbons (PAHs)															
Acenaphthene	EPA 8270/SIM	µg/L	0.10 U	0.10 U	0.48 U	0.10 U	0.10 U	0.10 U	0.48 U	0.10 U	0.10 U	0.10 UJ	0.10 U	0.10 U	5.3
Acenaphthylene	EPA 8270/SIM	µg/L	0.10 U	0.10 U	0.48 U	0.10 U	0.10 U	0.10 U	0.48 U	0.10 U	0.10 U	0.10 UJ	0.10 U	0.10 U	NE
Anthracene	EPA 8270/SIM	µg/L	0.10 U	0.10 U	0.48 U	0.10 U	0.10 U	0.10 U	0.48 U	0.10 U	0.10 U	0.10 UJ	0.10 U	0.10 U	2.1
Benzo(a)anthracene	EPA 8270/SIM	µg/L	0.010 U	0.010 U	0.048 U	0.010 U	0.010 U	0.010 U	0.07	0.010 U	0.010 U	0.010 UJ	0.012	0.010 U	0.00016
Benzo(b)fluoranthene	EPA 8270/SIM	µg/L	0.010 U	0.010 U	0.048 U	0.010 U	0.010 U	0.010 U	0.048 U	0.010 U	0.010 U	0.010 UJ	0.010 U	0.010 U	0.00016
Benzo(j,k)fluoranthene	EPA 8270/SIM	µg/L	0.010 U	0.010 U	0.048 U	0.010 U	0.010 U	0.010 U	0.048 U	0.010 U	0.010 U	0.010 UJ	0.010 U	0.010 U	0.0016
Benzo(g,h,i)perylene	EPA 8270/SIM	µg/L	0.010 U	0.010 U	0.048 U	0.010 U	0.010 U	0.010 U	0.048 U	0.010 U	0.010 U	0.010 UJ	0.010 U	0.010 U	NE
Benzo(a)pyrene	EPA 8270/SIM	µg/L	0.010 U	0.010 U	0.048 U	0.010 U	0.010 U	0.010 U	0.048 U	0.010 U	0.010 U	0.010 UJ	0.010 U	0.010 U	0.000016
Chrysene	EPA 8270/SIM	µg/L	0.010 U	0.010 U	0.048 U	0.010 U	0.010 U	0.010 U	0.048 U	0.010 U	0.010 U	0.010 UJ	0.011	0.010 U	0.016
Dibenzo(a,h)anthracene	EPA 8270/SIM	µg/L	0.010 U	0.010 U	0.048 U	0.010 U	0.010 U	0.010 U	0.048 U	0.010 U	0.010 U	0.010 UJ	0.010 U	0.010 U	0.000016
Dibenzofuran	EPA 8270/SIM	µg/L	0.10 U	0.10 U	0.96 U	0.10 U	0.10 U	0.10 U	0.97 U	0.10 U	0.10 U	0.10 UJ	0.10 U	0.10 U	16
Fluoranthene	EPA 8270/SIM	µg/L	0.10 U	0.10 U	0.48 U	0.10 U	0.10 U	0.10 U	0.48 U	0.10 U	0.10 U	0.10 UJ	0.10 U	0.10 U	1.8
Fluorene	EPA 8270/SIM	µg/L	0.10 U	0.10 U	0.48 U	0.10 U	0.10 U	0.10 U	0.48 U	0.10 U	0.10 U	0.10 UJ	0.10 U	0.10 U	3.7
Indeno(1,2,3-c,d)pyrene	EPA 8270/SIM	µg/L	0.010 U	0.010 U	0.048 U	0.010 U	0.010 U	0.010 U	0.048 U	0.010 U	0.010 U	0.010 UJ	0.010 U	0.010 U	0.00016
1-Methylnaphthalene	EPA 8270/SIM	µg/L	0.10 U	0.10 U	0.48 U	0.10 U	0.10 U	0.10 U	0.48 U	0.10 U	0.10 U	0.10 UJ	0.10 U	0.10 U	1.5
2-Methylnaphthalene	EPA 8270/SIM	µg/L	0.10 U	0.10 U	0.48 U	0.10 U	0.10 U	0.10 U	0.48 U	0.10 U	0.10 U	0.10 UJ	0.10 U	0.10 U	32
Naphthalene	EPA 8270/SIM	µg/L	0.10 U	0.54	0.48 U	0.10 U	0.10 U	0.10 U	0.48 U	0.10 U	0.10 U	0.10 UJ	0.10 U	0.10 U	1.4
Phenanthrene	EPA 8270/SIM	µg/L	0.10 U	0.10 U	0.48 U	0.10 U	0.10 U	0.10 U	0.48 U	0.10 U	0.10 U	0.10 UJ	0.10 U	0.10 U	NE
Pyrene	EPA 8270/SIM	µg/L	0.10 U	0.10 U	0.48 U	0.10 U	0.10 U	0.10 U	0.48 U	0.10 U	0.10 U	0.10 UJ	0.10 U	0.10 U	2
Total cPAH TEQ ⁵ (ND=0)	EPA 8270/SIM	µg/L	0 U	0 U	0 U	0 U	0 U	0 U	0.007	0 U	0 U	0 U	0.001	0 U	0.000016
Total cPAH TEQ ⁵ (ND=0.5RL)	EPA 8270/SIM	µg/L	0.0076 U	0.0076 U	0.036 UT	0.0076 U	0.0076 U	0.0076 U	0.041	0.0076 U	0.0076 UT	0.0076 U	0.008	0.0076 U	0.000016

Table D-2
Remedial Investigation Chemical Analytical Results - Groundwater COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Monitoring Well ¹	Analytical Method	Units	MW-11	MW-11	MW-12	MW-12	MW-12	MW-12	MW-13	MW-13	MW-13	MW-13	MW-13	MW-13	Groundwater Preliminary Cleanup Level ³ (PCUL)
Sample Date			01/22/15	04/20/15	06/12/14	09/24/14	01/22/15	04/20/15	06/12/14	09/25/14	09/25/14	01/22/15	01/22/15	04/20/15	
Monitoring Event			Jan-15	Apr-15	Jun-14	Sep-14	Jan-15	Apr-15	Jun-14	Sep-14	Sep-14 (Dup)	Jan-15	Jan-15 (Dup)	Apr-15	
Sampled By			GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	
Other SVOCs (mg/kg)															
Aniline	EPA 8270	µg/L	0.10 U	0.10 U	0.96 U	0.10 U	0.10 U	0.10 U	0.97 U	0.10 U	0.10 U	0.10 UJ	0.10 U	0.10 U	7.7
Benzidine	EPA 8270	µg/L	0.10 U	0.50 U	0.96 U	0.10 U	0.10 U	0.50 U	0.97 U	0.10 U	0.10 U	0.10 UJ	0.10 U	0.10 U	0.000023
Benzoic acid	EPA 8270	µg/L	0.50 U	0.50 U	0.96 U	0.50 U	0.50 U	0.50 U	0.97 U	0.50 U	0.50 U	0.50 UJ	0.50 U	0.50 U	590
Benzyl alcohol	EPA 8270	µg/L	0.10 U	0.13 J	0.96 U	0.13	0.10 U	0.17	0.97 U	0.15	0.12	0.10 UJ	0.10 U	0.10 U	800
Bis(2-chloroethoxy)methane	EPA 8270	µg/L	0.10 U	0.10 U	0.96 U	0.10 U	0.10 U	0.10 U	0.97 U	0.10 U	0.10 U	0.10 UJ	0.10 U	0.10 U	NE
Bis(2-chloroethyl)ether	EPA 8270	µg/L	0.10 U	0.10 U	0.96 U	0.10 U	0.10 U	0.10 U	0.97 U	0.10 U	0.10 U	0.10 UJ	0.10 U	0.10 U	0.06
Bis(2-chloroisopropyl)ether	EPA 8270	µg/L	0.10 U	0.10 U	0.96 U	0.10 U	0.10 U	0.10 U	0.97 U	0.10 U	0.10 U	0.10 UJ	0.10 U	0.10 U	900
Bis(2-ethylhexyl)phthalate	EPA 8270	µg/L	0.73 U	0.33 U	0.96 U	0.24 U	0.47 U	0.35 U	0.97 U	0.32 U	0.33 U	0.59 UJ	0.35 U	0.48	0.046
4-Bromophenyl phenyl ether	EPA 8270	µg/L	0.10 U	0.10 U	0.96 U	0.10 U	0.10 U	0.10 U	0.97 U	0.10 U	0.10 U	0.10 UJ	0.10 U	0.10 U	NE
Butyl benzyl phthalate	EPA 8270	µg/L	0.10 U	0.10 U	0.96 U	0.10 U	0.10 U	0.10 U	0.97 U	0.10 U	0.10 U	0.10 UJ	0.10 U	0.10 U	0.013
Carbazole	EPA 8270	µg/L	0.10 U	0.10 U	0.96 U	0.10 U	0.10 U	0.10 U	0.97 U	0.10 U	0.10 U	0.10 UJ	0.10 U	0.10 U	NE
4-Chloroaniline	EPA 8270	µg/L	0.10 U	0.10 U	0.96 U	0.10 U	0.10 U	0.10 U	0.97 U	0.10 U	0.10 U	0.10 UJ	0.10 U	0.10 U	2,300
4-Chloro-3-methylphenol	EPA 8270	µg/L	0.10 U	0.10 UJ	0.96 U	0.10 U	0.10 U	0.10 U	0.97 U	0.10 U	0.10 U	0.10 UJ	0.10 U	0.10 U	36
2-Chloronaphthalene	EPA 8270	µg/L	0.10 U	0.10 U	0.96 U	0.10 U	0.10 U	0.10 U	0.97 U	0.10 U	0.10 U	0.10 UJ	0.10 U	0.10 U	100
2-Chlorophenol	EPA 8270	µg/L	0.10 U	0.10 UJ	0.96 U	0.10 U	0.10 U	0.10 U	0.97 U	0.10 U	0.10 U	0.10 UJ	0.10 U	0.10 U	17
4-Chlorophenyl phenyl ether	EPA 8270	µg/L	0.10 U	0.10 U	0.96 U	0.10 U	0.10 U	0.10 U	0.97 U	0.10 U	0.10 U	0.10 UJ	0.10 U	0.10 U	NE
Decane	EPA 8270	µg/L	2.0 U	2.0 U	0.96 U	2.0 U	2.0 U	2.0 U	0.97 U	2.0 U	2.0 U	2.0 UJ	2.0 U	2.0 U	NE
Dibutyl phthalate	EPA 8270	µg/L	0.85 U	0.47 U	0.96 U	0.48	0.59 U	0.81 U	0.97 U	0.46	0.41	1.1 UJ	0.75 U	1.1	8
2,3-Dichloroaniline	EPA 8270	µg/L	0.10 U	0.10 U	0.96 U	0.10 U	0.10 U	0.10 U	0.97 U	0.10 U	0.10 U	0.10 UJ	0.10 U	0.10 U	NE
1,2-Dichlorobenzene (o-Dichlorobenzene)	EPA 8260	µg/L	--	--	--	--	--	--	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	4.6
	EPA 8270	µg/L	0.10 U	0.10 U	0.96 U	0.10 U	0.10 U	0.10 U	0.97 U	0.10 U	0.10 U	0.10 UJ	0.10 U	0.10 U	4.6
1,3-Dichlorobenzene (m-Dichlorobenzene)	EPA 8260	µg/L	--	--	--	--	--	--	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	2.0
	EPA 8270	µg/L	0.10 U	0.10 U	0.96 U	0.10 U	0.10 U	0.10 U	0.97 U	0.10 U	0.10 U	0.10 UJ	0.10 U	0.10 U	2.0
1,4-Dichlorobenzene (p-Dichlorobenzene)	EPA 8260	µg/L	--	--	--	--	--	--	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	4.9
	EPA 8270	µg/L	0.10 U	0.10 U	0.96 U	0.10 U	0.10 U	0.10 U	0.97 U	0.10 U	0.10 U	0.10 UJ	0.10 U	0.10 U	4.9
3,3'-Dichlorobenzidine	EPA 8270	µg/L	0.10 U	0.10 U	0.96 U	0.10 U	0.10 U	0.10 U	0.97 U	0.10 U	0.10 U	0.10 UJ	0.10 U	0.10 U	0.0033
2,4-Dichlorophenol	EPA 8270	µg/L	0.10 U	0.10 UJ	0.96 U	0.10 U	0.10 U	0.10 U	0.97 U	0.10 U	0.10 U	0.10 UJ	0.10 U	0.10 U	10
Bis(2-ethylhexyl)ester	EPA 8270	µg/L	0.10 U	0.10 U	0.96 U	0.10 U	0.10 U	0.10 U	0.97 U	0.10 U	0.10 U	0.10 UJ	0.10 U	0.10 U	400
Diethyl phthalate	EPA 8270	µg/L	0.10 U	0.10 U	0.96 U	0.10 U	0.10 U	0.27	0.97 U	0.10 U	0.10 U	0.10 UJ	0.10 U	0.10 U	93
Dimethyl phthalate	EPA 8270	µg/L	0.10 U	0.10 U	0.96 U	0.10 U	0.10 U	0.10 U	0.97 U	0.10 U	0.10 U	0.10 UJ	0.10 U	0.10 U	600
2,4-Dimethylphenol	EPA 8270	µg/L	0.10 U	0.10 UJ	0.96 U	0.10 U	0.10 U	0.10 U	0.97 U	0.10 U	0.10 U	0.10 UJ	0.10 U	0.10 U	6.30
1,2-Dinitrobenzene	EPA 8270	µg/L	0.10 U	0.10 U	0.96 U	0.10 U	0.10 U	0.10 U	0.97 U	0.10 U	0.10 U	0.10 UJ	0.10 U	0.10 U	1.6
1,3-Dinitrobenzene	EPA 8270	µg/L	0.10 U	0.10 U	0.96 U	0.10 U	0.10 U	0.10 U	0.97 U	0.10 U	0.10 U	0.10 UJ	0.10 U	0.10 U	1.6
1,4-Dinitrobenzene	EPA 8270	µg/L	0.10 U	0.10 U	0.96 U	0.10 U	0.10 U	0.10 U	0.97 U	0.10 U	0.10 U	0.10 UJ	0.10 U	0.10 U	1.6
4,6-Dinitro-2-methylphenol	EPA 8270	µg/L	0.50 U	0.50 UJ	0.96 U	0.50 U	0.50 U	0.50 U	0.97 U	0.50 U	0.50 U	0.50 UJ	0.50 U	0.50 U	NE
2,4-Dinitrophenol	EPA 8270	µg/L	1.0 U	1.0 UJ	0.96 U	1.0 U	1.0 U	1.0 U	0.97 U	1.0 U	1.0 U	1.0 UJ	1.0 U	1.0 U	100
2,4-Dinitrotoluene	EPA 8270	µg/L	0.25 U	0.25 U	0.96 U	0.10 U	0.25 U	0.25 U	0.97 U	0.10 U	0.10 U	0.25 UJ	0.25 U	0.10 U	0.18
2,6-Dinitrotoluene	EPA 8270	µg/L	0.10 U	0.10 U	0.96 U	0.10 U	0.10 U	0.10 U	0.97 U	0.10 U	0.10 U	0.10 UJ	0.10 U	0.10 U	300
Di-n-octyl phthalate	EPA 8270	µg/L	0.10 U	0.10 U	0.96 U	0.10 U	0.10 U	0.10 U	0.97 U	0.10 U	0.10 U	0.10 UJ	0.10 U	0.10 U	0.0039
1,2-Diphenylhydrazine	EPA 8270	µg/L	0.10 U	0.10 U	0.96 U	0.10 U	0.10 U	0.10 U	0.97 U	0.10 U	0.10 U	0.10 UJ	0.10 U	0.10 U	0.02
Hexachlorobenzene	EPA 8270	µg/L	0.10 U	0.10 U	0.96 U	0.10 U	0.10 U	0.10 U	0.97 U	0.10 U	0.10 U	0.10 UJ	0.10 U	0.10 U	0.000005
Hexachlorobutadiene	EPA 8260	µg/L	--	--	--	--	--	--	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.01
	EPA 8270	µg/L	0.10 U	0.10 U	0.96 U	0.10 U	0.10 U	0.10 U	0.97 U	0.10 U	0.10 U	0.10 UJ	0.10 U	0.10 U	0.01

Table D-2
Remedial Investigation Chemical Analytical Results - Groundwater COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Monitoring Well ¹	Analytical Method	Units	MW-11	MW-11	MW-12	MW-12	MW-12	MW-12	MW-13	MW-13	MW-13	MW-13	MW-13	MW-13	Groundwater Preliminary Cleanup Level ³ (PCUL)
Sample Date			01/22/15	04/20/15	06/12/14	09/24/14	01/22/15	04/20/15	06/12/14	09/25/14	09/25/14	01/22/15	01/22/15	04/20/15	
Monitoring Event			Jan-15	Apr-15	Jun-14	Sep-14	Jan-15	Apr-15	Jun-14	Sep-14	Sep-14 (Dup)	Jan-15	Jan-15 (Dup)	Apr-15	
Sampled By			GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	
Hexachlorocyclopentadiene	EPA 8270	µg/L	0.10 U	0.10 U	0.96 U	0.10 U	0.10 U	0.10 U	0.97 U	0.10 U	0.10 U	0.10 UJ	0.10 U	0.10 U	1.00
Hexachloroethane	EPA 8270	µg/L	0.10 U	0.10 U	0.96 U	0.10 U	0.10 U	0.10 U	0.97 U	0.10 U	0.10 U	0.10 UJ	0.10 U	0.10 U	0.02
Isophorone	EPA 8270	µg/L	0.10 U	0.10 U	0.96 U	0.10 U	0.10 U	0.10 U	0.97 U	0.10 U	0.10 U	0.10 UJ	0.10 U	0.10 U	110
2-Methylphenol (o-Cresol)	EPA 8270	µg/L	0.10 U	0.10 U	0.96 U	0.10 U	0.10 U	0.10 U	0.97 U	0.10 U	0.10 U	0.10 UJ	0.10 U	0.10 U	27
3 & 4 Methylphenol (m & p-Cresol)	EPA 8270	µg/L	0.10 U	0.10 UJ	0.96 U	0.10 U	0.10 U	0.10 U	0.97 U	0.10 U	0.10 U	0.10 UJ	0.10 U	0.10 U	400
2-Nitroaniline	EPA 8270	µg/L	0.10 U	0.10 U	0.96 U	0.10 U	0.10 U	0.10 U	0.97 U	0.10 U	0.10 U	0.10 UJ	0.10 U	0.10 U	160
3-Nitroaniline	EPA 8270	µg/L	0.10 U	0.10 U	0.96 U	0.10 U	0.10 U	0.10 U	0.97 U	0.10 U	0.10 U	0.10 UJ	0.10 U	0.10 U	NE
4-Nitroaniline	EPA 8270	µg/L	0.10 U	0.10 U	0.96 U	0.10 U	0.10 U	0.10 U	0.97 U	0.10 U	0.10 U	0.10 UJ	0.10 U	0.10 U	NE
Nitrobenzene	EPA 8270	µg/L	0.10 U	0.10 U	0.96 U	0.10 U	0.10 U	0.10 U	0.97 U	0.10 U	0.10 U	0.10 UJ	0.10 U	0.10 U	100
2-Nitrophenol	EPA 8270	µg/L	0.10 U	0.10 UJ	0.96 U	0.10 U	0.10 U	0.10 U	0.97 U	0.10 U	0.10 U	0.10 UJ	0.10 U	0.10 U	NE
4-Nitrophenol (p-Nitrophenol)	EPA 8270	µg/L	0.21	0.10 U	0.96 U	0.10 U	0.14	0.10 U	0.97 U	0.10 U	0.10 U	0.10 UJ	0.10 U	0.10 U	NE
n-Nitrosodimethylamine	EPA 8270	µg/L	0.10 U	0.10 U	0.96 U	0.10 U	0.10 U	0.10 U	0.97 U	0.10 U	0.10 U	0.10 UJ	0.10 U	0.10 U	0.34
n-Nitrosodiphenylamine (as Diphenylamine)	EPA 8270	µg/L	0.10 U	0.10 U	0.96 U	0.10 U	0.10 U	0.10 U	0.97 U	0.10 U	0.10 U	0.10 UJ	0.10 U	0.10 U	0.69
n-Nitrosodi-n-propylamine	EPA 8270	µg/L	0.10 U	0.10 U	0.96 U	0.10 U	0.10 U	0.10 U	0.97 U	0.10 U	0.10 U	0.10 UJ	0.10 U	0.10 U	0.058
n-Octadecane	EPA 8270	µg/L	0.10 U	0.24	0.96 U	0.10 U	0.10 U	0.10 U	0.97 U	0.10 U	0.10 U	0.10 UJ	0.10 U	0.10 U	NE
Pentachlorophenol	EPA 8270	µg/L	0.50 U	0.50 UJ	0.96 UJ	0.50 U	0.50 U	0.50 U	0.97 UJ	0.50 U	0.50 U	0.50 UJ	0.50 U	0.50 U	0.002
Phenol	EPA 8270	µg/L	0.10 U	0.10 UJ	0.96 U	0.10 U	0.10 U	0.10 U	0.97 U	0.10 U	0.10 U	0.10 UJ	0.10 U	0.10 U	370
Pyridine	EPA 8270	µg/L	0.10 U	0.10 U	0.96 U	0.10 U	0.10 U	0.10 U	0.97 U	0.10 U	0.10 U	0.10 UJ	0.10 U	0.10 U	8
2,3,4,6-Tetrachlorophenol	EPA 8270	µg/L	0.10 U	0.10 UJ	0.96 U	0.10 U	0.10 U	0.10 U	0.97 U	0.10 U	0.10 U	0.10 UJ	0.10 U	0.10 U	480
2,3,5,6-Tetrachlorophenol	EPA 8270	µg/L	0.10 U	0.10 UJ	0.96 U	0.10 U	0.10 U	0.10 U	0.97 U	0.10 U	0.10 U	0.10 UJ	0.10 U	0.10 U	NE
1,2,4-Trichlorobenzene	EPA 8260	µg/L	--	--	--	--	--	--	0.20 U	0.30 UJ	0.30 UJ	0.20 U	0.20 U	0.20 U	0.037
	EPA 8270	µg/L	0.10 U	0.10 U	0.96 U	0.10 U	0.10 U	0.10 U	0.97 U	0.10 U	0.10 U	0.10 UJ	0.10 U	0.10 U	0.037
2,4,5-Trichlorophenol	EPA 8270	µg/L	0.10 U	0.10 UJ	0.96 U	0.10 U	0.10 U	0.10 U	0.97 U	0.10 U	0.10 U	0.10 UJ	0.10 U	0.10 U	600
2,4,6-Trichlorophenol	EPA 8270	µg/L	0.10 U	0.10 UJ	0.96 U	0.10 U	0.10 U	0.10 U	0.97 U	0.10 U	0.10 U	0.10 UJ	0.10 U	0.10 U	0.28
Volatile Organic Compounds (VOCs)															
Acetone	EPA 8260	µg/L	--	--	--	--	--	--	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	NE
Benzene	EPA 8260	µg/L	--	--	--	--	--	--	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	1.6
Bromobenzene	EPA 8260	µg/L	--	--	--	--	--	--	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	NE
Bromochloromethane	EPA 8260	µg/L	--	--	--	--	--	--	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	NE
Bromoform (Tribromomethane)	EPA 8260	µg/L	--	--	--	--	--	--	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	12
Bromomethane	EPA 8260	µg/L	--	--	--	--	--	--	0.39 UJ	0.55 UJ	0.55 UJ	0.38 UJ	0.38 UJ	0.20 U	13
n-Butylbenzene	EPA 8260	µg/L	--	--	--	--	--	--	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	400
sec-Butylbenzene	EPA 8260	µg/L	--	--	--	--	--	--	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	800
tert-Butylbenzene	EPA 8260	µg/L	--	--	--	--	--	--	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	800
Carbon disulfide	EPA 8260	µg/L	--	--	--	--	--	--	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	400
Carbon tetrachloride	EPA 8260	µg/L	--	--	--	--	--	--	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.35
Chlorobenzene	EPA 8260	µg/L	--	--	--	--	--	--	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	200
Chloroethane	EPA 8260	µg/L	--	--	--	--	--	--	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	19,000
2-Chloroethyl vinyl ether	EPA 8260	µg/L	--	--	--	--	--	--	1.0 U	1.4 UJ	1.4 UJ	2.0 U	2.0 U	1.0 U	NE
Chloroform	EPA 8260	µg/L	--	--	--	--	--	--	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	1.2
Chloromethane	EPA 8260	µg/L	--	--	--	--	--	--	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	150
2-Chlorotoluene	EPA 8260	µg/L	--	--	--	--	--	--	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	160
4-Chlorotoluene	EPA 8260	µg/L	--	--	--	--	--	--	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	NE

Table D-2
Remedial Investigation Chemical Analytical Results - Groundwater COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Monitoring Well ¹	Analytical Method	Units	MW-11	MW-11	MW-12	MW-12	MW-12	MW-12	MW-13	MW-13	MW-13	MW-13	MW-13	MW-13	Groundwater Preliminary Cleanup Level ³ (PCUL)
Sample Date			01/22/15	04/20/15	06/12/14	09/24/14	01/22/15	04/20/15	06/12/14	09/25/14	09/25/14	01/22/15	01/22/15	04/20/15	
Monitoring Event			Jan-15	Apr-15	Jun-14	Sep-14	Jan-15	Apr-15	Jun-14	Sep-14	Sep-14 (Dup)	Jan-15	Jan-15 (Dup)	Apr-15	
Sampled By			GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	
Dibromochloromethane	EPA 8260	µg/L	--	--	--	--	--	--	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	2.2
1,2-Dibromo-3-chloropropane	EPA 8260	µg/L	--	--	--	--	--	--	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	0.2
Dibromomethane	EPA 8260	µg/L	--	--	--	--	--	--	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	80
Bromodichloromethane	EPA 8260	µg/L	--	--	--	--	--	--	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	1.8
Dichlorodifluoromethane (CFC-12)	EPA 8260	µg/L	--	--	--	--	--	--	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	5.6
1,1-Dichloroethane	EPA 8260	µg/L	--	--	--	--	--	--	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	11
1,2-Dichloroethane	EPA 8260	µg/L	--	--	--	--	--	--	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	4.2
1,1-Dichloroethene	EPA 8260	µg/L	--	--	--	--	--	--	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	130
cis-1,2-Dichloroethene	EPA 8260	µg/L	--	--	--	--	--	--	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	16
trans-1,2-Dichloroethene	EPA 8260	µg/L	--	--	--	--	--	--	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	1,000
1,2-Dichloropropane	EPA 8260	µg/L	--	--	--	--	--	--	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	3.1
1,3-Dichloropropane	EPA 8260	µg/L	--	--	--	--	--	--	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	NE
2,2-Dichloropropane	EPA 8260	µg/L	--	--	--	--	--	--	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	NE
1,1-Dichloropropene	EPA 8260	µg/L	--	--	--	--	--	--	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	NE
cis-1,3-Dichloropropene	EPA 8260	µg/L	--	--	--	--	--	--	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	2
trans-1,3-Dichloropropene	EPA 8260	µg/L	--	--	--	--	--	--	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	2
Ethylbenzene	EPA 8260	µg/L	--	--	--	--	--	--	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	31
1,2-Dibromoethane (EDB)	EPA 8260	µg/L	--	--	--	--	--	--	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.27
2-Hexanone	EPA 8260	µg/L	--	--	--	--	--	--	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	40
Isopropylbenzene (Cumene)	EPA 8260	µg/L	--	--	--	--	--	--	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	800
p-Isopropyltoluene	EPA 8260	µg/L	--	--	--	--	--	--	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	NE
2-Butanone (MEK)	EPA 8260	µg/L	--	--	--	--	--	--	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	1,700,000
Methyl iodide (Iodomethane)	EPA 8260	µg/L	--	--	--	--	--	--	2.1 UJ	1.9 UJ	1.9 UJ	1.3 U	1.3 U	1.0 U	NE
4-Methyl-2-pentanone (Methyl isobutyl ketone)	EPA 8260	µg/L	--	--	--	--	--	--	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	470,000
Methyl t-butyl ether (MTBE)	EPA 8260	µg/L	--	--	--	--	--	--	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	600
Methylene chloride	EPA 8260	µg/L	--	--	--	--	--	--	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	100
n-Propylbenzene	EPA 8260	µg/L	--	--	--	--	--	--	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	800
Styrene	EPA 8260	µg/L	--	--	--	--	--	--	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	8,200
1,1,1,2-Tetrachloroethane	EPA 8260	µg/L	--	--	--	--	--	--	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	7.4
1,1,1,2-Tetrachloroethane	EPA 8260	µg/L	--	--	--	--	--	--	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.3
Tetrachloroethene	EPA 8260	µg/L	--	--	--	--	--	--	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	2.9
Toluene	EPA 8260	µg/L	--	--	--	--	--	--	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	130
1,2,3-Trichlorobenzene	EPA 8260	µg/L	--	--	--	--	--	--	0.20 U	0.39 UJ	0.39 UJ	0.20 U	0.20 U	0.20 U	NE
1,1,1-Trichloroethane	EPA 8260	µg/L	--	--	--	--	--	--	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	5,500
1,1,2-Trichloroethane	EPA 8260	µg/L	--	--	--	--	--	--	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.9
Trichloroethene	EPA 8260	µg/L	--	--	--	--	--	--	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.7
Trichlorofluoromethane (CFC-11)	EPA 8260	µg/L	--	--	--	--	--	--	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	120
1,2,3-Trichloropropane	EPA 8260	µg/L	--	--	--	--	--	--	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	1,500
1,2,4-Trimethylbenzene	EPA 8260	µg/L	--	--	--	--	--	--	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	240
1,3,5-Trimethylbenzene	EPA 8260	µg/L	--	--	--	--	--	--	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	80
Vinyl acetate	EPA 8260	µg/L	--	--	--	--	--	--	1.0 UJ	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	7,800

Table D-2
Remedial Investigation Chemical Analytical Results - Groundwater COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Monitoring Well ¹	Analytical Method	Units	MW-11	MW-11	MW-12	MW-12	MW-12	MW-12	MW-13	MW-13	MW-13	MW-13	MW-13	MW-13	Groundwater Preliminary Cleanup Level ³ (PCUL)
Sample Date			01/22/15	04/20/15	06/12/14	09/24/14	01/22/15	04/20/15	06/12/14	09/25/14	09/25/14	01/22/15	01/22/15	04/20/15	
Monitoring Event			Jan-15	Apr-15	Jun-14	Sep-14	Jan-15	Apr-15	Jun-14	Sep-14	Sep-14 (Dup)	Jan-15	Jan-15 (Dup)	Apr-15	
Sampled By			GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	
Vinyl chloride	EPA 8260	µg/L	--	--	--	--	--	--	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.18
Xylene, m-,p-	EPA 8260	µg/L	--	--	--	--	--	--	0.40 U	0.40 U	0.40 U	0.40 U	0.40 U	0.40 U	290
Xylene, o-	EPA 8260	µg/L	--	--	--	--	--	--	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	430
Petroleum Hydrocarbons															
Gasoline-range hydrocarbons	NWTPH-G	µg/L	--	--	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U	100 U	800
Diesel-range hydrocarbons	NWTPH-Dx	µg/L	--	--	210 U	210 U	250 U	250 U	510	460	530	480 J	560 J	630	500
Oil-range hydrocarbons	NWTPH-Dx	µg/L	--	--	340 U	330 U	400 U	400 U	1,100	790	890	900 J	910 J	950	500
Total diesel- and oil-range hydrocarbons	NWTPH-Dx	µg/L	--	--	340 U	330 U	400 U	400 U	1,610	1,250	1,420	1,380 J	1,470 J	1,580	500
Diesel-range hydrocarbons	NWTPH-Dx Si/Gel	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	500
Oil-range hydrocarbons	NWTPH-Dx Si/Gel	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	500
Total diesel- and oil-range hydrocarbons	NWTPH-Dx Si/Gel	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	500
Conventional Parameters															
Total organic carbon (TOC)	SM 5310B	mg/L	2.9	2.3	--	--	--	--	--	--	--	--	--	--	NE
Field Measured Parameters															
pH	N/A	N/A	6.40	6.41	6.51	6.52	6.41	6.70	6.82	7.08	7.08	6.94	6.94	6.84	NE

Notes:

¹ Monitoring well locations are shown on Figures 3-2 and 3-4.

² Insufficient water to collect groundwater sample for chemical analysis.

³ Groundwater screening levels referenced from Table 4-2.

⁴ Total dioxin/furan Toxic Equivalency Quotients (TEQs) were calculated using United States Environmental Protection Agency (USEPA) Toxicity Equivalency Factor (TEF) values for human health (EPA 2003).

⁵ Total carcinogenic PAH (cPAH) TEQs were calculated using TEF values referenced from MTCA Table 708.2 (WAC 173-340-900).

mg/L = milligram per liter

µg/L = microgram per liter

NE = not established

Landau = Landau Associates

GEI = GeoEngineers

NE = not established

J = estimated result

U = analyte not detected above the reporting limit

-- = not analyzed

COPC = Contaminant of Potential Concern

Bold indicates analyte was detected.

Yellow shading identifies the detected results greater than the preliminary cleanup level.

Blue shading identifies the non-detected result greater than the preliminary cleanup level.

Table D-2
Remedial Investigation Chemical Analytical Results - Groundwater COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Monitoring Well ¹	Analytical Method	Units	MW-13	MW-14	MW-14 ²	MW-14	MW-14	MW-15	MW-15	MW-15	MW-15	MW-15	MW-16	MW-16	MW-16	Groundwater Preliminary Cleanup Level ³ (PCUL)
Sample Date			04/20/15	06/10/14	09/22/14	01/21/15	04/21/15	06/10/14	09/23/14	01/21/15	04/21/15	06/11/14	09/23/14	01/22/15		
Monitoring Event			Apr-15 (Dup)	Jun-14	Sep-14	Jan-15	Apr-15	Jun-14	Sep-14	Jan-15	Apr-15	Jun-14	Sep-14	Jan-15		
Sampled By			GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI		
Polychlorinated Biphenyls (PCBs)																
PCB-Aroclor 1016	EPA 8082	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE	
PCB-Aroclor 1221	EPA 8082	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE	
PCB-Aroclor 1232	EPA 8082	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE	
PCB-Aroclor 1242	EPA 8082	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE	
PCB-Aroclor 1248	EPA 8082	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE	
PCB-Aroclor 1254	EPA 8082	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE	
PCB-Aroclor 1260	EPA 8082	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE	
Total PCB Aroclors	EPA 8082	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	0.000007	
Total PCB Congeners	EPA 1668	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	0.000007	
Dioxins and Furans																
1,2,3,4,6,7,8-HpCDD	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE	
1,2,3,4,6,7,8-HpCDF	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE	
1,2,3,4,7,8,9-HpCDF	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE	
1,2,3,4,7,8-HxCDD	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE	
1,2,3,4,7,8-HxCDF	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE	
1,2,3,6,7,8-HxCDD	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE	
1,2,3,6,7,8-HxCDF	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE	
1,2,3,7,8,9-HxCDD	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE	
1,2,3,7,8,9-HxCDF	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE	
1,2,3,7,8-PeCDD	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE	
1,2,3,7,8-PeCDF	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE	
2,3,4,6,7,8-HxCDF	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE	
2,3,4,7,8-PeCDF	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE	
2,3,7,8-TCDD	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE	
2,3,7,8-TCDF	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE	
OCDD	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE	
OCDF	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE	
Total Dioxin/Furan TEQ ⁴ (ND=0)	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	0.0000000051	
Total Dioxin/Furan TEQ ⁴ (ND=0.5RL)	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	0.0000000051	
Total Metals																
Antimony	EPA 200.8/7470	µg/L	5.0 U	5.4 U	--	5.4 U	5.4 U	5.5 U	5.5 U	5.5 U	5.0 U	17	15	10	90	
Arsenic	EPA 200.8/7470	µg/L	11	4,500	--	7,800	5,100	64	71	160	64	440	160	140	8.0	
Barium	EPA 200.8/7470	µg/L	42	5.0 U	--	2.4	5.0 U	44	54	71	46	15	16	11	200	
Beryllium	EPA 200.8/7470	µg/L	10 U	10 U	--	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	4.4	
Cadmium	EPA 200.8/7470	µg/L	0.20 U	0.20 U	--	0.20 U	0.20 U	0.22	0.50 U	0.20 U	0.20 U	0.32	0.3	0.20 U	1.2	
Chromium III / Total	EPA 200.8/7470	µg/L	2.4	2.0 U	--	2.0 U	2.0 U	9.7	13	24	9.9	48	40	19	27	
Chromium VI	EPA 200.8/7470	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	50	
Copper	EPA 200.8/7470	µg/L	2.0 U	2.0 U	--	2.0 U	2.0 U	30	11	4.2	3.7	62	55	20	3.1	
Lead	EPA 200.8/7470	µg/L	1.0 U	1.0 U	--	1.0 U	1.0 U	110	53	9.9	15	1,500	1,700	370	8.1	
Mercury	EPA 200.8/7470	µg/L	0.50 U	0.50 U	--	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.025	
Nickel	EPA 200.8/7470	µg/L	2.0 U	2.0 U	--	2.0 U	2.0 U	25	24	44	27	140	42	33	8.2	

Table D-2
Remedial Investigation Chemical Analytical Results - Groundwater COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Monitoring Well ¹	Analytical Method	Units	MW-13	MW-14	MW-14 ²	MW-14	MW-14	MW-15	MW-15	MW-15	MW-15	MW-16	MW-16	MW-16	Groundwater Preliminary Cleanup Level ³ (PCUL)
Sample Date			04/20/15	06/10/14	09/22/14	01/21/15	04/21/15	06/10/14	09/23/14	01/21/15	04/21/15	06/11/14	09/23/14	01/22/15	
Monitoring Event			Apr-15 (Dup)	Jun-14	Sep-14	Jan-15	Apr-15	Jun-14	Sep-14	Jan-15	Apr-15	Jun-14	Sep-14	Jan-15	
Sampled By			GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	
Selenium	EPA 200.8/7470	µg/L	6.0 U	6.0 U	--	6.0 U	6.0 U	6.0 U	6.0 U	6.0 U	5.0 U	6.0 U	6.0 U	6.0 U	71
Silver	EPA 200.8/7470	µg/L	1.0 U	1.0 U	--	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.9
Thallium	EPA 200.8/7470	µg/L	2.0 U	2.0 U	--	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	0.062
Tin	EPA 200.8/7470	µg/L	7.8	5.0 U	--	5.0 U	5.0 U	43	23	30	30	5,500	2,500	1,800	9,600
Zinc	EPA 200.8/7470	µg/L	56 U	56 U	--	56 U	56 U	56 U	56 U	55 U	56 U	56 U	56	55 U	81
Dissolved Metals															
Antimony	EPA 200.8/7470	µg/L	5.5 U	5.5 U	--	5.5 U	5.5 U	5.5 U	5.5 U	5.5 U	5.5 U	17	17	11	90
Arsenic	EPA 200.8/7470	µg/L	12	4,200	--	7,900	4,200	68	78	140	76	480	180	130	8.0
Barium	EPA 200.8/7470	µg/L	37	5.0 U	--	5.0 U	5.0 U	39	53	71	52	11	11	5.0 U	200
Beryllium	EPA 200.8/7470	µg/L	10 U	10 U	--	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	4.4
Cadmium	EPA 200.8/7470	µg/L	0.20 U	0.20 U	--	0.20 U	0.20 U	0.20 U	0.50 U	0.20 U	0.20 U	0.20 U	0.4	0.20 U	1.2
Chromium III / Total	EPA 200.8/7470	µg/L	2.3	2.0 U	--	2.0 U	2.0 U	7.4	16	29	13	36	36	16	27
Copper	EPA 200.8/7470	µg/L	2.5	2.0 U	--	2.0 U	2.0 U	11	9.3	2.8	3.3	23	56	14	3.1
Lead	EPA 200.8/7470	µg/L	1.0 U	1.0 U	--	1.0 U	1.0 U	38	38	5.3	8.1	430	1,600	280	8.1
Mercury	EPA 200.8/7470	µg/L	0.50 U	0.50 U	--	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.025
Nickel	EPA 200.8/7470	µg/L	4	2.0 U	--	2.0 U	2.0 U	22	24	41	29	150	47	33	8.2
Selenium	EPA 200.8/7470	µg/L	6.0 U	6.0 U	--	6.0 U	6.0 U	6.0 U	6.0 U	6.0 U	6.0 U	6.0 U	6.0 U	6.0 U	71
Silver	EPA 200.8/7470	µg/L	1.0 U	1.0 U	--	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.9
Thallium	EPA 200.8/7470	µg/L	2.0 U	2.0 U	--	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	0.062
Tin	EPA 200.8/7470	µg/L	6.5	5.0 U	--	5.0 U	5.0 U	19	25	30	31	5,600	3,500	1,900	9,600
Zinc	EPA 200.8/7470	µg/L	56 U	56 U	--	56 U	56 U	56 U	56 U	55 U	56 U	56 U	56 U	55 U	81
Semi-Volatile Organic Compounds (SVOCs) - Polycyclic Aromatic Hydrocarbons (PAHs)															
Acenaphthene	EPA 8270/SIM	µg/L	0.10 U	0.49 U	--	0.95 U	0.96 U	0.47 U	0.08	0.94 U	0.99 U	4.7 U	0.47 U	2.3 U	5.3
Acenaphthylene	EPA 8270/SIM	µg/L	0.10 U	0.49 U	--	0.95 U	0.96 U	0.47 U	0.048 U	0.94 U	0.99 U	4.7 U	0.47 U	1.3	NE
Anthracene	EPA 8270/SIM	µg/L	0.10 U	0.49 U	--	0.95 U	0.96 U	0.47 U	0.048 U	0.94 U	0.99 U	4.7 U	0.57	2.3 U	2.1
Benzo(a)anthracene	EPA 8270/SIM	µg/L	0.010 U	0.049 U	--	0.048 U	0.048 U	0.047 U	0.0048 U	0.047 U	0.049 U	0.51	0.047 U	0.23 U	0.00016
Benzo(b)fluoranthene	EPA 8270/SIM	µg/L	0.01	0.049 U	--	0.048 U	0.048 U	0.047 U	0.0048 U	0.047 U	0.049 U	0.47 U	0.091	0.23 U	0.00016
Benzo(j,k)fluoranthene	EPA 8270/SIM	µg/L	0.010 U	0.049 U	--	0.048 U	0.048 U	0.047 U	0.0048 U	0.047 U	0.049 U	0.47 U	0.047 U	0.23 U	0.0016
Benzo(g,h,i)perylene	EPA 8270/SIM	µg/L	0.010 U	0.049 U	--	0.048 U	0.048 U	0.047 U	0.0048 U	0.047 U	0.049 U	0.47 U	0.047 U	0.23 U	NE
Benzo(a)pyrene	EPA 8270/SIM	µg/L	0.010 U	0.049 U	--	0.048 U	0.048 U	0.047 U	0.0048 U	0.047 U	0.049 U	0.47 U	0.047 U	0.23 U	0.000016
Chrysene	EPA 8270/SIM	µg/L	0.010 U	0.049 U	--	0.048 U	0.048 U	0.047 U	0.0048 U	0.047 U	0.049 U	0.47 U	0.047 U	0.23 U	0.016
Dibenzo(a,h)anthracene	EPA 8270/SIM	µg/L	0.010 U	0.049 U	--	0.048 U	0.048 U	0.047 U	0.0048 U	0.047 U	0.049 U	0.47 U	0.047 U	0.23 U	0.000016
Dibenzofuran	EPA 8270/SIM	µg/L	0.10 U	0.98 U	--	0.95 U	0.96 U	0.94 U	0.48 U	0.94 U	0.99 U	9.5 U	0.95 U	0.94 U	16
Fluoranthene	EPA 8270/SIM	µg/L	0.10 U	0.49 U	--	0.95 U	0.96 U	0.47 U	0.048 U	0.94 U	0.99 U	4.7 U	0.47 U	2.3 U	1.8
Fluorene	EPA 8270/SIM	µg/L	0.10 U	0.49 U	--	0.95 U	0.96 U	0.47 U	0.048 U	0.94 U	0.99 U	4.7 U	0.47 U	2.3 U	3.7
Indeno(1,2,3-c,d)pyrene	EPA 8270/SIM	µg/L	0.010 U	0.049 U	--	0.048 U	0.048 U	0.047 U	0.0048 U	0.047 U	0.049 U	0.47 U	0.047 U	0.23 U	0.00016
1-Methylnaphthalene	EPA 8270/SIM	µg/L	0.10 U	0.49 U	--	0.95 U	0.96 U	0.47 U	0.048 U	0.94 U	0.99 U	4.7 U	0.47 U	2.3 U	1.5
2-Methylnaphthalene	EPA 8270/SIM	µg/L	0.10 U	0.49 U	--	0.95 U	0.96 U	0.47 U	0.048 U	0.94 U	0.99 U	4.7 U	0.47 U	2.3 U	32
Naphthalene	EPA 8270/SIM	µg/L	0.10 U	0.49 U	--	0.95 U	0.96 U	0.47 U	0.079	0.94 U	0.99 U	4.7 U	1.1	0.99	1.4
Phenanthrene	EPA 8270/SIM	µg/L	0.10 U	0.49 U	--	0.95 U	0.96 U	0.47 U	0.048 U	0.94 U	0.99 U	4.7 U	0.47 U	2.3 U	NE
Pyrene	EPA 8270/SIM	µg/L	0.10 U	0.49 U	--	0.95 U	0.96 U	0.47 U	0.048 U	0.94 U	0.99 U	4.7 U	0.47 U	2.3 U	2
Total cPAH TEQ ⁵ (ND=0)	EPA 8270/SIM	µg/L	0.001	0 U	--	0 U	0 U	0 U	0 U	0 U	0 U	0.051	0.009	0 U	0.000016
Total cPAH TEQ ⁵ (ND=0.5RL)	EPA 8270/SIM	µg/L	0.008	0.037 U	--	0.037 U	0.037 U	0.035 U	0.0036 U	0.037 U	0.037 U	0.380	0.042	0.174 U	0.000016

Table D-2
Remedial Investigation Chemical Analytical Results - Groundwater COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Monitoring Well ¹	Analytical Method	Units	MW-13	MW-14	MW-14 ²	MW-14	MW-14	MW-15	MW-15	MW-15	MW-15	MW-15	MW-16	MW-16	MW-16	Groundwater Preliminary Cleanup Level ³ (PCUL)
Sample Date			04/20/15	06/10/14	09/22/14	01/21/15	04/21/15	06/10/14	09/23/14	01/21/15	04/21/15	06/11/14	09/23/14	01/22/15		
Monitoring Event			Apr-15 (Dup)	Jun-14	Sep-14	Jan-15	Apr-15	Jun-14	Sep-14	Jan-15	Apr-15	Jun-14	Sep-14	Jan-15		
Sampled By			GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI		
Other SVOCs (mg/kg)																
Aniline	EPA 8270	µg/L	0.10 U	0.98 U	--	0.95 U	0.96 U	0.94 U	0.48 U	0.94 U	0.99 U	9.5 U	0.95 U	0.94 U	7.7	
Benzidine	EPA 8270	µg/L	0.10 U	0.98 U	--	0.95 U	0.96 U	0.94 U	0.48 U	0.94 U	0.99 U	9.5 U	0.95 U	0.94 U	0.000023	
Benzoic acid	EPA 8270	µg/L	0.50 U	0.98 U	--	4.8 U	0.96 U	0.94 U	0.48 U	4.7 U	0.99 U	9.5 U	0.95 U	4.7 U	590	
Benzyl alcohol	EPA 8270	µg/L	0.10 U	0.98 U	--	0.95 U	0.96 U	0.94 U	0.48 U	0.94 U	0.99 U	9.5 U	5.6	5.9	800	
Bis(2-chloroethoxy)methane	EPA 8270	µg/L	0.10 U	0.98 U	--	0.95 U	0.96 U	0.94 U	0.48 U	0.94 U	0.99 U	9.5 U	0.95 U	0.94 U	NE	
Bis(2-chloroethyl)ether	EPA 8270	µg/L	0.10 U	0.98 U	--	0.95 U	0.96 U	0.94 U	0.48 U	0.94 U	0.99 U	9.5 U	0.95 U	0.94 U	0.06	
Bis(2-chloroisopropyl)ether	EPA 8270	µg/L	0.10 U	0.98 U	--	0.95 U	0.96 U	0.94 U	0.48 U	0.94 U	0.99 U	9.5 U	0.95 U	0.94 U	900	
Bis(2-ethylhexyl)phthalate	EPA 8270	µg/L	0.63	0.98 U	--	3.4 U	0.96 U	1.4	1.2 U	1.8 U	2.1 U	9.5 U	0.95 U	3.4	0.046	
4-Bromophenyl phenyl ether	EPA 8270	µg/L	0.10 U	0.98 U	--	0.95 U	0.96 U	0.94 U	0.48 U	0.94 U	0.99 U	9.5 U	0.95 U	0.94 U	NE	
Butyl benzyl phthalate	EPA 8270	µg/L	0.10 U	0.98 U	--	0.95 U	0.96 U	0.94 U	0.48 U	0.94 U	0.99 U	9.5 U	0.95 U	0.94 U	0.013	
Carbazole	EPA 8270	µg/L	0.10 U	0.98 U	--	0.95 U	0.96 U	0.94 U	0.48 U	0.94 U	0.99 U	9.5 U	0.95 U	0.94 U	NE	
4-Chloroaniline	EPA 8270	µg/L	0.10 U	0.98 U	--	0.95 U	0.96 U	0.94 U	0.48 U	0.94 U	0.99 U	9.5 U	0.95 U	0.94 U	2,300	
4-Chloro-3-methylphenol	EPA 8270	µg/L	0.10 U	0.98 U	--	0.95 U	0.96 U	0.94 U	0.48 U	0.94 U	0.99 U	9.5 U	0.95 U	0.94 U	36	
2-Chloronaphthalene	EPA 8270	µg/L	0.10 U	0.98 U	--	0.95 U	0.96 U	0.94 U	0.48 U	0.94 U	0.99 U	9.5 U	0.95 U	0.94 U	100	
2-Chlorophenol	EPA 8270	µg/L	0.10 U	0.98 U	--	0.95 U	0.96 U	0.94 U	0.48 U	0.94 U	0.99 U	9.5 U	0.95 U	0.94 U	17	
4-Chlorophenyl phenyl ether	EPA 8270	µg/L	0.10 U	0.98 U	--	0.95 U	0.96 U	0.94 U	0.48 U	0.94 U	0.99 U	9.5 U	0.95 U	0.94 U	NE	
Decane	EPA 8270	µg/L	2.0 U	0.98 U	--	19 U	0.96 U	0.94 U	0.48 U	19 U	0.99 U	9.5 U	0.95 U	19 U	NE	
Dibutyl phthalate	EPA 8270	µg/L	1.7	0.98 U	--	0.95 U	1.7 U	0.94 U	1.2	1.3 U	2.8 U	9.5 U	5.4	4.7	8	
2,3-Dichloroaniline	EPA 8270	µg/L	0.10 U	0.98 U	--	0.95 U	0.96 U	0.94 U	0.48 U	0.94 U	0.99 U	9.5 U	0.95 U	0.94 U	NE	
1,2-Dichlorobenzene (o-Dichlorobenzene)	EPA 8260	µg/L	0.20 U	0.20 U	--	0.20 U	0.20 U	0.20 UJ	0.20 U	0.20 U	0.20 U	1.0 UJ	1.0 U	1.0 U	4.6	
	EPA 8270	µg/L	0.10 U	0.98 U	--	0.95 U	0.96 U	0.94 U	0.48 U	0.94 U	0.99 U	9.5 U	0.95 U	0.94 U	4.6	
1,3-Dichlorobenzene (m-Dichlorobenzene)	EPA 8260	µg/L	0.20 U	0.20 U	--	0.20 U	0.20 U	0.20 UJ	0.20 U	0.20 U	0.20 U	1.0 UJ	1.0 U	1.0 U	2.0	
	EPA 8270	µg/L	0.10 U	0.98 U	--	0.95 U	0.96 U	0.94 U	0.48 U	0.94 U	0.99 U	9.5 U	0.95 U	0.94 U	2.0	
1,4-Dichlorobenzene (p-Dichlorobenzene)	EPA 8260	µg/L	0.20 U	0.20 U	--	0.20 U	0.20 U	0.20 UJ	0.20 U	0.20 U	0.20 U	1.0 UJ	1.0 U	1.0 U	4.9	
	EPA 8270	µg/L	0.10 U	0.98 U	--	0.95 U	0.96 U	0.94 U	0.48 U	0.94 U	0.99 U	9.5 U	0.95 U	0.94 U	4.9	
3,3'-Dichlorobenzidine	EPA 8270	µg/L	0.10 U	0.98 U	--	0.95 U	0.96 U	0.94 U	0.48 U	0.94 U	0.99 U	9.5 U	0.95 U	0.94 U	0.0033	
2,4-Dichlorophenol	EPA 8270	µg/L	0.10 U	0.98 U	--	0.95 U	0.96 U	1	1.3	0.94 U	0.99 U	9.5 U	0.95 U	0.94 U	10	
Bis(2-ethylhexyl)ester	EPA 8270	µg/L	0.10 U	0.98 U	--	0.95 U	0.96 U	0.94 U	0.48 U	0.94 U	0.99 U	9.5 U	0.95 U	0.94 U	400	
Diethyl phthalate	EPA 8270	µg/L	0.12	0.98 U	--	0.95 U	0.96 U	0.94 U	0.48 U	3.7	0.99 U	9.5 U	0.95 U	0.94 U	93	
Dimethyl phthalate	EPA 8270	µg/L	0.10 U	0.98 U	--	0.95 U	0.96 U	0.94 U	0.48 U	0.94 U	0.99 U	9.5 U	0.95 U	0.94 U	600	
2,4-Dimethylphenol	EPA 8270	µg/L	0.10 U	0.98 U	--	0.95 U	0.96 U	0.94 U	0.85	0.94 U	0.99 U	9.5 U	0.95 U	0.94 U	6.30	
1,2-Dinitrobenzene	EPA 8270	µg/L	0.10 U	0.98 U	--	0.95 U	0.96 U	0.94 U	0.48 U	0.94 U	0.99 U	9.5 U	0.95 U	0.94 U	1.6	
1,3-Dinitrobenzene	EPA 8270	µg/L	0.10 U	0.98 U	--	0.95 U	0.96 U	0.94 U	0.48 U	0.94 U	0.99 U	9.5 U	0.95 U	0.94 U	1.6	
1,4-Dinitrobenzene	EPA 8270	µg/L	0.10 U	0.98 U	--	0.95 U	0.96 U	0.94 U	0.48 U	0.94 U	0.99 U	9.5 U	0.95 U	0.94 U	1.6	
4,6-Dinitro-2-methylphenol	EPA 8270	µg/L	0.50 U	0.98 U	--	4.8 U	0.96 U	0.94 U	0.48 U	4.7 U	0.99 U	9.5 U	0.95 U	4.7 U	NE	
2,4-Dinitrophenol	EPA 8270	µg/L	1.0 U	0.98 U	--	9.5 U	0.96 U	0.94 U	0.48 U	9.4 U	0.99 U	9.5 U	0.95 U	9.4 U	100	
2,4-Dinitrotoluene	EPA 8270	µg/L	0.10 U	0.98 U	--	2.4 U	0.96 U	0.94 U	0.48 U	2.3 U	0.99 U	9.5 U	0.95 U	2.3 U	0.18	
2,6-Dinitrotoluene	EPA 8270	µg/L	0.10 U	0.98 U	--	0.95 U	0.96 U	0.94 U	0.48 U	0.94 U	0.99 U	9.5 U	0.95 U	0.94 U	300	
Di-n-octyl phthalate	EPA 8270	µg/L	0.10 U	0.98 U	--	0.95 U	0.96 U	0.94 U	0.48 U	0.94 U	0.99 U	9.5 U	0.95 U	0.94 U	0.0039	
1,2-Diphenylhydrazine	EPA 8270	µg/L	0.10 U	0.98 U	--	0.95 U	0.96 U	0.94 U	0.48 U	0.94 U	0.99 U	9.5 U	0.95 U	0.94 U	0.02	
Hexachlorobenzene	EPA 8270	µg/L	0.10 U	0.98 U	--	0.95 U	0.96 U	0.94 U	0.48 U	0.94 U	0.99 U	9.5 U	0.95 U	0.94 U	0.000005	
Hexachlorobutadiene	EPA 8260	µg/L	0.20 U	0.20 U	--	0.20 U	0.20 U	0.20 UJ	0.20 U	0.20 U	0.20 U	1.0 UJ	1.0 U	1.0 U	0.01	
	EPA 8270	µg/L	0.10 U	0.98 U	--	0.95 U	0.96 U	0.94 U	0.48 U	0.94 U	0.99 U	9.5 U	0.95 U	0.94 U	0.01	

Table D-2
Remedial Investigation Chemical Analytical Results - Groundwater COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Monitoring Well ¹	Analytical Method	Units	MW-13	MW-14	MW-14 ²	MW-14	MW-14	MW-15	MW-15	MW-15	MW-15	MW-16	MW-16	MW-16	Groundwater Preliminary Cleanup Level ³ (PCUL)
Sample Date			04/20/15	06/10/14	09/22/14	01/21/15	04/21/15	06/10/14	09/23/14	01/21/15	04/21/15	06/11/14	09/23/14	01/22/15	
Monitoring Event			Apr-15 (Dup)	Jun-14	Sep-14	Jan-15	Apr-15	Jun-14	Sep-14	Jan-15	Apr-15	Jun-14	Sep-14	Jan-15	
Sampled By			GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	
Hexachlorocyclopentadiene	EPA 8270	µg/L	0.10 U	0.98 U	--	0.95 U	0.96 U	0.94 U	0.48 U	0.94 U	0.99 U	9.5 U	0.95 U	0.94 U	1.00
Hexachloroethane	EPA 8270	µg/L	0.10 U	0.98 U	--	0.95 U	0.96 U	0.94 U	0.48 U	0.94 U	0.99 U	9.5 U	0.95 U	0.94 U	0.02
Isophorone	EPA 8270	µg/L	0.10 U	0.98 U	--	0.95 U	0.96 U	0.94 U	0.48 U	0.94 U	0.99 U	31	20	16	110
2-Methylphenol (o-Cresol)	EPA 8270	µg/L	0.10 U	0.98 U	--	0.95 U	0.96 U	1.4	3.9	9.4	3.8	9.5 U	3.1	3	27
3 & 4 Methylphenol (m & p-Cresol)	EPA 8270	µg/L	0.10 U	0.98 U	--	0.95 U	0.96 U	4.2	15	59	23	47	11	9.9	400
2-Nitroaniline	EPA 8270	µg/L	0.10 U	0.98 U	--	0.95 U	0.96 U	0.94 U	0.48 U	0.94 U	0.99 U	9.5 U	0.95 U	0.94 U	160
3-Nitroaniline	EPA 8270	µg/L	0.10 U	0.98 U	--	0.95 U	0.96 U	0.94 U	0.48 U	0.94 U	0.99 U	9.5 U	0.95 U	0.94 U	NE
4-Nitroaniline	EPA 8270	µg/L	0.10 U	0.98 U	--	0.95 U	0.96 U	0.94 U	0.48 U	0.94 U	0.99 U	9.5 U	0.95 U	0.94 U	NE
Nitrobenzene	EPA 8270	µg/L	0.10 U	0.98 U	--	0.95 U	0.96 U	0.94 U	0.48 U	0.94 U	0.99 U	9.5 U	0.95 U	0.94 U	100
2-Nitrophenol	EPA 8270	µg/L	0.10 U	0.98 U	--	0.95 U	0.96 U	0.94 U	0.48 U	0.94 U	0.99 U	9.5 U	0.95 U	0.94 U	NE
4-Nitrophenol (p-Nitrophenol)	EPA 8270	µg/L	0.10 U	0.98 U	--	0.95 U	0.96 U	0.94 U	0.48 U	0.94 U	0.99 U	9.5 U	0.95 U	0.94 U	NE
n-Nitrosodimethylamine	EPA 8270	µg/L	0.10 U	0.98 U	--	0.95 U	0.96 U	0.94 U	0.48 U	0.94 U	0.99 U	9.5 U	0.95 U	0.94 U	0.34
n-Nitrosodiphenylamine (as Diphenylamine)	EPA 8270	µg/L	0.10 U	0.98 U	--	0.95 U	0.96 U	0.94 U	0.48 U	0.94 U	0.99 U	9.5 U	0.95 U	0.94 U	0.69
n-Nitrosodi-n-propylamine	EPA 8270	µg/L	0.10 U	0.98 U	--	0.95 U	0.96 U	0.94 U	0.48 U	0.94 U	0.99 U	9.5 U	0.95 U	0.94 U	0.058
n-Octadecane	EPA 8270	µg/L	0.10 U	0.98 U	--	0.95 U	0.96 U	0.94 U	0.48 U	0.94 U	0.99 U	9.5 U	0.95 U	0.94 U	NE
Pentachlorophenol	EPA 8270	µg/L	0.50 U	0.98 U	--	4.8 U	0.96 U	0.94 U	0.69	4.7 U	0.99 U	9.5 U	8.1	4.7	0.002
Phenol	EPA 8270	µg/L	0.10 U	0.98 U	--	0.95 U	0.96 U	0.94 U	0.48 U	0.94 U	0.99 U	35	12	7.5	370
Pyridine	EPA 8270	µg/L	0.10 U	0.98 U	--	0.95 U	0.96 U	0.94 U	0.48 U	0.94 U	0.99 U	9.5 U	0.95 U	0.94 U	8
2,3,4,6-Tetrachlorophenol	EPA 8270	µg/L	0.10 U	0.98 U	--	0.95 U	0.96 U	0.94 U	0.48 U	0.94 U	0.99 U	9.5 U	4.7	3.9	480
2,3,5,6-Tetrachlorophenol	EPA 8270	µg/L	0.10 U	0.98 U	--	0.95 U	0.96 U	0.94 U	0.48 U	0.94 U	0.99 U	9.5 U	14	16	NE
1,2,4-Trichlorobenzene	EPA 8260	µg/L	0.20 U	0.20 U	--	0.20 U	0.20 U	0.20 UJ	0.20 U	0.20 U	0.20 U	1.0 UJ	1.0 U	1.0 U	0.037
	EPA 8270	µg/L	0.10 U	0.98 U	--	0.95 U	0.96 U	0.94 U	0.48 U	0.94 U	0.99 U	9.5 U	0.95 U	0.94 U	0.037
2,4,5-Trichlorophenol	EPA 8270	µg/L	0.10 U	0.98 U	--	0.95 U	0.96 U	0.94 U	0.48 U	0.94 U	0.99 U	9.5 U	0.95 U	0.94 U	600
2,4,6-Trichlorophenol	EPA 8270	µg/L	0.10 U	0.98 U	--	0.95 U	0.96 U	0.94 U	0.48 U	0.94 U	0.99 U	9.5 U	0.95 U	0.94 U	0.28
Volatile Organic Compounds (VOCs)															
Acetone	EPA 8260	µg/L	5.0 U	5.0 U	--	5.0 U	5.0 U	27 J	6.9	14	8	41 J	27	27	NE
Benzene	EPA 8260	µg/L	0.20 U	0.20 U	--	0.20 U	0.20 U	0.80 J	1.3	1.1	1.2	4.0 J	4.8	4.6	1.6
Bromobenzene	EPA 8260	µg/L	0.20 U	0.20 U	--	0.20 U	0.20 U	0.20 UJ	0.20 U	0.20 U	0.20 U	1.0 UJ	1.0 U	1.0 U	NE
Bromochloromethane	EPA 8260	µg/L	0.20 U	0.20 U	--	0.20 U	0.20 U	0.20 UJ	0.20 U	0.20 U	0.20 U	1.0 UJ	1.0 U	1.0 U	NE
Bromoform (Tribromomethane)	EPA 8260	µg/L	1.0 U	1.0 U	--	1.0 U	1.0 U	1.0 UJ	1.0 U	1.0 U	1.0 U	5.0 UJ	5.0 U	5.0 U	12
Bromomethane	EPA 8260	µg/L	0.20 U	0.39 UJ	--	0.20 U	0.20 U	0.39 UJ	0.20 U	0.20 U	0.20 U	2.6 UJ	1.0 U	1.9 UJ	13
n-Butylbenzene	EPA 8260	µg/L	0.20 U	0.20 U	--	0.20 U	0.20 U	0.20 UJ	0.20 U	0.20 U	0.20 U	1.0 UJ	1.0 U	1.0 U	400
sec-Butylbenzene	EPA 8260	µg/L	0.20 U	0.20 U	--	0.20 U	0.20 U	0.20 UJ	0.20 U	0.20 U	0.20 U	1.0 UJ	1.0 U	1.0 U	800
tert-Butylbenzene	EPA 8260	µg/L	0.20 U	0.20 U	--	0.20 U	0.20 U	0.20 UJ	0.20 U	0.20 U	0.20 U	1.0 UJ	1.0 U	1.0 U	800
Carbon disulfide	EPA 8260	µg/L	0.20 U	0.20 U	--	0.20 U	0.20 U	0.41 J	0.33	0.62	0.58	1.0 J	1.0 U	1.0 U	400
Carbon tetrachloride	EPA 8260	µg/L	0.20 U	0.20 U	--	0.20 U	0.20 U	0.20 UJ	0.20 U	0.20 U	0.20 U	1.0 UJ	1.0 U	1.0 U	0.35
Chlorobenzene	EPA 8260	µg/L	0.20 U	0.20 U	--	0.20 U	0.20 U	0.20 UJ	0.20 U	0.20 U	0.20 U	1.0 UJ	1.0 U	1.0 U	200
Chloroethane	EPA 8260	µg/L	1.0 U	1.0 U	--	1.0 U	1.0 U	1.0 UJ	1.0 U	1.0 U	1.0 U	5.0 UJ	5.0 U	5.0 U	19,000
2-Chloroethyl vinyl ether	EPA 8260	µg/L	1.0 U	1.0 U	--	3.0 UJ	1.0 U	1.0 UJ	1.0 U	3.0 UJ	1.0 U	5.0 UJ	5.0 U	10 U	NE
Chloroform	EPA 8260	µg/L	0.20 U	0.20 U	--	0.20 U	0.20 U	0.20 UJ	0.20 U	0.20 U	0.20 U	1.0 UJ	1.0 U	1.0 U	1.2
Chloromethane	EPA 8260	µg/L	1.0 U	1.0 U	--	1.0 U	1.0 U	1.0 UJ	1.0 U	1.0 U	1.0 U	5.0 UJ	5.0 U	5.0 U	150
2-Chlorotoluene	EPA 8260	µg/L	0.20 U	0.20 U	--	0.20 U	0.20 U	0.20 UJ	0.20 U	0.20 U	0.20 U	1.0 UJ	1.0 U	1.0 U	160
4-Chlorotoluene	EPA 8260	µg/L	0.20 U	0.20 U	--	0.20 U	0.20 U	0.20 UJ	0.20 U	0.20 U	0.20 U	1.0 UJ	1.0 U	1.0 U	NE

Table D-2
Remedial Investigation Chemical Analytical Results - Groundwater COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Monitoring Well ¹	Analytical Method	Units	MW-13	MW-14	MW-14 ²	MW-14	MW-14	MW-15	MW-15	MW-15	MW-15	MW-16	MW-16	MW-16	Groundwater Preliminary Cleanup Level ³ (PCUL)
Sample Date			04/20/15	06/10/14	09/22/14	01/21/15	04/21/15	06/10/14	09/23/14	01/21/15	04/21/15	06/11/14	09/23/14	01/22/15	
Monitoring Event			Apr-15 (Dup)	Jun-14	Sep-14	Jan-15	Apr-15	Jun-14	Sep-14	Jan-15	Apr-15	Jun-14	Sep-14	Jan-15	
Sampled By			GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	
Dibromochloromethane	EPA 8260	µg/L	0.20 U	0.20 U	--	0.20 U	0.20 U	0.20 UJ	0.20 U	0.20 U	0.20 U	1.0 UJ	1.0 U	1.0 U	2.2
1,2-Dibromo-3-chloropropane	EPA 8260	µg/L	1.0 U	1.0 U	--	1.0 U	1.0 U	1.0 UJ	1.0 U	1.0 U	1.0 U	5.0 UJ	5.0 U	5.0 U	0.2
Dibromomethane	EPA 8260	µg/L	0.20 U	0.20 U	--	0.20 U	0.20 U	0.20 UJ	0.20 U	0.20 U	0.20 U	1.0 UJ	1.0 U	1.0 U	80
Bromodichloromethane	EPA 8260	µg/L	0.20 U	0.20 U	--	0.20 U	0.20 U	0.20 UJ	0.20 U	0.20 U	0.20 U	1.0 UJ	1.0 U	1.0 U	1.8
Dichlorodifluoromethane (CFC-12)	EPA 8260	µg/L	0.20 U	0.20 U	--	0.20 U	0.20 U	0.20 UJ	0.20 U	0.20 U	0.20 U	1.0 UJ	1.0 U	1.0 U	5.6
1,1-Dichloroethane	EPA 8260	µg/L	0.20 U	0.20 U	--	0.20 U	0.20 U	0.20 UJ	0.20 U	0.20 U	0.20 U	1.0 UJ	1.0 U	1.0 U	11
1,2-Dichloroethane	EPA 8260	µg/L	0.20 U	0.20 U	--	0.20 U	0.20 U	0.20 UJ	0.20 U	0.20 U	0.20 U	1.0 UJ	1.0 U	1.0 U	4.2
1,1-Dichloroethene	EPA 8260	µg/L	0.20 U	0.20 U	--	0.20 U	0.20 U	0.20 UJ	0.20 U	0.20 U	0.20 U	1.0 UJ	1.0 U	1.0 U	130
cis-1,2-Dichloroethene	EPA 8260	µg/L	0.20 U	0.20 U	--	0.20 U	0.20 U	0.20 UJ	0.20 U	0.20 U	0.20 U	1.0 UJ	1.0 U	1.0 U	16
trans-1,2-Dichloroethene	EPA 8260	µg/L	0.20 U	0.20 U	--	0.20 U	0.20 U	0.20 UJ	0.20 U	0.20 U	0.20 U	1.0 UJ	1.0 U	1.0 U	1,000
1,2-Dichloropropane	EPA 8260	µg/L	0.20 U	0.20 U	--	0.20 U	0.20 U	0.20 UJ	0.20 U	0.20 U	0.20 U	1.0 UJ	1.0 U	1.0 U	3.1
1,3-Dichloropropane	EPA 8260	µg/L	0.20 U	0.20 U	--	0.20 U	0.20 U	0.20 UJ	0.20 U	0.20 U	0.20 U	1.0 UJ	1.0 U	1.0 U	NE
2,2-Dichloropropane	EPA 8260	µg/L	0.20 U	0.20 U	--	0.20 U	0.20 U	0.20 UJ	0.20 U	0.20 U	0.20 U	1.0 UJ	1.0 U	1.0 U	NE
1,1-Dichloropropene	EPA 8260	µg/L	0.20 U	0.20 U	--	0.20 U	0.20 U	0.20 UJ	0.20 U	0.20 U	0.20 U	1.0 UJ	1.0 U	1.0 U	NE
cis-1,3-Dichloropropene	EPA 8260	µg/L	0.20 U	0.20 U	--	0.20 U	0.20 U	0.20 UJ	0.20 U	0.20 U	0.20 U	1.0 UJ	1.0 U	1.0 U	2
trans-1,3-Dichloropropene	EPA 8260	µg/L	0.20 U	0.20 U	--	0.20 U	0.20 U	0.20 UJ	0.20 U	0.20 U	0.20 U	1.0 UJ	1.0 U	1.0 U	2
Ethylbenzene	EPA 8260	µg/L	0.20 U	0.20 U	--	0.20 U	0.20 U	0.20 UJ	0.20 U	0.20 U	0.20 U	1.1 J	1.2	1.3	31
1,2-Dibromoethane (EDB)	EPA 8260	µg/L	0.20 U	0.20 U	--	0.20 U	0.20 U	0.20 UJ	0.20 U	0.20 U	0.20 U	1.0 UJ	1.0 U	1.0 U	0.27
2-Hexanone	EPA 8260	µg/L	2.0 U	2.0 U	--	2.0 U	2.0 U	2.0 UJ	2.0 U	2.0 U	2.0 U	10 UJ	10 U	10 U	40
Isopropylbenzene (Cumene)	EPA 8260	µg/L	0.20 U	0.20 U	--	0.20 U	0.20 U	0.20 UJ	0.20 U	0.20 U	0.20 U	1.0 UJ	1.0 U	1.0 U	800
p-Isopropyltoluene	EPA 8260	µg/L	0.20 U	0.20 U	--	0.20 U	0.20 U	0.69 J	0.36	0.84	0.38	4.6 J	3.3	2.2	NE
2-Butanone (MEK)	EPA 8260	µg/L	5.0 U	5.0 U	--	5.0 U	5.0 U	6.1 J	5.0 U	5.0 U	5.0 U	25 UJ	25 U	25 U	1,700,000
Methyl iodide (Iodomethane)	EPA 8260	µg/L	1.0 U	2.1 UJ	--	1.0 U	1.0 U	2.1 UJ	1.0 U	1.0 U	1.0 U	14 UJ	5.0 U	6.5 U	NE
4-Methyl-2-pentanone (Methyl isobutyl ketone)	EPA 8260	µg/L	2.0 U	2.0 U	--	2.0 U	2.0 U	2.3 J	2.0 U	2.1	2.0 U	10 UJ	10 U	10 U	470,000
Methyl t-butyl ether (MTBE)	EPA 8260	µg/L	0.20 U	0.20 U	--	0.20 U	0.20 U	0.20 UJ	0.20 U	0.20 U	0.20 U	1.0 UJ	1.0 U	1.0 U	600
Methylene chloride	EPA 8260	µg/L	1.0 U	1.0 U	--	1.0 U	1.0 U	1.0 UJ	1.0 U	1.0 U	1.0 U	5.0 UJ	5.0 U	5.0 U	100
n-Propylbenzene	EPA 8260	µg/L	0.20 U	0.20 U	--	0.20 U	0.20 U	0.20 UJ	0.20 U	0.20 U	0.20 U	1.0 UJ	1.0 U	1.0 U	800
Styrene	EPA 8260	µg/L	0.20 U	0.20 U	--	0.20 U	0.20 U	0.20 UJ	0.20 U	0.20 U	0.20 U	1.0 UJ	1.0 U	1.0 U	8,200
1,1,1,2-Tetrachloroethane	EPA 8260	µg/L	0.20 U	0.20 U	--	0.20 U	0.20 U	0.20 UJ	0.20 U	0.20 U	0.20 U	1.0 UJ	1.0 U	1.0 U	7.4
1,1,2,2-Tetrachloroethane	EPA 8260	µg/L	0.20 U	0.20 U	--	0.20 U	0.20 U	0.20 UJ	0.20 U	0.20 U	0.20 U	1.0 UJ	1.0 U	1.0 U	0.3
Tetrachloroethene	EPA 8260	µg/L	0.20 U	0.20 U	--	0.20 U	0.20 U	0.20 UJ	0.20 U	0.20 U	0.20 U	1.0 UJ	1.0 U	1.0 U	2.9
Toluene	EPA 8260	µg/L	1.0 U	1.0 U	--	1.0 U	1.0 U	1.0 UJ	1.0 U	1.0 U	1.0 U	6.5 J	7.6	7.6	130
1,2,3-Trichlorobenzene	EPA 8260	µg/L	0.20 U	0.20 U	--	0.20 U	0.20 U	0.20 UJ	0.20 U	0.20 U	0.20 U	1.0 UJ	1.0 U	1.0 U	NE
1,1,1-Trichloroethane	EPA 8260	µg/L	0.20 U	0.20 U	--	0.20 U	0.20 U	0.20 UJ	0.20 U	0.20 U	0.20 U	1.0 UJ	1.0 U	1.0 U	5,500
1,1,2-Trichloroethane	EPA 8260	µg/L	0.20 U	0.20 U	--	0.20 U	0.20 U	0.20 UJ	0.20 U	0.20 U	0.20 U	1.0 UJ	1.0 U	1.0 U	0.9
Trichloroethene	EPA 8260	µg/L	0.20 U	0.20 U	--	0.20 U	0.20 U	0.20 UJ	0.20 U	0.20 U	0.20 U	1.0 UJ	1.0 U	1.0 U	0.7
Trichlorofluoromethane (CFC-11)	EPA 8260	µg/L	0.20 U	0.20 U	--	0.20 U	0.20 U	0.20 UJ	0.20 U	0.20 U	0.20 U	1.0 UJ	1.0 U	1.0 U	120
1,2,3-Trichloropropane	EPA 8260	µg/L	0.20 U	0.20 U	--	0.20 U	0.20 U	0.20 UJ	0.20 U	0.20 U	0.20 U	1.0 UJ	1.0 U	1.0 U	1,500
1,2,4-Trimethylbenzene	EPA 8260	µg/L	0.20 U	0.20 U	--	0.20 U	0.20 U	0.20 UJ	0.26	0.20 U	0.32	1.9 J	2.6	2	240
1,3,5-Trimethylbenzene	EPA 8260	µg/L	0.20 U	0.20 U	--	0.20 U	0.20 U	0.20 UJ	0.20 U	0.20 U	0.20 U	1.0 UJ	1.0 U	1.0 U	80
Vinyl acetate	EPA 8260	µg/L	1.0 U	1.0 UJ	--	1.0 U	1.0 U	1.0 UJ	1.0 U	1.0 U	1.0 U	5.0 UJ	5.0 U	5.0 U	7,800

Table D-2

Remedial Investigation Chemical Analytical Results - Groundwater COPCs

Port of Seattle - North Terminal 115

Seattle, Washington

Monitoring Well ¹	Analytical Method	Units	MW-13	MW-14	MW-14 ²	MW-14	MW-14	MW-15	MW-15	MW-15	MW-15	MW-16	MW-16	MW-16	Groundwater Preliminary Cleanup Level ³ (PCUL)
Sample Date			04/20/15	06/10/14	09/22/14	01/21/15	04/21/15	06/10/14	09/23/14	01/21/15	04/21/15	06/11/14	09/23/14	01/22/15	
Monitoring Event			Apr-15 (Dup)	Jun-14	Sep-14	Jan-15	Apr-15	Jun-14	Sep-14	Jan-15	Apr-15	Jun-14	Sep-14	Jan-15	
Sampled By			GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	
Vinyl chloride	EPA 8260	µg/L	0.20 U	0.20 U	--	0.20 U	0.20 U	0.20 UJ	0.20 U	0.20 U	0.20 U	1.0 UJ	1.0 U	1.0 U	0.18
Xylene, m-,p-	EPA 8260	µg/L	0.40 U	0.40 U	--	0.40 U	0.40 U	0.40 UJ	0.40 U	0.40 U	0.40 U	5.8 J	6.1	6.5	290
Xylene, o-	EPA 8260	µg/L	0.20 U	0.20 U	--	0.20 U	0.20 U	0.20 UJ	0.22	0.20 U	0.24	2.8 J	2.9	3.1	430
Petroleum Hydrocarbons															
Gasoline-range hydrocarbons	NWTPH-G	µg/L	100 U	--	--	--	--	--	--	--	--	--	--	--	800
Diesel-range hydrocarbons	NWTPH-Dx	µg/L	580	--	--	250 U	250 U	--	--	--	--	--	--	--	500
Oil-range hydrocarbons	NWTPH-Dx	µg/L	1,100	--	--	400 U	400 U	--	--	--	--	--	--	--	500
Total diesel- and oil-range hydrocarbons	NWTPH-Dx	µg/L	1,680	--	--	400 U	400 U	--	--	--	--	--	--	--	500
Diesel-range hydrocarbons	NWTPH-Dx Si/Gel	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	500
Oil-range hydrocarbons	NWTPH-Dx Si/Gel	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	500
Total diesel- and oil-range hydrocarbons	NWTPH-Dx Si/Gel	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	500
Conventional Parameters															
Total organic carbon (TOC)	SM 5310B	mg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
Field Measured Parameters															
pH	N/A	N/A	6.84	6.25	--	6.46	6.49	10.60	9.53	9.93	9.58	13.01	11.39	11.70	NE

Notes:

- ¹ Monitoring well locations are shown on Figures 3-2 and 3-4.
- ² Insufficient water to collect groundwater sample for chemical analysis.
- ³ Groundwater screening levels referenced from Table 4-2.
- ⁴ Total dioxin/furan Toxic Equivalency Quotients (TEQs) were calculated using United States Environmental Protection Agency (USEPA) Toxicity Equivalency Factor (TEF) values for human health (EPA 2003).
- ⁵ Total carcinogenic PAH (cPAH) TEQs were calculated using TEF values referenced from MTCA Table 708.2 (WAC 173-340-900).

mg/L = milligram per liter

µg/L = microgram per liter

NE = not established

Landau = Landau Associates

GEI = GeoEngineers

NE = not established

J = estimated result

U = analyte not detected above the reporting limit

-- = not analyzed

COPC = Contaminant of Potential Concern

Bold indicates analyte was detected.

Yellow shading identifies the detected results greater than the preliminary cleanup level.

Blue shading identifies the non-detected result greater than the preliminary cleanup level.

Table D-2
Remedial Investigation Chemical Analytical Results - Groundwater COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Monitoring Well ¹	Analytical Method	Units	MW-16	MW-17	MW-17	MW-17	MW-17	MW-18	MW-18	MW-18	MW-18	MW-18	MW-18	MW-18	Groundwater Preliminary Cleanup Level ³ (PCUL)
Sample Date			04/20/15	06/09/14	09/22/14	01/20/15	04/22/15	06/09/14	06/09/14	09/23/14	09/23/14	01/22/15	01/22/15	04/20/15	
Monitoring Event			Apr-15	Jun-14	Sep-14	Jan-15	Apr-15	Jun-14	Jun-14 (Dup)	Sep-14	Sep-14 (Dup)	Jan-15	Jan-15 (Dup)	Apr-15	
Sampled By			GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	
Polychlorinated Biphenyls (PCBs)															
PCB-Aroclor 1016	EPA 8082	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
PCB-Aroclor 1221	EPA 8082	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
PCB-Aroclor 1232	EPA 8082	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
PCB-Aroclor 1242	EPA 8082	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
PCB-Aroclor 1248	EPA 8082	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
PCB-Aroclor 1254	EPA 8082	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
PCB-Aroclor 1260	EPA 8082	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
Total PCB Aroclors	EPA 8082	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	0.000007
Total PCB Congeners	EPA 1668	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	0.000007
Dioxins and Furans															
1,2,3,4,6,7,8-HpCDD	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,4,6,7,8-HpCDF	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,4,7,8,9-HpCDF	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,4,7,8-HxCDD	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,4,7,8-HxCDF	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,6,7,8-HxCDD	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,6,7,8-HxCDF	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,7,8,9-HxCDD	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,7,8,9-HxCDF	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,7,8-PeCDD	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,7,8-PeCDF	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
2,3,4,6,7,8-HxCDF	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
2,3,4,7,8-PeCDF	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
2,3,7,8-TCDD	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
2,3,7,8-TCDF	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
OCDD	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
OCDF	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
Total Dioxin/Furan TEQ ⁴ (ND=0)	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	0.0000000051
Total Dioxin/Furan TEQ ⁴ (ND=0.5RL)	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	0.0000000051
Total Metals															
Antimony	EPA 200.8/7470	µg/L	9.3	5.4 U	5.4 U	5.4 U	5.4 U	5.0 U	5.0 U	10 U	10 U	5.5 U	5.5 U	5.0 U	90
Arsenic	EPA 200.8/7470	µg/L	160	11	21	8.9	11	170	190	380	400	370	340	290	8.0
Barium	EPA 200.8/7470	µg/L	11	31	24	21	23	220	230	360	340	330	310	280	200
Beryllium	EPA 200.8/7470	µg/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	4.4
Cadmium	EPA 200.8/7470	µg/L	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.80 U	0.80 U	1.0 U	1.0 U	0.50 U	0.50 U	1.0 U	1.2
Chromium III / Total	EPA 200.8/7470	µg/L	20	2.0 U	2.0 U	2.0 U	2.0 U	110	120	290	290	250	230	200	27
Chromium VI	EPA 200.8/7470	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	50
Copper	EPA 200.8/7470	µg/L	22	3.6	2.0 U	2.9	2.2	6.9	6.7	10	9.6	5.9	5.1	10 U	3.1
Lead	EPA 200.8/7470	µg/L	540	1.0 U	1.0 U	1.0 U	1.0 U	4.9	4.6	7.6	5.4	2.9	2.8	2.0 U	8.1
Mercury	EPA 200.8/7470	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.025
Nickel	EPA 200.8/7470	µg/L	49	6.8	4	5.8	4.3	76	80	180	180	140	130	130	8.2

Table D-2
Remedial Investigation Chemical Analytical Results - Groundwater COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Monitoring Well ¹	Analytical Method	Units	MW-16	MW-17	MW-17	MW-17	MW-17	MW-18	MW-18	MW-18	MW-18	MW-18	MW-18	MW-18	Groundwater Preliminary Cleanup Level ³ (PCUL)
Sample Date			04/20/15	06/09/14	09/22/14	01/20/15	04/22/15	06/09/14	06/09/14	09/23/14	09/23/14	01/22/15	01/22/15	04/20/15	
Monitoring Event			Apr-15	Jun-14	Sep-14	Jan-15	Apr-15	Jun-14	Jun-14 (Dup)	Sep-14	Sep-14 (Dup)	Jan-15	Jan-15 (Dup)	Apr-15	
Sampled By			GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	
Selenium	EPA 200.8/7470	µg/L	6.0 U	6.0 U	6.0 U	6.0 U	6.0 U	12 U	12 U	30 U	30 U	13 U	13 U	12 U	71
Silver	EPA 200.8/7470	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	4.3	4.5	5.5	5.3	8.4	8.6	5.0 U	1.9
Thallium	EPA 200.8/7470	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	0.062
Tin	EPA 200.8/7470	µg/L	1,600	5.0 U	5.0 U	5.0 U	5.0 U	130	140	370	370	270	260	350	9,600
Zinc	EPA 200.8/7470	µg/L	56 U	56 U	56 U	56 U	56 U	56 U	56 U	56 U	56 U	55 U	55 U	56 U	81
Dissolved Metals															
Antimony	EPA 200.8/7470	µg/L	6.5	5.5 U	5.5 U	5.5 U	5.5 U	5.5 U	5.5 U	10 U	10 U	5.5 U	5.5 U	5.5 U	90
Arsenic	EPA 200.8/7470	µg/L	170	9.6	23	8.2	12	190	200	560	520	300	310	320	8.0
Barium	EPA 200.8/7470	µg/L	6.2	24	25	20	22	220	230	370	360	310	310	280	200
Beryllium	EPA 200.8/7470	µg/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	4.4
Cadmium	EPA 200.8/7470	µg/L	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.80 U	0.80 U	1.0 U	1.0 U	0.50 U	0.50 U	1.0 U	1.2
Chromium III / Total	EPA 200.8/7470	µg/L	17	2.0 U	2.0 U	2.0 U	2.0 U	120	120	320	300	210	210	220	27
Copper	EPA 200.8/7470	µg/L	16	2.1	2.0 U	2.1	2.0 U	4.0 U	4.0 U	14	18	5.6	6.1	10 U	3.1
Lead	EPA 200.8/7470	µg/L	380	1.0 U	1.0 U	1.0 U	1.0 U	2.0 U	2.0 U	19	17	2.5	2.6	2.0 U	8.1
Mercury	EPA 200.8/7470	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.025
Nickel	EPA 200.8/7470	µg/L	59	4.5	4.8	5.1	3.5	80	84	220	210	130	130	130	8.2
Selenium	EPA 200.8/7470	µg/L	6.0 U	6.0 U	6.0 U	6.0 U	6.0 U	15 U	15 U	30 U	30 U	13 U	18 U	15 U	71
Silver	EPA 200.8/7470	µg/L	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	4.8	5.1	6.5	6.3	6.9	6.9	5.0 U	1.9
Thallium	EPA 200.8/7470	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	0.062
Tin	EPA 200.8/7470	µg/L	2,100	5.0 U	5.0 U	5.0 U	5.0 U	130	140	520	500	270	260	410	9,600
Zinc	EPA 200.8/7470	µg/L	56 U	56 U	56 U	56 U	56 U	56 U	56 U	56 U	55 U	55 U	55 U	56 U	81
Semi-Volatile Organic Compounds (SVOCs) - Polycyclic Aromatic Hydrocarbons (PAHs)															
Acenaphthene	EPA 8270/SIM	µg/L	0.94 UJ	0.47 U	0.10 U	0.10 U	0.10 U	1.1	1.1	1.1	1	0.57	2.1	0.10 U	5.3
Acenaphthylene	EPA 8270/SIM	µg/L	1.9 J	0.47 U	0.10 U	0.10 U	0.10 U	0.48 U	0.48 U	0.46 U	0.35	1.5	0.93 UJ	0.10 U	NE
Anthracene	EPA 8270/SIM	µg/L	0.94 UJ	0.47 U	0.10 U	0.10 U	0.10 U	0.48 U	0.48 U	0.46 U	0.75	0.64	0.93 UJ	0.10 U	2.1
Benzo(a)anthracene	EPA 8270/SIM	µg/L	0.94 UJ	0.048	0.010 U	0.039	0.010 U	0.2	0.048 U	0.21	0.25	0.046 U	0.049	0.10 U	0.00016
Benzo(b)fluoranthene	EPA 8270/SIM	µg/L	0.94 UJ	0.047 U	0.010 U	0.011	0.010 U	0.048 U	0.048 U	0.098	0.16	0.046 U	0.046 UJ	0.10 U	0.00016
Benzo(j,k)fluoranthene	EPA 8270/SIM	µg/L	0.94 UJ	0.047 U	0.010 U	0.010 U	0.010 U	0.048 U	0.048 U	0.1	0.18	0.046 U	0.046 UJ	0.10 U	0.0016
Benzo(g,h,i)perylene	EPA 8270/SIM	µg/L	0.94 UJ	0.047 U	0.010 U	0.023	0.010 U	0.048 U	0.048 U	0.076	0.093	0.046 U	0.046 UJ	0.10 U	NE
Benzo(a)pyrene	EPA 8270/SIM	µg/L	0.94 UJ	0.047 U	0.010 U	0.02	0.010 U	0.048 U	0.048 U	0.14	0.18	0.046 U	0.046 UJ	0.10 U	0.000016
Chrysene	EPA 8270/SIM	µg/L	0.94 UJ	0.047 U	0.010 U	0.039	0.010 U	0.056	0.048 U	0.2	0.29	0.046 U	0.046 UJ	0.10 U	0.016
Dibenzo(a,h)anthracene	EPA 8270/SIM	µg/L	0.94 UJ	0.047 U	0.010 U	0.010 U	0.010 U	0.048 U	0.048 U	0.046 U	0.059	0.046 U	0.046 UJ	0.10 U	0.000016
Dibenzofuran	EPA 8270/SIM	µg/L	0.94 UJ	0.95 U	0.10 U	0.10 U	0.10 U	0.96 U	0.97 U	0.93 U	0.65	0.92 U	0.93 UJ	0.27	16
Fluoranthene	EPA 8270/SIM	µg/L	0.94 UJ	0.47 U	0.10 U	0.10 U	0.10 U	0.48 U	0.48 U	0.99	1.4	0.46 U	0.93 UJ	0.10 U	1.8
Fluorene	EPA 8270/SIM	µg/L	0.94 UJ	0.47 U	0.10 U	0.10 U	0.10 U	0.54	0.55	0.98	1.2	0.46 U	0.93 UJ	0.10 U	3.7
Indeno(1,2,3-c,d)pyrene	EPA 8270/SIM	µg/L	0.94 UJ	0.047 U	0.010 U	0.010 U	0.010 U	0.048 U	0.048 U	0.065	0.069	0.046 U	0.046 UJ	0.10 U	0.00016
1-Methylnaphthalene	EPA 8270/SIM	µg/L	0.94 UJ	0.47 U	0.10 U	0.10 U	0.10 U	0.48 U	0.48 U	0.68	0.78	0.46 U	0.93 UJ	0.39	1.5
2-Methylnaphthalene	EPA 8270/SIM	µg/L	0.94 UJ	0.47 U	0.10 U	0.10 U	0.10 U	0.48 U	0.48 U	0.8	0.8	1.6	1.3	0.35	32
Naphthalene	EPA 8270/SIM	µg/L	2.2 J	0.47 U	0.10 U	0.1	0.10 U	2.2	2.2	5.9	7.3	9	12	9.7	1.4
Phenanthrene	EPA 8270/SIM	µg/L	0.94 UJ	0.47 U	0.10 U	0.10 U	0.10 U	0.48	0.49	2.2	2.9	0.83	2	0.85	NE
Pyrene	EPA 8270/SIM	µg/L	0.94 UJ	0.47 U	0.10 U	0.10 U	0.10 U	0.48 U	0.48 U	1	1.5	0.46 U	0.93 UJ	0.10 U	2
Total cPAH TEQ ⁵ (ND=0)	EPA 8270/SIM	µg/L	0 U	0.005	0 U	0.025	0 U	0.021	0 U	0.189	0.255	0 U	0.005	0 U	0.000016
Total cPAH TEQ ⁵ (ND=0.5RL)	EPA 8270/SIM	µg/L	0.710 U	0.038	0.0076 U	0.027	0.0076 U	0.054	0.036 U	0.190	0.250	0.036 U	0.037	0.0076 U	0.000016

Table D-2
Remedial Investigation Chemical Analytical Results - Groundwater COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Monitoring Well ¹	Analytical Method	Units	MW-16	MW-17	MW-17	MW-17	MW-17	MW-18	MW-18	MW-18	MW-18	MW-18	MW-18	MW-18	Groundwater Preliminary Cleanup Level ³ (PCUL)
Sample Date			04/20/15	06/09/14	09/22/14	01/20/15	04/22/15	06/09/14	06/09/14	09/23/14	09/23/14	01/22/15	01/22/15	04/20/15	
Monitoring Event			Apr-15	Jun-14	Sep-14	Jan-15	Apr-15	Jun-14	Jun-14 (Dup)	Sep-14	Sep-14 (Dup)	Jan-15	Jan-15 (Dup)	Apr-15	
Sampled By			GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	
Other SVOCs (mg/kg)															
Aniline	EPA 8270	µg/L	0.94 UJ	0.95 U	0.10 U	0.10 U	0.10 U	0.96 U	0.97 U	0.93 U	0.46 U	0.92 U	0.93 UJ	0.10 U	7.7
Benzidine	EPA 8270	µg/L	0.94 UJ	0.95 U	0.10 U	0.10 U	0.10 U	0.96 U	0.97 U	0.93 U	0.46 U	0.92 U	0.93 UJ	0.10 U	0.000023
Benzoic acid	EPA 8270	µg/L	0.94 UJ	0.95 U	0.50 U	0.50 U	0.50 U	0.96 U	0.97 U	0.93 U	0.46 U	4.6 U	4.6 UJ	0.50 U	590
Benzyl alcohol	EPA 8270	µg/L	0.94 U	0.95 U	0.25 U	0.10 U	0.10 U	0.96 U	0.97 U	0.93 U	0.46 U	0.92 U	0.93 UJ	0.10 U	800
Bis(2-chloroethoxy)methane	EPA 8270	µg/L	0.94 UJ	0.95 U	0.10 U	0.10 U	0.10 U	0.96 U	0.97 U	0.93 U	0.46 U	0.92 U	0.93 UJ	0.10 U	NE
Bis(2-chloroethyl)ether	EPA 8270	µg/L	0.94 UJ	0.95 U	0.10 U	0.10 U	0.10 U	0.96 U	0.97 U	0.93 U	0.46 U	0.92 U	0.93 UJ	0.10 U	0.06
Bis(2-chloroisopropyl)ether	EPA 8270	µg/L	0.94 UJ	0.95 U	0.10 U	0.10 U	0.10 U	0.96 U	0.97 U	0.93 U	0.46 U	0.92 U	0.93 UJ	0.10 U	900
Bis(2-ethylhexyl)phthalate	EPA 8270	µg/L	0.94 UJ	0.95 U	0.21 U	0.47 U	0.32 U	1.3	0.97 U	2.7 U	2.3 U	2.9	2.9 J	13	0.046
4-Bromophenyl phenyl ether	EPA 8270	µg/L	0.94 UJ	0.95 U	0.10 U	0.10 U	0.10 U	0.96 U	0.97 U	0.93 U	0.46 U	0.92 U	0.93 UJ	0.10 U	NE
Butyl benzyl phthalate	EPA 8270	µg/L	0.94 UJ	0.95 U	0.10 U	0.10 U	0.10 U	0.96 U	0.97 U	0.93 U	0.46 U	0.92 U	0.93 UJ	9	0.013
Carbazole	EPA 8270	µg/L	0.94 UJ	0.95 U	0.10 U	0.10 U	0.10 U	0.96 U	0.97 U	1.1	1.3	0.92 U	0.93 UJ	0.10 U	NE
4-Chloroaniline	EPA 8270	µg/L	0.94 UJ	0.95 U	0.10 U	0.10 U	0.10 U	0.96 U	0.97 U	0.93 U	0.46 U	0.92 U	0.93 UJ	0.10 U	2,300
4-Chloro-3-methylphenol	EPA 8270	µg/L	0.94 U	0.95 U	0.10 U	0.10 U	0.10 U	0.96 U	0.97 U	0.93 U	0.46 U	0.92 U	0.93 UJ	0.10 U	36
2-Chloronaphthalene	EPA 8270	µg/L	0.94 UJ	0.95 U	0.10 U	0.10 U	0.10 U	0.96 U	0.97 U	0.93 U	0.46 U	0.92 U	0.93 UJ	0.10 U	100
2-Chlorophenol	EPA 8270	µg/L	0.94 U	0.95 U	0.10 U	0.10 U	0.10 U	0.96 U	0.97 U	0.93 U	0.46 U	0.92 U	0.93 UJ	0.10 U	17
4-Chlorophenyl phenyl ether	EPA 8270	µg/L	0.94 UJ	0.95 U	0.10 U	0.10 U	0.10 U	0.96 U	0.97 U	0.93 U	0.46 U	0.92 U	0.93 UJ	0.10 U	NE
Decane	EPA 8270	µg/L	0.94 UJ	0.95 U	2.0 U	2.0 U	2.0 U	0.96 U	0.97 U	0.93 U	0.46 U	18 U	19 UJ	0.64	NE
Dibutyl phthalate	EPA 8270	µg/L	0.94 UJ	0.95 U	0.10 U	0.65 U	0.87 U	0.96 U	0.97 U	4	3.9	3.6	6.1 J	5.8	8
2,3-Dichloroaniline	EPA 8270	µg/L	0.94 UJ	0.95 U	0.10 U	0.10 U	0.10 U	0.96 U	0.97 U	0.93 U	0.46 U	0.92 U	0.93 UJ	0.10 U	NE
1,2-Dichlorobenzene (o-Dichlorobenzene)	EPA 8260	µg/L	1.0 U	0.20 U	0.20 U	0.20 U	0.20 U	--	--	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	4.6
	EPA 8270	µg/L	0.94 UJ	0.95 U	0.10 U	0.10 U	0.10 U	0.96 U	0.97 U	0.93 U	0.46 U	0.92 U	0.93 UJ	0.10 U	4.6
1,3-Dichlorobenzene (m-Dichlorobenzene)	EPA 8260	µg/L	1.0 U	0.20 U	0.20 U	0.20 U	0.20 U	--	--	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	2.0
	EPA 8270	µg/L	0.94 UJ	0.95 U	0.10 U	0.10 U	0.10 U	0.96 U	0.97 U	0.93 U	0.46 U	0.92 U	0.93 UJ	0.10 U	2.0
1,4-Dichlorobenzene (p-Dichlorobenzene)	EPA 8260	µg/L	1.0 U	0.20 U	0.20 U	0.20 U	0.20 U	--	--	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	4.9
	EPA 8270	µg/L	0.94 UJ	0.95 U	0.10 U	0.10 U	0.10 U	0.96 U	0.97 U	0.93 U	0.46 U	0.92 U	0.93 UJ	0.10 U	4.9
3,3'-Dichlorobenzidine	EPA 8270	µg/L	0.94 UJ	0.95 U	0.10 U	0.10 U	0.10 U	0.96 U	0.97 U	0.93 U	0.46 U	0.92 U	0.93 UJ	0.10 U	0.0033
2,4-Dichlorophenol	EPA 8270	µg/L	0.94 U	0.95 U	0.10 U	0.10 U	0.10 U	0.96 U	0.97 U	0.93 U	0.46 U	0.92 U	0.93 UJ	0.10 U	10
Bis(2-ethylhexyl)ester	EPA 8270	µg/L	0.94 UJ	0.95 U	0.10 U	0.10 U	0.10 U	0.96 U	0.97 U	0.93 U	0.46 U	0.92 U	0.93 UJ	2.5	400
Diethyl phthalate	EPA 8270	µg/L	0.94 UJ	0.95 U	0.16	0.10 U	0.10 U	2.7	0.97 U	2.2	0.46 U	0.92 U	0.93 UJ	0.10 U	93
Dimethyl phthalate	EPA 8270	µg/L	0.94 UJ	0.95 U	0.10 U	0.10 U	0.10 U	0.96 U	0.97 U	0.93 U	0.46 U	0.92 U	0.93 UJ	0.10 U	600
2,4-Dimethylphenol	EPA 8270	µg/L	2.7	0.95 U	0.10 U	0.10 U	0.10 U	2.4	2.5	6.2	6.3	3.3	3.1	4.9	6.30
1,2-Dinitrobenzene	EPA 8270	µg/L	0.94 UJ	0.95 U	0.10 U	0.10 U	0.10 U	0.96 U	0.97 U	0.93 U	0.46 U	0.92 U	0.93 UJ	0.10 U	1.6
1,3-Dinitrobenzene	EPA 8270	µg/L	0.94 UJ	0.95 U	0.10 U	0.10 U	0.10 U	0.96 U	0.97 U	0.93 U	0.46 U	0.92 U	0.93 UJ	0.10 U	1.6
1,4-Dinitrobenzene	EPA 8270	µg/L	0.94 UJ	0.95 U	0.10 U	0.10 U	0.10 U	0.96 U	0.97 U	0.93 U	0.46 U	0.92 U	0.93 UJ	0.10 U	1.6
4,6-Dinitro-2-methylphenol	EPA 8270	µg/L	0.94 U	0.95 U	0.50 U	0.50 U	0.50 U	0.96 U	0.97 U	0.93 U	0.46 U	4.6 U	4.6 UJ	0.50 U	NE
2,4-Dinitrophenol	EPA 8270	µg/L	0.94 U	0.95 U	1.0 U	1.0 U	1.0 U	0.96 U	0.97 U	0.93 U	0.46 U	9.2 U	9.3 UJ	1.0 U	100
2,4-Dinitrotoluene	EPA 8270	µg/L	0.94 UJ	0.95 U	0.10 U	0.25 U	0.10 U	0.96 U	0.97 U	0.93 U	0.46 U	2.3 U	0.93 UJ	0.10 U	0.18
2,6-Dinitrotoluene	EPA 8270	µg/L	0.94 UJ	0.95 U	0.10 U	0.10 U	0.10 U	0.96 U	0.97 U	0.93 U	0.46 U	0.92 U	0.93 UJ	0.10 U	300
Di-n-octyl phthalate	EPA 8270	µg/L	0.94 UJ	0.95 U	0.10 U	0.10 U	0.10 U	0.96 U	0.97 U	0.93 U	0.46 U	0.92 U	0.93 UJ	0.10 U	0.0039
1,2-Diphenylhydrazine	EPA 8270	µg/L	0.94 UJ	0.95 U	0.10 U	0.10 U	0.10 U	0.96 U	0.97 U	0.93 U	0.46 U	0.92 U	0.93 UJ	0.10 U	0.02
Hexachlorobenzene	EPA 8270	µg/L	0.94 UJ	0.95 U	0.10 U	0.10 U	0.10 U	0.96 U	0.97 U	0.93 U	0.46 U	0.92 U	0.93 UJ	0.10 U	0.000005
Hexachlorobutadiene	EPA 8260	µg/L	1.0 U	0.20 U	0.20 U	0.20 U	0.20 U	--	--	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	0.01
	EPA 8270	µg/L	0.94 UJ	0.95 U	0.10 U	0.10 U	0.10 U	0.96 U	0.97 U	0.93 U	0.46 U	0.92 U	0.93 UJ	0.10 U	0.01

Table D-2
Remedial Investigation Chemical Analytical Results - Groundwater COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Monitoring Well ¹	Analytical Method	Units	MW-16	MW-17	MW-17	MW-17	MW-17	MW-18	MW-18	MW-18	MW-18	MW-18	MW-18	MW-18	Groundwater Preliminary Cleanup Level ³ (PCUL)
Sample Date			04/20/15	06/09/14	09/22/14	01/20/15	04/22/15	06/09/14	06/09/14	09/23/14	09/23/14	01/22/15	01/22/15	04/20/15	
Monitoring Event			Apr-15	Jun-14	Sep-14	Jan-15	Apr-15	Jun-14	Jun-14 (Dup)	Sep-14	Sep-14 (Dup)	Jan-15	Jan-15 (Dup)	Apr-15	
Sampled By			GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	
Hexachlorocyclopentadiene	EPA 8270	µg/L	0.94 UJ	0.95 U	0.10 U	0.10 U	0.10 U	0.96 U	0.97 U	0.93 U	0.46 U	0.92 U	0.93 UJ	0.10 U	1.00
Hexachloroethane	EPA 8270	µg/L	0.94 UJ	0.95 U	0.10 U	0.10 U	0.10 U	0.96 U	0.97 U	0.93 U	0.46 U	0.92 U	0.93 UJ	0.10 U	0.02
Isophorone	EPA 8270	µg/L	32 J	0.95 U	0.10 U	0.10 U	0.10 U	0.96 U	0.97 U	0.93 U	0.46 U	0.92 U	0.93 UJ	0.10 U	110
2-Methylphenol (o-Cresol)	EPA 8270	µg/L	4.6 J	0.95 U	0.10 U	0.10 U	0.10 U	0.96 U	0.97 U	1.7	1.8	0.92 U	0.93 UJ	0.55	27
3 & 4 Methylphenol (m & p-Cresol)	EPA 8270	µg/L	30	0.95 U	0.10 U	0.10 U	0.10 U	0.96 U	0.97 U	0.93 U	0.46 U	0.92 U	0.93 UJ	0.10 U	400
2-Nitroaniline	EPA 8270	µg/L	0.94 UJ	0.95 U	0.10 U	0.10 U	0.10 U	0.96 U	0.97 U	0.93 U	0.46 U	0.92 U	0.93 UJ	0.10 U	160
3-Nitroaniline	EPA 8270	µg/L	0.94 UJ	0.95 U	0.10 U	0.10 U	0.10 U	0.96 U	0.97 U	0.93 U	0.46 U	0.92 U	0.93 UJ	0.10 U	NE
4-Nitroaniline	EPA 8270	µg/L	0.94 UJ	0.95 U	0.10 U	0.10 U	0.10 U	0.96 U	0.97 U	0.93 U	0.46 U	0.92 U	0.93 UJ	0.10 U	NE
Nitrobenzene	EPA 8270	µg/L	0.94 UJ	0.95 U	0.10 U	0.10 U	0.10 U	0.96 U	0.97 U	0.93 U	0.46 U	0.92 U	0.93 UJ	0.10 U	100
2-Nitrophenol	EPA 8270	µg/L	0.94 U	0.95 U	0.10 U	0.10 U	0.10 U	0.96 U	0.97 U	0.93 U	0.46 U	0.92 U	0.93 UJ	0.10 U	NE
4-Nitrophenol (p-Nitrophenol)	EPA 8270	µg/L	0.94 UJ	0.95 U	0.10 U	0.10 U	0.10 U	0.96 U	0.97 U	0.93 U	0.46 U	0.92 U	0.93 UJ	0.10 U	NE
n-Nitrosodimethylamine	EPA 8270	µg/L	0.94 UJ	0.95 U	0.10 U	0.10 U	0.10 U	0.96 U	0.97 U	0.93 U	0.46 U	0.92 U	0.93 UJ	0.10 U	0.34
n-Nitrosodiphenylamine (as Diphenylamine)	EPA 8270	µg/L	0.94 UJ	0.95 U	0.10 U	0.10 U	0.10 U	0.96 U	0.97 U	0.93 U	0.46 U	0.92 U	0.93 UJ	0.10 U	0.69
n-Nitrosodi-n-propylamine	EPA 8270	µg/L	0.94 UJ	0.95 U	0.10 U	0.10 U	0.10 U	0.96 U	0.97 U	0.93 U	0.46 U	0.92 U	0.93 UJ	0.10 U	0.058
n-Octadecane	EPA 8270	µg/L	0.94 UJ	0.95 U	0.10 U	0.10 U	0.10 U	0.96 U	0.97 U	0.93 U	0.46 U	0.92 U	0.93 UJ	0.10 U	NE
Pentachlorophenol	EPA 8270	µg/L	12	0.95 U	0.50 U	0.50 U	0.50 U	0.96 U	0.97 U	0.93 U	0.46 U	4.6 U	4.6 UJ	0.50 U	0.002
Phenol	EPA 8270	µg/L	12	0.95 U	0.10 U	0.10 U	0.10 U	0.96 U	0.97 U	0.93 U	0.46 U	0.92 U	0.93 UJ	0.10 U	370
Pyridine	EPA 8270	µg/L	0.94 UJ	0.95 U	0.10 U	0.10 U	0.10 U	0.96 U	0.97 U	0.93 U	0.46 U	0.92 U	0.93 UJ	0.10 U	8
2,3,4,6-Tetrachlorophenol	EPA 8270	µg/L	5.2	0.95 U	0.10 U	0.10 U	0.10 U	0.96 U	0.97 U	0.93 U	0.46 U	0.92 U	0.93 UJ	0.10 U	480
2,3,5,6-Tetrachlorophenol	EPA 8270	µg/L	21	0.95 U	0.10 U	0.10 U	0.10 U	0.96 U	0.97 U	0.93 U	0.46 U	0.92 U	0.93 UJ	0.10 U	NE
1,2,4-Trichlorobenzene	EPA 8260	µg/L	1.0 U	0.20 U	0.20 U	0.20 U	0.20 U	--	--	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	0.037
	EPA 8270	µg/L	0.94 UJ	0.95 U	0.10 U	0.10 U	0.10 U	0.96 U	0.97 U	0.93 U	0.46 U	0.92 U	0.93 UJ	0.10 U	0.037
2,4,5-Trichlorophenol	EPA 8270	µg/L	0.94 U	0.95 U	0.10 U	0.10 U	0.10 U	0.96 U	0.97 U	0.93 U	0.46 U	0.92 U	0.93 UJ	0.10 U	600
2,4,6-Trichlorophenol	EPA 8270	µg/L	1.2	0.95 U	0.10 U	0.10 U	0.10 U	0.96 U	0.97 U	0.93 U	0.46 U	0.92 U	0.93 UJ	0.10 U	0.28
Volatile Organic Compounds (VOCs)															
Acetone	EPA 8260	µg/L	55	5.0 U	5.0 U	5.0 U	5.0 U	--	--	25 U	25 U	25 U	25 U	25 U	NE
Benzene	EPA 8260	µg/L	4.7	0.20 U	0.20 U	0.20 U	0.20 U	--	--	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.6
Bromobenzene	EPA 8260	µg/L	1.0 U	0.20 U	0.20 U	0.20 U	0.20 U	--	--	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	NE
Bromochloromethane	EPA 8260	µg/L	1.0 U	0.20 U	0.20 U	0.20 U	0.20 U	--	--	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	NE
Bromoform (Tribromomethane)	EPA 8260	µg/L	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	--	--	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	12
Bromomethane	EPA 8260	µg/L	1.0 U	0.39 UJ	0.20 U	0.20 U	0.20 U	--	--	1.0 U	1.0 U	1.9 UJ	1.9 UJ	1.0 U	13
n-Butylbenzene	EPA 8260	µg/L	1.0 U	0.20 U	0.20 U	0.20 U	0.20 U	--	--	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	400
sec-Butylbenzene	EPA 8260	µg/L	1.0 U	0.20 U	0.20 U	0.20 U	0.20 U	--	--	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	800
tert-Butylbenzene	EPA 8260	µg/L	1.0 U	0.20 U	0.20 U	0.20 U	0.20 U	--	--	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	800
Carbon disulfide	EPA 8260	µg/L	1.0 U	0.20 U	0.20 U	0.20 U	0.20 U	--	--	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	400
Carbon tetrachloride	EPA 8260	µg/L	1.0 U	0.20 U	0.20 U	0.20 U	0.20 U	--	--	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	0.35
Chlorobenzene	EPA 8260	µg/L	1.0 U	0.20 U	0.20 U	0.20 U	0.20 U	--	--	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	200
Chloroethane	EPA 8260	µg/L	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	--	--	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	19,000
2-Chloroethyl vinyl ether	EPA 8260	µg/L	5.0 U	1.0 U	1.0 UJ	3.0 UJ	1.0 U	--	--	5.0 U	5.0 U	10 U	10 U	5.0 U	NE
Chloroform	EPA 8260	µg/L	1.0 U	0.20 U	0.20 U	0.20 U	0.20 U	--	--	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.2
Chloromethane	EPA 8260	µg/L	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	--	--	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	150
2-Chlorotoluene	EPA 8260	µg/L	1.0 U	0.20 U	0.20 U	0.20 U	0.20 U	--	--	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	160
4-Chlorotoluene	EPA 8260	µg/L	1.0 U	0.20 U	0.20 U	0.20 U	0.20 U	--	--	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	NE

Table D-2
Remedial Investigation Chemical Analytical Results - Groundwater COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Monitoring Well ¹	Analytical Method	Units	MW-16	MW-17	MW-17	MW-17	MW-17	MW-18	MW-18	MW-18	MW-18	MW-18	MW-18	MW-18	Groundwater Preliminary Cleanup Level ³ (PCUL)
Sample Date			04/20/15	06/09/14	09/22/14	01/20/15	04/22/15	06/09/14	06/09/14	09/23/14	09/23/14	01/22/15	01/22/15	04/20/15	
Monitoring Event			Apr-15	Jun-14	Sep-14	Jan-15	Apr-15	Jun-14	Jun-14 (Dup)	Sep-14	Sep-14 (Dup)	Jan-15	Jan-15 (Dup)	Apr-15	
Sampled By			GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	
Dibromochloromethane	EPA 8260	µg/L	1.0 U	0.20 U	0.20 U	0.20 U	0.20 U	--	--	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	2.2
1,2-Dibromo-3-chloropropane	EPA 8260	µg/L	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	--	--	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	0.2
Dibromomethane	EPA 8260	µg/L	1.0 U	0.20 U	0.20 U	0.20 U	0.20 U	--	--	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	80
Bromodichloromethane	EPA 8260	µg/L	1.0 U	0.20 U	0.20 U	0.20 U	0.20 U	--	--	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.8
Dichlorodifluoromethane (CFC-12)	EPA 8260	µg/L	1.0 U	0.20 U	0.20 U	0.20 U	0.20 U	--	--	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	5.6
1,1-Dichloroethane	EPA 8260	µg/L	1.0 U	0.20 U	0.20 U	0.20 U	0.20 U	--	--	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	11
1,2-Dichloroethane	EPA 8260	µg/L	1.0 U	0.20 U	0.20 U	0.20 U	0.20 U	--	--	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	4.2
1,1-Dichloroethene	EPA 8260	µg/L	1.0 U	0.20 U	0.20 U	0.20 U	0.20 U	--	--	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	130
cis-1,2-Dichloroethene	EPA 8260	µg/L	1.0 U	0.20 U	0.20 U	0.20 U	0.20 U	--	--	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	16
trans-1,2-Dichloroethene	EPA 8260	µg/L	1.0 U	0.20 U	0.20 U	0.20 U	0.20 U	--	--	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1,000
1,2-Dichloropropane	EPA 8260	µg/L	1.0 U	0.20 U	0.20 U	0.20 U	0.20 U	--	--	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	3.1
1,3-Dichloropropane	EPA 8260	µg/L	1.0 U	0.20 U	0.20 U	0.20 U	0.20 U	--	--	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	NE
2,2-Dichloropropane	EPA 8260	µg/L	1.0 U	0.20 U	0.20 U	0.20 U	0.20 U	--	--	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	NE
1,1-Dichloropropene	EPA 8260	µg/L	1.0 U	0.20 U	0.20 U	0.20 U	0.20 U	--	--	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	NE
cis-1,3-Dichloropropene	EPA 8260	µg/L	1.0 U	0.20 U	0.20 U	0.20 U	0.20 U	--	--	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	2
trans-1,3-Dichloropropene	EPA 8260	µg/L	1.0 U	0.20 U	0.20 U	0.20 U	0.20 U	--	--	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	2
Ethylbenzene	EPA 8260	µg/L	1.4	0.20 U	0.20 U	0.20 U	0.20 U	--	--	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	31
1,2-Dibromoethane (EDB)	EPA 8260	µg/L	1.0 U	0.20 U	0.20 U	0.20 U	0.20 U	--	--	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	0.27
2-Hexanone	EPA 8260	µg/L	10 U	2.0 U	2.0 U	2.0 U	2.0 U	--	--	10 U	10 U	10 U	10 U	10 U	40
Isopropylbenzene (Cumene)	EPA 8260	µg/L	1.0 U	0.20 U	0.20 U	0.20 U	0.20 U	--	--	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	800
p-Isopropyltoluene	EPA 8260	µg/L	3.1	0.20 U	0.20 U	0.20 U	0.20 U	--	--	1.7	1.3	1.0 U	1.0 U	1.0 U	NE
2-Butanone (MEK)	EPA 8260	µg/L	25 U	5.0 U	5.0 U	5.0 U	5.0 U	--	--	25 U	25 U	25 U	25 U	25 U	1,700,000
Methyl iodide (Iodomethane)	EPA 8260	µg/L	5.0 U	2.1 UJ	1.0 U	1.0 U	1.0 U	--	--	5.0 U	5.0 U	6.5 U	6.5 U	5.0 U	NE
4-Methyl-2-pentanone (Methyl isobutyl ketone)	EPA 8260	µg/L	10 U	2.0 U	2.0 U	2.0 U	2.0 U	--	--	10 U	10 U	10 U	10 U	10 U	470,000
Methyl t-butyl ether (MTBE)	EPA 8260	µg/L	1.0 U	0.20 U	0.20 U	0.20 U	0.20 U	--	--	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	600
Methylene chloride	EPA 8260	µg/L	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	--	--	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	100
n-Propylbenzene	EPA 8260	µg/L	1.0 U	0.20 U	0.20 U	0.20 U	0.20 U	--	--	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	800
Styrene	EPA 8260	µg/L	1.0 U	0.20 U	0.20 U	0.20 U	0.20 U	--	--	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	8,200
1,1,1,2-Tetrachloroethane	EPA 8260	µg/L	1.0 U	0.20 U	0.20 U	0.20 U	0.20 U	--	--	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	7.4
1,1,1,2,2-Tetrachloroethane	EPA 8260	µg/L	1.0 U	0.20 U	0.20 U	0.20 U	0.20 U	--	--	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	0.3
Tetrachloroethene	EPA 8260	µg/L	1.0 U	0.20 U	0.20 U	0.20 U	0.20 U	--	--	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	2.9
Toluene	EPA 8260	µg/L	7.4	1.0 U	1.0 U	1.0 U	1.0 U	--	--	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	130
1,2,3-Trichlorobenzene	EPA 8260	µg/L	1.0 U	0.20 U	0.20 U	0.20 U	0.20 U	--	--	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	NE
1,1,1-Trichloroethane	EPA 8260	µg/L	1.0 U	0.20 U	0.20 U	0.20 U	0.20 U	--	--	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	5,500
1,1,2-Trichloroethane	EPA 8260	µg/L	1.0 U	0.20 U	0.20 U	0.20 U	0.20 U	--	--	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	0.9
Trichloroethene	EPA 8260	µg/L	1.0 U	0.20 U	0.20 U	0.20 U	0.20 U	--	--	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	0.7
Trichlorofluoromethane (CFC-11)	EPA 8260	µg/L	1.0 U	0.20 U	0.20 U	0.20 U	0.20 U	--	--	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	120
1,2,3-Trichloropropane	EPA 8260	µg/L	1.0 U	0.20 U	0.20 U	0.20 U	0.20 U	--	--	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1,500
1,2,4-Trimethylbenzene	EPA 8260	µg/L	2.7	0.20 U	0.20 U	0.20 U	0.20 U	--	--	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	240
1,3,5-Trimethylbenzene	EPA 8260	µg/L	1.0 U	0.20 U	0.20 U	0.20 U	0.20 U	--	--	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	80
Vinyl acetate	EPA 8260	µg/L	5.0 U	1.0 UJ	1.0 U	1.0 U	1.0 U	--	--	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	7,800

Table D-2

Remedial Investigation Chemical Analytical Results - Groundwater COPCs

Port of Seattle - North Terminal 115

Seattle, Washington

Monitoring Well ¹	Analytical Method	Units	MW-16	MW-17	MW-17	MW-17	MW-17	MW-18	MW-18	MW-18	MW-18	MW-18	MW-18	MW-18	Groundwater Preliminary Cleanup Level ³ (PCUL)
Sample Date			04/20/15	06/09/14	09/22/14	01/20/15	04/22/15	06/09/14	06/09/14	09/23/14	09/23/14	01/22/15	01/22/15	04/20/15	
Monitoring Event			Apr-15	Jun-14	Sep-14	Jan-15	Apr-15	Jun-14	Jun-14 (Dup)	Sep-14	Sep-14 (Dup)	Jan-15	Jan-15 (Dup)	Apr-15	
Sampled By			GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	
Vinyl chloride	EPA 8260	µg/L	1.0 U	0.20 U	0.20 U	0.20 U	0.20 U	--	--	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	0.18
Xylene, m-,p-	EPA 8260	µg/L	7.3	0.40 U	0.40 U	0.40 U	0.40 U	--	--	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	290
Xylene, o-	EPA 8260	µg/L	3.4	0.20 U	0.20 U	0.20 U	0.20 U	--	--	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	430
Petroleum Hydrocarbons															
Gasoline-range hydrocarbons	NWTPH-G	µg/L	--	100 U	100 U	100 U	100 U	100 U	100 U	250	260	100 U	100 U	100 U	800
Diesel-range hydrocarbons	NWTPH-Dx	µg/L	--	200 U	200 U	250 U	250 U	5,400	3,800	15,000	12,000	5,700	13,000	9,700	500
Oil-range hydrocarbons	NWTPH-Dx	µg/L	--	350	330	400 U	400 U	6,400 J	4,200 J	18,000	16,000	6,600	17,000	11,000	500
Total diesel- and oil-range hydrocarbons	NWTPH-Dx	µg/L	--	350	330	400 U	400 U	11,800 J	8,000 J	33,000	28,000	12,300	30,000	20,700	500
Diesel-range hydrocarbons	NWTPH-Dx Si/Gel	µg/L	--	--	--	--	--	--	--	200 U	300	250 U	250 U	250 U	500
Oil-range hydrocarbons	NWTPH-Dx Si/Gel	µg/L	--	--	--	--	--	--	--	320 U	320 U	400 U	400 U	400 U	500
Total diesel- and oil-range hydrocarbons	NWTPH-Dx Si/Gel	µg/L	--	--	--	--	--	--	--	320 U	300	400 U	400 U	400 U	500
Conventional Parameters															
Total organic carbon (TOC)	SM 5310B	mg/L	--	--	--	--	--	--	--	1400 J	1800 J	760	680	700	NE
Field Measured Parameters															
pH	N/A	N/A	11.45	7.14	7.14	7.36	7.25	8.70	8.70	9.10	9.10	8.80	8.80	8.91	NE

Notes:

¹ Monitoring well locations are shown on Figures 3-2 and 3-4.

² Insufficient water to collect groundwater sample for chemical analysis.

³ Groundwater screening levels referenced from Table 4-2.

⁴ Total dioxin/furan Toxic Equivalency Quotients (TEQs) were calculated using United States Environmental Protection Agency (USEPA) Toxicity Equivalency Factor (TEF) values for human health (EPA 2003).

⁵ Total carcinogenic PAH (cPAH) TEQs were calculated using TEF values referenced from MTCA Table 708.2 (WAC 173-340-900).

mg/L = milligram per liter

µg/L = microgram per liter

NE = not established

Landau = Landau Associates

GEI = GeoEngineers

NE = not established

J = estimated result

U = analyte not detected above the reporting limit

-- = not analyzed

COPC = Contaminant of Potential Concern

Bold indicates analyte was detected.

Yellow shading identifies the detected results greater than the preliminary cleanup level.

Blue shading identifies the non-detected result greater than the preliminary cleanup level.

Table D-2
Remedial Investigation Chemical Analytical Results - Groundwater COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Monitoring Well ¹	Analytical Method	Units	MW-18	MW-19	MW-19	MW-19	MW-19	MW-19D	MW-19D	MW-19D	MW-19D	MW-20	MW-20	Groundwater Preliminary Cleanup Level ³ (PCUL)	
Sample Date			04/20/15	06/09/14	09/22/14	01/20/15	04/22/15	06/09/14	09/22/14	01/20/15	04/22/15	06/10/14	09/22/14		01/19/15
Monitoring Event			Apr-15 (Dup)	Jun-14	Sep-14	Jan-15	Apr-15	Jun-14	Sep-14	Jan-15	Apr-15	Jun-14	Sep-14		Jan-15
Sampled By			GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI		GEI
Polychlorinated Biphenyls (PCBs)															
PCB-Aroclor 1016	EPA 8082	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
PCB-Aroclor 1221	EPA 8082	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
PCB-Aroclor 1232	EPA 8082	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
PCB-Aroclor 1242	EPA 8082	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
PCB-Aroclor 1248	EPA 8082	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
PCB-Aroclor 1254	EPA 8082	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
PCB-Aroclor 1260	EPA 8082	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
Total PCB Aroclors	EPA 8082	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	0.000007
Total PCB Congeners	EPA 1668	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	0.000007
Dioxins and Furans															
1,2,3,4,6,7,8-HpCDD	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,4,6,7,8-HpCDF	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,4,7,8,9-HpCDF	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,4,7,8-HxCDD	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,4,7,8-HxCDF	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,6,7,8-HxCDD	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,6,7,8-HxCDF	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,7,8,9-HxCDD	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,7,8,9-HxCDF	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,7,8-PeCDD	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,7,8-PeCDF	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
2,3,4,6,7,8-HxCDF	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
2,3,4,7,8-PeCDF	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
2,3,7,8-TCDD	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
2,3,7,8-TCDF	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
OCDD	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
OCDF	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
Total Dioxin/Furan TEQ ⁴ (ND=0)	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	0.0000000051
Total Dioxin/Furan TEQ ⁴ (ND=0.5RL)	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	0.0000000051
Total Metals															
Antimony	EPA 200.8/7470	µg/L	5.0 U	5.4 U	5.4 U	5.4 U	5.4 U	5.4 U	5.4 U	5.4 U	5.6 U	5.4 U	5.4 U	5.4 U	90
Arsenic	EPA 200.8/7470	µg/L	290	31	34	12	21	56	62	55	49	3.3 U	6.1	4.6	8.0
Barium	EPA 200.8/7470	µg/L	280	260	310	96	270	45	53	59	77	33	54	26	200
Beryllium	EPA 200.8/7470	µg/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	4.4
Cadmium	EPA 200.8/7470	µg/L	1.0 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	1.2
Chromium III / Total	EPA 200.8/7470	µg/L	210	4.1	4.8	2.2	6.2 J	5.3	2.6	2.4	5.7 J	2.0 U	7.2	2.0 U	27
Chromium VI	EPA 200.8/7470	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	50
Copper	EPA 200.8/7470	µg/L	10 U	2.0 U	2.0 U	2.0 U	3	5.6	3.7	2.0 U	4.4	2.0 U	5.1	3.1	3.1
Lead	EPA 200.8/7470	µg/L	2.0 U	1.7	1.0 U	2.1	3.8	3.4	1.0 U	1.0 U	3.1	1.0 U	1.2	1.0 U	8.1
Mercury	EPA 200.8/7470	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.025
Nickel	EPA 200.8/7470	µg/L	130	15	16	8.4	12	5.3	4.7	3.4	9.8	4.4	10	3.7	8.2

Table D-2
Remedial Investigation Chemical Analytical Results - Groundwater COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Monitoring Well ¹	Analytical Method	Units	MW-18	MW-19	MW-19	MW-19	MW-19	MW-19D	MW-19D	MW-19D	MW-19D	MW-20	MW-20	MW-20	Groundwater Preliminary Cleanup Level ³ (PCUL)
Sample Date			04/20/15	06/09/14	09/22/14	01/20/15	04/22/15	06/09/14	09/22/14	01/20/15	04/22/15	06/10/14	09/22/14	01/19/15	
Monitoring Event			Apr-15 (Dup)	Jun-14	Sep-14	Jan-15	Apr-15	Jun-14	Sep-14	Jan-15	Apr-15	Jun-14	Sep-14	Jan-15	
Sampled By			GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	
Selenium	EPA 200.8/7470	µg/L	15 U	6.0 U	6.0 U	6.0 U	6.0 U	6.0 U	6.0 U	6.0 U	6.0 U	6.0 U	6.0 U	6.0 U	71
Silver	EPA 200.8/7470	µg/L	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.9
Thallium	EPA 200.8/7470	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	0.062
Tin	EPA 200.8/7470	µg/L	360	5.0 U	5.0 U	11	16	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	9,600
Zinc	EPA 200.8/7470	µg/L	56 U	56 U	56 U	56 U	56 U	56 U	56 U	56 U	56 U	56 U	56 U	56 U	81
Dissolved Metals															
Antimony	EPA 200.8/7470	µg/L	5.5 U	5.5 U	5.5 U	5.5 U	5.5 U	5.5 U	5.5 U	5.5 U	5.5 U	5.5 U	5.5 U	5.5 U	90
Arsenic	EPA 200.8/7470	µg/L	270	26	36	14	21	48	64	59	46	8.3 U	4.8	5.1	8.0
Barium	EPA 200.8/7470	µg/L	280	240	290	100	220	29	43	55	62	31	33	26	200
Beryllium	EPA 200.8/7470	µg/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	4.4
Cadmium	EPA 200.8/7470	µg/L	1.0 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	1.2
Chromium III / Total	EPA 200.8/7470	µg/L	210	2.5	3.4	2.0 U	2.4	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	27
Copper	EPA 200.8/7470	µg/L	10 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	3.1
Lead	EPA 200.8/7470	µg/L	2.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	8.1
Mercury	EPA 200.8/7470	µg/L	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.025
Nickel	EPA 200.8/7470	µg/L	130	15	14	7.8	8.4	3.1	3.2	2.9	2.4	3.8	2.7	3.4	8.2
Selenium	EPA 200.8/7470	µg/L	15 U	6.0 U	6.0 U	6.0 U	6.0 U	6.0 U	6.0 U	6.0 U	6.0 U	6.0 U	6.0 U	6.0 U	71
Silver	EPA 200.8/7470	µg/L	5.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.9
Thallium	EPA 200.8/7470	µg/L	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	0.062
Tin	EPA 200.8/7470	µg/L	390	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	9,600
Zinc	EPA 200.8/7470	µg/L	56 U	56 U	56 U	56 U	56 U	56 U	56 U	56 U	56 U	56 U	56 U	56 U	81
Semi-Volatile Organic Compounds (SVOCs) - Polycyclic Aromatic Hydrocarbons (PAHs)															
Acenaphthene	EPA 8270/SIM	µg/L	0.10 U	0.47 U	0.10 U	0.11 U	0.18	0.47 U	0.10 U	0.11 U	0.10 U	0.48 U	0.10 U	0.10 U	5.3
Acenaphthylene	EPA 8270/SIM	µg/L	0.10 U	0.47 U	0.10 U	0.11 U	0.10 U	0.47 U	0.10 U	0.11 U	0.10 U	0.48 U	0.10 U	0.10 U	NE
Anthracene	EPA 8270/SIM	µg/L	0.10 U	0.47 U	0.10 U	0.11 U	0.10 U	0.47 U	0.10 U	0.053 U	0.10 U	0.48 U	0.10 U	0.10 U	2.1
Benzo(a)anthracene	EPA 8270/SIM	µg/L	0.10 U	0.047 U	0.010 U	0.010 U	0.010 U	0.047 U	0.010 U	0.010 U	0.010 U	0.048 U	0.010 U	0.010 U	0.00016
Benzo(b)fluoranthene	EPA 8270/SIM	µg/L	0.10 U	0.047 U	0.010 U	0.010 U	0.010 U	0.047 U	0.010 U	0.010 U	0.010 U	0.048 U	0.010 U	0.010 U	0.00016
Benzo(j,k)fluoranthene	EPA 8270/SIM	µg/L	0.10 U	0.047 U	0.010 U	0.010 U	0.010 U	0.047 U	0.010 U	0.010 U	0.010 U	0.048 U	0.010 U	0.010 U	0.0016
Benzo(g,h,i)perylene	EPA 8270/SIM	µg/L	0.10 U	0.047 U	0.010 U	0.023	0.010 U	0.047 U	0.010 U	0.010 U	0.010 U	0.048 U	0.010 U	0.010 U	NE
Benzo(a)pyrene	EPA 8270/SIM	µg/L	0.10 U	0.047 U	0.010 U	0.010 U	0.010 U	0.047 U	0.010 U	0.010 U	0.010 U	0.048 U	0.010 U	0.010 U	0.000016
Chrysene	EPA 8270/SIM	µg/L	0.10 U	0.047 U	0.010 U	0.010 U	0.010 U	0.047 U	0.010 U	0.010 U	0.010 U	0.048 U	0.010 U	0.010 U	0.016
Dibenzo(a,h)anthracene	EPA 8270/SIM	µg/L	0.10 U	0.047 U	0.010 U	0.016	0.010 U	0.047 U	0.010 U	0.010 U	0.010 U	0.048 U	0.010 U	0.010 U	0.000016
Dibenzofuran	EPA 8270/SIM	µg/L	0.10 U	0.94 U	0.10 U	0.11 U	0.10 U	0.95 U	0.10 U	0.11 U	0.10 U	0.97 U	0.10 U	0.10 U	16
Fluoranthene	EPA 8270/SIM	µg/L	0.42	0.47 U	0.10 U	0.11 U	0.10 U	0.47 U	0.10 U	0.11 U	0.10 U	0.48 U	0.10 U	0.050 U	1.8
Fluorene	EPA 8270/SIM	µg/L	0.25	0.47 U	0.10 U	0.11 U	0.10 U	0.47 U	0.10 U	0.11 U	0.10 U	0.48 U	0.10 U	0.10 U	3.7
Indeno(1,2,3-c,d)pyrene	EPA 8270/SIM	µg/L	0.10 U	0.047 U	0.010 U	0.018	0.010 U	0.047 U	0.010 U	0.010 U	0.010 U	0.048 U	0.010 U	0.010 U	0.00016
1-Methylnaphthalene	EPA 8270/SIM	µg/L	0.33	0.47 U	0.10 U	0.11 U	0.11	0.47 U	0.10 U	0.11 U	0.10 U	0.48 U	0.10 U	0.10 U	1.5
2-Methylnaphthalene	EPA 8270/SIM	µg/L	0.10 U	0.47 U	0.10 U	0.11 U	0.10 U	0.47 U	0.10 U	0.11 U	0.10 U	0.48 U	0.10 U	0.10 U	32
Naphthalene	EPA 8270/SIM	µg/L	10	0.47 U	0.10 U	0.11 U	0.6	0.47 U	0.10 U	0.11 U	0.10 U	0.48 U	0.10 U	0.10 U	1.4
Phenanthrene	EPA 8270/SIM	µg/L	0.10 U	0.47 U	0.10 U	0.11 U	0.10 U	0.47 U	0.10 U	0.053 U	0.10 U	0.48 U	0.10 U	0.10 U	NE
Pyrene	EPA 8270/SIM	µg/L	0.35	0.47 U	0.10 U	0.11 U	0.11	0.47 U	0.10 U	0.11 U	0.10 U	0.48 U	0.10 U	0.11	2
Total cPAH TEQ ⁵ (ND=0)	EPA 8270/SIM	µg/L	0 U	0 U	0 U	0.003	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0.000016
Total cPAH TEQ ⁵ (ND=0.5RL)	EPA 8270/SIM	µg/L	0.0076 U	0.035 U	0.0076 U	0.010	0.0076 U	0.035 U	0.0076 U	0.0076 U	0.0076 U	0.035 U	0.0076 U	0.0076 U	0.000016

Table D-2
Remedial Investigation Chemical Analytical Results - Groundwater COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Monitoring Well ¹	Analytical Method	Units	MW-18	MW-19	MW-19	MW-19	MW-19	MW-19D	MW-19D	MW-19D	MW-19D	MW-19D	MW-20	MW-20	MW-20	Groundwater Preliminary Cleanup Level ³ (PCUL)
Sample Date			04/20/15	06/09/14	09/22/14	01/20/15	04/22/15	06/09/14	09/22/14	01/20/15	04/22/15	06/10/14	09/22/14	01/19/15		
Monitoring Event			Apr-15 (Dup)	Jun-14	Sep-14	Jan-15	Apr-15	Jun-14	Sep-14	Jan-15	Apr-15	Jun-14	Sep-14	Jan-15		
Sampled By			GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI		
Other SVOCs (mg/kg)																
Aniline	EPA 8270	µg/L	0.10 U	0.94 U	0.10 U	0.11 U	0.10 U	0.95 U	0.10 U	0.11 U	0.10 U	0.97 U	0.10 U	0.10 U	7.7	
Benzidine	EPA 8270	µg/L	0.10 U	0.94 U	0.10 U	0.11 U	0.50 U	0.95 U	0.10 U	0.11 U	0.50 U	0.97 U	0.10 U	0.10 U	0.000023	
Benzoic acid	EPA 8270	µg/L	0.50 U	0.94 U	0.50 U	0.55 U	0.50 U	0.95 U	0.50 U	0.53 UJ	0.50 U	0.97 U	0.50 U	0.50 U	590	
Benzyl alcohol	EPA 8270	µg/L	0.10 U	0.94 U	0.25 U	0.11 U	0.10 U	0.95 U	0.25 U	0.11 UJ	0.10 U	0.97 U	0.25 U	0.10 U	800	
Bis(2-chloroethoxy)methane	EPA 8270	µg/L	0.10 U	0.94 U	0.10 U	0.11 U	0.10 U	0.95 U	0.10 U	0.11 U	0.10 U	0.97 U	0.10 U	0.10 U	NE	
Bis(2-chloroethyl)ether	EPA 8270	µg/L	0.10 U	0.94 U	0.10 U	0.11 U	0.10 U	0.95 U	0.10 U	0.11 U	0.10 U	0.97 U	0.10 U	0.10 U	0.06	
Bis(2-chloroisopropyl)ether	EPA 8270	µg/L	0.10 U	0.94 U	0.10 U	0.11 U	0.10 U	0.95 U	0.10 U	0.11 U	0.10 U	0.97 U	0.10 U	0.10 U	900	
Bis(2-ethylhexyl)phthalate	EPA 8270	µg/L	9.8	0.94 U	0.39 U	0.77 U	0.69 U	0.95 U	0.17 U	0.98 U	0.46 U	0.97 U	0.28 U	0.59 U	0.046	
4-Bromophenyl phenyl ether	EPA 8270	µg/L	0.10 U	0.94 U	0.10 U	0.11 U	0.10 U	0.95 U	0.10 U	0.11 U	0.10 U	0.97 U	0.10 U	0.10 U	NE	
Butyl benzyl phthalate	EPA 8270	µg/L	11	0.94 U	0.10 U	0.11 U	0.10 U	0.95 U	0.10 U	0.11 U	0.10 U	0.97 U	0.10 U	0.10 U	0.013	
Carbazole	EPA 8270	µg/L	0.10 U	0.94 U	0.10 U	0.11 U	0.10 U	0.95 U	0.10 U	0.11 U	0.10 U	0.97 U	0.10 U	0.10 U	NE	
4-Chloroaniline	EPA 8270	µg/L	0.10 U	0.94 U	0.10 U	0.11 U	0.10 U	0.95 U	0.10 U	0.11 U	0.10 U	0.97 U	0.10 U	0.10 U	2,300	
4-Chloro-3-methylphenol	EPA 8270	µg/L	0.10 U	0.94 U	0.10 U	0.11 U	0.31	0.95 U	0.10 U	0.12 UJ	0.15	0.97 U	0.10 U	0.26	36	
2-Chloronaphthalene	EPA 8270	µg/L	0.10 U	0.94 U	0.10 U	0.11 U	0.10 U	0.95 U	0.10 U	0.11 U	0.10 U	0.97 U	0.10 U	0.10 U	100	
2-Chlorophenol	EPA 8270	µg/L	0.10 U	0.94 U	0.10 U	0.11 U	0.10 U	0.95 U	0.10 U	0.11 UJ	0.10 U	0.97 U	0.10 U	0.10 U	17	
4-Chlorophenyl phenyl ether	EPA 8270	µg/L	0.10 U	0.94 U	0.10 U	0.11 U	0.10 U	0.95 U	0.10 U	0.11 U	0.10 U	0.97 U	0.10 U	0.10 U	NE	
Decane	EPA 8270	µg/L	2.0 U	0.94 U	2.0 U	2.2 U	2.0 U	0.95 U	2.0 U	2.1 U	2.0 U	0.97 U	2.0 U	2.0 U	NE	
Dibutyl phthalate	EPA 8270	µg/L	3.4	0.94 U	0.54	0.64 U	1.4 U	0.95 U	0.10 U	1.0 U	0.67 U	0.97 U	0.32	0.65 U	8	
2,3-Dichloroaniline	EPA 8270	µg/L	0.10 U	0.94 U	0.10 U	0.11 U	0.10 U	0.95 U	0.10 U	0.11 U	0.10 U	0.97 U	0.10 U	0.10 U	NE	
1,2-Dichlorobenzene (o-Dichlorobenzene)	EPA 8260	µg/L	1.0 U	--	0.20 U	0.20 U	0.20 U	--	0.20 U	0.20 U	0.20 U	--	--	--	4.6	
	EPA 8270	µg/L	0.10 U	0.94 U	0.10 U	0.11 U	0.10 U	0.95 U	0.10 U	0.11 U	0.10 U	0.97 U	0.10 U	0.10 U	4.6	
1,3-Dichlorobenzene (m-Dichlorobenzene)	EPA 8260	µg/L	1.0 U	--	0.20 U	0.20 U	0.20 U	--	0.20 U	0.20 U	0.20 U	--	--	--	2.0	
	EPA 8270	µg/L	0.10 U	0.94 U	0.10 U	0.11 U	0.10 U	0.95 U	0.10 U	0.11 U	0.10 U	0.97 U	0.10 U	0.10 U	2.0	
1,4-Dichlorobenzene (p-Dichlorobenzene)	EPA 8260	µg/L	1.0 U	--	0.20 U	0.20 U	0.20 U	--	0.20 U	0.20 U	0.20 U	--	--	--	4.9	
	EPA 8270	µg/L	0.10 U	0.94 U	0.10 U	0.11 U	0.10 U	0.95 U	0.10 U	0.11 U	0.10 U	0.97 U	0.10 U	0.10 U	4.9	
3,3'-Dichlorobenzidine	EPA 8270	µg/L	0.10 U	0.94 U	0.10 U	0.11 U	0.10 U	0.95 U	0.10 U	0.11 U	0.10 U	0.97 U	0.10 U	0.10 U	0.0033	
2,4-Dichlorophenol	EPA 8270	µg/L	0.10 U	0.94 U	0.10 U	0.11 U	0.10 U	0.95 U	0.10 U	0.11 UJ	0.10 U	0.97 U	0.10 U	0.10 U	10	
Bis(2-ethylhexyl)ester	EPA 8270	µg/L	2.2	0.94 U	0.10 U	0.11 U	0.10 U	0.95 U	0.10 U	0.11 U	0.10 U	0.97 U	0.10 U	0.10 U	400	
Diethyl phthalate	EPA 8270	µg/L	0.10 U	0.94 U	0.10 U	0.11 U	0.10 U	0.95 U	0.10 U	0.11 U	0.10 U	0.97 U	0.10 U	0.12	93	
Dimethyl phthalate	EPA 8270	µg/L	0.10 U	0.94 U	0.10 U	0.11 U	0.10 U	0.95 U	0.10 U	0.11 U	0.10 U	0.97 U	0.10 U	0.10 U	600	
2,4-Dimethylphenol	EPA 8270	µg/L	2.5	0.94 U	0.10 U	0.11 U	0.10 U	0.95 U	0.10 U	0.11 UJ	0.10 U	0.97 U	0.10 U	0.10 U	6.30	
1,2-Dinitrobenzene	EPA 8270	µg/L	0.10 U	0.94 U	0.10 U	0.11 U	0.10 U	0.95 U	0.10 U	0.11 U	0.10 U	0.97 U	0.10 U	0.10 U	1.6	
1,3-Dinitrobenzene	EPA 8270	µg/L	0.10 U	0.94 U	0.10 U	0.11 U	0.10 U	0.95 U	0.10 U	0.11 U	0.10 U	0.97 U	0.10 U	0.10 U	1.6	
1,4-Dinitrobenzene	EPA 8270	µg/L	0.10 U	0.94 U	0.10 U	0.11 U	0.10 U	0.95 U	0.10 U	0.11 U	0.10 U	0.97 U	0.10 U	0.10 U	1.6	
4,6-Dinitro-2-methylphenol	EPA 8270	µg/L	0.50 U	0.94 U	0.50 U	0.55 U	0.50 U	0.95 U	0.50 U	0.53 UJ	0.50 U	0.97 U	0.50 U	0.50 U	NE	
2,4-Dinitrophenol	EPA 8270	µg/L	1.0 U	0.94 U	1.0 U	1.1 U	1.0 U	0.95 U	1.0 U	1.1 UJ	1.0 U	0.97 U	1.0 U	1.0 U	100	
2,4-Dinitrotoluene	EPA 8270	µg/L	0.10 U	0.94 U	0.10 U	0.28 U	0.25 U	0.95 U	0.10 U	0.26 U	0.25 U	0.97 U	0.10 U	0.25 U	0.18	
2,6-Dinitrotoluene	EPA 8270	µg/L	0.10 U	0.94 U	0.10 U	0.11 U	0.10 U	0.95 U	0.10 U	0.11 U	0.10 U	0.97 U	0.10 U	0.10 U	300	
Di-n-octyl phthalate	EPA 8270	µg/L	0.10 U	0.94 U	0.10 U	0.11 U	0.10 U	0.95 U	0.10 U	0.11 U	0.10 U	0.97 U	0.10 U	0.10 U	0.0039	
1,2-Diphenylhydrazine	EPA 8270	µg/L	0.10 U	0.94 U	0.10 U	0.11 U	0.10 U	0.95 U	0.10 U	0.11 U	0.10 U	0.97 U	0.10 U	0.10 U	0.02	
Hexachlorobenzene	EPA 8270	µg/L	0.10 U	0.94 U	0.10 U	0.11 U	0.10 U	0.95 U	0.10 U	0.11 U	0.10 U	0.97 U	0.10 U	0.10 U	0.000005	
Hexachlorobutadiene	EPA 8260	µg/L	1.0 U	--	0.20 U	0.20 U	0.20 U	--	0.20 U	0.20 U	0.20 U	--	--	--	0.01	
	EPA 8270	µg/L	0.10 U	0.94 U	0.10 U	0.11 U	0.10 U	0.95 U	0.10 U	0.11 U	0.10 U	0.97 U	0.10 U	0.10 U	0.01	

Table D-2
Remedial Investigation Chemical Analytical Results - Groundwater COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Monitoring Well ¹	Analytical Method	Units	MW-18	MW-19	MW-19	MW-19	MW-19	MW-19D	MW-19D	MW-19D	MW-19D	MW-20	MW-20	MW-20	Groundwater Preliminary Cleanup Level ³ (PCUL)
Sample Date			04/20/15	06/09/14	09/22/14	01/20/15	04/22/15	06/09/14	09/22/14	01/20/15	04/22/15	06/10/14	09/22/14	01/19/15	
Monitoring Event			Apr-15 (Dup)	Jun-14	Sep-14	Jan-15	Apr-15	Jun-14	Sep-14	Jan-15	Apr-15	Jun-14	Sep-14	Jan-15	
Sampled By			GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	
Hexachlorocyclopentadiene	EPA 8270	µg/L	0.10 U	0.94 U	0.10 U	0.11 U	0.10 U	0.95 U	0.10 U	0.11 U	0.10 U	0.97 U	0.10 U	0.10 U	1.00
Hexachloroethane	EPA 8270	µg/L	0.10 U	0.94 U	0.10 U	0.11 U	0.10 U	0.95 U	0.10 U	0.11 U	0.10 U	0.97 U	0.10 U	0.10 U	0.02
Isophorone	EPA 8270	µg/L	0.10 U	0.94 U	0.10 U	0.11 U	0.10 U	0.95 U	0.10 U	0.11 U	0.10 U	0.97 U	0.10 U	0.10 U	110
2-Methylphenol (o-Cresol)	EPA 8270	µg/L	0.10 U	0.94 U	0.10 U	0.11 U	0.10 U	0.95 U	0.10 U	0.11 U	0.10 U	0.97 U	0.10 U	0.10 U	27
3 & 4 Methylphenol (m & p-Cresol)	EPA 8270	µg/L	0.34	0.94 U	0.10 U	0.11 U	0.10 U	0.95 U	0.10 U	0.11 UJ	0.10 U	0.97 U	0.10 U	0.10 U	400
2-Nitroaniline	EPA 8270	µg/L	0.10 U	0.94 U	0.10 U	0.11 U	0.10 U	0.95 U	0.10 U	0.11 U	0.10 U	0.97 U	0.10 U	0.10 U	160
3-Nitroaniline	EPA 8270	µg/L	0.10 U	0.94 U	0.10 U	0.11 U	0.10 U	0.95 U	0.10 U	0.11 U	0.10 U	0.97 U	0.10 U	0.10 U	NE
4-Nitroaniline	EPA 8270	µg/L	0.10 U	0.94 U	0.10 U	0.11 U	0.10 U	0.95 U	0.10 U	0.11 U	0.10 U	0.97 U	0.10 U	0.10 U	NE
Nitrobenzene	EPA 8270	µg/L	0.10 U	0.94 U	0.10 U	0.11 U	0.10 U	0.95 U	0.10 U	0.11 U	0.10 U	0.97 U	0.10 U	0.10 U	100
2-Nitrophenol	EPA 8270	µg/L	0.10 U	0.94 U	0.10 U	0.11 U	0.10 U	0.95 U	0.10 U	0.11 UJ	0.10 U	0.97 U	0.10 U	0.10 U	NE
4-Nitrophenol (p-Nitrophenol)	EPA 8270	µg/L	0.10 U	0.94 U	0.10 U	0.11 U	0.10 U	0.95 U	0.10 U	0.11 U	0.10 UJ	0.97 U	0.10 U	0.10 U	NE
n-Nitrosodimethylamine	EPA 8270	µg/L	0.10 U	0.94 U	0.10 U	0.11 U	0.10 U	0.95 U	0.10 U	0.11 U	0.10 U	0.97 U	0.10 U	0.10 U	0.34
n-Nitrosodiphenylamine (as Diphenylamine)	EPA 8270	µg/L	0.10 U	0.94 U	0.10 U	0.11 U	0.10 U	0.95 U	0.10 U	0.11 U	0.10 U	0.97 U	0.10 U	0.10 U	0.69
n-Nitrosodi-n-propylamine	EPA 8270	µg/L	0.10 U	0.94 U	0.10 U	0.11 U	0.10 U	0.95 U	0.10 U	0.11 U	0.10 U	0.97 U	0.10 U	0.10 U	0.058
n-Octadecane	EPA 8270	µg/L	0.10 U	0.94 U	0.10 U	0.11 U	0.4	0.95 U	0.10 U	0.11 U	0.44	0.97 U	0.10 U	0.10 U	NE
Pentachlorophenol	EPA 8270	µg/L	0.50 U	0.94 U	0.50 U	0.55 U	0.50 U	0.95 U	0.50 U	0.53 UJ	0.50 U	0.97 U	0.50 U	0.50 U	0.002
Phenol	EPA 8270	µg/L	0.10 U	0.94 U	0.10 U	0.11 U	0.10 U	0.95 U	0.10 U	0.11 UJ	0.10 U	0.97 U	0.10 U	0.10 U	370
Pyridine	EPA 8270	µg/L	0.10 U	0.94 U	0.10 U	0.11 U	0.10 U	0.95 U	0.10 U	0.11 U	0.10 U	0.97 U	0.10 U	0.10 U	8
2,3,4,6-Tetrachlorophenol	EPA 8270	µg/L	0.10 U	0.94 U	0.10 U	0.11 U	0.10 U	0.95 U	0.10 U	0.11 UJ	0.10 U	0.97 U	0.10 U	0.10 U	480
2,3,5,6-Tetrachlorophenol	EPA 8270	µg/L	0.10 U	0.94 U	0.10 U	0.11 U	0.10 U	0.95 U	0.10 U	0.11 UJ	0.10 U	0.97 U	0.10 U	0.10 U	NE
1,2,4-Trichlorobenzene	EPA 8260	µg/L	1.0 U	--	0.20 U	0.20 U	0.20 U	--	0.20 U	0.20 U	0.20 U	--	--	--	0.037
	EPA 8270	µg/L	0.10 U	0.94 U	0.10 U	0.11 U	0.10 U	0.95 U	0.10 U	0.11 U	0.10 U	0.97 U	0.10 U	0.10 U	0.037
2,4,5-Trichlorophenol	EPA 8270	µg/L	0.2	0.94 U	0.10 U	0.11 U	0.10 U	0.95 U	0.10 U	0.11 UJ	0.10 U	0.97 U	0.10 U	0.10 U	600
2,4,6-Trichlorophenol	EPA 8270	µg/L	0.11	0.94 U	0.10 U	0.11 U	0.10 U	0.95 U	0.10 U	0.11 UJ	0.10 U	0.97 U	0.10 U	0.10 U	0.28
Volatile Organic Compounds (VOCs)															
Acetone	EPA 8260	µg/L	25 U	--	5.0 U	5.0 U	8	--	5.0 U	5.0 U	5.0 U	--	--	--	NE
Benzene	EPA 8260	µg/L	1.0 U	--	0.20 U	0.20 U	0.20 U	--	0.20 U	0.20 U	0.20 U	--	--	--	1.6
Bromobenzene	EPA 8260	µg/L	1.0 U	--	0.20 U	0.20 U	0.20 U	--	0.20 U	0.20 U	0.20 U	--	--	--	NE
Bromochloromethane	EPA 8260	µg/L	1.0 U	--	0.20 U	0.20 U	0.20 U	--	0.20 U	0.20 U	0.20 U	--	--	--	NE
Bromoform (Tribromomethane)	EPA 8260	µg/L	5.0 U	--	1.0 U	1.0 U	1.0 U	--	1.0 U	1.0 U	1.0 U	--	--	--	12
Bromomethane	EPA 8260	µg/L	1.0 U	--	0.20 U	0.20 U	0.20 U	--	0.20 U	0.20 U	0.20 U	--	--	--	13
n-Butylbenzene	EPA 8260	µg/L	1.0 U	--	0.20 U	0.20 U	0.20 U	--	0.20 U	0.20 U	0.20 U	--	--	--	400
sec-Butylbenzene	EPA 8260	µg/L	1.0 U	--	0.20 U	0.20 U	0.20 U	--	0.20 U	0.20 U	0.20 U	--	--	--	800
tert-Butylbenzene	EPA 8260	µg/L	1.0 U	--	0.20 U	0.20 U	0.20 U	--	0.20 U	0.20 U	0.20 U	--	--	--	800
Carbon disulfide	EPA 8260	µg/L	1.0 U	--	0.20 U	0.20 U	0.20 U	--	0.20 U	0.20 U	0.20 U	--	--	--	400
Carbon tetrachloride	EPA 8260	µg/L	1.0 U	--	0.20 U	0.20 U	0.20 U	--	0.20 U	0.20 U	0.20 U	--	--	--	0.35
Chlorobenzene	EPA 8260	µg/L	1.0 U	--	0.20 U	0.20 U	0.20 U	--	0.20 U	0.20 U	0.20 U	--	--	--	200
Chloroethane	EPA 8260	µg/L	5.0 U	--	1.0 U	1.0 U	1.0 U	--	1.0 U	1.0 U	1.0 U	--	--	--	19,000
2-Chloroethyl vinyl ether	EPA 8260	µg/L	5.0 U	--	1.0 UJ	3.0 UJ	1.0 U	--	1.0 UJ	3.0 UJ	1.0 U	--	--	--	NE
Chloroform	EPA 8260	µg/L	1.0 U	--	0.20 U	0.20 U	0.20 U	--	0.20 U	0.20 U	0.20 U	--	--	--	1.2
Chloromethane	EPA 8260	µg/L	5.0 U	--	1.0 U	1.0 U	1.0 U	--	1.0 U	1.0 U	1.0 U	--	--	--	150
2-Chlorotoluene	EPA 8260	µg/L	1.0 U	--	0.20 U	0.20 U	0.20 U	--	0.20 U	0.20 U	0.20 U	--	--	--	160
4-Chlorotoluene	EPA 8260	µg/L	1.0 U	--	0.20 U	0.20 U	0.20 U	--	0.20 U	0.20 U	0.20 U	--	--	--	NE

Table D-2
Remedial Investigation Chemical Analytical Results - Groundwater COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Monitoring Well ¹	Analytical Method	Units	MW-18	MW-19	MW-19	MW-19	MW-19	MW-19D	MW-19D	MW-19D	MW-19D	MW-20	MW-20	MW-20	Groundwater Preliminary Cleanup Level ³ (PCUL)
Sample Date			04/20/15	06/09/14	09/22/14	01/20/15	04/22/15	06/09/14	09/22/14	01/20/15	04/22/15	06/10/14	09/22/14	01/19/15	
Monitoring Event			Apr-15 (Dup)	Jun-14	Sep-14	Jan-15	Apr-15	Jun-14	Sep-14	Jan-15	Apr-15	Jun-14	Sep-14	Jan-15	
Sampled By			GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	
Dibromochloromethane	EPA 8260	µg/L	1.0 U	--	0.20 U	0.20 U	0.20 U	--	0.20 U	0.20 U	0.20 U	--	--	--	2.2
1,2-Dibromo-3-chloropropane	EPA 8260	µg/L	5.0 U	--	1.0 U	1.0 U	1.0 U	--	1.0 U	1.0 U	1.0 U	--	--	--	0.2
Dibromomethane	EPA 8260	µg/L	1.0 U	--	0.20 U	0.20 U	0.20 U	--	0.20 U	0.20 U	0.20 U	--	--	--	80
Bromodichloromethane	EPA 8260	µg/L	1.0 U	--	0.20 U	0.20 U	0.20 U	--	0.20 U	0.20 U	0.20 U	--	--	--	1.8
Dichlorodifluoromethane (CFC-12)	EPA 8260	µg/L	1.0 U	--	0.20 U	0.20 U	0.20 U	--	0.20 U	0.20 U	0.20 U	--	--	--	5.6
1,1-Dichloroethane	EPA 8260	µg/L	1.0 U	--	0.20 U	0.20 U	0.20 U	--	0.20 U	0.20 U	0.20 U	--	--	--	11
1,2-Dichloroethane	EPA 8260	µg/L	1.0 U	--	0.20 U	0.20 U	0.20 U	--	0.20 U	0.20 U	0.20 U	--	--	--	4.2
1,1-Dichloroethene	EPA 8260	µg/L	1.0 U	--	0.20 U	0.20 U	0.20 U	--	0.20 U	0.20 U	0.20 U	--	--	--	130
cis-1,2-Dichloroethene	EPA 8260	µg/L	1.0 U	--	0.20 U	0.20 U	0.20 U	--	0.20 U	0.20 U	0.20 U	--	--	--	16
trans-1,2-Dichloroethene	EPA 8260	µg/L	1.0 U	--	0.20 U	0.20 U	0.20 U	--	0.20 U	0.20 U	0.20 U	--	--	--	1,000
1,2-Dichloropropane	EPA 8260	µg/L	1.0 U	--	0.20 U	0.20 U	0.20 U	--	0.20 U	0.20 U	0.20 U	--	--	--	3.1
1,3-Dichloropropane	EPA 8260	µg/L	1.0 U	--	0.20 U	0.20 U	0.20 U	--	0.20 U	0.20 U	0.20 U	--	--	--	NE
2,2-Dichloropropane	EPA 8260	µg/L	1.0 U	--	0.20 U	0.20 U	0.20 U	--	0.20 U	0.20 U	0.20 U	--	--	--	NE
1,1-Dichloropropene	EPA 8260	µg/L	1.0 U	--	0.20 U	0.20 U	0.20 U	--	0.20 U	0.20 U	0.20 U	--	--	--	NE
cis-1,3-Dichloropropene	EPA 8260	µg/L	1.0 U	--	0.20 U	0.20 U	0.20 U	--	0.20 U	0.20 U	0.20 U	--	--	--	2
trans-1,3-Dichloropropene	EPA 8260	µg/L	1.0 U	--	0.20 U	0.20 U	0.20 U	--	0.20 U	0.20 U	0.20 U	--	--	--	2
Ethylbenzene	EPA 8260	µg/L	1.0 U	--	0.20 U	0.20 U	0.20 U	--	0.20 U	0.20 U	0.20 U	--	--	--	31
1,2-Dibromoethane (EDB)	EPA 8260	µg/L	1.0 U	--	0.20 U	0.20 U	0.20 U	--	0.20 U	0.20 U	0.20 U	--	--	--	0.27
2-Hexanone	EPA 8260	µg/L	10 U	--	2.0 U	2.0 U	2.0 U	--	2.0 U	2.0 U	2.0 U	--	--	--	40
Isopropylbenzene (Cumene)	EPA 8260	µg/L	1.0 U	--	0.20 U	0.20 U	0.20 U	--	0.20 U	0.20 U	0.20 U	--	--	--	800
p-Isopropyltoluene	EPA 8260	µg/L	1.0 U	--	0.20 U	0.20 U	0.20 U	--	0.20 U	0.20 U	0.20 U	--	--	--	NE
2-Butanone (MEK)	EPA 8260	µg/L	25 U	--	5.0 U	5.0 U	5.0 U	--	5.0 U	5.0 U	5.0 U	--	--	--	1,700,000
Methyl iodide (Iodomethane)	EPA 8260	µg/L	5.0 U	--	1.0 U	1.0 U	1.0 U	--	1.0 U	1.0 U	1.0 U	--	--	--	NE
4-Methyl-2-pentanone (Methyl isobutyl ketone)	EPA 8260	µg/L	10 U	--	2.0 U	2.0 U	2.0 U	--	2.0 U	2.0 U	2.0 U	--	--	--	470,000
Methyl t-butyl ether (MTBE)	EPA 8260	µg/L	1.0 U	--	0.20 U	0.20 U	0.20 U	--	0.20 U	0.20 U	0.20 U	--	--	--	600
Methylene chloride	EPA 8260	µg/L	5.0 U	--	1.0 U	1.0 U	1.0 U	--	1.0 U	1.0 U	1.0 U	--	--	--	100
n-Propylbenzene	EPA 8260	µg/L	1.0 U	--	0.20 U	0.20 U	0.20 U	--	0.20 U	0.20 U	0.20 U	--	--	--	800
Styrene	EPA 8260	µg/L	1.0 U	--	0.20 U	0.20 U	0.20 U	--	0.20 U	0.20 U	0.20 U	--	--	--	8,200
1,1,1,2-Tetrachloroethane	EPA 8260	µg/L	1.0 U	--	0.20 U	0.20 U	0.20 U	--	0.20 U	0.20 U	0.20 U	--	--	--	7.4
1,1,2,2-Tetrachloroethane	EPA 8260	µg/L	1.0 U	--	0.20 U	0.20 U	0.20 U	--	0.20 U	0.20 U	0.20 U	--	--	--	0.3
Tetrachloroethene	EPA 8260	µg/L	1.0 U	--	0.20 U	0.20 U	0.20 U	--	0.20 U	0.20 U	0.20 U	--	--	--	2.9
Toluene	EPA 8260	µg/L	5.0 U	--	1.0 U	1.0 U	1.0 U	--	1.0 U	1.0 U	1.0 U	--	--	--	130
1,2,3-Trichlorobenzene	EPA 8260	µg/L	1.0 U	--	0.20 U	0.20 U	0.20 U	--	0.20 U	0.20 U	0.20 U	--	--	--	NE
1,1,1-Trichloroethane	EPA 8260	µg/L	1.0 U	--	0.20 U	0.20 U	0.20 U	--	0.20 U	0.20 U	0.20 U	--	--	--	5,500
1,1,2-Trichloroethane	EPA 8260	µg/L	1.0 U	--	0.20 U	0.20 U	0.20 U	--	0.20 U	0.20 U	0.20 U	--	--	--	0.9
Trichloroethene	EPA 8260	µg/L	1.0 U	--	0.20 U	0.20 U	0.20 U	--	0.20 U	0.20 U	0.20 U	--	--	--	0.7
Trichlorofluoromethane (CFC-11)	EPA 8260	µg/L	1.0 U	--	0.20 U	0.20 U	0.20 U	--	0.20 U	0.20 U	0.20 U	--	--	--	120
1,2,3-Trichloropropane	EPA 8260	µg/L	1.0 U	--	0.20 U	0.20 U	0.20 U	--	0.20 U	0.20 U	0.20 U	--	--	--	1,500
1,2,4-Trimethylbenzene	EPA 8260	µg/L	1.0 U	--	0.20 U	0.20 U	0.20 U	--	0.20 U	0.20 U	0.20 U	--	--	--	240
1,3,5-Trimethylbenzene	EPA 8260	µg/L	1.0 U	--	0.20 U	0.20 U	0.20 U	--	0.20 U	0.20 U	0.20 U	--	--	--	80
Vinyl acetate	EPA 8260	µg/L	5.0 U	--	1.0 U	1.0 U	1.0 U	--	1.0 U	1.0 U	1.0 U	--	--	--	7,800

Table D-2
Remedial Investigation Chemical Analytical Results - Groundwater COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Monitoring Well ¹	Analytical Method	Units	MW-18	MW-19	MW-19	MW-19	MW-19	MW-19D	MW-19D	MW-19D	MW-19D	MW-20	MW-20	MW-20	Groundwater Preliminary Cleanup Level ³ (PCUL)
Sample Date			04/20/15	06/09/14	09/22/14	01/20/15	04/22/15	06/09/14	09/22/14	01/20/15	04/22/15	06/10/14	09/22/14	01/19/15	
Monitoring Event			Apr-15 (Dup)	Jun-14	Sep-14	Jan-15	Apr-15	Jun-14	Sep-14	Jan-15	Apr-15	Jun-14	Sep-14	Jan-15	
Sampled By			GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	GEI	
Vinyl chloride	EPA 8260	µg/L	1.0 U	--	0.20 U	0.20 U	0.20 U	--	0.20 U	0.20 U	0.20 U	--	--	--	0.18
Xylene, m-,p-	EPA 8260	µg/L	2.0 U	--	0.40 U	0.40 U	0.40 U	--	0.40 U	0.40 U	0.40 U	--	--	--	290
Xylene, o-	EPA 8260	µg/L	1.0 U	--	0.20 U	0.20 U	0.20 U	--	0.20 U	0.20 U	0.20 U	--	--	--	430
Petroleum Hydrocarbons															
Gasoline-range hydrocarbons	NWTPH-G	µg/L	100 U	100 U	100 U	100 U	100 U	--	--	--	--	100 U	100 U	100 U	800
Diesel-range hydrocarbons	NWTPH-Dx	µg/L	11,000	370	620	250 U	400	--	210 U	270	250 U	380	250	320	500
Oil-range hydrocarbons	NWTPH-Dx	µg/L	14,000	670	960	420	670	--	410	400	440	800	410	570	500
Total diesel- and oil-range hydrocarbons	NWTPH-Dx	µg/L	25,000	1,040	1,580	420	1,070	--	410	670	440	1,180	660	890	500
Diesel-range hydrocarbons	NWTPH-Dx Si/Gel	µg/L	--	--	--	--	--	--	--	--	--	--	250 U	250 U	500
Oil-range hydrocarbons	NWTPH-Dx Si/Gel	µg/L	--	--	--	--	--	--	--	--	--	--	400 U	400 U	500
Total diesel- and oil-range hydrocarbons	NWTPH-Dx Si/Gel	µg/L	--	--	--	--	--	--	--	--	--	--	400 U	400 U	500
Conventional Parameters															
Total organic carbon (TOC)	SM 5310B	mg/L	870	--	--	--	--	--	--	--	--	--	5.3	7.3	NE
Field Measured Parameters															
pH	N/A	N/A	8.91	7.09	6.67	6.18	6.85	6.97	6.67	6.51	6.70	6.52	6.73	5.97	NE

Notes:

¹ Monitoring well locations are shown on Figures 3-2 and 3-4.

² Insufficient water to collect groundwater sample for chemical analysis.

³ Groundwater screening levels referenced from Table 4-2.

⁴ Total dioxin/furan Toxic Equivalency Quotients (TEQs) were calculated using United States Environmental Protection Agency (USEPA) Toxicity Equivalency Factor (TEF) values for human health (EPA 2003).

⁵ Total carcinogenic PAH (cPAH) TEQs were calculated using TEF values referenced from MTCA Table 708.2 (WAC 173-340-900).

mg/L = milligram per liter

µg/L = microgram per liter

NE = not established

Landau = Landau Associates

GEI = GeoEngineers

NE = not established

J = estimated result

U = analyte not detected above the reporting limit

-- = not analyzed

COPC = Contaminant of Potential Concern

Bold indicates analyte was detected.

Yellow shading identifies the detected results greater than the preliminary cleanup level.

Blue shading identifies the non-detected result greater than the preliminary cleanup level.

Table D-2
Remedial Investigation Chemical Analytical Results - Groundwater COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Monitoring Well ¹	Analytical Method	Units	MW-20	MW-20	GMW-3S	GMW-3S	GMW-3S	GMW-3S	GMW-3S	GMW-3S	GMW-3D	GMW-3D	GMW-3D	GMW-3D	Groundwater Preliminary Cleanup Level ³ (PCUL)
Sample Date			04/21/15	03/17/17	03/23/09	04/28/10	10/28/10	04/27/11	12/01/11	04/27/12	03/23/09	04/28/10	10/28/10	04/27/11	
Monitoring Event			Apr-15	Mar-17	Mar-09	Apr-10	Oct-10	Apr-11	Dec-11	Apr-12	Mar-09	Apr-10	Oct-10	Apr-11	
Sampled By			GEI	Ecology	ERM	ERM	ERM	ERM	ERM	ERM	ERM	ERM	ERM	ERM	
Polychlorinated Biphenyls (PCBs)															
PCB-Aroclor 1016	EPA 8082	µg/L	--	n/a	--	--	--	--	--	--	--	--	--	--	NE
PCB-Aroclor 1221	EPA 8082	µg/L	--	n/a	--	--	--	--	--	--	--	--	--	--	NE
PCB-Aroclor 1232	EPA 8082	µg/L	--	n/a	--	--	--	--	--	--	--	--	--	--	NE
PCB-Aroclor 1242	EPA 8082	µg/L	--	n/a	--	--	--	--	--	--	--	--	--	--	NE
PCB-Aroclor 1248	EPA 8082	µg/L	--	n/a	--	--	--	--	--	--	--	--	--	--	NE
PCB-Aroclor 1254	EPA 8082	µg/L	--	n/a	--	--	--	--	--	--	--	--	--	--	NE
PCB-Aroclor 1260	EPA 8082	µg/L	--	n/a	--	--	--	--	--	--	--	--	--	--	NE
Total PCB Aroclors	EPA 8082	µg/L	--	0.010 U	--	--	--	--	--	--	--	--	--	--	0.000007
Total PCB Congeners	EPA 1668	µg/L	--	0.0046 J	--	--	--	--	--	--	--	--	--	--	0.000007
Dioxins and Furans															
1,2,3,4,6,7,8-HpCDD	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,4,6,7,8-HpCDF	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,4,7,8,9-HpCDF	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,4,7,8-HxCDD	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,4,7,8-HxCDF	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,6,7,8-HxCDD	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,6,7,8-HxCDF	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,7,8,9-HxCDD	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,7,8,9-HxCDF	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,7,8-PeCDD	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,7,8-PeCDF	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
2,3,4,6,7,8-HxCDF	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
2,3,4,7,8-PeCDF	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
2,3,7,8-TCDD	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
2,3,7,8-TCDF	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
OCDD	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
OCDF	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
Total Dioxin/Furan TEQ ⁴ (ND=0)	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	0.0000000051
Total Dioxin/Furan TEQ ⁴ (ND=0.5RL)	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	0.0000000051
Total Metals															
Antimony	EPA 200.8/7470	µg/L	5.4 U	--	--	--	--	0.2 U	50.0 U	0.2 U	--	--	--	--	90
Arsenic	EPA 200.8/7470	µg/L	4.4	--	604	445	546	480	414	387	55	31.1	34.8	35.6	8.0
Barium	EPA 200.8/7470	µg/L	21	--	--	--	--	--	--	--	--	--	--	--	200
Beryllium	EPA 200.8/7470	µg/L	10 U	--	--	--	--	0.2 U	0.20 U	0.2 U	--	--	--	--	4.4
Cadmium	EPA 200.8/7470	µg/L	0.20 U	--	--	--	--	0.1 U	0.10 U	0.1	--	--	--	--	1.2
Chromium III / Total	EPA 200.8/7470	µg/L	2.0 U	--	0.5 U	0.64	0.77	0.5 U	1.00 U	0.5 U	3.7	3.7	4.4	3.1	27
Chromium VI	EPA 200.8/7470	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	50
Copper	EPA 200.8/7470	µg/L	190	--	0.584 J	2	4.7	2	2	0.9	0.59 J	0.20 U	0.25 J	0.7	3.1
Lead	EPA 200.8/7470	µg/L	1.0 U	--	--	--	--	0.1 U	0.10 U	0.1 U	--	--	--	--	8.1
Mercury	EPA 200.8/7470	µg/L	0.50 U	--	--	--	--	0.10 U	0.10 U	0.10 U	--	--	--	--	0.025
Nickel	EPA 200.8/7470	µg/L	33	--	--	--	--	0.8	1	0.5 J	--	--	--	--	8.2

Table D-2
Remedial Investigation Chemical Analytical Results - Groundwater COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Monitoring Well ¹	Analytical Method	Units	MW-20	MW-20	GMW-3S	GMW-3S	GMW-3S	GMW-3S	GMW-3S	GMW-3S	GMW-3D	GMW-3D	GMW-3D	GMW-3D	Groundwater Preliminary Cleanup Level ³ (PCUL)
Sample Date			04/21/15	03/17/17	03/23/09	04/28/10	10/28/10	04/27/11	12/01/11	04/27/12	03/23/09	04/28/10	10/28/10	04/27/11	
Monitoring Event			Apr-15	Mar-17	Mar-09	Apr-10	Oct-10	Apr-11	Dec-11	Apr-12	Mar-09	Apr-10	Oct-10	Apr-11	
Sampled By			GEI	Ecology	ERM	ERM	ERM	ERM	ERM	ERM	ERM	ERM	ERM	ERM	
Selenium	EPA 200.8/7470	µg/L	6.0 U	--	--	--	--	0.5 U	0.50 U	2.0 U	--	--	--	--	71
Silver	EPA 200.8/7470	µg/L	1.0 U	--	0.085 U	0.071 UJ	0.071 UJ	0.2 U	3.0 U	0.2 U	0.085 U	0.071 UJ	0.071 UJ	0.2 U	1.9
Thallium	EPA 200.8/7470	µg/L	2.0 U	--	--	--	--	0.2 U	0.20 U	0.2 U	--	--	--	--	0.062
Tin	EPA 200.8/7470	µg/L	5.0 U	--	--	--	--	--	--	--	--	--	--	--	9,600
Zinc	EPA 200.8/7470	µg/L	56 U	--	10 UJ	5.00 U	1.30 U	4.0 U	10.0 U	4.0 U	9.40 J	5.00 U	1.30 U	4.0 U	81
Dissolved Metals															
Antimony	EPA 200.8/7470	µg/L	5.5 U	--	--	--	--	0.2 U	50.0 U	0.2 U	--	--	--	--	90
Arsenic	EPA 200.8/7470	µg/L	3.5	--	601	442	574	460	412	383	54.2	31.1	35.6	39.4	8.0
Barium	EPA 200.8/7470	µg/L	20	--	--	--	--	--	--	--	--	--	--	--	200
Beryllium	EPA 200.8/7470	µg/L	10 U	--	--	--	--	0.2 U	0.20 U	0.2 U	--	--	--	--	4.4
Cadmium	EPA 200.8/7470	µg/L	0.20 U	--	--	--	--	0.1 U	0.10 U	0.1 U	--	--	--	--	1.2
Chromium III / Total	EPA 200.8/7470	µg/L	2.0 U	--	0.37 J	0.62	0.83	0.5 U	1.00 U	0.5 U	3.5	3.3	4.1	3.4	27
Copper	EPA 200.8/7470	µg/L	2.0 U	--	2 UJ	0.20 U	1.1	0.5 U	2.0 U	0.9	0.48 J	0.20 U	0.20 U	0.5 U	3.1
Lead	EPA 200.8/7470	µg/L	1.0 U	--	--	--	--	0.1 U	0.10 U	0.1 U	--	--	--	--	8.1
Mercury	EPA 200.8/7470	µg/L	0.50 U	--	--	--	--	0.10 U	0.10 U	0.10 U	--	--	--	--	0.025
Nickel	EPA 200.8/7470	µg/L	2.3	--	--	--	--	0.8	0.9	0.6	--	--	--	--	8.2
Selenium	EPA 200.8/7470	µg/L	6.0 U	--	--	--	--	0.5 U	0.50 U	2.0 U	--	--	--	--	71
Silver	EPA 200.8/7470	µg/L	1.0 U	--	1 U	0.071 U	0.071 UJ	0.2 U	3.0 UJ	0.2 U	0.028 U	0.071 U	0.071 UJ	0.2 U	1.9
Thallium	EPA 200.8/7470	µg/L	2.0 U	--	--	--	--	0.2 U	0.20 U	0.2 U	--	--	--	--	0.062
Tin	EPA 200.8/7470	µg/L	5.0 U	--	--	--	--	--	--	--	--	--	--	--	9,600
Zinc	EPA 200.8/7470	µg/L	56 U	--	10 UJ	3.10 J	1.30 U	4.0 U	10.0 U	4.0 U	3.10 J	5.00 U	1.30 U	4.0 U	81
Semi-Volatile Organic Compounds (SVOCs) - Polycyclic Aromatic Hydrocarbons (PAHs)															
Acenaphthene	EPA 8270/SIM	µg/L	0.10 U	--	--	--	--	--	--	--	--	--	--	--	5.3
Acenaphthylene	EPA 8270/SIM	µg/L	0.10 U	--	--	--	--	--	--	--	--	--	--	--	NE
Anthracene	EPA 8270/SIM	µg/L	0.10 U	--	--	--	--	--	--	--	--	--	--	--	2.1
Benzo(a)anthracene	EPA 8270/SIM	µg/L	0.010 U	--	--	--	--	--	--	--	--	--	--	--	0.00016
Benzo(b)fluoranthene	EPA 8270/SIM	µg/L	0.010 U	--	--	--	--	--	--	--	--	--	--	--	0.00016
Benzo(j,k)fluoranthene	EPA 8270/SIM	µg/L	0.010 U	--	--	--	--	--	--	--	--	--	--	--	0.0016
Benzo(g,h,i)perylene	EPA 8270/SIM	µg/L	0.010 U	--	--	--	--	--	--	--	--	--	--	--	NE
Benzo(a)pyrene	EPA 8270/SIM	µg/L	0.010 U	--	--	--	--	--	--	--	--	--	--	--	0.000016
Chrysene	EPA 8270/SIM	µg/L	0.010 U	--	--	--	--	--	--	--	--	--	--	--	0.016
Dibenzo(a,h)anthracene	EPA 8270/SIM	µg/L	0.010 U	--	--	--	--	--	--	--	--	--	--	--	0.000016
Dibenzofuran	EPA 8270/SIM	µg/L	0.10 U	--	--	--	--	--	--	--	--	--	--	--	16
Fluoranthene	EPA 8270/SIM	µg/L	0.10 U	--	--	--	--	--	--	--	--	--	--	--	1.8
Fluorene	EPA 8270/SIM	µg/L	0.10 U	--	--	--	--	--	--	--	--	--	--	--	3.7
Indeno(1,2,3-c,d)pyrene	EPA 8270/SIM	µg/L	0.010 U	--	--	--	--	--	--	--	--	--	--	--	0.00016
1-Methylnaphthalene	EPA 8270/SIM	µg/L	0.10 U	--	--	--	--	--	--	--	--	--	--	--	1.5
2-Methylnaphthalene	EPA 8270/SIM	µg/L	0.10 U	--	--	--	--	--	--	--	--	--	--	--	32
Naphthalene	EPA 8270/SIM	µg/L	0.10 U	--	--	--	--	--	--	--	--	--	--	--	1.4
Phenanthrene	EPA 8270/SIM	µg/L	0.10 U	--	--	--	--	--	--	--	--	--	--	--	NE
Pyrene	EPA 8270/SIM	µg/L	0.10 U	--	--	--	--	--	--	--	--	--	--	--	2
Total cPAH TEQ ⁵ (ND=0)	EPA 8270/SIM	µg/L	0 U	--	--	--	--	--	--	--	--	--	--	--	0.000016
Total cPAH TEQ ⁵ (ND=0.5RL)	EPA 8270/SIM	µg/L	0.0076 U	--	--	--	--	--	--	--	--	--	--	--	0.000016

Table D-2
Remedial Investigation Chemical Analytical Results - Groundwater COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Monitoring Well ¹	Analytical Method	Units	MW-20	MW-20	GMW-3S	GMW-3S	GMW-3S	GMW-3S	GMW-3S	GMW-3S	GMW-3D	GMW-3D	GMW-3D	GMW-3D	Groundwater Preliminary Cleanup Level ³ (PCUL)
Sample Date			04/21/15	03/17/17	03/23/09	04/28/10	10/28/10	04/27/11	12/01/11	04/27/12	03/23/09	04/28/10	10/28/10	04/27/11	
Monitoring Event			Apr-15	Mar-17	Mar-09	Apr-10	Oct-10	Apr-11	Dec-11	Apr-12	Mar-09	Apr-10	Oct-10	Apr-11	
Sampled By			GEI	Ecology	ERM	ERM	ERM	ERM	ERM	ERM	ERM	ERM	ERM	ERM	
Other SVOCs (mg/kg)															
Aniline	EPA 8270	µg/L	0.10 U	--	--	--	--	--	--	--	--	--	--	--	7.7
Benzidine	EPA 8270	µg/L	0.10 U	--	--	--	--	--	--	--	--	--	--	--	0.000023
Benzoic acid	EPA 8270	µg/L	0.50 U	--	--	--	--	--	--	--	--	--	--	--	590
Benzyl alcohol	EPA 8270	µg/L	0.10 U	--	--	--	--	--	--	--	--	--	--	--	800
Bis(2-chloroethoxy)methane	EPA 8270	µg/L	0.10 U	--	--	--	--	--	--	--	--	--	--	--	NE
Bis(2-chloroethyl)ether	EPA 8270	µg/L	0.10 U	--	--	--	--	--	--	--	--	--	--	--	0.06
Bis(2-chloroisopropyl)ether	EPA 8270	µg/L	0.10 U	--	--	--	--	--	--	--	--	--	--	--	900
Bis(2-ethylhexyl)phthalate	EPA 8270	µg/L	0.70 U	--	--	--	--	--	--	--	--	--	--	--	0.046
4-Bromophenyl phenyl ether	EPA 8270	µg/L	0.10 U	--	--	--	--	--	--	--	--	--	--	--	NE
Butyl benzyl phthalate	EPA 8270	µg/L	0.10 U	--	--	--	--	--	--	--	--	--	--	--	0.013
Carbazole	EPA 8270	µg/L	0.10 U	--	--	--	--	--	--	--	--	--	--	--	NE
4-Chloroaniline	EPA 8270	µg/L	0.10 U	--	--	--	--	--	--	--	--	--	--	--	2,300
4-Chloro-3-methylphenol	EPA 8270	µg/L	0.10 U	--	--	--	--	--	--	--	--	--	--	--	36
2-Chloronaphthalene	EPA 8270	µg/L	0.10 U	--	--	--	--	--	--	--	--	--	--	--	100
2-Chlorophenol	EPA 8270	µg/L	0.10 U	--	0.57 U	0.36 U	0.36 U	0.50 U	0.50 U	0.50 U	0.57 U	0.37 U	0.37 UJ	0.50 UJ	17
4-Chlorophenyl phenyl ether	EPA 8270	µg/L	0.10 U	--	--	--	--	--	--	--	--	--	--	--	NE
Decane	EPA 8270	µg/L	2.0 U	--	--	--	--	--	--	--	--	--	--	--	NE
Dibutyl phthalate	EPA 8270	µg/L	1.9 U	--	--	--	--	--	--	--	--	--	--	--	8
2,3-Dichloroaniline	EPA 8270	µg/L	0.10 U	--	--	--	--	--	--	--	--	--	--	--	NE
1,2-Dichlorobenzene (o-Dichlorobenzene)	EPA 8260	µg/L	0.10 U	--	--	--	--	--	--	--	--	--	--	--	4.6
	EPA 8270	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	4.6
1,3-Dichlorobenzene (m-Dichlorobenzene)	EPA 8260	µg/L	0.10 U	--	--	--	--	--	--	--	--	--	--	--	2.0
	EPA 8270	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	2.0
1,4-Dichlorobenzene (p-Dichlorobenzene)	EPA 8260	µg/L	0.10 U	--	--	--	--	--	--	--	--	--	--	--	4.9
	EPA 8270	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	4.9
3,3'-Dichlorobenzidine	EPA 8270	µg/L	0.10 U	--	--	--	--	--	--	--	--	--	--	--	0.0033
2,4-Dichlorophenol	EPA 8270	µg/L	0.10 U	--	0.29 U	0.38 U	0.38 U	2.6 UJ	2.6 U	2.6 U	0.29 U	0.39 U	0.38 UJ	2.6 UJ	10
Bis(2-ethylhexyl)ester	EPA 8270	µg/L	0.10 U	--	--	--	--	--	--	--	--	--	--	--	400
Diethyl phthalate	EPA 8270	µg/L	0.10 U	--	--	--	--	--	--	--	--	--	--	--	93
Dimethyl phthalate	EPA 8270	µg/L	0.10 U	--	--	--	--	--	--	--	--	--	--	--	600
2,4-Dimethylphenol	EPA 8270	µg/L	0.10 U	--	--	--	--	--	--	--	--	--	--	--	6.30
1,2-Dinitrobenzene	EPA 8270	µg/L	0.10 U	--	--	--	--	--	--	--	--	--	--	--	1.6
1,3-Dinitrobenzene	EPA 8270	µg/L	0.10 U	--	--	--	--	--	--	--	--	--	--	--	1.6
1,4-Dinitrobenzene	EPA 8270	µg/L	0.10 U	--	--	--	--	--	--	--	--	--	--	--	1.6
4,6-Dinitro-2-methylphenol	EPA 8270	µg/L	0.50 U	--	--	--	--	--	--	--	--	--	--	--	NE
2,4-Dinitrophenol	EPA 8270	µg/L	1.0 U	--	--	--	--	--	--	--	--	--	--	--	100
2,4-Dinitrotoluene	EPA 8270	µg/L	0.10 U	--	--	--	--	--	--	--	--	--	--	--	0.18
2,6-Dinitrotoluene	EPA 8270	µg/L	0.10 U	--	--	--	--	--	--	--	--	--	--	--	300
Di-n-octyl phthalate	EPA 8270	µg/L	0.10 U	--	--	--	--	--	--	--	--	--	--	--	0.0039
1,2-Diphenylhydrazine	EPA 8270	µg/L	0.10 U	--	--	--	--	--	--	--	--	--	--	--	0.02
Hexachlorobenzene	EPA 8270	µg/L	0.10 U	--	--	--	--	--	--	--	--	--	--	--	0.000005
Hexachlorobutadiene	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	0.01
	EPA 8270	µg/L	0.10 U	--	--	--	--	--	--	--	--	--	--	--	0.01

Table D-2
Remedial Investigation Chemical Analytical Results - Groundwater COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Monitoring Well ¹	Analytical Method	Units	MW-20	MW-20	GMW-3S	GMW-3S	GMW-3S	GMW-3S	GMW-3S	GMW-3S	GMW-3D	GMW-3D	GMW-3D	GMW-3D	Groundwater Preliminary Cleanup Level ³ (PCUL)
Sample Date			04/21/15	03/17/17	03/23/09	04/28/10	10/28/10	04/27/11	12/01/11	04/27/12	03/23/09	04/28/10	10/28/10	04/27/11	
Monitoring Event			Apr-15	Mar-17	Mar-09	Apr-10	Oct-10	Apr-11	Dec-11	Apr-12	Mar-09	Apr-10	Oct-10	Apr-11	
Sampled By			GEI	Ecology	ERM	ERM	ERM	ERM	ERM	ERM	ERM	ERM	ERM	ERM	
Hexachlorocyclopentadiene	EPA 8270	µg/L	0.10 U	--	--	--	--	--	--	--	--	--	--	--	1.00
Hexachloroethane	EPA 8270	µg/L	0.10 U	--	--	--	--	--	--	--	--	--	--	--	0.02
Isophorone	EPA 8270	µg/L	0.10 U	--	--	--	--	--	--	--	--	--	--	--	110
2-Methylphenol (o-Cresol)	EPA 8270	µg/L	0.10 U	--	--	--	--	--	--	--	--	--	--	--	27
3 & 4 Methylphenol (m & p-Cresol)	EPA 8270	µg/L	0.10 U		--	--	--	--	--	--	--	--	--	--	400
2-Nitroaniline	EPA 8270	µg/L	0.10 U	--	--	--	--	--	--	--	--	--	--	--	160
3-Nitroaniline	EPA 8270	µg/L	0.10 U	--	--	--	--	--	--	--	--	--	--	--	NE
4-Nitroaniline	EPA 8270	µg/L	0.10 U	--	--	--	--	--	--	--	--	--	--	--	NE
Nitrobenzene	EPA 8270	µg/L	0.10 U	--	--	--	--	--	--	--	--	--	--	--	100
2-Nitrophenol	EPA 8270	µg/L	0.10 U	--	--	--	--	--	--	--	--	--	--	--	NE
4-Nitrophenol (p-Nitrophenol)	EPA 8270	µg/L	0.10 U	--	--	--	--	--	--	--	--	--	--	--	NE
n-Nitrosodimethylamine	EPA 8270	µg/L	0.10 U	--	--	--	--	--	--	--	--	--	--	--	0.34
n-Nitrosodiphenylamine (as Diphenylamine)	EPA 8270	µg/L	0.10 U	--	--	--	--	--	--	--	--	--	--	--	0.69
n-Nitrosodi-n-propylamine	EPA 8270	µg/L	0.10 U	--	--	--	--	--	--	--	--	--	--	--	0.058
n-Octadecane	EPA 8270	µg/L	0.10 U	--	--	--	--	--	--	--	--	--	--	--	NE
Pentachlorophenol	EPA 8270	µg/L	0.50 U	--	0.68 U	0.44 U	0.44 U	2.4 UJ	2.4 U	0.085 U	0.68 U	0.45 U	0.44 UJ	2.4 UJ	0.002
Phenol	EPA 8270	µg/L	0.10 U	--	0.53 U	0.12 U	0.12 U	0.50 U	0.50 U	0.50 U	0.53 U	0.13 U	0.12 UJ	0.50 UJ	370
Pyridine	EPA 8270	µg/L	0.10 U	--	--	--	--	--	--	--	--	--	--	--	8
2,3,4,6-Tetrachlorophenol	EPA 8270	µg/L	0.10 U	--	--	0.45 U	0.46 U	0.50 U	0.50 U	0.50 U	--	0.47 U	0.46 UJ	0.50 UJ	480
2,3,5,6-Tetrachlorophenol	EPA 8270	µg/L	0.10 U	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,4-Trichlorobenzene	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	0.037
	EPA 8270	µg/L	0.10 U	--	--	--	--	--	--	--	--	--	--	--	0.037
2,4,5-Trichlorophenol	EPA 8270	µg/L	0.10 U	--	0.43 U	0.41 U	0.41 U	2.2 UJ	2.2 U	2.2 U	0.43 U	0.42 U	0.41 UJ	2.2 UJ	600
2,4,6-Trichlorophenol	EPA 8270	µg/L	0.10 U	--	0.3 U	0.19 U	0.19 U	2.4 UJ	2.4 U	2.4 U	0.30 U	0.20 U	0.19 UJ	2.4 UJ	0.28
Volatile Organic Compounds (VOCs)															
Acetone	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
Benzene	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	1.6
Bromobenzene	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
Bromochloromethane	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
Bromoform (Tribromomethane)	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	12
Bromomethane	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	13
n-Butylbenzene	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	400
sec-Butylbenzene	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	800
tert-Butylbenzene	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	800
Carbon disulfide	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	400
Carbon tetrachloride	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	0.35
Chlorobenzene	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	200
Chloroethane	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	19,000
2-Chloroethyl vinyl ether	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
Chloroform	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	1.2
Chloromethane	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	150
2-Chlorotoluene	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	160
4-Chlorotoluene	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE

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Remedial Investigation Chemical Analytical Results - Groundwater COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Monitoring Well ¹	Analytical Method	Units	MW-20	MW-20	GMW-3S	GMW-3S	GMW-3S	GMW-3S	GMW-3S	GMW-3S	GMW-3D	GMW-3D	GMW-3D	GMW-3D	Groundwater Preliminary Cleanup Level ³ (PCUL)
Sample Date			04/21/15	03/17/17	03/23/09	04/28/10	10/28/10	04/27/11	12/01/11	04/27/12	03/23/09	04/28/10	10/28/10	04/27/11	
Monitoring Event			Apr-15	Mar-17	Mar-09	Apr-10	Oct-10	Apr-11	Dec-11	Apr-12	Mar-09	Apr-10	Oct-10	Apr-11	
Sampled By			GEI	Ecology	ERM	ERM	ERM	ERM	ERM	ERM	ERM	ERM	ERM	ERM	
Dibromochloromethane	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	2.2
1,2-Dibromo-3-chloropropane	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	0.2
Dibromomethane	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	80
Bromodichloromethane	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	1.8
Dichlorodifluoromethane (CFC-12)	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	5.6
1,1-Dichloroethane	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	11
1,2-Dichloroethane	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	4.2
1,1-Dichloroethene	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	130
cis-1,2-Dichloroethene	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	16
trans-1,2-Dichloroethene	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	1,000
1,2-Dichloropropane	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	3.1
1,3-Dichloropropane	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
2,2-Dichloropropane	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,1-Dichloropropene	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
cis-1,3-Dichloropropene	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	2
trans-1,3-Dichloropropene	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	2
Ethylbenzene	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	31
1,2-Dibromoethane (EDB)	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	0.27
2-Hexanone	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	40
Isopropylbenzene (Cumene)	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	800
p-Isopropyltoluene	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
2-Butanone (MEK)	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	1,700,000
Methyl iodide (Iodomethane)	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
4-Methyl-2-pentanone (Methyl isobutyl ketone)	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	470,000
Methyl t-butyl ether (MTBE)	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	600
Methylene chloride	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	100
n-Propylbenzene	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	800
Styrene	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	8,200
1,1,1,2-Tetrachloroethane	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	7.4
1,1,1,2,2-Tetrachloroethane	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	0.3
Tetrachloroethene	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	2.9
Toluene	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	130
1,2,3-Trichlorobenzene	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,1,1-Trichloroethane	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	5,500
1,1,2-Trichloroethane	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	0.9
Trichloroethene	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	0.7
Trichlorofluoromethane (CFC-11)	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	120
1,2,3-Trichloropropane	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	1,500
1,2,4-Trimethylbenzene	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	240
1,3,5-Trimethylbenzene	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	80
Vinyl acetate	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	7,800

Table D-2

Remedial Investigation Chemical Analytical Results - Groundwater COPCs

Port of Seattle - North Terminal 115

Seattle, Washington

Monitoring Well ¹	Analytical Method	Units	MW-20	MW-20	GMW-3S	GMW-3S	GMW-3S	GMW-3S	GMW-3S	GMW-3S	GMW-3D	GMW-3D	GMW-3D	GMW-3D	Groundwater Preliminary Cleanup Level ³ (PCUL)
Sample Date			04/21/15	03/17/17	03/23/09	04/28/10	10/28/10	04/27/11	12/01/11	04/27/12	03/23/09	04/28/10	10/28/10	04/27/11	
Monitoring Event			Apr-15	Mar-17	Mar-09	Apr-10	Oct-10	Apr-11	Dec-11	Apr-12	Mar-09	Apr-10	Oct-10	Apr-11	
Sampled By			GEI	Ecology	ERM	ERM	ERM	ERM	ERM	ERM	ERM	ERM	ERM	ERM	
Vinyl chloride	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	0.18
Xylene, m-,p-	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	290
Xylene, o-	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	430
Petroleum Hydrocarbons															
Gasoline-range hydrocarbons	NWTPH-G	µg/L	100 U	--	--	--	--	--	--	--	--	--	--	--	800
Diesel-range hydrocarbons	NWTPH-Dx	µg/L	250 U	--	--	--	--	--	--	--	--	--	--	--	500
Oil-range hydrocarbons	NWTPH-Dx	µg/L	580	--	--	--	--	--	--	--	--	--	--	--	500
Total diesel- and oil-range hydrocarbons	NWTPH-Dx	µg/L	580	--	--	--	--	--	--	--	--	--	--	--	500
Diesel-range hydrocarbons	NWTPH-Dx Si/Gel	µg/L	250 U	--	--	--	--	--	--	--	--	--	--	--	500
Oil-range hydrocarbons	NWTPH-Dx Si/Gel	µg/L	400 U	--	--	--	--	--	--	--	--	--	--	--	500
Total diesel- and oil-range hydrocarbons	NWTPH-Dx Si/Gel	µg/L	400 U	--	--	--	--	--	--	--	--	--	--	--	500
Conventional Parameters															
Total organic carbon (TOC)	SM 5310B	mg/L	4.3	--	--	--	--	--	--	--	--	--	--	--	NE
Field Measured Parameters															
pH	N/A	N/A	6.56	--	8.65	6.16	6.38	6.45	6.26	5.77	8.68	5.95	6.3	6.38	NE

Notes:

- ¹ Monitoring well locations are shown on Figures 3-2 and 3-4.
- ² Insufficient water to collect groundwater sample for chemical analysis.
- ³ Groundwater screening levels referenced from Table 4-2.
- ⁴ Total dioxin/furan Toxic Equivalency Quotients (TEQs) were calculated using United States Environmental Protection Agency (USEPA) Toxicity Equivalency Factor (TEF) values for human health (EPA 2003).
- ⁵ Total carcinogenic PAH (cPAH) TEQs were calculated using TEF values referenced from MTCA Table 708.2 (WAC 173-340-900).

mg/L = milligram per liter

µg/L = microgram per liter

NE = not established

Landau = Landau Associates

GEI = GeoEngineers

NE = not established

J = estimated result

U = analyte not detected above the reporting limit

-- = not analyzed

COPC = Contaminant of Potential Concern

Bold indicates analyte was detected.

Yellow shading identifies the detected results greater than the preliminary cleanup level.

Blue shading identifies the non-detected result greater than the preliminary cleanup level.

Table D-2
Remedial Investigation Chemical Analytical Results - Groundwater COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Monitoring Well ¹	Analytical Method	Units	GMW-3D	GMW-3D	GMW-18	GMW-18	GMW-18	GMW-18	GMW-18	GMW-18	GMW-18	GMW-18	GMW-20	GMW-20	GMW-20	Groundwater Preliminary Cleanup Level ³ (PCUL)
Sample Date			12/01/11	04/27/12	03/26/09	04/29/10	10/27/10	04/27/11	11/30/11	11/30/11	04/26/12	03/26/09	04/28/10	10/25/10		
Monitoring Event			Dec-11	Apr-12	Mar-09	Apr-10	Oct-10	Apr-11	Nov-11	Nov-11 (Dup)	Apr-12	Mar-09	Apr-10	Oct-10		
Sampled By			ERM	ERM	ERM	ERM	ERM	ERM	ERM	ERM	ERM	ERM	ERM	ERM		
Polychlorinated Biphenyls (PCBs)																
PCB-Aroclor 1016	EPA 8082	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	NE
PCB-Aroclor 1221	EPA 8082	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	NE
PCB-Aroclor 1232	EPA 8082	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	NE
PCB-Aroclor 1242	EPA 8082	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	NE
PCB-Aroclor 1248	EPA 8082	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	NE
PCB-Aroclor 1254	EPA 8082	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	NE
PCB-Aroclor 1260	EPA 8082	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	NE
Total PCB Aroclors	EPA 8082	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	0.000007
Total PCB Congeners	EPA 1668	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	0.000007
Dioxins and Furans																
1,2,3,4,6,7,8-HpCDD	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,4,6,7,8-HpCDF	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,4,7,8,9-HpCDF	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,4,7,8-HxCDD	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,4,7,8-HxCDF	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,6,7,8-HxCDD	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,6,7,8-HxCDF	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,7,8,9-HxCDD	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,7,8,9-HxCDF	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,7,8-PeCDD	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,7,8-PeCDF	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	NE
2,3,4,6,7,8-HxCDF	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	NE
2,3,4,7,8-PeCDF	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	NE
2,3,7,8-TCDD	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	NE
2,3,7,8-TCDF	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	NE
OCDD	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	NE
OCDF	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	NE
Total Dioxin/Furan TEQ ⁴ (ND=0)	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	0.0000000051
Total Dioxin/Furan TEQ4 (ND=0.5RL)	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	0.0000000051
Total Metals																
Antimony	EPA 200.8/7470	µg/L	--	--	--	--	--	0.2 U	50.0 U	50.0 U	0.2	--	--	--	--	90
Arsenic	EPA 200.8/7470	µg/L	34.8	27.7	4.11	10.3	8.4	11.4	3.6	--	6.2	1,490	2,000	1,340	--	8.0
Barium	EPA 200.8/7470	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	200
Beryllium	EPA 200.8/7470	µg/L	--	--	--	--	--	0.2 U	0.20 U	0.20 U	0.2 U	--	--	--	--	4.4
Cadmium	EPA 200.8/7470	µg/L	--	--	--	--	--	0.1 U	0.10 U	0.10 U	0.1 U	--	--	--	--	1.2
Chromium III / Total	EPA 200.8/7470	µg/L	5.0 U	3.9	--	--	--	0.9	0.50 U	0.5	0.6	--	--	--	--	27
Chromium VI	EPA 200.8/7470	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	50
Copper	EPA 200.8/7470	µg/L	2.0 U	0.9	--	--	--	1.7	2.0 U	2.0 U	1.9	--	--	--	--	3.1
Lead	EPA 200.8/7470	µg/L	--	--	--	--	--	0.1 U	0.10 U	0.10 U	0.1 U	--	--	--	--	8.1
Mercury	EPA 200.8/7470	µg/L	--	--	--	--	--	0.10 U	0.10 U	0.10 U	0.10 U	--	--	--	--	0.025
Nickel	EPA 200.8/7470	µg/L	--	--	--	--	--	1.2	0.7	0.7	9.2 J	--	--	--	--	8.2

Table D-2
Remedial Investigation Chemical Analytical Results - Groundwater COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Monitoring Well ¹	Analytical Method	Units	GMW-3D	GMW-3D	GMW-18	GMW-18	GMW-18	GMW-18	GMW-18	GMW-18	GMW-18	GMW-20	GMW-20	GMW-20	Groundwater Preliminary Cleanup Level ³ (PCUL)
Sample Date			12/01/11	04/27/12	03/26/09	04/29/10	10/27/10	04/27/11	11/30/11	11/30/11	04/26/12	03/26/09	04/28/10	10/25/10	
Monitoring Event			Dec-11	Apr-12	Mar-09	Apr-10	Oct-10	Apr-11	Nov-11	Nov-11 (Dup)	Apr-12	Mar-09	Apr-10	Oct-10	
Sampled By			ERM	ERM	ERM	ERM	ERM	ERM	ERM	ERM	ERM	ERM	ERM	ERM	
Selenium	EPA 200.8/7470	µg/L	--	--	--	--	--	0.5 U	0.50 U	0.50 U	0.5 U	--	--	--	71
Silver	EPA 200.8/7470	µg/L	3.0 U	0.2 U	--	--	--	0.2 U	3.0 U	3.0 U	0.2 U	--	--	--	1.9
Thallium	EPA 200.8/7470	µg/L	--	--	--	--	--	0.2 U	0.20 U	0.20 U	0.2 U	--	--	--	0.062
Tin	EPA 200.8/7470	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	9,600
Zinc	EPA 200.8/7470	µg/L	10.0 U	4.0 U	--	--	--	4.0 U	10.0 U	10.0 U	4.0 U	--	--	--	81
Dissolved Metals															
Antimony	EPA 200.8/7470	µg/L	--	--	--	--	--	0.2 U	50.0 U	50.0 U	0.3	--	--	--	90
Arsenic	EPA 200.8/7470	µg/L	35.8	28.1	3.7	9.5	8	13.1	4	--	5.9	1,430	1,760	1,350	8.0
Barium	EPA 200.8/7470	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	200
Beryllium	EPA 200.8/7470	µg/L	--	--	--	--	--	0.2 U	0.20 U	0.20 U	0.2 U	--	--	--	4.4
Cadmium	EPA 200.8/7470	µg/L	--	--	--	--	--	0.1 U	0.10 U	0.10 U	0.1 U	--	--	--	1.2
Chromium III / Total	EPA 200.8/7470	µg/L	4	3.9	--	--	--	0.8	0.50 U	0.50 U	0.5 U	--	--	--	27
Copper	EPA 200.8/7470	µg/L	2.0 U	0.6	--	--	--	1	2.0 U	2.0 U	1.7	--	--	--	3.1
Lead	EPA 200.8/7470	µg/L	--	--	--	--	--	0.1 U	0.10 U	0.10 U	0.1 U	--	--	--	8.1
Mercury	EPA 200.8/7470	µg/L	--	--	--	--	--	0.10 U	0.10 U	0.10 U	0.10 U	--	--	--	0.025
Nickel	EPA 200.8/7470	µg/L	--	--	--	--	--	2.7 J	0.6	0.50 U	0.5 U	--	--	--	8.2
Selenium	EPA 200.8/7470	µg/L	--	--	--	--	--	0.5 U	0.50 U	0.50 U	0.5 U	--	--	--	71
Silver	EPA 200.8/7470	µg/L	3.0 U	0.2 U	--	--	--	0.2 U	3.0 UJ	3.0 U	0.2 U	--	--	--	1.9
Thallium	EPA 200.8/7470	µg/L	--	--	--	--	--	0.2 U	0.20 U	0.20 U	0.2 U	--	--	--	0.062
Tin	EPA 200.8/7470	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	9,600
Zinc	EPA 200.8/7470	µg/L	10.0 U	4.0 U	--	--	--	4.0 U	10.0 U	10.0 U	4.0 U	--	--	--	81
Semi-Volatile Organic Compounds (SVOCs) - Polycyclic Aromatic Hydrocarbons (PAHs)															
Acenaphthene	EPA 8270/SIM	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	5.3
Acenaphthylene	EPA 8270/SIM	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
Anthracene	EPA 8270/SIM	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	2.1
Benzo(a)anthracene	EPA 8270/SIM	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	0.00016
Benzo(b)fluoranthene	EPA 8270/SIM	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	0.00016
Benzo(j,k)fluoranthene	EPA 8270/SIM	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	0.0016
Benzo(g,h,i)perylene	EPA 8270/SIM	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
Benzo(a)pyrene	EPA 8270/SIM	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	0.000016
Chrysene	EPA 8270/SIM	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	0.016
Dibenzo(a,h)anthracene	EPA 8270/SIM	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	0.000016
Dibenzofuran	EPA 8270/SIM	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	16
Fluoranthene	EPA 8270/SIM	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	1.8
Fluorene	EPA 8270/SIM	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	3.7
Indeno(1,2,3-c,d)pyrene	EPA 8270/SIM	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	0.00016
1-Methylnaphthalene	EPA 8270/SIM	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	1.5
2-Methylnaphthalene	EPA 8270/SIM	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	32
Naphthalene	EPA 8270/SIM	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	1.4
Phenanthrene	EPA 8270/SIM	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
Pyrene	EPA 8270/SIM	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	2
Total cPAH TEQ ⁵ (ND=0)	EPA 8270/SIM	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	0.000016
Total cPAH TEQ ⁵ (ND=0.5RL)	EPA 8270/SIM	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	0.000016

Table D-2
Remedial Investigation Chemical Analytical Results - Groundwater COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Monitoring Well ¹	Analytical Method	Units	GMW-3D	GMW-3D	GMW-18	GMW-18	GMW-18	GMW-18	GMW-18	GMW-18	GMW-18	GMW-18	GMW-20	GMW-20	GMW-20	Groundwater Preliminary Cleanup Level ³ (PCUL)
Sample Date			12/01/11	04/27/12	03/26/09	04/29/10	10/27/10	04/27/11	11/30/11	11/30/11	04/26/12	03/26/09	04/28/10	10/25/10		
Monitoring Event			Dec-11	Apr-12	Mar-09	Apr-10	Oct-10	Apr-11	Nov-11	Nov-11 (Dup)	Apr-12	Mar-09	Apr-10	Oct-10		
Sampled By			ERM	ERM	ERM	ERM	ERM	ERM	ERM	ERM	ERM	ERM	ERM	ERM	ERM	
Other SVOCs (mg/kg)																
Aniline	EPA 8270	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	7.7
Benzidine	EPA 8270	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	0.000023
Benzoic acid	EPA 8270	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	590
Benzyl alcohol	EPA 8270	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	800
Bis(2-chloroethoxy)methane	EPA 8270	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	NE
Bis(2-chloroethyl)ether	EPA 8270	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	0.06
Bis(2-chloroisopropyl)ether	EPA 8270	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	900
Bis(2-ethylhexyl)phthalate	EPA 8270	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	0.046
4-Bromophenyl phenyl ether	EPA 8270	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	NE
Butyl benzyl phthalate	EPA 8270	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	0.013
Carbazole	EPA 8270	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	NE
4-Chloroaniline	EPA 8270	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	2,300
4-Chloro-3-methylphenol	EPA 8270	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	36
2-Chloronaphthalene	EPA 8270	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	100
2-Chlorophenol	EPA 8270	µg/L	0.50 U	0.50 U	0.57 U	0.36 U	0.36 U	0.50 U	0.50 U	--	0.50 U	0.57 U	0.36 U	0.41 U	--	17
4-Chlorophenyl phenyl ether	EPA 8270	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	NE
Decane	EPA 8270	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	NE
Dibutyl phthalate	EPA 8270	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	8
2,3-Dichloroaniline	EPA 8270	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2-Dichlorobenzene (o-Dichlorobenzene)	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	4.6
	EPA 8270	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	4.6
1,3-Dichlorobenzene (m-Dichlorobenzene)	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	2.0
	EPA 8270	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	2.0
1,4-Dichlorobenzene (p-Dichlorobenzene)	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	4.9
	EPA 8270	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	4.9
3,3'-Dichlorobenzidine	EPA 8270	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	0.0033
2,4-Dichlorophenol	EPA 8270	µg/L	2.6 U	2.6 U	0.30 U	0.38 U	0.38 U	2.6 UJ	2.6 U	--	2.6 U	0.29 U	0.38 U	0.43 U	--	10
Bis(2-ethylhexyl)ester	EPA 8270	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	400
Diethyl phthalate	EPA 8270	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	93
Dimethyl phthalate	EPA 8270	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	600
2,4-Dimethylphenol	EPA 8270	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	6.30
1,2-Dinitrobenzene	EPA 8270	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	1.6
1,3-Dinitrobenzene	EPA 8270	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	1.6
1,4-Dinitrobenzene	EPA 8270	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	1.6
4,6-Dinitro-2-methylphenol	EPA 8270	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	NE
2,4-Dinitrophenol	EPA 8270	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	100
2,4-Dinitrotoluene	EPA 8270	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	0.18
2,6-Dinitrotoluene	EPA 8270	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	300
Di-n-octyl phthalate	EPA 8270	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	0.0039
1,2-Diphenylhydrazine	EPA 8270	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	0.02
Hexachlorobenzene	EPA 8270	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	0.000005
Hexachlorobutadiene	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	0.01
	EPA 8270	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	0.01

Table D-2
Remedial Investigation Chemical Analytical Results - Groundwater COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Monitoring Well ¹	Analytical Method	Units	GMW-3D	GMW-3D	GMW-18	GMW-18	GMW-18	GMW-18	GMW-18	GMW-18	GMW-18	GMW-20	GMW-20	GMW-20	Groundwater Preliminary Cleanup Level ³ (PCUL)
Sample Date			12/01/11	04/27/12	03/26/09	04/29/10	10/27/10	04/27/11	11/30/11	11/30/11	04/26/12	03/26/09	04/28/10	10/25/10	
Monitoring Event			Dec-11	Apr-12	Mar-09	Apr-10	Oct-10	Apr-11	Nov-11	Nov-11 (Dup)	Apr-12	Mar-09	Apr-10	Oct-10	
Sampled By			ERM	ERM	ERM	ERM	ERM	ERM	ERM	ERM	ERM	ERM	ERM	ERM	
Hexachlorocyclopentadiene	EPA 8270	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	1.00
Hexachloroethane	EPA 8270	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	0.02
Isophorone	EPA 8270	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	110
2-Methylphenol (o-Cresol)	EPA 8270	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	27
3 & 4 Methylphenol (m & p-Cresol)	EPA 8270	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	400
2-Nitroaniline	EPA 8270	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	160
3-Nitroaniline	EPA 8270	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
4-Nitroaniline	EPA 8270	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
Nitrobenzene	EPA 8270	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	100
2-Nitrophenol	EPA 8270	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
4-Nitrophenol (p-Nitrophenol)	EPA 8270	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
n-Nitrosodimethylamine	EPA 8270	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	0.34
n-Nitrosodiphenylamine (as Diphenylamine)	EPA 8270	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	0.69
n-Nitrosodi-n-propylamine	EPA 8270	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	0.058
n-Octadecane	EPA 8270	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
Pentachlorophenol	EPA 8270	µg/L	2.4 U	0.085 U	0.68 U	0.44 U	0.44 U	2.4 UJ	2.4 U	--	0.085 U	0.68 U	0.44 U	0.50 U	0.002
Phenol	EPA 8270	µg/L	0.50 U	0.50 U	0.53 U	0.12 U	0.12 U	0.50 U	0.50 U	--	0.50 U	0.53 U	0.12 U	0.14 U	370
Pyridine	EPA 8270	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	8
2,3,4,6-Tetrachlorophenol	EPA 8270	µg/L	0.50 U	0.50 U	--	0.45 U	0.45 U	0.50 U	0.50 U	--	0.50 U	--	0.45 U	0.52 U	480
2,3,5,6-Tetrachlorophenol	EPA 8270	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,4-Trichlorobenzene	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	0.037
	EPA 8270	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	0.037
2,4,5-Trichlorophenol	EPA 8270	µg/L	2.2 U	2.2 U	0.44 UJ	0.41 U	0.41 U	2.2 UJ	2.2 U	--	2.2 U	0.43 UJ	0.41 U	0.47 U	600
2,4,6-Trichlorophenol	EPA 8270	µg/L	2.4 U	2.4 U	0.31 U	0.19 U	0.19 U	2.4 UJ	2.4 U	--	2.4 U	0.30 U	0.19 U	0.22 U	0.28
Volatile Organic Compounds (VOCs)															
Acetone	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
Benzene	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	1.6
Bromobenzene	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
Bromochloromethane	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
Bromoform (Tribromomethane)	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	12
Bromomethane	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	13
n-Butylbenzene	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	400
sec-Butylbenzene	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	800
tert-Butylbenzene	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	800
Carbon disulfide	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	400
Carbon tetrachloride	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	0.35
Chlorobenzene	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	200
Chloroethane	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	19,000
2-Chloroethyl vinyl ether	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
Chloroform	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	1.2
Chloromethane	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	150
2-Chlorotoluene	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	160
4-Chlorotoluene	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE

Table D-2
Remedial Investigation Chemical Analytical Results - Groundwater COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Monitoring Well ¹	Analytical Method	Units	GMW-3D	GMW-3D	GMW-18	GMW-18	GMW-18	GMW-18	GMW-18	GMW-18	GMW-18	GMW-20	GMW-20	GMW-20	Groundwater Preliminary Cleanup Level ³ (PCUL)
Sample Date			12/01/11	04/27/12	03/26/09	04/29/10	10/27/10	04/27/11	11/30/11	11/30/11	04/26/12	03/26/09	04/28/10	10/25/10	
Monitoring Event			Dec-11	Apr-12	Mar-09	Apr-10	Oct-10	Apr-11	Nov-11	Nov-11 (Dup)	Apr-12	Mar-09	Apr-10	Oct-10	
Sampled By			ERM	ERM	ERM	ERM	ERM	ERM	ERM	ERM	ERM	ERM	ERM	ERM	
Dibromochloromethane	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	2.2
1,2-Dibromo-3-chloropropane	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	0.2
Dibromomethane	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	80
Bromodichloromethane	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	1.8
Dichlorodifluoromethane (CFC-12)	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	5.6
1,1-Dichloroethane	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	11
1,2-Dichloroethane	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	4.2
1,1-Dichloroethene	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	130
cis-1,2-Dichloroethene	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	16
trans-1,2-Dichloroethene	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	1,000
1,2-Dichloropropane	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	3.1
1,3-Dichloropropane	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
2,2-Dichloropropane	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,1-Dichloropropene	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
cis-1,3-Dichloropropene	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	2
trans-1,3-Dichloropropene	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	2
Ethylbenzene	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	31
1,2-Dibromoethane (EDB)	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	0.27
2-Hexanone	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	40
Isopropylbenzene (Cumene)	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	800
p-Isopropyltoluene	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
2-Butanone (MEK)	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	1,700,000
Methyl iodide (Iodomethane)	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
4-Methyl-2-pentanone (Methyl isobutyl ketone)	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	470,000
Methyl t-butyl ether (MTBE)	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	600
Methylene chloride	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	100
n-Propylbenzene	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	800
Styrene	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	8,200
1,1,1,2-Tetrachloroethane	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	7.4
1,1,2,2-Tetrachloroethane	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	0.3
Tetrachloroethene	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	2.9
Toluene	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	130
1,2,3-Trichlorobenzene	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,1,1-Trichloroethane	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	5,500
1,1,2-Trichloroethane	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	0.9
Trichloroethene	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	0.7
Trichlorofluoromethane (CFC-11)	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	120
1,2,3-Trichloropropane	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	1,500
1,2,4-Trimethylbenzene	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	240
1,3,5-Trimethylbenzene	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	80
Vinyl acetate	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	7,800

Table D-2
Remedial Investigation Chemical Analytical Results - Groundwater COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Monitoring Well ¹	Analytical Method	Units	GMW-3D	GMW-3D	GMW-18	GMW-18	GMW-18	GMW-18	GMW-18	GMW-18	GMW-18	GMW-20	GMW-20	GMW-20	Groundwater Preliminary Cleanup Level ³ (PCUL)
Sample Date			12/01/11	04/27/12	03/26/09	04/29/10	10/27/10	04/27/11	11/30/11	11/30/11	04/26/12	03/26/09	04/28/10	10/25/10	
Monitoring Event			Dec-11	Apr-12	Mar-09	Apr-10	Oct-10	Apr-11	Nov-11	Nov-11 (Dup)	Apr-12	Mar-09	Apr-10	Oct-10	
Sampled By			ERM	ERM	ERM	ERM	ERM	ERM	ERM	ERM	ERM	ERM	ERM	ERM	
Vinyl chloride	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	0.18
Xylene, m-,p-	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	290
Xylene, o-	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	430
Petroleum Hydrocarbons															
Gasoline-range hydrocarbons	NWTPH-G	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	800
Diesel-range hydrocarbons	NWTPH-Dx	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	500
Oil-range hydrocarbons	NWTPH-Dx	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	500
Total diesel- and oil-range hydrocarbons	NWTPH-Dx	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	500
Diesel-range hydrocarbons	NWTPH-Dx Si/Gel	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	500
Oil-range hydrocarbons	NWTPH-Dx Si/Gel	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	500
Total diesel- and oil-range hydrocarbons	NWTPH-Dx Si/Gel	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	500
Conventional Parameters															
Total organic carbon (TOC)	SM 5310B	mg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
Field Measured Parameters															
pH	N/A	N/A	6.31	5.73	9.4	6.54	7.04	6.58	6.57	6.57	6.08	9.69	6	--	NE

Notes:

¹ Monitoring well locations are shown on Figures 3-2 and 3-4.

² Insufficient water to collect groundwater sample for chemical analysis.

³ Groundwater screening levels referenced from Table 4-2.

⁴ Total dioxin/furan Toxic Equivalency Quotients (TEQs) were calculated using United States Environmental Protection Agency (USEPA) Toxicity Equivalency Factor (TEF) values for human health (EPA 2003).

⁵ Total carcinogenic PAH (cPAH) TEQs were calculated using TEF values referenced from MTCA Table 708.2 (WAC 173-340-900).

mg/L = milligram per liter

µg/L = microgram per liter

NE = not established

Landau = Landau Associates

GEI = GeoEngineers

NE = not established

J = estimated result

U = analyte not detected above the reporting limit

-- = not analyzed

COPC = Contaminant of Potential Concern

Bold indicates analyte was detected.

Yellow shading identifies the detected results greater than the preliminary cleanup level.

Blue shading identifies the non-detected result greater than the preliminary cleanup level.

Table D-2
Remedial Investigation Chemical Analytical Results - Groundwater COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Monitoring Well ¹	Analytical Method	Units	GMW-20	GMW-20	GMW-20	GMW-24	GMW-24	GMW-24	GMW-24	GMW-24	GMW-24	GMW-24	GMW-25	GMW-25	GMW-25	Groundwater Preliminary Cleanup Level ³ (PCUL)
Sample Date			04/27/11	11/30/2011	4/26/2012	03/25/09	04/28/10	10/25/10	04/27/11	11/30/11	04/25/12	11/5/2009	06/11/14	09/25/14		
Monitoring Event			Apr-11	Nov-11	Apr-12	Mar-09	Apr-10	Oct-10	Apr-11	Nov-11	Apr-12	Nov-09	Jun-14	Sep-14		
Sampled By			ERM	ERM	ERM	ERM	ERM	ERM	ERM	ERM	ERM	Landau	GEI	GEI		
Polychlorinated Biphenyls (PCBs)																
PCB-Aroclor 1016	EPA 8082	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	NE
PCB-Aroclor 1221	EPA 8082	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	NE
PCB-Aroclor 1232	EPA 8082	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	NE
PCB-Aroclor 1242	EPA 8082	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	NE
PCB-Aroclor 1248	EPA 8082	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	NE
PCB-Aroclor 1254	EPA 8082	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	NE
PCB-Aroclor 1260	EPA 8082	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	NE
Total PCB Aroclors	EPA 8082	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	0.000007
Total PCB Congeners	EPA 1668	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	0.000007
Dioxins and Furans																
1,2,3,4,6,7,8-HpCDD	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,4,6,7,8-HpCDF	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,4,7,8,9-HpCDF	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,4,7,8-HxCDD	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,4,7,8-HxCDF	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,6,7,8-HxCDD	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,6,7,8-HxCDF	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,7,8,9-HxCDD	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,7,8,9-HxCDF	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,7,8-PeCDD	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,2,3,7,8-PeCDF	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	NE
2,3,4,6,7,8-HxCDF	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	NE
2,3,4,7,8-PeCDF	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	NE
2,3,7,8-TCDD	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	NE
2,3,7,8-TCDF	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	NE
OCDD	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	NE
OCDF	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	NE
Total Dioxin/Furan TEQ ⁴ (ND=0)	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	0.0000000051
Total Dioxin/Furan TEQ4 (ND=0.5RL)	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	0.0000000051
Total Metals																
Antimony	EPA 200.8/7470	µg/L	0.2 U	50.0 U	0.2 U	--	--	--	0.2 U	50.0 U	0.2 U	1 U	5.4 U	5.5 U		90
Arsenic	EPA 200.8/7470	µg/L	1,080	2,770	957	0.595	0.36 J	0.15 J	0.7	0.20 U	0.4	1,400	1,100	990		8.0
Barium	EPA 200.8/7470	µg/L	--	--	--	--	--	--	--	--	--	--	5.0 U	5.0 U		200
Beryllium	EPA 200.8/7470	µg/L	0.2 U	0.20 U	0.2 U	--	--	--	0.2 U	0.20 U	0.2 U	11 U	10 U	10 U		4.4
Cadmium	EPA 200.8/7470	µg/L	0.1 U	0.2	0.1 U	--	--	--	0.1 U	0.10 U	0.1 U	4.4 U	0.20 U	0.20 U		1.2
Chromium III / Total	EPA 200.8/7470	µg/L	0.5 U	0.50 U	0.5 U	--	--	--	0.5 U	1.00 U	0.5 U	2 U	2.0 U	2.0 U		27
Chromium VI	EPA 200.8/7470	µg/L	--	--	--	--	--	--	--	--	--	10 UJ	--	--		50
Copper	EPA 200.8/7470	µg/L	1.3	3	0.8	--	--	--	0.6	2.0 U	0.5 U	1.5	2.0 U	2.0 U		3.1
Lead	EPA 200.8/7470	µg/L	0.1 U	0.10 U	0.1 U	--	--	--	0.1 U	0.10 U	0.1 U	1 U	1.0 U	1.0 U		8.1
Mercury	EPA 200.8/7470	µg/L	0.10 U	0.10 U	0.10 U	--	--	--	0.10 U	0.10 U	0.10 U	0.1 U	0.50 U	0.50 U		0.025
Nickel	EPA 200.8/7470	µg/L	0.9	1.5	2.9	--	--	--	0.8	1.1	1.1 J	22 U	2.0 U	2.0 U		8.2

Table D-2
Remedial Investigation Chemical Analytical Results - Groundwater COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Monitoring Well ¹	Analytical Method	Units	GMW-20	GMW-20	GMW-20	GMW-24	GMW-24	GMW-24	GMW-24	GMW-24	GMW-24	GMW-24	GMW-25	GMW-25	GMW-25	Groundwater Preliminary Cleanup Level ³ (PCUL)
Sample Date			04/27/11	11/30/2011	4/26/2012	03/25/09	04/28/10	10/25/10	04/27/11	11/30/11	04/25/12	11/5/2009	06/11/14	09/25/14		
Monitoring Event			Apr-11	Nov-11	Apr-12	Mar-09	Apr-10	Oct-10	Apr-11	Nov-11	Apr-12	Nov-09	Jun-14	Sep-14		
Sampled By			ERM	ERM	ERM	ERM	ERM	ERM	ERM	ERM	ERM	Landau	GEI	GEI		
Selenium	EPA 200.8/7470	µg/L	0.5 U	0.50 U	0.5 U	--	--	--	0.5 U	0.50 U	0.5 U	5.6 U	6.0 U	6.0 U	71	
Silver	EPA 200.8/7470	µg/L	0.2 U	3.0 U	0.2 U	--	--	--	0.2 U	3.0 U	0.2 U	11 U	1.0 U	1.0 U	1.9	
Thallium	EPA 200.8/7470	µg/L	0.2 U	0.20 U	0.2 U	--	--	--	0.2 U	0.20 U	0.2 U	5.6 U	2.0 U	2.0 U	0.062	
Tin	EPA 200.8/7470	µg/L	--	--	--	--	--	--		--	--	10 U	5.0 U	5.0 U	9,600	
Zinc	EPA 200.8/7470	µg/L	4.0 U	10.0 U	6	--	--	--	4.0 U	10.0 U	4.0 U	19	56 U	56 U	81	
Dissolved Metals																
Antimony	EPA 200.8/7470	µg/L	0.2 U	50.0 U	0.2 U	--	--	--	0.2 U	50.0 U	0.2 U	1 U	5.5 U	5.5 U	90	
Arsenic	EPA 200.8/7470	µg/L	1,080	2600	869	0.501	0.32 J	0.12 J	0.7	0.2	0.3 J	1,200	1,000	1,000 J	8.0	
Barium	EPA 200.8/7470	µg/L	--	--	--	--	--	--	--	--	--	--	5.0 U	5.0 U	200	
Beryllium	EPA 200.8/7470	µg/L	0.2 U	0.20 U	0.2 U	--	--	--	0.2 U	0.20 U	0.2 U	10 U	10 U	10 U	4.4	
Cadmium	EPA 200.8/7470	µg/L	0.1 U	0.10 U	0.1 U	--	--	--	0.1 U	0.10 U	0.1 U	4 U	0.20 U	0.20 U	1.2	
Chromium III / Total	EPA 200.8/7470	µg/L	1.0 U	0.50 U	0.5 U	--	--	--	0.5 U	0.50 U	0.5 U	2 U	2.0 U	2.0 U	27	
Copper	EPA 200.8/7470	µg/L	0.8	2.0 U	0.5	--	--	--	0.6	2.0 U	0.8	1 U	2.0 U	2.0 U	3.1	
Lead	EPA 200.8/7470	µg/L	0.1 U	0.10 U	0.1 U	--	--	--	0.1 U	0.10 U	0.1 U	1 U	1.0 U	1.0 U	8.1	
Mercury	EPA 200.8/7470	µg/L	0.10 U	0.10 U	0.10 U	--	--	--	0.10 U	0.10 U	0.10 U	0.1 U	0.50 U	0.50 U	0.025	
Nickel	EPA 200.8/7470	µg/L	1.4	0.5	1.2	--	--	--	0.5 U	0.7	0.7	20 U	2.0 U	2.0 U	8.2	
Selenium	EPA 200.8/7470	µg/L	0.5 U	0.50 U	0.5 U	--	--	--	0.5 U	0.50 U	0.5 U	5 U	6.0 U	6.0 U	71	
Silver	EPA 200.8/7470	µg/L	0.2 U	3.0 UJ	0.2 U	--	--	--	0.2 U	3.0 UJ	0.2 U	10 U	1.0 U	1.0 U	1.9	
Thallium	EPA 200.8/7470	µg/L	0.2 U	0.20 U	0.2 U	--	--	--	0.2 U	0.20 U	0.2 U	5 U	2.0 U	2.0 U	0.062	
Tin	EPA 200.8/7470	µg/L	--	--	--	--	--	--		--	--	10 U	5.0 U	5.0 U	9,600	
Zinc	EPA 200.8/7470	µg/L	4.0 U	10.0 U	5	--	--	--	4.0 U	10.0 U	4.0 U	5 U	56 U	56 U	81	
Semi-Volatile Organic Compounds (SVOCs) - Polycyclic Aromatic Hydrocarbons (PAHs)																
Acenaphthene	EPA 8270/SIM	µg/L	--	--	--	--	--	--	--	--	--	0.1 U	0.49 U	0.10 U	5.3	
Acenaphthylene	EPA 8270/SIM	µg/L	--	--	--	--	--	--	--	--	--	0.1 U	0.49 U	0.10 U	NE	
Anthracene	EPA 8270/SIM	µg/L	--	--	--	--	--	--	--	--	--	0.1 U	0.49 U	0.10 U	2.1	
Benzo(a)anthracene	EPA 8270/SIM	µg/L	--	--	--	--	--	--	--	--	--	0.01 U	0.068	0.010 U	0.00016	
Benzo(b)fluoranthene	EPA 8270/SIM	µg/L	--	--	--	--	--	--	--	--	--	0.01 U	0.049 U	0.010 U	0.00016	
Benzo(j,k)fluoranthene	EPA 8270/SIM	µg/L	--	--	--	--	--	--	--	--	--	0.01 U	0.049 U	0.010 U	0.0016	
Benzo(g,h,i)perylene	EPA 8270/SIM	µg/L	--	--	--	--	--	--	--	--	--	0.01 U	0.049 U	0.010 U	NE	
Benzo(a)pyrene	EPA 8270/SIM	µg/L	--	--	--	--	--	--	--	--	--	0.01 U	0.049 U	0.010 U	0.000016	
Chrysene	EPA 8270/SIM	µg/L	--	--	--	--	--	--	--	--	--	0.01 U	0.049 U	0.010 U	0.016	
Dibenzo(a,h)anthracene	EPA 8270/SIM	µg/L	--	--	--	--	--	--	--	--	--	0.01 U	0.049 U	0.010 U	0.000016	
Dibenzofuran	EPA 8270/SIM	µg/L	--	--	--	--	--	--	--	--	--	1 U	0.97 U	0.10 U	16	
Fluoranthene	EPA 8270/SIM	µg/L	--	--	--	--	--	--	--	--	--	0.1 U	0.49 U	0.10 U	1.8	
Fluorene	EPA 8270/SIM	µg/L	--	--	--	--	--	--	--	--	--	0.1 U	0.49 U	0.10 U	3.7	
Indeno(1,2,3-c,d)pyrene	EPA 8270/SIM	µg/L	--	--	--	--	--	--	--	--	--	0.01 U	0.049 U	0.010 U	0.00016	
1-Methylnaphthalene	EPA 8270/SIM	µg/L	--	--	--	--	--	--	--	--	--	0.1 U	0.49 U	0.10 U	1.5	
2-Methylnaphthalene	EPA 8270/SIM	µg/L	--	--	--	--	--	--	--	--	--	0.1 U	0.49 U	0.10 U	32	
Naphthalene	EPA 8270/SIM	µg/L	--	--	--	--	--	--	--	--	--	0.1 U	0.49 U	0.10 U	1.4	
Phenanthrene	EPA 8270/SIM	µg/L	--	--	--	--	--	--	--	--	--	0.1 U	0.49 U	0.10 U	NE	
Pyrene	EPA 8270/SIM	µg/L	--	--	--	--	--	--	--	--	--	0.1 U	0.49 U	0.10 U	2	
Total cPAH TEQ ⁵ (ND=0)	EPA 8270/SIM	µg/L	--	--	--	--	--	--	--	--	--	0 U	0.0068	0 U	0.000016	
Total cPAH TEQ ⁵ (ND=0.5RL)	EPA 8270/SIM	µg/L	--	--	--	--	--	--	--	--	--	0.0076 U	0.0410	0.0076 U	0.000016	

Table D-2
Remedial Investigation Chemical Analytical Results - Groundwater COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Monitoring Well ¹	Analytical Method	Units	GMW-20	GMW-20	GMW-20	GMW-24	GMW-24	GMW-24	GMW-24	GMW-24	GMW-24	GMW-24	GMW-25	GMW-25	GMW-25	Groundwater Preliminary Cleanup Level ³ (PCUL)
Sample Date			04/27/11	11/30/2011	4/26/2012	03/25/09	04/28/10	10/25/10	04/27/11	11/30/11	04/25/12	11/5/2009	06/11/14	09/25/14		
Monitoring Event			Apr-11	Nov-11	Apr-12	Mar-09	Apr-10	Oct-10	Apr-11	Nov-11	Apr-12	Nov-09	Jun-14	Sep-14		
Sampled By			ERM	ERM	ERM	ERM	ERM	ERM	ERM	ERM	ERM	Landau	GEI	GEI		
Other SVOCs (mg/kg)																
Aniline	EPA 8270	µg/L	--	--	--	--	--	--	--	--	--	5 U	0.97 U	0.10 U	7.7	
Benzidine	EPA 8270	µg/L	--	--	--	--	--	--	--	--	--	10 U	0.97 U	0.10 U	0.000023	
Benzoic acid	EPA 8270	µg/L	--	--	--	--	--	--	--	--	--	--	0.97 U	0.50 U	590	
Benzyl alcohol	EPA 8270	µg/L	--	--	--	--	--	--	--	--	--	1 U	0.97 U	0.10 U	800	
Bis(2-chloroethoxy)methane	EPA 8270	µg/L	--	--	--	--	--	--	--	--	--	1 U	0.97 U	0.10 U	NE	
Bis(2-chloroethyl)ether	EPA 8270	µg/L	--	--	--	--	--	--	--	--	--	1 U	0.97 U	0.10 U	0.06	
Bis(2-chloroisopropyl)ether	EPA 8270	µg/L	--	--	--	--	--	--	--	--	--	1 U	0.97 U	0.10 U	900	
Bis(2-ethylhexyl)phthalate	EPA 8270	µg/L	--	--	--	--	--	--	--	--	--	1 U	0.97 U	0.12 U	0.046	
4-Bromophenyl phenyl ether	EPA 8270	µg/L	--	--	--	--	--	--	--	--	--	1 U	0.97 U	0.10 U	NE	
Butyl benzyl phthalate	EPA 8270	µg/L	--	--	--	--	--	--	--	--	--	1 U	0.97 U	0.10 U	0.013	
Carbazole	EPA 8270	µg/L	--	--	--	--	--	--	--	--	--	1 U	0.97 U	0.10 U	NE	
4-Chloroaniline	EPA 8270	µg/L	--	--	--	--	--	--	--	--	--	10 U	0.97 U	0.10 U	2,300	
4-Chloro-3-methylphenol	EPA 8270	µg/L	--	--	--	--	--	--	--	--	--	1 U	0.97 U	0.10 U	36	
2-Chloronaphthalene	EPA 8270	µg/L	--	--	--	--	--	--	--	--	--	1 U	0.97 U	0.10 U	100	
2-Chlorophenol	EPA 8270	µg/L	0.50 U	0.50 U	0.50 U	0.56 U	0.36 U	0.36 U	0.50 U	0.50 U	0.50 U	1 U	0.97 U	0.10 U	17	
4-Chlorophenyl phenyl ether	EPA 8270	µg/L	--	--	--	--	--	--	--	--	--	1 U	0.97 U	0.10 U	NE	
Decane	EPA 8270	µg/L	--	--	--	--	--	--	--	--	--	--	0.97 U	2.0 U	NE	
Dibutyl phthalate	EPA 8270	µg/L	--	--	--	--	--	--	--	--	--	1 U	0.97 U	0.10 U	8	
2,3-Dichloroaniline	EPA 8270	µg/L	--	--	--	--	--	--	--	--	--	1 U	0.97 U	0.10 U	NE	
1,2-Dichlorobenzene (o-Dichlorobenzene)	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	0.2 U	--	--	4.6	
	EPA 8270	µg/L	--	--	--	--	--	--	--	--	--	1 U	0.97 U	0.10 U	4.6	
1,3-Dichlorobenzene (m-Dichlorobenzene)	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	0.2 U	--	--	2.0	
	EPA 8270	µg/L	--	--	--	--	--	--	--	--	--	1 U	0.97 U	0.10 U	2.0	
1,4-Dichlorobenzene (p-Dichlorobenzene)	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	0.2 U	--	--	4.9	
	EPA 8270	µg/L	--	--	--	--	--	--	--	--	--	1 U	0.97 U	0.10 U	4.9	
3,3'-Dichlorobenzidine	EPA 8270	µg/L	--	--	--	--	--	--	--	--	--	10 U	0.97 U	0.10 U	0.0033	
2,4-Dichlorophenol	EPA 8270	µg/L	2.6 UJ	2.6 U	2.6 U	0.29 U	0.38 U	0.38 U	2.6 UJ	2.6 U	2.6 U	1 U	0.97 U	0.10 U	10	
Bis(2-ethylhexyl)ester	EPA 8270	µg/L	--	--	--	--	--	--	--	--	--	1 U	0.97 U	0.10 U	400	
Diethyl phthalate	EPA 8270	µg/L	--	--	--	--	--	--	--	--	--	1 U	0.97 U	0.10 U	93	
Dimethyl phthalate	EPA 8270	µg/L	--	--	--	--	--	--	--	--	--	1 U	0.97 U	0.10 U	600	
2,4-Dimethylphenol	EPA 8270	µg/L	--	--	--	--	--	--	--	--	--	1 U	0.97 U	0.10 U	6.30	
1,2-Dinitrobenzene	EPA 8270	µg/L	--	--	--	--	--	--	--	--	--	1 U	0.97 U	0.10 U	1.6	
1,3-Dinitrobenzene	EPA 8270	µg/L	--	--	--	--	--	--	--	--	--	1 U	0.97 U	0.10 U	1.6	
1,4-Dinitrobenzene	EPA 8270	µg/L	--	--	--	--	--	--	--	--	--	1 U	0.97 U	0.10 U	1.6	
4,6-Dinitro-2-methylphenol	EPA 8270	µg/L	--	--	--	--	--	--	--	--	--	5 U	0.97 U	0.50 U	NE	
2,4-Dinitrophenol	EPA 8270	µg/L	--	--	--	--	--	--	--	--	--	10 U	0.97 U	1.0 U	100	
2,4-Dinitrotoluene	EPA 8270	µg/L	--	--	--	--	--	--	--	--	--	1 U	0.97 U	0.10 U	0.18	
2,6-Dinitrotoluene	EPA 8270	µg/L	--	--	--	--	--	--	--	--	--	1 U	0.97 U	0.10 U	300	
Di-n-octyl phthalate	EPA 8270	µg/L	--	--	--	--	--	--	--	--	--	1 U	0.97 U	0.10 U	0.0039	
1,2-Diphenylhydrazine	EPA 8270	µg/L	--	--	--	--	--	--	--	--	--	1 U	0.97 U	0.10 U	0.02	
Hexachlorobenzene	EPA 8270	µg/L	--	--	--	--	--	--	--	--	--	1 U	0.97 U	0.10 U	0.000005	
Hexachlorobutadiene	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	0.2 U	--	--	0.01	
	EPA 8270	µg/L	--	--	--	--	--	--	--	--	--	1 U	0.97 U	0.10 U	0.01	

Table D-2
Remedial Investigation Chemical Analytical Results - Groundwater COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Monitoring Well ¹	Analytical Method	Units	GMW-20	GMW-20	GMW-20	GMW-24	GMW-24	GMW-24	GMW-24	GMW-24	GMW-24	GMW-25	GMW-25	GMW-25	Groundwater Preliminary Cleanup Level ³ (PCUL)
Sample Date			04/27/11	11/30/2011	4/26/2012	03/25/09	04/28/10	10/25/10	04/27/11	11/30/11	04/25/12	11/5/2009	06/11/14	09/25/14	
Monitoring Event			Apr-11	Nov-11	Apr-12	Mar-09	Apr-10	Oct-10	Apr-11	Nov-11	Apr-12	Nov-09	Jun-14	Sep-14	
Sampled By			ERM	ERM	ERM	ERM	ERM	ERM	ERM	ERM	ERM	Landau	GEI	GEI	
Hexachlorocyclopentadiene	EPA 8270	µg/L	--	--	--	--	--	--	--	--	--	1 U	0.97 U	0.10 U	1.00
Hexachloroethane	EPA 8270	µg/L	--	--	--	--	--	--	--	--	--	1 U	0.97 U	0.10 U	0.02
Isophorone	EPA 8270	µg/L	--	--	--	--	--	--	--	--	--	1 U	0.97 U	0.10 U	110
2-Methylphenol (o-Cresol)	EPA 8270	µg/L	--	--	--	--	--	--	--	--	--	1 U	0.97 U	0.10 U	27
3 & 4 Methylphenol (m & p-Cresol)	EPA 8270	µg/L	--	--	--	--	--	--	--	--	--	--	0.97 U	0.10 U	400
2-Nitroaniline	EPA 8270	µg/L	--	--	--	--	--	--	--	--	--	1 U	0.97 U	0.10 U	160
3-Nitroaniline	EPA 8270	µg/L	--	--	--	--	--	--	--	--	--	1 U	0.97 U	0.10 U	NE
4-Nitroaniline	EPA 8270	µg/L	--	--	--	--	--	--	--	--	--	1 U	0.97 U	0.10 U	NE
Nitrobenzene	EPA 8270	µg/L	--	--	--	--	--	--	--	--	--	1 U	0.97 U	0.10 U	100
2-Nitrophenol	EPA 8270	µg/L	--	--	--	--	--	--	--	--	--	1 U	0.97 U	0.10 U	NE
4-Nitrophenol (p-Nitrophenol)	EPA 8270	µg/L	--	--	--	--	--	--	--	--	--	1 U	0.97 U	0.10 U	NE
n-Nitrosodimethylamine	EPA 8270	µg/L	--	--	--	--	--	--	--	--	--	1 U	0.97 U	0.10 U	0.34
n-Nitrosodiphenylamine (as Diphenylamine)	EPA 8270	µg/L	--	--	--	--	--	--	--	--	--	10 U	0.97 U	0.10 U	0.69
n-Nitrosodi-n-propylamine	EPA 8270	µg/L	--	--	--	--	--	--	--	--	--	1 U	0.97 U	0.10 U	0.058
n-Octadecane	EPA 8270	µg/L	--	--	--	--	--	--	--	--	--	--	0.97 U	0.10 U	NE
Pentachlorophenol	EPA 8270	µg/L	2.4 UJ	2.4 U	0.085 U	0.67 U	0.43 U	0.43 U	2.4 UJ	2.4 U	0.085 U	5 U	0.97 U	0.50 U	0.002
Phenol	EPA 8270	µg/L	0.50 U	0.50 U	0.50 U	0.52 U	0.12 U	0.12 U	0.50 U	0.50 U	0.50 U	1 U	0.97 U	0.10 U	370
Pyridine	EPA 8270	µg/L	--	--	--	--	--	--	--	--	--	10 U	0.97 U	0.10 U	8
2,3,4,6-Tetrachlorophenol	EPA 8270	µg/L	0.50 U	0.50 U	0.50 U	--	0.45 U	0.45 U	0.50 U	0.50 U	0.50 U	1 U	0.97 U	0.10 U	480
2,3,5,6-Tetrachlorophenol	EPA 8270	µg/L	--	--	--	--	--	--	--	--	--	1 U	0.97 U	0.10 U	NE
1,2,4-Trichlorobenzene	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	0.2 U	--	--	0.037
	EPA 8270	µg/L	--	--	--	--	--	--	--	--	--	1 U	0.97 U	0.10 U	0.037
2,4,5-Trichlorophenol	EPA 8270	µg/L	2.2 UJ	2.2 U	2.2 U	0.43 UJ	0.41 U	0.41 U	2.2 UJ	2.2 U	2.2 U	1 U	0.97 U	0.10 U	600
2,4,6-Trichlorophenol	EPA 8270	µg/L	2.4 UJ	2.4 U	2.4 U	0.30 U	0.19 U	0.19 U	2.4 UJ	2.4 U	2.4 U	1 U	0.97 U	0.10 U	0.28
Volatile Organic Compounds (VOCs)															
Acetone	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	5 U	--	--	NE
Benzene	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	0.2 U	--	--	1.6
Bromobenzene	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	0.2 U	--	--	NE
Bromochloromethane	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	0.2 U	--	--	NE
Bromoform (Tribromomethane)	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	1 U	--	--	12
Bromomethane	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	0.2 U	--	--	13
n-Butylbenzene	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	0.2 U	--	--	400
sec-Butylbenzene	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	0.2 U	--	--	800
tert-Butylbenzene	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	0.2 U	--	--	800
Carbon disulfide	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	0.2 U	--	--	400
Carbon tetrachloride	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	0.2 U	--	--	0.35
Chlorobenzene	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	0.2 U	--	--	200
Chloroethane	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	1 U	--	--	19,000
2-Chloroethyl vinyl ether	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	1 U	--	--	NE
Chloroform	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	0.2 U	--	--	1.2
Chloromethane	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	1 U	--	--	150
2-Chlorotoluene	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	0.2 U	--	--	160
4-Chlorotoluene	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	0.2 U	--	--	NE

Table D-2
Remedial Investigation Chemical Analytical Results - Groundwater COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Monitoring Well ¹	Analytical Method	Units	GMW-20	GMW-20	GMW-20	GMW-24	GMW-24	GMW-24	GMW-24	GMW-24	GMW-24	GMW-24	GMW-25	GMW-25	GMW-25	Groundwater Preliminary Cleanup Level ³ (PCUL)
Sample Date			04/27/11	11/30/2011	4/26/2012	03/25/09	04/28/10	10/25/10	04/27/11	11/30/11	04/25/12	11/5/2009	06/11/14	09/25/14		
Monitoring Event			Apr-11	Nov-11	Apr-12	Mar-09	Apr-10	Oct-10	Apr-11	Nov-11	Apr-12	Nov-09	Jun-14	Sep-14		
Sampled By			ERM	ERM	ERM	ERM	ERM	ERM	ERM	ERM	ERM	Landau	GEI	GEI		
Dibromochloromethane	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	0.2 U	--	--	2.2	
1,2-Dibromo-3-chloropropane	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	1 U	--	--	0.2	
Dibromomethane	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	0.2 U	--	--	80	
Bromodichloromethane	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	0.2 U	--	--	1.8	
Dichlorodifluoromethane (CFC-12)	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	0.2 U	--	--	5.6	
1,1-Dichloroethane	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	0.2 U	--	--	11	
1,2-Dichloroethane	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	0.2 U	--	--	4.2	
1,1-Dichloroethene	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	0.02 U	--	--	130	
cis-1,2-Dichloroethene	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	0.2 U	--	--	16	
trans-1,2-Dichloroethene	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	0.2 U	--	--	1,000	
1,2-Dichloropropane	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	0.2 U	--	--	3.1	
1,3-Dichloropropane	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	0.2 U	--	--	NE	
2,2-Dichloropropane	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE	
1,1-Dichloropropene	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	0.2 U	--	--	NE	
cis-1,3-Dichloropropene	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	0.2 U	--	--	2	
trans-1,3-Dichloropropene	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	0.2 U	--	--	2	
Ethylbenzene	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	0.2 U	--	--	31	
1,2-Dibromoethane (EDB)	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	0.2 U	--	--	0.27	
2-Hexanone	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	2 U	--	--	40	
Isopropylbenzene (Cumene)	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	0.2 U	--	--	800	
p-Isopropyltoluene	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	0.2 U	--	--	NE	
2-Butanone (MEK)	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	5 U	--	--	1,700,000	
Methyl iodide (Iodomethane)	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	1 U	--	--	NE	
4-Methyl-2-pentanone (Methyl isobutyl ketone)	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	2 U	--	--	470,000	
Methyl t-butyl ether (MTBE)	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	0.2 U	--	--	600	
Methylene chloride	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	1 U	--	--	100	
n-Propylbenzene	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	0.2 U	--	--	800	
Styrene	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	0.2 U	--	--	8,200	
1,1,1,2-Tetrachloroethane	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	0.2 U	--	--	7.4	
1,1,2,2-Tetrachloroethane	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	0.2 U	--	--	0.3	
Tetrachloroethene	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	0.2 U	--	--	2.9	
Toluene	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	1 U	--	--	130	
1,2,3-Trichlorobenzene	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	0.2 U	--	--	NE	
1,1,1-Trichloroethane	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	0.2 U	--	--	5,500	
1,1,2-Trichloroethane	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	0.2 U	--	--	0.9	
Trichloroethene	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	0.2 U	--	--	0.7	
Trichlorofluoromethane (CFC-11)	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	0.2 U	--	--	120	
1,2,3-Trichloropropane	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	0.2 U	--	--	1,500	
1,2,4-Trimethylbenzene	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	0.2 U	--	--	240	
1,3,5-Trimethylbenzene	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	0.2 U	--	--	80	
Vinyl acetate	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	2 U	--	--	7,800	

Table D-2
Remedial Investigation Chemical Analytical Results - Groundwater COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Monitoring Well ¹	Analytical Method	Units	GMW-20	GMW-20	GMW-20	GMW-24	GMW-24	GMW-24	GMW-24	GMW-24	GMW-24	GMW-25	GMW-25	GMW-25	Groundwater Preliminary Cleanup Level ³ (PCUL)
Sample Date			04/27/11	11/30/2011	4/26/2012	03/25/09	04/28/10	10/25/10	04/27/11	11/30/11	04/25/12	11/5/2009	06/11/14	09/25/14	
Monitoring Event			Apr-11	Nov-11	Apr-12	Mar-09	Apr-10	Oct-10	Apr-11	Nov-11	Apr-12	Nov-09	Jun-14	Sep-14	
Sampled By			ERM	ERM	ERM	ERM	ERM	ERM	ERM	ERM	ERM	Landau	GEI	GEI	
Vinyl chloride	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	0.02 U	--	--	0.18
Xylene, m-,p-	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	0.4 U	--	--	290
Xylene, o-	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	0.2 U	--	--	430
Petroleum Hydrocarbons															
Gasoline-range hydrocarbons	NWTPH-G	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	800
Diesel-range hydrocarbons	NWTPH-Dx	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	500
Oil-range hydrocarbons	NWTPH-Dx	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	500
Total diesel- and oil-range hydrocarbons	NWTPH-Dx	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	500
Diesel-range hydrocarbons	NWTPH-Dx Si/Gel	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	500
Oil-range hydrocarbons	NWTPH-Dx Si/Gel	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	500
Total diesel- and oil-range hydrocarbons	NWTPH-Dx Si/Gel	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	500
Conventional Parameters															
Total organic carbon (TOC)	SM 5310B	mg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
Field Measured Parameters															
pH	N/A	N/A	6.59	6.3	5.75	8.45	5.76	6.23	6.24	6.03	6.77	6.26	6.45	6.65	NE

Notes:

¹ Monitoring well locations are shown on Figures 3-2 and 3-4.

² Insufficient water to collect groundwater sample for chemical analysis.

³ Groundwater screening levels referenced from Table 4-2.

⁴ Total dioxin/furan Toxic Equivalency Quotients (TEQs) were calculated using United States Environmental Protection Agency (USEPA) Toxicity Equivalency Factor (TEF) values for human health (EPA 2003).

⁵ Total carcinogenic PAH (cPAH) TEQs were calculated using TEF values referenced from MTCA Table 708.2 (WAC 173-340-900).

mg/L = milligram per liter

µg/L = microgram per liter

NE = not established

Landau = Landau Associates

GEI = GeoEngineers

NE = not established

J = estimated result

U = analyte not detected above the reporting limit

-- = not analyzed

COPC = Contaminant of Potential Concern

Bold indicates analyte was detected.

Yellow shading identifies the detected results greater than the preliminary cleanup level.

Blue shading identifies the non-detected result greater than the preliminary cleanup level.

Table D-2
Remedial Investigation Chemical Analytical Results - Groundwater COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Monitoring Well ¹	Analytical Method	Units	GMW-25	GMW-25	GMW-26	GMW-26	GMW-26	GMW-26	GMW-26	GMW-26	GMW-27	GMW-27	GMW-27	GMW-27	GMW-27	Groundwater Preliminary Cleanup Level ³ (PCUL)
Sample Date			01/21/15	04/21/15	11/5/2009	06/11/14	09/25/14	01/21/15	04/21/15	11/5/2009	06/12/14	09/24/14	01/22/15	04/20/15		
Monitoring Event			Jan-15	Apr-15	Nov-09	Jun-14	Sep-14	Jan-15	Apr-15	Nov-09	Jun-14	Sep-14	Jan-15	Apr-15		
Sampled By			GEI	GEI	Landau	GEI	GEI	GEI	GEI	Landau	GEI	GEI	GEI	GEI		
Polychlorinated Biphenyls (PCBs)																
PCB-Aroclor 1016	EPA 8082	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	NE
PCB-Aroclor 1221	EPA 8082	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	NE
PCB-Aroclor 1232	EPA 8082	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	NE
PCB-Aroclor 1242	EPA 8082	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	NE
PCB-Aroclor 1248	EPA 8082	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	NE
PCB-Aroclor 1254	EPA 8082	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	NE
PCB-Aroclor 1260	EPA 8082	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	NE
Total PCB Aroclors	EPA 8082	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	0.000007
Total PCB Congeners	EPA 1668	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	--	0.000007
Dioxins and Furans																
1,2,3,4,6,7,8-HpCDD	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	0.000001 UJ	--	NE
1,2,3,4,6,7,8-HpCDF	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	0.000001 UJ	--	NE
1,2,3,4,7,8,9-HpCDF	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	0.000001 UJ	--	NE
1,2,3,4,7,8-HxCDD	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	0.000001 UJ	--	NE
1,2,3,4,7,8-HxCDF	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	0.000001 UJ	--	NE
1,2,3,6,7,8-HxCDD	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	0.000001 UJ	--	NE
1,2,3,6,7,8-HxCDF	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	0.000001 UJ	--	NE
1,2,3,7,8,9-HxCDD	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	0.000001 UJ	--	NE
1,2,3,7,8,9-HxCDF	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	0.000001 UJ	--	NE
1,2,3,7,8-PeCDD	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	0.0000005 UJ	--	NE
1,2,3,7,8-PeCDF	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	0.0000005 UJ	--	NE
2,3,4,6,7,8-HxCDF	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	0.000001 UJ	--	NE
2,3,4,7,8-PeCDF	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	0.0000005 UJ	--	NE
2,3,7,8-TCDD	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	0.0000005 UJ	--	NE
2,3,7,8-TCDF	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	0.0000005 UJ	--	NE
OCDD	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	0.00000361 J	--	NE
OCDF	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	0.000001 UJ	--	NE
Total Dioxin/Furan TEQ ⁴ (ND=0)	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	0.000000001 J	--	0.0000000051
Total Dioxin/Furan TEQ4 (ND=0.5RL)	EPA 1613	µg/L	--	--	--	--	--	--	--	--	--	--	--	0.000000974 J	--	0.0000000051
Total Metals																
Antimony	EPA 200.8/7470	µg/L	5.4 U	5.4 U	1 U	5.4 U	5.4 U	5.4 U	5.4 U	1 U	5.4 U	5.4 U	5.4 U	5.4 U	5.4 U	90
Arsenic	EPA 200.8/7470	µg/L	210	1,300	370	480	310	310	300	26	11	9.4	6.7	8.7		8.0
Barium	EPA 200.8/7470	µg/L	14	8.8	--	5.0 U	5.0 U	4.5	5.0 U	--	6.5	120	23	7.6		200
Beryllium	EPA 200.8/7470	µg/L	10 U	10 U	11 U	10 U	10 U	10 U	10 U	11 U	10 U	10 U	10 U	10 U	10 U	4.4
Cadmium	EPA 200.8/7470	µg/L	0.20 U	0.20 U	4.4 U	0.20 U	0.20 U	0.20 U	0.20 U	4.4 U	0.20 U	0.20 U	0.20 U	0.20 U	0.20 U	1.2
Chromium III / Total	EPA 200.8/7470	µg/L	2.0 U	2.0 U	2 U	2.0 U	2.0 U	2.0 U	2.0 U	5	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	27
Chromium VI	EPA 200.8/7470	µg/L	--	--	10 U	--	--	--	--	10 U	--	--	--	--	--	50
Copper	EPA 200.8/7470	µg/L	3	2.0 U	2.8	2.0 U	2.5	2.0 U	2.0 U	1 U	2.0 U	2.0 U	2.0 U	2.0 U	3.4	3.1
Lead	EPA 200.8/7470	µg/L	1.0 U	1.0 U	1 U	1.0 U	1.0 U	1.0 U	1.0 U	1.2	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	8.1
Mercury	EPA 200.8/7470	µg/L	0.50 U	0.50 U	0.1 U	0.50 U	0.50 U	0.50 U	0.50 U	0.1 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.025
Nickel	EPA 200.8/7470	µg/L	8	2.4	22 U	2.0 U	2.0 U	2.2	2.0 U	22 U	4.3	29	9.1	6.8		8.2

Table D-2
Remedial Investigation Chemical Analytical Results - Groundwater COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Monitoring Well ¹	Analytical Method	Units	GMW-25	GMW-25	GMW-26	GMW-26	GMW-26	GMW-26	GMW-26	GMW-27	GMW-27	GMW-27	GMW-27	GMW-27	Groundwater Preliminary Cleanup Level ³ (PCUL)
Sample Date			01/21/15	04/21/15	11/5/2009	06/11/14	09/25/14	01/21/15	04/21/15	11/5/2009	06/12/14	09/24/14	01/22/15	04/20/15	
Monitoring Event			Jan-15	Apr-15	Nov-09	Jun-14	Sep-14	Jan-15	Apr-15	Nov-09	Jun-14	Sep-14	Jan-15	Apr-15	
Sampled By			GEI	GEI	Landau	GEI	GEI	GEI	GEI	Landau	GEI	GEI	GEI	GEI	
Selenium	EPA 200.8/7470	µg/L	6.0 U	6.0 U	5.6 U	6.0 U	6.0 U	6.0 U	6.0 U	5.6 U	6.0 U	6.0 U	6.0 U	6.0 U	71
Silver	EPA 200.8/7470	µg/L	1.0 U	1.0 U	11 U	1.0 U	1.0 U	1.0 U	1.0 U	11 U	1.0 U	1.0 U	1.0 U	1.0 U	1.9
Thallium	EPA 200.8/7470	µg/L	2.0 U	2.0 U	5.6 U	2.0 U	2.0 U	2.0 U	2.0 U	5.6 U	2.0 U	2.0 U	2.0 U	2.0 U	0.062
Tin	EPA 200.8/7470	µg/L	5.0 U	5.0 U	10 U	5.0 U	5.0 U	5.0 U	5.0 U	10 U	5.0 U	5.0 U	5.0 U	5.0 U	9,600
Zinc	EPA 200.8/7470	µg/L	56 U	56 U	17	56 U	56 U	56 U	56 U	16	56 U	56 U	56 U	56 U	81
Dissolved Metals															
Antimony	EPA 200.8/7470	µg/L	5.5 U	5.5 U	1 U	5.5 U	5.5 U	5.5 U	5.5 U	1 U	5.5 U	5.5 U	5.5 U	5.5 U	90
Arsenic	EPA 200.8/7470	µg/L	150	1,400	400	410	320 J	310	280	25	10	9.3	7	9.3	8.0
Barium	EPA 200.8/7470	µg/L	12	8.4	–	5.0 U	5.0 U	5.0 U	5.0 U	–	6	120	19	5.4	200
Beryllium	EPA 200.8/7470	µg/L	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	4.4
Cadmium	EPA 200.8/7470	µg/L	0.20 U	0.20 U	4 U	0.20 U	0.20 U	0.20 U	0.20 U	4 U	0.20 U	0.20 U	0.20 U	0.20 U	1.2
Chromium III / Total	EPA 200.8/7470	µg/L	2.0 U	2.0 U	2 U	2.0 U	2.0 U	2.0 U	2.0 U	8.3	2.0 U	2.0 U	2.0 U	2.0 U	27
Copper	EPA 200.8/7470	µg/L	2.2	2.0 U	1 U	2.0 U	2.0 U	2.0 U	2.0 U	1 U	2.0 U	2.0 U	2.0 U	2.0 U	3.1
Lead	EPA 200.8/7470	µg/L	1.0 U	1.0 U	1 U	1.0 U	1.0 U	1.0 U	1.0 U	1 U	1.0 U	1.0 U	1.0 U	1.0 U	8.1
Mercury	EPA 200.8/7470	µg/L	0.50 U	0.50 U	0.1 U	0.50 U	0.50 U	0.50 U	0.50 U	0.1 U	0.50 U	0.50 U	0.50 U	0.50 U	0.025
Nickel	EPA 200.8/7470	µg/L	7.8	2.3	20 U	2.0 U	2.0 U	2.0 U	2.0 U	20 U	4.2	32	7.9	4.9	8.2
Selenium	EPA 200.8/7470	µg/L	6.0 U	6.0 U	5 U	6.0 U	6.0 U	6.0 U	6.0 U	8 U	6.0 U	6.0 U	6.0 U	6.0 U	71
Silver	EPA 200.8/7470	µg/L	1.0 U	1.0 U	10 U	1.0 U	1.0 U	1.0 U	1.0 U	10 U	1.0 U	1.0 U	1.0 U	1.0 U	1.9
Thallium	EPA 200.8/7470	µg/L	2.0 U	2.0 U	5 U	2.0 U	2.0 U	2.0 U	2.0 U	5 U	2.0 U	2.0 U	2.0 U	2.0 U	0.062
Tin	EPA 200.8/7470	µg/L	5.0 U	5.0 U	10 U	5.0 U	5.0 U	5.0 U	5.0 U	10 U	5.0 U	5.0 U	5.0 U	5.0 U	9,600
Zinc	EPA 200.8/7470	µg/L	56 U	56 U	5 U	56 U	56 U	56 U	56 U	5 U	56 U	56 U	56 U	56 U	81
Semi-Volatile Organic Compounds (SVOCs) - Polycyclic Aromatic Hydrocarbons (PAHs)															
Acenaphthene	EPA 8270/SIM	µg/L	0.10 U	0.10 U	0.1 U	0.48 U	0.10 U	0.10 U	0.10 U	0.1 U	0.48 U	0.10 U	0.10 UJ	0.10 U	5.3
Acenaphthylene	EPA 8270/SIM	µg/L	0.10 U	0.10 U	0.1 U	0.48 U	0.10 U	0.10 U	0.10 U	0.1 U	0.48 U	0.10 U	0.10 UJ	0.10 U	NE
Anthracene	EPA 8270/SIM	µg/L	0.10 U	0.10 U	0.1 U	0.48 U	0.10 U	0.10 U	0.10 U	0.1 U	0.48 U	0.10 U	0.10 UJ	0.10 U	2.1
Benzo(a)anthracene	EPA 8270/SIM	µg/L	0.010 U	0.010 U	0.01 U	0.048 U	0.010 U	0.010 U	0.010 U	0.01 U	0.048 U	0.010 U	0.010 UJ	0.010 U	0.00016
Benzo(b)fluoranthene	EPA 8270/SIM	µg/L	0.010 U	0.010 U	0.01 U	0.048 U	0.010 U	0.010 U	0.010 U	0.01 U	0.048 U	0.010 U	0.010 UJ	0.010 U	0.00016
Benzo(j,k)fluoranthene	EPA 8270/SIM	µg/L	0.010 U	0.010 U	0.01 U	0.048 U	0.010 U	0.010 U	0.010 U	0.01 U	0.048 U	0.010 U	0.010 UJ	0.010 U	0.0016
Benzo(g,h,i)perylene	EPA 8270/SIM	µg/L	0.010 U	0.010 U	0.01 U	0.048 U	0.010 U	0.010 U	0.010 U	0.01 U	0.048 U	0.010 U	0.010 UJ	0.010 U	NE
Benzo(a)pyrene	EPA 8270/SIM	µg/L	0.010 U	0.010 U	0.01 U	0.048 U	0.010 U	0.010 U	0.010 U	0.01 U	0.048 U	0.010 U	0.010 UJ	0.010 U	0.000016
Chrysene	EPA 8270/SIM	µg/L	0.010 U	0.010 U	0.01 U	0.048 U	0.010 U	0.010 U	0.010 U	0.01 U	0.048 U	0.010 U	0.010 UJ	0.010 U	0.016
Dibenzo(a,h)anthracene	EPA 8270/SIM	µg/L	0.010 U	0.010 U	0.01 U	0.048 U	0.010 U	0.010 U	0.010 U	0.01 U	0.048 U	0.010 U	0.010 UJ	0.010 U	0.000016
Dibenzofuran	EPA 8270/SIM	µg/L	0.10 U	0.10 U	1 U	0.95 U	0.10 U	0.10 U	0.10 U	1 U	0.96 U	0.10 U	0.10 UJ	0.10 U	16
Fluoranthene	EPA 8270/SIM	µg/L	0.10 U	0.10 U	0.1 U	0.48 U	0.10 U	0.10 U	0.10 U	0.1 U	0.48 U	0.10 U	0.10 UJ	0.10 U	1.8
Fluorene	EPA 8270/SIM	µg/L	0.10 U	0.10 U	0.1 U	0.48 U	0.10 U	0.10 U	0.10 U	0.1 U	0.48 U	0.10 U	0.10 UJ	0.10 U	3.7
Indeno(1,2,3-c,d)pyrene	EPA 8270/SIM	µg/L	0.010 U	0.010 U	0.01 U	0.048 U	0.010 U	0.010 U	0.010 U	0.01 U	0.048 U	0.010 U	0.010 UJ	0.010 U	0.00016
1-Methylnaphthalene	EPA 8270/SIM	µg/L	0.10 U	0.10 U	0.1 U	0.48 U	0.10 U	0.10 U	0.10 U	0.1 U	0.48 U	0.10 U	0.10 UJ	0.10 U	1.5
2-Methylnaphthalene	EPA 8270/SIM	µg/L	0.10 U	0.10 U	0.1 U	0.48 U	0.10 U	0.10 U	0.10 U	0.1 U	0.48 U	0.10 U	0.10 UJ	0.10 U	32
Naphthalene	EPA 8270/SIM	µg/L	0.10 U	0.10 U	0.1 U	0.48 U	0.10 U	0.10 U	0.10 U	0.1 U	0.48 U	0.10 U	0.10 UJ	0.10 U	1.4
Phenanthrene	EPA 8270/SIM	µg/L	0.10 U	0.10 U	0.1 U	0.48 U	0.10 U	0.10 U	0.10 U	0.1 U	0.48 U	0.10 U	0.10 UJ	0.10 U	NE
Pyrene	EPA 8270/SIM	µg/L	0.10 U	0.10 U	0.1 U	0.48 U	0.10 U	0.10 U	0.10 U	0.1 U	0.48 U	0.10 U	0.10 UJ	0.10 U	2
Total cPAH TEQ ⁵ (ND=0)	EPA 8270/SIM	µg/L	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0 U	0.000016
Total cPAH TEQ ⁵ (ND=0.5RL)	EPA 8270/SIM	µg/L	0.0076 U	0.0076 U	0.0076 U	0.036 U	0.0076 U	0.0076 U	0.0076 U	0.0076 U	0.036 U	0.0076 U	0.0076 U	0.0076 U	0.000016

Table D-2
Remedial Investigation Chemical Analytical Results - Groundwater COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Monitoring Well ¹	Analytical Method	Units	GMW-25	GMW-25	GMW-26	GMW-26	GMW-26	GMW-26	GMW-26	GMW-27	GMW-27	GMW-27	GMW-27	GMW-27	Groundwater Preliminary Cleanup Level ³ (PCUL)
Sample Date			01/21/15	04/21/15	11/5/2009	06/11/14	09/25/14	01/21/15	04/21/15	11/5/2009	06/12/14	09/24/14	01/22/15	04/20/15	
Monitoring Event			Jan-15	Apr-15	Nov-09	Jun-14	Sep-14	Jan-15	Apr-15	Nov-09	Jun-14	Sep-14	Jan-15	Apr-15	
Sampled By			GEI	GEI	Landau	GEI	GEI	GEI	GEI	Landau	GEI	GEI	GEI	GEI	
Other SVOCs (mg/kg)															
Aniline	EPA 8270	µg/L	0.10 U	0.10 U	5 U	0.95 U	0.10 U	0.10 U	0.10 U	5 U	0.96 U	0.10 U	0.10 UJ	0.10 U	7.7
Benzidine	EPA 8270	µg/L	0.10 U	0.10 U	10 U	0.95 U	0.10 U	0.10 U	0.10 U	10 U	0.96 U	0.10 U	0.10 UJ	0.10 U	0.000023
Benzoic acid	EPA 8270	µg/L	0.50 U	0.50 U	--	0.95 U	0.50 U	0.50 U	0.50 U	--	0.96 U	0.50 U	0.50 UJ	0.50 U	590
Benzyl alcohol	EPA 8270	µg/L	0.10 U	0.10 U	1 U	0.95 U	0.10 U	0.10 U	0.10 U	0.097	1 U	0.96 U	0.10 U	0.10 UJ	800
Bis(2-chloroethoxy)methane	EPA 8270	µg/L	0.10 U	0.10 U	1 U	0.95 U	0.10 U	0.10 U	0.10 U	1 U	0.96 U	0.10 U	0.10 UJ	0.10 U	NE
Bis(2-chloroethyl)ether	EPA 8270	µg/L	0.10 U	0.10 U	1 U	0.95 U	0.10 U	0.10 U	0.10 U	1 U	0.96 U	0.10 U	0.10 UJ	0.10 U	0.06
Bis(2-chloroisopropyl)ether	EPA 8270	µg/L	0.10 U	0.10 U	1 U	0.95 U	0.10 U	0.10 U	0.10 U	1 U	0.96 U	0.10 U	0.10 UJ	0.10 U	900
Bis(2-ethylhexyl)phthalate	EPA 8270	µg/L	0.30 U	0.33 U	1 U	0.95 U	0.10 U	0.18 U	0.59 U	1 U	0.96 U	0.18 U	1.1 UJ	0.10 U	0.046
4-Bromophenyl phenyl ether	EPA 8270	µg/L	0.10 U	0.10 U	1 U	0.95 U	0.10 U	0.10 U	0.10 U	1 U	0.96 U	0.10 U	0.10 UJ	0.10 U	NE
Butyl benzyl phthalate	EPA 8270	µg/L	0.10 U	0.10 U	1 U	0.95 U	0.10 U	0.10 U	0.10 U	1 U	0.96 U	0.10 U	0.10 UJ	0.10 U	0.013
Carbazole	EPA 8270	µg/L	0.10 U	0.10 U	1 U	0.95 U	0.10 U	0.10 U	0.10 U	1 U	0.96 U	0.10 U	0.10 UJ	0.10 U	NE
4-Chloroaniline	EPA 8270	µg/L	0.10 U	0.10 U	10 U	0.95 U	0.10 U	0.10 U	0.10 U	10 U	0.96 U	0.10 U	0.10 UJ	0.10 U	2,300
4-Chloro-3-methylphenol	EPA 8270	µg/L	0.10 U	0.10 U	1 U	0.95 U	0.10 U	0.10 U	0.10 U	1 U	0.96 U	0.10 U	0.10 UJ	0.10 U	36
2-Chloronaphthalene	EPA 8270	µg/L	0.10 U	0.10 U	1 U	0.95 U	0.10 U	0.10 U	0.10 U	1 U	0.96 U	0.10 U	0.10 UJ	0.10 U	100
2-Chlorophenol	EPA 8270	µg/L	0.10 U	0.10 U	1 U	0.95 U	0.10 U	0.10 U	0.10 U	1 U	0.96 U	0.10 U	0.10 UJ	0.10 U	17
4-Chlorophenyl phenyl ether	EPA 8270	µg/L	0.10 U	0.10 U	1 U	0.95 U	0.10 U	0.10 U	0.10 U	1 U	0.96 U	0.10 U	0.10 UJ	0.10 U	NE
Decane	EPA 8270	µg/L	2.0 U	2.0 U	--	0.95 U	2.0 U	2.0 U	2.0 U	--	0.96 U	2.0 U	2.0 UJ	2.0 U	NE
Dibutyl phthalate	EPA 8270	µg/L	0.49 U	0.78 U	1 U	0.95 U	0.10 U	0.31 U	1.5 U	1 U	0.96 U	0.41	2.4 UJ	0.10 U	8
2,3-Dichloroaniline	EPA 8270	µg/L	0.10 U	0.10 U	1 U	0.95 U	0.10 U	0.10 U	0.10 U	1 U	0.96 U	0.10 U	0.10 UJ	0.10 U	NE
1,2-Dichlorobenzene (o-Dichlorobenzene)	EPA 8260	µg/L	--	--	0.2 U	--	--	--	--	0.2 U	--	--	--	--	4.6
	EPA 8270	µg/L	0.10 U	0.10 U	1 U	0.95 U	0.10 U	0.10 U	0.10 U	1 U	0.96 U	0.10 U	0.10 UJ	0.10 U	4.6
1,3-Dichlorobenzene (m-Dichlorobenzene)	EPA 8260	µg/L	--	--	0.2 U	--	--	--	--	0.2 U	--	--	--	--	2.0
	EPA 8270	µg/L	0.10 U	0.10 U	1 U	0.95 U	0.10 U	0.10 U	0.10 U	1 U	0.96 U	0.10 U	0.10 UJ	0.10 U	2.0
1,4-Dichlorobenzene (p-Dichlorobenzene)	EPA 8260	µg/L	--	--	0.2 U	--	--	--	--	0.2 U	--	--	--	--	4.9
	EPA 8270	µg/L	0.10 U	0.10 U	1 U	0.95 U	0.10 U	0.10 U	0.10 U	1 U	0.96 U	0.10 U	0.10 UJ	0.10 U	4.9
3,3'-Dichlorobenzidine	EPA 8270	µg/L	0.10 U	0.10 U	10 U	0.95 U	0.10 U	0.10 U	0.10 U	10 U	0.96 U	0.10 U	0.10 UJ	0.10 U	0.0033
2,4-Dichlorophenol	EPA 8270	µg/L	0.10 U	0.10 U	1 U	16	4.7	0.38	1.2	1 U	0.96 U	0.10 U	0.10 UJ	0.10 U	10
Bis(2-ethylhexyl)ester	EPA 8270	µg/L	0.10 U	0.10 U	1 U	0.95 U	0.10 U	0.10 U	0.10 U	1 U	0.96 U	0.10 U	0.10 UJ	0.10 U	400
Diethyl phthalate	EPA 8270	µg/L	0.10 U	0.10 U	1 U	0.95 U	0.10 U	0.10 U	0.10 U	1 U	0.96 U	0.10 U	0.10 UJ	0.13	93
Dimethyl phthalate	EPA 8270	µg/L	0.10 U	0.10 U	1 U	0.95 U	0.10 U	0.10 U	0.10 U	1 U	0.96 U	0.10 U	0.10 UJ	0.10 U	600
2,4-Dimethylphenol	EPA 8270	µg/L	0.10 U	0.10 U	1 U	0.95 U	0.10 U	0.10 U	0.10 U	1 U	0.96 U	0.10 U	0.10 UJ	0.10 U	6.30
1,2-Dinitrobenzene	EPA 8270	µg/L	0.10 U	0.10 U	1 U	0.95 U	0.10 U	0.10 U	0.10 U	1 U	0.96 U	0.10 U	0.10 UJ	0.10 U	1.6
1,3-Dinitrobenzene	EPA 8270	µg/L	0.10 U	0.10 U	1 U	0.95 U	0.10 U	0.10 U	0.10 U	1 U	0.96 U	0.10 U	0.10 UJ	0.10 U	1.6
1,4-Dinitrobenzene	EPA 8270	µg/L	0.10 U	0.10 U	1 U	0.95 U	0.10 U	0.10 U	0.10 U	1 U	0.96 U	0.10 U	0.10 UJ	0.10 U	1.6
4,6-Dinitro-2-methylphenol	EPA 8270	µg/L	0.50 U	0.50 U	5 U	0.95 U	0.50 U	0.50 U	0.50 U	5 U	0.96 U	0.50 U	0.50 UJ	0.50 U	NE
2,4-Dinitrophenol	EPA 8270	µg/L	1.0 U	1.0 U	10 U	0.95 U	1.0 U	1.0 U	1.0 U	10 U	0.96 U	1.0 U	1.0 UJ	1.0 U	100
2,4-Dinitrotoluene	EPA 8270	µg/L	0.25 U	0.10 U	1 U	0.95 U	0.10 U	0.25 U	0.10 U	1 U	0.96 U	0.10 U	0.25 UJ	0.10 U	0.18
2,6-Dinitrotoluene	EPA 8270	µg/L	0.10 U	0.10 U	1 U	0.95 U	0.10 U	0.10 U	0.10 U	1 U	0.96 U	0.10 U	0.10 UJ	0.10 U	300
Di-n-octyl phthalate	EPA 8270	µg/L	0.10 U	0.10 U	1 U	0.95 U	0.10 U	0.10 U	0.10 U	1 U	0.96 U	0.10 U	0.10 UJ	0.10 U	0.0039
1,2-Diphenylhydrazine	EPA 8270	µg/L	0.10 U	0.10 U	1 U	0.95 U	0.10 U	0.10 U	0.10 U	1 U	0.96 U	0.10 U	0.10 UJ	0.10 U	0.02
Hexachlorobenzene	EPA 8270	µg/L	0.10 U	0.10 U	1 U	0.95 U	0.10 U	0.10 U	0.10 U	1 U	0.96 U	0.10 U	0.10 UJ	0.10 U	0.000005
Hexachlorobutadiene	EPA 8260	µg/L	--	--	0.2 U	--	--	--	--	0.2 U	--	--	--	--	0.01
	EPA 8270	µg/L	0.10 U	0.10 U	1 U	0.95 U	0.10 U	0.10 U	0.10 U	1 U	0.96 U	0.10 U	0.10 UJ	0.10 U	0.01

Table D-2
Remedial Investigation Chemical Analytical Results - Groundwater COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Monitoring Well ¹	Analytical Method	Units	GMW-25	GMW-25	GMW-26	GMW-26	GMW-26	GMW-26	GMW-26	GMW-27	GMW-27	GMW-27	GMW-27	GMW-27	Groundwater Preliminary Cleanup Level ³ (PCUL)
Sample Date			01/21/15	04/21/15	11/5/2009	06/11/14	09/25/14	01/21/15	04/21/15	11/5/2009	06/12/14	09/24/14	01/22/15	04/20/15	
Monitoring Event			Jan-15	Apr-15	Nov-09	Jun-14	Sep-14	Jan-15	Apr-15	Nov-09	Jun-14	Sep-14	Jan-15	Apr-15	
Sampled By			GEI	GEI	Landau	GEI	GEI	GEI	GEI	Landau	GEI	GEI	GEI	GEI	
Hexachlorocyclopentadiene	EPA 8270	µg/L	0.10 U	0.10 U	1 U	0.95 U	0.10 U	0.10 U	0.10 U	1 U	0.96 U	0.10 U	0.10 UJ	0.10 U	1.00
Hexachloroethane	EPA 8270	µg/L	0.10 U	0.10 U	1 U	0.95 U	0.10 U	0.10 U	0.10 U	1 U	0.96 U	0.10 U	0.10 UJ	0.10 U	0.02
Isophorone	EPA 8270	µg/L	0.10 U	0.10 U	1 U	0.95 U	0.10 U	0.10 U	0.10 U	1 U	0.96 U	0.10 U	0.10 UJ	0.10 U	110
2-Methylphenol (o-Cresol)	EPA 8270	µg/L	0.10 U	0.10 U	1 U	0.95 U	0.10 U	0.10 U	0.10 U	1 U	0.96 U	0.10 U	0.10 UJ	0.10 U	27
3 & 4 Methylphenol (m & p-Cresol)	EPA 8270	µg/L	0.10 U	0.10 U	--	0.95 U	0.10 U	0.10 U	0.10 U	--	0.96 U	0.10 U	0.10 UJ	0.2	400
2-Nitroaniline	EPA 8270	µg/L	0.10 U	0.10 U	1 U	0.95 U	0.10 U	0.10 U	0.10 U	1 U	0.96 U	0.10 U	0.10 UJ	0.10 U	160
3-Nitroaniline	EPA 8270	µg/L	0.10 U	0.10 U	1 U	0.95 U	0.10 U	0.10 U	0.10 U	1 U	0.96 U	0.10 U	0.10 UJ	0.10 U	NE
4-Nitroaniline	EPA 8270	µg/L	0.10 U	0.10 U	1 U	0.95 U	0.10 U	0.10 U	0.10 U	1 U	0.96 U	0.10 U	0.10 UJ	0.10 U	NE
Nitrobenzene	EPA 8270	µg/L	0.10 U	0.10 U	1 U	0.95 U	0.10 U	0.10 U	0.10 U	1 U	0.96 U	0.10 U	0.10 UJ	0.10 U	100
2-Nitrophenol	EPA 8270	µg/L	0.10 U	0.10 U	1 U	0.95 U	0.10 U	0.10 U	0.10 U	1 U	0.96 U	0.10 U	0.10 UJ	0.10 U	NE
4-Nitrophenol (p-Nitrophenol)	EPA 8270	µg/L	0.10 U	0.10 U	1 U	0.95 U	0.10 U	0.10 U	0.10 U	1 U	0.96 U	0.10 U	0.10 UJ	0.10 U	NE
n-Nitrosodimethylamine	EPA 8270	µg/L	0.10 U	0.10 U	1 U	0.95 U	0.10 U	0.10 U	0.10 U	1 U	0.96 U	0.10 U	0.10 UJ	0.10 U	0.34
n-Nitrosodiphenylamine (as Diphenylamine)	EPA 8270	µg/L	0.10 U	0.10 U	10 U	0.95 U	0.10 U	0.10 U	0.10 U	10 U	0.96 U	0.10 U	0.10 UJ	0.10 U	0.69
n-Nitrosodi-n-propylamine	EPA 8270	µg/L	0.10 U	0.10 U	1 U	0.95 U	0.10 U	0.10 U	0.19	1 U	0.96 U	0.10 U	0.10 UJ	0.10 U	0.058
n-Octadecane	EPA 8270	µg/L	0.11	0.10 U	--	0.95 U	0.10 U	0.10 U	0.10 U	--	0.96 U	0.10 U	0.10 UJ	0.10 U	NE
Pentachlorophenol	EPA 8270	µg/L	0.50 U	0.50 U	5 U	0.95 U	0.50 U	0.50 U	0.50 U	5 U	0.96 UJ	0.50 U	0.50 UJ	0.50 U	0.002
Phenol	EPA 8270	µg/L	0.10 U	0.10 U	1 U	0.95 U	0.10 U	0.10 U	0.10 U	1 U	0.96 U	0.10 U	0.10 UJ	0.10 U	370
Pyridine	EPA 8270	µg/L	0.10 U	0.10 U	10 U	0.95 U	0.10 U	0.10 U	0.10 U	10 U	0.96 U	0.10 U	0.10 UJ	0.10 U	8
2,3,4,6-Tetrachlorophenol	EPA 8270	µg/L	0.10 U	0.10 U	1 U	0.95 U	0.10 U	0.10 U	0.10 U	1 U	0.96 U	0.10 U	0.10 UJ	0.10 U	480
2,3,5,6-Tetrachlorophenol	EPA 8270	µg/L	0.10 U	0.10 U	1 U	5.1	0.10 U	0.10 U	0.10 U	1 U	0.96 U	0.10 U	0.10 UJ	0.10 U	NE
1,2,4-Trichlorobenzene	EPA 8260	µg/L	--	--	0.2 U	--	--	--	--	0.2 U	--	--	--	--	0.037
	EPA 8270	µg/L	0.10 U	0.10 U	1 U	0.95 U	0.10 U	0.10 U	0.10 U	1 U	0.96 U	0.10 U	0.10 UJ	0.10 U	0.037
2,4,5-Trichlorophenol	EPA 8270	µg/L	0.10 U	0.10 U	1 U	0.95 U	0.10 U	0.10 U	0.10 U	1 U	0.96 U	0.10 U	0.10 UJ	0.10 U	600
2,4,6-Trichlorophenol	EPA 8270	µg/L	0.10 U	0.10 U	1 U	0.95 U	0.10 U	0.10 U	0.10 U	1 U	0.96 U	0.10 U	0.10 UJ	0.10 U	0.28
Volatile Organic Compounds (VOCs)															
Acetone	EPA 8260	µg/L	--	--	5 U	--	--	--	--	5 U	--	--	--	--	NE
Benzene	EPA 8260	µg/L	--	--	0.2 U	--	--	--	--	0.2 U	--	--	--	--	1.6
Bromobenzene	EPA 8260	µg/L	--	--	0.2 U	--	--	--	--	0.2 U	--	--	--	--	NE
Bromochloromethane	EPA 8260	µg/L	--	--	0.2 U	--	--	--	--	0.2 U	--	--	--	--	NE
Bromoform (Tribromomethane)	EPA 8260	µg/L	--	--	1 U	--	--	--	--	1 U	--	--	--	--	12
Bromomethane	EPA 8260	µg/L	--	--	0.2 U	--	--	--	--	0.2 U	--	--	--	--	13
n-Butylbenzene	EPA 8260	µg/L	--	--	0.2 U	--	--	--	--	0.2 U	--	--	--	--	400
sec-Butylbenzene	EPA 8260	µg/L	--	--	0.2 U	--	--	--	--	0.2 U	--	--	--	--	800
tert-Butylbenzene	EPA 8260	µg/L	--	--	0.2 U	--	--	--	--	0.2 U	--	--	--	--	800
Carbon disulfide	EPA 8260	µg/L	--	--	0.2 U	--	--	--	--	0.2 U	--	--	--	--	400
Carbon tetrachloride	EPA 8260	µg/L	--	--	0.2 U	--	--	--	--	0.2 U	--	--	--	--	0.35
Chlorobenzene	EPA 8260	µg/L	--	--	0.2 U	--	--	--	--	0.2 U	--	--	--	--	200
Chloroethane	EPA 8260	µg/L	--	--	1 U	--	--	--	--	1 U	--	--	--	--	19,000
2-Chloroethyl vinyl ether	EPA 8260	µg/L	--	--	1 U	--	--	--	--	1 U	--	--	--	--	NE
Chloroform	EPA 8260	µg/L	--	--	0.2 U	--	--	--	--	0.2 U	--	--	--	--	1.2
Chloromethane	EPA 8260	µg/L	--	--	1 U	--	--	--	--	1 U	--	--	--	--	150
2-Chlorotoluene	EPA 8260	µg/L	--	--	0.2 U	--	--	--	--	0.2 U	--	--	--	--	160
4-Chlorotoluene	EPA 8260	µg/L	--	--	0.2 U	--	--	--	--	0.2 U	--	--	--	--	NE

Table D-2
Remedial Investigation Chemical Analytical Results - Groundwater COPCs
Port of Seattle - North Terminal 115
Seattle, Washington

Monitoring Well ¹	Analytical Method	Units	GMW-25	GMW-25	GMW-26	GMW-26	GMW-26	GMW-26	GMW-26	GMW-27	GMW-27	GMW-27	GMW-27	GMW-27	Groundwater Preliminary Cleanup Level ³ (PCUL)
Sample Date			01/21/15	04/21/15	11/5/2009	06/11/14	09/25/14	01/21/15	04/21/15	11/5/2009	06/12/14	09/24/14	01/22/15	04/20/15	
Monitoring Event			Jan-15	Apr-15	Nov-09	Jun-14	Sep-14	Jan-15	Apr-15	Nov-09	Jun-14	Sep-14	Jan-15	Apr-15	
Sampled By			GEI	GEI	Landau	GEI	GEI	GEI	GEI	Landau	GEI	GEI	GEI	GEI	
Dibromochloromethane	EPA 8260	µg/L	--	--	0.2 U	--	--	--	--	0.2 U	--	--	--	--	2.2
1,2-Dibromo-3-chloropropane	EPA 8260	µg/L	--	--	1 U	--	--	--	--	1 U	--	--	--	--	0.2
Dibromomethane	EPA 8260	µg/L	--	--	0.2 U	--	--	--	--	0.2 U	--	--	--	--	80
Bromodichloromethane	EPA 8260	µg/L	--	--	0.2 U	--	--	--	--	0.2 U	--	--	--	--	1.8
Dichlorodifluoromethane (CFC-12)	EPA 8260	µg/L	--	--	0.2 U	--	--	--	--	0.2 U	--	--	--	--	5.6
1,1-Dichloroethane	EPA 8260	µg/L	--	--	0.2 U	--	--	--	--	0.2 U	--	--	--	--	11
1,2-Dichloroethane	EPA 8260	µg/L	--	--	0.2 U	--	--	--	--	0.2 U	--	--	--	--	4.2
1,1-Dichloroethene	EPA 8260	µg/L	--	--	0.02 U	--	--	--	--	0.02 U	--	--	--	--	130
cis-1,2-Dichloroethene	EPA 8260	µg/L	--	--	0.2 U	--	--	--	--	0.2 U	--	--	--	--	16
trans-1,2-Dichloroethene	EPA 8260	µg/L	--	--	0.2 U	--	--	--	--	0.2 U	--	--	--	--	1,000
1,2-Dichloropropane	EPA 8260	µg/L	--	--	0.2 U	--	--	--	--	0.2 U	--	--	--	--	3.1
1,3-Dichloropropane	EPA 8260	µg/L	--	--	0.2 U	--	--	--	--	0.2 U	--	--	--	--	NE
2,2-Dichloropropane	EPA 8260	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE
1,1-Dichloropropene	EPA 8260	µg/L	--	--	0.2 U	--	--	--	--	0.2 U	--	--	--	--	NE
cis-1,3-Dichloropropene	EPA 8260	µg/L	--	--	0.2 U	--	--	--	--	0.2 U	--	--	--	--	2
trans-1,3-Dichloropropene	EPA 8260	µg/L	--	--	0.2 U	--	--	--	--	0.2 U	--	--	--	--	2
Ethylbenzene	EPA 8260	µg/L	--	--	0.2 U	--	--	--	--	0.2 U	--	--	--	--	31
1,2-Dibromoethane (EDB)	EPA 8260	µg/L	--	--	0.2 U	--	--	--	--	0.2 U	--	--	--	--	0.27
2-Hexanone	EPA 8260	µg/L	--	--	2 U	--	--	--	--	2 U	--	--	--	--	40
Isopropylbenzene (Cumene)	EPA 8260	µg/L	--	--	0.2 U	--	--	--	--	0.2 U	--	--	--	--	800
p-Isopropyltoluene	EPA 8260	µg/L	--	--	0.2 U	--	--	--	--	0.2 U	--	--	--	--	NE
2-Butanone (MEK)	EPA 8260	µg/L	--	--	5 U	--	--	--	--	5 U	--	--	--	--	1,700,000
Methyl iodide (Iodomethane)	EPA 8260	µg/L	--	--	1 U	--	--	--	--	1 U	--	--	--	--	NE
4-Methyl-2-pentanone (Methyl isobutyl ketone)	EPA 8260	µg/L	--	--	2 U	--	--	--	--	2 U	--	--	--	--	470,000
Methyl t-butyl ether (MTBE)	EPA 8260	µg/L	--	--	0.2 U	--	--	--	--	0.2 U	--	--	--	--	600
Methylene chloride	EPA 8260	µg/L	--	--	1 U	--	--	--	--	1 U	--	--	--	--	100
n-Propylbenzene	EPA 8260	µg/L	--	--	0.2 U	--	--	--	--	0.2 U	--	--	--	--	800
Styrene	EPA 8260	µg/L	--	--	0.2 U	--	--	--	--	0.2 U	--	--	--	--	8,200
1,1,1,2-Tetrachloroethane	EPA 8260	µg/L	--	--	0.2 U	--	--	--	--	0.2 U	--	--	--	--	7.4
1,1,2,2-Tetrachloroethane	EPA 8260	µg/L	--	--	0.2 U	--	--	--	--	0.2 U	--	--	--	--	0.3
Tetrachloroethene	EPA 8260	µg/L	--	--	0.2 U	--	--	--	--	0.2 U	--	--	--	--	2.9
Toluene	EPA 8260	µg/L	--	--	1 U	--	--	--	--	1 U	--	--	--	--	130
1,2,3-Trichlorobenzene	EPA 8260	µg/L	--	--	0.2 U	--	--	--	--	0.2 U	--	--	--	--	NE
1,1,1-Trichloroethane	EPA 8260	µg/L	--	--	0.2 U	--	--	--	--	0.2 U	--	--	--	--	5,500
1,1,2-Trichloroethane	EPA 8260	µg/L	--	--	0.2 U	--	--	--	--	0.2 U	--	--	--	--	0.9
Trichloroethene	EPA 8260	µg/L	--	--	0.2 U	--	--	--	--	0.2 U	--	--	--	--	0.7
Trichlorofluoromethane (CFC-11)	EPA 8260	µg/L	--	--	0.2 U	--	--	--	--	0.2 U	--	--	--	--	120
1,2,3-Trichloropropane	EPA 8260	µg/L	--	--	0.2 U	--	--	--	--	0.2 U	--	--	--	--	1,500
1,2,4-Trimethylbenzene	EPA 8260	µg/L	--	--	0.2 U	--	--	--	--	0.2 U	--	--	--	--	240
1,3,5-Trimethylbenzene	EPA 8260	µg/L	--	--	0.2 U	--	--	--	--	0.2 U	--	--	--	--	80
Vinyl acetate	EPA 8260	µg/L	--	--	2 U	--	--	--	--	2 U	--	--	--	--	7,800

Table D-2

Remedial Investigation Chemical Analytical Results - Groundwater COPCs

Port of Seattle - North Terminal 115

Seattle, Washington

Monitoring Well ¹	Analytical Method	Units	GMW-25	GMW-25	GMW-26	GMW-26	GMW-26	GMW-26	GMW-26	GMW-26	GMW-27	GMW-27	GMW-27	GMW-27	GMW-27	Groundwater Preliminary Cleanup Level ³ (PCUL)
Sample Date			01/21/15	04/21/15	11/5/2009	06/11/14	09/25/14	01/21/15	04/21/15	11/5/2009	06/12/14	09/24/14	01/22/15	04/20/15		
Monitoring Event			Jan-15	Apr-15	Nov-09	Jun-14	Sep-14	Jan-15	Apr-15	Nov-09	Jun-14	Sep-14	Jan-15	Apr-15		
Sampled By			GEI	GEI	Landau	GEI	GEI	GEI	GEI	Landau	GEI	GEI	GEI	GEI		
Vinyl chloride	EPA 8260	µg/L	--	--	0.02 U	--	--	--	--	0.02 U	--	--	--	--	0.18	
Xylene, m-,p-	EPA 8260	µg/L	--	--	0.4 U	--	--	--	--	0.4 U	--	--	--	--	290	
Xylene, o-	EPA 8260	µg/L	--	--	0.2 U	--	--	--	--	0.2 U	--	--	--	--	430	
Petroleum Hydrocarbons																
Gasoline-range hydrocarbons	NWTPH-G	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	800	
Diesel-range hydrocarbons	NWTPH-Dx	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	500	
Oil-range hydrocarbons	NWTPH-Dx	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	500	
Total diesel- and oil-range hydrocarbons	NWTPH-Dx	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	500	
Diesel-range hydrocarbons	NWTPH-Dx Si/Gel	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	500	
Oil-range hydrocarbons	NWTPH-Dx Si/Gel	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	500	
Total diesel- and oil-range hydrocarbons	NWTPH-Dx Si/Gel	µg/L	--	--	--	--	--	--	--	--	--	--	--	--	500	
Conventional Parameters																
Total organic carbon (TOC)	SM 5310B	mg/L	--	--	--	--	--	--	--	--	--	--	--	--	NE	
Field Measured Parameters																
pH	N/A	N/A	6.33	6.16	6.04	6.17	6.38	6.28	6.21	6.52	6.41	6.50	6.69	6.43	NE	

Notes:

- ¹ Monitoring well locations are shown on Figures 3-2 and 3-4.
- ² Insufficient water to collect groundwater sample for chemical analysis.
- ³ Groundwater screening levels referenced from Table 4-2.
- ⁴ Total dioxin/furan Toxic Equivalency Quotients (TEQs) were calculated using United States Environmental Protection Agency (USEPA) Toxicity Equivalency Factor (TEF) values for human health (EPA 2003).
- ⁵ Total carcinogenic PAH (cPAH) TEQs were calculated using TEF values referenced from MTCA Table 708.2 (WAC 173-340-900).

mg/L = milligram per liter

µg/L = microgram per liter

NE = not established

Landau = Landau Associates

GEI = GeoEngineers

NE = not established

J = estimated result

U = analyte not detected above the reporting limit

-- = not analyzed

COPC = Contaminant of Potential Concern

Bold indicates analyte was detected.

Yellow shading identifies the detected results greater than the preliminary cleanup level.

Blue shading identifies the non-detected result greater than the preliminary cleanup level.

Table D-3										
Remedial Investigation Chemical Analytical Results - Catch Basin Solid COPCs										
Port of Seattle - North Terminal 115										
Seattle, Washington										
Sample Location ¹	Analytical Method	Units	CB-313	CB-322	CB-323			CB-324	CB-328	Target Sediment Concentration ²
Sample Identification			CB-313	CB-322	CB-323	CB-323	CB-323-Dup	CB-324	CB-328	
Sampled By			GEI	GEI	Landau	GEI	GEI	GEI	GEI	
Sample Date			01/16/14	01/16/14	11/19/09	01/16/14	01/16/14	01/16/14	01/16/14	
Polychlorinated Biphenyls (PCBs)										
PCB-Aroclor 1016	EPA 8082	mg/kg	0.073 U	0.057 U	0.18 U	0.072 U	0.058 U	0.095 U	0.058 U	NE
PCB-Aroclor 1221	EPA 8082	mg/kg	0.073 U	0.057 U	0.18 U	0.072 U	0.058 U	0.095 U	0.058 U	NE
PCB-Aroclor 1232	EPA 8082	mg/kg	0.073 U	0.057 U	0.18 U	0.072 U	0.058 U	0.095 U	0.058 U	NE
PCB-Aroclor 1242	EPA 8082	mg/kg	0.073 U	0.057 U	0.18 U	0.072 U	0.058 U	0.095 U	0.058 U	NE
PCB-Aroclor 1248	EPA 8082	mg/kg	0.073 U	0.057 U	0.18 U	0.072 U	0.058 U	0.095 U	0.058 U	NE
PCB-Aroclor 1254	EPA 8082	mg/kg	0.13	0.057 U	0.18 U	0.072 U	0.058 U	0.095 U	0.095	NE
PCB-Aroclor 1260	EPA 8082	mg/kg	0.073 U	0.057 U	0.18 U	0.072 U	0.058 U	0.095 U	0.062	NE
Total PCB Aroclors	EPA 8082	mg/kg	0.13	0.057 U	0.18 U	0.072 U	0.058 U	0.095 U	0.16	0.13
Dioxins and Furans										
1,2,3,4,6,7,8-HpCDD	EPA 1613	mg/kg	0.000849	0.000303	--	0.000224	0.000284	0.000353	0.00221	NE
1,2,3,4,6,7,8-HpCDF	EPA 1613	mg/kg	0.000167	0.0000671	--	0.0000369	0.0000417	0.0000673	0.000267	NE
1,2,3,4,7,8,9-HpCDF	EPA 1613	mg/kg	0.0000145	0.0000049	--	0.00000279	0.00000323 J	0.00000475	0.0000199	NE
1,2,3,4,7,8-HxCDD	EPA 1613	mg/kg	0.00000824	0.00000518	--	0.00000295	0.00000358 J	0.00000573	0.0000252	NE
1,2,3,4,7,8-HxCDF	EPA 1613	mg/kg	0.00000879	0.00000393	--	0.00000229 J	0.00000277 J	0.00000401	0.0000132	NE
1,2,3,6,7,8-HxCDD	EPA 1613	mg/kg	0.000025	0.0000113	--	0.00000799	0.00000952	0.0000128	0.0000658	NE
1,2,3,6,7,8-HxCDF	EPA 1613	mg/kg	0.00000744	0.00000392	--	0.00000208 J	0.00000249 J	0.0000037	0.0000113	NE
1,2,3,7,8,9-HxCDD	EPA 1613	mg/kg	0.0000179	0.00000995	--	0.000000738	0.00000861	0.0000121	0.0000497	NE
1,2,3,7,8,9-HxCDF	EPA 1613	mg/kg	0.00000105 J	0.000000580 J	--	0.000000187 J	0.000000575 J	0.000000482 J	0.000617 J	NE
1,2,3,7,8-PeCDD	EPA 1613	mg/kg	0.00000508	0.00000372	--	0.00000262 J	0.00000291 J	0.00000376	0.0000131	NE
1,2,3,7,8-PeCDF	EPA 1613	mg/kg	0.00000180 J	0.00000169 J	--	0.000000814 J	0.000000834 J	0.00000108 J	0.00000283	NE
2,3,4,6,7,8-HxCDF	EPA 1613	mg/kg	0.00000106	0.00000538	--	0.00000289	0.00000347 J	0.00000543	0.0000168	NE
2,3,4,7,8-PeCDF	EPA 1613	mg/kg	0.00000285	0.00000158 J	--	0.000000832 J	0.000000932 J	0.00000167 J	0.00000361	NE
2,3,7,8-TCDD	EPA 1613	mg/kg	0.00000118	0.00000165	--	0.000000168	0.00000194	0.000000749	0.00000172	NE
2,3,7,8-TCDF	EPA 1613	mg/kg	0.00000166	0.00000195	--	0.000000901	0.00000103	0.00000135	0.00000268	NE
OCDD	EPA 1613	mg/kg	0.01140	0.00303	--	0.00222	0.0029	0.00326	0.02570	NE
OCDF	EPA 1613	mg/kg	0.000789	0.000253	--	0.000113	0.000134	0.000238	0.001170	NE
Total Dioxin/Furan TEQ ³ (ND=0)	EPA 1613	mg/kg	0.000029	0.00001485	--	0.00001058	0.00001256	0.0000149	0.00006755	0.0000002
Total Dioxin/Furan TEQ ³ (ND=0.5RL)	EPA 1613	mg/kg	0.000029	0.00001485	--	0.00001058	0.00001256	0.0000149	0.00006755	0.0000002
Metals										
Antimony	EPA 6000/7000	mg/kg	7.2	5.0 U	18 U	5.0 U	5.0 U	5.0 U	25	88
Arsenic	EPA 6000/7000	mg/kg	20	10	18 U	4.6	3.5	10	25	7
Barium	EPA 6000/7000	mg/kg	350	330	--	130	120	130	220	44,000
Beryllium	EPA 6000/7000	mg/kg	0.50 U	0.50 U	--	0.50 U	0.50 U	0.50 U	0.50 U	440
Cadmium	EPA 6000/7000	mg/kg	1.8	1.6	--	0.72	1.1	1.3	3.2	5.1
Chromium III/Total	EPA 6000/7000	mg/kg	100	79	34	33	29	50	96	260
Chromium VI	EPA 6000/7000	mg/kg	--	--	--	--	--	--	--	NE
Copper	EPA 6000/7000	mg/kg	220	140	150	100	110	130	530	390
Lead	EPA 6000/7000	mg/kg	180	120	59	61	74	79	330	450
Mercury	EPA 6000/7000	mg/kg	0.38	0.094	0.18 U	0.094	0.091	0.18	0.22	0.41
Nickel	EPA 6000/7000	mg/kg	69	52	--	30	29	43	54	4,400
Selenium	EPA 6000/7000	mg/kg	1.3	0.8	--	0.50 U	0.50 U	0.98	0.98	1,100
Silver	EPA 6000/7000	mg/kg	0.52	0.50 U	--	0.50 U	0.50 U	0.50 U	0.81	6.1
Thallium	EPA 6000/7000	mg/kg	0.25 U	0.25 U	--	0.25 U	0.25 U	0.25 U	0.25 U	2.2
Tin	EPA 6000/7000	mg/kg	100	600	640	10,000 J	15,000 J	490	220	130,000
Zinc	EPA 6000/7000	mg/kg	2,700	2,300	580	910 J	2,000 J	910	2,300	410
Semi-Volatile Organic Compounds (SVOCs) - Polycyclic Aromatic Hydrocarbons (PAHs)										
Acenaphthene	EPA 8270/SIM	mg/kg	0.058 U	0.046 U	0.024 U	0.057 U	0.047 U	0.076 U	0.046 U	0.5
Acenaphthylene	EPA 8270/SIM	mg/kg	0.18	0.046 U	0.024 U	0.057 U	0.047 U	0.076 U	0.077	1.3
Anthracene	EPA 8270/SIM	mg/kg	0.34	0.05	0.024 U	0.057 U	0.047 U	0.076 U	0.19	0.96
Benzo(a)anthracene	EPA 8270/SIM	mg/kg	1.5	0.22	0.03	0.14	0.18	0.22	0.3	1.3
Benzo(b)fluoranthene	EPA 8270/SIM	mg/kg	2.2	0.4	0.047	0.25	0.27	0.44	0.71	3.2
Benzo(k)fluoranthene	EPA 8270/SIM	mg/kg	0.38	0.085	0.031	0.057 U	0.068	0.098	0.19	3.2
Benzo(g,h,i)perylene	EPA 8270/SIM	mg/kg	1.4	0.33	0.044	0.21	0.21	0.36	0.47	0.67
Benzo(a)pyrene	EPA 8270/SIM	mg/kg	1.1	0.2	0.028	0.13	0.13	0.21	0.27	1.6
Chrysene	EPA 8270/SIM	mg/kg	2.9	0.42	0.072	0.31	0.35	0.49	0.72	1.4
Dibenzo(a,h)anthracene	EPA 8270/SIM	mg/kg	0.25	0.058	0.024 U	0.057 U	0.047 U	0.076 U	0.078	0.23
Dibenzofuran	EPA 8270/SIM	mg/kg	0.29 U	0.23 U	0.60 U	0.29 U	0.23 U	0.38 U	0.23 U	0.54
Fluoranthene	EPA 8270/SIM	mg/kg	2.6	0.32	0.077	0.27	0.37	0.39	0.72	1.7
Fluorene	EPA 8270/SIM	mg/kg	0.14	0.046 U	0.024 U	0.057 U	0.048	0.076 U	0.064	0.54
Indeno(1,2,3-c,d)pyrene	EPA 8270/SIM	mg/kg	0.75	0.16	0.024 U	0.099	0.11	0.17	0.21	0.6
1-Methylnaphthalene	EPA 8270/SIM	mg/kg	0.058 U	0.046 U	0.024 U	0.057 U	0.047 U	0.076 U	0.046 U	29
2-Methylnaphthalene	EPA 8270/SIM	mg/kg	0.066	0.046 U	0.024 U	0.057 U	0.047 U	0.076 U	0.046 U	0.67
Naphthalene	EPA 8270/SIM	mg/kg	0.085	0.046 U	0.024 U	0.057 U	0.047 U	0.076 U	0.048	2.1
Phenanthrene	EPA 8270/SIM	mg/kg	1.1	0.15	0.025	0.15	0.17	0.2	0.32	1.5
Pyrene	EPA 8270/SIM	mg/kg	2.5	0.35	0.072	0.27	0.34	0.37	0.73	2.6
Total LPAHs ⁴	EPA 8270/SIM	mg/kg	1.91	0.2	0.025	0.15	0.22	0.2	0.32	5.2
Total HPAHs ⁵	EPA 8270/SIM	mg/kg	15.58	2.54	0.4	1.58	2.03	2.75	4.59	12
Total cPAH TEQ ⁶ (ND=0)	EPA 8270/SIM	mg/kg	1.60	0.30	0.04	0.18	0.20	0.31	0.43	0.09
Total cPAH TEQ ⁶ (ND=0.5RL)	EPA 8270/SIM	mg/kg	1.60	0.30	0.04	0.19	0.20	0.31	0.43	0.09
Other SVOCs										
Aniline	EPA 8270	mg/kg	1.5 U	1.2 U	0.60 U	1.5 U	1.2 U	1.8 U	1.2 U	150
Benzidine	EPA 8270	mg/kg	0.29 U	0.23 U	6.0 U	0.29 U	0.23 U	0.38 U	0.23 U	NE
Benzoic Acid	EPA 8270	mg/kg	1.5 UJ	1.2 UJ	--	1.5 UJ	1.2 UJ	1.8 UJ	1.2 UJ	0.65
Benzyl Alcohol	EPA 8270	mg/kg	0.29 U	0.23 U	0.60 U	0.29 U	0.23 U	0.38 U	0.23 U	0.057
Bis(2-Chloroethoxy)methane	EPA 8270	mg/kg	0.29 U	0.23 U	0.60 U	0.29 U	0.23 U	0.38 U	0.23 U	NE
Bis(2-Chloroethyl)ether	EPA 8270	mg/kg	0.29 U	0.23 U	0.60 U	0.29 U	0.23 U	0.38 U	0.23 U	0.78
Bis(2-Chloroisopropyl)ether	EPA 8270	mg/kg	0.29 U	0.23 U	0.60 U	0.29 U	0.23 U	0.38 U	0.23 U	NE
Bis(2-Ethylhexyl)phthalate	EPA 8270	mg/kg	12	48	2.5	9.7 J	20 J	18	12	1.3
4-Bromophenyl phenyl ether	EPA 8270	mg/kg	0.29 U	0.23 U	0.60 U	0.29 U	0.23 U	0.38 U	0.23 U	NE
Butyl benzyl phthalate	EPA 8270	mg/kg	1.4	0.23 U	0.60 U	0.29 U	0.23 U	0.38 U	5	0.063
Carbazole	EPA 8270	mg/kg	0.29 U	0.23 U	0.60 U	0.29 U	0.23 U	0.38 U	0.23 U	NE
4-Chloroaniline										

Table D-3										
Remedial Investigation Chemical Analytical Results - Catch Basin Solid COPCs										
Port of Seattle - North Terminal 115										
Seattle, Washington										
Sample Location ¹	Analytical Method	Units	CB-313	CB-322	CB-323			CB-324	CB-328	Target Sediment Concentraion ²
Sample Identification			CB-313	CB-322	CB-323	CB-323	CB-323-Dup	CB-324	CB-328	
Sampled By			GEI	GEI	Landau	GEI	GEI	GEI	GEI	
Sample Date			01/16/14	01/16/14	11/19/09	01/16/14	01/16/14	01/16/14	01/16/14	
4-Chlorophenyl phenyl ether	EPA 8270	mg/kg	0.29 U	0.23 U	0.60 U	0.29 U	0.23 U	0.38 U	0.23 U	NE
Decane	EPA 8270	mg/kg	0.29 UJ	0.23 UJ	--	0.29 UJ	0.23 UJ	0.38 UJ	0.23 UJ	NE
Dibutyl phthalate	EPA 8270	mg/kg	0.29 U	0.23 U	0.60 U	0.29 U	0.23 U	0.38 U	0.68	1.4
2,3-Dichloroaniline	EPA 8270	mg/kg	0.29 U	0.23 U	0.60 U	0.29 U	0.23 U	0.38 U	0.23 U	NE
1,2-Dichlorobenzene (o-Dichlorobenzene)	EPA 8260	mg/kg	0.0026 UJ	0.0018 UJ	--	0.0021 U	0.0018 U	0.0030 UJ	0.0013 U	0.035
	EPA 8270	mg/kg	0.29 U	0.23 U	0.60 U	0.29 U	0.23 U	0.38 U	0.23 U	0.035
1,3-Dichlorobenzene (m-Dichlorobenzene)	EPA 8260	mg/kg	0.0026 UJ	0.0018 UJ	--	0.0021 U	0.0018 U	0.0030 UJ	0.0013 U	NE
	EPA 8270	mg/kg	0.29 U	0.23 U	0.60 U	0.29 U	0.23 U	0.38 U	0.23 U	NE
1,4-Dichlorobenzene (p-Dichlorobenzene)	EPA 8260	mg/kg	0.0026 UJ	0.0018 UJ	--	0.0021 U	0.0018 U	0.0030 UJ	0.0013 U	0.11
	EPA 8270	mg/kg	0.29 U	0.23 U	0.60 U	0.29 U	0.23 U	0.38 U	0.23 U	0.11
3,3'-Dichlorobenzidine	EPA 8270	mg/kg	0.29 U	0.23 U	0.60 U	0.29 U	0.23 U	0.38 U	0.23 U	1.9
2,4-Dichlorophenol	EPA 8270	mg/kg	0.29 U	0.23 U	0.60 U	0.29 U	0.23 U	0.38 U	0.23 U	510
Bis(2-ethylhexyl)ester	EPA 8270	mg/kg	0.29 U	0.23 U	0.60 U	0.29 U	0.23 U	0.38 U	0.23 U	NE
Diethyl phthalate	EPA 8270	mg/kg	1.5 U	1.2 U	0.60 U	1.5 U	1.2 U	1.8 U	1.2 U	0.2
Dimethyl phthalate	EPA 8270	mg/kg	0.29 U	0.23 U	0.60 U	0.29 U	0.23 U	0.38 U	0.23 U	0.071
2,4-Dimethylphenol	EPA 8270	mg/kg	0.29 U	0.23 U	0.60 U	0.29 U	0.23 U	0.38 U	0.23 U	0.029
1,2-Dinitrobenzene	EPA 8270	mg/kg	0.29 U	0.23 U	0.60 U	0.29 U	0.23 U	0.38 U	0.23 U	NE
1,3-Dinitrobenzene	EPA 8270	mg/kg	1.5 UJ	1.2 UJ	0.60 U	1.5 UJ	1.2 UJ	1.8 UJ	1.2 UJ	NE
1,4-Dinitrobenzene	EPA 8270	mg/kg	0.29 UJ	0.23 UJ	0.60 U	0.29 UJ	0.23 UJ	0.38 UJ	0.23 UJ	NE
4,6-Dinitro-2-Methylphenol	EPA 8270	mg/kg	1.5 UJ	1.2 UJ	3.0 U	1.5 UJ	1.2 UJ	1.8 UJ	1.2 UJ	NE
2,4-Dinitrophenol	EPA 8270	mg/kg	1.5 UJ	1.2 UJ	0.60 U	1.5 UJ	1.2 UJ	1.8 UJ	1.2 UJ	340
2,4-Dinitrotoluene	EPA 8270	mg/kg	0.29 U	0.23 U	0.60 U	0.29 U	0.23 U	0.38 U	0.23 U	2.8
2,6-Dinitrotoluene	EPA 8270	mg/kg	0.29 U	0.23 U	0.60 U	0.29 U	0.23 U	0.38 U	0.23 U	0.57
Di-N-Octyl Phthalate	EPA 8270	mg/kg	0.29 U	0.23 U	0.60 U	0.29 UJ	2.0 J	0.38 U	0.23 U	6.2
1,2-Diphenylhydrazine	EPA 8270	mg/kg	0.29 U	0.23 U	0.60 U	0.29 U	0.23 U	0.38 U	0.23 U	NE
Hexachlorobenzene	EPA 8270	mg/kg	0.29 U	0.23 U	0.60 U	0.29 U	0.23 U	0.38 U	0.23 U	0.001
Hexachlorobutadiene	EPA 8260	mg/kg	0.013 UJ	0.0092 UJ	--	0.011 U	0.0089 U	0.015 UJ	0.0065 U	0.011
	EPA 8270	mg/kg	0.29 U	0.23 U	0.60 U	0.29 U	0.23 U	0.38 U	0.23 U	0.011
Hexachlorocyclopentadiene	EPA 8270	mg/kg	0.29 U	0.23 U	0.60 U	0.29 U	0.23 U	0.38 U	0.23 U	1,000
Hexachloroethane	EPA 8270	mg/kg	0.29 U	0.23 U	0.60 U	0.29 U	0.23 U	0.38 U	0.23 U	21
Isophorone	EPA 8270	mg/kg	0.29 U	0.23 U	0.60 U	0.29 U	0.23 U	0.38 U	0.23 U	900
2-Methylphenol (o-Cresol)	EPA 8270	mg/kg	0.29 U	0.23 U	0.60 U	0.29 U	0.23 U	0.38 U	0.23 U	0.063
3 & 4 Methylphenol (m & p-Cresol)	EPA 8270	mg/kg	0.29 U	0.23 U	0.60 U	0.29 UJ	1.1 J	1.4	0.23 U	0.67
2-Nitroaniline	EPA 8270	mg/kg	0.29 U	0.23 U	0.60 U	0.29 U	0.23 U	0.38 U	0.23 U	1,700
3-Nitroaniline	EPA 8270	mg/kg	0.29 U	0.23 U	0.60 U	0.29 U	0.23 U	0.38 U	0.23 U	NE
4-Nitroaniline	EPA 8270	mg/kg	0.29 U	0.23 U	0.60 U	0.29 U	0.23 U	0.38 U	0.23 U	NE
Nitrobenzene	EPA 8270	mg/kg	0.29 U	0.23 U	0.60 U	0.29 U	0.23 U	0.38 U	0.23 U	340
2-Nitrophenol	EPA 8270	mg/kg	0.29 U	0.23 U	0.60 U	0.29 U	0.23 U	0.38 U	0.23 U	NE
4-Nitrophenol (p-Nitrophenol)	EPA 8270	mg/kg	0.29 U	0.23 U	0.60 U	0.29 U	0.23 U	0.38 U	0.23 U	NE
n-Nitrosodimethylamine	EPA 8270	mg/kg	0.29 U	0.23 U	0.60 U	0.29 U	0.23 U	0.38 U	0.23 U	0.025
n-Nitrosodiphenylamine (as Diphenylamine)	EPA 8270	mg/kg	0.29 U	0.23 U	0.60 U	0.29 U	0.23 U	0.38 U	0.23 U	0.028
n-Nitrosodi-n-Propylamine	EPA 8270	mg/kg	0.29 U	0.23 U	0.60 U	0.29 U	0.23 U	0.38 U	0.23 U	0.12
n-Octadecane	EPA 8270	mg/kg	2.3 J	0.23 UJ	0.60 U	0.29 UJ	0.23 UJ	1.1 J	0.23 UJ	NE
Pentachlorophenol	EPA 8270	mg/kg	1.5 UJ	1.2 UJ	3.0 U	1.5 UJ	1.2 UJ	1.8 UJ	1.2 UJ	0.36
Phenol	EPA 8270	mg/kg	0.29 U	0.23 U	0.60 U	0.29 U	0.23 U	0.38 U	0.23 U	0.42
Pyridine	EPA 8270	mg/kg	0.29 U	0.23 U	0.60 U	0.29 U	0.23 U	0.38 U	0.23 U	NE
2,3,4,6-Tetrachlorophenol	EPA 8270	mg/kg	0.29 U	0.23 U	0.60 U	0.29 U	0.23 U	0.38 U	0.23 U	NE
2,3,5,6-Tetrachlorophenol	EPA 8270	mg/kg	0.29 UJ	0.23 UJ	0.60 U	0.29 UJ	0.23 UJ	0.38 UJ	0.23 UJ	NE
1,2,4-Trichlorobenzene	EPA 8260	mg/kg	0.0026 UJ	0.0018 UJ	--	0.0021 U	0.0018 U	0.0030 UJ	0.0013 U	0.031
	EPA 8270	mg/kg	0.29 U	0.23 U	0.60 U	0.29 U	0.23 U	0.38 U	0.23 U	0.031
2,4,5-Trichlorophenol	EPA 8270	mg/kg	0.29 U	0.23 U	0.60 U	0.29 U	0.23 U	0.38 U	0.23 U	17,000
2,4,6-Trichlorophenol	EPA 8270	mg/kg	0.29 U	0.23 U	0.60 U	0.29 U	0.23 U	0.38 U	0.23 U	78
Volatile Organic Compounds (VOCs)										
Acetone	EPA 8260	mg/kg	0.67 J	0.31	--	0.16 J	0.096 J	0.36	0.098	NE
Benzene	EPA 8260	mg/kg	0.0026 U	0.0018 U	--	0.0021 U	0.0018 U	0.0030 U	0.0013 U	NE
Bromobenzene	EPA 8260	mg/kg	0.0026 UJ	0.0018 UJ	--	0.0021 U	0.0018 U	0.0030 UJ	0.0013 U	NE
Bromochloromethane	EPA 8260	mg/kg	0.0026 U	0.0018 U	--	0.0021 U	0.0018 U	0.0030 U	0.0013 U	NE
Bromoform (Tribromomethane)	EPA 8260	mg/kg	0.0026 UJ	0.0018 U	--	0.0021 U	0.0018 U	0.0030 U	0.0013 U	NE
Bromomethane	EPA 8260	mg/kg	0.0026 U	0.0018 U	--	0.0021 U	0.0018 U	0.0030 U	0.0013 U	NE
n-Butylbenzene	EPA 8260	mg/kg	0.0026 UJ	0.0018 UJ	--	0.0021 U	0.0018 U	0.0030 UJ	0.0013 U	NE
sec-Butylbenzene	EPA 8260	mg/kg	0.0061 J	0.0018 UJ	--	0.0021 U	0.0018 U	0.0030 UJ	0.0013 U	NE
tert-Butylbenzene	EPA 8260	mg/kg	0.0026 UJ	0.0018 UJ	--	0.0021 U	0.0018 U	0.0030 UJ	0.0013 U	NE
Carbon disulfide	EPA 8260	mg/kg	0.019	0.006	--	0.0021 U	0.0018 U	0.017	0.0026	NE
Carbon tetrachloride	EPA 8260	mg/kg	0.0026 U	0.0018 U	--	0.0021 U	0.0018 U	0.0030 U	0.0013 U	NE
Chlorobenzene	EPA 8260	mg/kg	0.0026 UJ	0.0018 U	--	0.0021 U	0.0018 U	0.0030 U	0.0013 U	NE
Chloroethane	EPA 8260	mg/kg	0.013 U	0.0092 U	--	0.011 U	0.0089 U	0.015 U	0.0065 U	NE
2-Chloroethyl vinyl ether	EPA 8260	mg/kg	0.013 UJ	0.0092 UJ	--	0.011 UJ	0.0089 UJ	0.015 UJ	0.0065 UJ	NE
Chloroform	EPA 8260	mg/kg	0.0026 U	0.0018 U	--	0.0021 U	0.0018 U	0.0030 U	0.0013 U	NE
Chloromethane	EPA 8260	mg/kg	0.013 U	0.0092 U	--	0.011 U	0.0089 U	0.015 U	0.0065 U	NE
2-Chlorotoluene	EPA 8260	mg/kg	0.0026 UJ	0.0018 UJ	--	0.0021 U	0.0018 U	0.0030 UJ	0.0013 U	NE
4-Chlorotoluene	EPA 8260	mg/kg	0.0026 UJ	0.0018 UJ	--	0.0021 U	0.0018 U	0.0030 UJ	0.0013 U	NE
Dibromochloromethane	EPA 8260	mg/kg	0.0026 UJ	0.0018 U	--	0.0021 U	0.0018 U	0.0030 U	0.0013 U	NE
1,2-Dibromo-3-chloropropane	EPA 8260	mg/kg	--	--	--	--	--	--	--	NE
Dibromomethane	EPA 8260	mg/kg	0.0026 U	0.0018 U	--	0.0021 U	0.0018 U	0.0030 U	0.0013 U	NE
Bromodichloromethane (Dichlorobromomethane)	EPA 8260	mg/kg	0.0026 U	0.0018 U	--	0.0021 U	0.0018 U	0.0030 U	0.0013 U	NE
Dichlorodifluoromethane (CFC-12)	EPA 8260	mg/kg	0.0026 U	0.0018 U	--	0.0021 U	0.0018 U	0.0030 U	0.0013 U	NE
1,1-Dichloroethane	EPA 8260	mg/kg	0.0026 U	0.0018 U	--	0.0021 U	0.0018 U	0.0030 U	0.0013 U	NE
1,2-Dichloroethane	EPA 8260	mg/kg	0.0026 U	0.0018 U	--	0.0021 U	0.0018 U	0.0030 U	0.0013 U	NE
1,1-Dichloroethene	EPA 8260	mg/kg	0.0026 U	0.0018 U	--	0.0021 U	0.0018 U	0.0030 U	0.0013 U	NE

Table D-3										
Remedial Investigation Chemical Analytical Results - Catch Basin Solid COPCs										
Port of Seattle - North Terminal 115										
Seattle, Washington										
Sample Location ¹	Analytical Method	Units	CB-313	CB-322	CB-323			CB-324	CB-328	Target Sediment Concentraion ²
Sample Identification			CB-313	CB-322	CB-323	CB-323	CB-323-Dup	CB-324	CB-328	
Sampled By			GEI	GEI	Landau	GEI	GEI	GEI	GEI	
Sample Date			01/16/14	01/16/14	11/19/09	01/16/14	01/16/14	01/16/14	01/16/14	
cis-1,2-Dichloroethene	EPA 8260	mg/kg	0.0026 U	0.0018 U	--	0.0021 U	0.0018 U	0.0030 U	0.0013 U	NE
trans-1,2-Dichloroethene	EPA 8260	mg/kg	0.0026 U	0.0018 U	--	0.0021 U	0.0018 U	0.0030 U	0.0013 U	NE
1,2-Dichloropropane	EPA 8260	mg/kg	0.0026 U	0.0018 U	--	0.0021 U	0.0018 U	0.0030 U	0.0013 U	NE
1,3-Dichloropropane	EPA 8260	mg/kg	0.0026 UJ	0.0018 U	--	0.0021 U	0.0018 U	0.0030 U	0.0013 U	NE
2,2-Dichloropropane	EPA 8260	mg/kg	0.0026 U	0.0018 U	--	0.0021 U	0.0018 U	0.0030 U	0.0013 U	NE
1,1-Dichloropropene	EPA 8260	mg/kg	0.0026 U	0.0018 U	--	0.0021 U	0.0018 U	0.0030 U	0.0013 U	NE
cis-1,3-Dichloropropene	EPA 8260	mg/kg	0.0026 U	0.0018 U	--	0.0021 U	0.0018 U	0.0030 U	0.0013 U	NE
trans-1,3-Dichloropropene	EPA 8260	mg/kg	0.0026 UJ	0.0018 U	--	0.0021 U	0.0018 U	0.0030 U	0.0013 U	NE
Ethylbenzene	EPA 8260	mg/kg	0.013 J	0.0018 U	--	0.0021 U	0.0018 U	0.017	0.0013 U	NE
1,2-Dibromoethane (EDB)	EPA 8260	mg/kg	0.0026 UJ	0.0018 U	--	0.0021 U	0.0018 U	0.0030 U	0.0013 U	NE
2-Hexanone	EPA 8260	mg/kg	0.013 UJ	0.0092 U	--	0.011 U	0.0089 U	0.015 U	0.0065 U	NE
Isopropylbenzene (Cumene)	EPA 8260	mg/kg	0.0026 UJ	0.0018 U	--	0.0021 U	0.0018 U	0.0030 U	0.0013 U	NE
p-Isopropyltoluene	EPA 8260	mg/kg	0.097 J	0.20 J	--	0.0055	0.0067	3.8	0.0013 U	NE
2-Butanone (MEK)	EPA 8260	mg/kg	0.17	0.079	--	0.079 J	0.024 J	0.096	0.025	NE
Methyl iodide (Iodomethane)	EPA 8260	mg/kg	0.013 U	0.0092 U	--	0.011 U	0.0089 U	0.015 U	0.0065 U	NE
4-Methyl-2-pentanone (Methyl isobutyl ketone)	EPA 8260	mg/kg	0.043	0.0092 U	--	0.011 U	0.0089 U	0.015 U	0.0065 U	NE
Methyl tert-butyl ether (MTBE)	EPA 8260	mg/kg	0.0026 U	0.0018 U	--	0.0021 U	0.0018 U	0.0030 U	0.0013 U	NE
Methylene chloride	EPA 8260	mg/kg	0.013 U	0.0092 U	--	0.011 U	0.0089 U	0.015 U	0.0065 U	NE
n-Propylbenzene	EPA 8260	mg/kg	0.0036 J	0.0018 UJ	--	0.0021 U	0.0018 U	0.0031 J	0.0013 U	NE
Styrene	EPA 8260	mg/kg	0.0026 UJ	0.0022	--	0.0021 U	0.0018 U	0.0030 U	0.0013 U	NE
1,1,1,2-Tetrachloroethane	EPA 8260	mg/kg	0.0026 UJ	0.0018 U	--	0.0021 U	0.0018 U	0.0030 U	0.0013 U	NE
1,1,2,2-Tetrachloroethane	EPA 8260	mg/kg	0.0026 UJ	0.0018 UJ	--	0.0021 U	0.0018 U	0.0030 UJ	0.0013 U	NE
Tetrachloroethene	EPA 8260	mg/kg	0.0026 UJ	0.0018 U	--	0.0021 U	0.0018 U	0.0030 U	0.0013 U	NE
Toluene	EPA 8260	mg/kg	0.048	0.021	--	0.011 U	0.0089 U	0.83 J	0.0065 U	NE
1,2,3-Trichlorobenzene	EPA 8260	mg/kg	0.0026 UJ	0.0018 UJ	--	0.0021 U	0.0018 U	0.0030 UJ	0.0013 U	NE
1,1,1-Trichloroethane	EPA 8260	mg/kg	0.0026 U	0.0018 U	--	0.0021 U	0.0018 U	0.0030 U	0.0013 U	NE
1,1,2-Trichloroethane	EPA 8260	mg/kg	0.0026 UJ	0.0018 U	--	0.0021 U	0.0018 U	0.0030 U	0.0013 U	NE
Trichloroethene	EPA 8260	mg/kg	0.0026 U	0.0018 U	--	0.0021 U	0.0018 U	0.0030 U	0.0013 U	NE
Trichlorofluoromethane (CFC-11)	EPA 8260	mg/kg	0.0026 U	0.0018 U	--	0.0021 U	0.0018 U	0.0030 U	0.0013 U	NE
1,2,3-Trichloropropane	EPA 8260	mg/kg	0.0026 UJ	0.0018 UJ	--	0.0021 U	0.0018 U	0.0030 UJ	0.0013 U	NE
1,2,4-Trimethylbenzene	EPA 8260	mg/kg	0.031 J	0.0071 J	--	0.0021 U	0.0018 U	0.0075 J	0.0013 U	NE
1,3,5-Trimethylbenzene	EPA 8260	mg/kg	0.018 J	0.0039 J	--	0.0021 U	0.0018 U	0.0032 J	0.0013 U	NE
Vinyl acetate	EPA 8260	mg/kg	0.013 U	0.0092 U	--	0.011 U	0.0089 U	0.015 U	0.0065 U	NE
Vinyl chloride	EPA 8260	mg/kg	0.0026 U	0.0018 U	--	0.0021 U	0.0018 U	0.0030 U	0.0013 U	NE
Xylene, m-,p-	EPA 8260	mg/kg	0.018 J	0.0046	--	0.0042 U	0.0035 U	0.0059 U	0.0026 U	NE
Xylene, o-	EPA 8260	mg/kg	0.019 J	0.0044	--	0.0021 U	0.0018 U	0.0030 U	0.0013 U	NE
Petroleum Hydrocarbons										
Gasoline-range hydrocarbons	NWTPH-G	mg/kg	9.7 UJ	6.3 UJ	--	9.9 U	7.3 UJ	14 UJ	6.6 U	NE
Diesel-range hydrocarbons	NWTPH-Dx	mg/kg	1,100 J	690 U	--	1,200 U	950 U	1,500 U	780 U	NE
Oil-range hydrocarbons	NWTPH-Dx	mg/kg	10,000	4,800	--	7,600	6,700	8,700	5,500	NE
Total diesel- and oil-range hydrocarbons	NWTPH-Dx	mg/kg	11,100 J	4,800	--	7,600	6,700	8,700	5,500	NE

Notes:

¹ Sample locations are shown on Figure 3-5.

² The Target Sediment Concentration screening levels developed by Ecology are used for comparison to the catch basin solid results (Table 4-3).

³ Total dioxin/furan TEQs were calculated using United States Environmental Protection Agency (USEPA) TEF values for human health (EPA, 2003).

⁴ Total LPAHs are the sum of detected acenaphthene, acenaphthylene, anthracene, fluorene, 2-methylnaphthalene, naphthalene and phenanthrene.

⁵ Total HPAHs are the sum of detected benzo(a)anthracene, benzo(a)pyrene, benzofluoranthenes, benzo(g,h,i)perylene, chrysene, dibenzo(a,h)anthracene, fluoranthene, indeno(1,2,3)pyrene and pyrene.

⁶ Total carcinogenic PAHs (cPAHs) calculated using toxic equivalent (TEQ) methodology relative to benzo(a)pyrene. cPAHs that were not detected were assigned a value of half of the reporting limit (ND=0.5RL) for these calculations.

NE = not established

LPAH = Low Molecular Weight PAH

HPAH = High Molecular Weight PAH

J = estimated result

U = analyte not detected above the reported sample quantization limit

EPA = Environmental Protection Agency

mg/kg = milligram per kilogram

-- = not analyzed

Bold indicates analyte was detected.

Yellow shading identifies the detected results greater than the catch basin solids screening level.

Blue shading identifies the non-detected result greater than the catch basin solids screening level.

Appendix E

Historical Exploration and Well Completion Logs

Appendix F

Glacier Bay and LDW Sediment Investigation

Appendix G

Field Procedures

Appendix H

Tidal Study

Appendix I

Hydraulic Conductivity Study

Appendix J

Stormwater System Video Survey
(Provided as a Separate Electronic Deliverable)

Appendix K

Laboratory Data Reports

Appendix L

Data Validation Reports

Appendix M

Data Concentration Figures

Sampling Location

T115N Site*

- Grab Sample (SKCDPH 1998)
- Soil Characterization Study/Monitoring Well (Landau 2009)
- Remedial Investigation/Monitoring Well (GeoEngineers 2014)

Glacier Northwest Site*

- ⊕ Soil Characterization Study/Monitoring Well (Shaw 2003)
- ▲ Soil Characterization Study (RETEC 1995)
- Soil Characterization Study 2/Monitoring Well (RETEC 1995)
- Remedial Investigation (ERM 2015)

* Gray Symbol and Sample ID Denotes No Sample Data

Stratigraphic Units

AD – Alluvial Deposit: Native LDW alluvial deposits comprised of layers of clay, fine silt and sand interspersed with coarser sands and gravels measuring to depths greater than 30 feet.

OS – Organic Silt: Native organic silt layer overlying portions of the LDW alluvium deposits comprised of organic rich clayey silt having low to medium plasticity measuring up to approximately 5 feet in thickness where encountered.

FI – Initial Fill: Fill material from unknown source(s) placed prior to the early 1930s to raise the western portion of T115N above MHHW and is comprised of cohesive silt and clay with variable sand and gravel content.

FD – Dredged Fill: Dredged LDW sediment placed from the late 1940s through the mid-1970s and is comprised of poorly graded, fine to medium sandy silt having a high organic content.

FO – Operational Fill: Fill material from unknown source(s) placed in the early 1960s to raise the existing grade of T115N and create additional land east to the east to facilitate tin reclamation operations and predominantly consists of silt and sand with variable gravel content.

FT – Terminal Fill: Dredged LDW sediment and fill from unknown source(s) placed in the early 1970s to create land that would become the Port of Seattle Terminal 115 and is comprised of undifferentiated sand with variable silt and gravel content.

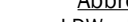
FS – Storm Drain Line Fill: Fill material from unknown source(s) placed in 1972 to backfill the 48-inch-diameter SPU storm drain trench spanning West Marginal Way and the LDW along the northern portion of T115N and is generally characterized as a fine to coarse gravel with variable silt and sand content.

FP – Pond Fill: Fill material placed in the early 1980s to infill the former evaporation /settling ponds used for historical tin reclamation operations and is comprised of layered silt and sand with variable gravel content.

Current Feature

-  T115N
-  Elevation Contours (Feet NAVD88)
-  Fence
-  Railroad Tracks (Buried)
-  Slope Armor (Rip Rap)
-  Compact Gravel
-  Soil/Vegetation
-  Concrete Pavement
-  Underground Power Line
-  Sanitary Sewer Line
-  Storm Drain Line
-  Telecommunication Line
-  Cable Line
-  Catch Basin
-  Sign Post
-  Manhole Cover

Historical Feature

-  Historical Shoreline (Approximate)
-  1965 Shoreline (Approximate)
-  Approximate Location of Former Settling Ponds
-  Approximate Location of Former Underground Fuel Storage Tank (UST)
-  Former Above Ground Storage Tank (AST)
-  AST Spill Containment Curb (Approximate)

Abbreviations

- LDW – Lower Duwamish Waterway
- T115N – North Terminal 115 Site
- AST – Above Ground Storage Tank
- UST – Underground Storage Tank
- NAD 83 – North American Datum 1983
- NAVD88 – North American Vertical Datum 1988
- MHHW – Mean Higher High Water
- PCUL – Preliminary Cleanup Level
- ft bgs – Feet Below Ground Surface
- mg/kg – Milligram Per Kilogram
- ng/kg – Nanogram Per Kilogram
- µg/L – Microgram Per Liter
- ng/L – Nanogram Per Liter
- U – Not Detected Greater Than The Reporting Limit
- J – Estimated Concentration
- – Not Analyzed
- ND – Non-Detect
- RL – Reporting Limit

Notes:

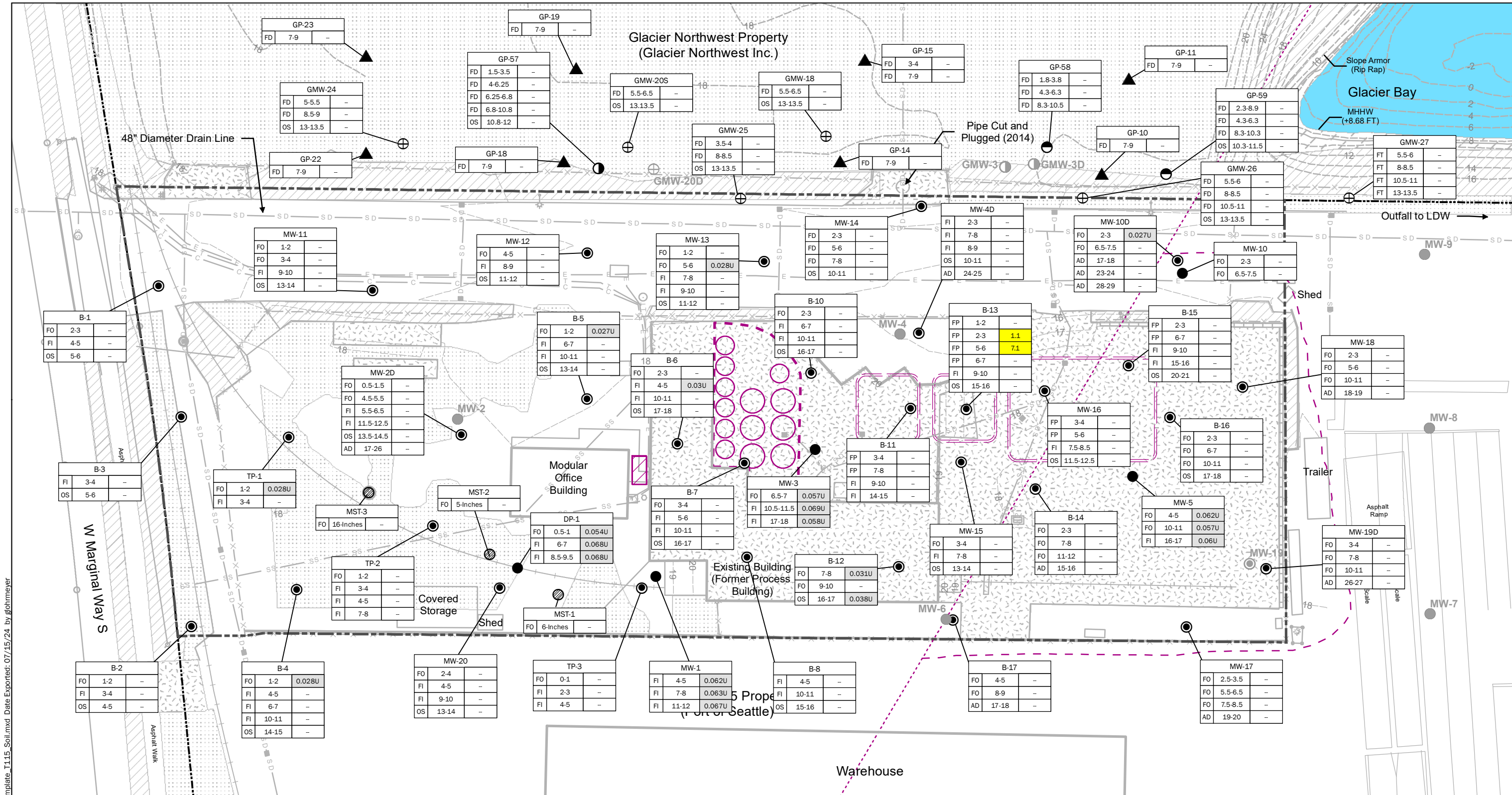
1. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

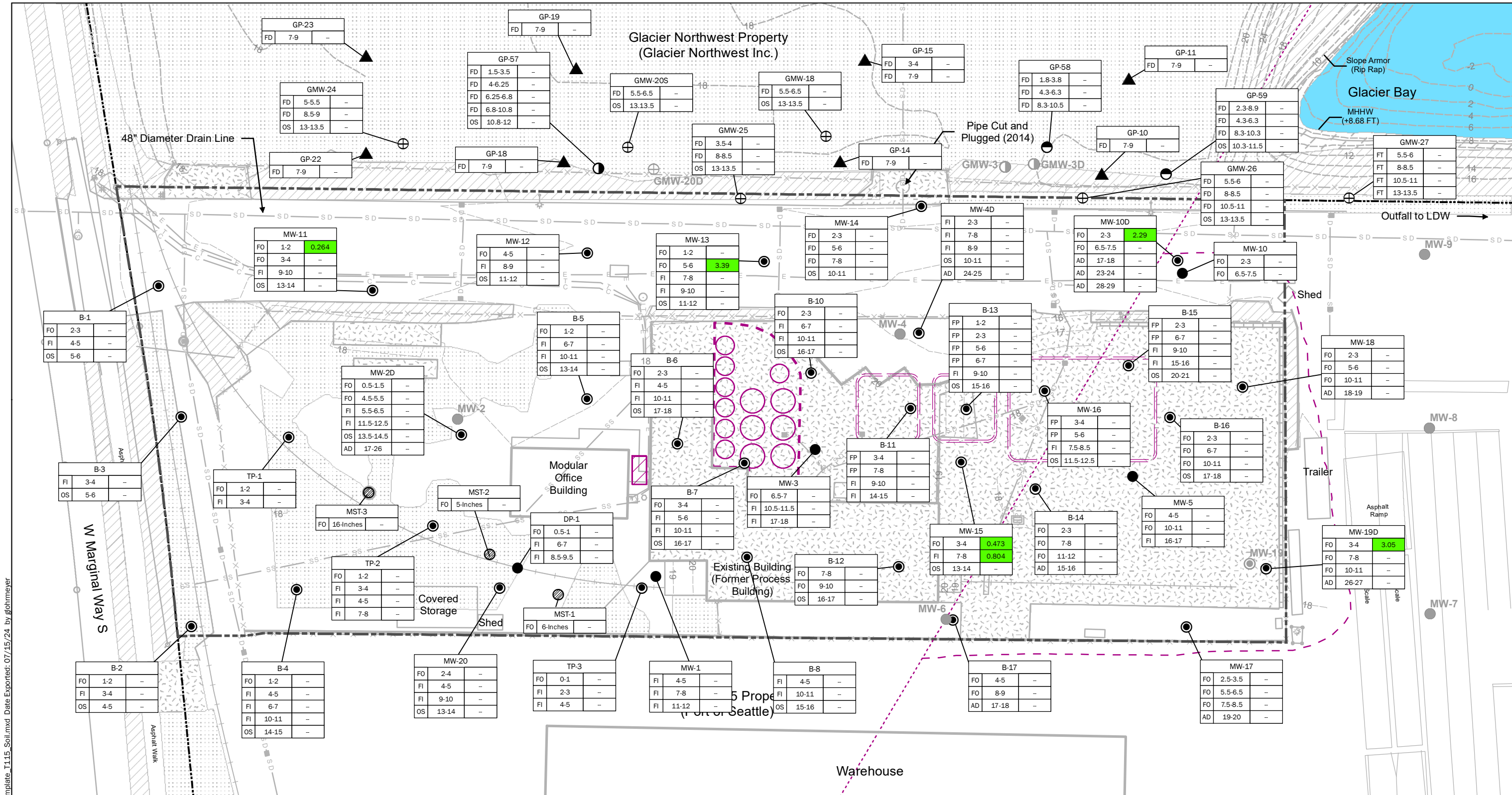
Key to Soil and Groundwater Concentration Summary Figures

Port of Seattle – North Terminal 115
Seattle, Washington



Figure M-1





Notes:

- Ground surface is asphalt pavement unless otherwise noted.
- Mean Higher High Water (MHHW) referenced from United States Army Corps of Engineers (USACE) Duwamish Waterway tidal Datum No. 92 for the North Puget Sound Region.
- The locations of all features shown are approximate.
- This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Data Source: Base from Dowl HKM 2014 survey and Bush, Roed and Hitchings, Inc. 2008 survey.

Projection: NAD 1983 StatePlane Washington North FIPS 4601 Feet
Vertical Datum: North American Vertical Datum 1988 (NAVD88)

Legend

PCUL = 5.2
Mean Reporting Limit = 1.7
Basis for PCUL = Natural Background

	Detect or Non-Detect Result Less than the PCUL
	Detected Concentration Greater Than The PCUL
	Non-Detect Result Greater Than The PCUL

PCUL - Preliminary Cleanup Level
ng/kg - Nanogram Per Kilogram
ft bgs - Feet Below Ground Surface
U - Not Detected Greater Than the Reporting Limit
J - Estimated Concentration
TEQ - Toxicity Equivalency Quotient
ND - Non-Detect
RL - Reporting Limit

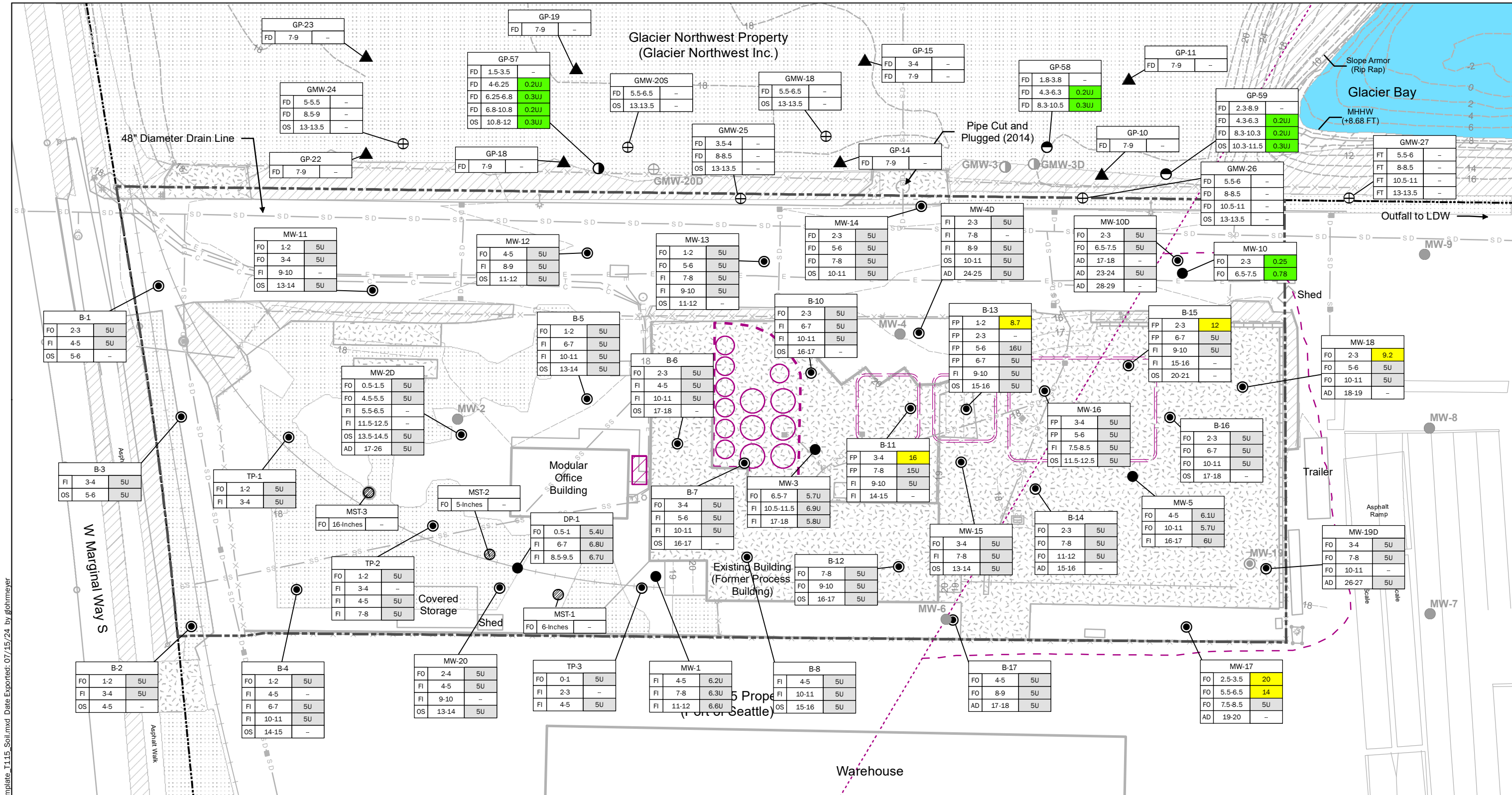
**Total Dioxin/Furan TEQ (ND=0.5RL)
Concentrations in Soil**

Port of Seattle - North Terminal 115
Seattle, Washington

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Figure M-3

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P:\0303112\GIS\MDX\030311200_Base_Template_T115_Soil.mxd Date Exported: 07/15/24 by gghmeyer

Notes:

1. Ground surface is asphalt pavement unless otherwise noted.
2. Mean Higher High Water (MHHW) referenced from United States Army Corps of Engineers (USACE) Duwamish Waterway tidal Datum No. 92 for the North Puget Sound Region.
3. The locations of all features shown are approximate.
4. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Data Source: Base from Dowl HKM 2014 survey and Bush, Roed and Hitchings, Inc. 2008 survey.

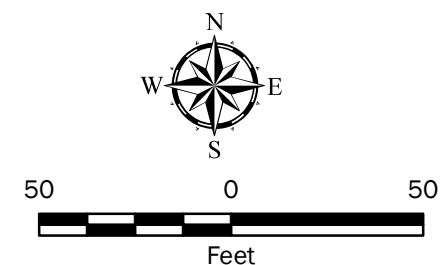
Projection: NAD 1983 StatePlane Washington North FIPS 4601 Feet
Vertical Datum: North American Vertical Datum 1988 (NAVD88)

Legend

PCUL = 4.1
Mean Reporting Limit = 5.3
Basis for PCUL = Surface Water

	Detect or Non-Detect Result Less than the PCUL
	Detected Concentration Greater Than The PCUL
	Non-Detect Result Greater Than The PCUL

PCUL - Preliminary Cleanup Level
mg/kg - Milligram Per Kilogram
ft bgs - Feet Below Ground Surface
U - Not Detected Greater Than the Reporting Limit
J - Estimated Concentration

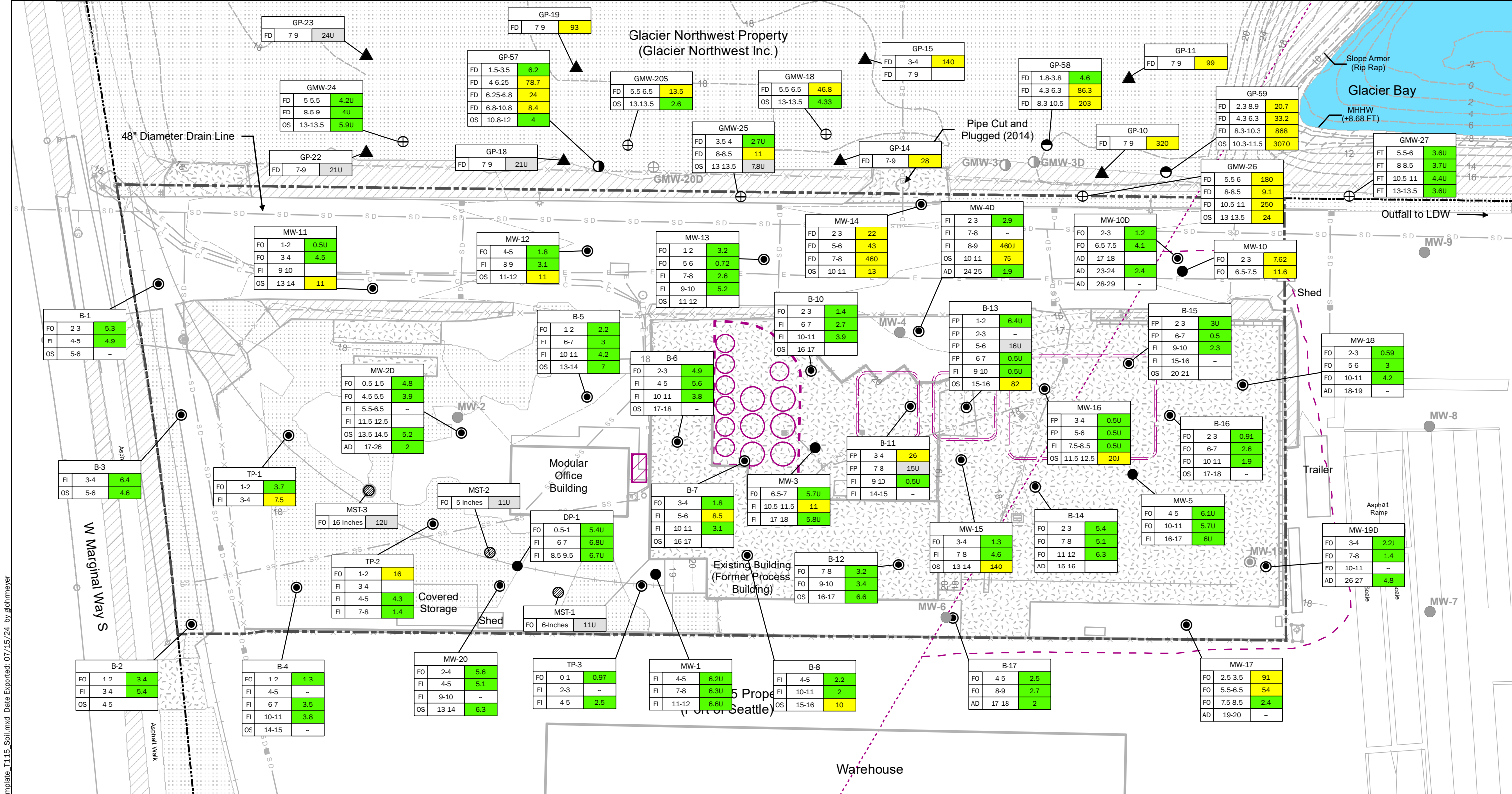


Antimony Concentrations in Soil

Port of Seattle - North Terminal 115
Seattle, Washington



Figure M-4



Notes:

- Ground surface is asphalt pavement unless otherwise noted.
- Mean Higher High Water (MHHW) referenced from United States Army Corps of Engineers (USACE) Duwamish Waterway tidal Datum No. 92 for the North Puget Sound Region.
- The locations of all features shown are approximate.
- This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Data Source: Base from Dowl HKM 2014 survey and Bush, Roed and Hitchings, Inc. 2008 survey.

Projection: NAD 1983 StatePlane Washington North FIPS 4601 Feet
Vertical Datum: North American Vertical Datum 1988 (NAVD88)

Legend

PCUL = 7
Mean Reporting Limit = 5.4
Basis for PCUL = Natural Background

	Detect or Non-Detect Result Less than the PCUL
	Detected Concentration Greater Than The PCUL
	Non-Detect Result Greater Than The PCUL

PCUL - Preliminary Cleanup Level
mg/kg - Milligram Per Kilogram
ft bgs - Feet Below Ground Surface
U - Not Detected Greater Than the Reporting Limit
J - Estimated Concentration

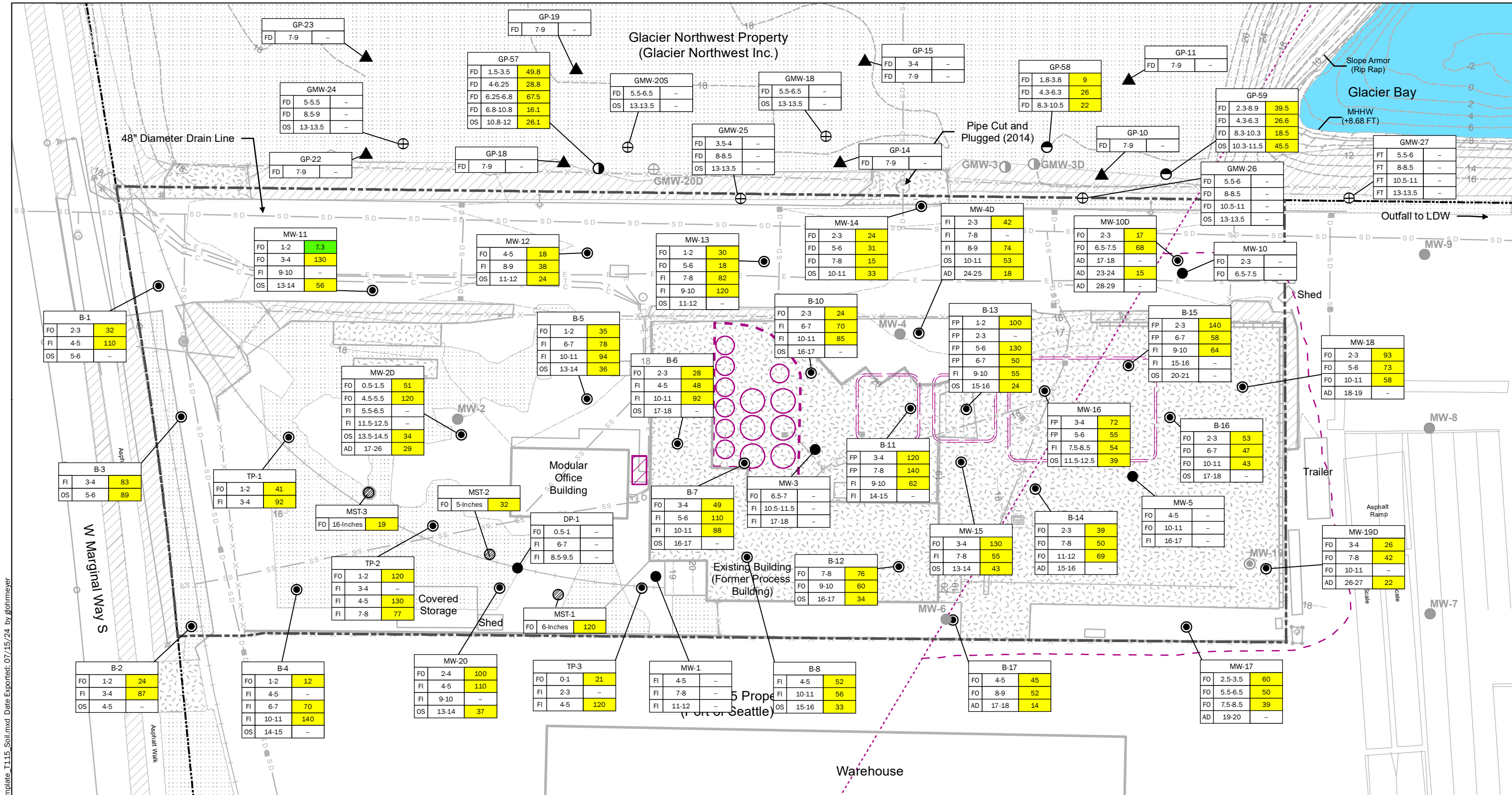
Arsenic Concentrations in Soil

Port of Seattle - North Terminal 115
Seattle, Washington

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Figure M-5

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Notes:

- Ground surface is asphalt pavement unless otherwise noted.
- Mean Higher High Water (MHHW) referenced from United States Army Corps of Engineers (USACE) Duwamish Waterway tidal Datum No. 92 for the North Puget Sound Region.
- The locations of all features shown are approximate.
- This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Data Source: Base from Dowl HKM 2014 survey and Bush, Roed and Hitchings, Inc. 2008 survey.

Projection: NAD 1983 StatePlane Washington North FIPS 4601 Feet
Vertical Datum: North American Vertical Datum 1988 (NAVD88)

Legend

PCUL = 8.3
Mean Reporting Limit = 1.9
Basis for PCUL = Surface Water

	Detect or Non-Detect Result Less than the PCUL
	Detected Concentration Greater Than The PCUL
	Non-Detect Result Greather Than The PCUL

PCUL - Preliminary Cleanup Level
mg/kg - Milligram Per Kilogram
ft bgs - Feet Below Ground Surface
U - Not Detected Greater Than the Reporting Limit
J - Estimated Concentration

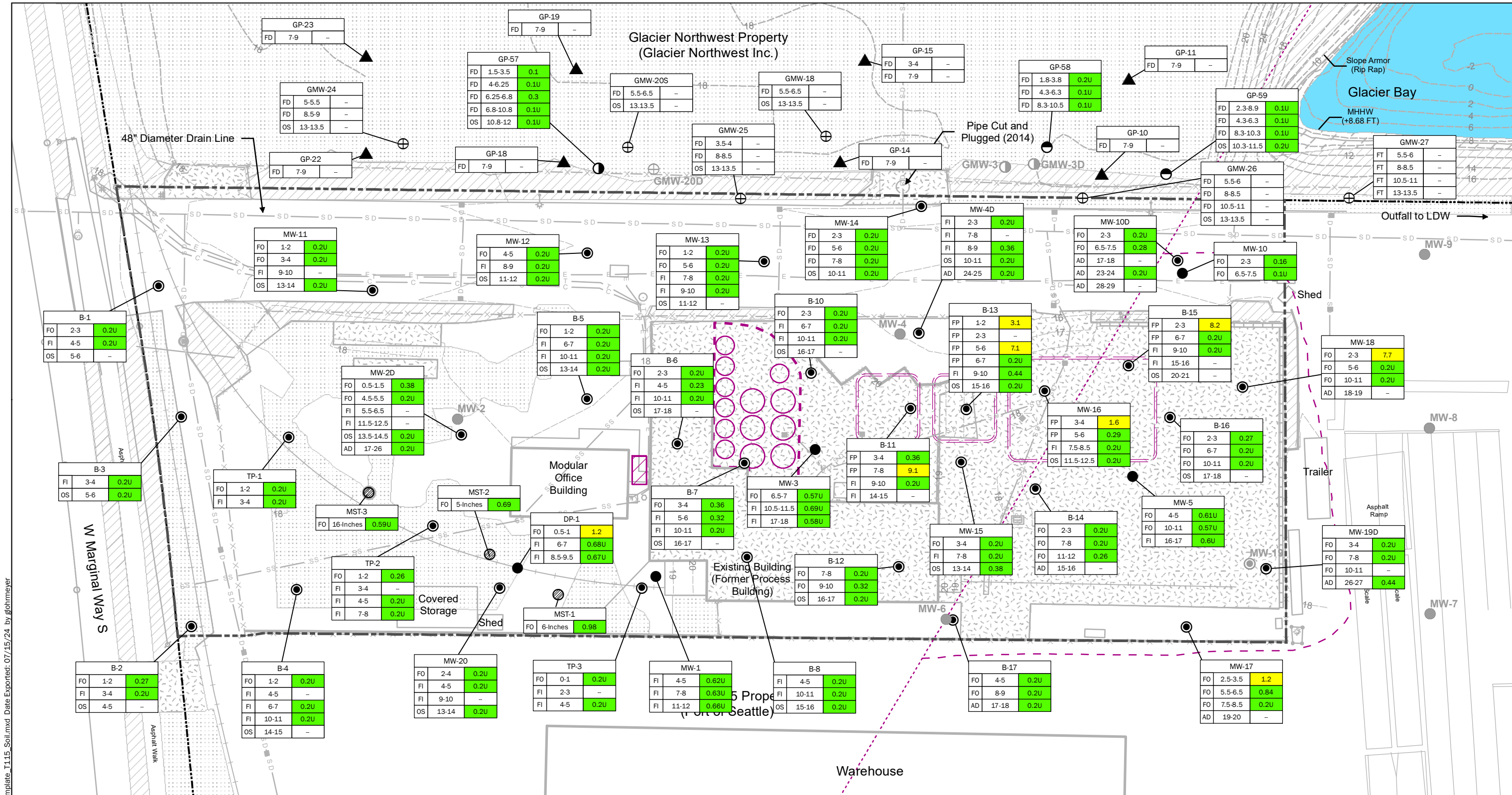
50 0 50
Feet

Barium Concentrations in Soil

Port of Seattle - North Terminal 115
Seattle, Washington

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Figure M-6



Notes:

1. Ground surface is asphalt pavement unless otherwise noted.
2. Mean Higher High Water (MHHW) referenced from United States Army Corps of Engineers (USACE) Duwamish Waterway tidal Datum No. 92 for the North Puget Sound Region.
3. The locations of all features shown are approximate.
4. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

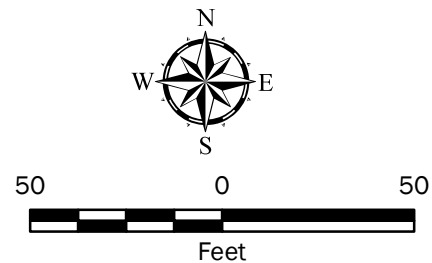
Data Source: Base from Dowl HKM 2014 survey and Bush, Roed and Hitchings, Inc. 2008 survey.

Projection: NAD 1983 StatePlane Washington North FIPS 4601 Feet
Vertical Datum: North American Vertical Datum 1988 (NAVD88)

Legend

- PCUL = 1
Mean Reporting Limit = 0.25
Basis for PCUL = Natural Background
- Detect or Non-Detect Result Less than the PCUL
 - Detected Concentration Greater Than The PCUL
 - Non-Detect Result Greater Than The PCUL

- PCUL - Preliminary Cleanup Level
mg/kg - Milligram Per Kilogram
ft bgs - Feet Below Ground Surface
U - Not Detected Greater Than the Reporting Limit
J - Estimated Concentration

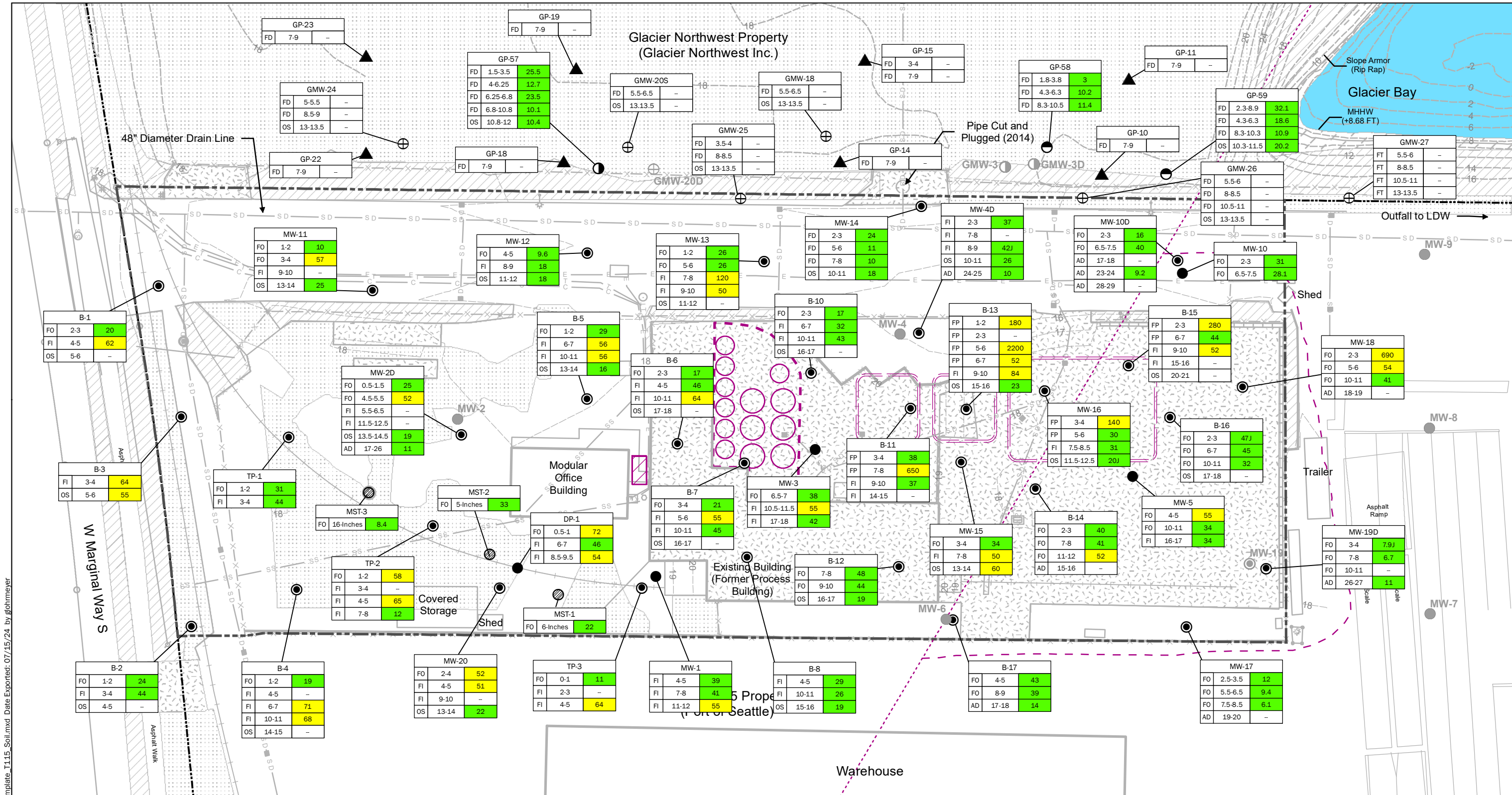


Cadmium
Concentrations in Soil

Port of Seattle - North Terminal 115
Seattle, Washington



Figure M-7



Notes:

- Ground surface is asphalt pavement unless otherwise noted.
- Mean Higher High Water (MHHW) referenced from United States Army Corps of Engineers (USACE) Duwamish Waterway tidal Datum No. 92 for the North Puget Sound Region.
- The locations of all features shown are approximate.
- This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Data Source: Base from Dowl HKM 2014 survey and Bush, Roed and Hitchings, Inc. 2008 survey.

Projection: NAD 1983 StatePlane Washington North FIPS 4601 Feet
Vertical Datum: North American Vertical Datum 1988 (NAVD88)

Legend

PCUL = 48
Mean Reporting Limit = 0.8
Basis for PCUL = Natural Background

	Detect or Non-Detect Result Less than the PCUL
	Detected Concentration Greater Than The PCUL
	Non-Detect Result Greater Than The PCUL

PCUL - Preliminary Cleanup Level
mg/kg - Milligram Per Kilogram
ft bgs - Feet Below Ground Surface
U - Not Detected Greater Than the Reporting Limit
J - Estimated Concentration

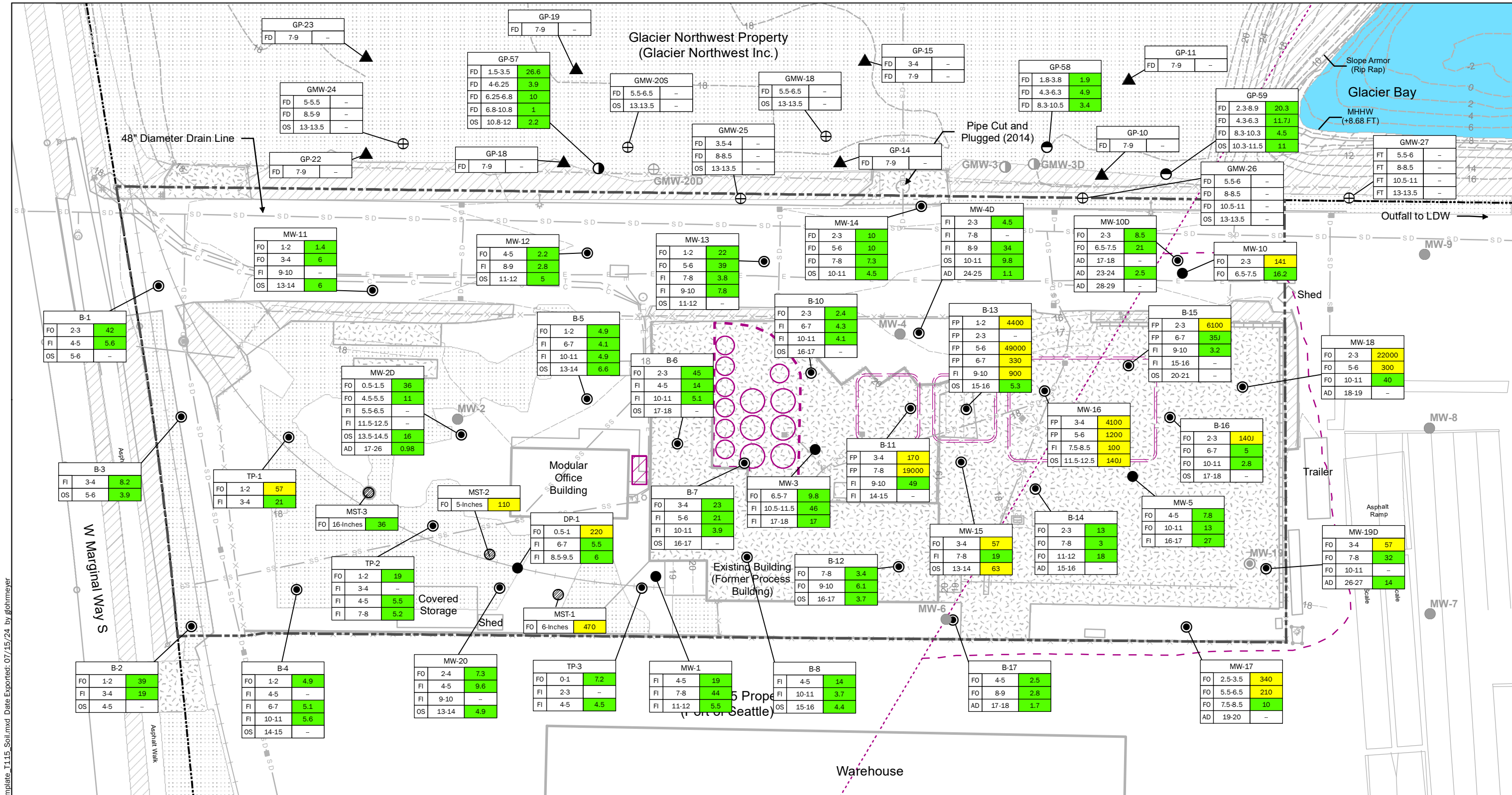
Chromium III/Total Concentrations in Soil

Port of Seattle - North Terminal 115
Seattle, Washington

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Figure M-8

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Notes:

- Ground surface is asphalt pavement unless otherwise noted.
- Mean Higher High Water (MHHW) referenced from United States Army Corps of Engineers (USACE) Duwamish Waterway tidal Datum No. 92 for the North Puget Sound Region.
- The locations of all features shown are approximate.
- This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Data Source: Base from Dowl HKM 2014 survey and Bush, Roed and Hitchings, Inc. 2008 survey.

Projection: NAD 1983 StatePlane Washington North FIPS 4601 Feet
Vertical Datum: North American Vertical Datum 1988 (NAVD88)

Legend

PCUL = 50
Mean Reporting Limit = 6.1
Basis for PCUL = TEE

	Detect or Non-Detect Result Less than the PCUL
	Detected Concentration Greater Than The PCUL
	Non-Detect Result Greather Than The PCUL

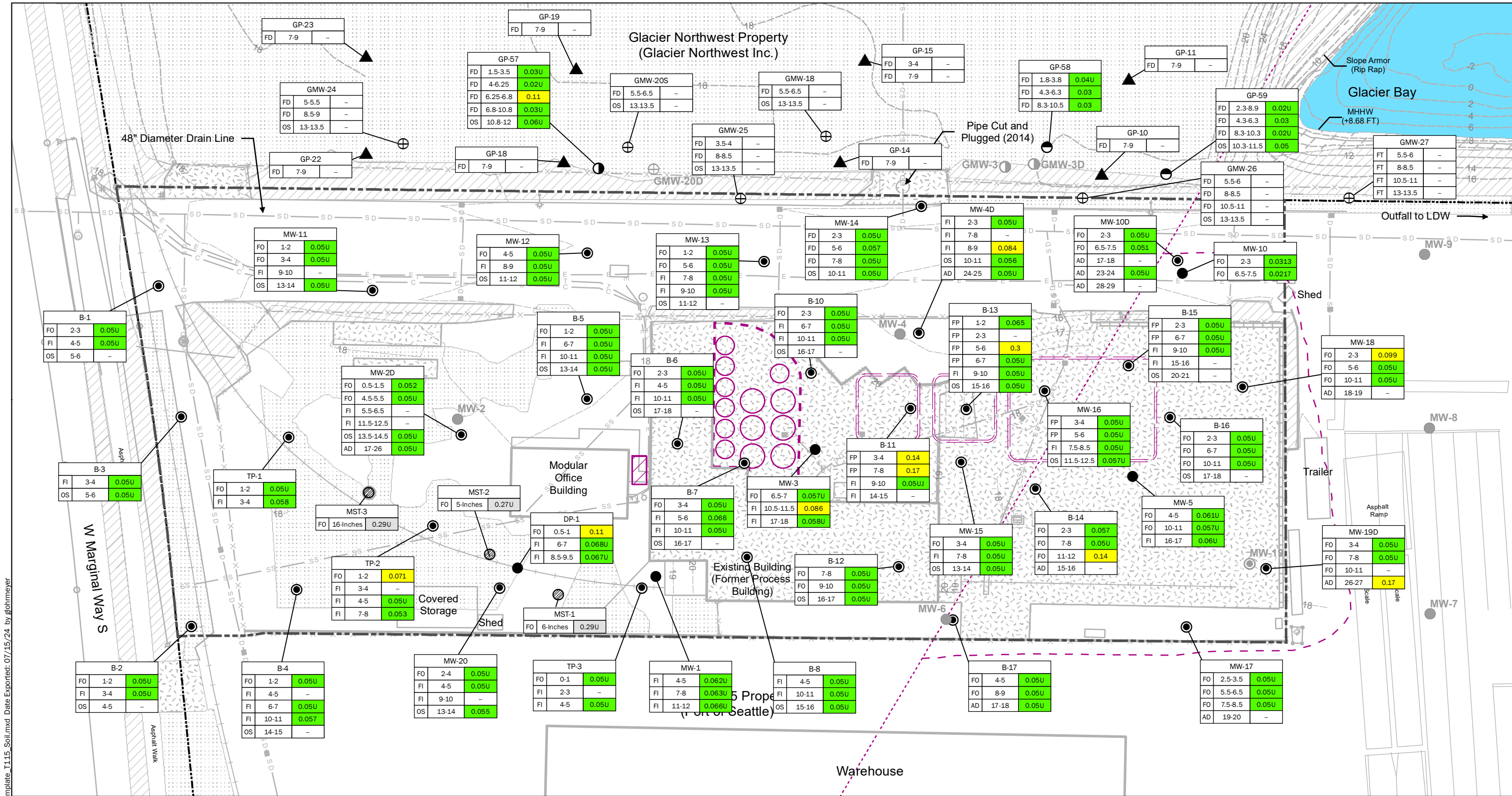
PCUL - Preliminary Cleanup Level
mg/kg - Milligram Per Kilogram
ft bgs - Feet Below Ground Surface
U - Not Detected Greater Than the Reporting Limit
J - Estimated Concentration

Lead Concentrations in Soil

Port of Seattle - North Terminal 115
Seattle, Washington

GEOENGINEERS

Figure M-10



Notes:

- Ground surface is asphalt pavement unless otherwise noted.
- Mean Higher High Water (MHHW) referenced from United States Army Corps of Engineers (USACE) Duwamish Waterway tidal Datum No. 92 for the North Puget Sound Region.
- The locations of all features shown are approximate.
- This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Data Source: Base from Dowl HKM 2014 survey and Bush, Roed and Hitchings, Inc. 2008 survey.

Projection: NAD 1983 StatePlane Washington North FIPS 4601 Feet
Vertical Datum: North American Vertical Datum 1988 (NAVD88)

Legend

PCUL = 0.07
Mean Reporting Limit = 0.058
Basis for PCUL = Natural Background

	Detect or Non-Detect Result Less than the PCUL
	Detected Concentration Greater Than The PCUL
	Non-Detect Result Greather Than The PCUL

PCUL - Preliminary Cleanup Level
mg/kg - Milligram Per Kilogram
ft bgs - Feet Below Ground Surface
U - Not Detected Greater Than the Reporting Limit
J - Estimated Concentration

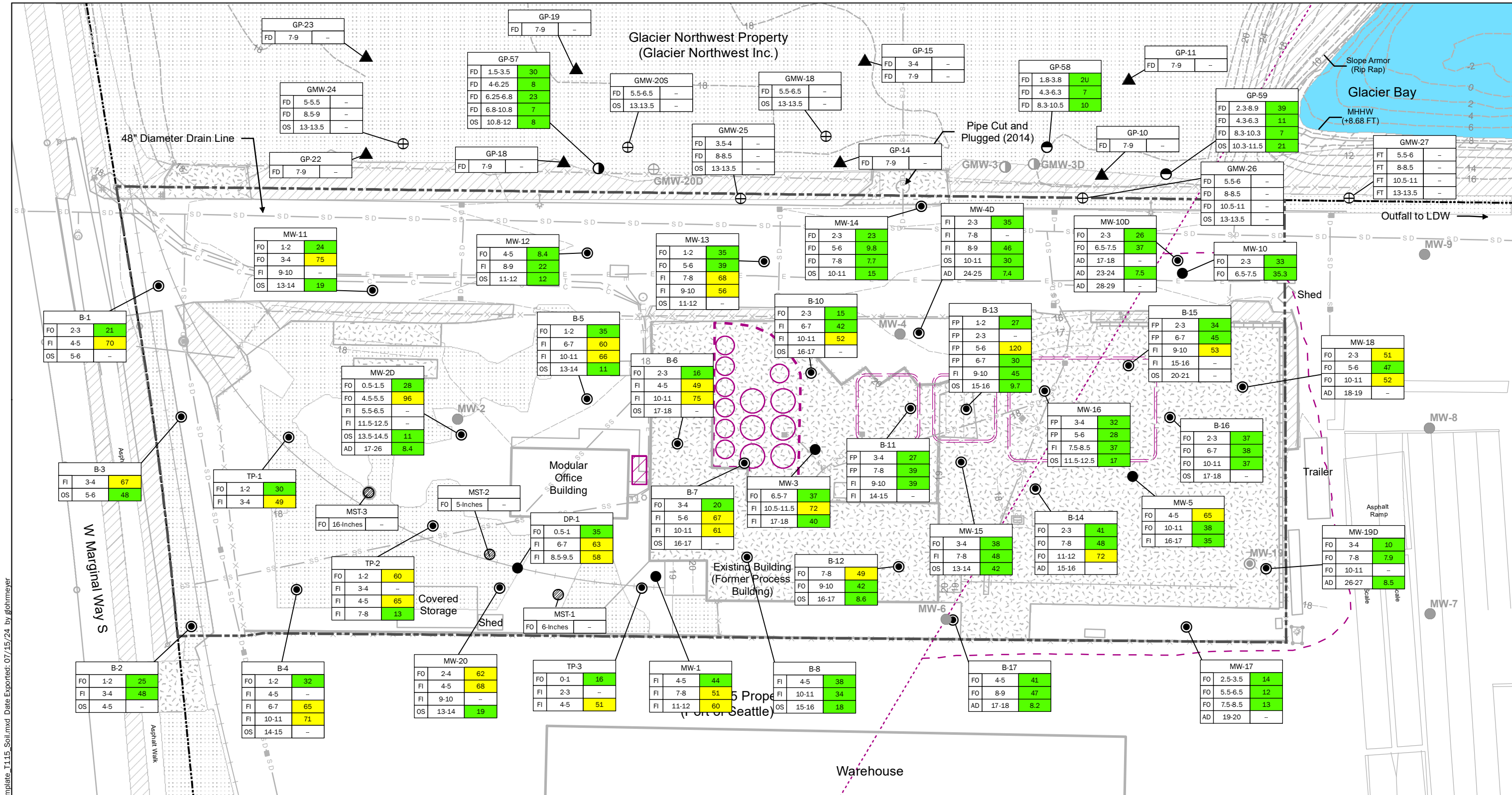
Mercury Concentrations in Soil

Port of Seattle - North Terminal 115
Seattle, Washington

GEOENGINEERS

Figure M-11

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P:\0303112\GIS\MDX\030311200_Base_Template_T115_Soil.mxd Date Exported: 07/15/24 by gghmeyer

Notes:

1. Ground surface is asphalt pavement unless otherwise noted.
2. Mean Higher High Water (MHHW) referenced from United States Army Corps of Engineers (USACE) Duwamish Waterway tidal Datum No. 92 for the North Puget Sound Region.
3. The locations of all features shown are approximate.
4. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

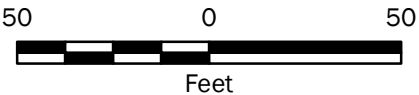
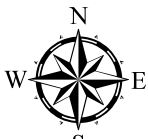
Data Source: Base from Dowl HKM 2014 survey and Bush, Roed and Hitchings, Inc. 2008 survey.

Projection: NAD 1983 StatePlane Washington North FIPS 4601 Feet
Vertical Datum: North American Vertical Datum 1988 (NAVD88)

Legend

- PCUL = 48
Mean Reporting Limit = 0.9
Basis for PCUL = Natural Background
- Detect or Non-Detect Result Less than the PCUL
 - Detect or Non-Detect Result Greater Than The PCUL
 - Non-Detect Result Greater Than The PCUL

- PCUL - Preliminary Cleanup Level
mg/kg - Milligram Per Kilogram
ft bgs - Feet Below Ground Surface
U - Not Detected Greater Than the Reporting Limit
J - Estimated Concentration

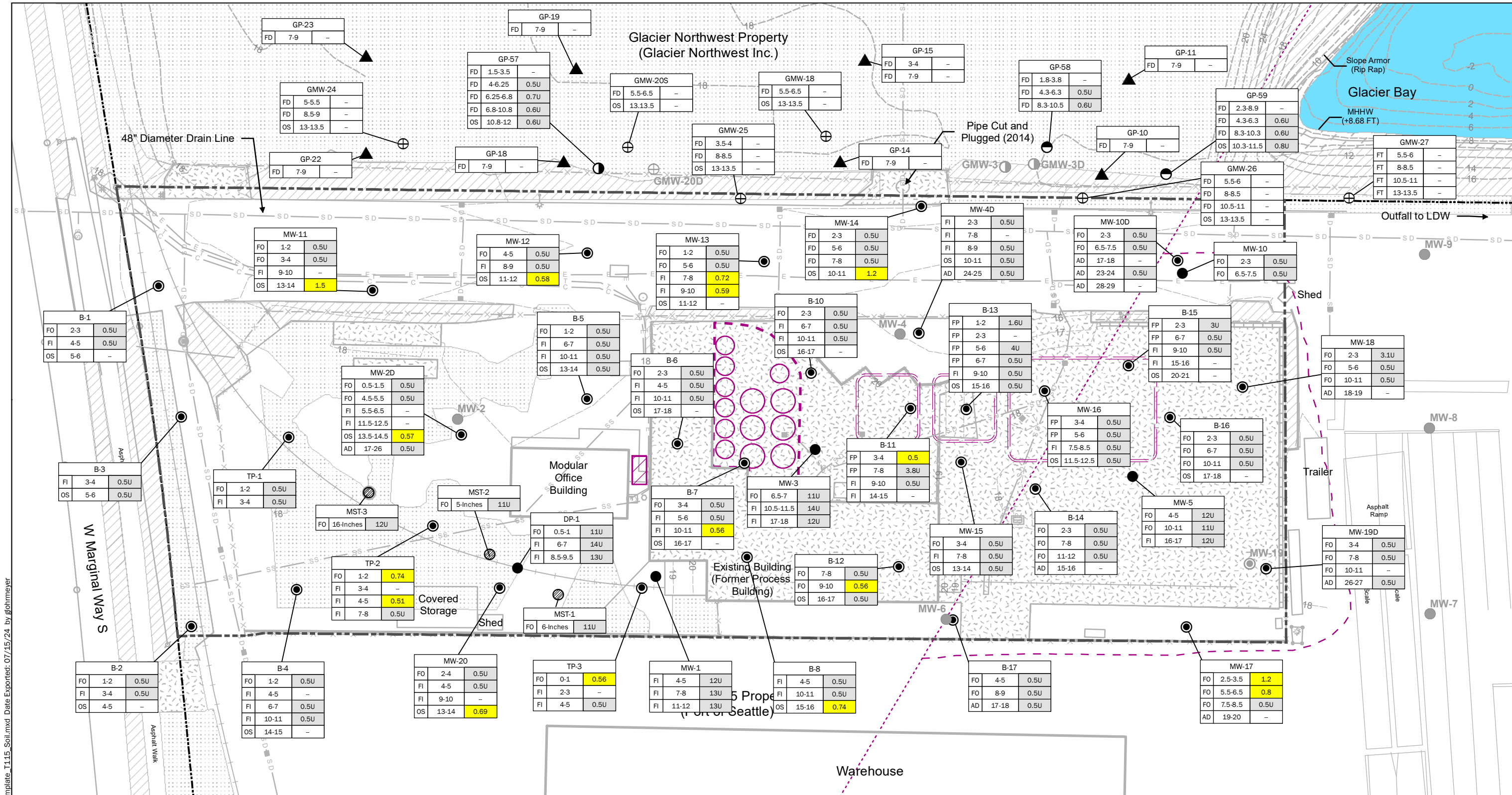


Nickel
Concentrations in Soil

Port of Seattle - North Terminal 115
Seattle, Washington



Figure M-12



Notes:

- Ground surface is asphalt pavement unless otherwise noted.
- Mean Higher High Water (MHHW) referenced from United States Army Corps of Engineers (USACE) Duwamish Waterway tidal Datum No. 92 for the North Puget Sound Region.
- The locations of all features shown are approximate.
- This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Data Source: Base from Dowl HKM 2014 survey and Bush, Roed and Hitchings, Inc. 2008 survey.

Projection: NAD 1983 StatePlane Washington North FIPS 4601 Feet
Vertical Datum: North American Vertical Datum 1988 (NAVD88)

Legend

PCUL = 0.3
Mean Reporting Limit = 2.2
Basis for PCUL = TEE

	Detect or Non-Detect Result Less than the PCUL
	Detected Concentration Greater Than The PCUL
	Non-Detect Result Greather Than The PCUL

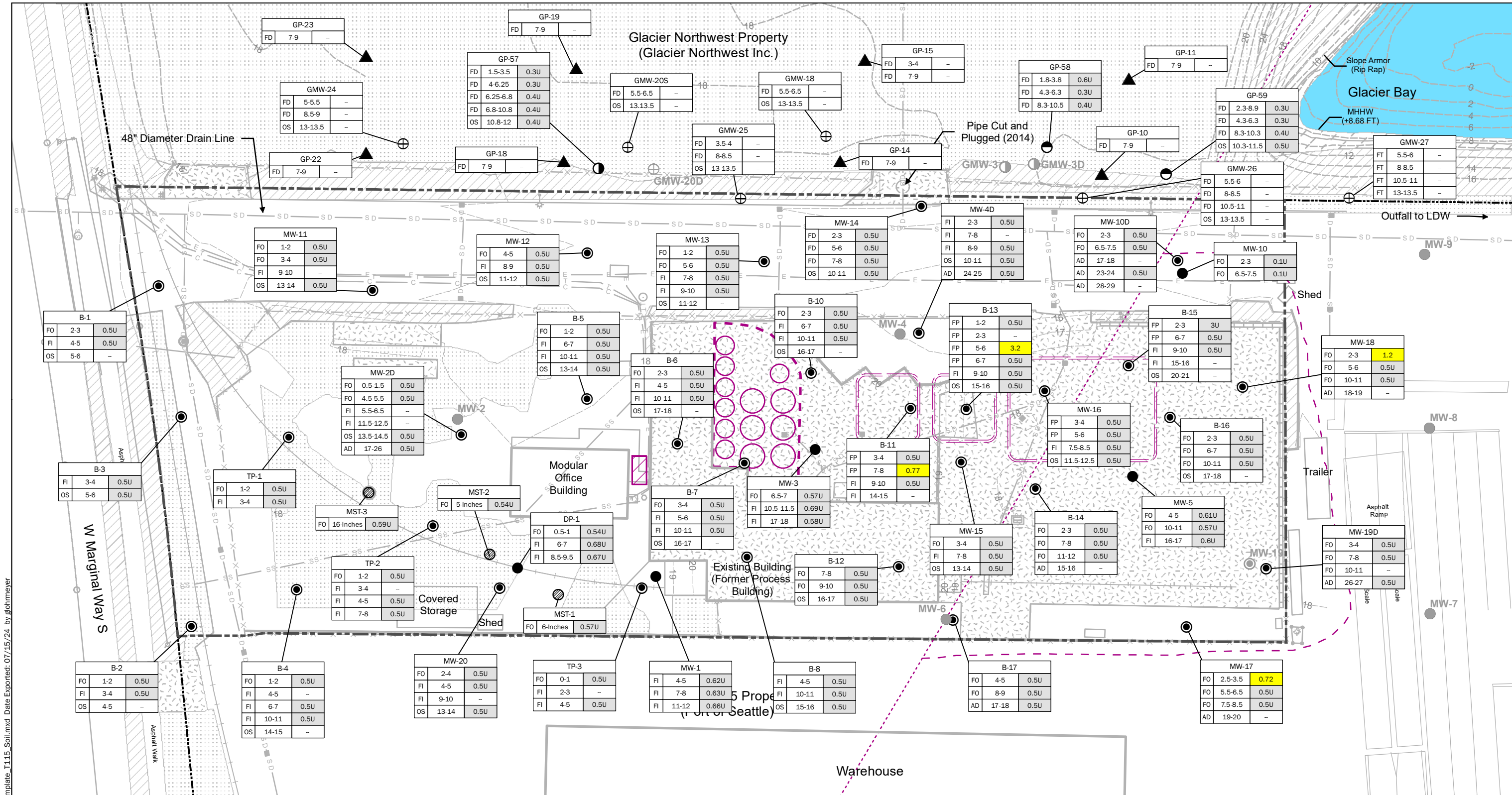
PCUL - Preliminary Cleanup Level
mg/kg - Milligram Per Kilogram
ft bgs - Feet Below Ground Surface
U - Not Detected Greater Than the Reporting Limit
J - Estimated Concentration

Selenium Concentrations in Soil

Port of Seattle - North Terminal 115
Seattle, Washington

GEOENGINEERS

Figure M-13



Notes:

- Ground surface is asphalt pavement unless otherwise noted.
- Mean Higher High Water (MHHW) referenced from United States Army Corps of Engineers (USACE) Duwamish Waterway tidal Datum No. 92 for the North Puget Sound Region.
- The locations of all features shown are approximate.
- This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Data Source: Base from Dowl HKM 2014 survey and Bush, Roed and Hitchings, Inc. 2008 survey.

Projection: NAD 1983 StatePlane Washington North FIPS 4601 Feet
Vertical Datum: North American Vertical Datum 1988 (NAVD88)

Legend

PCUL = 0.016
Mean Reporting Limit = 0.53
Basis for PCUL = Surface Water

	Detect or Non-Detect Result Less than the PCUL
	Detected Concentration Greater Than The PCUL
	Non-Detect Result Greather Than The PCUL

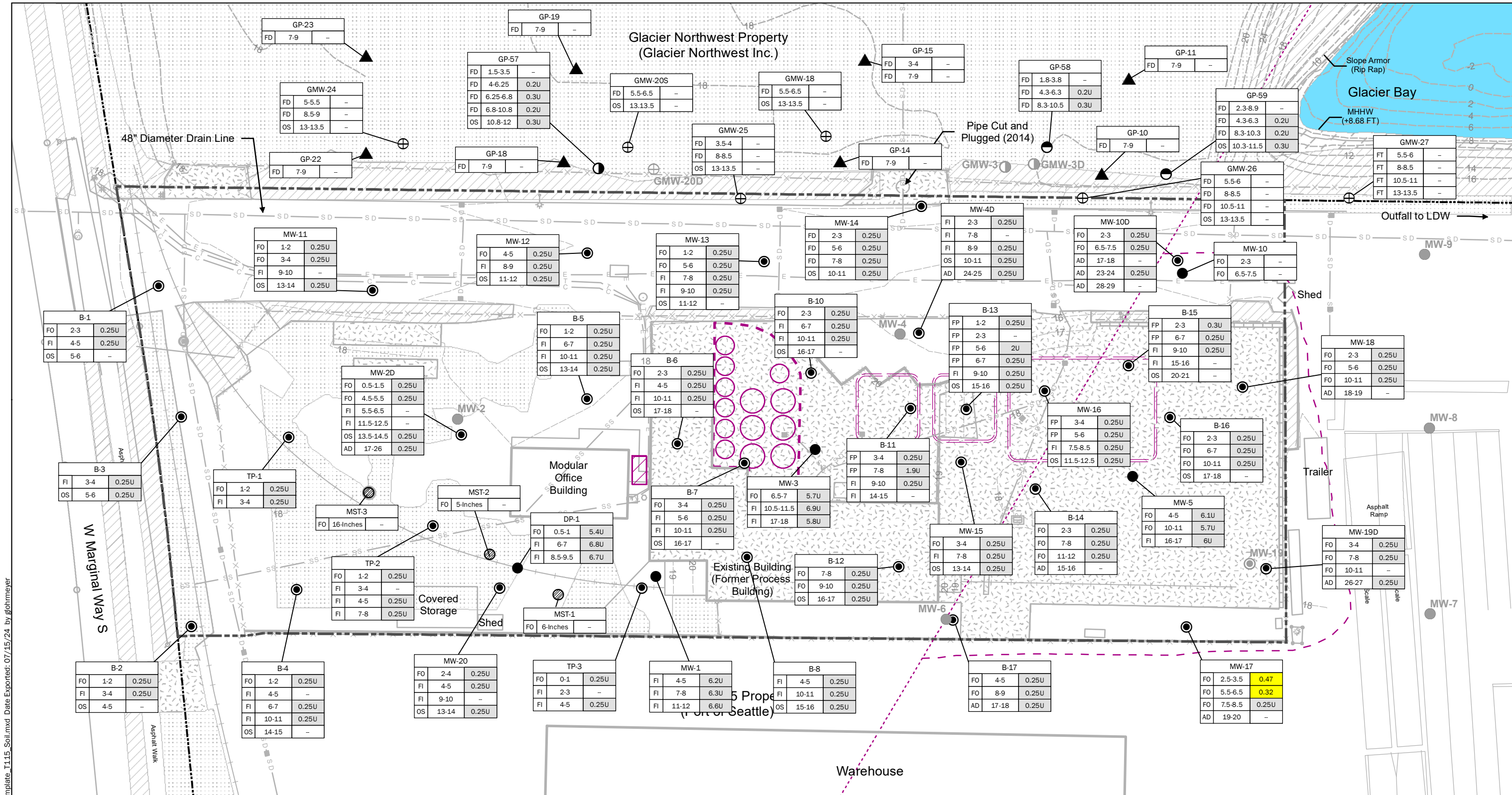
PCUL - Preliminary Cleanup Level
mg/kg - Milligram Per Kilogram
ft bgs - Feet Below Ground Surface
U - Not Detected Greater Than the Reporting Limit
J - Estimated Concentration

Silver Concentrations in Soil

Port of Seattle - North Terminal 115
Seattle, Washington

GEOENGINEERS

Figure M-14



Notes:

1. Ground surface is asphalt pavement unless otherwise noted.
2. Mean Higher High Water (MHHW) referenced from United States Army Corps of Engineers (USACE) Duwamish Waterway tidal Datum No. 92 for the North Puget Sound Region.
3. The locations of all features shown are approximate.
4. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Data Source: Base from Dowl HKM 2014 survey and Bush, Roed and Hitchings, Inc. 2008 survey.

Projection: NAD 1983 StatePlane Washington North FIPS 4601 Feet
Vertical Datum: North American Vertical Datum 1988 (NAVD88)

Legend

PCUL = 0.0044
Mean Reporting Limit = 0.88
Basis for PCUL = Surface Water

	Detect or Non-Detect Result Less than the PCUL
	Detected Concentration Greater Than The PCUL
	Non-Detect Result Greather Than The PCUL

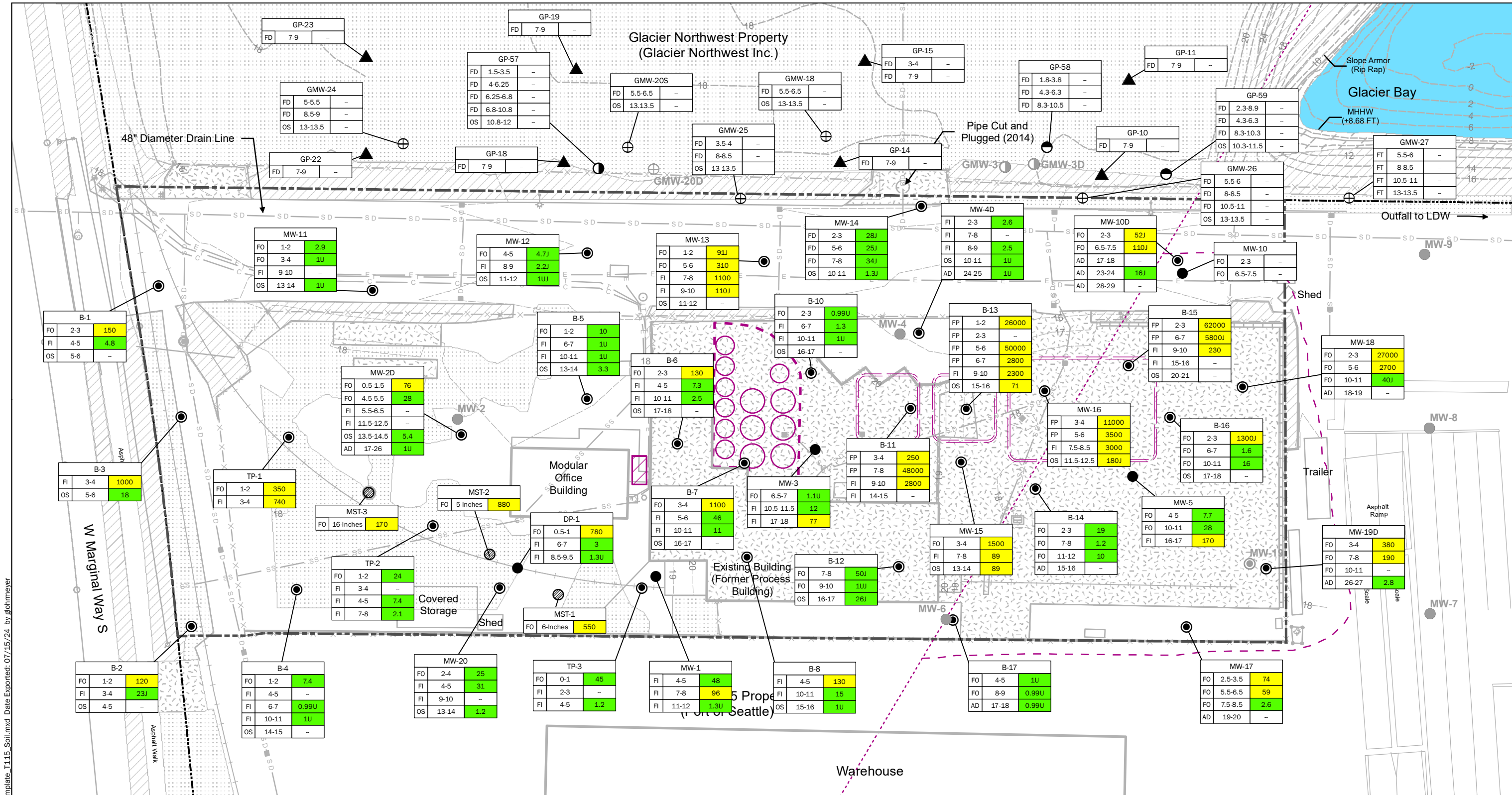
PCUL - Preliminary Cleanup Level
mg/kg - Milligram Per Kilogram
ft bgs - Feet Below Ground Surface
U - Not Detected Greater Than the Reporting Limit
J - Estimated Concentration

Thallium Concentrations in Soil

Port of Seattle - North Terminal 115
Seattle, Washington

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Figure M-15



Notes:

- Ground surface is asphalt pavement unless otherwise noted.
- Mean Higher High Water (MHHW) referenced from United States Army Corps of Engineers (USACE) Duwamish Waterway tidal Datum No. 92 for the North Puget Sound Region.
- The locations of all features shown are approximate.
- This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Data Source: Base from Dowl HKM 2014 survey and Bush, Roed and Hitchings, Inc. 2008 survey.

Projection: NAD 1983 StatePlane Washington North FIPS 4601 Feet
Vertical Datum: North American Vertical Datum 1988 (NAVD88)

Legend

PCUL = 50
Mean Reporting Limit = 1.0
Basis for PCUL = TEE

	Detect or Non-Detect Result Less than the PCUL
	Detected Concentration Greater Than The PCUL
	Non-Detect Result Greather Than The PCUL

PCUL - Preliminary Cleanup Level
mg/kg - Milligram Per Kilogram
ft bgs - Feet Below Ground Surface
U - Not Detected Greater Than the Reporting Limit
J - Estimated Concentration

Tin Concentrations in Soil

Port of Seattle - North Terminal 115
Seattle, Washington

Figure M-16

Notes:

1. Ground surface is asphalt pavement unless otherwise noted.

2. Mean Higher High Water (MHHW) referenced from United States Army Corps of Engineers (USACE) Duwamish Waterway tidal Datum No. 92 for the North Puget Sound Region.

3. The locations of all features shown are approximate.

4. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Data Source: Base from Dowl HKM 2014 survey and Bush, Roed and Hitchings, Inc. 2008 survey.

Projection: NAD 1983 StatePlane Washington North FIPS 4601 Feet
Vertical Datum: North American Vertical Datum 1988 (NAVD88)

Legend

PCUL = 50
Mean Reporting Limit = 1.0
Basis for PCUL = TEE

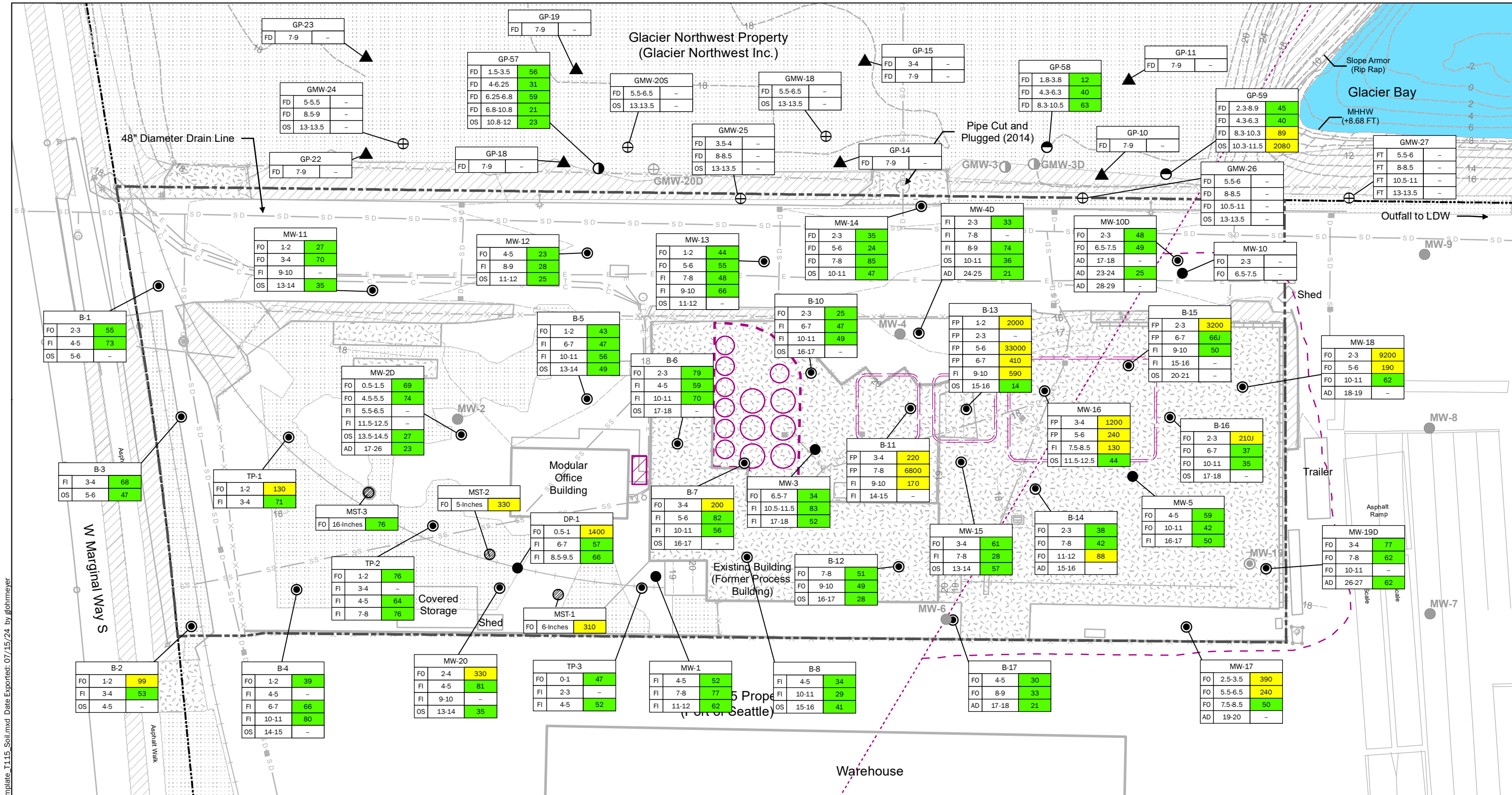
	Detect or Non-Detect Result Less than the PCUL
	Detected Concentration Greater Than The PCUL
	Non-Detect Result Greather Than The PCUL

PCUL - Preliminary Cleanup Level
mg/kg - Milligram Per Kilogram
ft bgs - Feet Below Ground Surface
U - Not Detected Greater Than the Reporting Limit
J - Estimated Concentration

Tin Concentrations in Soil

Port of Seattle - North Terminal 115
Seattle, Washington

Figure M-16



P:\0303112\GIS\MD\030311200_Base_Template_T115_Soil.mxd Date Exported: 07/15/24 by gghmeyer

Notes:

1. Ground surface is asphalt pavement unless otherwise noted.
2. Mean Higher High Water (MHHW) referenced from United States Army Corps of Engineers (USACE) Duwamish Waterway tidal Datum No. 92 for the North Puget Sound Region.
3. The locations of all features shown are approximate.
4. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Data Source: Base from Dowl HKM 2014 survey and Bush, Roed and Hitchings, Inc. 2008 survey.

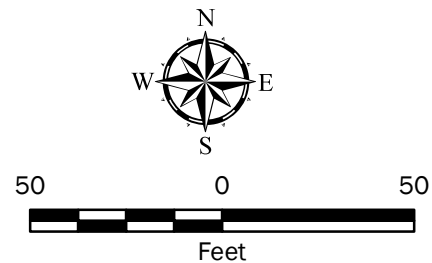
Projection: NAD 1983 StatePlane Washington North FIPS 4601 Feet
Vertical Datum: North American Vertical Datum 1988 (NAVD88)

Legend

PCUL = 85
Mean Reporting Limit = 9.7
Basis for PCUL = Natural Background

	Detect or Non-Detect Result Less than the PCUL
	Detected Concentration Greater Than The PCUL
	Non-Detect Result Greater Than The PCUL

PCUL - Preliminary Cleanup Level
mg/kg - Milligram Per Kilogram
ft bgs - Feet Below Ground Surface
U - Not Detected Greater Than the Reporting Limit
J - Estimated Concentration

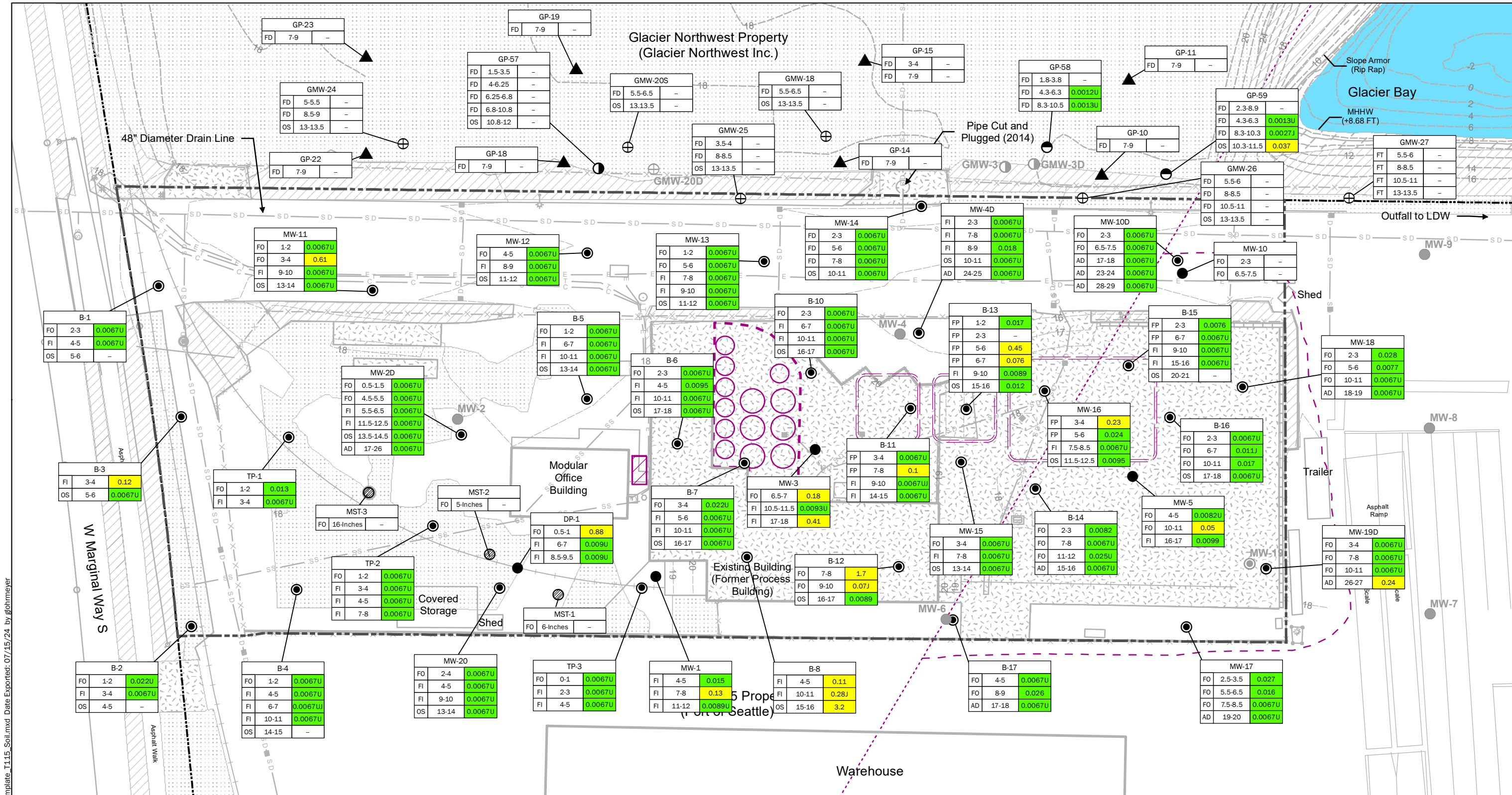


Zinc Concentrations in Soil

Port of Seattle - North Terminal 115
Seattle, Washington



Figure M-17



Notes:

- Ground surface is asphalt pavement unless otherwise noted.
- Mean Higher High Water (MHHW) referenced from United States Army Corps of Engineers (USACE) Duwamish Waterway tidal Datum No. 92 for the North Puget Sound Region.
- The locations of all features shown are approximate.
- This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Data Source: Base from Dowl HKM 2014 survey and Bush, Roed and Hitchings, Inc. 2008 survey.

Projection: NAD 1983 StatePlane Washington North FIPS 4601 Feet
Vertical Datum: North American Vertical Datum 1988 (NAVD88)

Legend

PCUL = 0.028
Mean Reporting Limit = 0.0073
Basis for PCUL = Sediment

	Detect or Non-Detect Result Less than the PCUL
	Detected Concentration Greater Than The PCUL
	Non-Detect Result Greater Than The PCUL

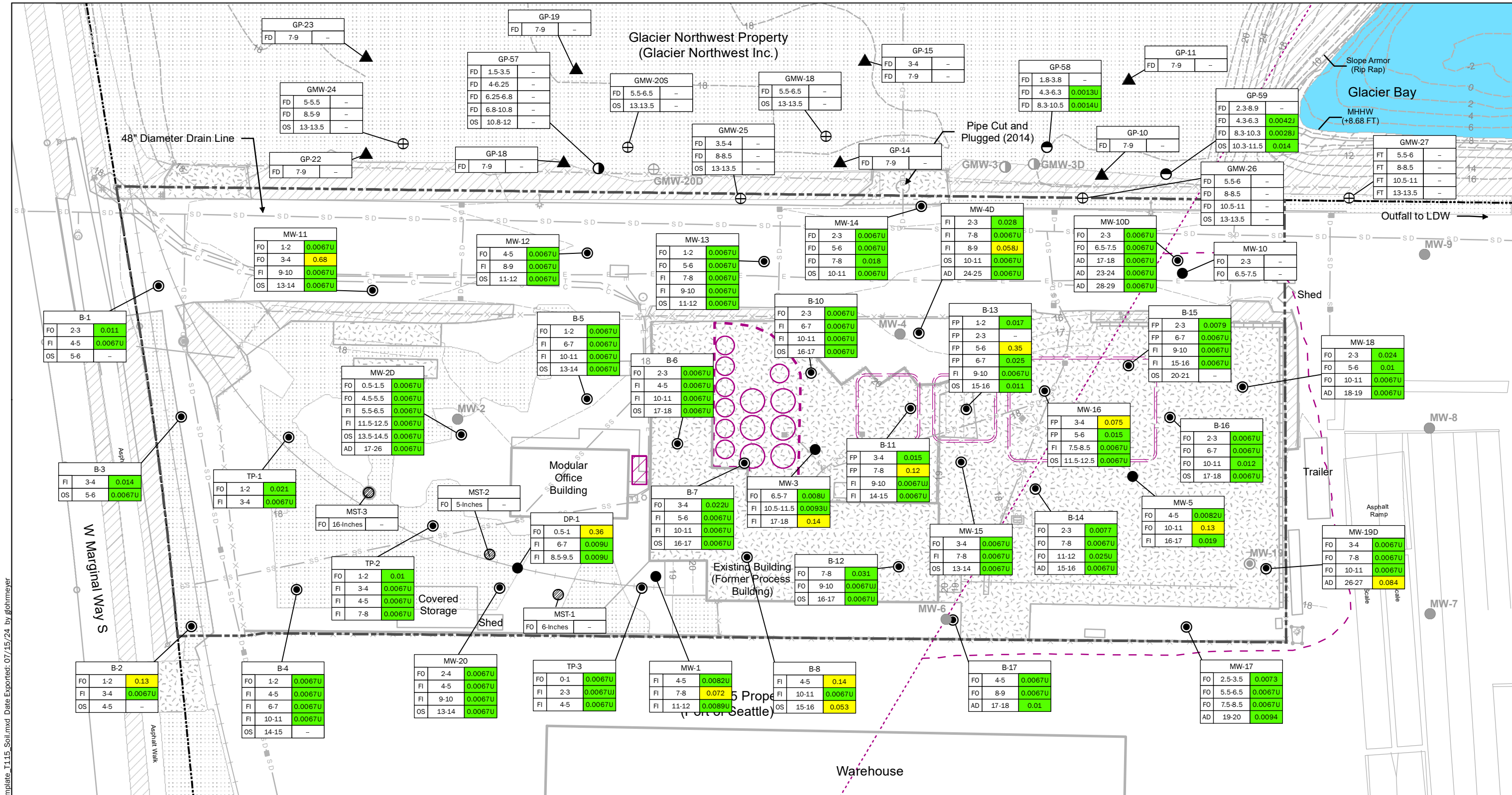
PCUL - Preliminary Cleanup Level
mg/kg - Milligram Per Kilogram
ft bgs - Feet Below Ground Surface
U - Not Detected Greater Than the Reporting Limit
J - Estimated Concentration

Acenaphthene Concentrations in Soil

Port of Seattle - North Terminal 115
Seattle, Washington

GEOENGINEERS

Figure M-18



Notes:

- Ground surface is asphalt pavement unless otherwise noted.
- Mean Higher High Water (MHHW) referenced from United States Army Corps of Engineers (USACE) Duwamish Waterway tidal Datum No. 92 for the North Puget Sound Region.
- The locations of all features shown are approximate.
- This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Data Source: Base from Dowl HKM 2014 survey and Bush, Roed and Hitchings, Inc. 2008 survey.

Projection: NAD 1983 StatePlane Washington North FIPS 4601 Feet
Vertical Datum: North American Vertical Datum 1988 (NAVD88)

Legend

PCUL = 0.051
Mean Reporting Limit = 0.0071
Basis for PCUL = Surface Water

	Detect or Non-Detect Result Less than the PCUL
	Detected Concentration Greater Than The PCUL
	Non-Detect Result Greater Than The PCUL

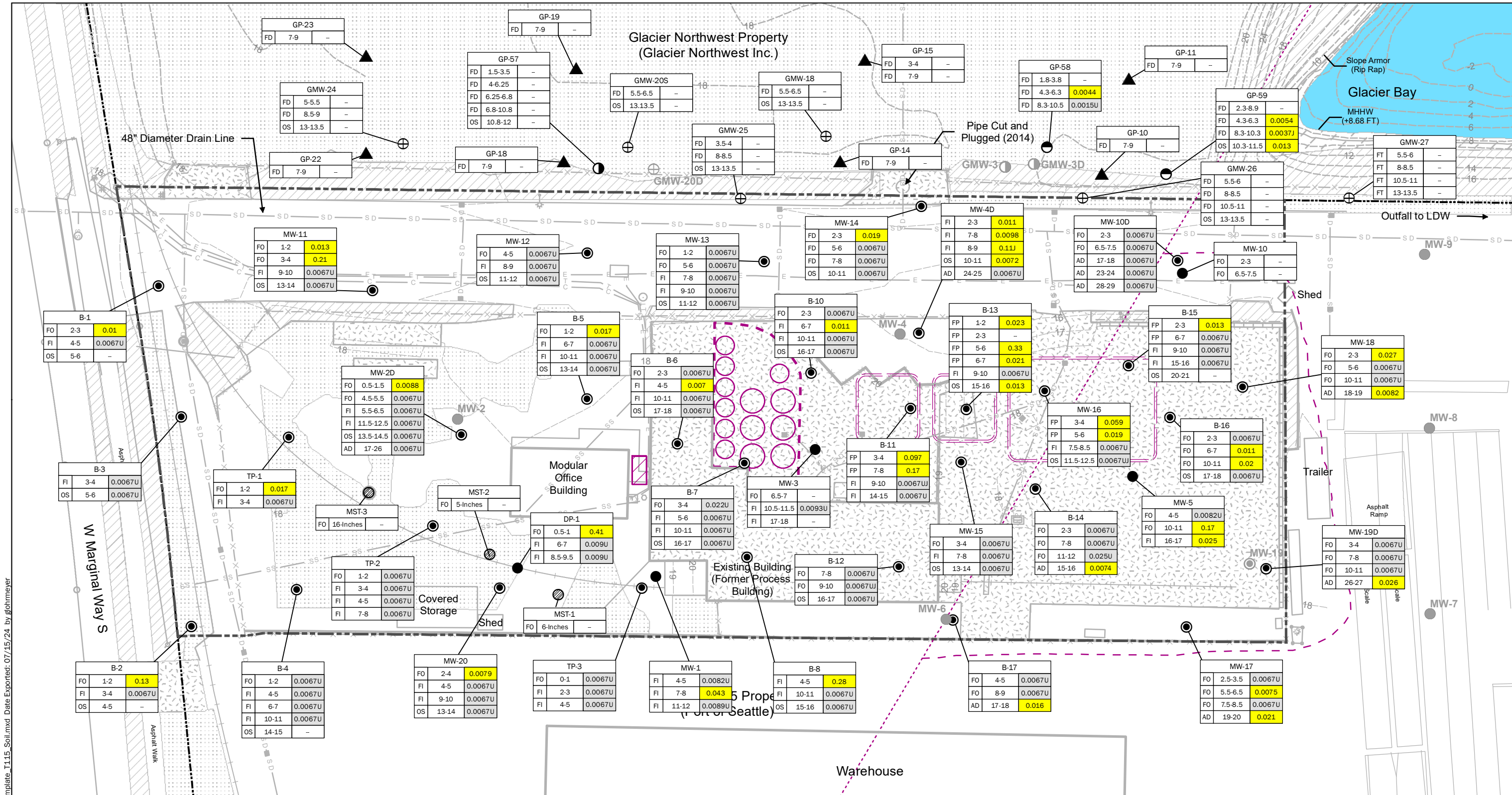
PCUL - Preliminary Cleanup Level
mg/kg - Milligram Per Kilogram
ft bgs - Feet Below Ground Surface
U - Not Detected Greater Than the Reporting Limit
J - Estimated Concentration

Anthracene Concentrations in Soil

Port of Seattle - North Terminal 115
Seattle, Washington

GEOENGINEERS

Figure M-19



Notes:

- Ground surface is asphalt pavement unless otherwise noted.
- Mean Higher High Water (MHHW) referenced from United States Army Corps of Engineers (USACE) Duwamish Waterway tidal Datum No. 92 for the North Puget Sound Region.
- The locations of all features shown are approximate.
- This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Data Source: Base from Dowl HKM 2014 survey and Bush, Roed and Hitchings, Inc. 2008 survey.

Projection: NAD 1983 StatePlane Washington North FIPS 4601 Feet
Vertical Datum: North American Vertical Datum 1988 (NAVD88)

Legend

PCUL = 0.000057
Mean Reporting Limit = 0.0072
Basis for PCUL = Surface Water

	Detect or Non-Detect Result Less than the PCUL
	Detected Concentration Greater Than The PCUL
	Non-Detect Result Greather Than The PCUL

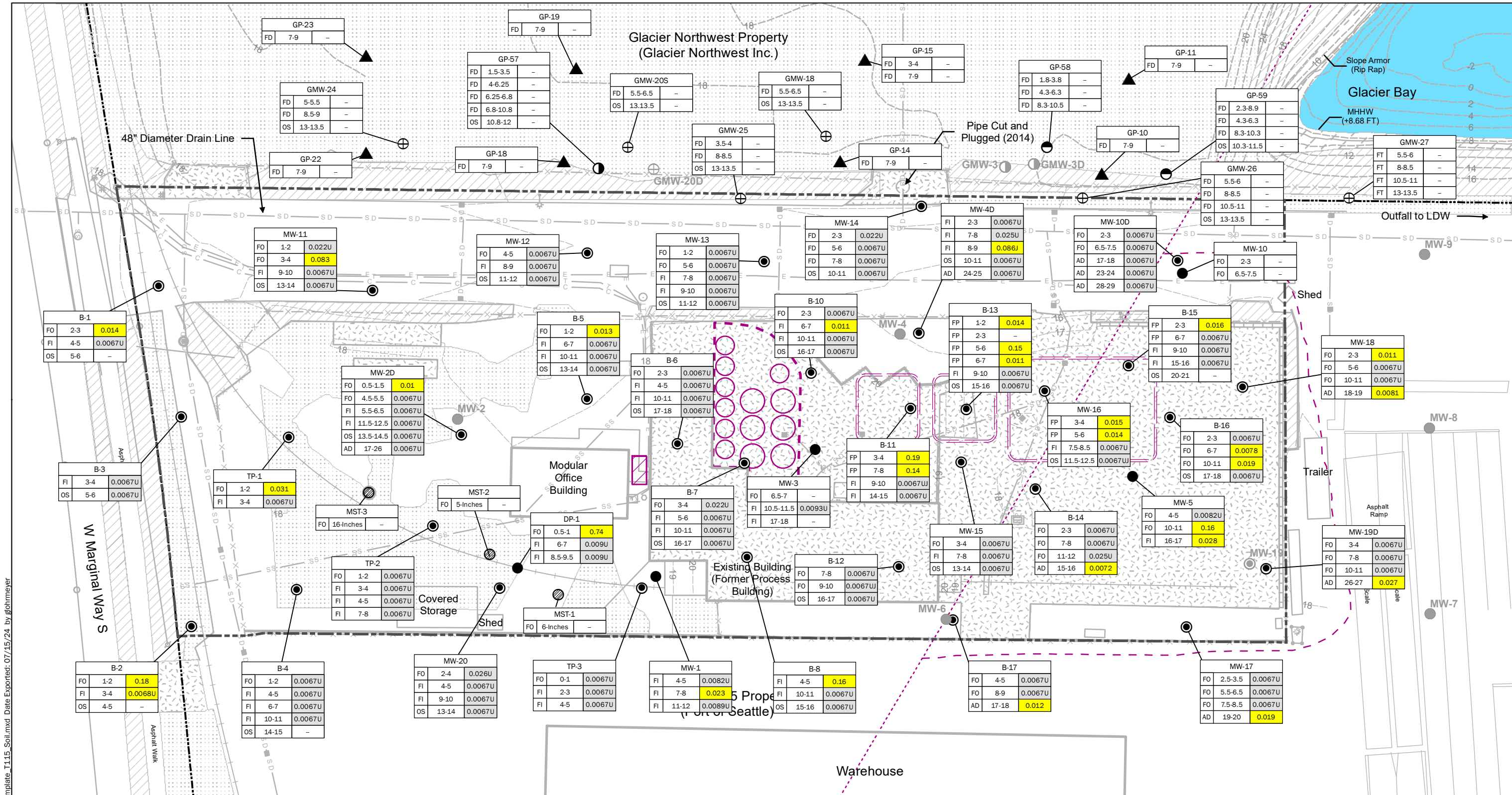
PCUL - Preliminary Cleanup Level
mg/kg - Milligram Per Kilogram
ft bgs - Feet Below Ground Surface
U - Not Detected Greater Than the Reporting Limit
J - Estimated Concentration

Benzo(a)anthracene Concentrations in Soil

Port of Seattle - North Terminal 115
Seattle, Washington

GEOENGINEERS

Figure M-20



Notes:

1. Ground surface is asphalt pavement unless otherwise noted.
2. Mean Higher High Water (MHHW) referenced from United States Army Corps of Engineers (USACE) Duwamish Waterway tidal Datum No. 92 for the North Puget Sound Region.
3. The locations of all features shown are approximate.
4. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Data Source: Base from Dowl HKM 2014 survey and Bush, Roed and Hitchings, Inc. 2008 survey.

Projection: NAD 1983 StatePlane Washington North FIPS 4601 Feet
Vertical Datum: North American Vertical Datum 1988 (NAVD88)

Legend

PCUL = 0.0002
Mean Reporting Limit = 0.0077
Basis for PCUL = Surface Water

Color	Description
Green	Detect or Non-Detect Result Less than the PCUL
Yellow	Detected Concentration Greater Than The PCUL
Grey	Non-Detect Result Greater Than The PCUL

Table Example:

Location ID	Concentration (mg/kg)	Sample Interval (ft bgs)	Stratigraphic Unit
MW-1	0.12	4-5	

PCUL - Preliminary Cleanup Level
mg/kg - Milligram Per Kilogram
ft bgs - Feet Below Ground Surface
U - Not Detected Greater Than the Reporting Limit
J - Estimated Concentration

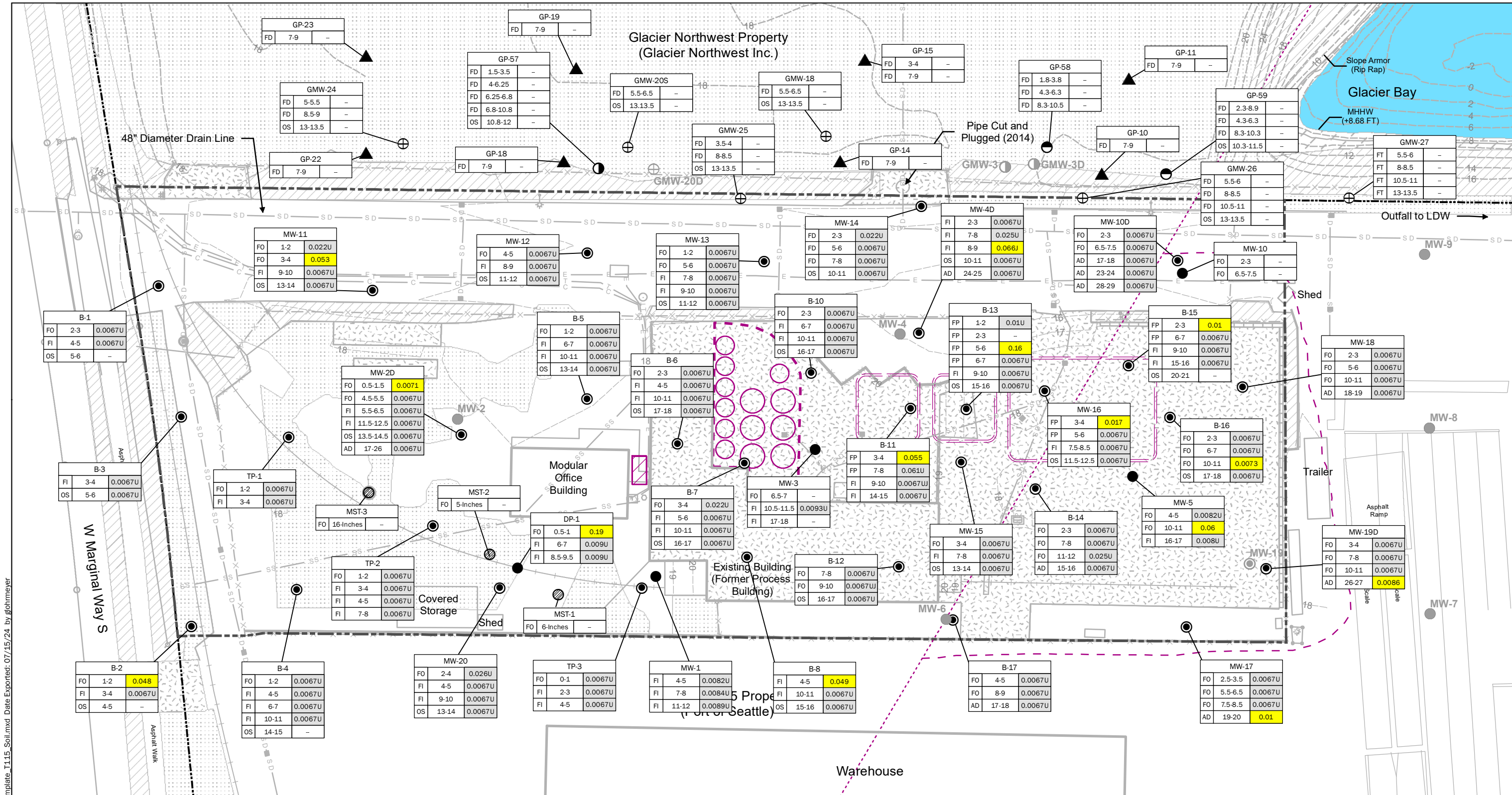
50 0 50
Feet

Benzo(b)fluoranthene Concentrations in Soil

Port of Seattle - North Terminal 115
Seattle, Washington

GEOENGINEERS

Figure M-21



Notes:

- Ground surface is asphalt pavement unless otherwise noted.
- Mean Higher High Water (MHHW) referenced from United States Army Corps of Engineers (USACE) Duwamish Waterway tidal Datum No. 92 for the North Puget Sound Region.
- The locations of all features shown are approximate.
- This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Data Source: Base from Dowl HKM 2014 survey and Bush, Roed and Hitchings, Inc. 2008 survey.

Projection: NAD 1983 StatePlane Washington North FIPS 4601 Feet
Vertical Datum: North American Vertical Datum 1988 (NAVD88)

Legend

PCUL = 0.002
Mean Reporting Limit = 0.0081
Basis for PCUL = Surface Water

	Detect or Non-Detect Result Less than the PCUL
	Detected Concentration Greater Than The PCUL
	Non-Detect Result Greather Than The PCUL

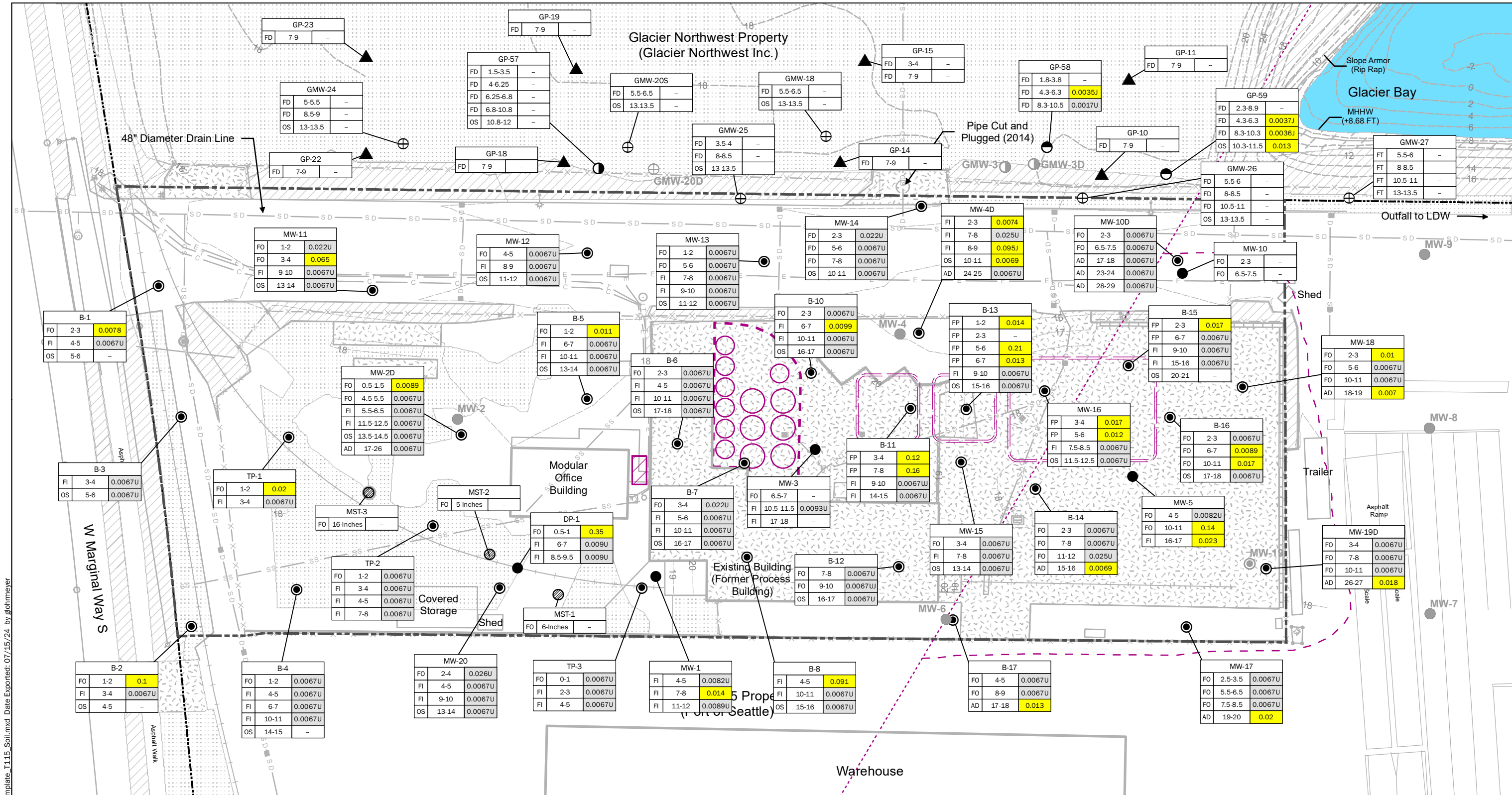
PCUL - Preliminary Cleanup Level
mg/kg - Milligram Per Kilogram
ft bgs - Feet Below Ground Surface
U - Not Detected Greater Than the Reporting Limit
J - Estimated Concentration

Benzo(k)fluoranthene Concentrations in Soil

Port of Seattle - North Terminal 115
Seattle, Washington

GEOENGINEERS

Figure M-22



Notes:

- Ground surface is asphalt pavement unless otherwise noted.
- Mean Higher High Water (MHHW) referenced from United States Army Corps of Engineers (USACE) Duwamish Waterway tidal Datum No. 92 for the North Puget Sound Region.
- The locations of all features shown are approximate.
- This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Data Source: Base from Dowl HKM 2014 survey and Bush, Roed and Hitchings, Inc. 2008 survey.

Projection: NAD 1983 StatePlane Washington North FIPS 4601 Feet
Vertical Datum: North American Vertical Datum 1988 (NAVD88)

Legend

PCUL = 0.000016
Mean Reporting Limit = 0.0077
Basis for PCUL = Surface Water

	Detect or Non-Detect Result Less than the PCUL
	Detected Concentration Greater Than The PCUL
	Non-Detect Result Greather Than The PCUL

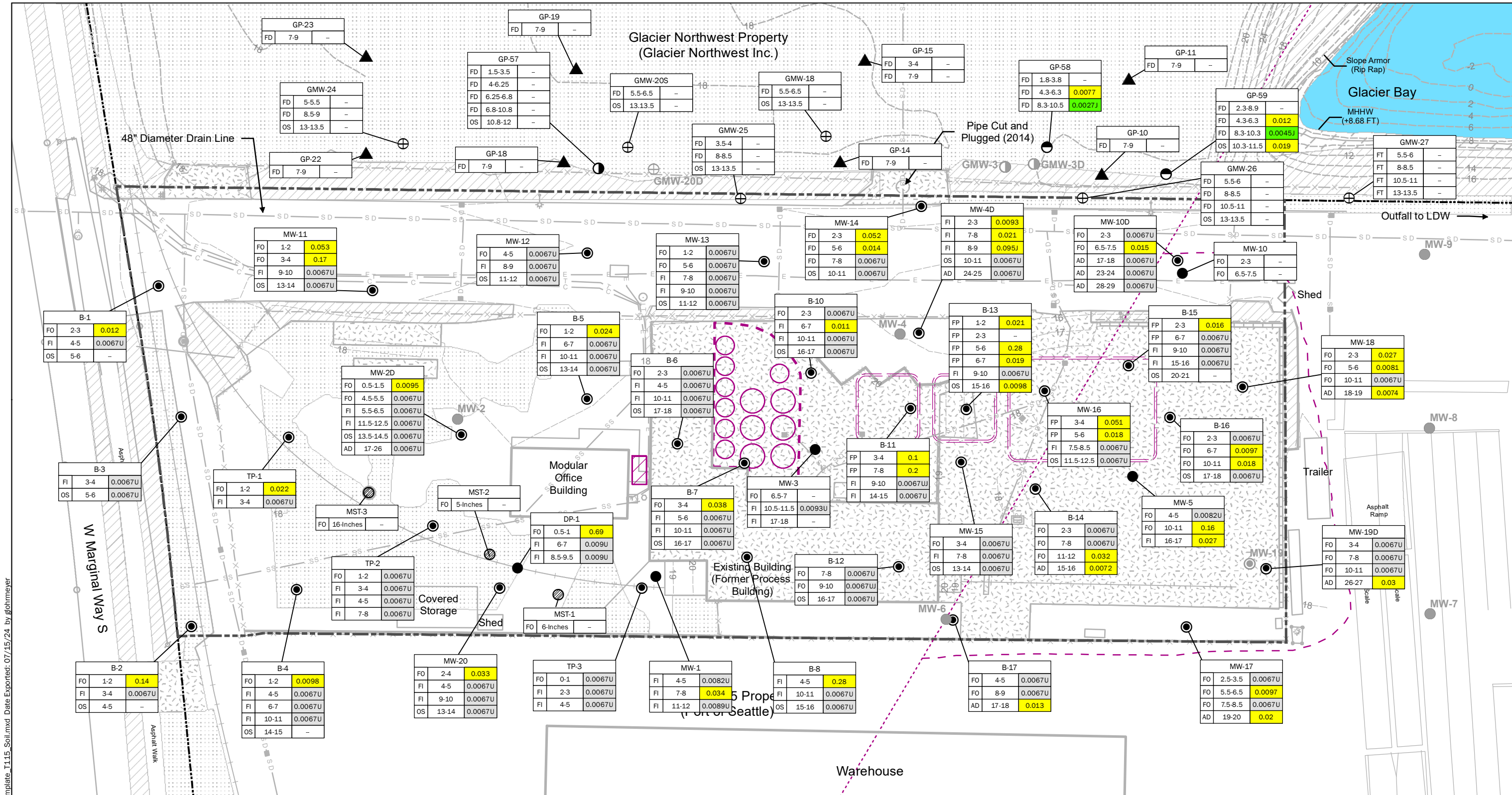
PCUL - Preliminary Cleanup Level
mg/kg - Milligram Per Kilogram
ft bgs - Feet Below Ground Surface
U - Not Detected Greater Than the Reporting Limit
J - Estimated Concentration

Benzo(a)pyrene Concentrations in Soil

Port of Seattle - North Terminal 115
Seattle, Washington

GEOENGINEERS

Figure M-23



Notes:

- Ground surface is asphalt pavement unless otherwise noted.
- Mean Higher High Water (MHHW) referenced from United States Army Corps of Engineers (USACE) Duwamish Waterway tidal Datum No. 92 for the North Puget Sound Region.
- The locations of all features shown are approximate.
- This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Data Source: Base from Dowl HKM 2014 survey and Bush, Roed and Hitchings, Inc. 2008 survey.

Projection: NAD 1983 StatePlane Washington North FIPS 4601 Feet
Vertical Datum: North American Vertical Datum 1988 (NAVD88)

Legend

PCUL = 0.0064
Mean Reporting Limit = 0.0068
Basis for PCUL = Surface Water

	Detect or Non-Detect Result Less than the PCUL
	Detected Concentration Greater Than The PCUL
	Non-Detect Result Greater Than The PCUL

PCUL - Preliminary Cleanup Level
mg/kg - Milligram Per Kilogram
ft bgs - Feet Below Ground Surface
U - Not Detected Greater Than the Reporting Limit
J - Estimated Concentration

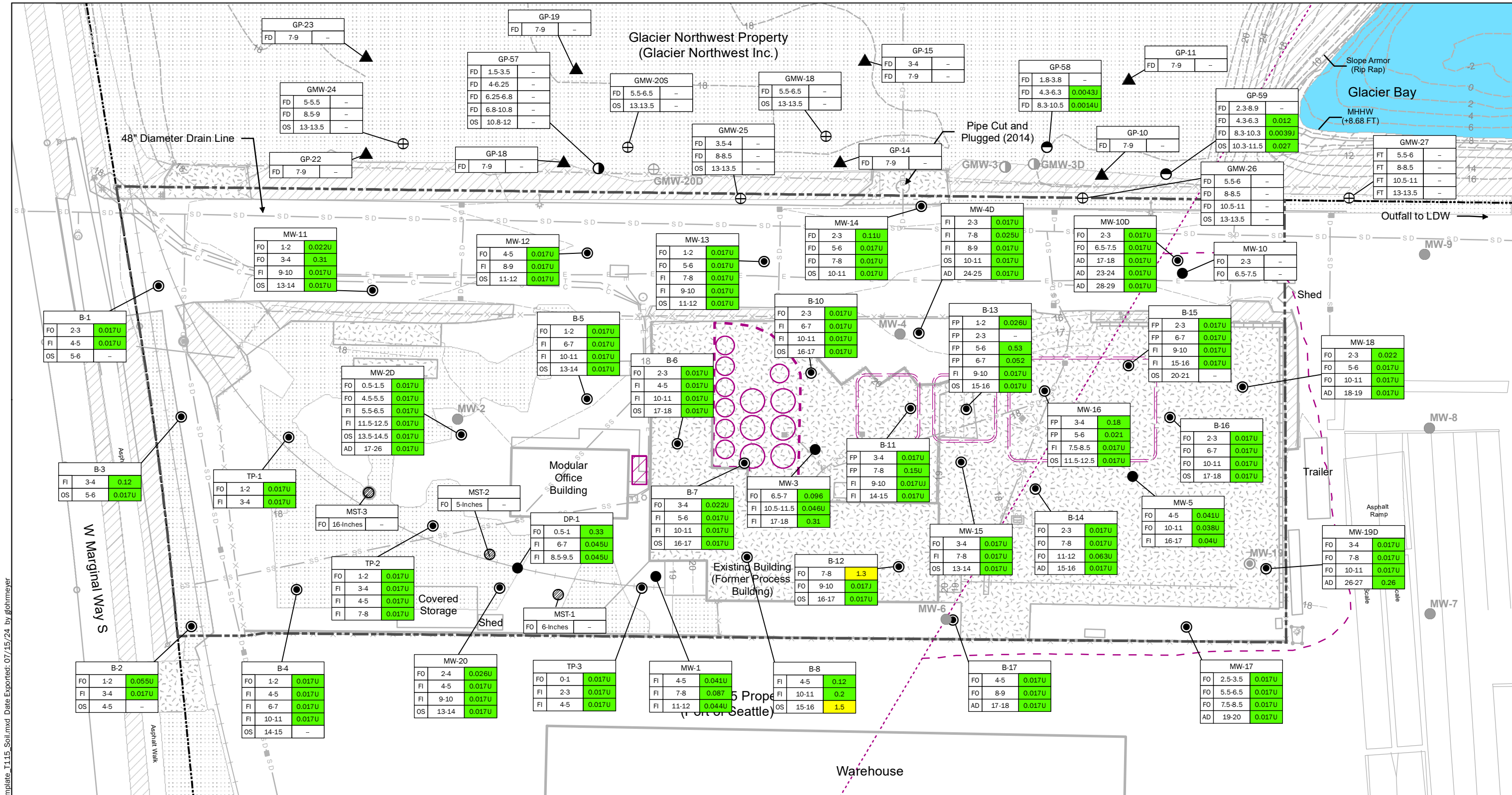
Chrysene Concentrations in Soil

Port of Seattle - North Terminal 115
Seattle, Washington

GEOENGINEERS

Figure M-24

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Notes:

- Ground surface is asphalt pavement unless otherwise noted.
- Mean Higher High Water (MHHW) referenced from United States Army Corps of Engineers (USACE) Duwamish Waterway tidal Datum No. 92 for the North Puget Sound Region.
- The locations of all features shown are approximate.
- This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Data Source: Base from Dowl HKM 2014 survey and Bush, Roed and Hitchings, Inc. 2008 survey.

Projection: NAD 1983 StatePlane Washington North FIPS 4601 Feet
Vertical Datum: North American Vertical Datum 1988 (NAVD88)

Legend

PCUL = 0.54
Mean Reporting Limit = 0.022
Basis for PCUL = Bank Erosion

	Detect or Non-Detect Result Less than the PCUL
	Detect or Non-Detect Result Greater Than The PCUL
	Non-Detect Result Greater Than The PCUL

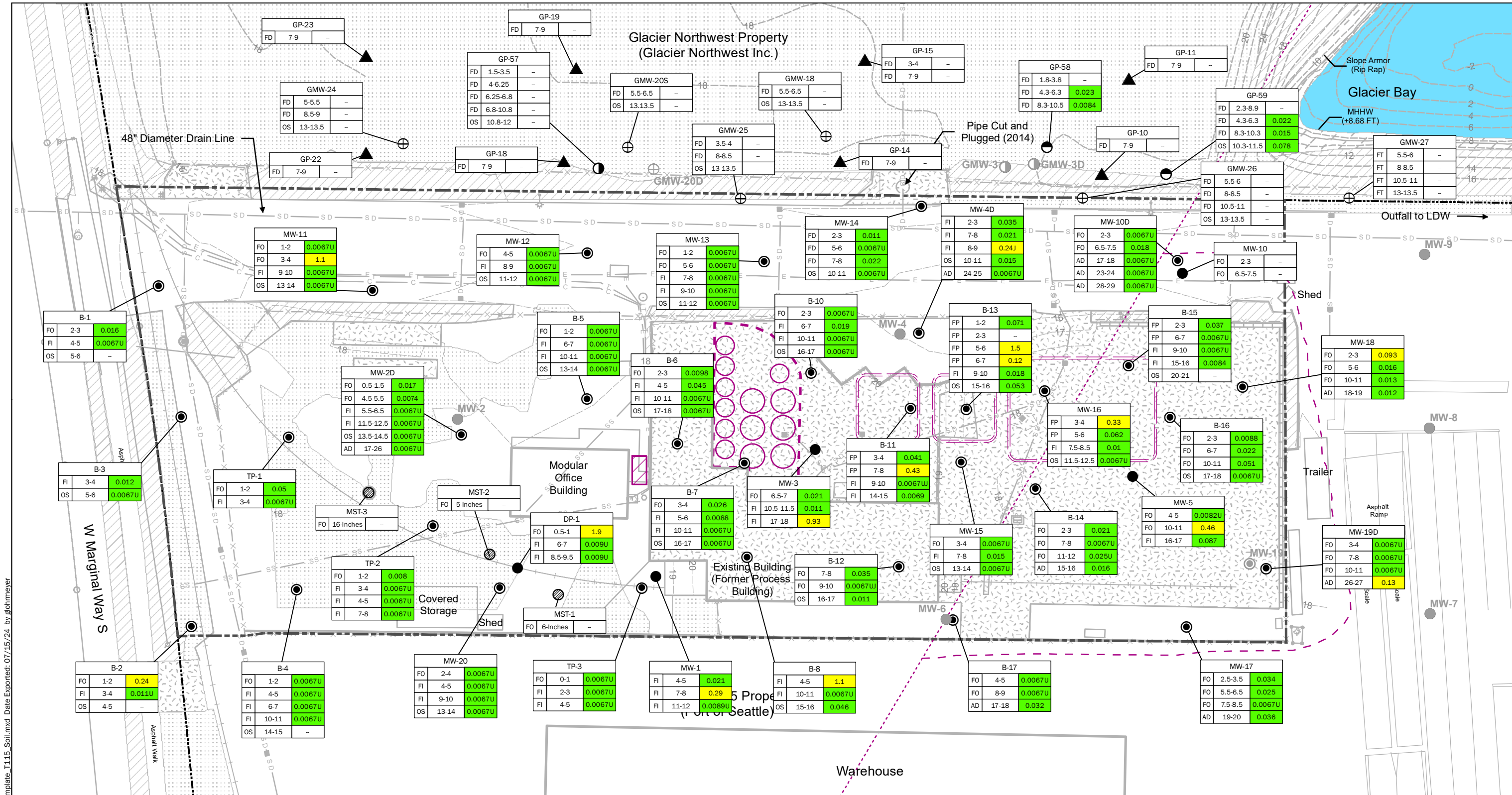
PCUL - Preliminary Cleanup Level
mg/kg - Milligram Per Kilogram
ft bgs - Feet Below Ground Surface
U - Not Detected Greater Than the Reporting Limit
J - Estimated Concentration

Dibenzofuran Concentrations in Soil

Port of Seattle - North Terminal 115
Seattle, Washington

GEOENGINEERS

Figure M-26



Notes:

- Ground surface is asphalt pavement unless otherwise noted.
- Mean Higher High Water (MHHW) referenced from United States Army Corps of Engineers (USACE) Duwamish Waterway tidal Datum No. 92 for the North Puget Sound Region.
- The locations of all features shown are approximate.
- This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Data Source: Base from Dowl HKM 2014 survey and Bush, Roed and Hitchings, Inc. 2008 survey.

Projection: NAD 1983 StatePlane Washington North FIPS 4601 Feet
Vertical Datum: North American Vertical Datum 1988 (NAVD88)

Legend

PCUL = 0.09
Mean Reporting Limit = 0.007
Basis for PCUL = Sediment

Green	Detect or Non-Detect Result Less than the PCUL
Yellow	Detected Concentration Greater Than The PCUL
Grey	Non-Detect Result Greater Than The PCUL

PCUL - Preliminary Cleanup Level
mg/kg - Milligram Per Kilogram
ft bgs - Feet Below Ground Surface
U - Not Detected Greater Than the Reporting Limit
J - Estimated Concentration

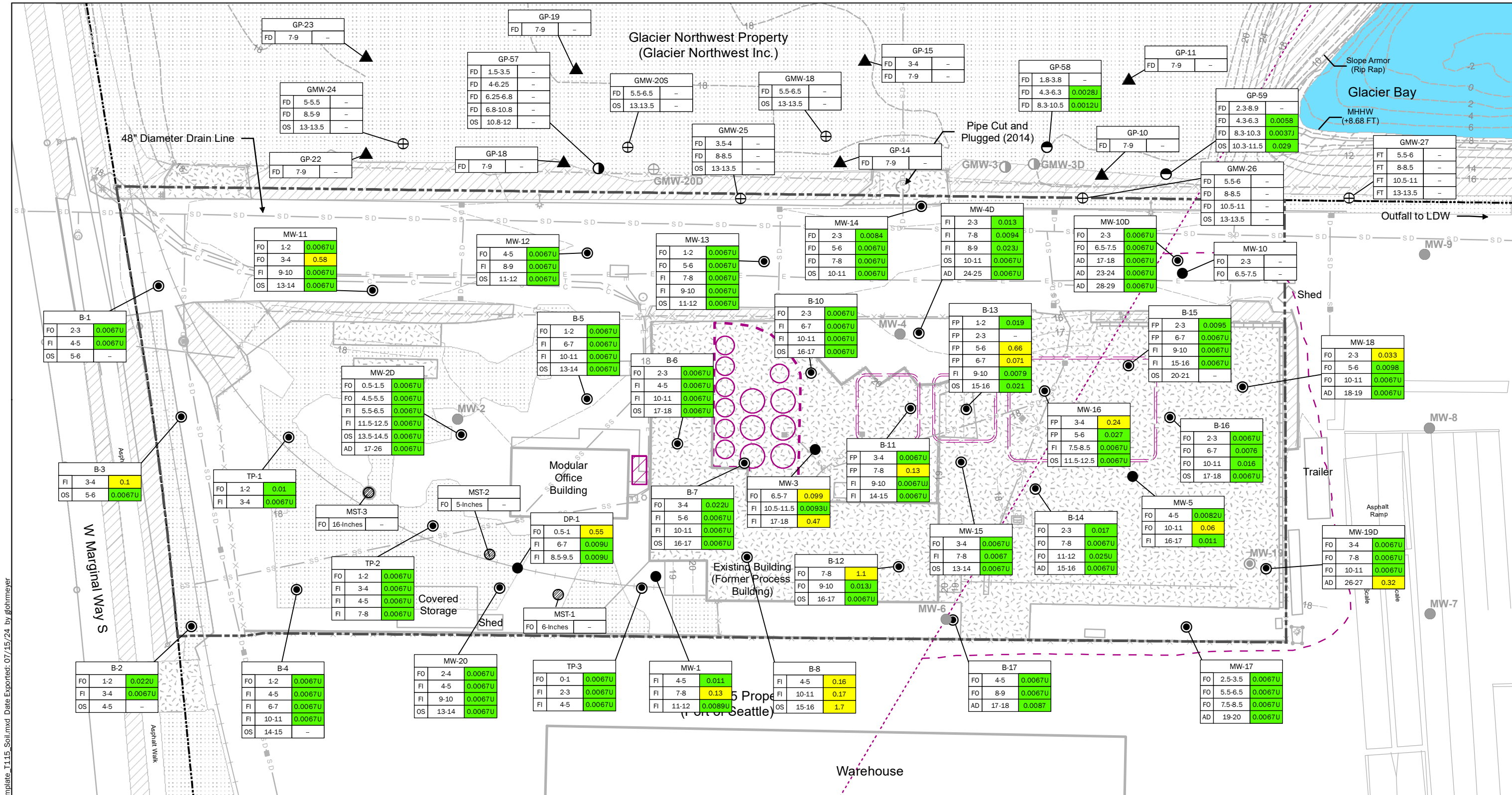
50 0 50
Feet

Fluoranthene Concentrations in Soil

Port of Seattle - North Terminal 115
Seattle, Washington

GEOENGINEERS

Figure M-27



Notes:

- Ground surface is asphalt pavement unless otherwise noted.
- Mean Higher High Water (MHHW) referenced from United States Army Corps of Engineers (USACE) Duwamish Waterway tidal Datum No. 92 for the North Puget Sound Region.
- The locations of all features shown are approximate.
- This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Data Source: Base from Dowl HKM 2014 survey and Bush, Roed and Hitchings, Inc. 2008 survey.

Projection: NAD 1983 StatePlane Washington North FIPS 4601 Feet
Vertical Datum: North American Vertical Datum 1988 (NAVD88)

Legend

PCUL = 0.029
Mean Reporting Limit = 0.0073
Basis for PCUL = Sediment

	Detect or Non-Detect Result Less than the PCUL
	Detected Concentration Greater Than The PCUL
	Non-Detect Result Greater Than The PCUL

PCUL - Preliminary Cleanup Level
mg/kg - Milligram Per Kilogram
ft bgs - Feet Below Ground Surface
U - Not Detected Greater Than the Reporting Limit
J - Estimated Concentration

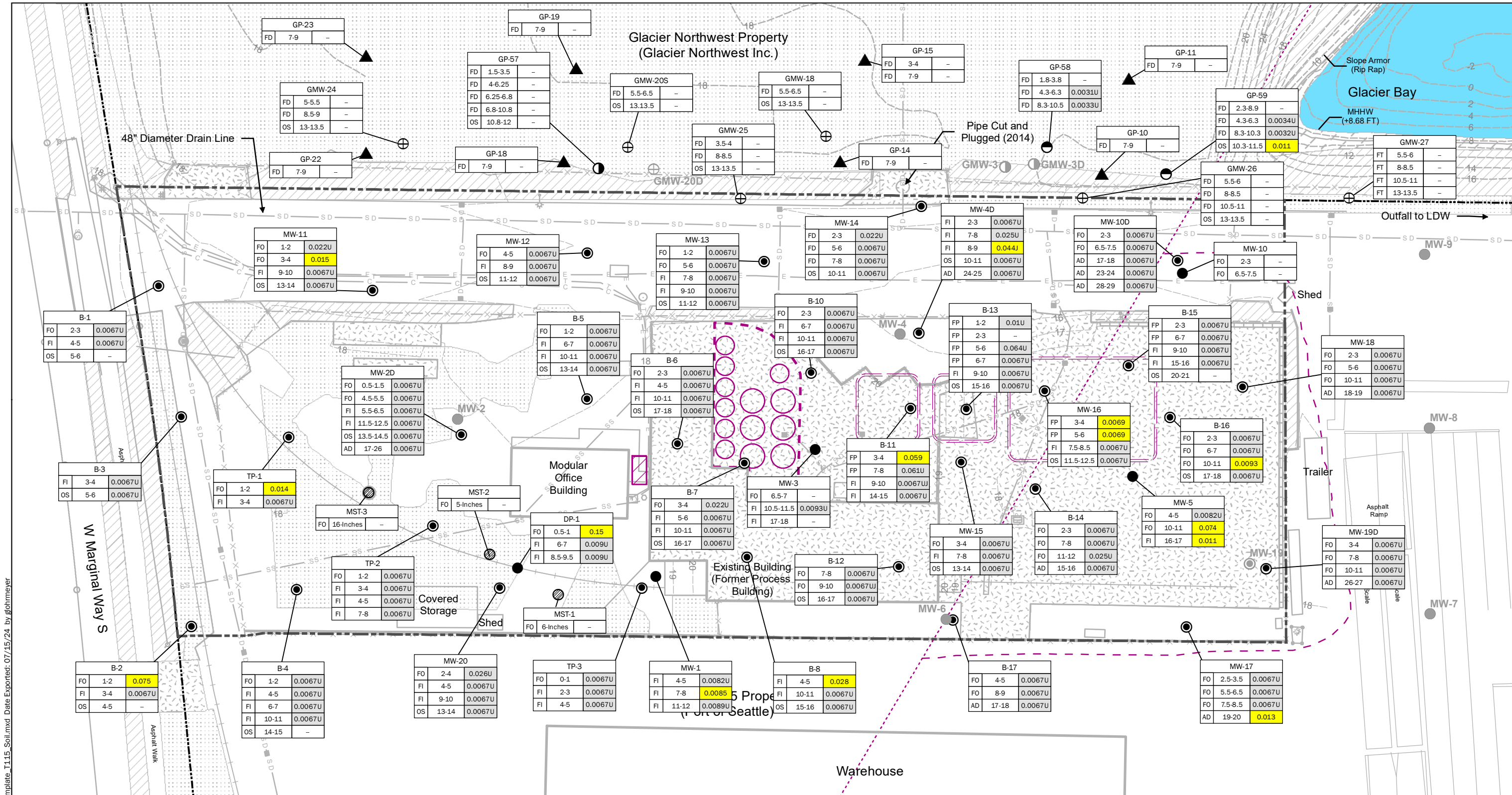
Fluorene Concentrations in Soil

Port of Seattle - North Terminal 115
Seattle, Washington

GEOENGINEERS

Figure M-28

P:\0303112\GIS\MXD\030311200_Base_Template_T115_Soil.mxd Date Exported: 07/15/24 by gghmeyer



Notes:

- Ground surface is asphalt pavement unless otherwise noted.
- Mean Higher High Water (MHHW) referenced from United States Army Corps of Engineers (USACE) Duwamish Waterway tidal Datum No. 92 for the North Puget Sound Region.
- The locations of all features shown are approximate.
- This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Data Source: Base from Dowl HKM 2014 survey and Bush, Roed and Hitchings, Inc. 2008 survey.

Projection: NAD 1983 StatePlane Washington North FIPS 4601 Feet
Vertical Datum: North American Vertical Datum 1988 (NAVD88)

Legend

PCUL = 0.00056
Mean Reporting Limit = 0.0085
Basis for PCUL = Surface Water

	Detect or Non-Detect Result Less than the PCUL
	Detected Concentration Greater Than The PCUL
	Non-Detect Result Greater Than The PCUL

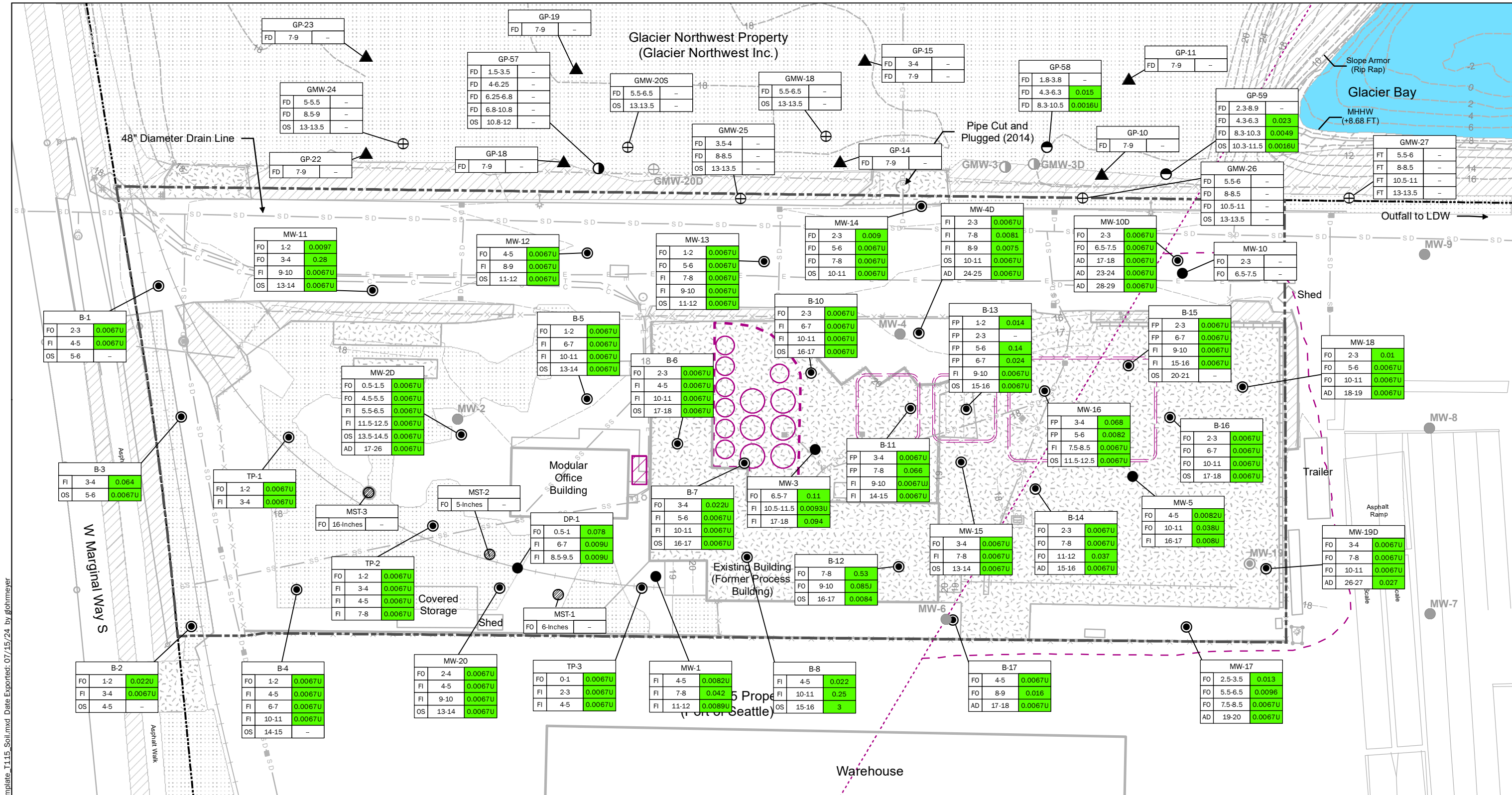
PCUL - Preliminary Cleanup Level
mg/kg - Milligram Per Kilogram
ft bgs - Feet Below Ground Surface
U - Not Detected Greater Than the Reporting Limit
J - Estimated Concentration

Indeno(1,2,3-c,d)pyrene Concentrations in Soil

Port of Seattle - North Terminal 115
Seattle, Washington

GEOENGINEERS

Figure M-29



Notes:

- Ground surface is asphalt pavement unless otherwise noted.
- Mean Higher High Water (MHHW) referenced from United States Army Corps of Engineers (USACE) Duwamish Waterway tidal Datum No. 92 for the North Puget Sound Region.
- The locations of all features shown are approximate.
- This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Data Source: Base from Dowl HKM 2014 survey and Bush, Roed and Hitchings, Inc. 2008 survey.

Projection: NAD 1983 StatePlane Washington North FIPS 4601 Feet
Vertical Datum: North American Vertical Datum 1988 (NAVD88)

Legend

PCUL = 29
Mean Reporting Limit = 0.0074
Basis for PCUL = Bank Erosion

	Detect or Non-Detect Result Less than the PCUL
	Detected Concentration Greater Than The PCUL
	Non-Detect Result Greater Than The PCUL

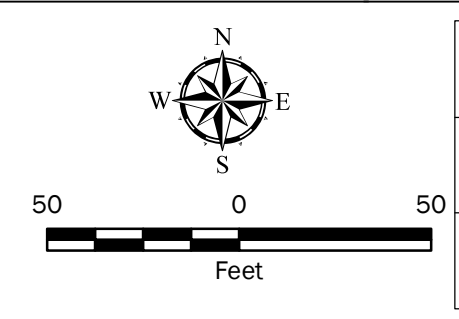
mg/kg - Milligram Per Kilogram
ft bgs - Feet Below Ground Surface
U - Not Detected Greater Than the Reporting Limit
J - Estimated Concentration

Location ID

Concentration (mg/kg)

Sample Interval (ft bgs)

Stratigraphic Unit

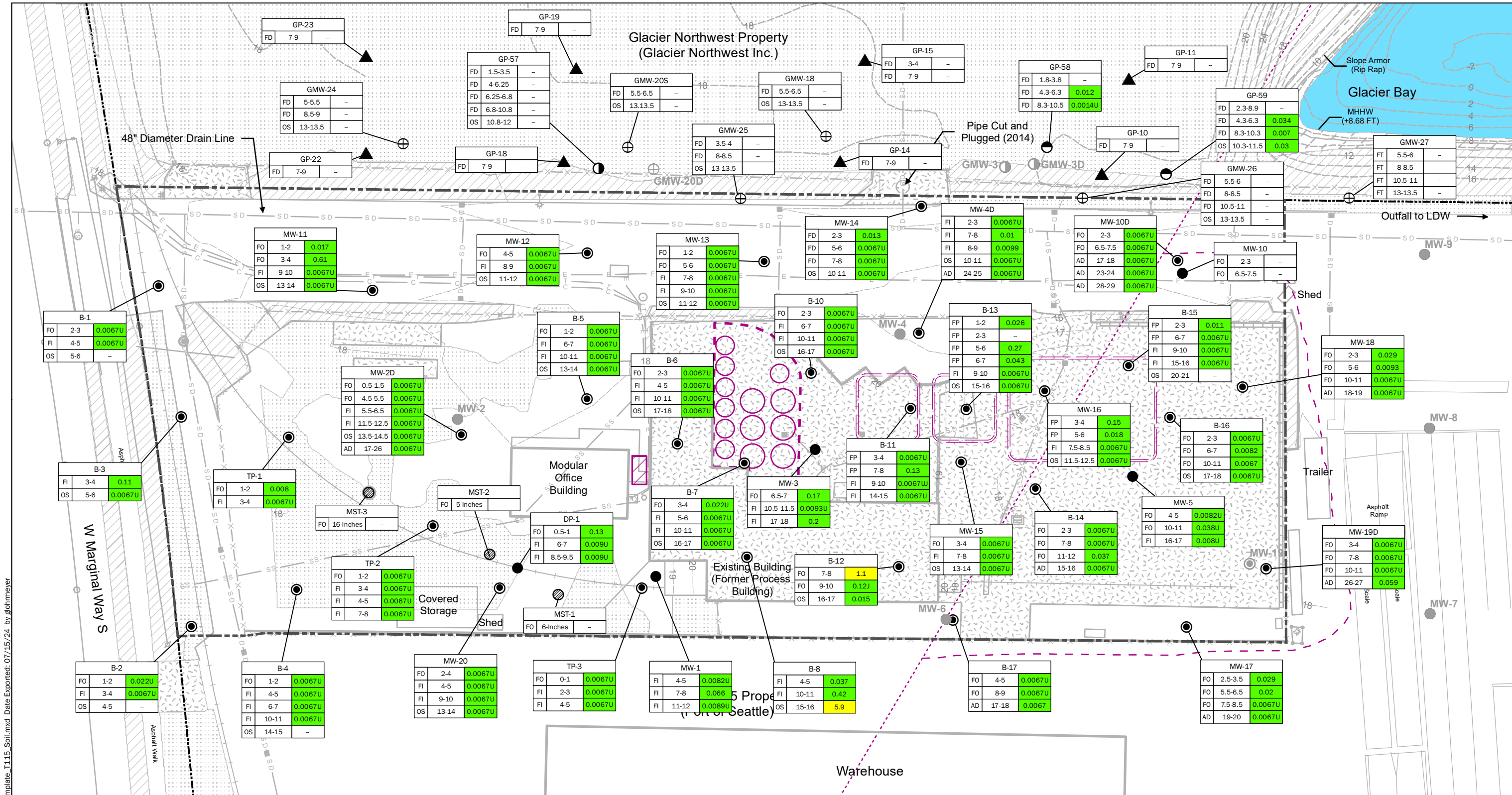


1-Methylnaphthalene Concentrations in Soil

Port of Seattle - North Terminal 115
Seattle, Washington

GEOENGINEERS

Figure M-30



Notes:

- Ground surface is asphalt pavement unless otherwise noted.
- Mean Higher High Water (MHHW) referenced from United States Army Corps of Engineers (USACE) Duwamish Waterway tidal Datum No. 92 for the North Puget Sound Region.
- The locations of all features shown are approximate.
- This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Data Source: Base from Dowl HKM 2014 survey and Bush, Roed and Hitchings, Inc. 2008 survey.

Projection: NAD 1983 StatePlane Washington North FIPS 4601 Feet
Vertical Datum: North American Vertical Datum 1988 (NAVD88)

Legend

PCUL = 0.67
Mean Reporting Limit = 0.0074
Basis for PCUL = Bank Erosion

Color	Description
Green	Detect or Non-Detect Result Less than the PCUL
Yellow	Detected Concentration Greater Than The PCUL
Grey	Non-Detect Result Greater Than The PCUL

Table Example:

Location ID	Concentration (mg/kg)	Sample Interval (ft bgs)	Stratigraphic Unit
MW-1	0.12	4-5	

PCUL - Preliminary Cleanup Level
mg/kg - Milligram Per Kilogram
ft bgs - Feet Below Ground Surface
U - Not Detected Greater Than the Reporting Limit
J - Estimated Concentration

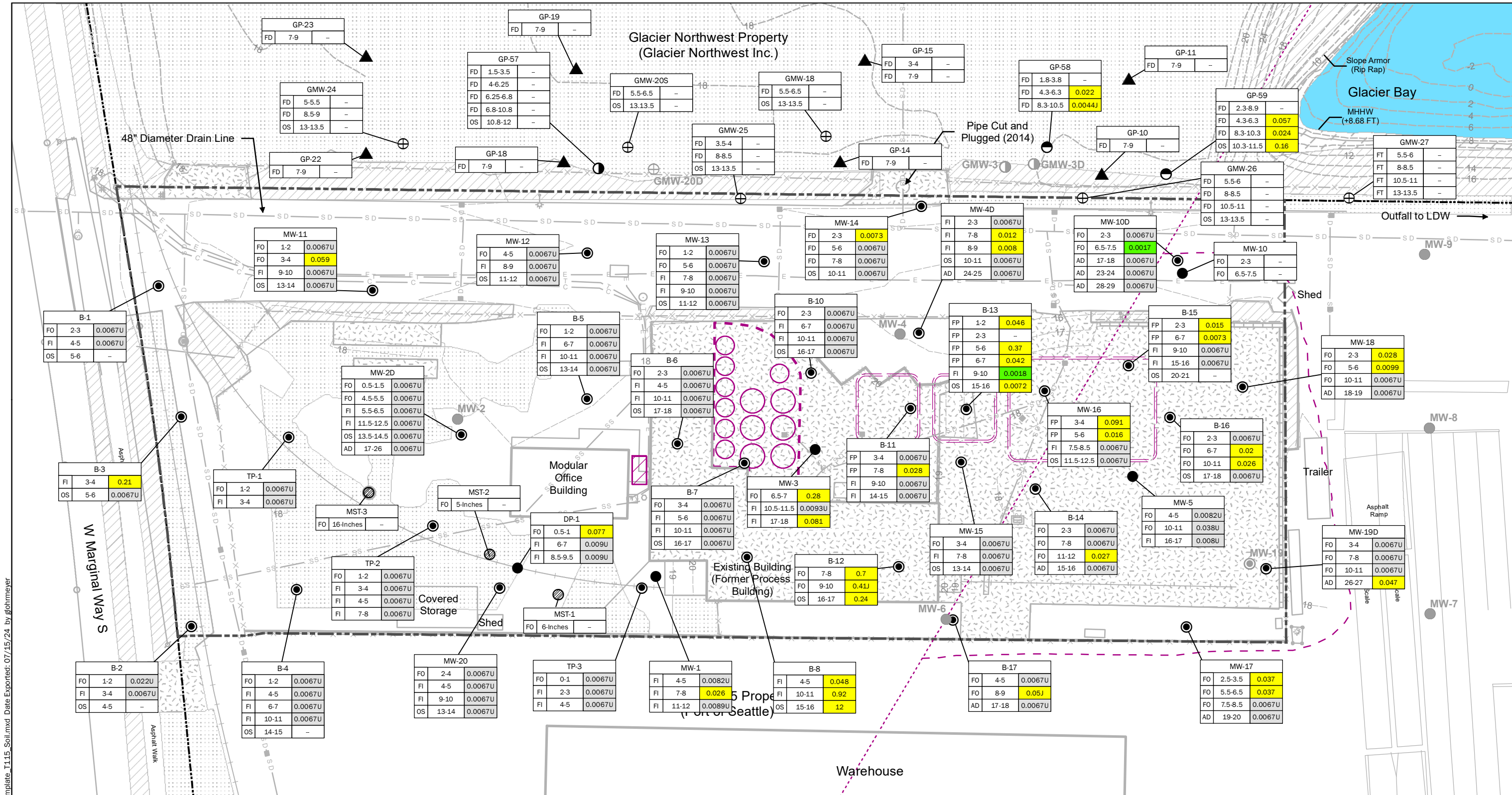
50 0 50
Feet

2-Methylnaphthalene Concentrations in Soil

Port of Seattle - North Terminal 115
Seattle, Washington

GEOENGINEERS

Figure M-31



Notes:

1. Ground surface is asphalt pavement unless otherwise noted.
2. Mean Higher High Water (MHHW) referenced from United States Army Corps of Engineers (USACE) Duwamish Waterway tidal Datum No. 92 for the North Puget Sound Region.
3. The locations of all features shown are approximate.
4. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Data Source: Base from Dowl HKM 2014 survey and Bush, Roed and Hitchings, Inc. 2008 survey.

Projection: NAD 1983 StatePlane Washington North FIPS 4601 Feet
Vertical Datum: North American Vertical Datum 1988 (NAVD88)

Legend

PCUL = 0.0021
Mean Reporting Limit = 0.0049
Basis for PCUL = Surface Water

	Detect or Non-Detect Result Less than the PCUL
	Detected Concentration Greater Than The PCUL
	Non-Detect Result Greather Than The PCUL

MW-1		Location ID
FO	4-5	0.12
Concentration (mg/kg)		
Sample Interval (ft bgs)		
Stratigraphic Unit		

PCUL - Preliminary Cleanup Level
mg/kg - Milligram Per Kilogram
ft bgs - Feet Below Ground Surface
U - Not Detected Greater Than the Reporting Limit
J - Estimated Concentration

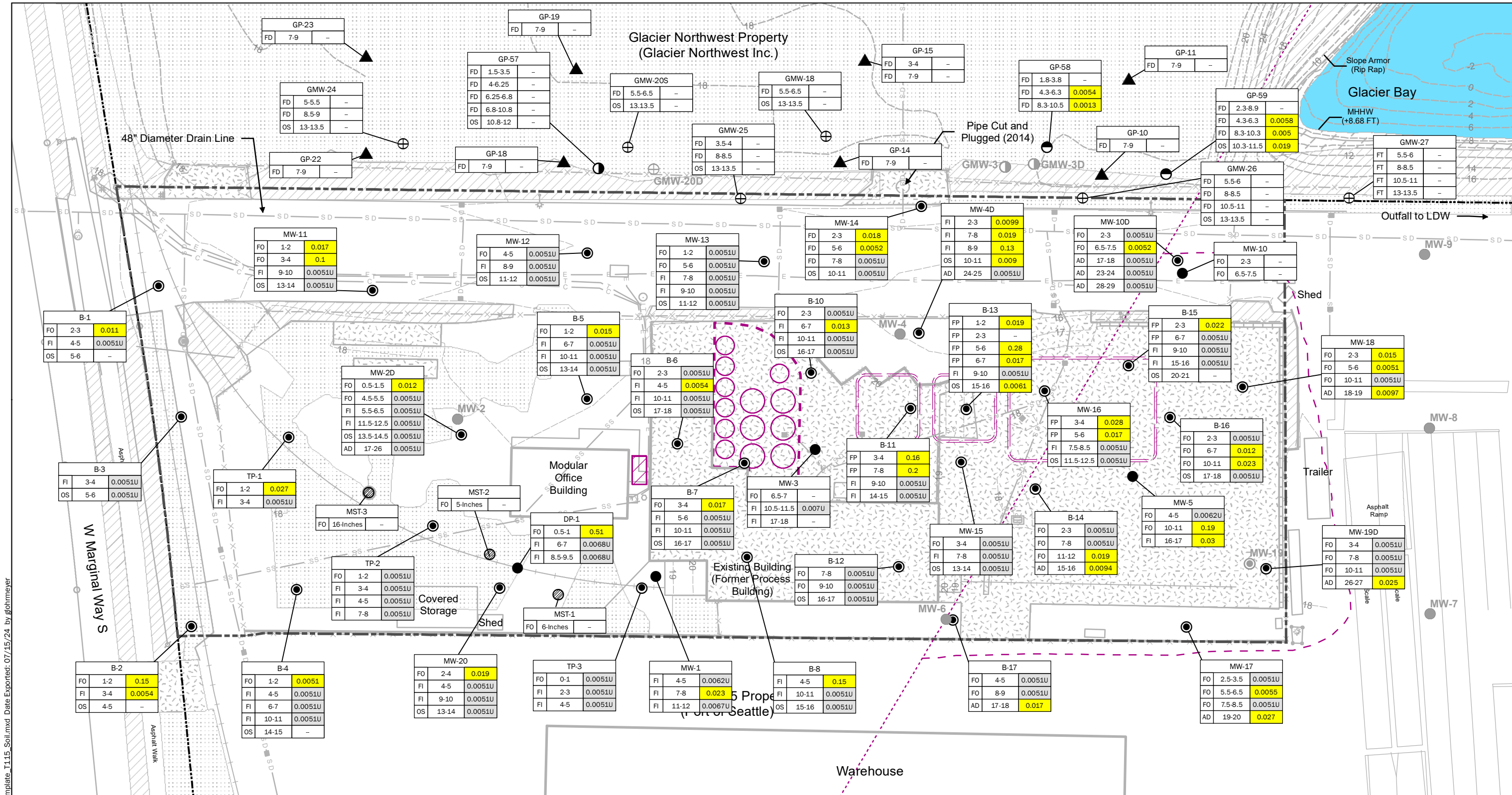
50 0 50
Feet

Naphthalene Concentrations in Soil

Port of Seattle - North Terminal 115
Seattle, Washington

GEOENGINEERS

Figure M-32



Notes:

- Ground surface is asphalt pavement unless otherwise noted.
- Mean Higher High Water (MHHW) referenced from United States Army Corps of Engineers (USACE) Duwamish Waterway tidal Datum No. 92 for the North Puget Sound Region.
- The locations of all features shown are approximate.
- This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Data Source: Base from Dowl HKM 2014 survey and Bush, Roed and Hitchings, Inc. 2008 survey.

Projection: NAD 1983 StatePlane Washington North FIPS 4601 Feet
Vertical Datum: North American Vertical Datum 1988 (NAVD88)

Legend

PCUL = 0.000016
Mean Reporting Limit = 0.0052
Basis for PCUL = Surface Water

	Detect or Non-Detect Result Less than the PCUL
	Detected Concentration Greater Than The PCUL
	Non-Detect Result Greater Than The PCUL

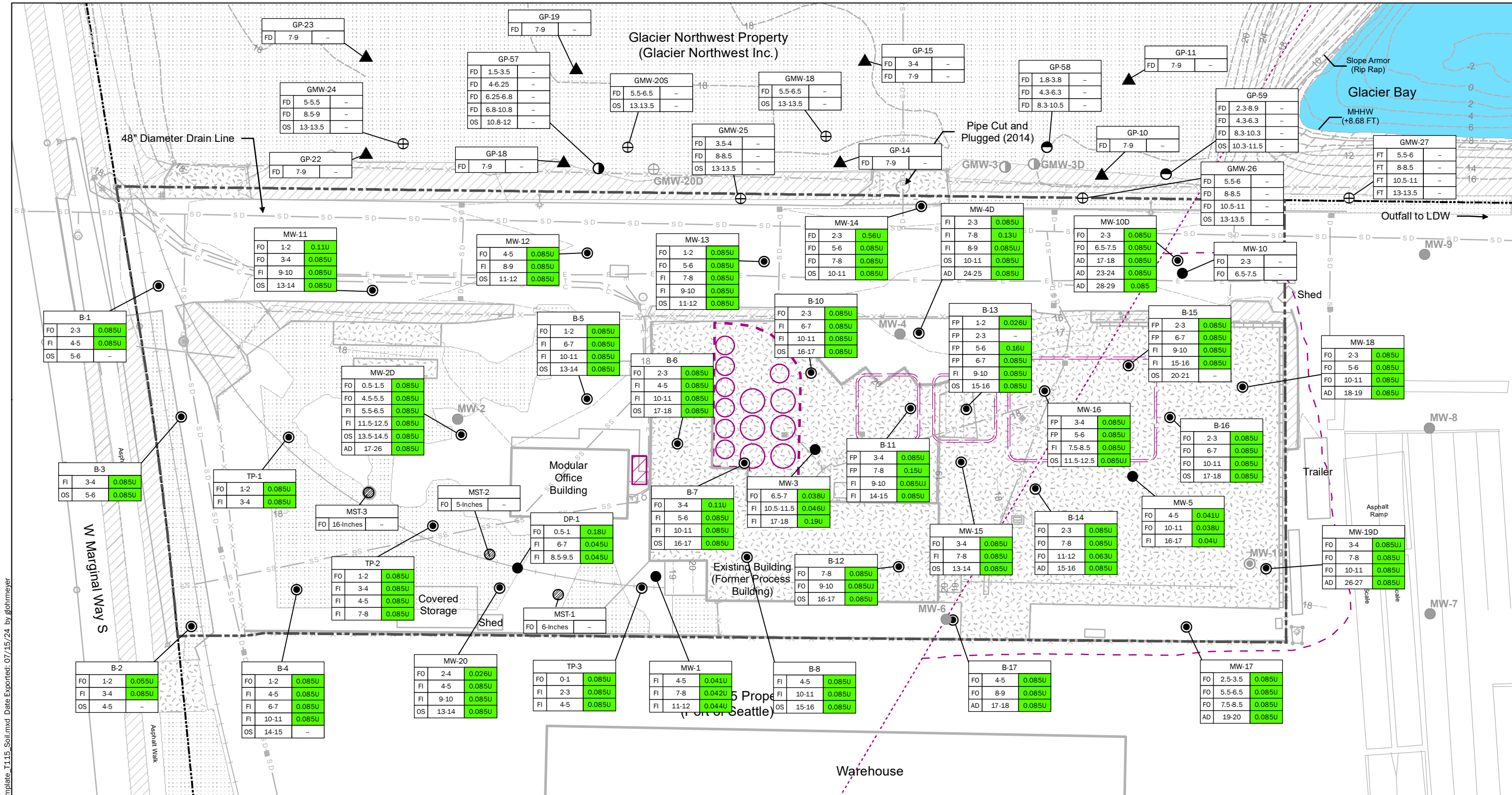
PCUL - Preliminary Cleanup Level
mg/kg - Milligram Per Kilogram
ft bgs - Feet Below Ground Surface
U - Not Detected Greater Than the Reporting Limit
J - Estimated Concentration
TEQ - Toxicity Equivalency Quotient
ND - Non-Detect
RL - Reporting Limit

**Total cPAH TEQ (ND=0.5RL)
Concentrations in Soil**

Port of Seattle - North Terminal 115
Seattle, Washington

GEOENGINEERS

Figure M-34



Notes:

- Ground surface is asphalt pavement unless otherwise noted.
- Mean Higher High Water (MHHW) referenced from United States Army Corps of Engineers (USACE) Duwamish Waterway tidal Datum No. 92 for the North Puget Sound Region.
- The locations of all features shown are approximate.
- This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Data Source: Base from Dowl HKM 2014 survey and Bush, Roed and Hitchings, Inc. 2008 survey.

Projection: NAD 1983 StatePlane Washington North FIPS 4601 Feet
Vertical Datum: North American Vertical Datum 1988 (NAVD88)

Legend

PCUL = 150
Mean Reporting Limit = 0.092
Basis for PCUL = Bank Erosion

	Detect or Non-Detect Result Less than the PCUL
	Detected Concentration Greater Than The PCUL
	Non-Detect Result Greater Than The PCUL

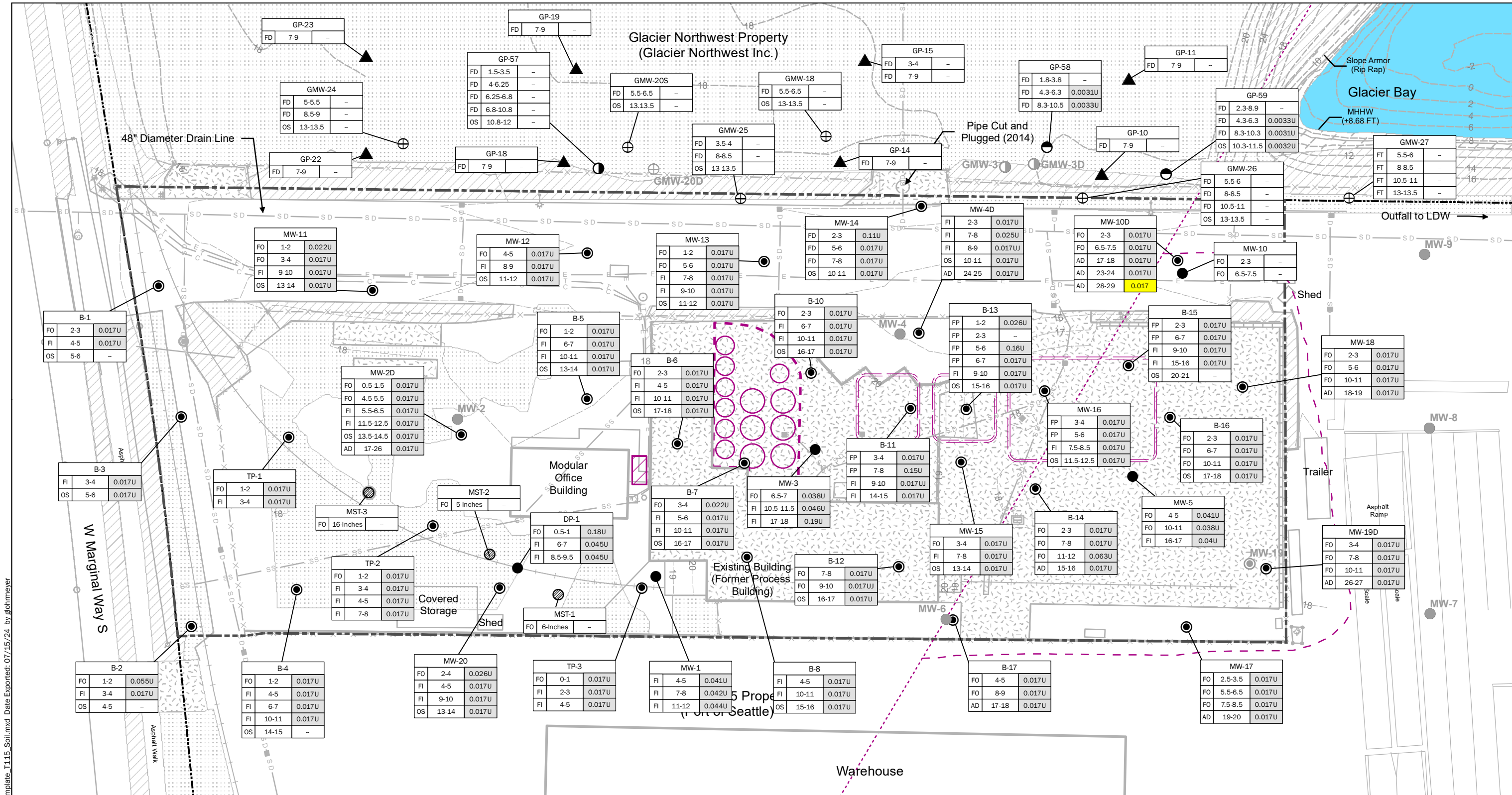
PCUL - Preliminary Cleanup Level
mg/kg - Milligram Per Kilogram
ft bgs - Feet Below Ground Surface
U - Not Detected Greater Than the Reporting Limit
J - Estimated Concentration

Aniline Concentrations in Soil

Port of Seattle - North Terminal 115
Seattle, Washington

GEOENGINEERS

Figure M-35



Notes:

1. Ground surface is asphalt pavement unless otherwise noted.
2. Mean Higher High Water (MHHW) referenced from United States Army Corps of Engineers (USACE) Duwamish Waterway tidal Datum No. 92 for the North Puget Sound Region.
3. The locations of all features shown are approximate.
4. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Data Source: Base from Dowl HKM 2014 survey and Bush, Roed and Hitchings, Inc. 2008 survey.

Projection: NAD 1983 StatePlane Washington North FIPS 4601 Feet
Vertical Datum: North American Vertical Datum 1988 (NAVD88)

Legend

PCUL = 0.000022
Mean Reporting Limit = 0.025
Basis for PCUL = Surface Water

Color	Description
Green	Detect or Non-Detect Result Less than the PCUL
Yellow	Detected Concentration Greater Than The PCUL
Grey	Non-Detect Result Greater Than The PCUL

Table Example:

Location ID	Concentration (mg/kg)	Sample Interval (ft bgs)	Stratigraphic Unit
MW-1	4-5	0.12	

PCUL - Preliminary Cleanup Level
mg/kg - Milligram Per Kilogram
ft bgs - Feet Below Ground Surface
U - Not Detected Greater Than the Reporting Limit
J - Estimated Concentration

Scale: 50 0 50 Feet

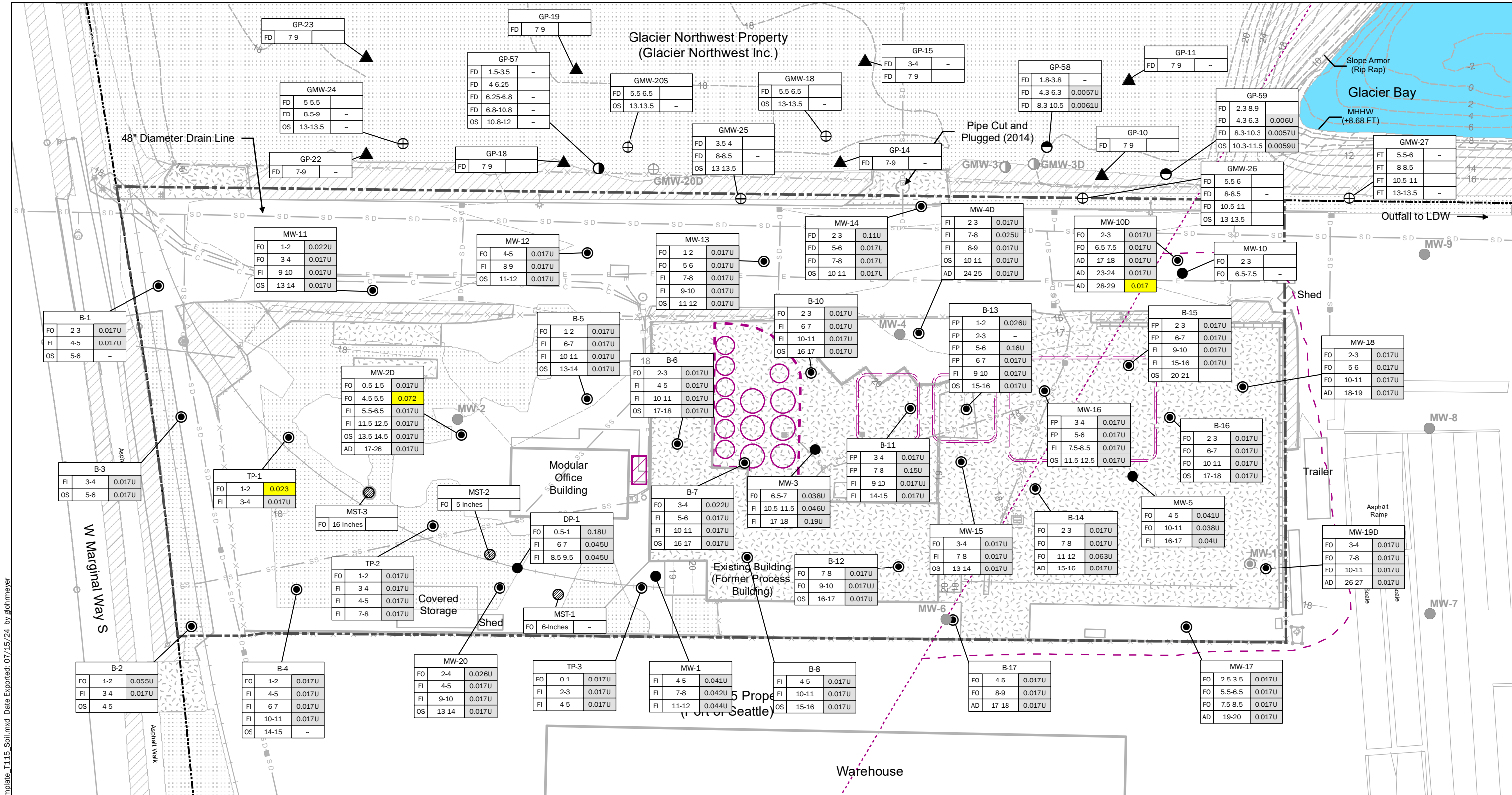
Compass Rose: N, S, E, W

Bis(2-Chloroethyl)Ether Concentrations in Soil

Port of Seattle - North Terminal 115
Seattle, Washington

GEOENGINEERS

Figure M-36



Notes:

- Ground surface is asphalt pavement unless otherwise noted.
- Mean Higher High Water (MHHW) referenced from United States Army Corps of Engineers (USACE) Duwamish Waterway tidal Datum No. 92 for the North Puget Sound Region.
- The locations of all features shown are approximate.
- This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

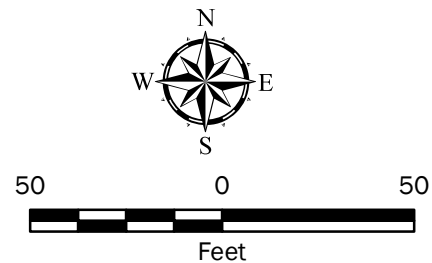
Data Source: Base from Dowl HKM 2014 survey and Bush, Roed and Hitchings, Inc. 2008 survey.

Projection: NAD 1983 StatePlane Washington North FIPS 4601 Feet
Vertical Datum: North American Vertical Datum 1988 (NAVD88)

Legend

- PCUL = 0.00018
Mean Reporting Limit = 0.025
Basis for PCUL = Surface Water
- | | |
|------------|--|
| Green box | Detect or Non-Detect Result Less than the PCUL |
| Yellow box | Detected Concentration Greater Than The PCUL |
| Grey box | Non-Detect Result Greater Than The PCUL |

- PCUL - Preliminary Cleanup Level
mg/kg - Milligram Per Kilogram
ft bgs - Feet Below Ground Surface
U - Not Detected Greater Than the Reporting Limit
J - Estimated Concentration

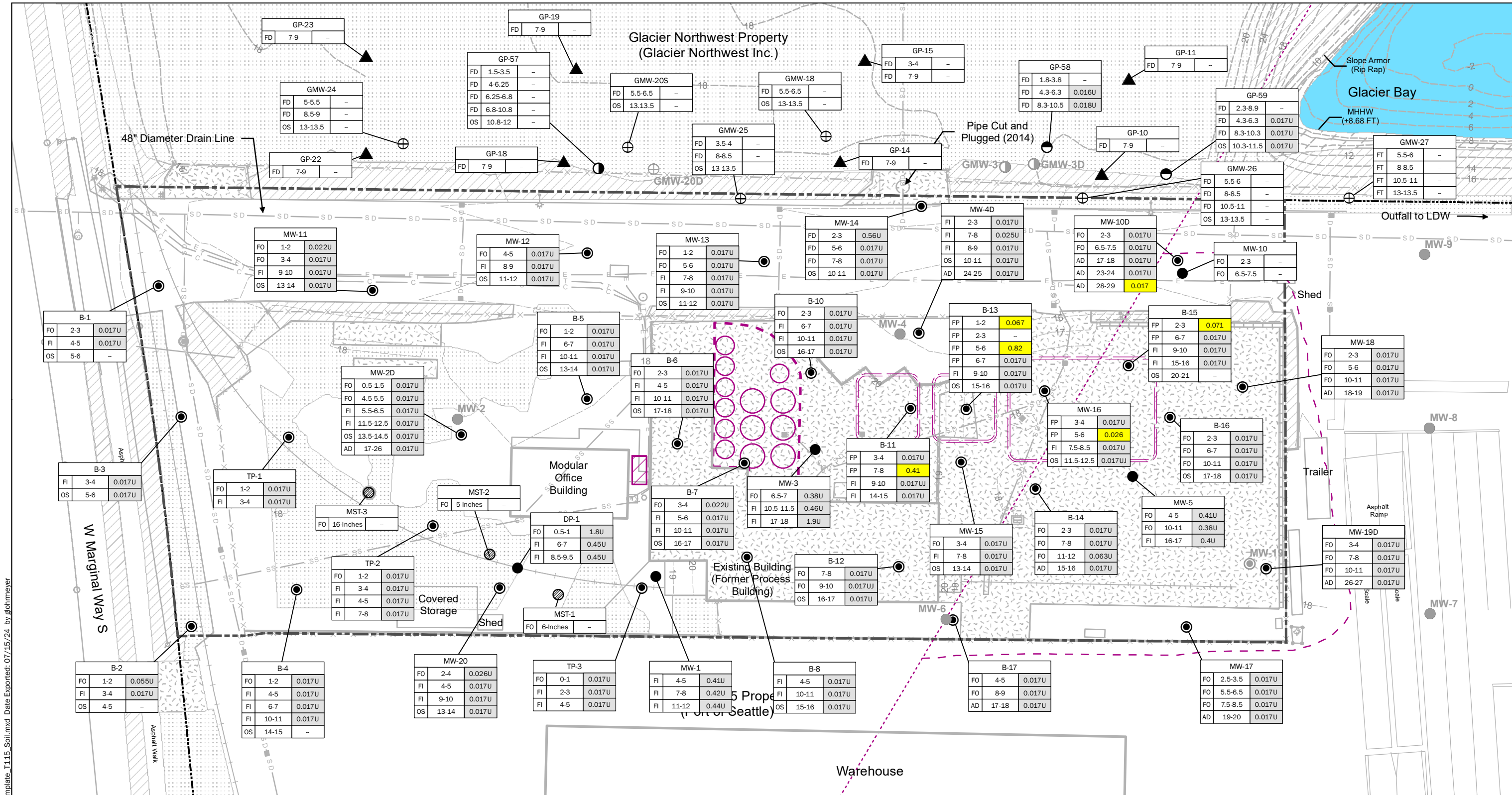


Butyl Benzyl Phthalate
Concentrations in Soil

Port of Seattle - North Terminal 115
Seattle, Washington



Figure M-38



Notes:

- Ground surface is asphalt pavement unless otherwise noted.
- Mean Higher High Water (MHHW) referenced from United States Army Corps of Engineers (USACE) Duwamish Waterway tidal Datum No. 92 for the North Puget Sound Region.
- The locations of all features shown are approximate.
- This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Data Source: Base from Dowl HKM 2014 survey and Bush, Roed and Hitchings, Inc. 2008 survey.

Projection: NAD 1983 StatePlane Washington North FIPS 4601 Feet
Vertical Datum: North American Vertical Datum 1988 (NAVD88)

Legend

PCUL = 0.0000033
Mean Reporting Limit = 0.078
Basis for PCUL = Surface Water

	Detect or Non-Detect Result Less than the PCUL
	Detected Concentration Greater Than The PCUL
	Non-Detect Result Greater Than The PCUL

PCUL - Preliminary Cleanup Level
mg/kg - Milligram Per Kilogram
ft bgs - Feet Below Ground Surface
U - Not Detected Greater Than the Reporting Limit
J - Estimated Concentration

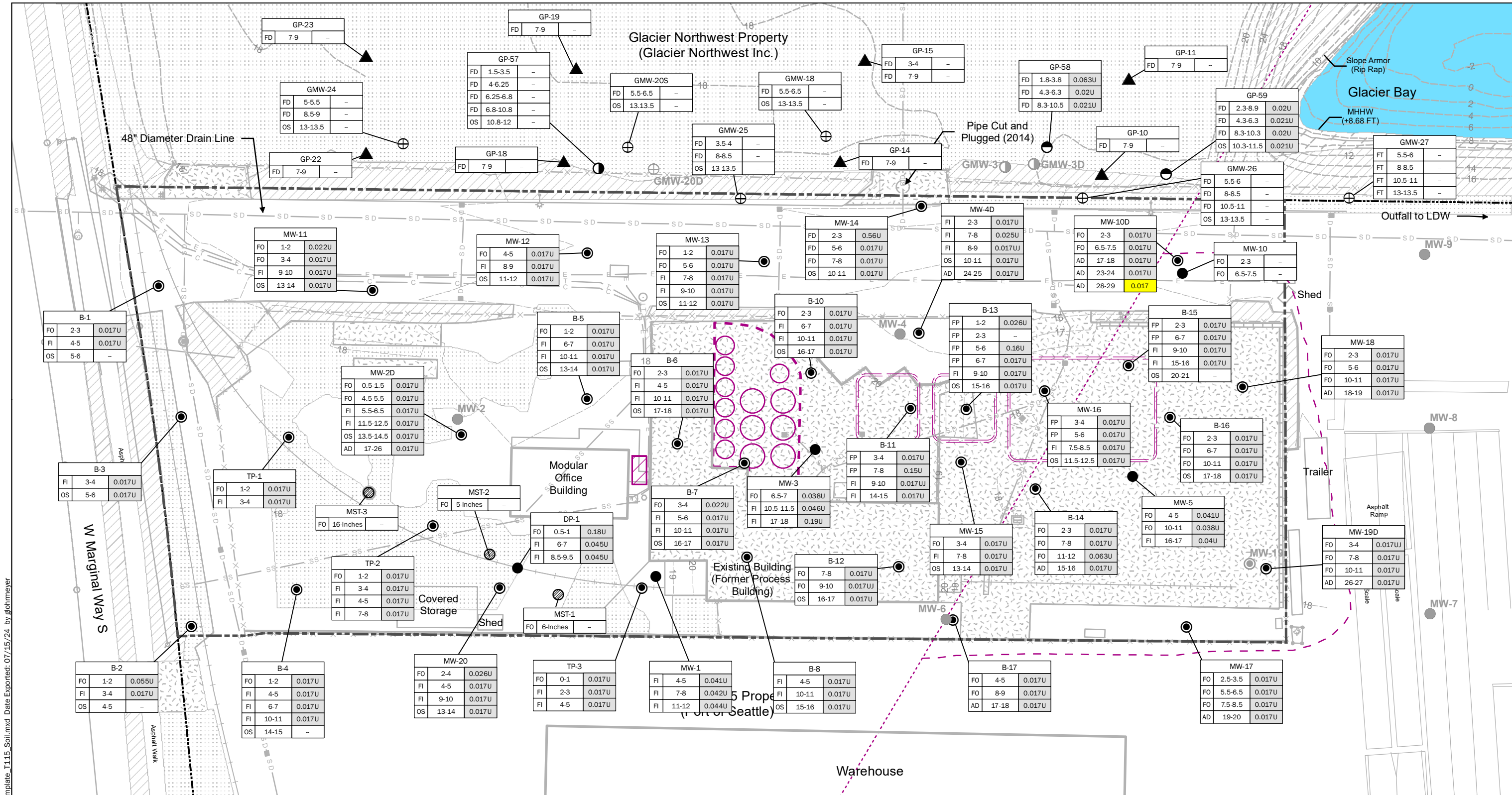
3,3'-Dichlorobenzidine Concentrations in Soil

Port of Seattle - North Terminal 115
Seattle, Washington

GEOENGINEERS

Figure M-39

P:\0303112\GIS\MDX\030311200_Base_Template_T115_Soil.mxd Date Exported: 07/15/24 by gghmeyer



Notes:

- Ground surface is asphalt pavement unless otherwise noted.
- Mean Higher High Water (MHHW) referenced from United States Army Corps of Engineers (USACE) Duwamish Waterway tidal Datum No. 92 for the North Puget Sound Region.
- The locations of all features shown are approximate.
- This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Data Source: Base from Dowl HKM 2014 survey and Bush, Roed and Hitchings, Inc. 2008 survey.

Projection: NAD 1983 StatePlane Washington North FIPS 4601 Feet
Vertical Datum: North American Vertical Datum 1988 (NAVD88)

Legend

PCUL = 0.0043
Mean Reporting Limit = 0.032
Basis for PCUL = Surface Water

	Detect or Non-Detect Result Less than the PCUL
	Detected Concentration Greater Than The PCUL
	Non-Detect Result Greater Than The PCUL

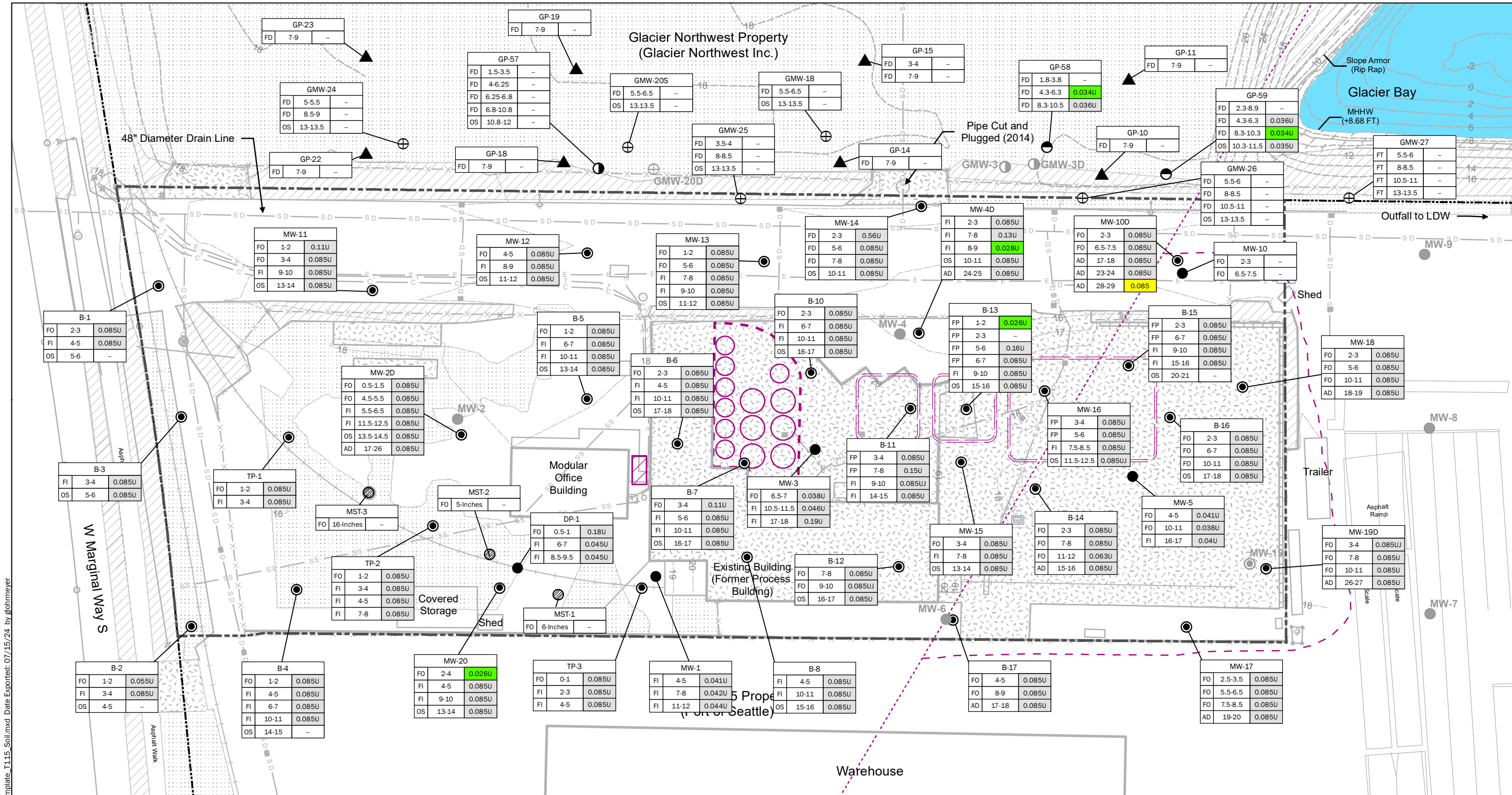
PCUL - Preliminary Cleanup Level
mg/kg - Milligram Per Kilogram
ft bgs - Feet Below Ground Surface
U - Not Detected Greater Than the Reporting Limit
J - Estimated Concentration

2,4-Dichlorophenol Concentrations in Soil

Port of Seattle - North Terminal 115
Seattle, Washington

GEOENGINEERS

Figure M-40



P:\0303112\GIS\MDX\030311200_Base_Template_T115_Soil.mxd Date Exported: 07/15/24 by gghmeyer

Notes:
1. Ground surface is asphalt pavement unless otherwise noted.
2. Mean Higher High Water (MHHW) referenced from United States Army Corps of Engineers (USACE) Duwamish Waterway tidal Datum No. 92 for the North Puget Sound Region.
3. The locations of all features shown are approximate.
4. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Data Source: Base from Dowl HKM 2014 survey and Bush, Roed and Hitchings, Inc. 2008 survey.

Projection: NAD 1983 StatePlane Washington North FIPS 4601 Feet
Vertical Datum: North American Vertical Datum 1988 (NAVD88)

Legend

PCUL = 0.034
Mean Reporting Limit = 0.087
Basis for PCUL = Sediment

Detect or Non-Detect Result Less than the PCUL
Detected Concentration Greater Than The PCUL
Non-Detect Result Greater Than The PCUL

Location ID
Concentration (mg/kg)
Sample Interval (ft bgs)
Stratigraphic Unit

MW-1
FO 4-5 0.12

PCUL - Preliminary Cleanup Level
mg/kg - Milligram Per Kilogram
ft bgs - Feet Below Ground Surface
U - Not Detected Greater Than the Reporting Limit
J - Estimated Concentration

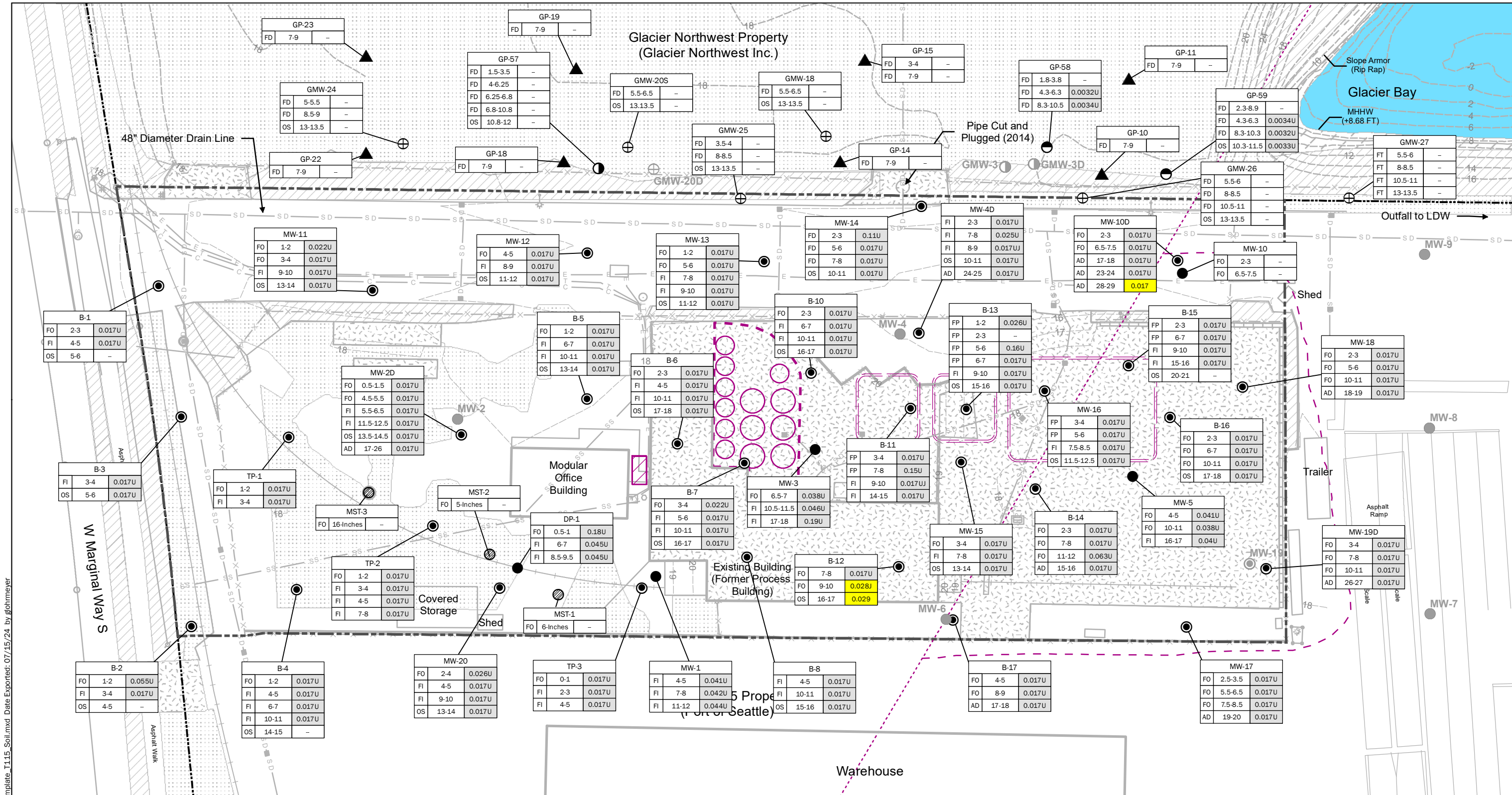
50 0 50
Feet

Diethyl Phthalate Concentrations in Soil

Port of Seattle - North Terminal 115
Seattle, Washington

GEOENGINEERS

Figure M-41



Notes:

- Ground surface is asphalt pavement unless otherwise noted.
- Mean Higher High Water (MHHW) referenced from United States Army Corps of Engineers (USACE) Duwamish Waterway tidal Datum No. 92 for the North Puget Sound Region.
- The locations of all features shown are approximate.
- This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Data Source: Base from Dowl HKM 2014 survey and Bush, Roed and Hitchings, Inc. 2008 survey.

Projection: NAD 1983 StatePlane Washington North FIPS 4601 Feet
Vertical Datum: North American Vertical Datum 1988 (NAVD88)

Legend

PCUL = 0.0031
Mean Reporting Limit = 0.026
Basis for PCUL = Surface Water

	Detect or Non-Detect Result Less than the PCUL
	Detected Concentration Greater Than The PCUL
	Non-Detect Result Greater Than The PCUL

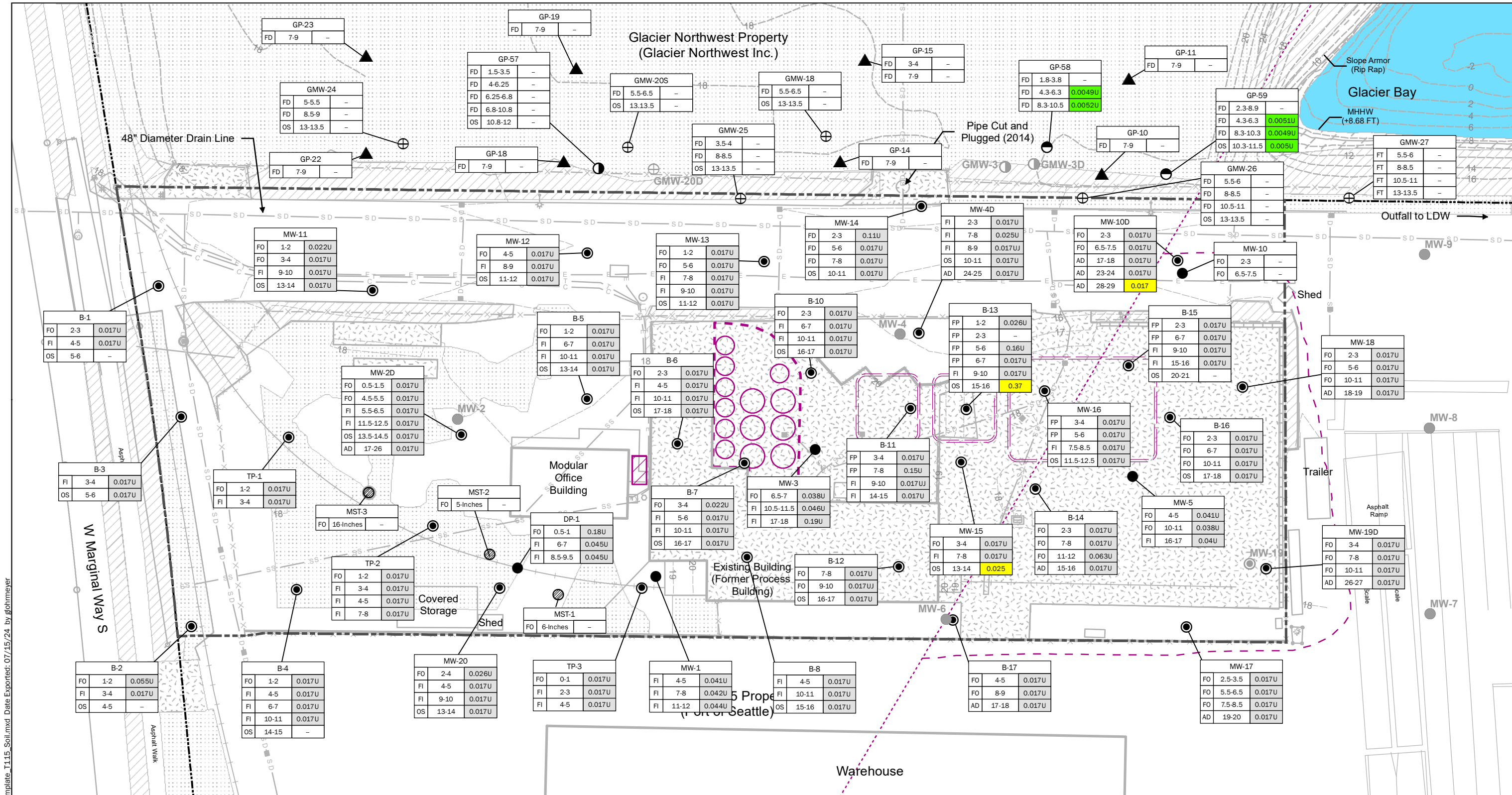
PCUL - Preliminary Cleanup Level
mg/kg - Milligram Per Kilogram
ft bgs - Feet Below Ground Surface
U - Not Detected Greater Than the Reporting Limit
J - Estimated Concentration

2,4-Dimethylphenol Concentrations in Soil

Port of Seattle - North Terminal 115
Seattle, Washington

GEOENGINEERS

Figure M-42



P:\0303112\GIS\MXD\030311200_Base_Template_T115_Soil.mxd Date Exported: 07/15/24 by glhmmeyer

Notes:

- Ground surface is asphalt pavement unless otherwise noted.
- Mean Higher High Water (MHHW) referenced from United States Army Corps of Engineers (USACE) Duwamish Waterway tidal Datum No. 92 for the North Puget Sound Region.
- The locations of all features shown are approximate.
- This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Data Source: Base from Dowl HKM 2014 survey and Bush, Roed and Hitchings, Inc. 2008 survey.

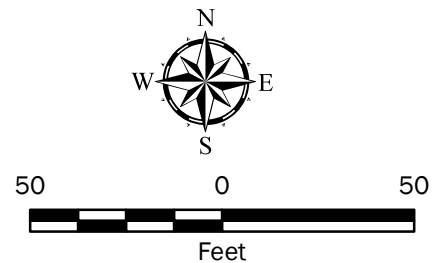
Projection: NAD 1983 StatePlane Washington North FIPS 4601 Feet
Vertical Datum: North American Vertical Datum 1988 (NAVD88)

Legend

PCUL = 0.01
Mean Reporting Limit = 0.026
Basis for PCUL = Sediment

- Detect or Non-Detect Result Less than the PCUL
- Detect or Non-Detect Result Greater Than the PCUL
- Non-Detect Result Greater Than The PCUL

PCUL - Preliminary Cleanup Level
mg/kg - Milligram Per Kilogram
ft bgs - Feet Below Ground Surface
U - Not Detected Greater Than the Reporting Limit
J - Estimated Concentration

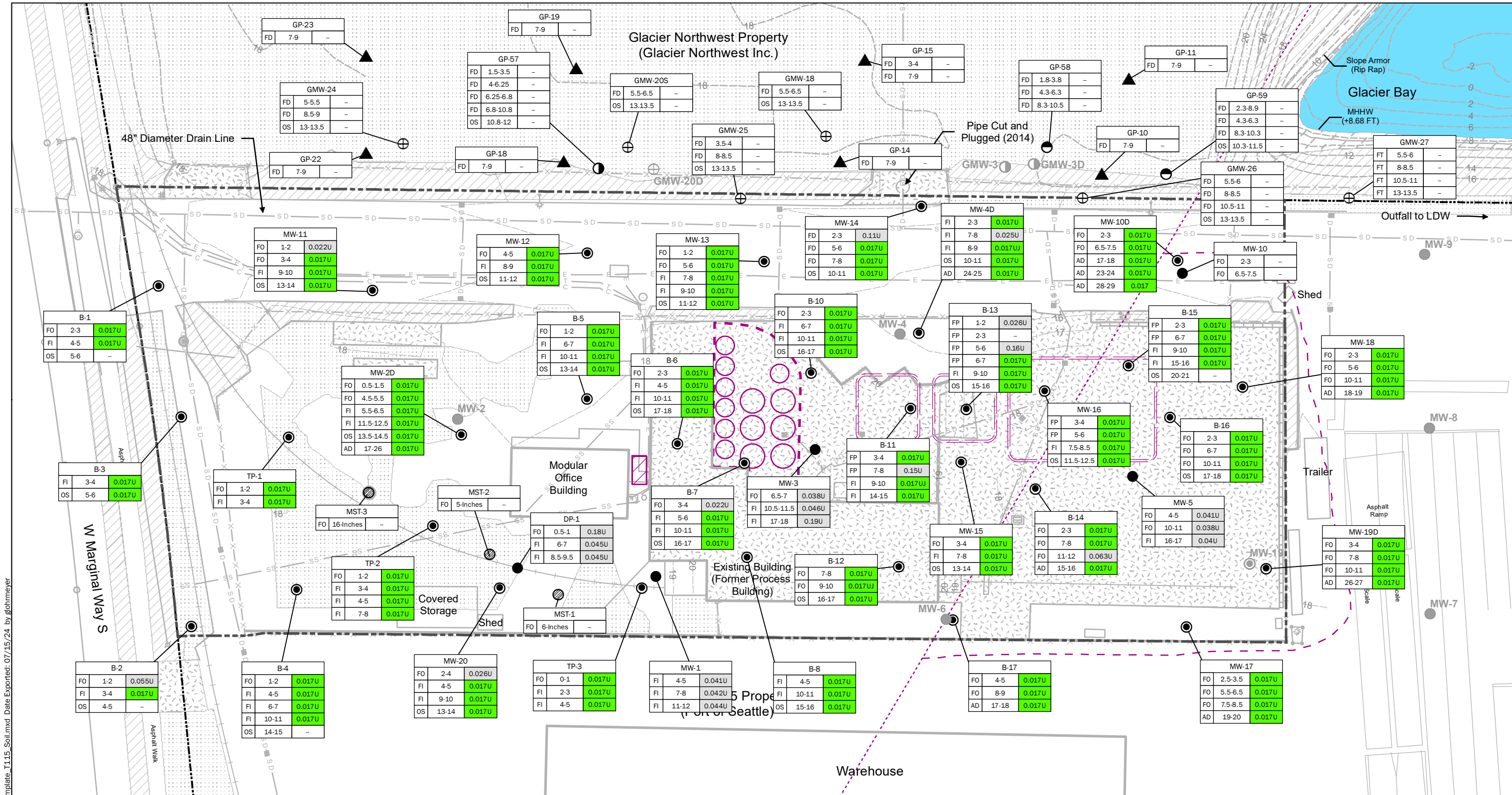


o-Cresol (2-Methylphenol) Concentrations in Soil

Port of Seattle - North Terminal 115
Seattle, Washington

GEOENGINEERS

Figure M-43



P:\0303112\GIS\MXD\030311200_Base_Template_T115_Soil.mxd Date Exported: 07/15/24 by gghmeyer

Notes:

1. Ground surface is asphalt pavement unless otherwise noted.
2. Mean Higher High Water (MHHW) referenced from United States Army Corps of Engineers (USACE) Duwamish Waterway tidal Datum No. 92 for the North Puget Sound Region.
3. The locations of all features shown are approximate.
4. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

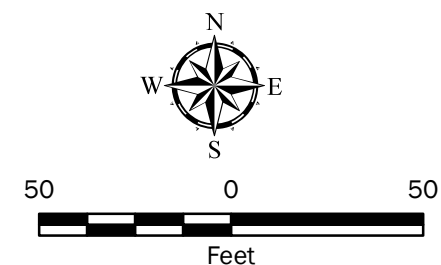
Data Source: Base from Dowl HKM 2014 survey and Bush, Roed and Hitchings, Inc. 2008 survey.

Projection: NAD 1983 StatePlane Washington North FIPS 4601 Feet
Vertical Datum: North American Vertical Datum 1988 (NAVD88)

Legend

- PCUL = 0.017
Mean Reporting Limit = 0.025
Basis for PCUL = Bank Erosion
- Detect or Non-Detect Result Less than the PCUL
 - Detected Concentration Greater Than The PCUL
 - Non-Detect Result Greater Than The PCUL

- PCUL - Preliminary Cleanup Level
mg/kg - Milligram Per Kilogram
ft bgs - Feet Below Ground Surface
U - Not Detected Greater Than the Reporting Limit
J - Estimated Concentration

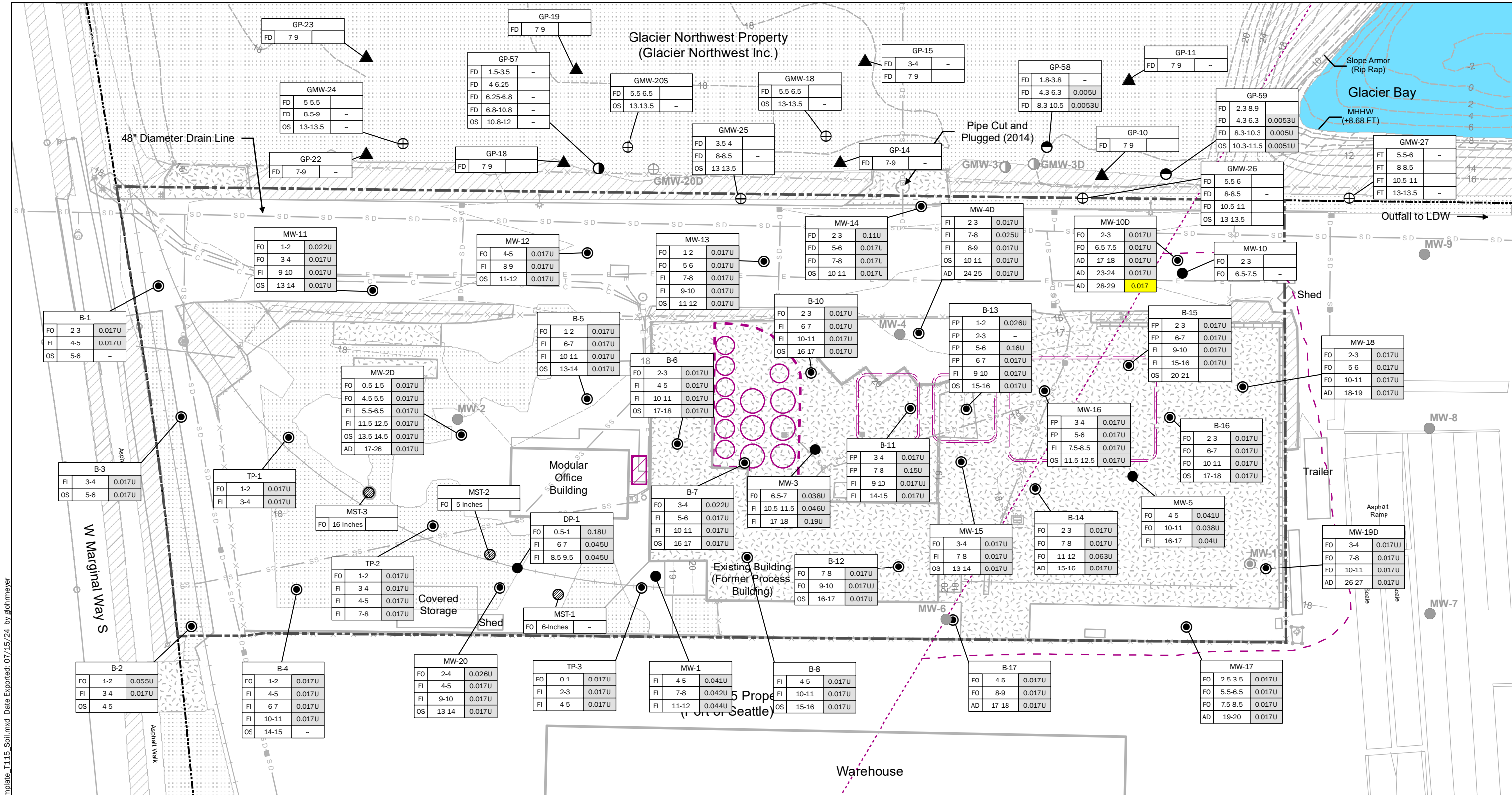


N-Nitrosodimethylamine Concentrations in Soil

Port of Seattle - North Terminal 115
Seattle, Washington



Figure M-44



Notes:

- Ground surface is asphalt pavement unless otherwise noted.
- Mean Higher High Water (MHHW) referenced from United States Army Corps of Engineers (USACE) Duwamish Waterway tidal Datum No. 92 for the North Puget Sound Region.
- The locations of all features shown are approximate.
- This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Data Source: Base from Dowl HKM 2014 survey and Bush, Roed and Hitchings, Inc. 2008 survey.

Projection: NAD 1983 StatePlane Washington North FIPS 4601 Feet
Vertical Datum: North American Vertical Datum 1988 (NAVD88)

Legend

PCUL = 0.0011
Mean Reporting Limit = 0.025
Basis for PCUL = Surface Water

	Detect or Non-Detect Result Less than the PCUL
	Detected Concentration Greater Than The PCUL
	Non-Detect Result Greater Than The PCUL

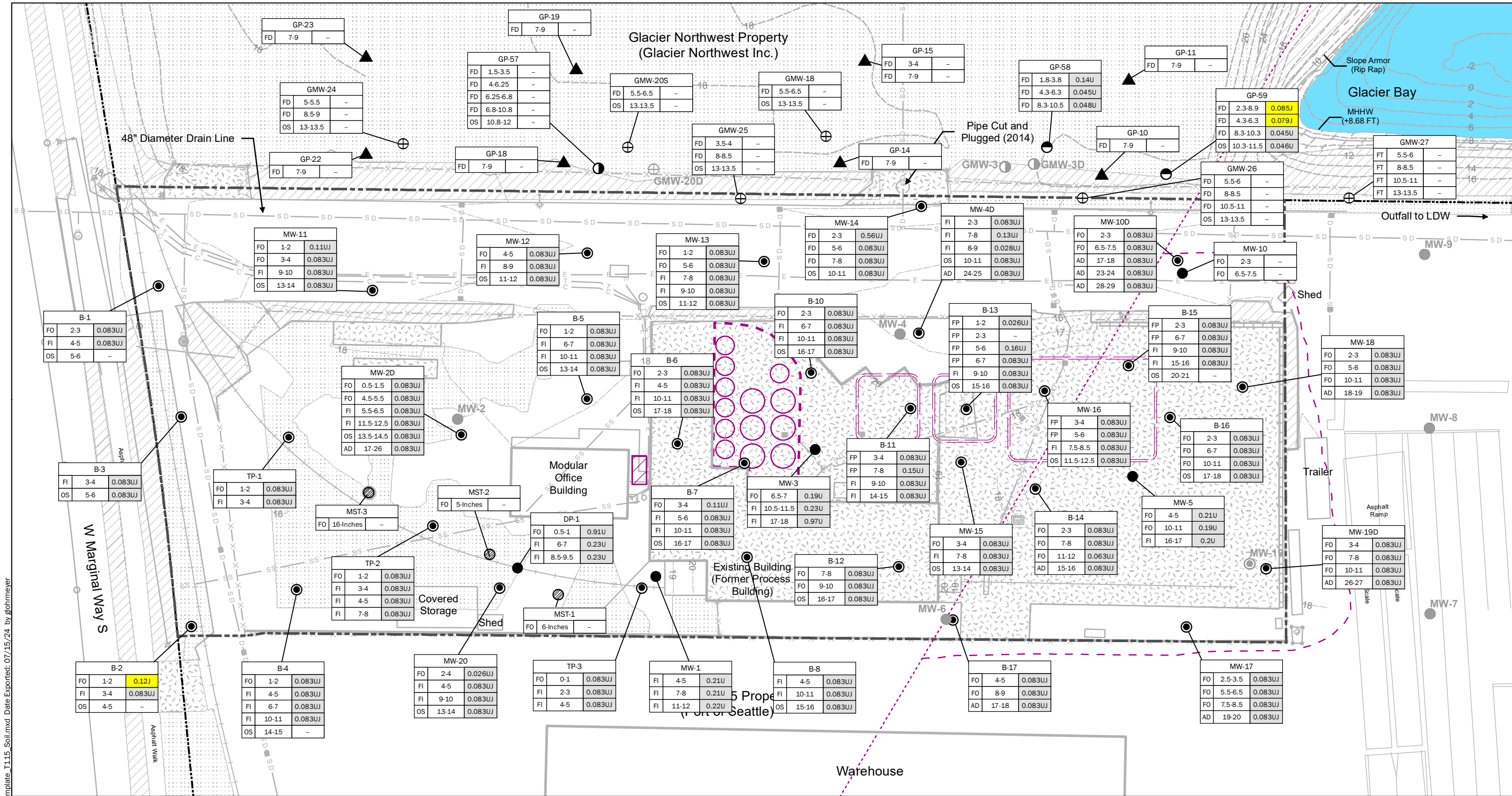
PCUL - Preliminary Cleanup Level
mg/kg - Milligram Per Kilogram
ft bgs - Feet Below Ground Surface
U - Not Detected Greater Than the Reporting Limit
J - Estimated Concentration

N-Nitrosodiphenylamine (as Diphenylamine) Concentrations in Soil

Port of Seattle - North Terminal 115
Seattle, Washington

GEOENGINEERS

Figure M-45



Notes:

- Ground surface is asphalt pavement unless otherwise noted.
- Mean Higher High Water (MHHW) referenced from United States Army Corps of Engineers (USACE) Duwamish Waterway tidal Datum No. 92 for the North Puget Sound Region.
- The locations of all features shown are approximate.
- This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Data Source: Base from Dowl HKM 2014 survey and Bush, Roed and Hitchings, Inc. 2008 survey.

Projection: NAD 1983 StatePlane Washington North FIPS 4601 Feet
Vertical Datum: North American Vertical Datum 1988 (NAVD88)

Legend

PCUL = 0.0000018
Mean Reporting Limit = 0.11
Basis for PCUL = Surface Water

Green box	Detect or Non-Detect Result Less than the PCUL
Yellow box	Detected Concentration Greater Than The PCUL
Grey box	Non-Detect Result Greater Than The PCUL

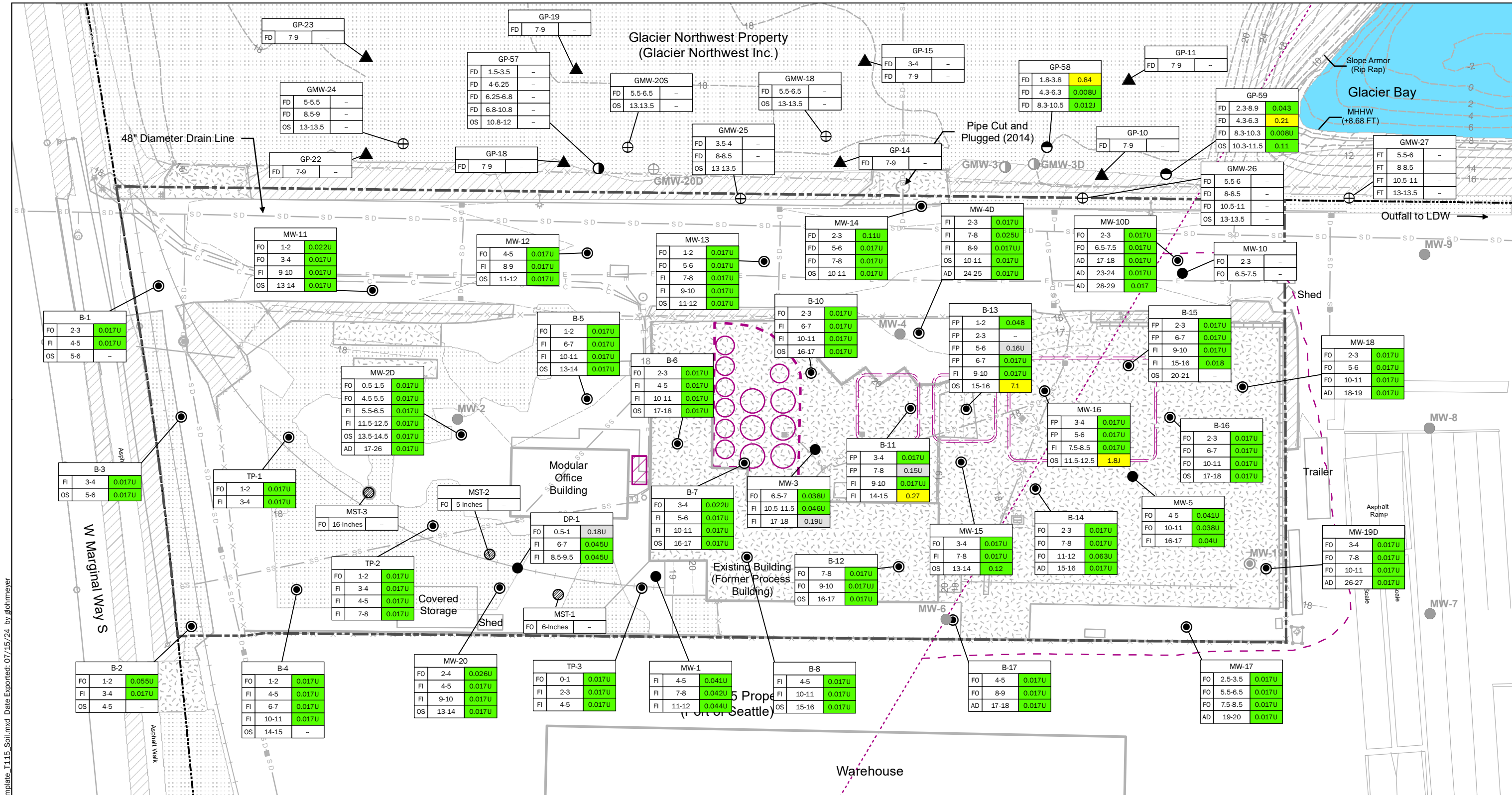
PCUL - Preliminary Cleanup Level
mg/kg - Milligram Per Kilogram
ft bgs - Feet Below Ground Surface
U - Not Detected Greater Than the Reporting Limit
J - Estimated Concentration

Pentachlorophenol Concentrations in Soil

Port of Seattle - North Terminal 115
Seattle, Washington

GEOENGINEERS

Figure M-47



Notes:

- Ground surface is asphalt pavement unless otherwise noted.
- Mean Higher High Water (MHHW) referenced from United States Army Corps of Engineers (USACE) Duwamish Waterway tidal Datum No. 92 for the North Puget Sound Region.
- The locations of all features shown are approximate.
- This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Data Source: Base from Dowl HKM 2014 survey and Bush, Roed and Hitchings, Inc. 2008 survey.

Projection: NAD 1983 StatePlane Washington North FIPS 4601 Feet
Vertical Datum: North American Vertical Datum 1988 (NAVD88)

Legend

PCUL = 0.12
Mean Reporting Limit = 0.026
Basis for PCUL = Sediment

Color	Description
Green	Detect or Non-Detect Result Less than the PCUL
Yellow	Detected Concentration Greater Than The PCUL
Grey	Non-Detect Result Greater Than The PCUL

Table Example:

Location ID	Concentration (mg/kg)	Sample Interval (ft bgs)	Stratigraphic Unit
MW-1	4-5	0.12	

PCUL - Preliminary Cleanup Level
mg/kg - Milligram Per Kilogram
ft bgs - Feet Below Ground Surface
U - Not Detected Greater Than the Reporting Limit
J - Estimated Concentration

Scale: 50 0 50 Feet

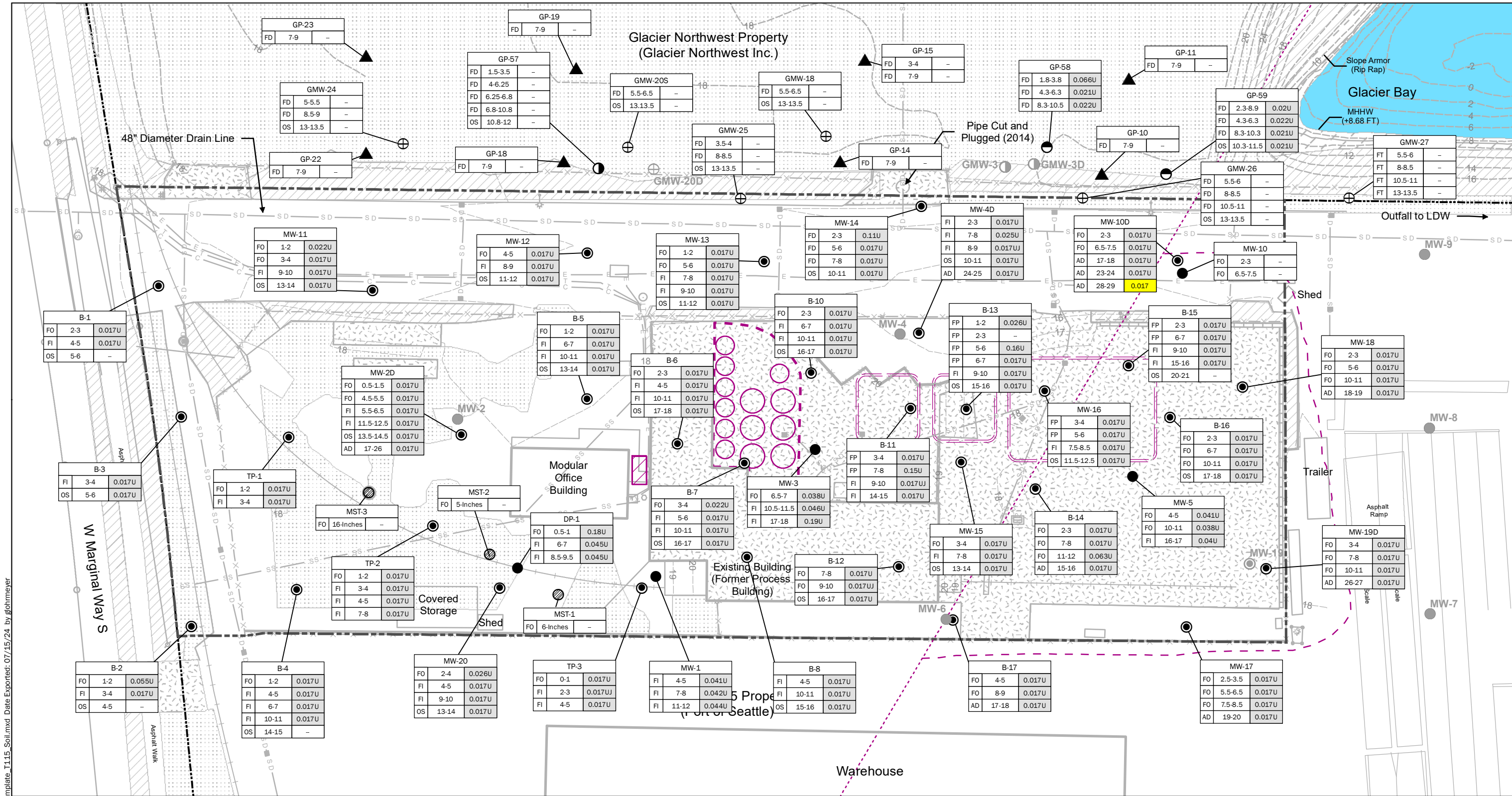
North Arrow: N, S, E, W

Phenol Concentrations in Soil

Port of Seattle - North Terminal 115
Seattle, Washington

GEOENGINEERS

Figure M-48



Notes:

- Ground surface is asphalt pavement unless otherwise noted.
- Mean Higher High Water (MHHW) referenced from United States Army Corps of Engineers (USACE) Duwamish Waterway tidal Datum No. 92 for the North Puget Sound Region.
- The locations of all features shown are approximate.
- This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Data Source: Base from Dowl HKM 2014 survey and Bush, Roed and Hitchings, Inc. 2008 survey.

Projection: NAD 1983 StatePlane Washington North FIPS 4601 Feet
Vertical Datum: North American Vertical Datum 1988 (NAVD88)

Legend

PCUL = 0.00019
Mean Reporting Limit = 0.025
Basis for PCUL = Surface Water

	Detect or Non-Detect Result Less than the PCUL
	Detected Concentration Greater Than The PCUL
	Non-Detect Result Greater Than The PCUL

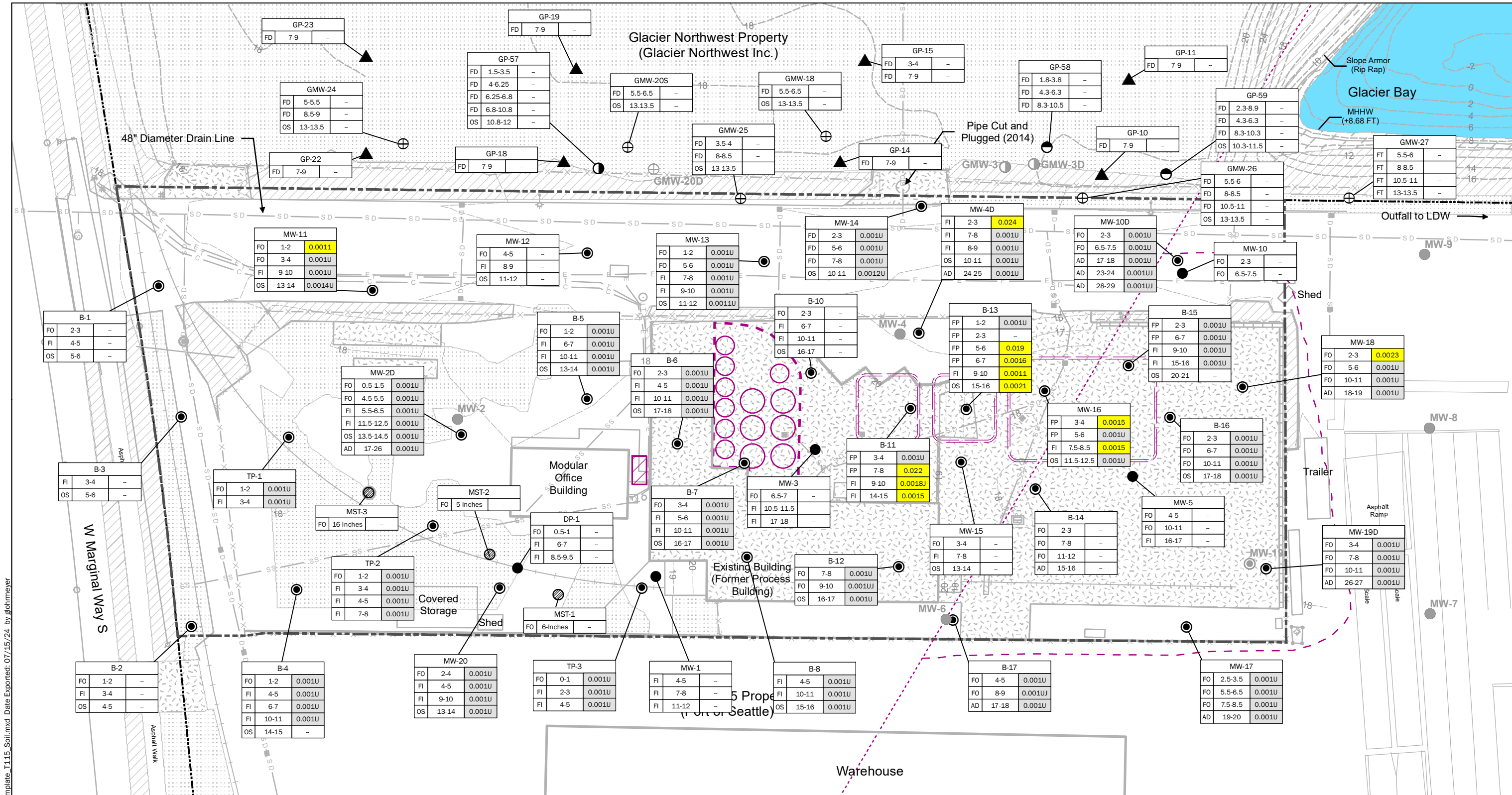
PCUL - Preliminary Cleanup Level
mg/kg - Milligram Per Kilogram
ft bgs - Feet Below Ground Surface
U - Not Detected Greater Than the Reporting Limit
J - Estimated Concentration

2,4,6-Trichlorophenol Concentrations in Soil

Port of Seattle - North Terminal 115
Seattle, Washington

GEOENGINEERS

Figure M-49



Notes:

- Ground surface is asphalt pavement unless otherwise noted.
- Mean Higher High Water (MHHW) referenced from United States Army Corps of Engineers (USACE) Duwamish Waterway tidal Datum No. 92 for the North Puget Sound Region.
- The locations of all features shown are approximate.
- This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Data Source: Base from Dowl HKM 2014 survey and Bush, Roed and Hitchings, Inc. 2008 survey.

Projection: NAD 1983 StatePlane Washington North FIPS 4601 Feet
Vertical Datum: North American Vertical Datum 1988 (NAVD88)

Legend

PCUL = 0.00056
Mean Reporting Limit = 0.001
Basis for PCUL = Surface Water

	Detect or Non-Detect Result Less than the PCUL
	Detected Concentration Greater Than The PCUL
	Non-Detect Result Greater Than The PCUL

PCUL - Preliminary Cleanup Level
mg/kg - Milligram Per Kilogram
ft bgs - Feet Below Ground Surface
U - Not Detected Greater Than the Reporting Limit
J - Estimated Concentration

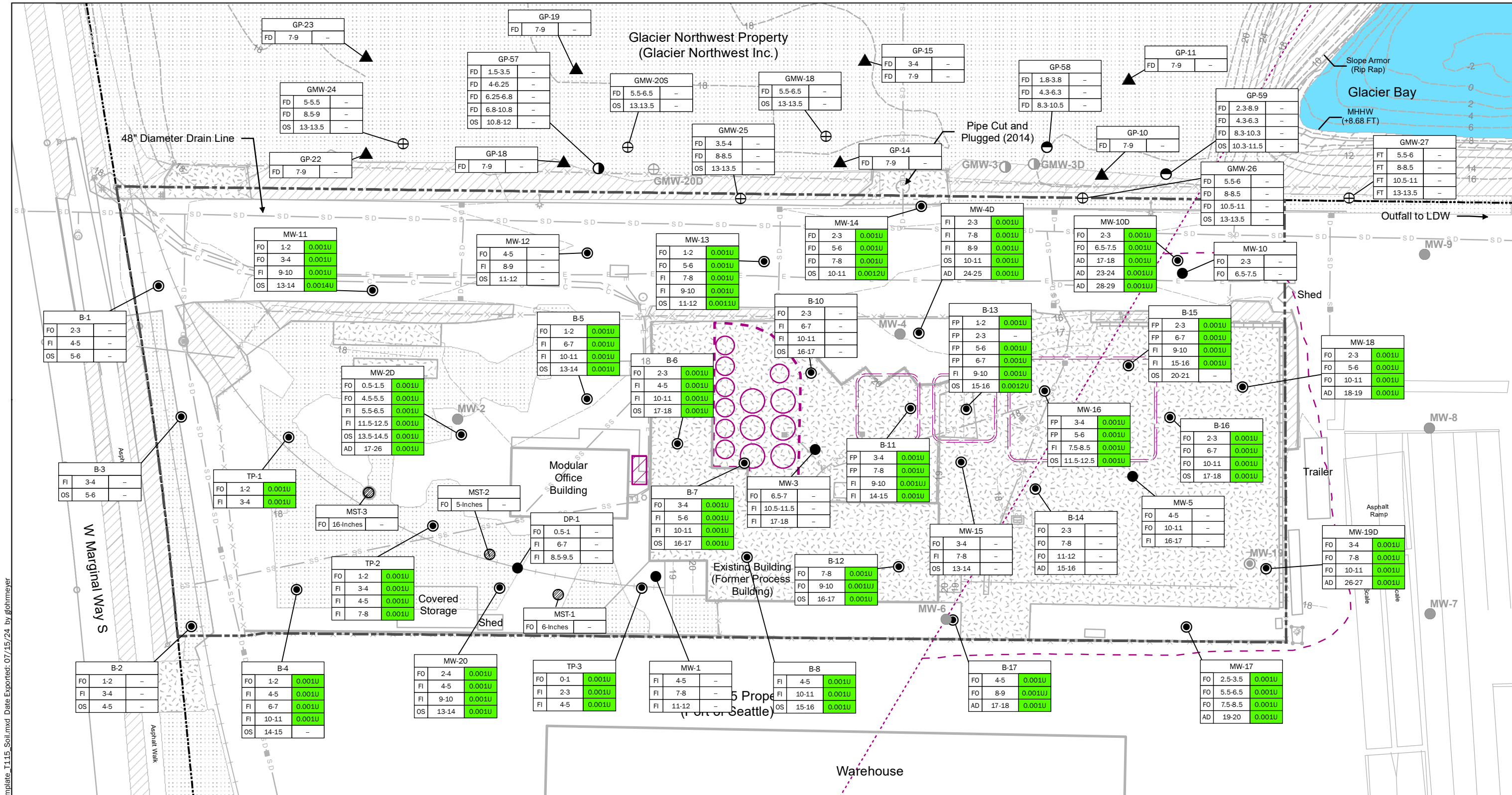
Benzene Concentrations in Soil

Port of Seattle - North Terminal 115
Seattle, Washington

GEOENGINEERS

Figure M-50

P:\0303112\GIS\MD\030311200_Base_Template_T115_Soil.mxd Date Exported: 07/15/24 by glhnmeyer



Notes:

1. Ground surface is asphalt pavement unless otherwise noted.
2. Mean Higher High Water (MHHW) referenced from United States Army Corps of Engineers (USACE) Duwamish Waterway tidal Datum No. 92 for the North Puget Sound Region.
3. The locations of all features shown are approximate.
4. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Data Source: Base from Dowl HKM 2014 survey and Bush, Roed and Hitchings, Inc. 2008 survey.

Projection: NAD 1983 StatePlane Washington North FIPS 4601 Feet
Vertical Datum: North American Vertical Datum 1988 (NAVD88)

Legend

PCUL = 0.052
Mean Reporting Limit = 0.001
Basis for PCUL = Surface Water

	Detect or Non-Detect Result Less than the PCUL
	Detected Concentration Greater Than The PCUL
	Non-Detect Result Greater Than The PCUL

U - Not Detected Greater Than the Reporting Limit
J - Estimated Concentration

mg/kg - Milligram Per Kilogram
ft bgs - Feet Below Ground Surface

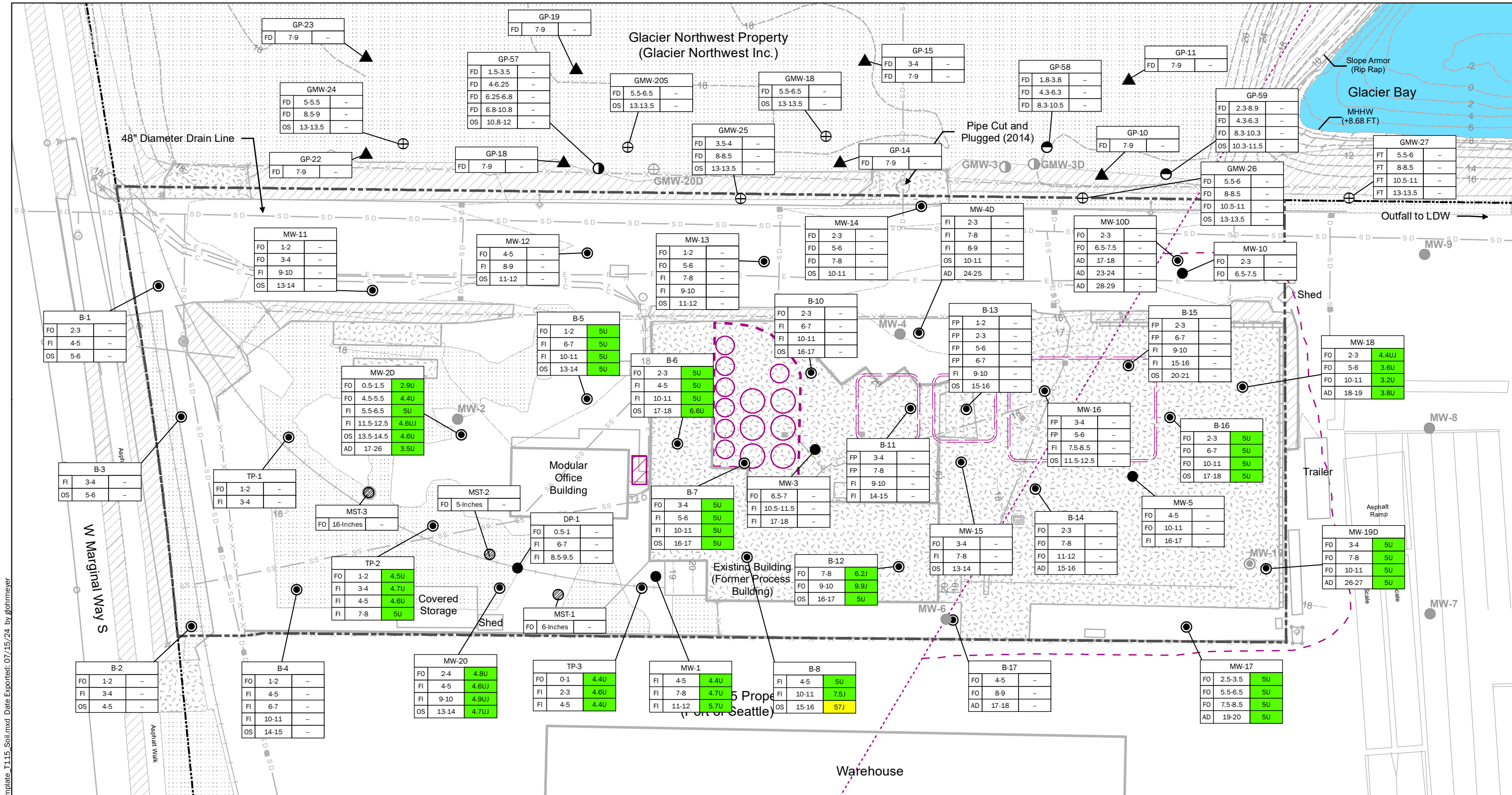
50 0 50
Feet

Chloroform Concentrations in Soil

Port of Seattle - North Terminal 115
Seattle, Washington

GEOENGINEERS

Figure M-51



Notes:

1. Ground surface is asphalt pavement unless otherwise noted.
2. Mean Higher High Water (MHHW) referenced from United States Army Corps of Engineers (USACE) Duwamish Waterway tidal Datum No. 92 for the North Puget Sound Region.
3. The locations of all features shown are approximate.
4. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Data Source: Base from Dowl HKM 2014 survey and Bush, Roed and Hitchings, Inc. 2008 survey.

Projection: NAD 1983 StatePlane Washington North FIPS 4601 Feet
Vertical Datum: North American Vertical Datum 1988 (NAVD88)

Legend

PCUL = 30
Mean Reporting Limit = 4.8
Basis for PCUL = Direct Contact

	Detect or Non-Detect Result Less than the PCUL
	Detected Concentration Greater Than The PCUL
	Non-Detect Result Greather Than The PCUL

mg/kg - Milligram Per Kilogram
ft bgs - Feet Below Ground Surface
U - Not Detected Greater Than the Reporting Limit
J - Estimated Concentration

50 0 50
Feet

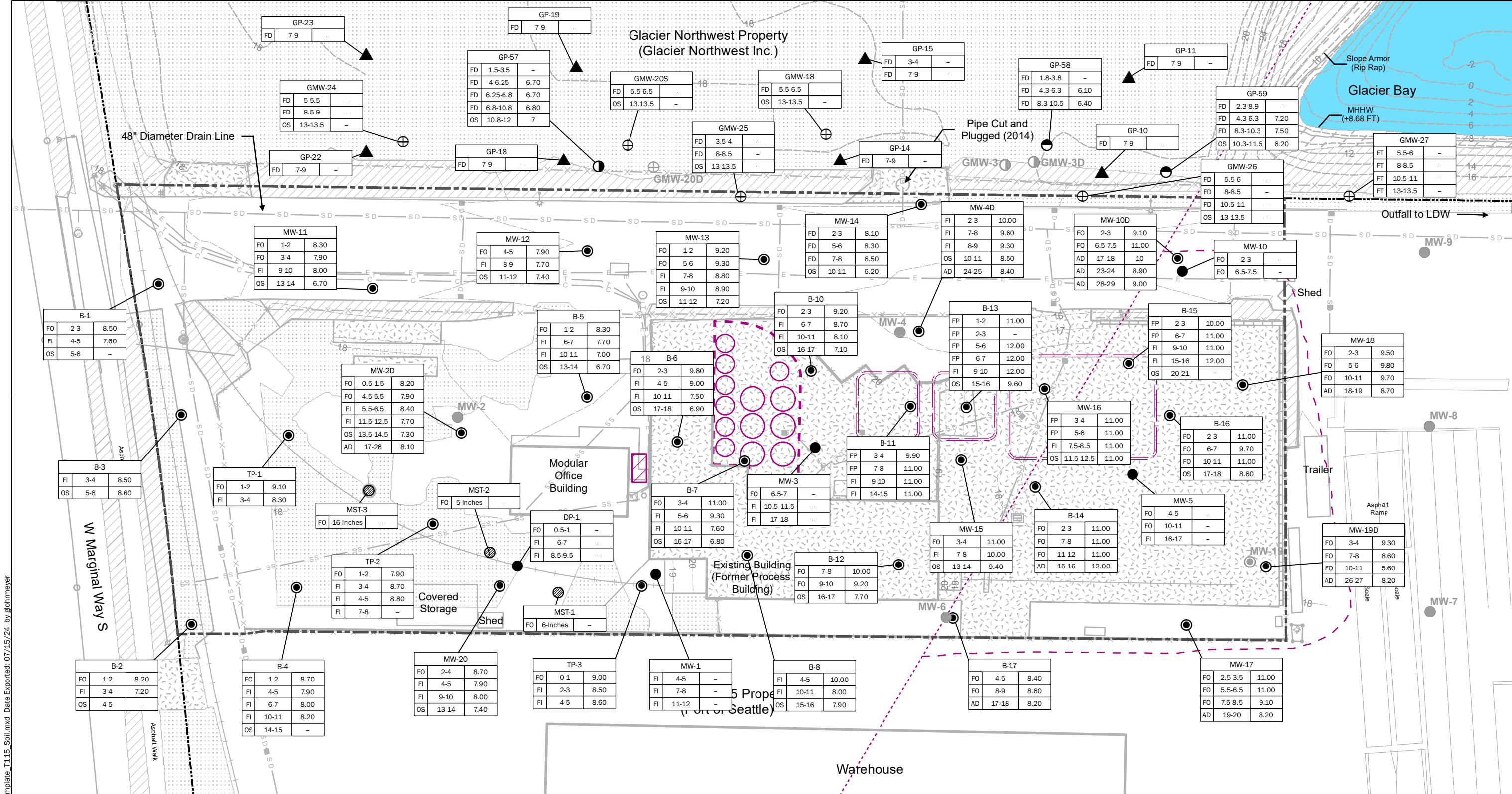
Location ID	Concentration (mg/kg)	Sample Interval (ft bgs)	Stratigraphic Unit
MW-1	4-5	0.12	

Gasoline-Range Hydrocarbon Concentrations in Soil

Port of Seattle - North Terminal 115
Seattle, Washington

GEOENGINEERS

Figure M-52



Notes:

- Ground surface is asphalt pavement unless otherwise noted.
- Mean Higher High Water (MHHW) referenced from United States Army Corps of Engineers (USACE) Duwamish Waterway tidal Datum No. 92 for the North Puget Sound Region.
- The locations of all features shown are approximate.
- This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Data Source: Base from Dowl HKM 2014 survey and Bush, Roed and Hitchings, Inc. 2008 survey.

Projection: NAD 1983 StatePlane Washington North FIPS 4601 Feet
Vertical Datum: North American Vertical Datum 1988 (NAVD88)

Legend

PCUL = NA
Mean Reporting Limit = NA
Basis for PCUL = N/A

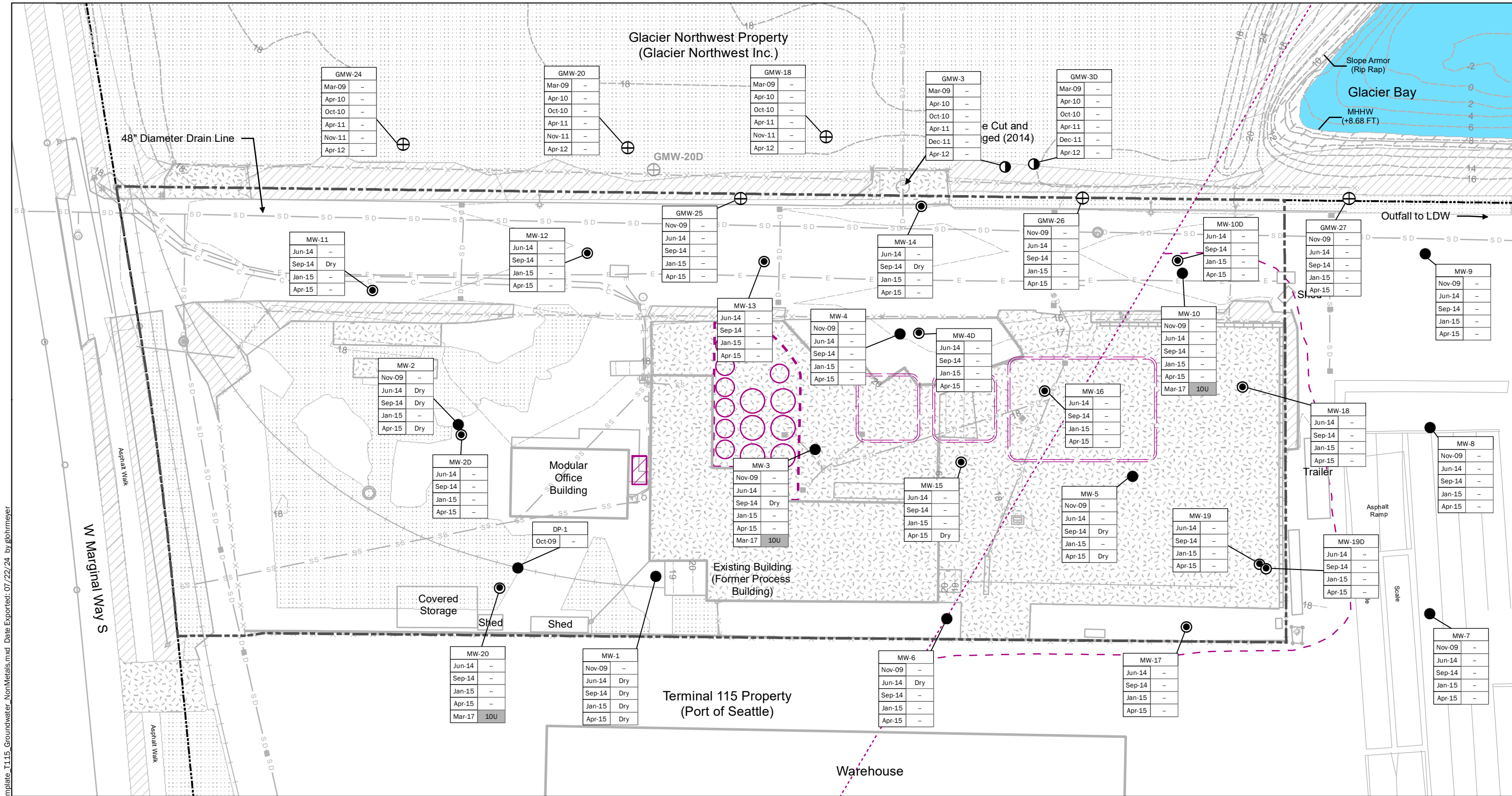
	Detect or Non-Detect Result Less than the PCUL
	Detected Concentration Greater Than The PCUL
	Non-Detect Result Greater Than The PCUL

pH Concentrations in Soil

Port of Seattle - North Terminal 115
Seattle, Washington

GEOENGINEERS

Figure M-54



Notes:

- Ground surface is asphalt pavement unless otherwise noted.
- Mean Higher High Water (MHHW) referenced from United States Army Corps of Engineers (USACE) Duwamish Waterway tidal Datum No. 92 for the North Puget Sound Region.
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- This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Data Source: Base from Dowl HKM 2014 survey and Bush, Roed and Hitchings, Inc. 2008 survey.

Projection: NAD 1983 StatePlane Washington North FIPS 4601 Feet
Vertical Datum: North American Vertical Datum 1988 (NAVD88)

Legend

PCUL = 0.007
Mean Reporting Limit = 10
Basis for PCUL = Surface Water

Green	Detect or Non-Detect Result Less than the PCUL
Yellow	Detected Concentration Greater Than The PCUL
Grey	Non-Detect Result Greater Than The PCUL

PCUL - Preliminary Cleanup Level
ng/L - Nanograms Per Liter
- - - Not Analyzed
U - Not Detected Greater Than the Reporting Limit
J - Estimated Concentration
TEQ - Toxicity Equivalency Quotient
ND - Non-Detect
RL - Reporting Limit

Total PCB Aroclor Concentrations in Groundwater

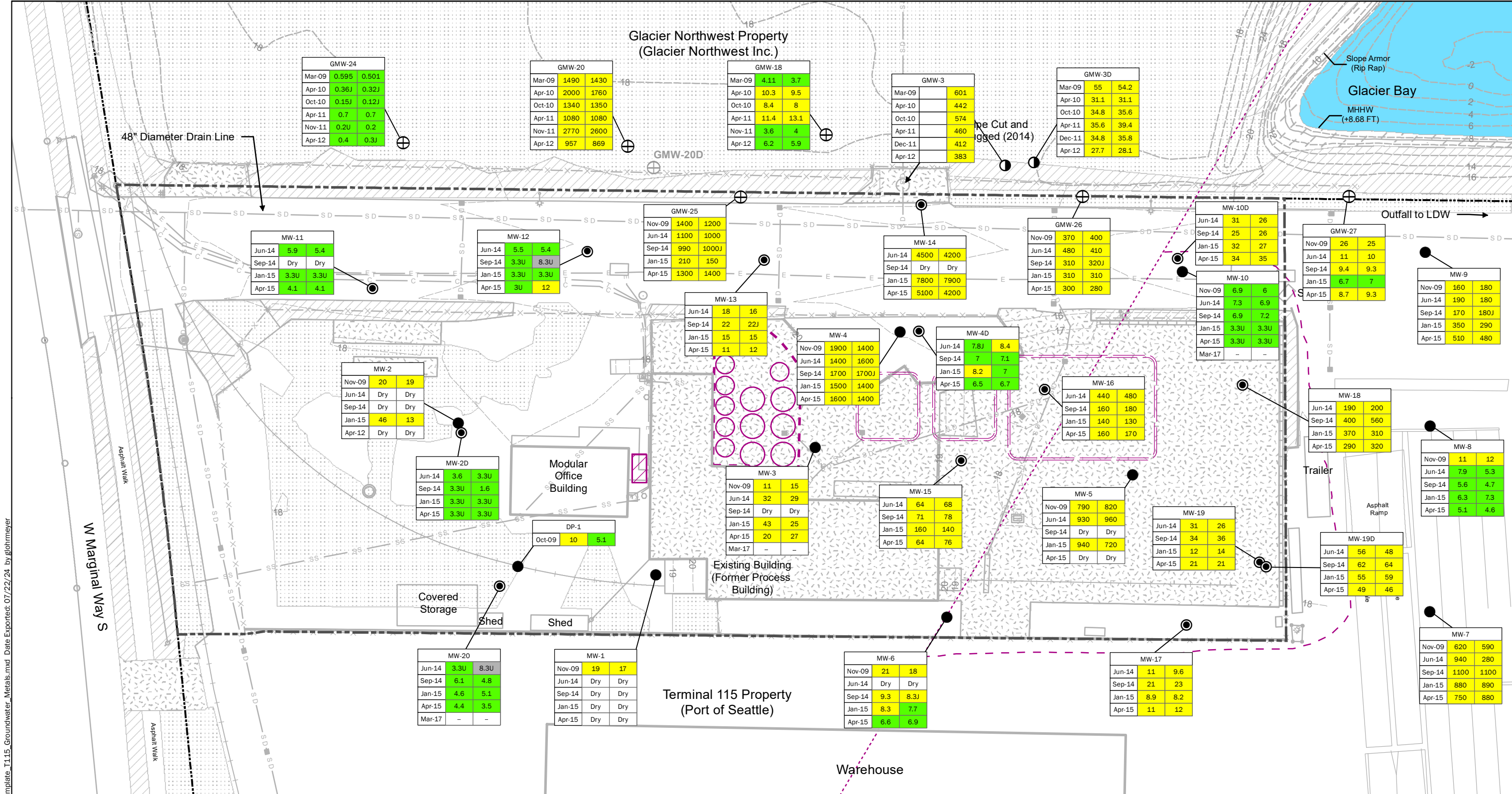
Port of Seattle - North Terminal 115
Seattle, Washington

GEOENGINEERS

Figure M-55

P:\0\0303112\GIS\MXD\030311200_Base_Template_T115_Groundwater_NonMetals.mxd Date Exported: 07/22/24 by glohnmeyer

P:\0303112\GIS\MD\030311200_Base_Template_T115_Groundwater_Metals.mxd Date Exported: 07/22/24 by ghmeyer



Notes:

1. Ground surface is asphalt pavement unless otherwise noted.
2. Mean Higher High Water (MHHW) referenced from United States Army Corps of Engineers (USACE) Duwamish Waterway tidal Datum No. 92 for the North Puget Sound Region.
3. The locations of all features shown are approximate.
4. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Data Source: Base from Dowl HKM 2014 survey and Bush, Roed and Hitchings, Inc. 2008 survey.

Projection: NAD 1983 StatePlane Washington North FIPS 4601 Feet
Vertical Datum: North American Vertical Datum 1988 (NAVD88)

Legend

PCUL = 8
Mean Reporting Limit = 3.3
Basis for PCUL = Natural Background

	Detect or Non-Detect Result Less than the PCUL
	Detected Concentration Greater Than The PCUL
	Non-Detect Result Greater Than The PCUL

DP-1	Location ID
Oct-09	Dissolved Concentration (µg/L)
6.2	
5.1	
	Total Concentration (µg/L)
	Monitoring Event (Date)

PCUL - Preliminary Cleanup Level µg/L - Micrograms Per Liter

-- - Not Analyzed

U - Not Detected Greater Than the Reporting Limit

J - Estimated Concentration

TEQ - Toxicity Equivalency Quotient

ND - Non-Detect

RL - Reporting Limit

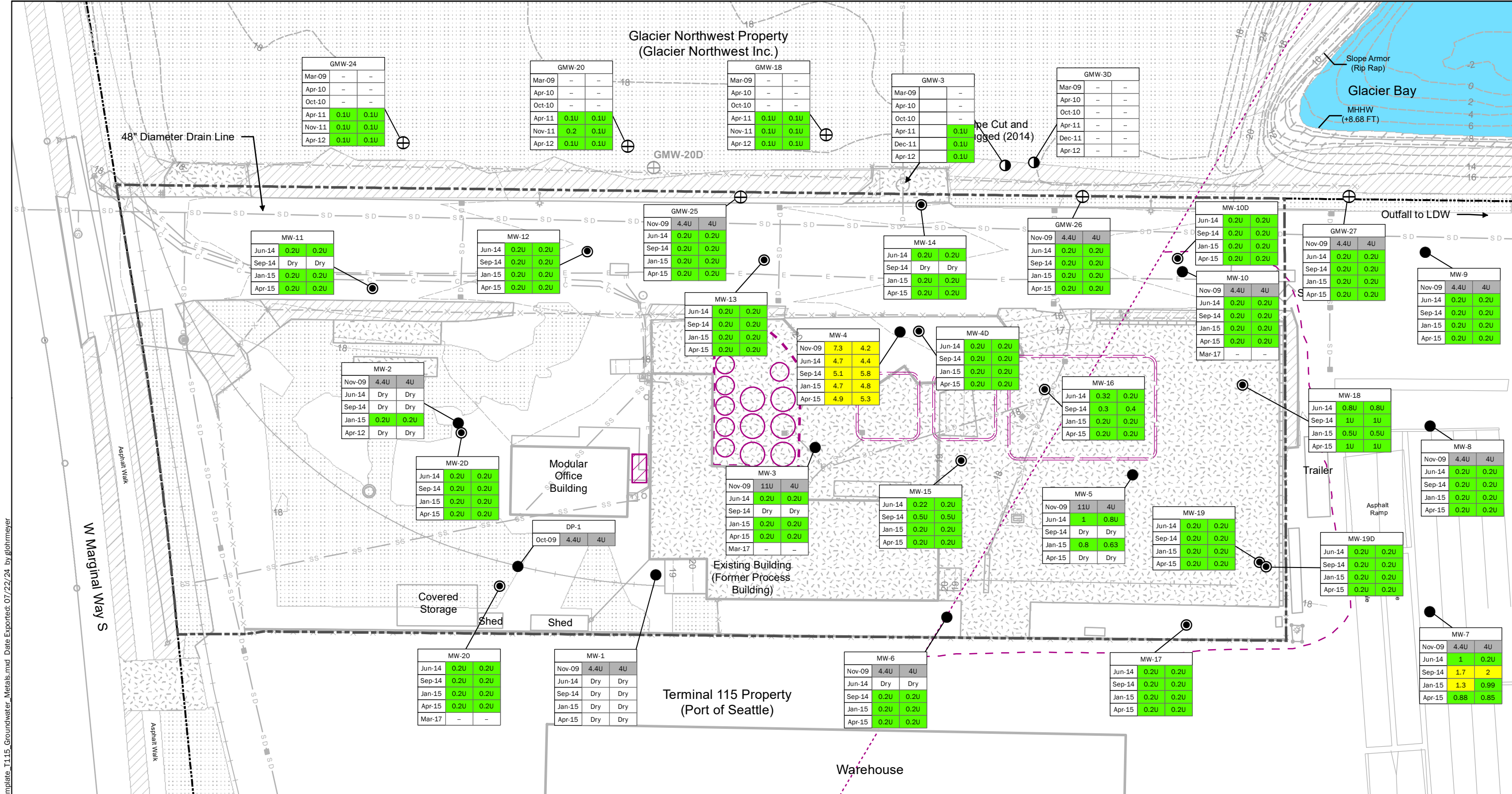
Arsenic Concentrations in Groundwater

Port of Seattle - North Terminal 115
Seattle, Washington

GEOENGINEERS

Figure M-58

P:\0303112\GIS\MXD\030311200_Base_Template_T115_Groundwater_Metals.mxd Date Exported: 07/22/24 by ghmeyer



Notes:

1. Ground surface is asphalt pavement unless otherwise noted.
2. Mean Higher High Water (MHHW) referenced from United States Army Corps of Engineers (USACE) Duwamish Waterway tidal Datum No. 92 for the North Puget Sound Region.
3. The locations of all features shown are approximate.
4. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Data Source: Base from Dowl HKM 2014 survey and Bush, Roed and Hitchings, Inc. 2008 survey.

Projection: NAD 1983 StatePlane Washington North FIPS 4601 Feet
Vertical Datum: North American Vertical Datum 1988 (NAVD88)

Legend

PCUL = 1.2
Mean Reporting Limit = 0.98
Basis for PCUL = Sediment

Detect or Non-Detect Result Less than the PCUL

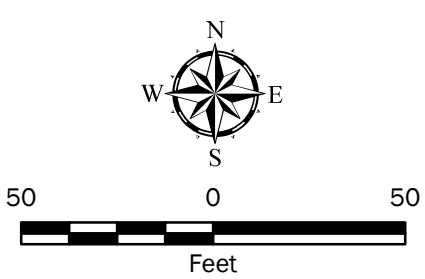
Detected Concentration Greater Than The PCUL

Non-Detect Result Greather Than The PCUL

DP-1		
Location ID	Dissolved Concentration (µg/L)	Total Concentration (µg/L)
Oct-09	6.2	5.1

Monitoring Event (Date)

PCUL - Preliminary Cleanup Level
µg/L - Micrograms Per Liter
-- - Not Analyzed
U - Not Detected Greater Than the Reporting Limit
J - Estimated Concentration
TEQ - Toxicity Equivalency Quotient
ND - Non-Detect
RL - Reporting Limit

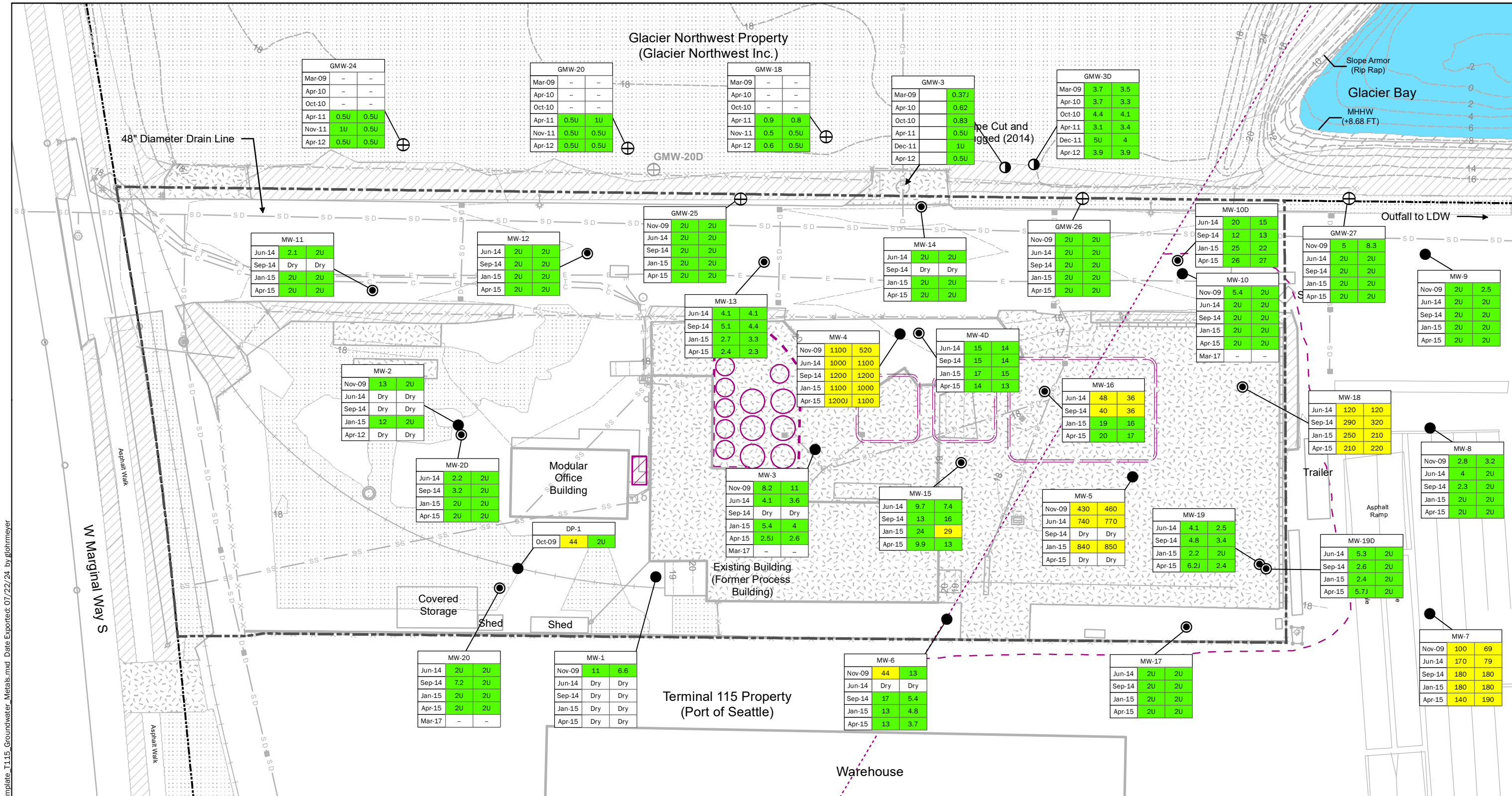


Cadmium Concentrations in Groundwater

Port of Seattle - North Terminal 115
Seattle, Washington

GEOENGINEERS

Figure M-60



Notes:

- Ground surface is asphalt pavement unless otherwise noted.
- Mean Higher High Water (MHHW) referenced from United States Army Corps of Engineers (USACE) Duwamish Waterway tidal Datum No. 92 for the North Puget Sound Region.
- The locations of all features shown are approximate.
- This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Data Source: Base from Dowl HKM 2014 survey and Bush, Roed and Hitchings, Inc. 2008 survey.

Projection: NAD 1983 StatePlane Washington North FIPS 4601 Feet
Vertical Datum: North American Vertical Datum 1988 (NAVD88)

Legend

PCUL = 27
Mean Reporting Limit = 2.0
Basis for PCUL = Drinking Water

	Detect or Non-Detect Result Less than the PCUL
	Detected Concentration Greater Than The PCUL
	Non-Detect Result Greater Than The PCUL

PCUL - Preliminary Cleanup Level
µg/L - Micrograms Per Liter
-- - Not Analyzed
U - Not Detected Greater Than the Reporting Limit
J - Estimated Concentration
TEQ - Toxicity Equivalency Quotient
ND - Non-Detect
RL - Reporting Limit

Chromium III/Total Concentrations in Groundwater

Port of Seattle - North Terminal 115
Seattle, Washington

GEOENGINEERS

Figure M-61

P:\0303112\GIS\MXD\030311200_Base_Template_T115_Groundwater_Metals.mxd Date Exported: 07/22/24 by ghmeyer

P:\0303112\GIS\MXD\030311200_Base_Template_T115_Groundwater_Metals.mxd Date Exported: 07/22/24 by ghmeyer



Notes:

- Ground surface is asphalt pavement unless otherwise noted.
- Mean Higher High Water (MHHW) referenced from United States Army Corps of Engineers (USACE) Duwamish Waterway tidal Datum No. 92 for the North Puget Sound Region.
- The locations of all features shown are approximate.
- This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Data Source: Base from Dowl HKM 2014 survey and Bush, Roed and Hitchings, Inc. 2008 survey.

Projection: NAD 1983 StatePlane Washington North FIPS 4601 Feet
Vertical Datum: North American Vertical Datum 1988 (NAVD88)

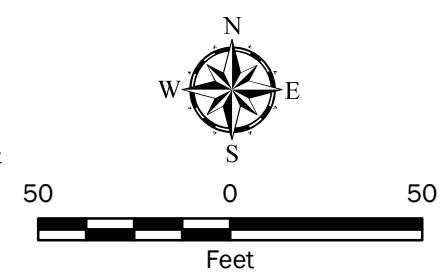
Legend

PCUL = 3.1
Mean Reporting Limit = 2.3
Basis for PCUL = Surface Water

Color	Description
Green	Detect or Non-Detect Result Less than the PCUL
Yellow	Detected Concentration Greater Than The PCUL
Grey	Non-Detect Result Greater Than The PCUL

Location ID	Dissolved Concentration (µg/L)	Total Concentration (µg/L)	Monitoring Event (Date)
DP-1	6.2	5.1	Oct-09

PCUL - Preliminary Cleanup Level
µg/L - Micrograms Per Liter
-- - Not Analyzed
U - Not Detected Greater Than the Reporting Limit
J - Estimated Concentration
TEQ - Toxicity Equivalency Quotient
ND - Non-Detect
RL - Reporting Limit



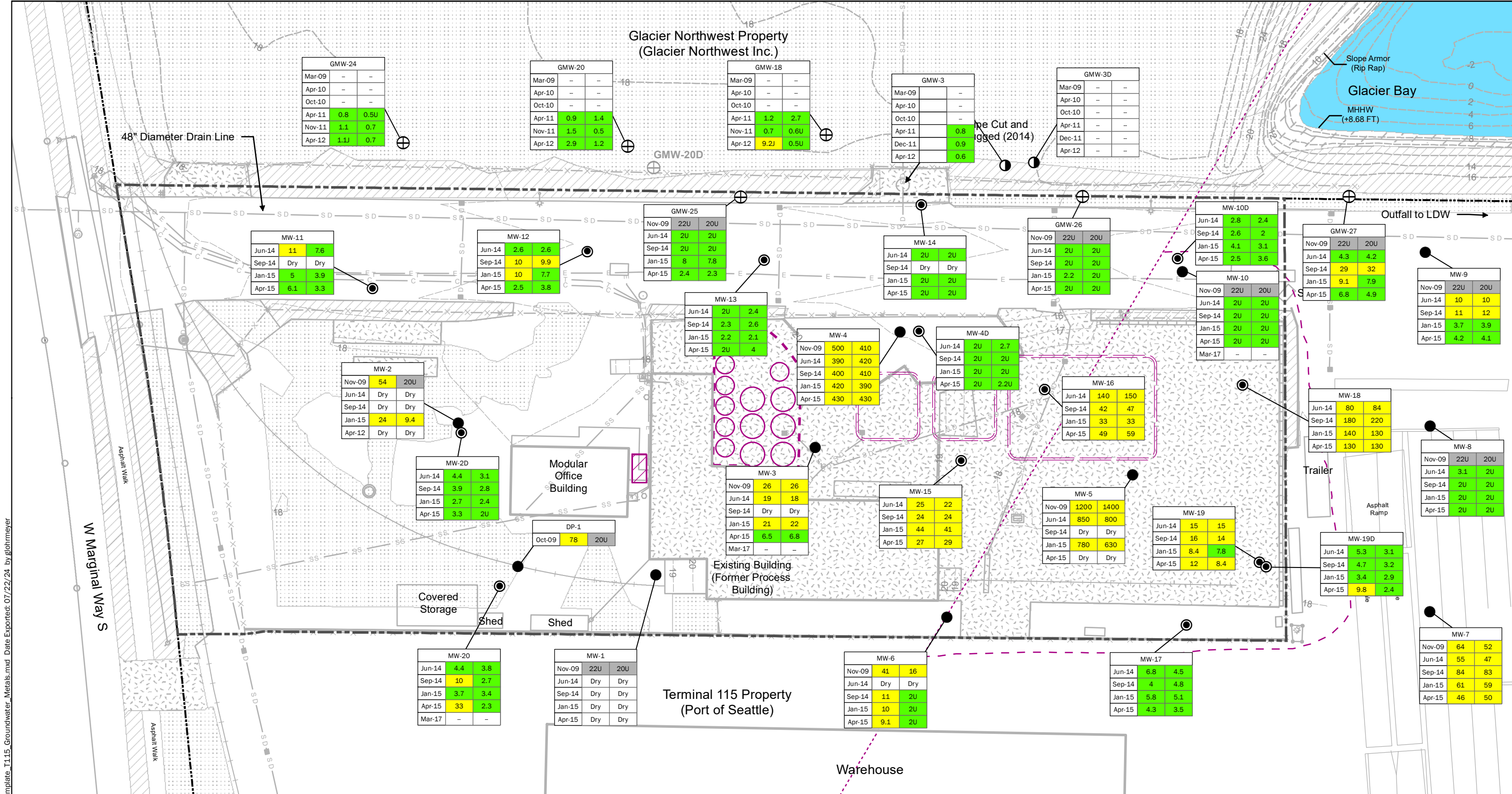
Copper Concentrations in Groundwater

Port of Seattle - North Terminal 115
Seattle, Washington

GEOENGINEERS

Figure M-62

P:\0303112\GIS\MXD\030311200_Base_Template_T115_Groundwater_Metals.mxd Date Exported: 07/22/24 by gldhmeyer



Notes:

1. Ground surface is asphalt pavement unless otherwise noted.
2. Mean Higher High Water (MHHW) referenced from United States Army Corps of Engineers (USACE) Duwamish Waterway tidal Datum No. 92 for the North Puget Sound Region.
3. The locations of all features shown are approximate.
4. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Data Source: Base from Dowl HKM 2014 survey and Bush, Roed and Hitchings, Inc. 2008 survey.

Projection: NAD 1983 StatePlane Washington North FIPS 4601 Feet
Vertical Datum: North American Vertical Datum 1988 (NAVD88)

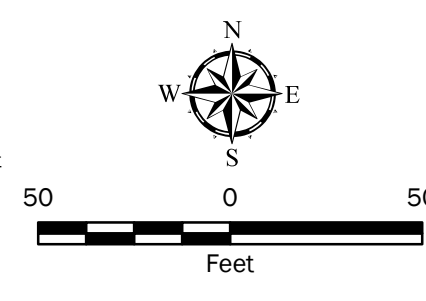
Legend

PCUL = 8.2
Mean Reporting Limit = 6.1
Basis for PCUL = Surface Water

Color	Description
Green	Detect or Non-Detect Result Less than the PCUL
Yellow	Detected Concentration Greater Than The PCUL
Grey	Non-Detect Result Greater Than The PCUL

Location ID	Dissolved Concentration (µg/L)	Total Concentration (µg/L)	Monitoring Event (Date)
DP-1	6.2	5.1	

PCUL - Preliminary Cleanup Level µg/L - Micrograms Per Liter
-- - Not Analyzed
U - Not Detected Greater Than the Reporting Limit
J - Estimated Concentration
TEQ - Toxicity Equivalency Quotient
ND - Non-Detect
RL - Reporting Limit



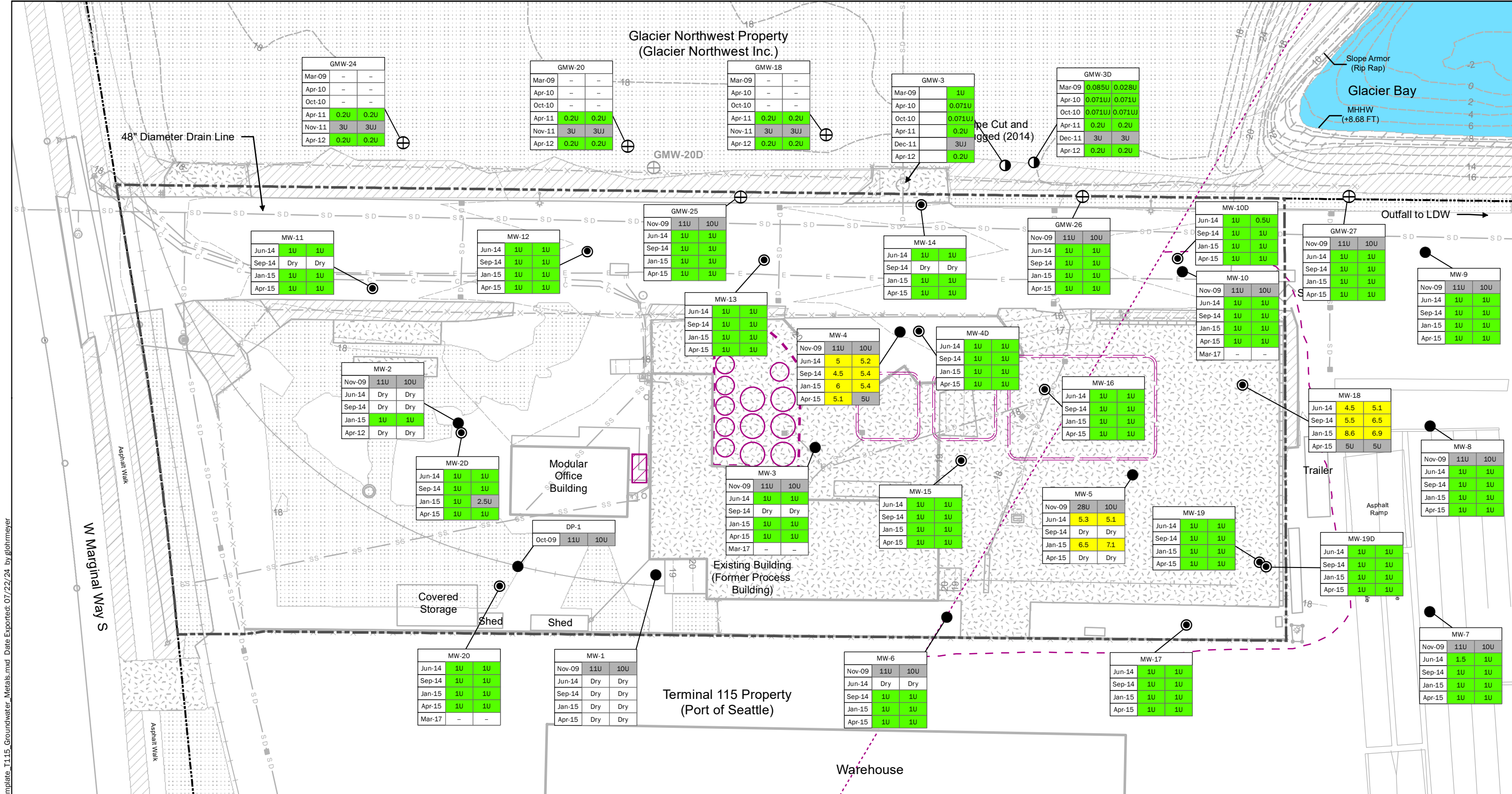
Nickel Concentrations in Groundwater

Port of Seattle - North Terminal 115
Seattle, Washington

GEOENGINEERS

Figure M-65

P:\0303112\GIS\MXD\030311200_Base_Template_T115_Groundwater_Metals.mxd Date Exported: 07/22/24 by gldhmeyer



Notes:

- Ground surface is asphalt pavement unless otherwise noted.
- Mean Higher High Water (MHHW) referenced from United States Army Corps of Engineers (USACE) Duwamish Waterway tidal Datum No. 92 for the North Puget Sound Region.
- The locations of all features shown are approximate.
- This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Data Source: Base from Dowl HKM 2014 survey and Bush, Roed and Hitchings, Inc. 2008 survey.

Projection: NAD 1983 StatePlane Washington North FIPS 4601 Feet
Vertical Datum: North American Vertical Datum 1988 (NAVD88)

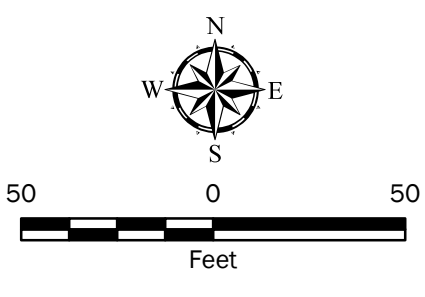
Legend

PCUL = 1.9
Mean Reporting Limit = 2.6
Basis for PCUL = Surface Water

Color	Description
Green	Detect or Non-Detect Result Less than the PCUL
Yellow	Detected Concentration Greater Than The PCUL
Grey	Non-Detect Result Greater Than The PCUL

Location ID	Dissolved Concentration (µg/L)	Total Concentration (µg/L)	Monitoring Event (Date)
DP-1	6.2	5.1	

PCUL - Preliminary Cleanup Level
µg/L - Micrograms Per Liter
-- - Not Analyzed
U - Not Detected Greater Than the Reporting Limit
J - Estimated Concentration
TEQ - Toxicity Equivalency Quotient
ND - Non-Detect
RL - Reporting Limit



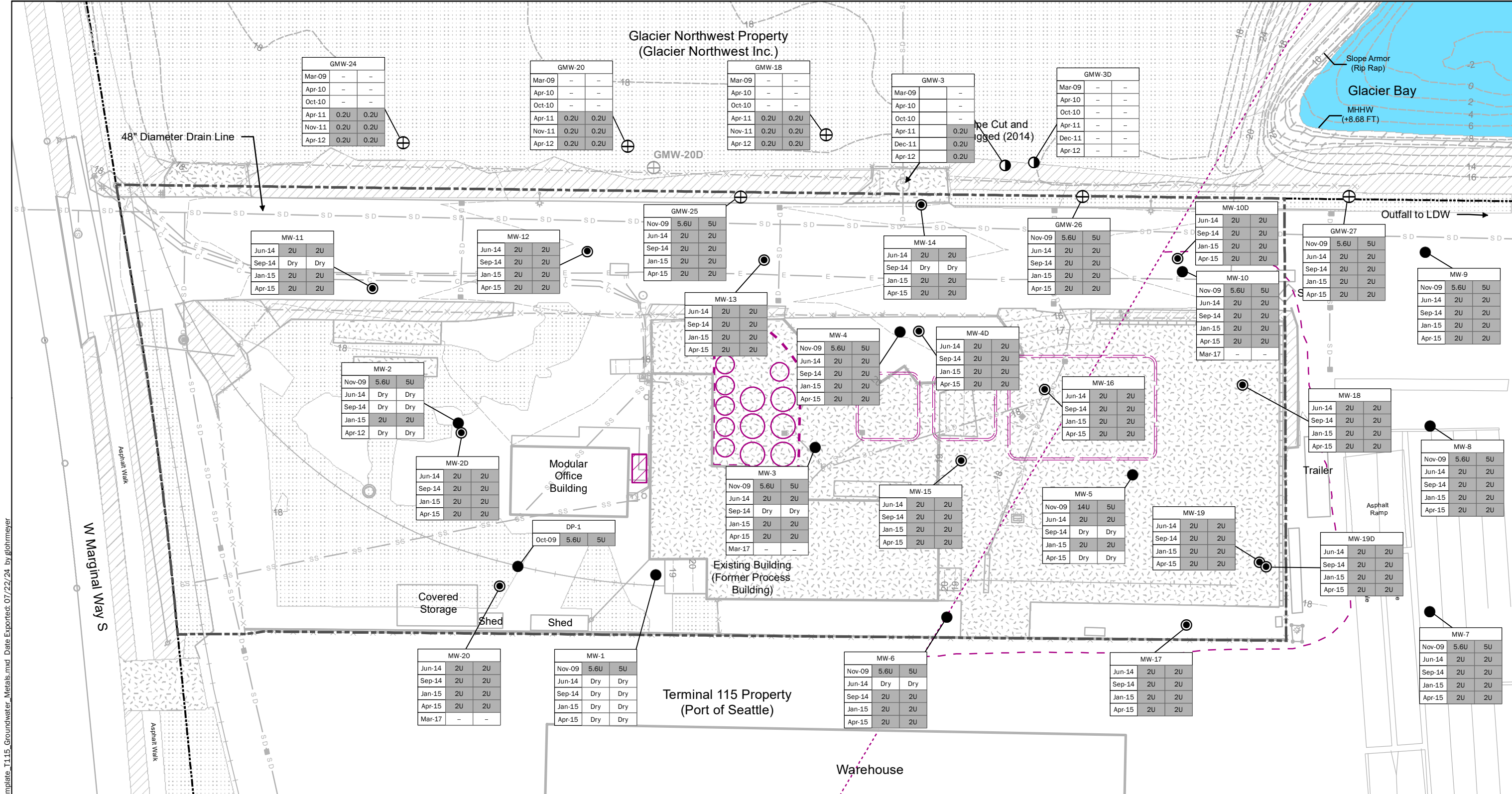
Silver Concentrations in Groundwater

Port of Seattle - North Terminal 115
Seattle, Washington

GEOENGINEERS

Figure M-66

P:\0303112\GIS\MXD\030311200_Base_Template_T115_Groundwater_Metals.mxd Date Exported: 07/22/24 by ghmeyer



Notes:

1. Ground surface is asphalt pavement unless otherwise noted.
2. Mean Higher High Water (MHHW) referenced from United States Army Corps of Engineers (USACE) Duwamish Waterway tidal Datum No. 92 for the North Puget Sound Region.
3. The locations of all features shown are approximate.
4. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Data Source: Base from Dowl HKM 2014 survey and Bush, Roed and Hitchings, Inc. 2008 survey.

Projection: NAD 1983 StatePlane Washington North FIPS 4601 Feet
Vertical Datum: North American Vertical Datum 1988 (NAVD88)

Legend

PCUL = 0.062
Mean Reporting Limit = 2.5
Basis for PCUL = Surface Water

Detect or Non-Detect Result Less than the PCUL
Detected Concentration Greater Than The PCUL
Non-Detect Result Greather Than The PCUL

PCUL - Preliminary Cleanup Level
µg/L - Micrograms Per Liter
-- - Not Analyzed
U - Not Detected Greater Than the Reporting Limit
J - Estimated Concentration
TEQ - Toxicity Equivalency Quotient
ND - Non-Detect
RL - Reporting Limit

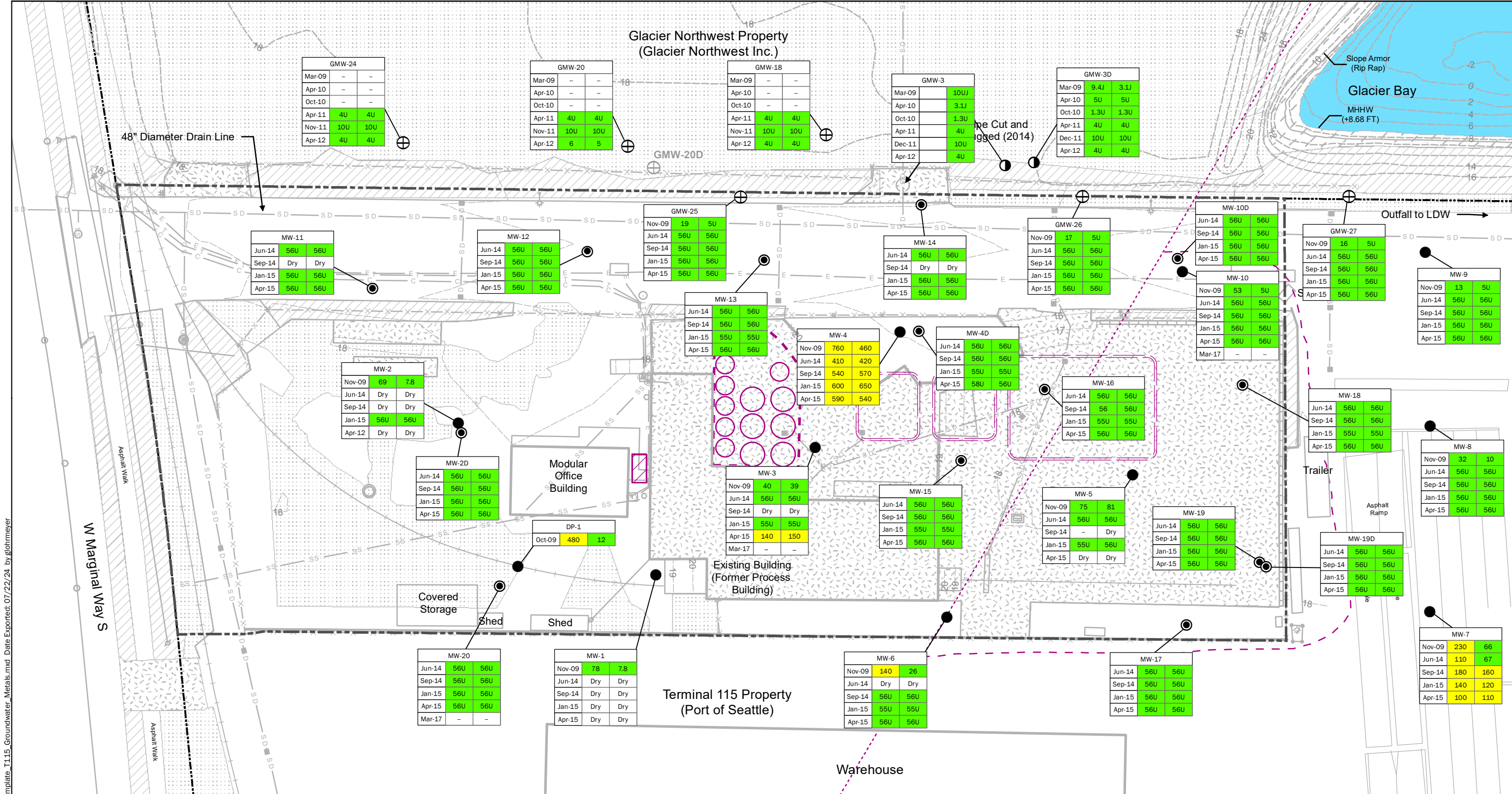
Thallium Concentrations in Groundwater

Port of Seattle - North Terminal 115
Seattle, Washington

GEOENGINEERS

Figure M-67

P:\0303112\GIS\MXD\030311200_Base_Template_T115_Groundwater_Metals.mxd Date Exported: 07/22/24 by ghmeyer



Notes:

1. Ground surface is asphalt pavement unless otherwise noted.
2. Mean Higher High Water (MHHW) referenced from United States Army Corps of Engineers (USACE) Duwamish Waterway tidal Datum No. 92 for the North Puget Sound Region.
3. The locations of all features shown are approximate.
4. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Data Source: Base from Dowl HKM 2014 survey and Bush, Roed and Hitchings, Inc. 2008 survey.

Projection: NAD 1983 StatePlane Washington North FIPS 4601 Feet
Vertical Datum: North American Vertical Datum 1988 (NAVD88)

Legend

PCUL = 81
Mean Reporting Limit = 56
Basis for PCUL = Surface Water

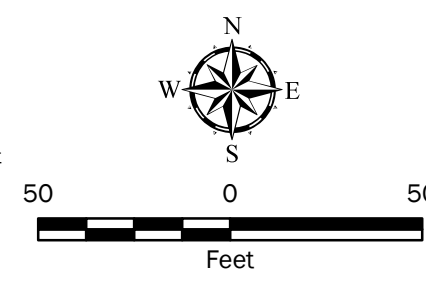
DP-1
Oct-09 6.2 5.1

Location ID
Dissolved Concentration (µg/L)
Total Concentration (µg/L)
Monitoring Event (Date)

Color Legend:

- Green: Detect or Non-Detect Result Less than the PCUL
- Yellow: Detected Concentration Greater Than The PCUL
- Grey: Non-Detect Result Greater Than The PCUL

PCUL - Preliminary Cleanup Level µg/L - Micrograms Per Liter
- - - Not Analyzed
U - Not Detected Greater Than the Reporting Limit
J - Estimated Concentration
TEQ - Toxicity Equivalency Quotient
ND - Non-Detect
RL - Reporting Limit

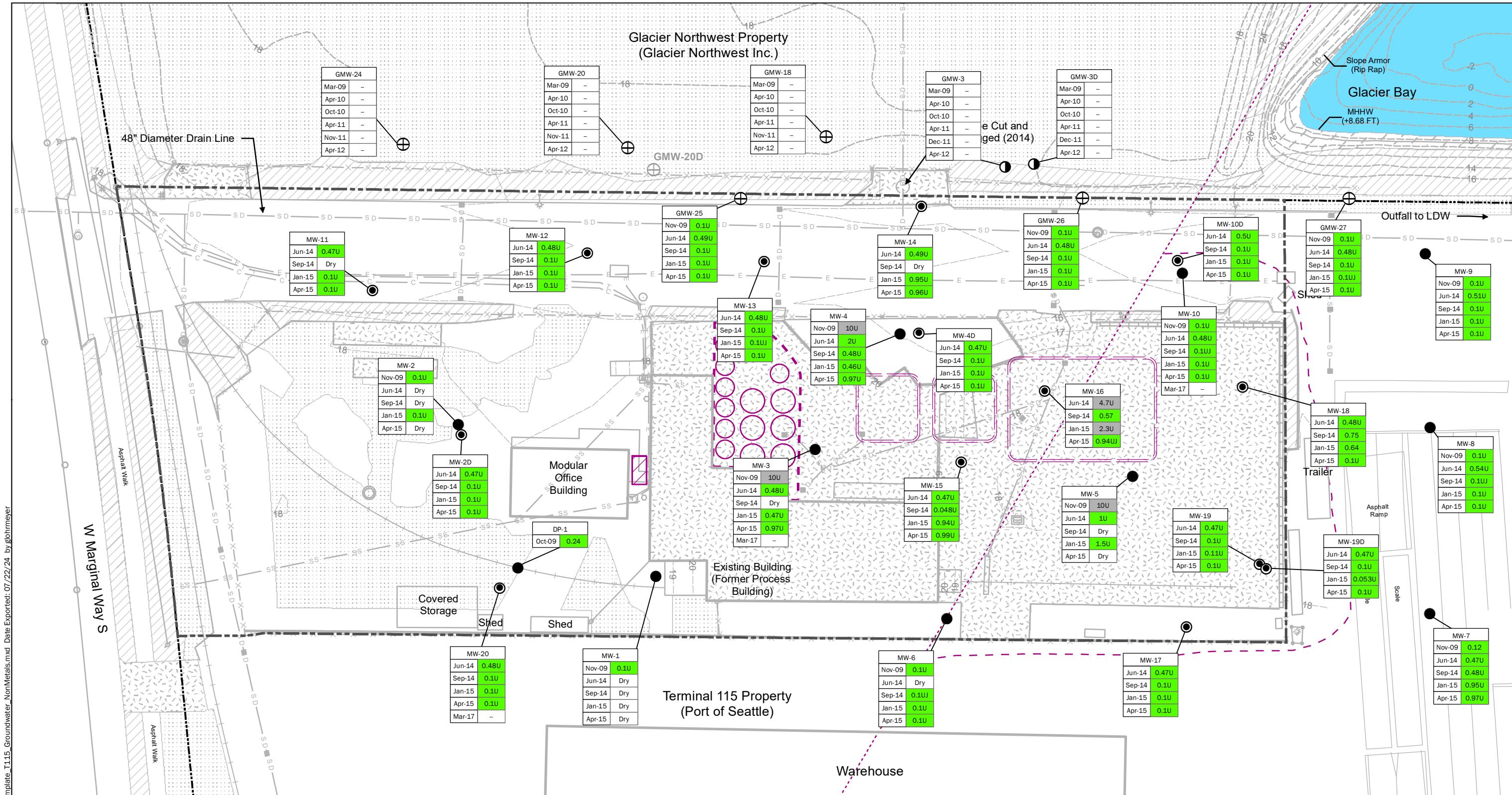


Zinc Concentrations in Groundwater

Port of Seattle - North Terminal 115
Seattle, Washington

GEOENGINEERS

Figure M-68



Notes:

- Ground surface is asphalt pavement unless otherwise noted.
- Mean Higher High Water (MHHW) referenced from United States Army Corps of Engineers (USACE) Duwamish Waterway tidal Datum No. 92 for the North Puget Sound Region.
- The locations of all features shown are approximate.
- This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Data Source: Base from Dowl HKM 2014 survey and Bush, Roed and Hitchings, Inc. 2008 survey.

Projection: NAD 1983 StatePlane Washington North FIPS 4601 Feet
Vertical Datum: North American Vertical Datum 1988 (NAVD88)

Legend

PCUL = 2.1
Mean Reporting Limit = 0.7
Basis for PCUL = Sediment

Green box	Detect or Non-Detect Result Less than the PCUL
Yellow box	Detected Concentration Greater Than The PCUL
Grey box	Non-Detect Result Greater Than The PCUL

PCUL - Preliminary Cleanup Level
µg/L - Micrograms Per Liter
- - - Not Analyzed
U - Not Detected Greater Than the Reporting Limit
J - Estimated Concentration
TEQ - Toxicity Equivalency Quotient
ND - Non-Detect
RL - Reporting Limit

Anthracene Concentrations in Groundwater

Port of Seattle - North Terminal 115
Seattle, Washington

GEOENGINEERS

Figure M-70

Notes:

1. Ground surface is asphalt pavement unless otherwise noted.

2. Mean Higher High Water (MHHW) referenced from United States Army Corps of Engineers (USACE) Duwamish Waterway tidal Datum No. 92 for the North Puget Sound Region.

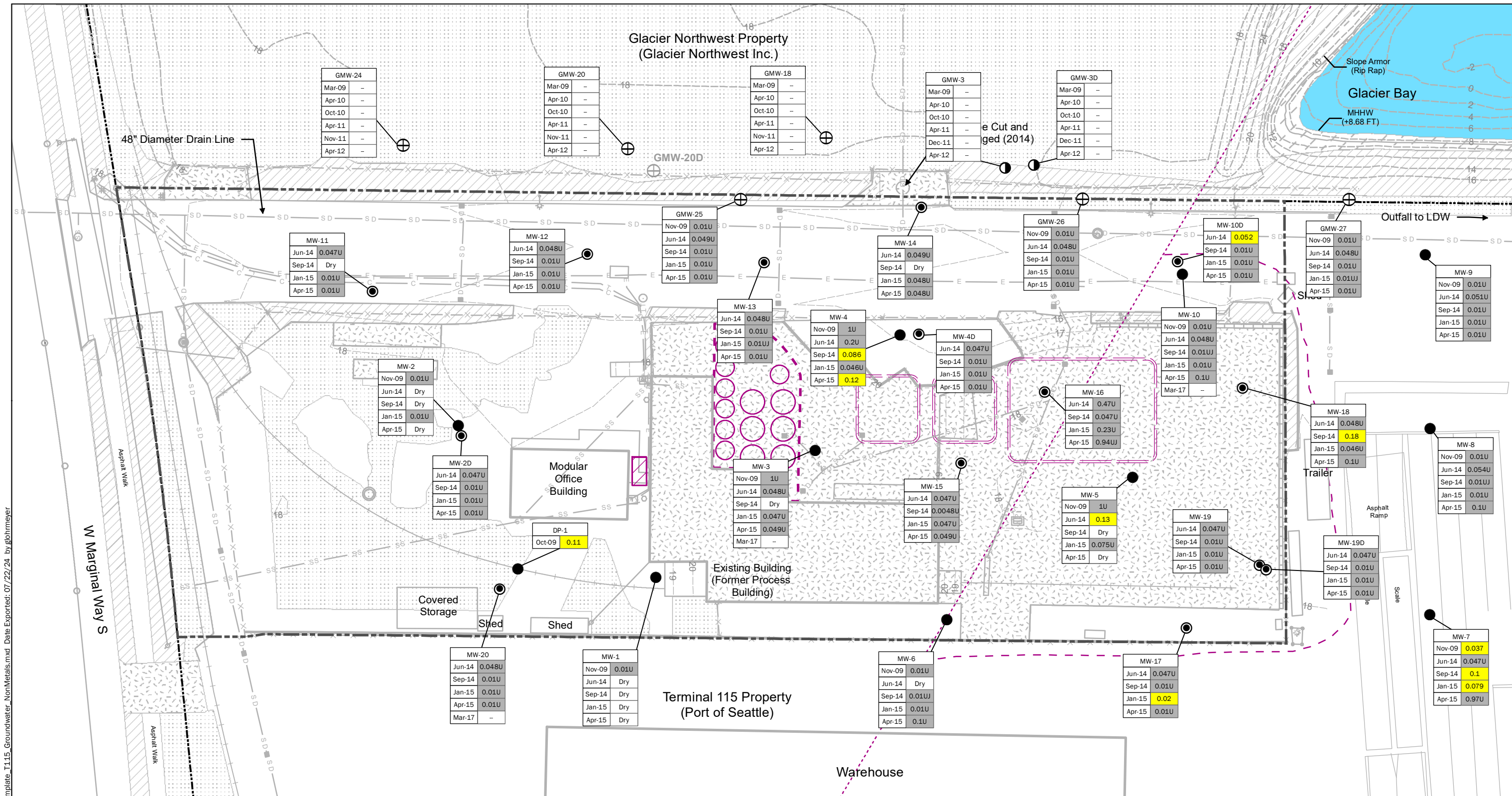
3. The locations of all features shown are approximate.

4. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Data Source: Base from Dowl HKM 2014 survey and Bush, Roed and Hitchings, Inc. 2008 survey.

Projection: NAD 1983 StatePlane Washington North FIPS 4601 Feet
Vertical Datum: North American Vertical Datum 1988 (NAVD88)

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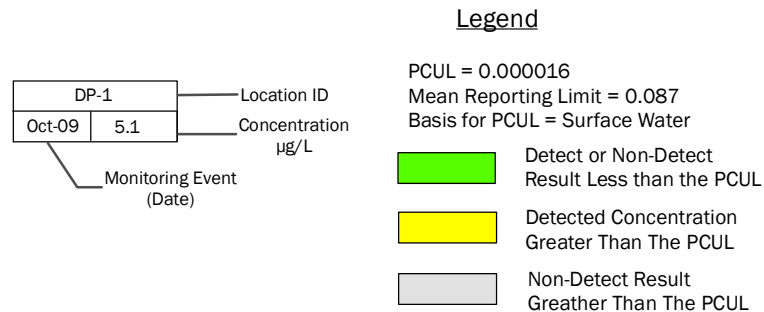


Notes:

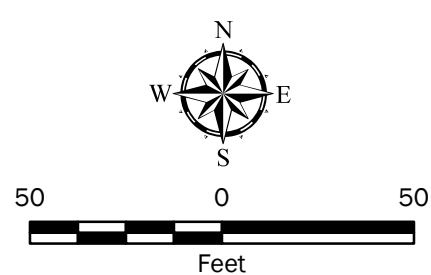
1. Ground surface is asphalt pavement unless otherwise noted.
2. Mean Higher High Water (MHHW) referenced from United States Army Corps of Engineers (USACE) Duwamish Waterway tidal Datum No. 92 for the North Puget Sound Region.
3. The locations of all features shown are approximate.
4. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Data Source: Base from Dowl HKM 2014 survey and Bush, Roed and Hitchings, Inc. 2008 survey.

Projection: NAD 1983 StatePlane Washington North FIPS 4601 Feet
Vertical Datum: North American Vertical Datum 1988 (NAVD88)



PCUL - Preliminary Cleanup Level
µg/L - Micrograms Per Liter
-- - Not Analyzed
U - Not Detected Greater Than the Reporting Limit
J - Estimated Concentration
TEQ - Toxicity Equivalency Quotient
ND - Non-Detect
RL - Reporting Limit

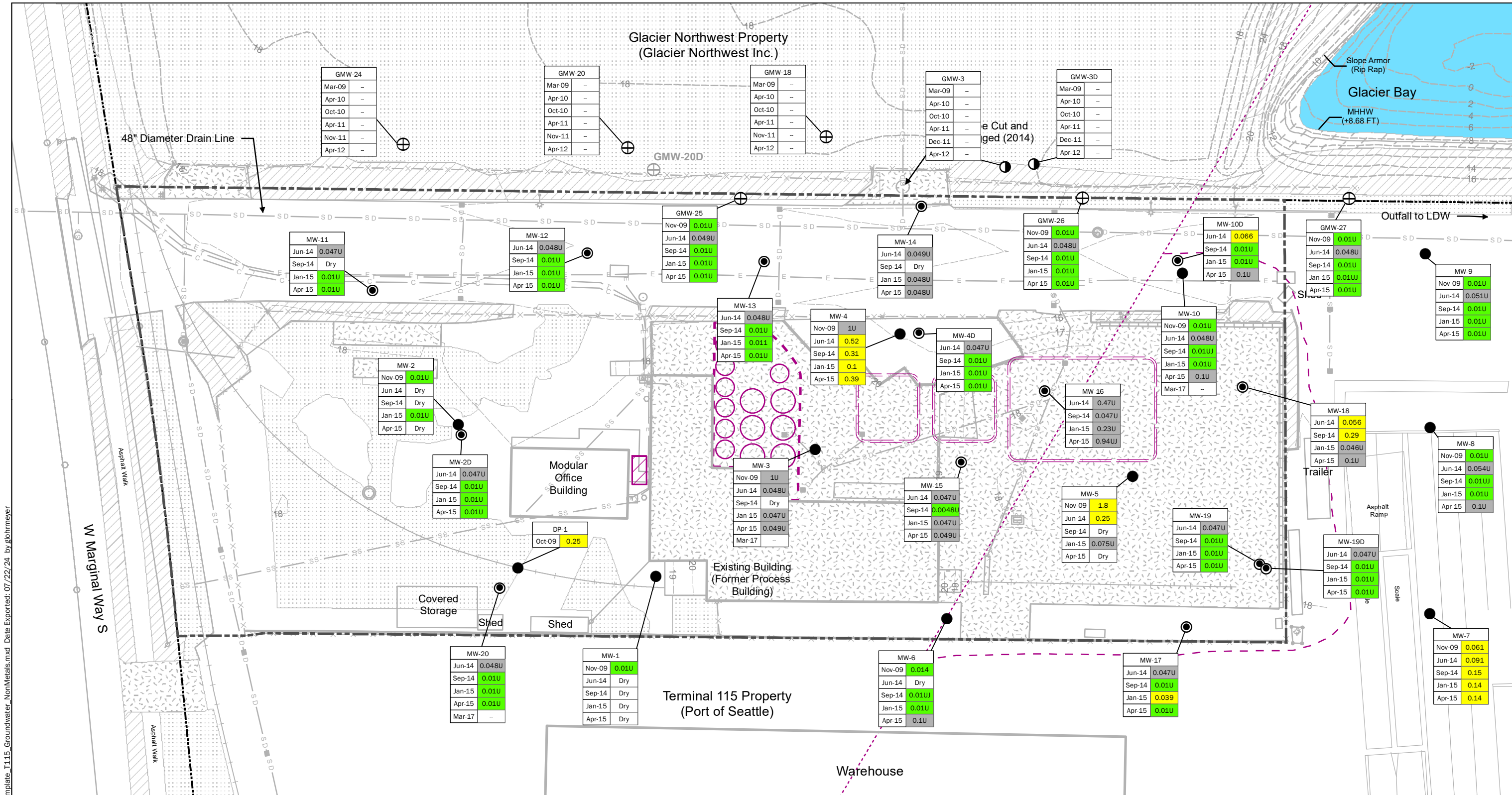


Benzo(a)pyrene
Concentrations in Groundwater

Port of Seattle - North Terminal 115
Seattle, Washington

GEOENGINEERS

Figure M-74



Notes:

- Ground surface is asphalt pavement unless otherwise noted.
- Mean Higher High Water (MHHW) referenced from United States Army Corps of Engineers (USACE) Duwamish Waterway tidal Datum No. 92 for the North Puget Sound Region.
- The locations of all features shown are approximate.
- This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Data Source: Base from Dowl HKM 2014 survey and Bush, Roed and Hitchings, Inc. 2008 survey.

Projection: NAD 1983 StatePlane Washington North FIPS 4601 Feet
Vertical Datum: North American Vertical Datum 1988 (NAVD88)

Legend

PCUL = 0.016
Mean Reporting Limit = 0.062
Basis for PCUL = Surface Water

	Detect or Non-Detect Result Less than the PCUL
	Detected Concentration Greater Than The PCUL
	Non-Detect Result Greater Than The PCUL

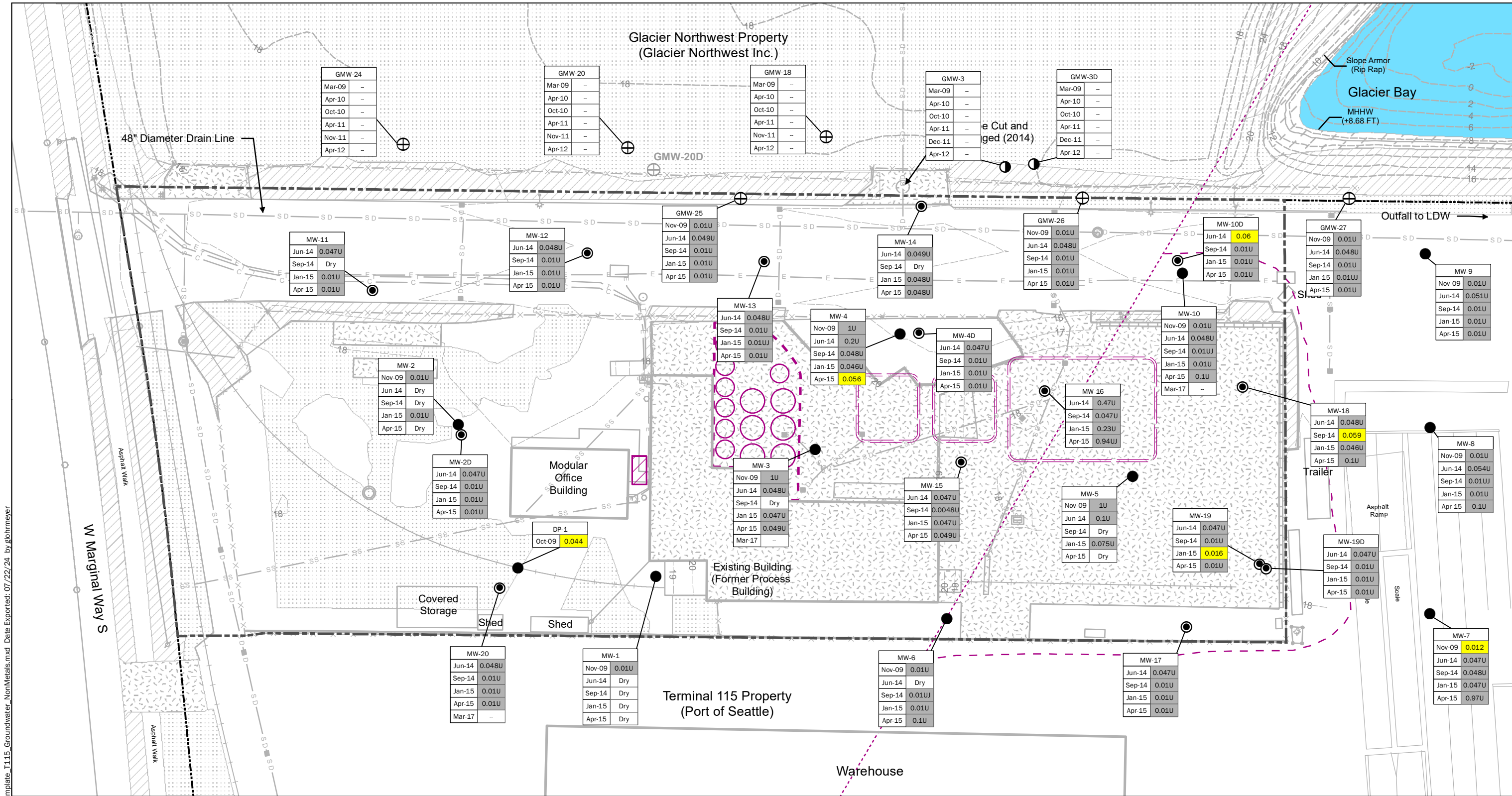
PCUL - Preliminary Cleanup Level
µg/L - Micrograms Per Liter
-- - Not Analyzed
U - Not Detected Greater Than the Reporting Limit
J - Estimated Concentration
TEQ - Toxicity Equivalency Quotient
ND - Non-Detect
RL - Reporting Limit

Chrysene Concentrations in Groundwater

Port of Seattle - North Terminal 115
Seattle, Washington

GEOENGINEERS

Figure M-75



Notes:

1. Ground surface is asphalt pavement unless otherwise noted.
2. Mean Higher High Water (MHHW) referenced from United States Army Corps of Engineers (USACE) Duwamish Waterway tidal Datum No. 92 for the North Puget Sound Region.
3. The locations of all features shown are approximate.
4. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Data Source: Base from Dowl HKM 2014 survey and Bush, Roed and Hitchings, Inc. 2008 survey.

Projection: NAD 1983 StatePlane Washington North FIPS 4601 Feet
Vertical Datum: North American Vertical Datum 1988 (NAVD88)

Legend

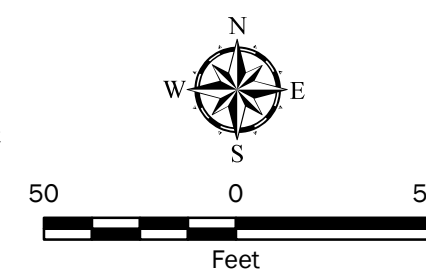
PCUL = 0.000016
Mean Reporting Limit = 0.086
Basis for PCUL = Surface Water

Color	Description
Green	Detect or Non-Detect Result Less than the PCUL
Yellow	Detected Concentration Greater Than The PCUL
Grey	Non-Detect Result Greater Than The PCUL

Monitoring Event (Date)

Location ID	Concentration µg/L
DP-1	5.1

PCUL - Preliminary Cleanup Level
µg/L - Micrograms Per Liter
-- - Not Analyzed
U - Not Detected Greater Than the Reporting Limit
J - Estimated Concentration
TEQ - Toxicity Equivalency Quotient
ND - Non-Detect
RL - Reporting Limit

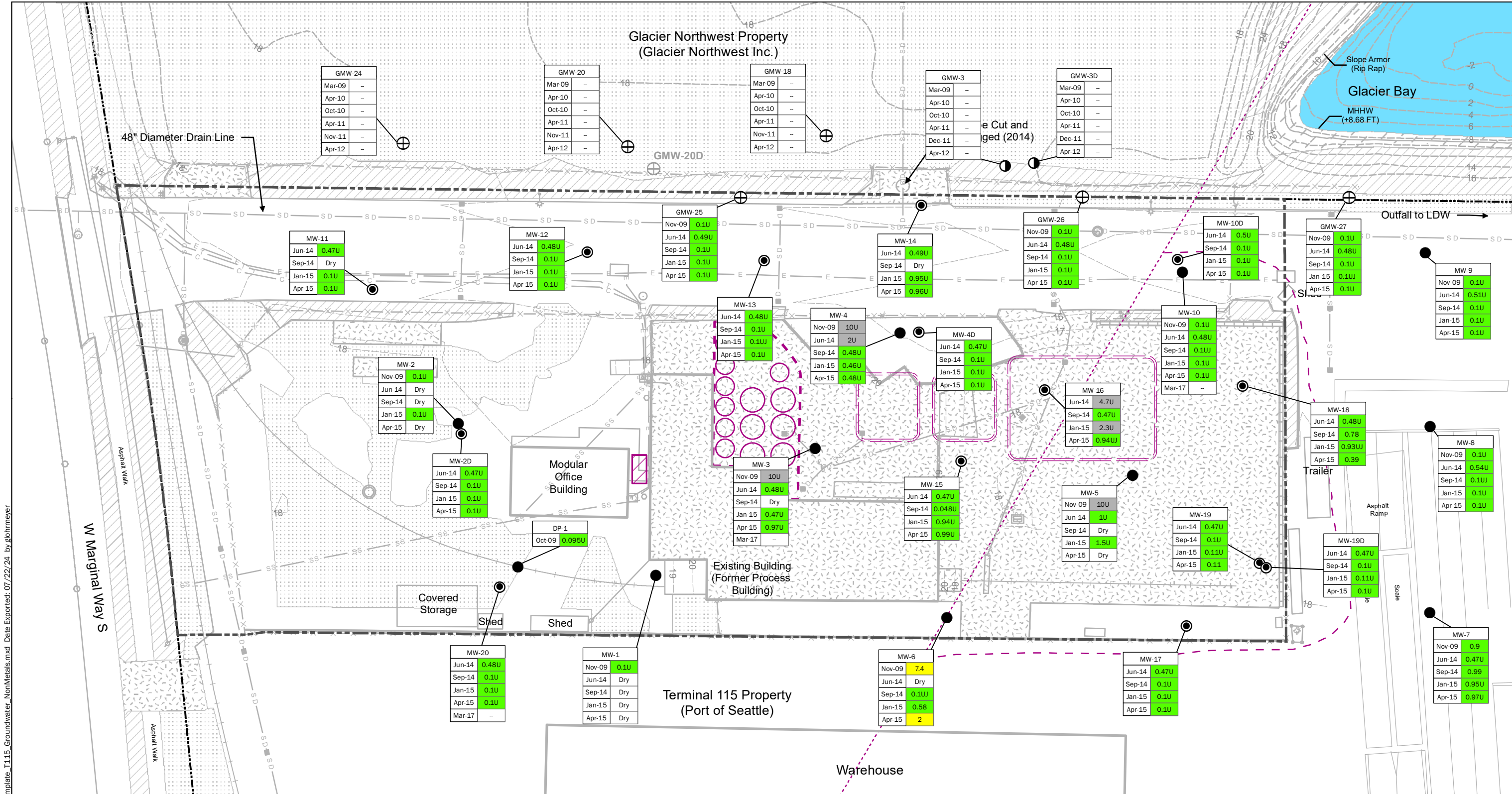


Dibenzo(a,h)anthracene Concentrations in Groundwater

Port of Seattle - North Terminal 115
Seattle, Washington

GEOENGINEERS

Figure M-76



Notes:

- Ground surface is asphalt pavement unless otherwise noted.
- Mean Higher High Water (MHHW) referenced from United States Army Corps of Engineers (USACE) Duwamish Waterway tidal Datum No. 92 for the North Puget Sound Region.
- The locations of all features shown are approximate.
- This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Data Source: Base from Dowl HKM 2014 survey and Bush, Roed and Hitchings, Inc. 2008 survey.

Projection: NAD 1983 StatePlane Washington North FIPS 4601 Feet
Vertical Datum: North American Vertical Datum 1988 (NAVD88)

Legend

PCUL = 1.5
Mean Reporting Limit = 0.72
Basis for PCUL = Drinking Water

Green	Detect or Non-Detect Result Less than the PCUL
Yellow	Detected Concentration Greater Than The PCUL
Grey	Non-Detect Result Greater Than The PCUL

Location ID
Concentration µg/L
Monitoring Event (Date)

DP-1
Oct-09 5.1

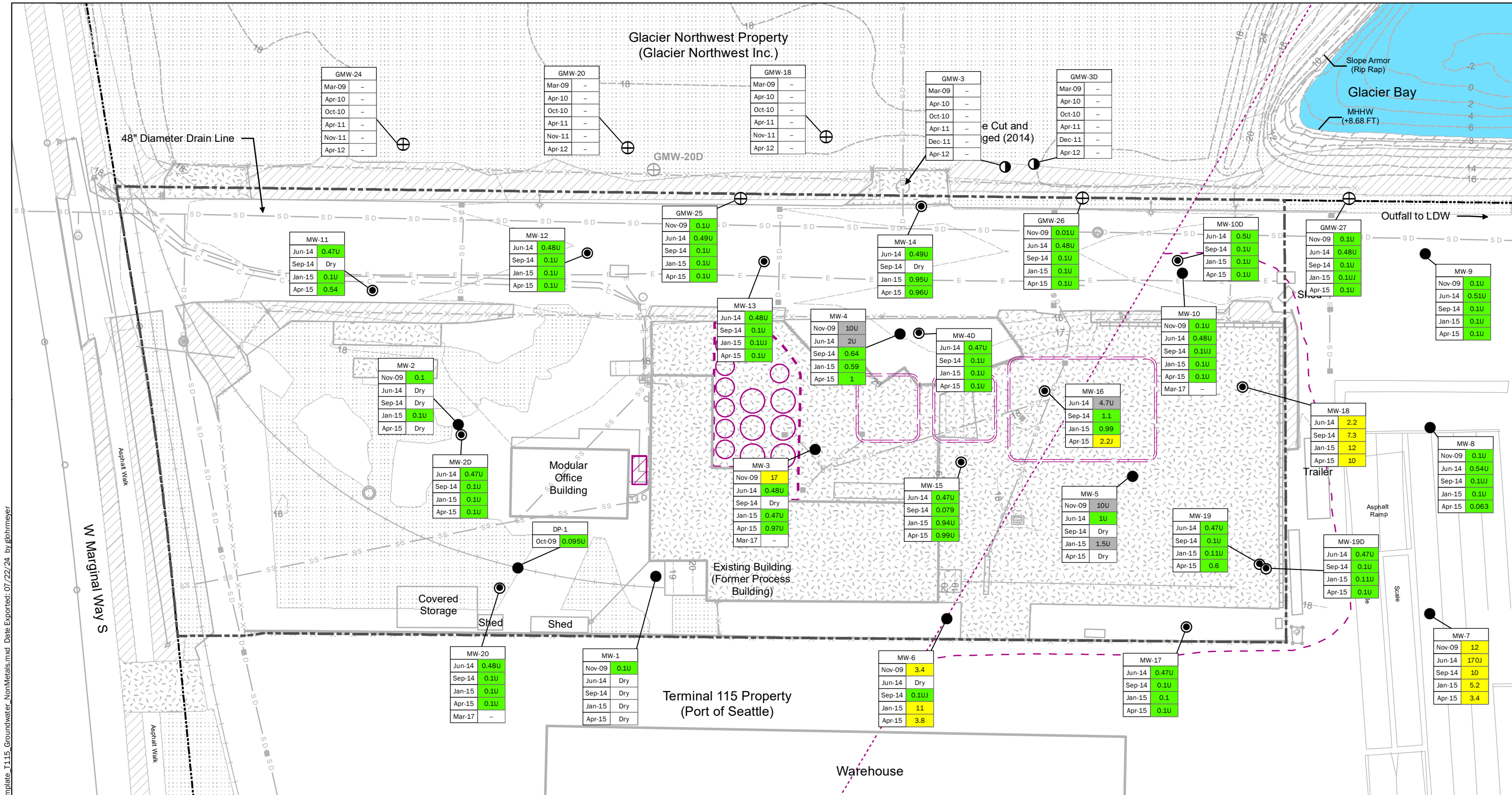
PCUL - Preliminary Cleanup Level
µg/L - Micrograms Per Liter
- - - Not Analyzed
U - Not Detected Greater Than the Reporting Limit
J - Estimated Concentration
TEQ - Toxicity Equivalency Quotient
ND - Non-Detect
RL - Reporting Limit

1-Methylnaphthalene Concentrations in Groundwater

Port of Seattle - North Terminal 115
Seattle, Washington

GEOENGINEERS

Figure M-80



Notes:

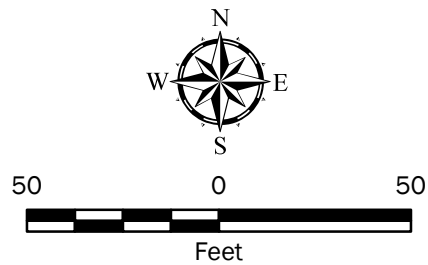
1. Ground surface is asphalt pavement unless otherwise noted.
 2. Mean Higher High Water (MHHW) referenced from United States Army Corps of Engineers (USACE) Duwamish Waterway tidal Datum No. 92 for the North Puget Sound Region.
 3. The locations of all features shown are approximate.
 4. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.
- Data Source: Base from Dowl HKM 2014 survey and Bush, Roed and Hitchings, Inc. 2008 survey.
- Projection: NAD 1983 StatePlane Washington North FIPS 4601 Feet
Vertical Datum: North American Vertical Datum 1988 (NAVD88)

Legend

DP-1	Location ID
Oct-09	5.1
Monitoring Event (Date)	Concentration µg/L

- PCUL = 1.4
Mean Reporting Limit = 2.1
Basis for PCUL = Surface Water
- Detect or Non-Detect Result Less than the PCUL
 - Detect or Non-Detect Result Greater Than The PCUL
 - Non-Detect Result Greather Than The PCUL

- PCUL - Preliminary Cleanup Level
µg/L - Micrograms Per Liter
-- - Not Analyzed
U - Not Detected Greater Than the Reporting Limit
J - Estimated Concentration
TEQ - Toxicity Equivalency Quotient
ND - Non-Detect
RL - Reporting Limit

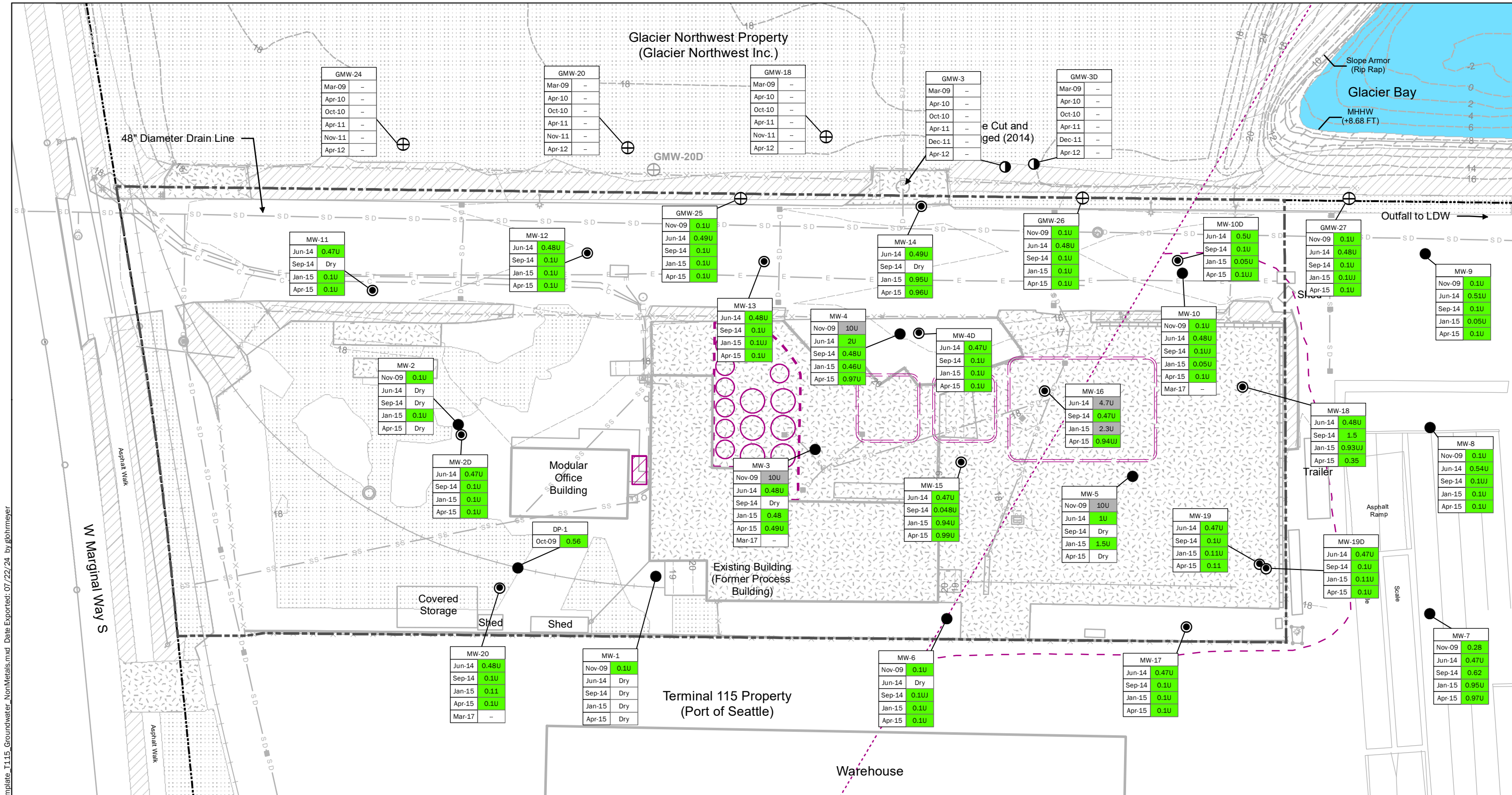


Naphthalene
Concentrations in Groundwater

Port of Seattle - North Terminal 115
Seattle, Washington



Figure M-81



Notes:

- Ground surface is asphalt pavement unless otherwise noted.
- Mean Higher High Water (MHHW) referenced from United States Army Corps of Engineers (USACE) Duwamish Waterway tidal Datum No. 92 for the North Puget Sound Region.
- The locations of all features shown are approximate.
- This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Data Source: Base from Dowl HKM 2014 survey and Bush, Roed and Hitchings, Inc. 2008 survey.

Projection: NAD 1983 StatePlane Washington North FIPS 4601 Feet
Vertical Datum: North American Vertical Datum 1988 (NAVD88)

Legend

PCUL = 2
Mean Reporting Limit = 0.71
Basis for PCUL = Sediment

	Detect or Non-Detect Result Less than the PCUL
	Detected Concentration Greater Than The PCUL
	Non-Detect Result Greater Than The PCUL

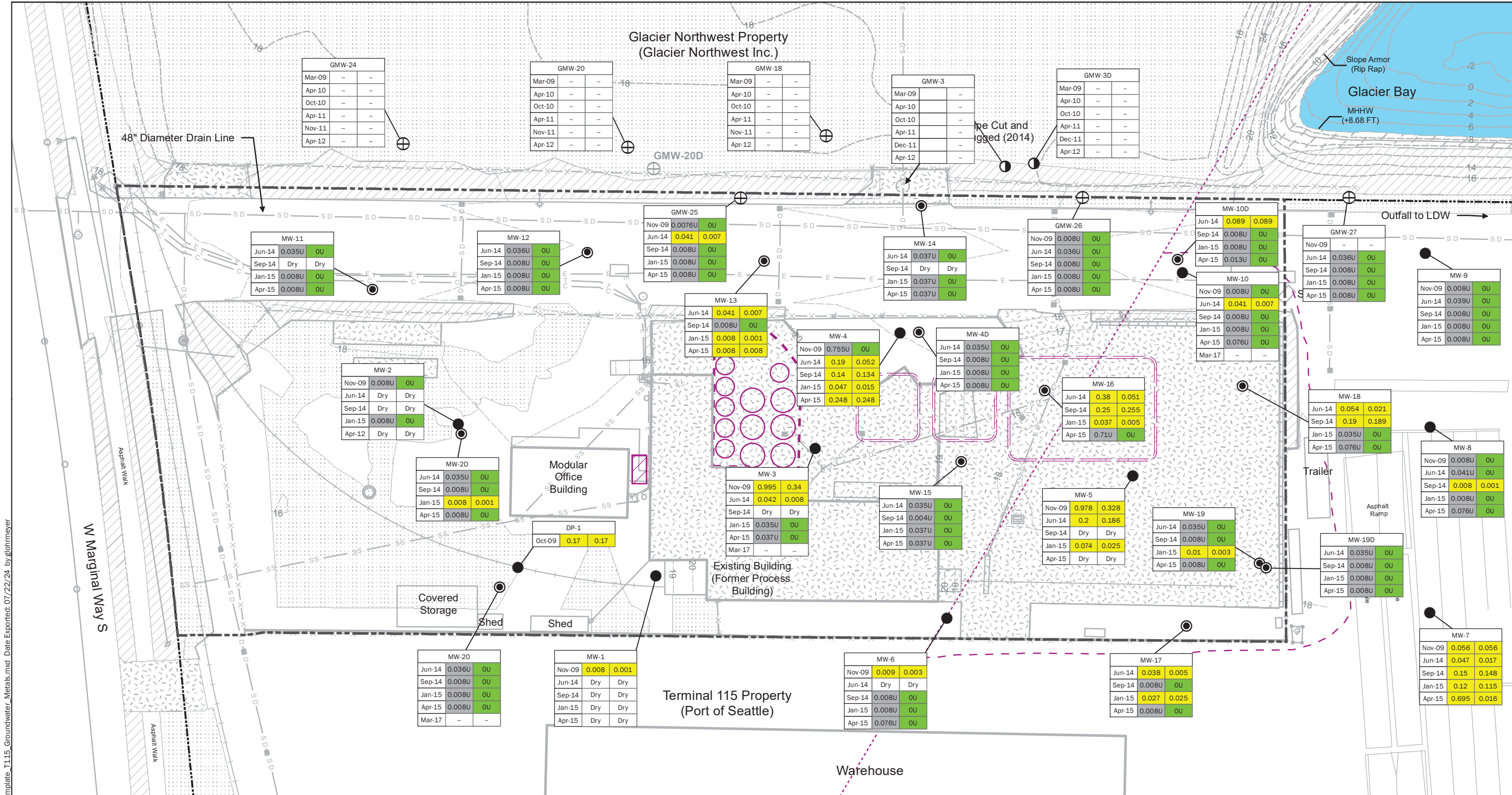
PCUL - Preliminary Cleanup Level
µg/L - Micrograms Per Liter
-- - Not Analyzed
U - Not Detected Greater Than the Reporting Limit
J - Estimated Concentration
TEQ - Toxicity Equivalency Quotient
ND - Non-Detect
RL - Reporting Limit

Pyrene Concentrations in Groundwater

Port of Seattle - North Terminal 115
Seattle, Washington

GEOENGINEERS

Figure M-82



Notes:

- Ground surface is asphalt pavement unless otherwise noted.
- Mean Higher High Water (MHHW) referenced from United States Army Corps of Engineers (USACE) Duwamish Waterway tidal Datum No. 92 for the North Puget Sound Region.
- The locations of all features shown are approximate.
- This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Data Source: Base from Dowl HKM 2014 survey and Bush, Roed and Hitchings, Inc. 2008 survey.

Projection: NAD 1983 StatePlane Washington North FIPS 4601 Feet
Vertical Datum: North American Vertical Datum 1988 (NAVD88)

Legend

PCUL = 0.000016
Mean Reporting Limit = 38
Basis for PCUL = Surface Water

Green box	Detect or Non-Detect Result Less than the PCUL
Yellow box	Detected Concentration Greater Than The PCUL
Grey box	Non-Detect Result Greater Than The PCUL

PCUL - Preliminary Cleanup Level µg/L - Micrograms Per Liter
- - - Not Analyzed
U - Not Detected Greater Than the Reporting Limit
J - Estimated Concentration
TEQ - Toxicity Equivalency Quotient
ND - Non-Detect
RL - Reporting Limit

Notes:

Location ID

DP-1	6.2	5.1
------	-----	-----

ND=ORL (µg/L)

ND=0.5RL (µg/L)

Monitoring Event (Date)

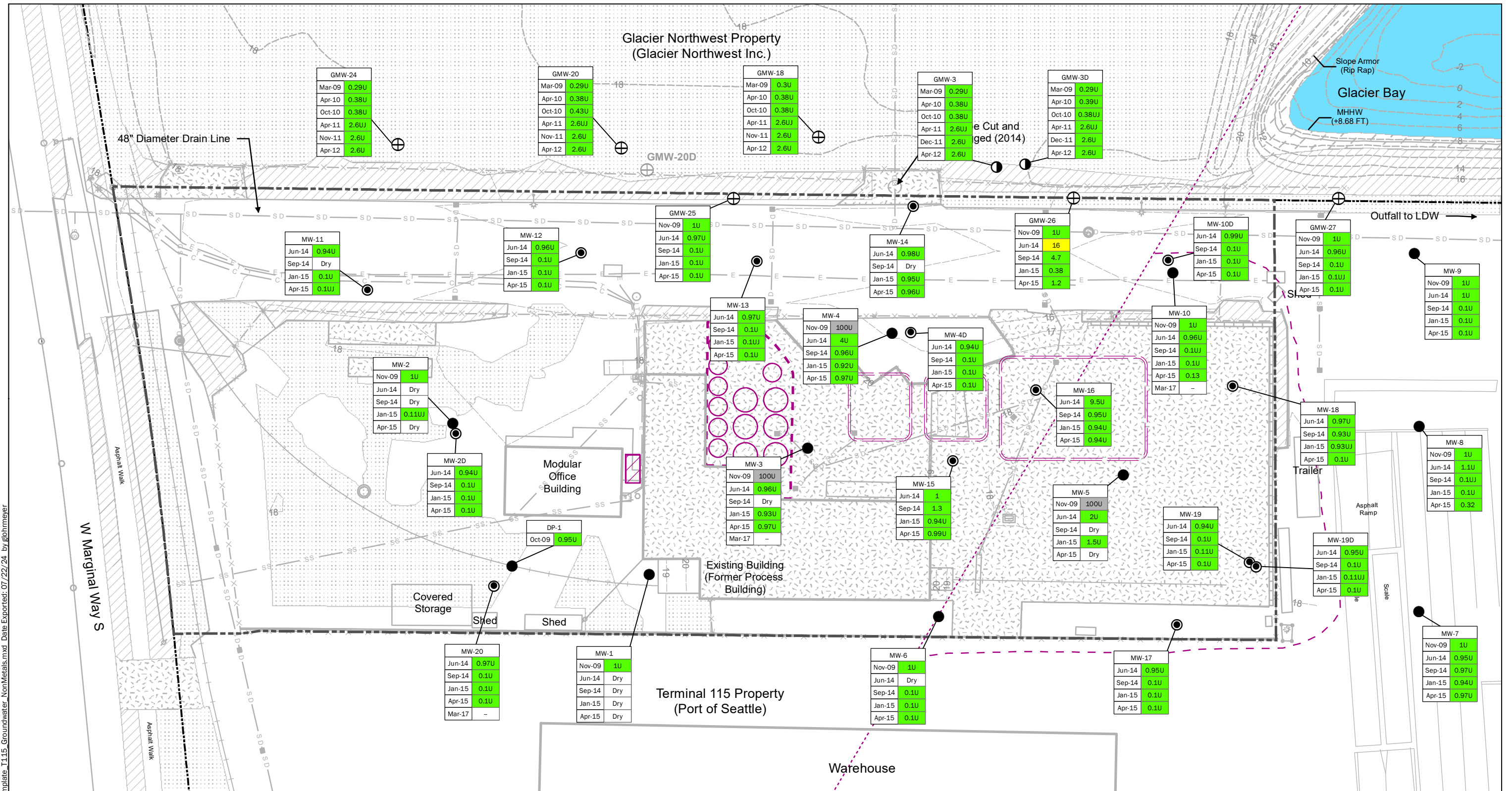
Total cPAH TEQ Concentrations in Groundwater

Port of Seattle - North Terminal 115
Seattle, Washington

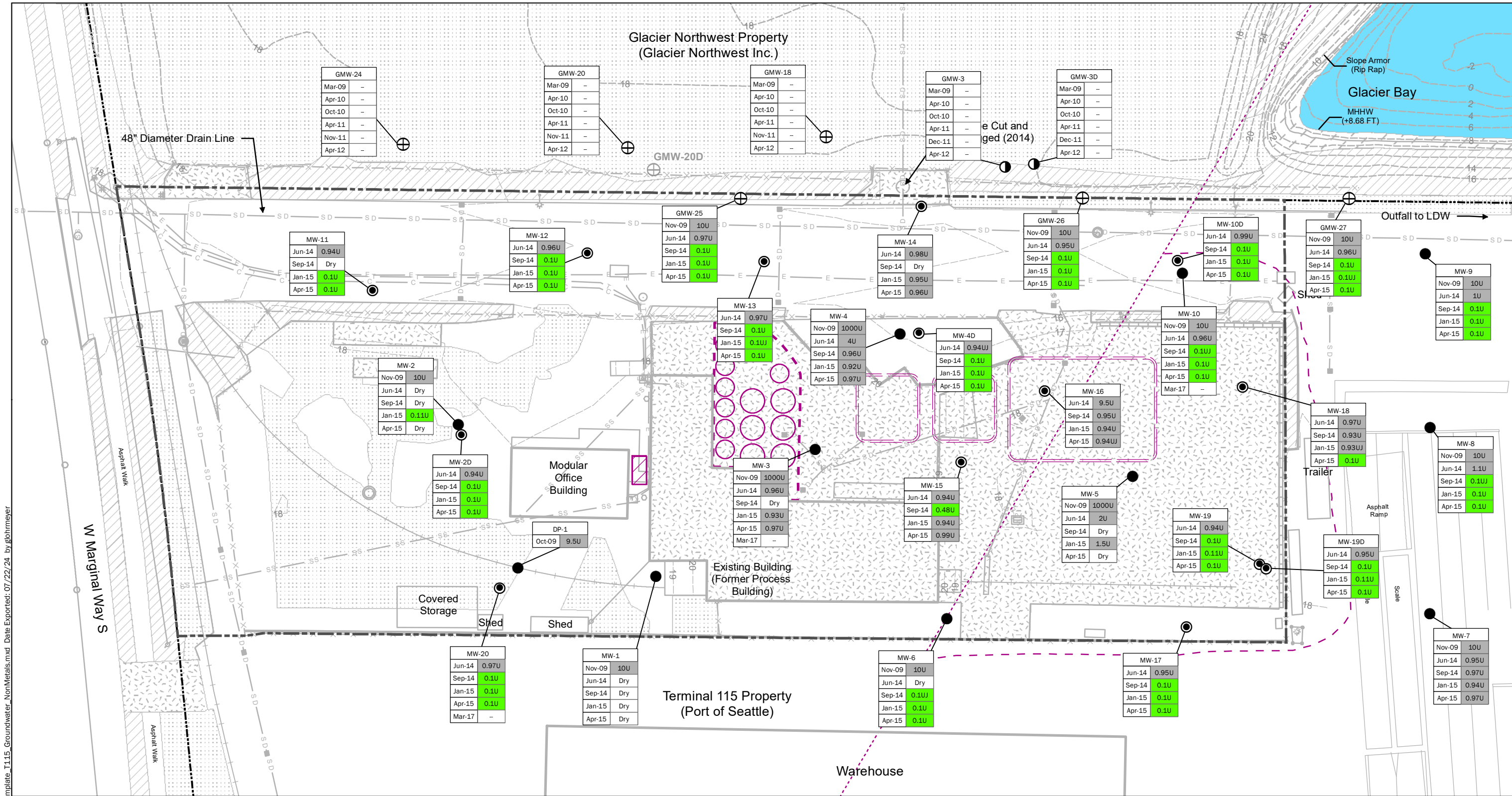
GEOENGINEERS

Figure M-83

P:\0303112\GIS\MXD\030311200_Base_Template_T115_Groundwater_Metals.mxd Date Exported: 07/22/24 by ghmeyer



A compass rose is positioned above a scale bar. The compass rose has eight points, with the cardinal directions labeled: N (North) at the top, S (South) at the bottom, E (East) on the right, and W (West) on the left. The scale bar is a horizontal line with alternating black and white segments. It is marked with the number 50 at the left end, 0 in the middle, and 50 at the right end. Below the scale bar, the word "Feet" is written.



Notes:

1. Ground surface is asphalt pavement unless otherwise noted.
2. Mean Higher High Water (MHHW) referenced from United States Army Corps of Engineers (USACE) Duwamish Waterway tidal Datum No. 92 for the North Puget Sound Region.
3. The locations of all features shown are approximate.
4. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Data Source: Base from Dowl HKM 2014 survey and Bush, Roed and Hitchings, Inc. 2008 survey.

Projection: NAD 1983 StatePlane Washington North FIPS 4601 Feet
Vertical Datum: North American Vertical Datum 1988 (NAVD88)

Legend

PCUL = 0.69
Mean Reporting Limit = 34
Basis for PCUL = Surface Water

	Detect or Non-Detect Result Less than the PCUL
	Detected Concentration Greater Than The PCUL
	Non-Detect Result Greater Than The PCUL

DP-1

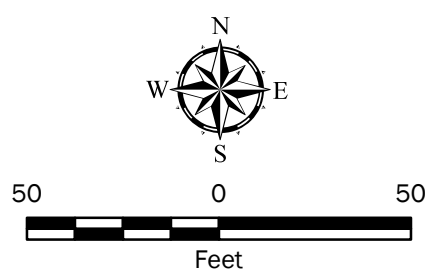
Oct-09	5.1
--------	-----

Monitoring Event (Date)

Location ID

Concentration µg/L

PCUL - Preliminary Cleanup Level
µg/L - Micrograms Per Liter
-- - Not Analyzed
U - Not Detected Greater Than the Reporting Limit
J - Estimated Concentration
TEQ - Toxicity Equivalency Quotient
ND - Non-Detect
RL - Reporting Limit

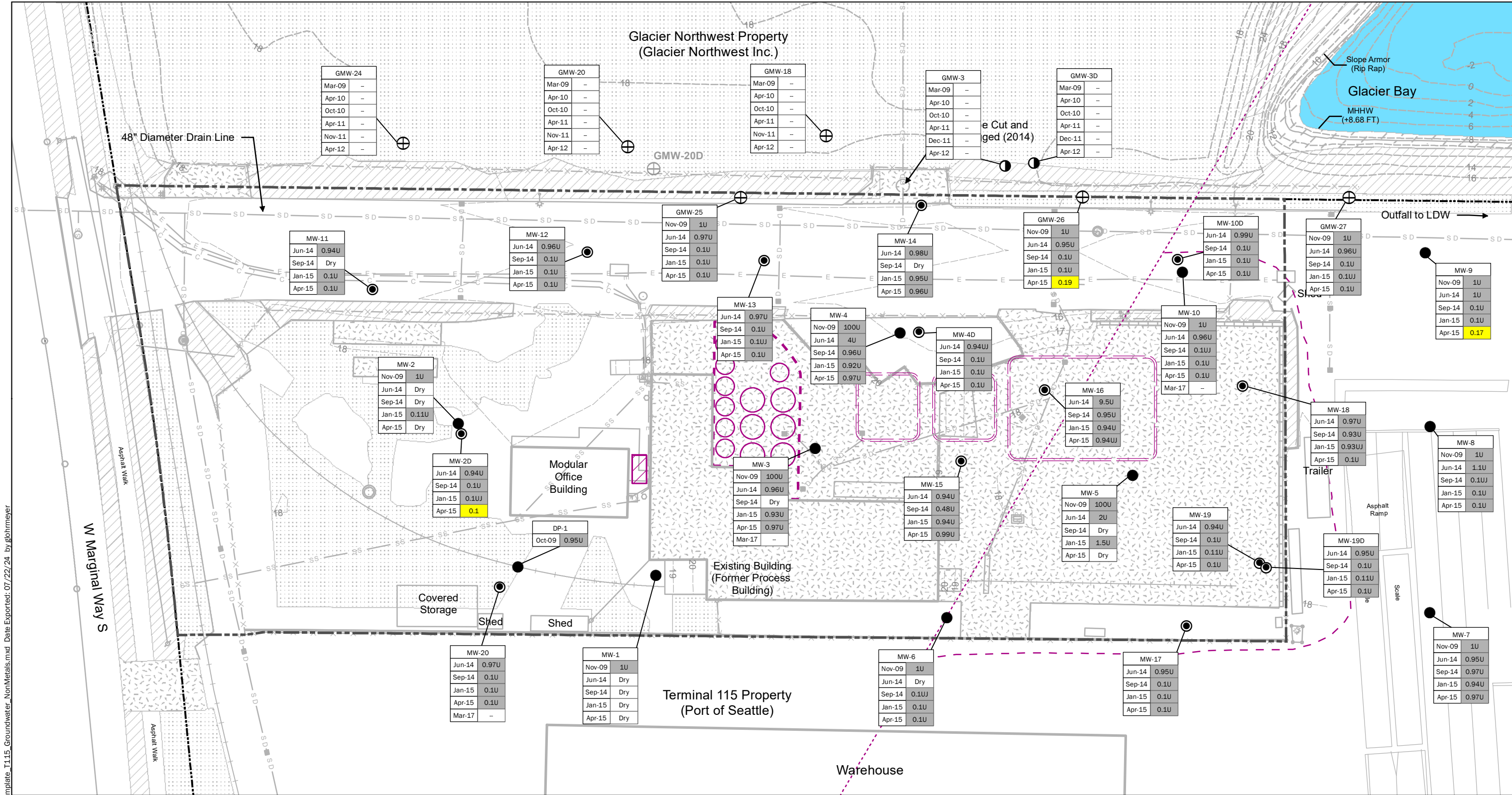


**N-Nitrosodiphenylamine (as Diphenylamine)
Concentrations in Groundwater**

Port of Seattle - North Terminal 115
Seattle, Washington

GEOENGINEERS

Figure M-93



Notes:

- Ground surface is asphalt pavement unless otherwise noted.
- Mean Higher High Water (MHHW) referenced from United States Army Corps of Engineers (USACE) Duwamish Waterway tidal Datum No. 92 for the North Puget Sound Region.
- The locations of all features shown are approximate.
- This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Data Source: Base from Dowl HKM 2014 survey and Bush, Roed and Hitchings, Inc. 2008 survey.

Projection: NAD 1983 StatePlane Washington North FIPS 4601 Feet
Vertical Datum: North American Vertical Datum 1988 (NAVD88)

Legend

PCUL = 0.058
Mean Reporting Limit = 4.0
Basis for PCUL = Surface Water

Green box	Detect or Non-Detect Result Less than the PCUL
Yellow box	Detected Concentration Greater Than The PCUL
Grey box	Non-Detect Result Greater Than The PCUL

PCUL - Preliminary Cleanup Level
µg/L -
-- - Not Analyzed
U - Not Detected Greater Than the Reporting Limit
J - Estimated Concentration
TEQ - Toxicity Equivalency Quotient
ND - Non-Detect
RL - Reporting Limit

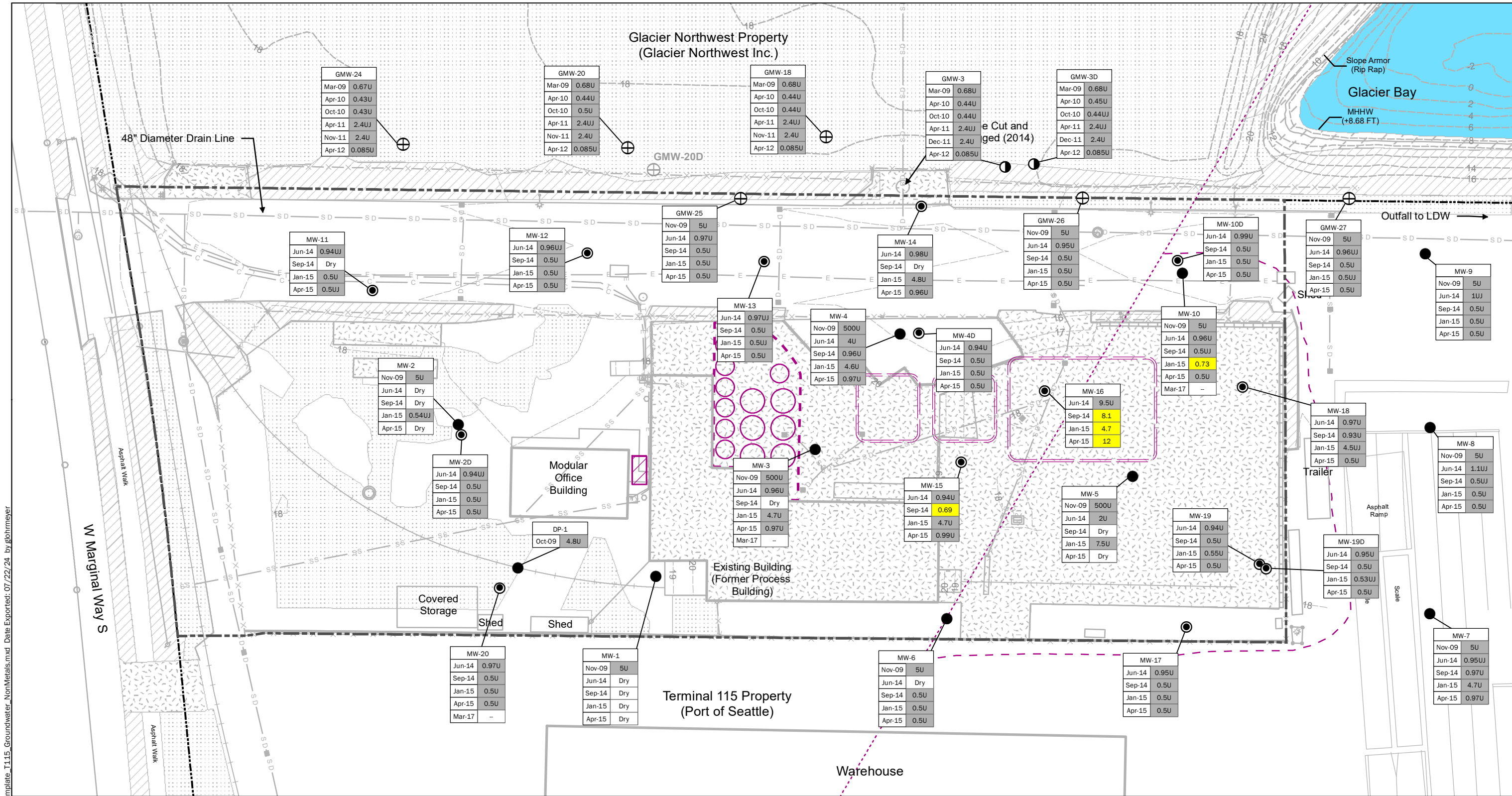
N-Nitrosodi-n-Propylamine Concentrations in Groundwater

Port of Seattle - North Terminal 115
Seattle, Washington

GEOENGINEERS

Figure M-94

P:\0303112\GIS\MXD\030311200_Base_Template_T115_Groundwater_NonMetals.mxd Date Exported: 07/22/24 by glohnmeyer



Notes:

1. Ground surface is asphalt pavement unless otherwise noted.
2. Mean Higher High Water (MHHW) referenced from United States Army Corps of Engineers (USACE) Duwamish Waterway tidal Datum No. 92 for the North Puget Sound Region.
3. The locations of all features shown are approximate.
4. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Data Source: Base from Dowl HKM 2014 survey and Bush, Roed and Hitchings, Inc. 2008 survey.

Projection: NAD 1983 StatePlane Washington North FIPS 4601 Feet
Vertical Datum: North American Vertical Datum 1988 (NAVD88)

Legend

PCUL = 0.002
Mean Reporting Limit = 19
Basis for PCUL = Surface Water

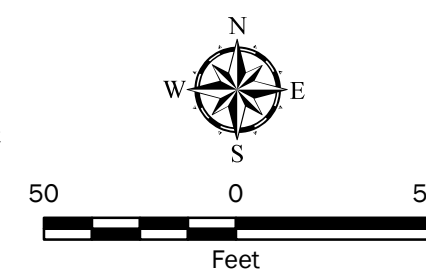
Color	Description
Green	Detect or Non-Detect Result Less than the PCUL
Yellow	Detected Concentration Greater Than The PCUL
Grey	Non-Detect Result Greater Than The PCUL

DP-1

Location ID	Concentration µg/L
Oct-09	5.1

Monitoring Event (Date)

PCUL - Preliminary Cleanup Level
µg/L - Micrograms Per Liter
-- - Not Analyzed
U - Not Detected Greater Than the Reporting Limit
J - Estimated Concentration
TEQ - Toxicity Equivalency Quotient
ND - Non-Detect
RL - Reporting Limit

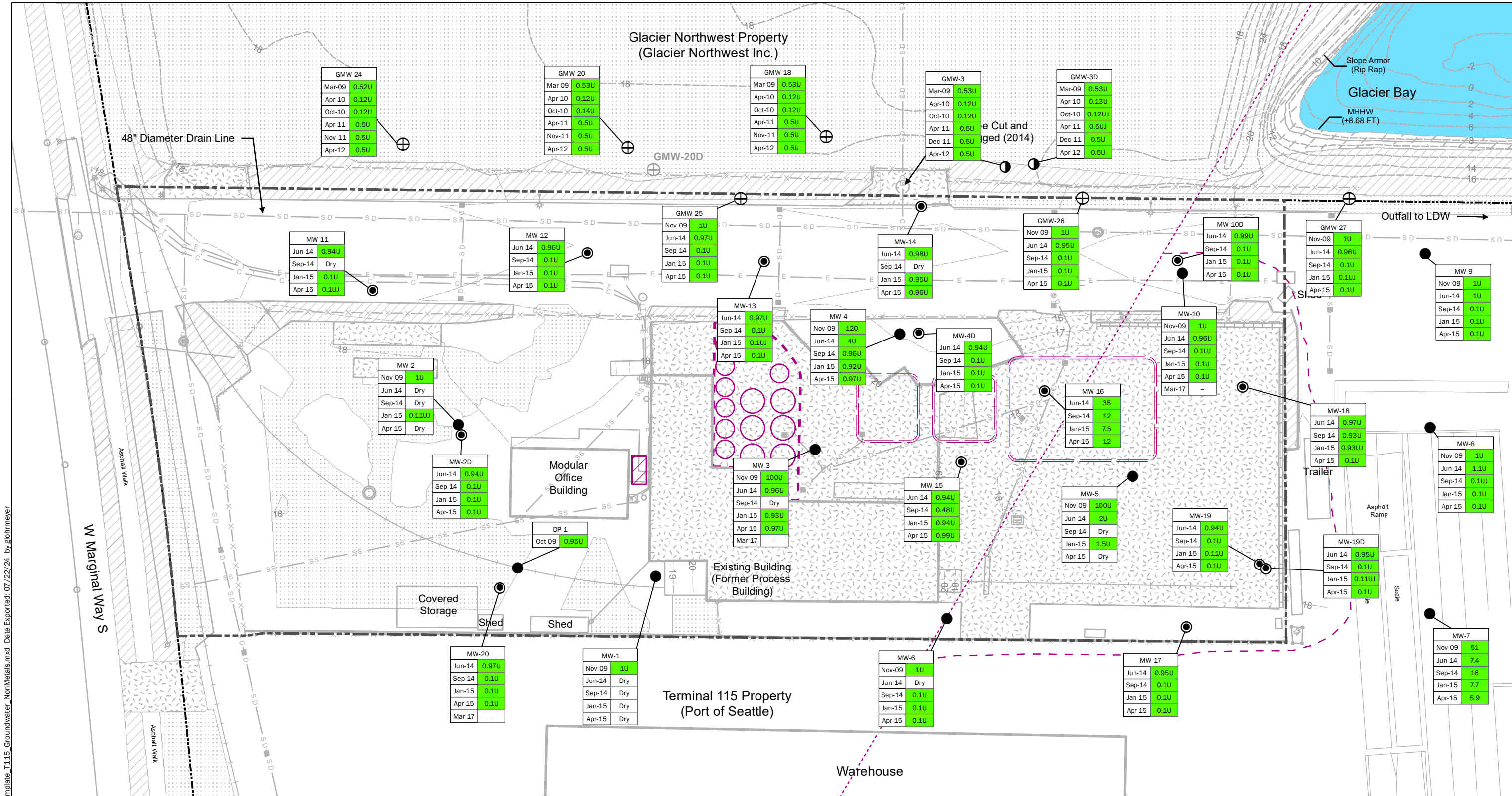


Pentachlorophenol Concentrations in Groundwater

Port of Seattle - North Terminal 115
Seattle, Washington

GEOENGINEERS

Figure M-95



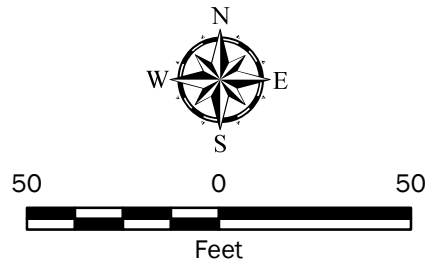
Notes:

1. Ground surface is asphalt pavement unless otherwise noted.
 2. Mean Higher High Water (MHHW) referenced from United States Army Corps of Engineers (USACE) Duwamish Waterway tidal Datum No. 92 for the North Puget Sound Region.
 3. The locations of all features shown are approximate.
 4. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.
- Data Source: Base from Dowl HKM 2014 survey and Bush, Roed and Hitchings, Inc. 2008 survey.
- Projection: NAD 1983 StatePlane Washington North FIPS 4601 Feet
Vertical Datum: North American Vertical Datum 1988 (NAVD88)

Legend

- PCUL = 370
Mean Reporting Limit = 3.2
Basis for PCUL = Sediment
- Detect or Non-Detect Result Less than the PCUL
 - Detect or Non-Detect Result Greater Than The PCUL
 - Non-Detect Result Greater Than The PCUL

- PCUL - Preliminary Cleanup Level
µg/L - Micrograms Per Liter
-- - Not Analyzed
U - Not Detected Greater Than the Reporting Limit
J - Estimated Concentration
TEQ - Toxicity Equivalency Quotient
ND - Non-Detect
RL - Reporting Limit

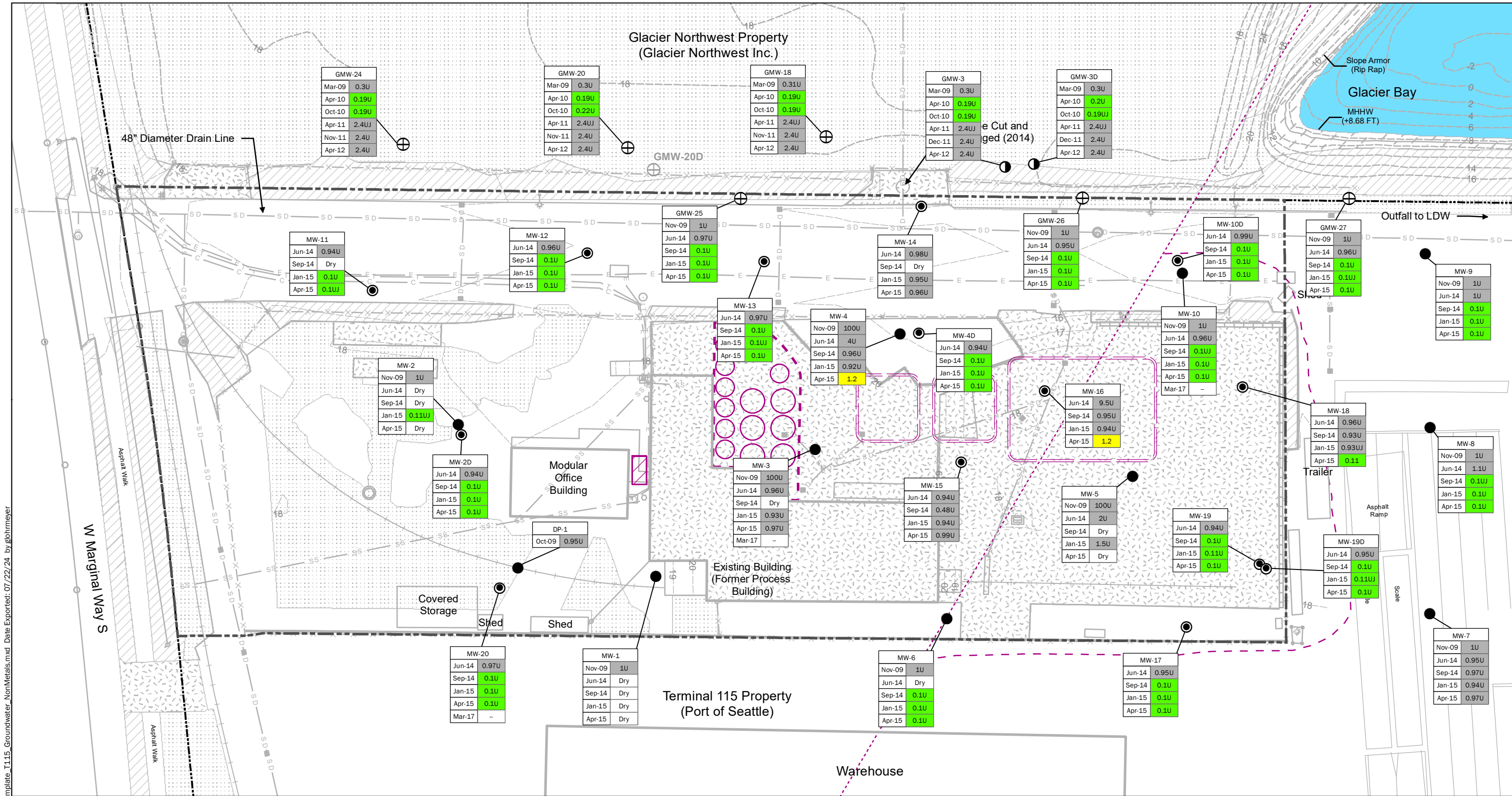


Phenol
Concentrations in Groundwater

Port of Seattle - North Terminal 115
Seattle, Washington



Figure M-96



Notes:

1. Ground surface is asphalt pavement unless otherwise noted.
2. Mean Higher High Water (MHHW) referenced from United States Army Corps of Engineers (USACE) Duwamish Waterway tidal Datum No. 92 for the North Puget Sound Region.
3. The locations of all features shown are approximate.
4. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Data Source: Base from Dowl HKM 2014 survey and Bush, Roed and Hitchings, Inc. 2008 survey.

Projection: NAD 1983 StatePlane Washington North FIPS 4601 Feet
Vertical Datum: North American Vertical Datum 1988 (NAVD88)

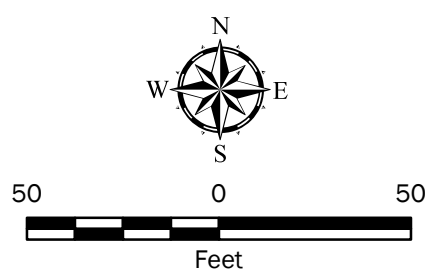
Legend

PCUL = 0.28
Mean Reporting Limit = 4.0
Basis for PCUL = Surface Water

Color	Description
Green	Detect or Non-Detect Result Less than the PCUL
Yellow	Detected Concentration Greater Than The PCUL
Grey	Non-Detect Result Greater Than The PCUL

DP-1 Location ID: Oct-09 5.1
Monitoring Event (Date)

PCUL - Preliminary Cleanup Level
µg/L - Micrograms Per Liter
-- - Not Analyzed
U - Not Detected Greater Than the Reporting Limit
J - Estimated Concentration
TEQ - Toxicity Equivalency Quotient
ND - Non-Detect
RL - Reporting Limit

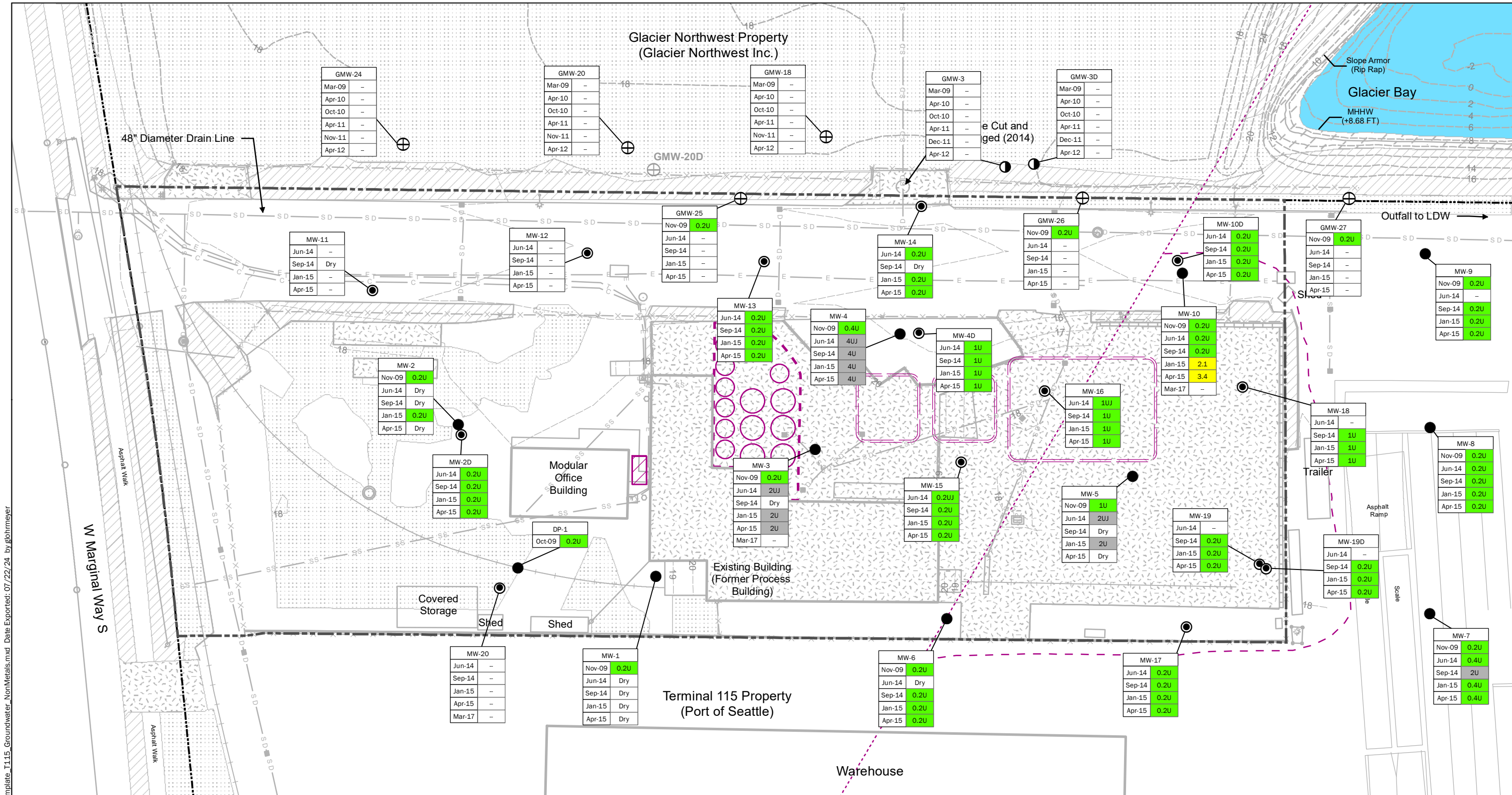


2,4,6-Trichlorophenol Concentrations in Groundwater

Port of Seattle - North Terminal 115
Seattle, Washington

GEOENGINEERS

Figure M-97



Notes:

- Ground surface is asphalt pavement unless otherwise noted.
- Mean Higher High Water (MHHW) referenced from United States Army Corps of Engineers (USACE) Duwamish Waterway tidal Datum No. 92 for the North Puget Sound Region.
- The locations of all features shown are approximate.
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Data Source: Base from Dowl HKM 2014 survey and Bush, Roed and Hitchings, Inc. 2008 survey.

Projection: NAD 1983 StatePlane Washington North FIPS 4601 Feet
Vertical Datum: North American Vertical Datum 1988 (NAVD88)

Legend

PCUL = 1.2
Mean Reporting Limit = 0.67
Basis for PCUL = Indoor Air

Green	Detect or Non-Detect Result Less than the PCUL
Yellow	Detected Concentration Greater Than The PCUL
Grey	Non-Detect Result Greater Than The PCUL

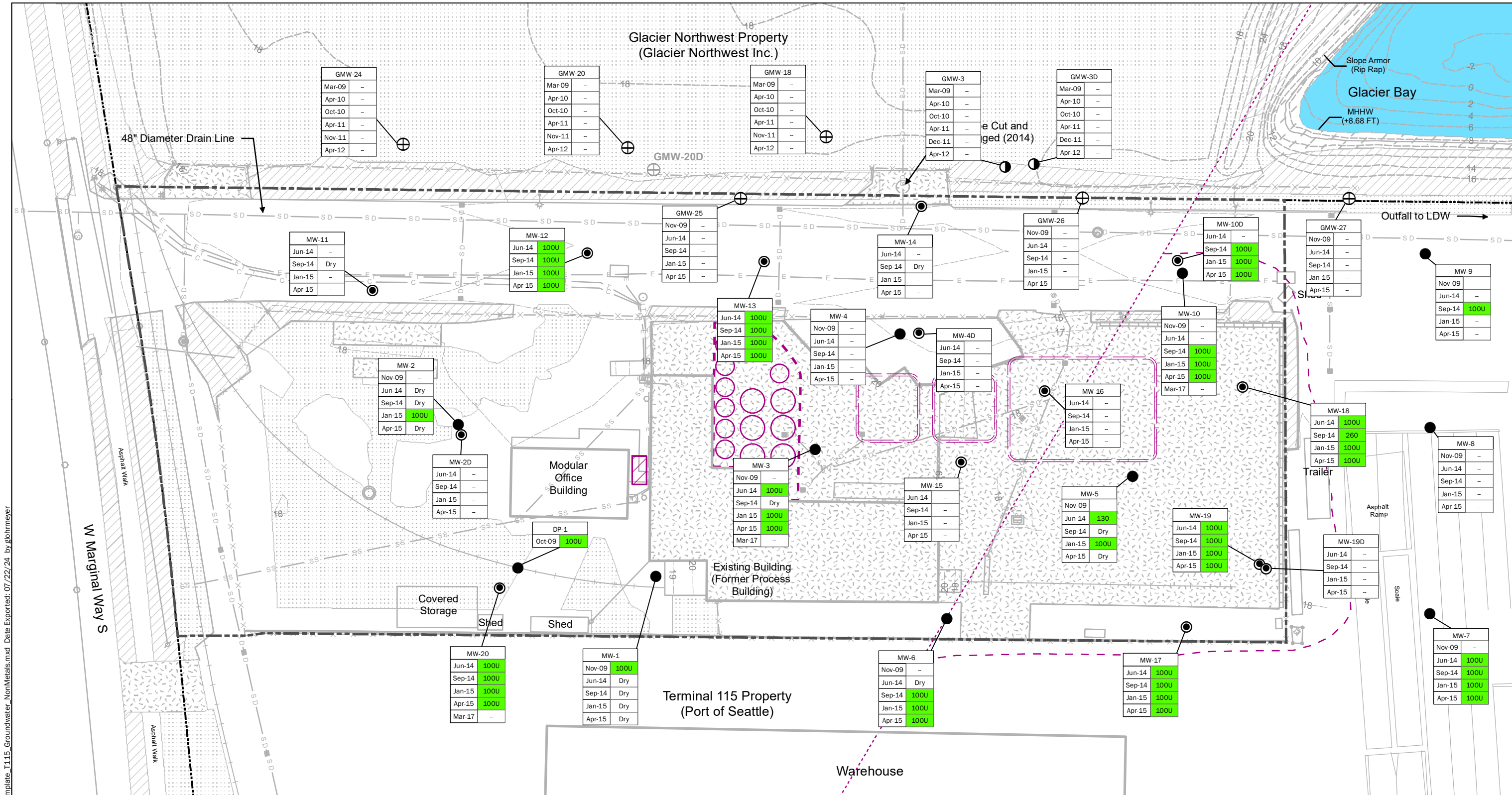
PCUL - Preliminary Cleanup Level
µg/L - Micrograms Per Liter
- - - Not Analyzed
U - Not Detected Greater Than the Reporting Limit
J - Estimated Concentration
TEQ - Toxicity Equivalency Quotient
ND - Non-Detect
RL - Reporting Limit

Chloroform Concentrations in Groundwater

Port of Seattle - North Terminal 115
Seattle, Washington

GEOENGINEERS

Figure M-99



Notes:

- Ground surface is asphalt pavement unless otherwise noted.
- Mean Higher High Water (MHHW) referenced from United States Army Corps of Engineers (USACE) Duwamish Waterway tidal Datum No. 92 for the North Puget Sound Region.
- The locations of all features shown are approximate.
- This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Data Source: Base from Dowl HKM 2014 survey and Bush, Roed and Hitchings, Inc. 2008 survey.

Projection: NAD 1983 StatePlane Washington North FIPS 4601 Feet
Vertical Datum: North American Vertical Datum 1988 (NAVD88)

Legend

PCUL = 800
Mean Reporting Limit = 100
Basis for PCUL = Drinking Water

Green box	Detect or Non-Detect Result Less than the PCUL
Yellow box	Detected Concentration Greater Than The PCUL
Grey box	Non-Detect Result Greater Than The PCUL

PCUL - Preliminary Cleanup Level
µg/L - Micrograms Per Liter
-- - Not Analyzed
U - Not Detected Greater Than the Reporting Limit
J - Estimated Concentration
TEQ - Toxicity Equivalency Quotient
ND - Non-Detect
RL - Reporting Limit

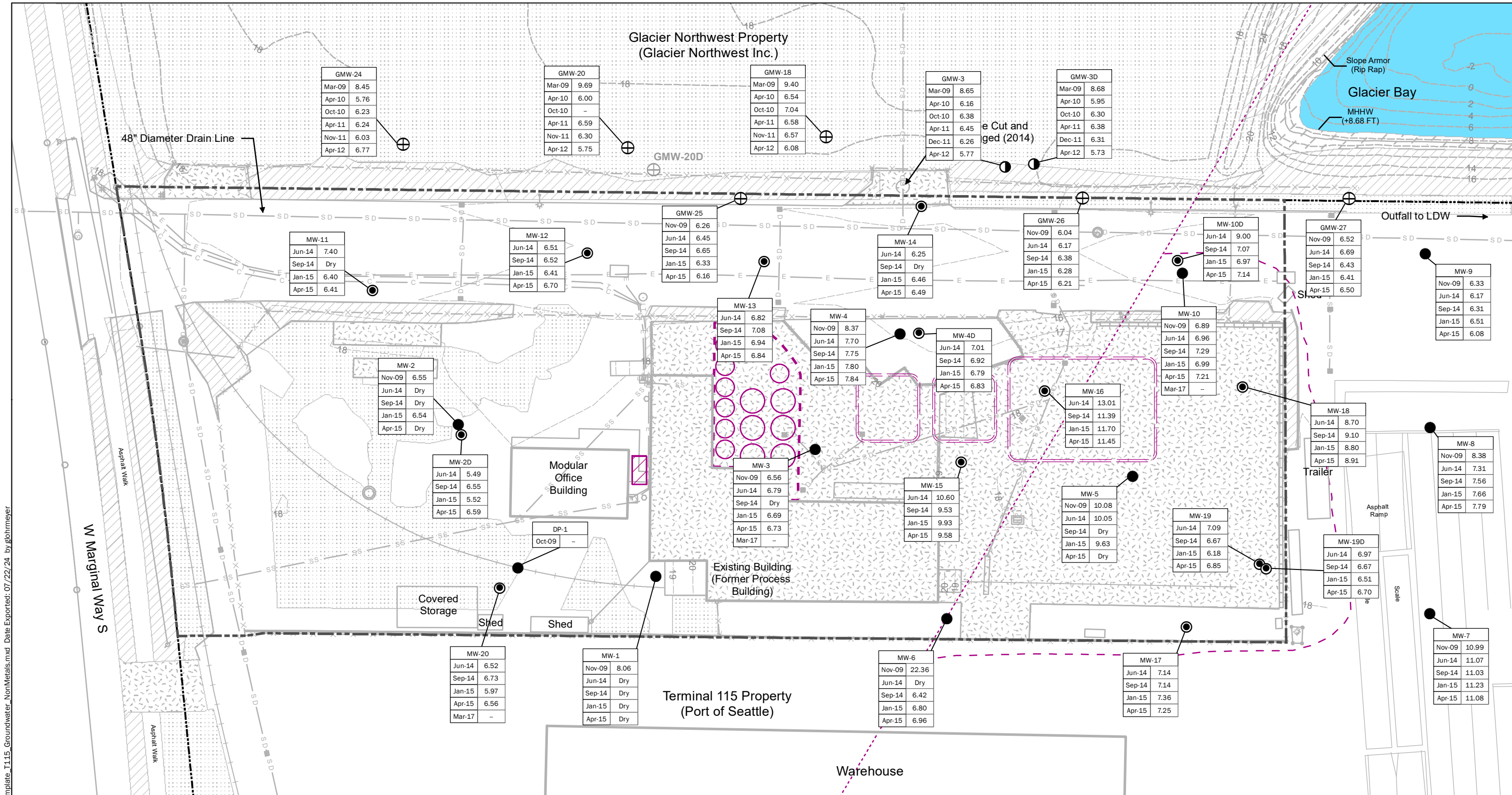
Gasoline-Range Hydrocarbon Concentrations in Groundwater

Port of Seattle - North Terminal 115
Seattle, Washington

GEOENGINEERS

Figure M-100

P:\0303112\GIS\MXD\030311200_Base_Template_T115_Groundwater_NonMetals.mxd Date Exported: 07/22/24 by glohmeyer



Notes:

- Ground surface is asphalt pavement unless otherwise noted.
 - Mean Higher High Water (MHHW) referenced from United States Army Corps of Engineers (USACE) Duwamish Waterway tidal Datum No. 92 for the North Puget Sound Region.
 - The locations of all features shown are approximate.
 - This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.
- Data Source: Base from Dowl HKM 2014 survey and Bush, Roed and Hitchings, Inc. 2008 survey.
- Projection: NAD 1983 StatePlane Washington North FIPS 4601 Feet
Vertical Datum: North American Vertical Datum 1988 (NAVD88)

DP-1		Location ID
Oct-09	5.1	Concentration
		Monitoring Event (Date)

Legend

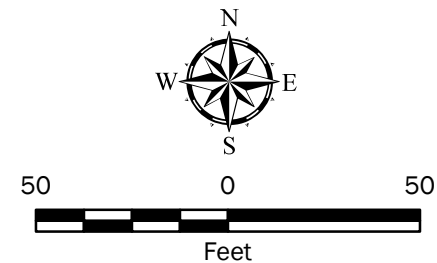
PCUL = NA
Mean Reporting Limit = NA
Basis for PCUL = N/A

Detect or Non-Detect Result Less than the PCUL

Detect or Non-Detect Result Greater Than The PCUL

Non-Detect Result Greater Than The PCUL

PCUL - Preliminary Cleanup Level
-- Not Analyzed
- - Not Analyzed
U - Not Detected Greater Than the Reporting Limit
J - Estimated Concentration
TEQ - Toxicity Equivalency Quotient
ND - Non-Detect
RL - Reporting Limit



pH
Concentrations in Groundwater

Port of Seattle - North Terminal 115
Seattle, Washington

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Figure M-102

Appendix N

Glacier NW Site Isoconcentration Figures