DEPARTMENT OF ECOLOGY
State of Washington

Lower Duwamish Waterway
RM 0.0 to 1.0 West
(Spokane Street to Kellogg Island)

Source Control Action Plan

February 2013

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Lower Duwamish Waterway
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(Spokane Street to Kellogg Island)

Source Control Action Plan

Produced by

Toxics Cleanup Program
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Washington State Department of Ecology
Bellevue, Washington

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City of Seattle
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Table of Contents

Tables and Figures

Tables

Figures

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Executive Summary

The purpose of this Source Control Action Plan (SCAP) is to describe potential sources of contaminants to sediments along the Lower Duwamish Waterway (LDW) River Mile (RM) 0.0 to 1.0 West, and to identify actions necessary to minimize recontamination of sediment after cleanup. This SCAP is based on a thorough review of information pertinent to sediment recontamination, as documented in *Lower Duwamish Waterway, RM 0.0 to 1.0 West (Spokane Street to Kellogg Island), Summary of Existing Information and Identification of Data Gaps* (SAIC 2012).

The LDW, located in Seattle, Washington, was added to the National Priorities List by the U.S. Environmental Protection Agency (EPA) on September 13, 2001. Chemicals of concern (COCs) found in waterway sediments include polychlorinated biphenyls (PCBs), polycyclic aromatic hydrocarbons (PAHs), dioxins/furans, arsenic and other metals, and phthalates. These COCs may pose threats to people, fish, and wildlife.

In December 2000, EPA and the Washington State Department of Ecology (Ecology) entered into an order with King County, the Port of Seattle, the City of Seattle, and The Boeing Company to perform a Remedial Investigation (RI) and Feasibility Study (FS) of sediment contamination in the waterway. EPA is the lead agency for the RI/FS. Ecology is the lead agency for controlling current sources of pollution to the site, in cooperation with the City of Seattle, King County, the Port of Seattle, the City of Tukwila, and EPA.

Phase 1 of the RI/FS (Windward 2003b) used existing data to identify potential human health and ecological risks, information needs, and high priority areas for cleanup. Seven candidate early action areas were identified (Windward 2003a). Ecology's *Lower Duwamish Waterway Source Control Status Report, 2003 to June 2007* (Ecology 2007d) and *Lower Duwamish Waterway Source Control Status Report, July 2007 to March 2008* (Ecology 2008a) identified another 16 areas where source control actions may be necessary. The Spokane Street to Kellogg Island source control area was identified as one of these areas. One additional source control area was added by Ecology in 2010, for a total of 24 source control areas.

As part of source control efforts in the LDW, Ecology works with other members of the Source Control Work Group (SCWG) to develop SCAPs for areas of sediment contamination that will or may require cleanup. The SCAP for each of these sediment areas describes potential sources of sediment contaminants and the actions needed to control them, and evaluates whether ongoing sources are present that could recontaminate sediments after cleanup. In addition, the SCAPs describe source control actions that are planned or currently underway, and sampling and monitoring activities that will be conducted to identify additional sources.

Sections 1 and 2 of this SCAP provide background information about the LDW site and the sediments near the Spokane Street to Kellogg Island source control area. Lead; mercury; zinc; PCBs; PAHs, phthalates, and other semivolatile organic compounds (SVOCs); and dioxins/furans are considered to be the major COCs in sediments near the source control area. While this SCAP focuses on these COCs, other chemicals that could result in sediment recontamination will be addressed as sources are identified.

Section 3 contains the following: a description of potential sources of contamination that may affect sediments near the Spokane Street to Kellogg Island source control area, including outfalls, spills to the waterway, and releases from adjacent properties or upland properties within the SW Dakota Street and SW Idaho Street storm drain (SD) basins and the Duwamish West combined sewer overflow (CSO) basin; an evaluation of the significance of these potential sources; and a listing of the actions that are planned or underway to control potential contaminant sources. Section 4 discusses monitoring activities that will be conducted to identify additional sources and assess progress, and Section 5 describes how source control efforts will be tracked and reported. Section 6 lists documents reviewed during preparation of this SCAP.

Table ES-1 lists the source control actions that have been identified for the Spokane Street to Kellogg Island source control area. This table includes a brief description of the potential contaminant sources for each property, source control activities to be conducted, parties involved in source control actions for each property or task, and milestone/target dates for completion of the identified action items. The milestones and targets are best-case scenarios based on consultation with the identified agencies or facilities. They reflect reasonably achievable schedules, and include the time required for planning, contracting, field work, laboratory analysis, and activities dependent on weather.

A removal action for sediment near the Spokane Street to Kellogg Island source control area was not scheduled at the time this SCAP was prepared.

Table ES-1. Source Control Actions – Spokane Street to Kellogg Island Source Control Area

Potential Sources	Action Items	Priority	Responsible Party(ies)	Status	Target Date
SW Dakota Street SD Outfalls (Outfalls 2148, 2149, 2150, and 2233)					
Concentrations of zinc, chrysene, BEHP, butyl benzyl phthalate, benzoic acid, benzyl alcohol, and PCBs exceed screening levels in LDW sediments near the SW Dakota Street SD Outfalls and in storm drain solids samples collected from the SW Dakota Street SD system.	Continue source tracing to identify potential sources of the sediment COCs reported above screening levels in storm drain structures in the SW Dakota Street SD basin.	Medium	SPU, Ecology	In Progress	TBD
SW Idaho Street SD Outfall (Outfall 2147)					
Concentrations of zinc, PAHs, BEHP, butyl benzyl phthalate, 4-methylphenol, benzoic acid, benzyl alcohol, hexachlorobenzene, and PCBs exceed screening levels in LDW sediments near the SW Dakota Street SD outfalls and in storm drain solids samples collected from the SW Dakota Street SD system.	Continue source tracing to identify potential sources of the sediment COCs reported above screening levels in storm drain structures in the SW Idaho Street SD basin.	Medium	SPU, Ecology	In Progress	TBD
Duwamish West CSO/Siphon West CSO					
Concentrations of arsenic, lead, mercury, zinc, PAHs, BEHP, butyl benzyl phthalate, 4-methylphenol, benzyl alcohol, phenol, and PCBs have been detected in in-pipe water samples.	Continue to perform facility inspections within the CSO basin as part of ongoing source control efforts. Document source control actions that are identified as a result of these inspections, if any, in future Source Control Status Reports.	Low	KCIW, Ecology	In Progress	TBD
Outfalls 2140, 2141, 2142, 2142, 2144, 2145, 2146					
Little information was available to determine whether these outfalls are abandoned or active. Active outfalls with undocumented drainage have the potential to transport contaminants present in stormwater (if any) to LDW sediments near the Spokane Street to Kellogg Island source control area.	Conduct an inspection during a storm event to determine if Outfalls 2140 through 2146 are operational or have been abandoned. If discharge from these outfalls is observed, request that the property owners conduct dye testing to determine if storm drain lines are connected to the unresolved outfalls and delineate the associated drainage areas.	Medium	SPU, Ecology	Planned	TBD

Table ES-1. Source Control Actions – Spokane Street to Kellogg Island Source Control Area

Potential Sources	Action Items	Priority	Responsible Party(ies)	Status	Target Date
Riverside Mill LLC Property (3800 West Marginal Way SW 98106)					
Stormwater and surface runoff are discharged to the LDW and over-water activities are performed by tenants at the property. Information submitted to Ecology in August 1999 indicates that soil contaminated with PCBs and lead was excavated and removed from the property; however, the extent of contaminated soil is unknown. Groundwater has not been evaluated for PCBs or lead.	Perform an initial inspection at the facility to verify compliance with applicable regulations and source control BMPs.	Medium	SPU	Planned	TBD
	Request information from the property owner regarding the 1999 excavation and removal of soil contaminated with PCBs and lead, to evaluate the potential for sediment recontamination via the groundwater discharge pathway.	Medium	Ecology	Planned	TBD
BNSF Railroad Right-of-Way					
Stormwater enters a drainage ditch on the property, which appears to discharge to the LDW. If a spill occurs at the property, contaminants may infiltrate the ground surface. During a storm, contaminants may be entrained in stormwater, rather than infiltrate the ground surface. Exposed soil is present to the south of the railroad trestle. Given the industrial history of the area, contaminants may be present in soil.	Determine whether the drainage ditch discharges to the LDW and will identify if stormwater runoff is conveyed to the drainage ditch from Riverside Mill or other nearby facilities/properties.	Medium	SPU, Ecology	Planned	TBD
Port of Seattle Terminal 103 (3840 West Marginal Way SW 98106)					
Industrial activities at the property may represent a potential source of contaminants to stormwater. Property tenants (General Construction and CalPortland) perform over-water activities.	Perform a facility inspection at General Construction to verify compliance with applicable regulations and source control BMPs.	Low	SPU	Planned	TBD
	Perform a facility inspection at CalPortland to verify compliance with applicable regulations and source control BMPs.	Low	SPU	Planned	TBD

Table ES-1. Source Control Actions – Spokane Street to Kellogg Island Source Control Area

Potential Sources	Action Items	Priority	Responsible Party(ies)	Status	Target Date
Global Diving & Salvage (3840 West Marginal Way SW 98106)					
Global Diving & Salvage stores some petroleum products and solvents outdoors. These materials have the potential to come into contact with stormwater.	Request that Global Diving & Salvage provide information to determine if catch basins at the facility are plumbed to the storm drain system at Terminal 103 or the SW Dakota Street SD system.	Low	Ecology	Planned	TBD
	Perform a facility inspection to verify compliance with applicable regulations and source control BMPs.	Low	SPU	Planned	TBD
Port of Seattle Terminal 105 (4014 West Marginal Way SW 98106)					
Previous environmental investigations have confirmed the presence of PCBs, PAHs, metals, pentachlorophenol, benzene, and heavy oil-range petroleum hydrocarbons in soil. Metals, BEHP, and pesticides were detected in groundwater. Bank soil samples collected in 2011 confirmed the presence of arsenic, mercury, PAHs, PCBs, and dioxins/furans. Mercury in seep water at the park (Seep 71) exceeded the Marine Chronic WQS and mercury in sediment offshore of the park has exceeded the SQS.	Determine if the Liquid Disposal Corporation USTs have been removed from the Terminal 105 Park.	Medium	Port of Seattle	Planned	TBD
	Request that the Port of Seattle and Ferguson Enterprises provide information to determine if PCB-bearing dredge spoils were removed from parcel 3530 prior to the construction of the warehouse over the disposal area.	Medium	Ecology	Planned	TBD
	Assess the need for an environmental investigation at the Terminal 105 Park to characterize the nature and extent of soil and groundwater contaminated by PCBs, PAHs, and metals in order to determine the potential for sediment recontamination associated with bank erosion/leaching and groundwater discharge.	Medium	Ecology	Planned	TBD
Encore Oils (former Pacific Rendering) (4034 West Marginal Way SW 98106)					
Stormwater from this facility is conveyed to the stream on the Terminal 105 Park, which is connected to the LDW. In May and July 2012, SPU identified corrective actions for Encore Oils to improve housekeeping and maintenance of the storm drain system at the facility in order to meet the minimum requirements for source control.	Assess the need for additional environmental investigations and/or cleanup of contaminated soil at this property.	Medium	Ecology	Planned	TBD
	Perform a follow-up inspection to determine if Encore Oils has implemented the corrective actions identified during the inspections performed in May and July 2012.	Low	SPU	Planned	TBD

Table ES-1. Source Control Actions – Spokane Street to Kellogg Island Source Control Area

Potential Sources	Action Items	Priority	Responsible Party(ies)	Status	Target Date
Spills that occur on the property may be conveyed to the LDW. Materials used at Encore Oils may be harmful to the river environment but may not contain sediment COCs. Previous environmental investigations have confirmed the presence of PCBs, PAHs, metals, and heavy oil-range petroleum hydrocarbons in soil.	Determine if Encore Oils is required to obtain coverage under the ISGP or is eligible for a CNE certificate.	Low	Ecology	Planned	TBD
Ferguson Enterprises Inc. (4100 West Marginal Way SW 98106)					
Previous environmental investigations have confirmed the presence of PCBs, PAHs, metals, and pentachlorophenol in soil. Metals, BEHP, phthalates, and pesticides were detected in groundwater.	Request that the Port of Seattle and Ferguson Enterprises provide information to determine if PCB-bearing dredge spoils were removed from parcel 3530 prior to the construction of the warehouse over the disposal area.	Medium	Ecology	Planned	TBD
	Assess the need for additional environmental investigations and/or cleanup of contaminated soil and groundwater at this property.	Medium	Ecology	Planned	TBD
General Recycling of Washington (4200 West Marginal Way SW 98106)					
General Recycling is currently working to complete Level 2 corrective actions to address stormwater quality problems at the facility. The company will upgrade its stormwater treatment system to include chemical treatment during fall 2012.	Request that General Recycling update the facility SWPPP to include the chemical treatment upgrades to the stormwater treatment system. General Recycling will be required to provide the updated SWPPP to Ecology.	Medium	Ecology	Planned	TBD
Previous environmental investigations have confirmed the presence of PCBs, PAHs, and metals in soil. Arsenic, zinc, phthalates, PAHs, and PCBs were detected in groundwater.	Assess the need for additional environmental investigations and/or cleanup of contaminated soil and groundwater at this property.	Medium	Ecology	Planned	TBD

Table ES-1. Source Control Actions – Spokane Street to Kellogg Island Source Control Area

Potential Sources	Action Items	Priority	Responsible Party(ies)	Status	Target Date
Former Seaboard Lumber Property					
Spills at the Evergreen Trails property may be conveyed to the intertidal bay at Herring's House Park via the storm drain system. Previous environmental investigations have confirmed the presence of PAHs, pentachlorophenol and other SVOCs, metals, and petroleum hydrocarbons in soil at Evergreen Trails. Stormwater at Herring's House Park infiltrates the ground surface. Contaminants in stormwater, if any, may be conveyed to groundwater and released to the LDW. PAHs, arsenic, lead, mercury, pentachlorophenol, and diesel-range hydrocarbons are present in soil at Herring's House Park. Soil contaminated with PAHs, metals, and petroleum hydrocarbons were left in place at the shoreline following the intertidal restoration. Arsenic and petroleum hydrocarbons are present in groundwater.	Perform a follow-up inspection at Evergreen Trails to verify that corrective actions identified during the May 2008 inspection have been implemented and that the facility is maintaining appropriate source control BMPs.	Medium	Ecology	Planned	TBD
	Request that Evergreen Trails verify which outfall (Outfall 2140 or 2141 or other) the facility uses to discharge stormwater to the intertidal bay at Herring's House Park.	Medium	Ecology	Planned	TBD
	Assess the need for additional environmental investigations at Evergreen Trails and Herring's House Park to define the nature and extent of residual soil and groundwater contamination at the properties to determine if LDW sediment near the properties is or has the potential to become contaminated via the groundwater discharge and bank erosion pathways.	Medium	Ecology	Planned	TBD
Port of Seattle Terminal 107 (5402 West Marginal Way SW 98106)					
Potential inputs to a pipe located near the ravine on the northern portion of the Terminal 107 Park are unknown. Historical operations performed by A. Abrahamson Brick Yard, Riverside Auto Wrecking, and the metal salvage yard represent potential sources of sediment COCs. No environmental investigations have been performed to evaluate the potential impacts. Bank soil samples collected in 2011 from an area of CKD fill contained arsenic, lead, and zinc at concentrations exceeding the SQS and CSL.	Determine the potential inputs to a pipe located near the ravine in the northern portion of the Terminal 107 Park.	Medium	Port of Seattle	Planned	TBD
	Perform an environmental investigation to determine if soil and groundwater are contaminated due to the historical industrial operations and fill activities performed at Terminal 107 in order to evaluate the potential for sediment recontamination via the soil and groundwater and bank erosion/leaching pathways.	Medium	Port of Seattle	Planned	TBD

Table ES-1. Source Control Actions – Spokane Street to Kellogg Island Source Control Area

Potential Sources	Action Items	Priority	Responsible Party(ies)	Status	Target Date
Former Fraser Properties (3601 & 3801 West Marginal Way SW 98106)					
No information regarding the current operations performed by Global Diving and Rehabitat Northwest was available for review. The potential for sediment recontamination related to stormwater from these facilities is unknown. Ecology inspectors identified potentially contaminated soil at the properties in 2002. Potential contaminants in soil and groundwater include, but are not limited to, PAHs, petroleum hydrocarbons, solvents, and metals.	Perform an inspection at Global Diving & Salvage to ensure compliance with applicable regulations and source control BMPs.	Low	SPU, Ecology	Planned	TBD
	Perform an inspection at Rehabitat Northwest to ensure compliance with applicable regulations and source control BMPs.	Low	SPU, Ecology	Planned	TBD
	Assess the need for additional environmental investigations and/or cleanup of suspected soil and groundwater contamination at this property.	Low	Ecology	Planned	TBD
Former Concrete Restoration (4025 West Marginal Way SW 98106)					
The current operations performed by Global Diving & Salvage and Gary's Westside Towing have not been evaluated by SPU or Ecology for compliance with source control BMPs. Previous environmental investigations have confirmed that soil beneath the property is contaminated by metals and petroleum. Groundwater contamination is suspected at this property.	Perform business inspections at Gary's Westside Towing to verify compliance with applicable regulations and source control BMPs.	Medium	SPU, Ecology	Planned	TBD
	Perform business inspections at Global Diving & Salvage to verify compliance with applicable regulations and source control BMPs.	Medium	SPU, Ecology	Planned	TBD
	Request additional information from Brys Auto Wrecking regarding the previous environmental investigation(s) at the property to determine if LDW sediment COCs are present in soil and groundwater at concentrations indicating a potential for sediment recontamination.	Low	Ecology	Planned	TBD
	Assess the need for additional investigations and/or cleanup of suspected soil and groundwater contamination at this property.	Low	Ecology	Planned	TBD

Table ES-1. Source Control Actions – Spokane Street to Kellogg Island Source Control Area

Potential Sources	Action Items	Priority	Responsible Party(ies)	Status	Target Date
West Seattle Estates (4699 15th Avenue SW 98106)					
Stormwater at West Seattle Estates infiltrates the ground surface in some areas and collects in ditches along 16th Avenue SW in other areas. Contaminants in stormwater, if any, may be conveyed through a culvert that discharges to the LDW at SW Idaho Street or via the groundwater discharge pathway.	Request information regarding cleanup and groundwater monitoring at West Seattle Estates in order to evaluate the potential for sediment recontamination via the groundwater discharge pathway.	Low	Ecology	Planned	TBD
Cleanup activities have been performed to remediate priority pollutant metals in groundwater. Active monitoring is apparently ongoing; however, concentrations of priority pollutant metals remaining in groundwater, if any, are unknown. Groundwater is likely to flow to the south towards Puget Creek. Puget Creek discharges to the LDW at SW Idaho Street.	Assess the need for additional investigations and/or cleanup of soil and groundwater contamination at this property.	Low	Ecology	Planned	TBD
Puget Park (4767 16th Avenue SW 98106) and the McFarland Property (4818 15th Avenue SW 98106)					
Soil and groundwater beneath the property are contaminated with metals and creek sediment is contaminated with dioxins/furans. The lateral and vertical extents of contamination have not been determined. Groundwater discharges to Puget Creek, which enters the LDW near SW Idaho Street. Lead and arsenic concentrations have not exceeded sediment screening levels in sediment samples collected near Outfall 2147; however, the dioxin/furan TEQ in LDW sediment has exceeded the LDW background level.	Request information from Seattle Parks to determine if the leachate collection trench was installed downgradient of the Puget Park Lobe.	Low	Ecology	Planned	TBD
	Assess the need for additional investigations and/or cleanup of soil and groundwater contamination at this property.	Low	Ecology	Planned	TBD

Priority:

High priority action item – to be completed prior to sediment cleanup
Medium priority action item – to be completed prior to or concurrent with sediment cleanup
Low priority action item – ongoing actions or actions to be completed as resources become available

Acronyms/Abbreviations

BEHP	bis(2-ethylhexyl)phthalate
BMP	best management practice
BTEX	benzene, toluene, ethylbenzene, and xylenes
CNE	Certificate of No Exposure
COC	chemical of concern
ISGP	Industrial Stormwater General Permit
LDW	Lower Duwamish Waterway
MTCA	Model Toxics Control Act
PAH	polycyclic aromatic hydrocarbon
PCB	polychlorinated biphenyl
SD	storm drain
SPU	Seattle Public Utilities
SVOC	semivolatile organic compound
SWPPP	Stormwater Pollution Prevention Plan
TBD	to be determined
USACE	U.S. Army Corps of Engineers
USEPA	U.S. Environmental Protection Agency

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Acronyms/Abbreviations

µg/L	micrograms per liter
2LAET	second lowest apparent effects threshold
AET	apparent effects threshold
APL	American President Lines
AST	aboveground storage tank
BEHP	bis(2-ethylhexyl)phthalate
bgs	below ground surface
BMP	best management practice
BNSF	Burlington Northern Santa Fe
BTEX	benzene, toluene, ethylbenzene, and xylenes
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CKD	cement kiln dust
CNE	Certificate of No Exposure
COC	chemical of concern
cPAH	carcinogenic polycyclic aromatic hydrocarbon
CPE	chlorinated polyethylene
CSCSL	Confirmed and Suspected Contaminated Sites List
CSL	Cleanup Screening Level
CSO	combined sewer overflow
DMR	Discharge Monitoring Report
DW	dry weight
EAA	Early Action Area
Ecology	Washington State Department of Ecology
EOF	emergency overflow
EPA	United States Environmental Protection Agency
ESA	Environmental Site Assessment
FS	Feasibility Study
HPAH	high molecular weight polycyclic aromatic hydrocarbon
HWTR	Hazardous Waste and Toxics Reduction
ID	identification
ISGP	Industrial Stormwater General Permit
ISIS	Integrated Site Information System
KCIW	King County Industrial Waste
LAET	lowest apparent effects threshold
LDW	Lower Duwamish Waterway
LDWG	Lower Duwamish Waterway Group
LPAH	low molecular weight polycyclic aromatic hydrocarbon
LUST	leaking underground storage tank
mg/kg	milligrams per kilogram
mg/L	milligrams per liter
MTCA	Model Toxics Control Act
NFA	No Further Action
ng/kg	nanograms per kilogram
NOAA	National Oceanic and Atmospheric Administration
NOV	Notice of Violation

Acronyms/Abbreviations (continued)

NPDES	National Pollutant Discharge Elimination System
OC	organic carbon
PAH	polycyclic aromatic hydrocarbon
PBT	persistent bioaccumulative toxin
PCB	polychlorinated biphenyl
PSAPCA	Puget Sound Air Pollution Control Agency
PSCAA	Puget Sound Clean Air Agency
PVC	polyvinyl chloride
RCRA	Resource Conservation and Recovery Act
RI	Remedial Investigation
RM	river mile
ROD	Record of Decision
SAIC	Science Applications International Corporation
SCAP	Source Control Action Plan
SCWG	Source Control Work Group
SD	storm drain
SKCDPH	Seattle/King County Department of Public Health
SMS	Sediment Management Standards
SPU	Seattle Public Utilities
sq ft	square foot or feet
SQG	small quantity hazardous waste generator
SQS	Sediment Quality Standard
SVOC	semivolatile organic compound
SWPPP	Stormwater Pollution Prevention Plan
TBD	to be determined
TBT	tributyltin
TEQ	toxic equivalency
TOC	total organic carbon
TPH	total petroleum hydrocarbons
USACE	United States Army Corps of Engineers
USEPA	United States Environmental Protection Agency
UST	underground storage tank
VCP	Voluntary Cleanup Program
VOC	volatile organic compound
WAC	Washington Administrative Code
WET	whole effluent toxicity
WQS	water quality standards

1.0 Introduction

This Source Control Action Plan (SCAP) describes potential sources of contamination that may affect sediments in and adjacent to the River Mile (RM) 0.0 to 1.0 West[1] (Spokane Street to Kellogg Island) source control area of the Lower Duwamish Waterway (LDW). The purpose of this plan is to evaluate the significance of these sources and to determine if actions are needed to minimize the potential for recontamination of sediment near the Spokane Street to Kellogg Island source control area after cleanup. In addition, this SCAP describes:

- Source control actions/programs that are planned or currently underway,
- Sampling and monitoring activities that will be conducted to identify additional sources and assess progress, and
- How these source control efforts will be tracked and reported.

The information in this document was obtained from a variety of sources, including the following documents[2]:

- *Lower Duwamish Waterway, RM 0.0 to 1.0 West (Spokane Street to Kellogg Island) – Summary of Existing Information and Identification of Data Gaps* (Data Gaps Report), Science Applications International Corporation (SAIC), September 2012, located on Ecology's website: http://www.ecy.wa.gov/programs/tcp/sites_brochure/lower_duwamish/sites/RM_00-10_W_SpoSt/RM_00_10W_SpokaneSt.html
- *Lower Duwamish Waterway Source Control Strategy*, Washington State Department of Ecology (Ecology), January 2004, located on Ecology's website: http://www.ecy.wa.gov/biblio/0409043.html
- *Lower Duwamish Waterway Remedial Investigation,* Windward Environmental LLC (Windward), July 9, 2010, located on Lower Duwamish Waterway Group's website: http://www.ldwg.org/assets/phase2_ri/final%20ri/Final_LDW_RI.pdf
- *Lower Duwamish Waterway Draft Final Feasibility Study*, AECOM , October 15, 2010, located on Lower Duwamish Waterway Group's website: http://www.ldwg.org/rifs_docs9.htm#finalfs

1.1 Organization of Document

Section 1 of this SCAP describes the LDW site, the strategy for source control, and the responsibilities of the public agencies involved in source control for the LDW. Section 2 provides background information on the Spokane Street to Kellogg Island source control area, including a description of the chemicals of concern (COCs) for sediments. Section 3 provides an overview of

[1] River miles as defined in this report are measured from the southern tip of Harbor Island.
[2] This SCAP incorporates data published through August 31, 2012. Section 5, Tracking and Reporting of Source Control Activities, describes how newer data will be disseminated.

potential sources of contaminants that may affect sediments near the Spokane Street to Kellogg Island source control area, including outfalls, spills, properties adjacent to the LDW, and upland properties within the SW Dakota Street and SW Idaho Street storm drain (SD) basins, and the Duwamish West combined sewer overflow (CSO) basin. Section 3 also describes actions planned or currently underway to control potential sources of contaminants. Sections 4 and 5 describe monitoring and tracking/reporting activities, respectively. References are listed in Section 6, and figures and tables are presented at the end of the document.

As new information about the facilities and potential sources discussed in this document becomes available and as source control progress is made, Ecology will update the information in this SCAP as needed. The status of source control actions is summarized in the LDW Source Control Status Reports (Ecology 2007c, 2008a, 2008c, 2009, 2011c, 2012, and as updated).

1.2 Lower Duwamish Waterway Site

The LDW is the downstream portion of the Duwamish River, extending from the southern tip of Harbor Island to just south of the Norfolk CSO (Figure 1). It is a major shipping route for bulk and containerized cargo. Most of the upland areas adjacent to the LDW have been developed for industrial and commercial operations. These include cargo handling and storage, marine construction, boat manufacturing, marina operations, concrete manufacturing, paper and metals fabrication, food processing, and aerospace manufacturing. In addition to industry, the river is used for fishing, recreation, and wildlife habitat. Residential areas near the waterway include the South Park and Georgetown neighborhoods.

Beginning in 1913, this portion of the Duwamish River was dredged and straightened to promote navigation and industrial development, resulting in the river's current form. Shoreline features within the waterway include constructed bulkheads, piers, wharves, buildings extending over the water, and steeply sloped banks armored with riprap or other fill materials (Weston 1999). This development left intertidal habitats dispersed in relatively small patches, with the exception of Kellogg Island, which is the largest contiguous area of intertidal habitat remaining in the Duwamish River (Tanner 1991). Over the past 20 years, public agencies and volunteer organizations have worked to restore intertidal and subtidal habitat to the river. Some of the largest restoration projects are at Herring's House Park/Terminal 107, Turning Basin 3, Hamm Creek, and Terminal 105. Kellogg Island, Herring's House Park/Terminal 107 and Terminal 105 are located within the Spokane Street to Kellogg Island source control area.

The presence of chemical contamination in the LDW has been recognized since the 1970s (Windward 2003b). In 1988, the United States Environmental Protection Agency (EPA or USEPA) investigated sediments in the LDW as part of the Elliott Bay Action Program. Problem chemicals identified by the EPA study included metals, polycyclic aromatic hydrocarbons (PAHs), polychlorinated biphenyls (PCBs), phthalates, and other organic compounds. In 1999, EPA completed a study of approximately 6 miles of the waterway, from the southern tip of Harbor Island to just south of the turning basin near the Norfolk CSO (Weston 1999). This study confirmed the presence of PCBs, PAHs, phthalates, mercury, and other metals. These contaminants pose threats to people, fish, and wildlife.

In December 2000, EPA and Ecology signed an agreement with King County, the Port of Seattle, the City of Seattle, and The Boeing Company, collectively known as the Lower Duwamish Waterway Group (LDWG). Under the agreement, the LDWG is conducting a Remedial Investigation (RI) and Feasibility Study (FS) of the LDW to assess risks to human health and the environment and to evaluate cleanup alternatives. The RI for the site was completed in two phases. Results of Phase 1 were published in July 2003 (Windward 2003b). The Phase 1 RI used existing data to characterize the nature and extent of chemical contamination in LDW sediments, develop preliminary risk estimates, and identify candidate sites for early cleanup action. The Phase 2 RI was published in July 2010, and presents the results of investigations conducted for the LDW study area between 2003 and 2009, including studies to assess sediment dynamics, the nature and extent of contamination in the LDW, preliminary background concentrations, ecological and human health risks, and potential chemical sources (Windward 2010b). No additional early cleanup areas were identified. A draft final FS, which addresses cleanup options for contaminated sediments in the LDW, was completed in October 2010. A Proposed Plan for cleanup of the LDW is currently in progress.

On September 13, 2001, EPA added the LDW to its National Priorities List. This is EPA's list of hazardous waste sites that warrant further investigation and cleanup under Superfund. Ecology added the site to the Washington State Hazardous Sites List on February 26, 2002.

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

In June 2003, the *Technical Memorandum: Data Analysis and Candidate Site Identification* was issued. Seven candidate sites for early action were recommended. The sites, as listed in the Technical Memorandum (Windward 2003a), are:

- Area 1: Area near Duwamish/Diagonal CSO/SD, on the east side of the LDW (RM 0.4 to 0.6);
- Area 2: Located at approximately RM 2.2, on the west side of the LDW, just south of the 1st Avenue S Bridge;
- Area 3: Slip 4 (RM 2.8);
- Area 4: Located south of Slip 4, on the east side of the LDW, just offshore of the Boeing Plant 2 and Jorgensen Forge properties (RM 2.9 to 3.7);
- Area 5: Located at approximately RM 3.6, on the west side of the LDW;
- Area 6: Located at approximately RM 3.8, on the east side of the LDW; and
- Area 7: Area near Norfolk CSO (RM 4.9-5.0), on the east side of the LDW.

Ecology and EPA refined the boundaries of the candidate early action areas (EAAs), generally based on storm drain basin boundaries. The seven candidate EAAs are shown on Figure 1.

Of the seven candidate EAAs, five either had sponsors to begin investigations or were already under investigation by a member or group of members of the LDWG. These five sites are: Slip 4,

Terminal 117, Boeing Plant 2, Duwamish/Diagonal CSO/SD, and Norfolk CSO/SD.[3] EPA is the lead agency for managing cleanup at Terminal 117 and Slip 4. The other three early action cleanup projects were begun before the current LDW RI/FS was initiated. Cleanup at Boeing Plant 2, under the Resource Conservation and Recovery Act (RCRA), with oversight by EPA, is currently in progress. The Duwamish/Diagonal CSO/SD and Norfolk CSO/SD cleanups are under King County management as part of the Elliott Bay-Duwamish Restoration Program. Cleanup at Duwamish/Diagonal was partially completed in March 2004; a partial sediment cleanup was conducted at Norfolk CSO/SD in 1999. Additional sediment removal actions were completed by Boeing inshore of the Norfolk CSO/SD area in September 2003 and by the City of Seattle in Slip 4 in February 2012. Early action cleanups may involve members of the LDWG or other parties as appropriate. Planning and implementation of early action cleanups is being conducted concurrently with the RI/FS.

In 2007, Ecology, in consultation with EPA, identified eight additional source control areas based on available sediment data, size of the upland basin draining to the source control area, and general knowledge about facilities operating in the basin. In February 2008, Ecology identified the areas of the LDW not covered by a SCAP or planned SCAP. Using the same criteria as in 2007, eight additional potential source control areas were added to the list (Ecology 2008a). The Spokane Street to Kellogg Island source control area was identified as one of these areas. One additional source control area was added by Ecology in 2010, for a total of 24 source control areas. Ecology and EPA redefined the boundaries of the source control areas, generally defined by stormwater drainage basins. The seven candidate EAAs and 17 additional source control areas are shown in Figure 1. Stormwater drainage basins and CSO basins located in the vicinity of the Spokane Street to Kellogg Island source control area are shown on Figures 2 and 3, respectively.

Further information about the LDW can be found at:
http://yosemite.epa.gov/r10/cleanup.nsf/sites/lduwamish and
http://www.ecy.wa.gov/programs/tcp/sites_brochure/lower_duwamish/lower_duwamish_hp.html

1.3 LDW Source Control Strategy

The LDW Source Control Strategy (Ecology 2004) describes the process for identifying source control issues and implementing effective source controls for the LDW. The plan is to identify and manage sources of potential contamination and recontamination in coordination with sediment cleanups. The goal of the strategy is to minimize the potential for recontamination of sediments to levels exceeding the LDW sediment cleanup goals and the Washington State Sediment Management Standards (SMS).[4] Existing administrative and legal authorities will be used to perform inspections and require necessary source control actions.

The strategy is being implemented through the development of a series of detailed, area-specific SCAPs that will be coordinated with sediment cleanups, beginning with the candidate EAAs. Each SCAP will document what is known about the area, the potential sources of recontamination,

[3] These five sites are identified as EAAs in the Draft Final FS for the Lower Duwamish Waterway, published on October 15, 2010 (AECOM 2010). The two candidate EAAs without sponsors are identified in the Draft Final FS as Areas of Potential Concern.
[4] Washington Administrative Code (WAC) 173-204

actions taken to address them, and how to determine when adequate source control is achieved for an area. Because the scope of source control for each area will vary, it is necessary to adapt each plan to the specific situation at that area. The success of this strategy depends on the coordination and cooperation of all public agencies with responsibility for source control in the LDW area, as well as prompt compliance by the businesses that must make necessary changes to control releases from their properties.

The source control strategy focuses on controlling contamination that affects LDW sediments. It is based on the principles of source control for sediment sites described in EPA's *Principles for Managing Contaminated Sediment Risks at Hazardous Waste Sites; February 12, 2002* (USEPA 2002), and Ecology's SMS. The first principle is to control sources early, starting with identifying all ongoing sources of contaminants to the site. EPA's Record of Decision (ROD) for the site will require that sources of sediment contamination to the entire site be evaluated, investigated, and controlled as necessary. Dividing source control work into specific SCAPs and prioritizing those plans to coordinate with sediment cleanups will address the guidance and regulations and will be consistent with the selected remedial actions in the EPA ROD.

Source control priorities are divided into four tiers. Tier 1 consists of source control actions associated with candidate EAA sediment cleanups. Tier 2 consists of source control actions associated with cleanup areas identified in the RI/FS and EPA's ROD. Tier 3 consists of source control necessary to minimize future sediment contamination from basins that may not drain directly to an identified sediment cleanup area. Tier 4 consists of source control necessary to address any recontamination identified by post-cleanup sediment monitoring (Ecology 2008a). This document is a SCAP for a Tier 3 Source Control Area.

Further information about the LDW Source Control Strategy can be found at:
http://www.ecy.wa.gov/biblio/0409052.html and
http://www.ecy.wa.gov/programs/tcp/sites_brochure/lower_duwamish/lower_duwamish_hp.html

1.4 Source Control Work Group

The primary public agencies responsible for source control for the LDW are Ecology, the City of Seattle, King County, the Port of Seattle, City of Tukwila, and EPA. All of these agencies, except the City of Tukwila, are involved in the source control activities for the Spokane Street to Kellogg Island source control area.

In order to coordinate among these agencies, Ecology formed the Source Control Work Group (SCWG) in January 2002. The purpose of the SCWG is to share information, discuss strategy, actively participate in developing SCAPs, jointly implement source control measures, and share progress reports on source control activities for the LDW area. The monthly SCWG meetings are chaired by Ecology. All final decisions on source control actions and completeness will be made by Ecology, in consultation with EPA, as outlined in the April 2004 Ecology/EPA LDW Memorandum of Understanding (EPA and Ecology 2004).

Other public agencies with relevant source control responsibilities include the Washington State Department of Transportation, Puget Sound Clean Air Agency (PSCAA), and the Seattle/King County Department of Public Health (SKCDPH). These agencies are invited to participate in source control with the SCWG as appropriate (Ecology 2004).

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2.0 River Mile 0.0 to 1.0 West (Spokane Street to Kellogg Island)

The Spokane Street to Kellogg Island source control area is located along the western side of the LDW Superfund Site between RM 0.0 and 1.0 (Figure 1). Facilities within the Spokane Street to Kellogg Island source control area are listed in Table 1. Elevated concentrations of chemicals have been measured in sediments near the source control area, including lead; mercury; zinc; PCBs; PAHs, phthalates, and other semivolatile organic compounds (SVOCs); and dioxins/furans. These may be a result of historical and/or ongoing sources within the source control area.[5] Chemicals may have entered the LDW through direct discharges, spills, bank erosion, groundwater discharge, surface water runoff, atmospheric deposition, or other non-point source discharges.

RM 0.0 to 1.0 West extends from SW Spokane Street to the southern end of Terminal 107 (Figure 4). The source control area includes two storm drain basins and one CSO basin:

- The SW Dakota Street SD basin covers approximately 54 acres, and includes 18 facilities with Ecology Facility/Site identification (ID) numbers. The storm drain basin spans west-to-east from 19th Avenue SW to West Marginal Way SW and north-to-south from the West Seattle Bridge to SW Idaho Street. A portion of the Terminal 105, Encore Oils (former Pacific Rendering), and Ferguson Enterprises properties are within the SW Dakota Street SD basin (Figure 4).
- The SW Idaho Street SD basin covers approximately 424 acres and includes 17 facilities with Ecology Facility/Site ID numbers. In addition, cement kiln dust (CKD) was used as fill material at several properties in the SW Idaho Street SD basin. The storm drain basin spans west-to-east from 21st Avenue SW to West Marginal Way SW between RM 0.2 and 0.9 West and from 21st Avenue SW to South Seattle Community College between RM 0.9 and 2.2 West. Between RM 0.2 and 0.3 West, the storm drain basin extends east of West Marginal Way SW. The storm drain basin spans north-to-south from SW Idaho Street to SW Myrtle Street (Figure 4).
- The Duwamish West CSO basin covers approximately 860 acres. The CSO basin spans west-to-east from Delridge Way SW to the LDW. From north-to-south the CSO basin spans from 26th Avenue SW (north of the West Seattle Bridge) to SW Holly Street (western side of the basin) and Terminal 115 (eastern side of the basin). The Duwamish West CSO basin includes Harbor Island. Park land in this area is not included in the CSO basin (Figure 5).

[5] Historical sources of PCBs include electrical equipment spills and leakage, residential trash burning, and building sealant (caulk) volatilization and abrasion. Sources of phthalates include polymer (primarily PVC) off-gassing, industrial and commercial air emissions, and leaching of roofing materials (Ecology and King County 2011).

Properties located directly adjacent or within close proximity to the waterway between RM 0.0 and 1.0 West include:

- Riverside Mill LLC property and its tenants
  - Bob's Boat Shop
  - United Motor Freight
- BNSF Railroad Right-of-Way
- Port of Seattle Terminal 103 and its tenants
  - General Construction Company
  - Northwest Aggregates
- Global Diving & Salvage
- Port of Seattle Terminal 105
- Encore Oils (former Pacific Rendering)
- Ferguson Enterprises
- General Recycling of Washington
- Former Seaboard Lumber Property, which includes:
  - Evergreen Trails
  - Herring's House Park
- Port of Seattle Terminal 107 and its tenant
  - Alaska Marine Lines

The storm drain system at Global Diving & Salvage appears to be plumbed to the Terminal 103 storm drain system. Prior to 2000, Terminal 103 included the parcel now occupied by Global Diving & Salvage. Stormwater discharges from Encore Oils and Ferguson Enterprises enter a drainage channel/stream that flows through Port of Seattle Terminal 105 and is hydraulically connected to the LDW. These properties are adjacent to the drainage channel/stream. In addition, Prior to 1997, Terminal 105 included the parcels now occupied by Pacific Rendering, Ferguson Enterprises. Due to these conditions, all properties/parcels east of West Marginal Way SW are considered as properties adjacent to the LDW within the context of this SCAP.

Upland properties and facilities within the SW Dakota Street SD basin that could potentially affect sediments near the Spokane Street to Kellogg Island source control area include the following:

- Former Fraser Properties
- Tryg Winquist
- West Seattle Recycling Center
- Active Environmental
- Former Concrete Restoration
- Heathco and Penthouse Drapery
- Raynroof Roofing
- 4101 West Marginal Way Business Park and its tenants

    - Aquatic Enterprises
    - Cohesive Garage
    - Metal Shorts
    - Wheelchairs Plus
- Strutz Property
- Seattle Parks and Recreation Westbridge Maintenance Facility

Upland properties and facilities within the SW Idaho Street SD basin that could potentially affect sediments near the Spokane Street to Kellogg Island source control area include the following:

- New Finishes/Pacifica
- Continental Van Lines
- Airclean Technologies
- Former Central Painting property/Expert Marble & Granite
- Fog Tite Meter and Seal
- Evergreen Building Products
- Heath Landscape
- West Seattle Estates
- Ortega Property
- South Seattle Community College
- King Residence

CKD was used as fill at several properties in the LDW basin, including the following properties in the Spokane Street to Kellogg Island source control area:

- Puget Park and the McFarland Property (including the Upper Hudson Street Site)
- Washington Federal Savings and Loan

These facilities are shown on Figure 4. The tax parcels associated with these facilities are identified on Figures 6a through 6c.

In addition, information about the Duwamish West CSO basin was reviewed to identify any additional facilities that could represent potential sediment recontamination sources. Ecology has assigned Facility/Site identification numbers to 143 facilities within the Duwamish West CSO basin. SAIC reviewed information on facilities in the Duwamish West CSO located outside the Spokane Street to Kellogg Island source control area boundary and not included in other Data Gaps Reports or SCAPs. SAIC identified no data gaps or necessary source control actions. SAIC also reviewed information for facilities with assigned Facility/Site identification numbers in the Chelan and Harbor CSO basins, which are secondary and tertiary contributors, respectively, to the Duwamish West CSO basin. SAIC identified no data gaps or necessary source control actions (SAIC 2012).

2.1 Chemicals of Concern in Sediment

Sediments near the Spokane Street to Kellogg Island source control area generally consist of approximately 40 to greater than 80 percent fines. Total organic carbon (TOC) in this area ranges from 1.0 to 3.1 percent (Windward 2010b).

Several environmental investigations have included the collection of sediment near the Spokane Street to Kellogg Island source control area. Sampling locations are listed in Table 2 and are shown in Figures 7a through 7d.

- One surface sediment sampled collected during the Harbor Island Remedial Investigation in 1991 (Windward 2003b);
- Three surface sediment samples collected during the Terminal 105 Site Assessment in 1993 (Olympus 1994);
- Twenty surface samples collected during the Seaboard Lumber – Phase 2 Investigation in 1996 (Herrera 1996);
- Twenty-seven surface sediment samples collected as part of a National Oceanic and Atmospheric Administration (NOAA) sediment characterization of the Duwamish River in 1997 (NOAA 1998);
- Thirteen surface samples collected during the King County CSO Water Quality Assessment in 1997 (King County 1999);
- One surface sediment sample collected during the Puget Sound Sediment Quality/NOAA Site Characterization in 1998 (Ecology 2000);
- Twenty-eight surface sediment samples collected during an EPA Site Inspection in 1998 (Weston 1999);
- Eight surface sediment samples collected as part of a benthic invertebrate and clam tissues study in 2004 (Windward 2005a);
- Twenty-five surface sediment and 37 subsurface sediment samples from five coring locations collected during the LDW Phase 2 RI from 2005 to 2006 (Windward 2005a, 2005b, 2005c, 2007);
- Four surface sediment samples collected during the Ecology Sediment Profile Imaging study in 2006 (Ecology 2007c);
- Three surface sample collected during the LDW RI Dioxin Sampling in 2010 (Windward 2010a); and
- Fourteen surface sediment samples collected as part of outfall sampling in 2011 (SAIC 2011).

Sediment data near the Spokane Street to Kellogg Island source control area are detailed in the Spokane Street to Kellogg Island Data Gaps Report (SAIC 2012). Chemical data were compared to the SMS, which include both the Sediment Quality Standards (SQS) and Cleanup Screening Levels (CSLs) (WAC 173-204). Sediments that meet the SQS criteria have a low likelihood of

adverse effects on sediment-dwelling biological resources. However, an exceedance of the SQS numerical criteria does not necessarily indicate adverse effects or toxicity, and the degree of SQS exceedance does not correspond to the level of sediment toxicity. The CSL is greater than or equal to the SQS and represents a higher level of risk to benthic organisms than SQS levels. The SQS and CSL values provide a basis for identifying sediments that may pose a risk to some ecological receptors. The SMS for most organic chemicals are based on total organic carbon (OC)-normalized concentrations. The results of this comparison are provided in Tables 3 and 4.

COCs were identified based on the results of sediment sampling in the vicinity of the Spokane Street to Kellogg Island source control area, as identified above. Chemicals that exceeded the SQS in at least one surface or subsurface sediment sample are considered COCs for the Spokane Street to Kellogg Island source control area. In general, chemicals were present in sediment samples at concentrations only slightly above the SQS values; the greatest exceedances were observed for PCBs in subsurface samples collected near the Terminal 107 Park and the former Seaboard Lumber property, the SW Idaho Street SD outfall, downstream from Kellogg Island and immediately north of Lafarge Cement (Figures 7b through 7d). The highest concentrations of dioxins/furans were detected at location LDW-SS509, which was collected near the former Seaboard Lumber property and the Terminal 107 Park. Additional information on SQS/CSL exceedances is provided in the Spokane Street to Kellogg Island Data Gaps Report (SAIC 2012).

The following chemicals were detected in sediments near the Spokane Street to Kellogg Island source control area at concentrations above the SQS/CSL, and are considered sediment COCs.

Chemicals Detected at Concentrations Above the SQS/CSL	**Surface Sediment**		**Subsurface Sediment**	
	> SQS	**> CSL**	**> SQS**	**> CSL**
Metals				
Lead			●	●
Mercury	●	●	●	●
Zinc	●		●	
PAHs				
Acenaphthene	●			
Benzo(a)anthracene	●	●	●	●
Benzo(a)pyrene	●	●	●	
Benzofluoranthenes (total calc'd)	●	●	●	●
Benzo(g,h,i)perylene	●	●		
Chrysene	●	●	●	●
Dibenzo(a,h)anthracene	●			
Fluoranthene	●	●	●	●
Fluorene	●			
Indeno(1,2,3-cd)pyrene	●	●	●	
Phenanthrene	●			
Pyrene	●	●	●	●
Total HPAH	●	●	●	●

Chemicals Detected at Concentrations Above the SQS/CSL	Surface Sediment		Subsurface Sediment	
	> SQS	> CSL	> SQS	> CSL
Phthalates				
Bis(2-ethylhexyl)phthalate	●	●	●	
Butyl benzyl phthalate	●			
Phenols				
2,4-Dimethylphenol	●	●		
4-Methylphenol	●	●		
Phenol	●			
Other SVOCs				
Benzoic acid	●	●		
Benzyl alcohol	●	●		
Dibenzofuran	●			
N-nitroso-di-n-propylamine			●	
PCBs				
PCBs (total)	●	●	●	●

Exceedance factors, which are a measure of the degree to which maximum detected concentrations exceed the SQS/CSL values, are listed in Tables 3 and 4.

Although no SQS have been promulgated, pesticides are considered potential COCs at the Spokane Street to Kellogg Island source control area. Concentrations of pesticides including DDT compounds, chlordane, endosulfan, and methoxychlor were detected at 10 surface sampling locations. Greatest concentrations of pesticides were detected at surface sample location 203, which was collected offshore of the former Seaboard Lumber property. Because pesticides have been detected near the Spokane Street to Kellogg Island source control area, analysis for pesticides should be considered when future sediment samples are collected in this area.

Organotin compounds are persistent bioaccumulative toxins (PBTs) and are generally considered to be COCs for LDW sediments. Tributyltin (TBT) is used as the indicator chemical for organotin compounds. The mean concentration of TBT in the LDW is 90 milligrams per kilogram (mg/kg) dry weight (DW) (AECOM 2010). Organotin compounds were detected at 28 sampling locations near the Spokane Street to Kellogg Island source control area between 1991 and 2006, with concentrations of TBT up to 0.25 mg/kg DW at location DR038 (SAIC 2012). Since the maximum TBT concentration in sediments near the Spokane Street to Kellogg Island source control area is more than three orders of magnitude below the mean TBT concentration in LDW sediment, organotin compounds are not considered to be COCs for the sediments adjacent to the source control area.

Dioxins and furans are considered potential COCs within the Spokane Street to Kellogg Island source control area. These compounds were detected in 15 sediment samples at concentrations that exceed LDW background toxic equivalency (TEQ) concentrations of dioxins and furans as described in *Lower Duwamish Waterway Remedial Investigation Report* (Windward 2010b). Dioxin/furan TEQs above LDW background levels ranged from 2.22 J nanograms per kilogram (ng/kg) DW to 74.5 ng/kg DW.

2.2 Potential Pathways to Sediment

Transport pathways that could potentially contribute to sediment contamination near the Spokane Street to Kellogg Island source control area include direct discharges via storm drain and CSO outfalls, surface runoff (sheet flow), groundwater discharge, bank erosion, atmospheric deposition, and spills directly to the LDW. Relevant pathways are described briefly below, and are discussed in more detail in the Spokane Street to Kellogg Island Data Gaps Report (SAIC 2012). Specific contaminant sources and transport pathways are discussed in Section 3.

2.2.1 Direct Discharges from Outfalls

The LDW area is served by a combination of separated storm drain and sanitary sewers, and combined sewer systems. Storm drains convey stormwater runoff collected from streets, parking lots, roof drains, and residential, commercial, and industrial properties to the waterway. In the LDW, there are both public and private storm drain systems. Most of the waterfront properties along the LDW are served by privately owned systems that discharge directly to the waterway. The other upland areas are served by a combination of privately and publicly owned systems. The storm drain systems in the Spokane Street to Kellogg Island source control area are publicly owned by the City of Seattle, King County, and the Port of Seattle. Privately owned storm drain systems are operated by General Recycling of Washington and Evergreen Trails.

Storm drains entering the LDW carry runoff generated by rain and snow. A wide range of chemicals may become dissolved or suspended in runoff as rainwater flows over the land. Urban areas may accumulate particulates, dust, oil, asphalt, rust, rubber, metals, pesticides, detergents, or other materials as a result of urban activities. These can be flushed into storm drains during wet weather. Storm drains can also convey materials from businesses with permitted discharges (i.e., National Pollutant Discharge Elimination System [NPDES] industrial or individual stormwater permits), vehicle washing, runoff from landscaped areas, erosion of contaminated soil, groundwater infiltration, and materials illegally dumped into the system.

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

Additional information on public storm drains and CSOs is presented in the Spokane Street to Kellogg Island Data Gaps Report (SAIC 2012). Seven public storm drains, two private storm drains, seven outfalls of unknown origin, four drainage ditches and channels, and one CSO/emergency overflow (EOF) discharge to the LDW within the Spokane Street to Kellogg Island source control area (Figure 4). These are discussed in more detail in Section 3.

2.2.2 Surface Runoff (Sheet Flow)

In areas lacking collection systems, spills or leaks on properties adjacent to the LDW could flow directly over impervious surfaces or through creeks and ditches to the waterway. Current operational practices at adjacent properties may contribute to the movement of contaminants to the LDW via runoff.

2.2.3 Groundwater Discharges

Groundwater flow in the Spokane Street to Kellogg Island source control area is generally to the east, toward the LDW, although the direction may vary locally depending on the nature of the subsurface material, and temporally, based on proximity to the LDW and the influence of tidal action. Contaminants in soil resulting from spills and releases to adjacent properties may be transported to groundwater and subsequently be released to the LDW near the Spokane Street to Kellogg Island source control area.

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

Groundwater contamination has been documented at Terminal 103, Terminal 105, and the former Seaboard Lumber property (SAIC 2012).

The Spokane Street to Kellogg Island source control area has been identified as an area with generally lower seepage levels. Five seep locations were identified during the Windward seep reconnaissance survey. Seeps 64, 69, and 71 were selected for chemical analysis (Figures 7b through 7d) (Windward 2004). Copper, lead, and mercury were detected at concentrations that exceeded the Marine Chronic Water Quality Standard (WQS); lead and mercury concentrations also exceeded the draft groundwater-to-sediment screening levels. PCBs were detected in Seep 64 at a concentration of 0.46 J micrograms per liter (µg/L), which is 15 times greater than the Marine Chronic WQS of 0.030 µg/L (Table 5).

2.2.4 Bank Erosion

The banks of the LDW shoreline are susceptible to erosion by wind and surface water, particularly in areas where banks are steep. Shoreline armoring and the presence of vegetation reduce the potential for bank erosion. Contaminants in soils along the banks of the LDW could be released directly to sediments via erosion. Soil contamination has been documented at Terminal 103, Terminal 105, General Recycling, and the former Seaboard Lumber property.

In May 2011, ten bank soil samples were collected from two areas within the Spokane Street to Kellogg Island source control area, the Terminal 105 Park (former Riverside Marina area) and Terminal 107 (Figures 7b and 7d). The samples at Terminal 107 were collected from a layer that was identified as possible CKD. Soil samples were analyzed for metals, PCBs, PAHs, other SVOCs, total petroleum hydrocarbons (TPH), TBT, polybrominated diethyl ethers, pesticides, and dioxins/furans. Concentrations of arsenic, lead, mercury, and zinc exceeded the SQS and CSL. Concentrations of arsenic, total carcinogenic PAH (cPAH), PCBs, and dioxins/furans exceeded LDW background levels (Table 6) (Hart Crowser 2012).

	Terminal 105 Park			**Terminal 107**		
Chemical	**>SQS**	**>CSL**	**>LDW Background**	**>SQS**	**>CSL**	**>LDW Background**
Arsenic			●	●	●	●
Lead				●	●	
Mercury	●	●				
Zinc				●	●	
cPAH			●			
Dioxins/Furans			●			●
PCBs			●			

2.2.5 Spills to the LDW

Near-water and over-water activities have the potential to impact adjacent sediments from spills of material containing COCs. Facilities along the LDW conduct loading and unloading activities within the Spokane Street to Kellogg Island source control area. Accidental spills during loading/unloading operations may result in transport of contaminants to sediment. Over-water activities are performed at the Riverside Mill property, Terminal 103, and at General Recycling.

2.2.6 Atmospheric Deposition

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

distances by wind, and can be deposited to land and water surfaces by precipitation or particle deposition.

One of the properties within the Spokane Street to Kellogg Island source control area, Encore Oils, is currently regulated as a point source of air emissions. Four properties within the Duwamish West CSO basin and one property within the Chelan CSO basin have been regulated as point sources of air emissions. These properties are listed below.

Facility	PSCAA Facility Registration No.
Spokane Street to Kellogg Island Source Control Area	
Encore Oils	18429
Duwamish West CSO Basin	
BP West Coast Products	16004
Kinder Morgan Liquids Terminals	16002
Olympic Pipe Line Co, BP Pipelines	18166
Shell Oil Products – Seattle Terminal	16003
Chelan CSO Basin	
Nucor Steel Seattle Inc.	10281

All of the facilities located in the Duwamish West CSO basin are on Harbor Island, with the exception of Duwamish Shipyard and Lafarge Cement. Duwamish Shipyard ceased operations in April 2007 (SAIC 2007). Historically, the Lafarge facility was regulated as a point source of air emissions under the federal Clean Air Act. In January 2010, the USEPA and Lafarge entered a consent decree settlement to address alleged violations of the Clean Air Act at operations across the United States. Several states and agencies, including Washington State and PSCAA, joined in the settlement. The kiln was to be put into a care and maintenance mode at the end of 2010 (Lafarge 2010).

Contaminants originating from nearby properties and streets may be transported through the air and deposited in the LDW or in areas that drain to the LDW. Secondary impacts of air sources on the stormwater pathway to receiving waters and sediment are not well understood; additional information is needed. Recent and ongoing atmospheric deposition studies in the LDW area is summarized in the LDW Source Control Status Reports (Ecology 2007d, 2008a, 2008c, 2009, 2011c, 2012, and as updated). Ecology is currently conducting an air deposition scoping study to inventory known point sources and make recommendations on how to address air deposition for source control.

3.0 Potential Sources of Sediment Recontamination

Potential sources of sediment recontamination are described in detail in the Spokane Street to Kellogg Island Data Gaps Report (SAIC 2012). This section summarizes the information on outfalls (Section 3.1), adjacent properties (Section 3.2), and upland properties (Sections 3.3 and 3.4).

3.1 Outfalls

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

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

There are seven public storm drains, two private storm drains, seven outfalls of unknown origin, four drainage ditches and channels, and one CSO/EOF that discharge to the LDW within the Spokane Street to Kellogg Island source control area (Figure 4).

3.1.1 Public Storm Drain Outfalls

Outfall No.[a]	Outfall Name	Diameter/Material	Outfall Type
2147	SW Idaho Street SD	72-inch concrete	SPU Public SD
2149	SW Dakota Street SD, head	24-inch CPE	Port of Seattle Public SD
2233	SW Dakota Street SD, mouth	Drainage channel	Port of Seattle Drainage Channel
8132	T103_01	Unknown	Port of Seattle Public SD
8133[b]	T103_02	Unknown	Port of Seattle Public SD
8134	T103_03	Drainage channel	Port of Seattle Public Ditch
8135	T103_04	Drainage channel	Port of Seattle Public Ditch
2148	NA	12-inch CPE	Port of Seattle Public SD

Outfall No.[a]	Outfall Name	Diameter/Material	Outfall Type
2150	NA	18-inch CPE	Port of Seattle Public SD
2226	NA	Creek	SPU Drainage Channel
2232	NA	18-inch CPE	Port of Seattle Public SD

a – Outfall number as listed in Windward 2010, Appendix H.
b – The presence of Outfall 8133 has not been confirmed; the presumed location under a pier cannot be safely accessed (Anderson 2012).

Lateral storm drain lines connect several of the surrounding facilities to the main lines in the SW Dakota Street and SW Idaho Street SD basins and the Duwamish West CSO basin. The approximate drainage area associated with the SW Dakota Street and SW Idaho Street SD outfalls is shown on Figures 2 and 4. The approximate drainage area associated with the Duwamish West CSO outfall is shown on Figure 3.

Outfalls 8132, 8133, 8134, and 8135 are located on Terminal 103. The companies operating at Terminal 103 are the sole dischargers to these outfalls. Additional information regarding stormwater discharge from the operators at Terminal 103 will be discussed in Section 3.2.3. Outfall 2232 is located on Terminal 105. Based on the storm drain maps available for review, it appears that stormwater from the Ferguson Enterprises facility may discharge to the LDW through this outfall. Additional information regarding Ferguson Enterprises is discussed in Section 3.2.7.

Seattle Public Utilities (SPU) has collected storm drain solids samples from the storm drain structures associated with the SW Dakota Street and SW Idaho Street SD basins between February 2005 and April 2011. The SCWG compares analytical results from these samples to the SQS, apparent effects threshold (AET), and Model Toxics Control Act (MTCA) Method A cleanup standards. Although these regulatory standards are not applicable to storm drain solids, the SCWG uses these values as a benchmark to describe storm drain solids quality (SPU 2010j). In this document, values described above (SQS/CSL, lowest AET [LAET]/second lowest AET [2LAET], and MTCA Method A) that are used for comparison to storm drain solids data are referred to as "storm drain screening values." It should be emphasized that none of these values are applied as cleanup levels to storm drain or combined sewer solids. It is important to note that any comparison of this kind is most likely conservative given that sediments discharged from storm drains are highly dispersed in the receiving environment and mixed with the natural sedimentation taking place in the system.

SW Dakota Street SD Outfall (Outfalls 2148, 2149, 2150, and 2233)

The SW Dakota Street outfall (Outfall 2149) discharges to the head of the stream that flows through the Terminal 105 Park. This stream flows into the LDW and the mouth of the stream has been designated as Outfall 2233. Discharges from Encore Oils (former Pacific Rendering) and Ferguson enter the stream through Outfalls 2148 and 2150. Based on data provided by SPU, the SW Dakota Street SD basin drains an area of approximately 54 acres. Additional information

regarding the drainage basin is provided in the Spokane Street to Kellogg Island Data Gaps Report (SAIC 2012).

There are 18 facilities within the SW Dakota Street SD basin (Table 1):

- 3 of these facilities are listed on Ecology's Confirmed and Suspected Contaminated Sites List (CSCSL) (1 of these facilities has received a No Further Action [NFA] determination from Ecology).
- 1 facility has an active EPA ID number.
- 1 facility is listed on Ecology's leaking underground storage tank (LUST) and underground storage tank (UST) lists.

Terminal 105 Park, Encore Oils (former Pacific Rendering) and Ferguson are geographically located within the SW Dakota Street SD basin.

Additionally, an unknown number of undocumented industrial operations may take place within the SW Dakota Street SD basin. Undocumented industrial activities may be an ongoing source of contaminants to sediments adjacent to the Spokane Street to Kellogg Island source control area.

Storm Drain Solids Sampling (2005 to 2010)

SPU has collected solids samples from storm drain structures within the SW Dakota Street SD basin between February 2005 and April 2010 (Figure 8). The samples were analyzed for PCBs; metals and mercury; and PAHs, phthalates, and other SVOCs (SPU 2010j). Several sediment COCs were detected in the samples at concentrations exceeding the storm drain screening values; these COCs are listed below. The chemical concentrations are listed in Table 7.

Chemical	Private Catch Basins		Right-of-Way Catch Basins		Sediment COC?
	>SQS/ LAET	>CSL/ 2LAET	>SQS/ LAET	>CSL/ 2LAET	
Metals					
Zinc	●	●	●		✓
PAHs					
2-Methylnaphthalene	●	●	●	●	
Chrysene	●				✓
Phthalates					
BEHP	●	●	●	●	✓
Butyl benzyl phthalate	●	●	●	●	✓
Diethyl phthalate	●				
Dimethyl phthalate	●	●			
Di-n-butyl phthalate			●		
Other SVOCs					
Benzoic acid			●	●	✓
Benzyl alcohol			●	●	✓

Chemical	Private Catch Basins		Right-of-Way Catch Basins		Sediment COC?
	>SQS/ LAET	>CSL/ 2LAET	>SQS/ LAET	>CSL/ 2LAET	
PCBs					
Total PCBs	●		●		✓
Petroleum Hydrocarbons					
Heavy-oil range	●				

SW Idaho Street SD Outfall (Outfall 2147)

Outfall 2147 is an active stormwater outfall located at the eastern end of SW Idaho Street (Figure 8). Based on data provided by SPU, the SW Idaho Street SD basin drains an area of approximately 424 acres. Additional information regarding the drainage basin is provided in the Spokane Street to Kellogg Island Data Gaps Report (SAIC 2012).

There are 17 facilities within the SW Idaho Street SD basin, including the properties with CKD fill (Table 1):

- 5 facilities are listed on Ecology's CSCSL (1 of these facilities has received an NFA determination from Ecology).
- 2 facilities have active EPA ID numbers.
- 1 facility holds an NPDES permit.
- 2 facilities hold a King County Industrial Waste (KCIW) discharge permit.
- 1 facility is listed on Ecology's LUST and UST lists.

General Recycling of Washington is located adjacent to the LDW as well as within the SW Idaho Street SD.

SPU Storm Drain Sampling

SPU has collected solids samples from storm drain structures within the SW Idaho Street SD basin between September 2008 and April 2011 (Figure 8). The samples were analyzed for PCBs; metals and mercury; and PAHs, phthalates, and other SVOCs (SPU 2010j). Several sediment COCs were detected in inline, sediment trap, and right-of-way catch basin samples at concentrations exceeding the storm drain screening values; these COCs are listed below. The chemical concentrations are listed in Table 8.

Chemical	Sediment Trap		Inline Grab		Right-of-Way Catch Basins		Sediment COC?
	>SQS/ LAET	>CSL/ 2LAET	>SQS/ LAET	>CSL/ 2LAET	>SQS/ LAET	>CSL/ 2LAET	
Metals							
Zinc	●						✓
PAHs							
Phenanthrene	●	●					✓

Chemical	Sediment Trap		Inline Grab		Right-of-Way Catch Basins		Sediment COC?
	>SQS/ LAET	>CSL/ 2LAET	>SQS/ LAET	>CSL/ 2LAET	>SQS/ LAET	>CSL/ 2LAET	
Total LPAH	●						
Benzo(a)anthracene	●	●					✓
Benzo(a)pyrene	●	●					✓
Benzo(g,h,i)perylene	●	●	●	●			✓
Total benzofluoranthenes	●	●					✓
Chrysene	●	●					✓
Dibenzo(a,h)anthracene	●	●					✓
Fluoranthene	●	●					✓
Indeno(1,2,3-cd)pyrene	●	●	●	●			✓
Pyrene	●	●					✓
Total HPAH	●	●					✓
Phthalates							
BEHP	●	●	●		●	●	✓
Butyl benzyl phthalate	●	●	●		●	●	✓
Other SVOCs							
4-Methylphenol	●	●			●	●	✓
Benzoic acid					●	●	✓
Benzyl alcohol					●	●	✓
Hexachlorobenzene					●	●	
PCBs							
Total PCBs	●		●				✓
Petroleum Hydrocarbons							
Heavy-oil range	●		●				

Potential for Future Releases to LDW Sediments

SW Dakota Street SD Basin

Catch basin storm drain solids sampling has indicated that concentrations of sediment COCs exceeding storm drain screening values are present in the SW Dakota Street SD basin. These COCs may be discharged to the LDW through Outfall 2149 and the drainage channel associated with the SW Dakota Street SD basin and may represent a source of contaminants to the sediments adjacent to the Spokane Street to Kellogg Island source control area.

Zinc, PCBs, bis(2-ethylhexyl)phthalate (BEHP), butyl benzyl phthalate, and benzyl alcohol concentrations that exceed screening levels are present in both LDW sediment samples near Outfall 2149 at the head of the drainage channel associated with the SW Dakota Street SD basin and near Outfall 2233 at the mouth of the drainage channel (Figure 7b), and in storm drain solids

samples collected from the SW Dakota Street SD system. Concentrations of acenaphthene, benzo(g,h,i)perylene, chrysene, fluorene, fluoranthene, indeno(1,2,3-cd)pyrene, phenanthrene, total high molecular weight polycyclic aromatic hydrocarbon (HPAHs), and PCBs also exceeded screening levels in a sediment sample collected from the LDW adjacent to Outfall 2233.

SW Idaho Street SD Basin

Storm drain solids sampling has indicated that concentrations of sediment COCs exceeding storm drain screening values are present in the SW Idaho Street SD basin. These COCs may be discharged to the LDW through Outfall 2147 and may represent a source of contaminants to the sediments adjacent to the Spokane Street to Kellogg Island source control area.

PCB concentrations that exceed screening levels are present in both LDW sediment samples near Outfall 2147 (Figure 7b) and in storm drain solids samples collected from the SW Idaho Street SD system.

Source Control Actions

Ecology will continue to perform facility inspections to determine if undocumented industrial operations are occurring within the SW Dakota Street and SW Idaho Street SD basins that may be an ongoing source of sediment recontamination. SPU plans to inspect high-risk businesses throughout the LDW storm drain basins every two years. High-risk businesses perform operations that represent a high potential for sediment recontamination.

Information needed to assess the potential for sediment recontamination associated with the public storm drain outfalls was summarized in the Spokane Street to Kellogg Island Data Gaps Report. The following source control actions will be conducted to fill the identified data gaps and reduce the potential for recontamination of sediments near the Spokane Street to Kellogg Island source control area:

- SPU and Ecology will continue source tracing to identify potential sources of the sediment COCs reported above screening levels in storm drain structures within the SW Dakota Street and SW Idaho Street SD basins.

3.1.2 King County Combined Sewer Overflows

The Duwamish West CSO discharges to the LDW within the Spokane Street to Kellogg Island source control area. KCIW estimates that, on a county-wide basis, industrial discharges comprise less than 0.5 percent of the total volume of a CSO event (Tiffany 2008). Typically, domestic users of the combined sewer system contribute a larger percentage of the chemical loading than industrial users. For example, KCIW testing has indicated that industrial users of the combined sewer system contribute less than 10 percent of the phthalate load, with the remainder coming from uncontrollable sources such as domestic users.

Outfall No.	Outfall Name	Diameter/Material	Outfall Type
NA	Duwamish West CSO, Siphon West CSO	36-inch (material unknown)	King County Public CSO/EOF

Duwamish West CSO/

The Duwamish West CSO basin covers approximately 860 acres. On the west side of the LDW, the CSO basin spans west-to-east from Delridge Way SW to the LDW. Park land in this area is not included in the CSO basin (Figure 5). From north-to-south the CSO basin spans from 26th Avenue SW (north of the West Seattle Bridge) to SW Holly Street (western side of the basin) and Terminal 115 (eastern side of the basin). The Duwamish West CSO basin includes Harbor Island. Land uses within the CSO basin include industrial, commercial, and residential properties. The Chelan Avenue and Harbor CSO basins are secondary and tertiary contributors to the Duwamish West CSO basin (King County 2009).

The Duwamish West CSO is an overflow relief structure associated with the Duwamish Siphon. The Duwamish Siphon directs flows from the west side of the LDW to the Duwamish Pump Station on the east side of the LDW (King County 2009). From 2005 to 2010, combined wastewater and stormwater overflows were discharged through the Duwamish West CSO less than once per year, with an annual average volume of approximately 0.60 mgy (Table 9) (King County 2011a). The most recent CSO event at the Duwamish West CSO was in December 2007; approximately 6.3 million gallons discharged through the CSO during a three-day storm (King County 2008).

King County collected four in-pipe water samples from the Duwamish Siphon Forebay between September 2007 and May 2009. The December 2007 sampling event coincided with the December 2007 CSO event. The samples were analyzed for PCBs; total and dissolved metals and mercury; and PAHs, phthalates, and other SVOCs (King County 2008, 2009, 2011a, 2011b). Several sediment COCs were detected in the samples; all detected chemicals and concentrations are listed in Table 10. Sediment COCs detected in the CSO samples included the following.

- Metals: arsenic, lead, mercury, zinc
- PAHs: acenaphthene, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene, fluoranthene, fluorene, indeno(1,2,3-cd)pyrene, phenanthrene, pyrene
- Phthalates: BEHP, butyl benzyl phthalate
- Other SVOCs: 4-methylphenol, benzyl alcohol, phenol
- PCBs

Ecology has assigned Facility/Site Identification numbers to 143 facilities/properties within the Duwamish West CSO basin:

- 31 facilities are listed on Ecology's CSCSL (7 of these facilities have received an NFA determination from Ecology).
- 42 facilities have active EPA ID numbers.
- 24 facilities hold NPDES permits.
- 7 facilities have KCIW discharge authorizations or permits.
- 21 facilities are listed on Ecology's LUST list.
- 43 facilities are listed on Ecology's UST list.

Additional information about these facilities is provided in the Spokane Street to Kellogg Island Data Gaps Report (SAIC 2012).

Potential for Future Releases to LDW Sediments

Although COCs from individual industrial and commercial facilities within the CSO basin are significantly diluted, the cumulative effects of CSO events could contribute to recontamination of sediments near the Spokane Street to Kellogg Island source control area. Industrial and commercial facilities discharging industrial wastes and/or stormwater to the combined sewer system are therefore considered to represent potential but relatively minor sources of sediment recontamination.

Additionally, undocumented industrial operations may take place within the Duwamish West CSO basin. Undocumented industrial activities may be an ongoing source of contaminants to sediments adjacent to the Spokane Street to Kellogg Island source control area.

However, due to the infrequent and relatively low volume of discharge from this CSO (King County 2011a), the potential for sediment recontamination associated with potential releases of COCs from the Duwamish West CSO is considered very low.

Source Control Actions

Ecology, and/or KCIW will continue to perform facility inspections within the CSO basin as part of ongoing source control efforts. Source control actions that are identified as a result of these inspections, if any, will be listed in future Source Control Status Reports.

3.1.3 Private Outfalls and Unresolved Outfalls

Outfall No.	Outfall Owner	Diameter/Material	Outfall Type
Private Outfalls			
2139	Lafarge Cement	6-inch ductile iron	Private SD
2157	General Recycling	24-inch concrete	Private SD
Outfalls of Unknown/Unresolved Origin			
2140	NA	8-inch steel	Unknown
2141	NA	8-inch steel	Unknown
2142	NA	8-inch steel	Unknown
2143	NA	8-inch steel	Unknown
2144	NA	10-inch ductile iron	Unknown
2145	NA	4-inch ductile iron	Unknown
2146	NA	6-inch ductile iron	Unknown

Outfall 2139 is operated by Lafarge Cement. Discharge from this outfall to the LDW is addressed in the Kellogg Island to Lafarge Source Control Data Gaps Report. Lafarge Cement

planned to abandon Outfall 2139 in December 2010; however, it has not been confirmed if the outfall has been abandoned (SAIC 2011).

General Recycling discharges stormwater to the LDW through one outfall (General Recycling 2011b), which is assumed to be Outfall 2157. Outfalls 2144, 2145, and 2146 are located on the General Recycling facility. It appears that these outfalls are not in use. Additional information regarding General Recycling is available in Section 3.2.8.

Evergreen Trails appears to discharge stormwater from its facility to either Outfall 2140 or 2141, based on the facility map provided in the company's Stormwater Pollution Prevention Plan (SWPPP) (Evergreen Trails 2012). Additional information regarding Evergreen Trails is available in Section 3.2.9

Potential for Future Releases to LDW Sediments

The potential for future releases to LDW sediments due to the stormwater discharges from General Recycling and Evergreen Trails is discussed in Sections 3.2.8 and 3.2.9, respectively.

Little information was available to determine whether seven outfalls of unknown or unresolved origin are abandoned or active. Active outfalls with undocumented drainage have the potential to transport contaminants present in stormwater (if any) to LDW sediments near the Spokane Street to Kellogg Island source control area.

Source Control Actions

Information needed to assess the potential for sediment recontamination associated with the unknown/unresolved outfalls was summarized in the Spokane Street to Kellogg Island Data Gaps Report (SAIC 2012). The following source control actions will be conducted to fill the identified data gaps and reduce the potential for recontamination of sediments near the Spokane Street to Kellogg Island source control area:

- Ecology or SPU will conduct an inspection during a storm event to determine if the seven unresolved outfalls (Outfall 2140 through 2146) are operational or have been abandoned.
- If discharge from these outfalls is observed, Ecology will request that the property owners conduct dye testing to determine if storm drain lines are connected to the unresolved outfalls and delineate the associated drainage areas.

Source control actions related to General Recycling and Outfall 2157 are described in Section 3.2.8. Source control actions related to Evergreen Trails are described in Section 3.2.9.

3.2 Adjacent Properties

Several facilities are located adjacent to the LDW[6] in the Spokane Street to Kellogg Island source control area; information about these facilities relevant to recontamination of LDW sediments was presented in the Spokane Street to Kellogg Island Data Gaps Report (SAIC 2012). Facilities and properties that were identified as potential sources of sediment recontamination or for which insufficient information was available to assess the potential for sediment recontamination are listed below.

Facility/Property	Address	Potential Contaminant Pathways
Riverside Mill LLC Property	3800 West Marginal Way SW 98106	Stormwater, surface runoff, spills, groundwater discharge, bank erosion/leaching
BNSF Railroad Right-of-Way	None	Stormwater, surface runoff, spills, groundwater discharge, bank erosion/leaching
Port of Seattle Terminal 103	3840 West Marginal Way SW 98106	Stormwater, surface runoff, spills, groundwater discharge
Global Diving & Salvage	3840 West Marginal Way SW 98106	Stormwater, groundwater discharge
Port of Seattle Terminal 105	4260 West Marginal Way SW 98106	Spills, groundwater discharge, bank erosion/leaching
Encore Oils (former Pacific Rendering) [a]	4034 West Marginal Way SW 98106	Stormwater, surface runoff, spills, groundwater discharge
Ferguson Enterprises	4100 West Marginal Way SW 98106	Stormwater, surface runoff, spills, groundwater discharge
General Recycling of Washington	4260 West Marginal Way SW 98106	Stormwater, surface runoff, spills, groundwater discharge, bank erosion/leaching
Former Seaboard Lumber Property	4500 West Marginal Way SW 98106	Stormwater, surface runoff, spills, groundwater discharge, bank erosion/leaching
Port of Seattle Terminal 107	4700 West Marginal Way SW 98106	Spills, groundwater discharge, bank erosion/leaching

a – Encore Oils is also affiliated with Sequential-Pacific Biodiesel, LLC. http://www.sqbiofuels.com

These facilities are discussed in more detail in Sections 3.2.1 through 3.2.10. The following sections summarize historical operations, current operations, regulatory history, environmental investigations, the potential for sediment recontamination, and source control actions to be implemented for the facilities adjacent to the LDW.

[6] As described in Section 2, Global Diving & Salvage, Encore Oils, and Ferguson Enterprises are considered as properties adjacent to the LDW due the shared storm drain systems and property histories with Terminal 103 (Global Diving & Salvage) and Terminal 105 (Encore Oils and Ferguson Enterprises).

3.2.1 Riverside Mill LLC Property

Current Operations	Boat repair and rigging, cargo and equipment transportation, storage, and rigging
Historical Operations	Steel mill; nut, bolt, railroad spike, and fastener manufacturing; metal plating and finishing; heavy-duty trailer manufacturing and repair
Tax Parcel No.	7666703290, 7666703321
Address	3800 West Marginal Way SW 98106
Facility/Site ID	2093: Seattle Steel Industrial Fasteners 4091: BASF at United Motor Freight 10931: Bob's Boats 89431534: United Motor Freight
Chemicals of Concern	PCBs, lead, petroleum hydrocarbons
Media Affected	Soil

Riverside Mill LLC owns two parcels adjacent to the LDW. Riverside Mill leases the property to Bob's Boat Shop and United Motor Freight. The property is bordered by West Marginal Way SW to the east, the West Seattle Bridge to the north, the LDW to the west, and the Burlington Northern Santa Fe (BNSF) Right-of-Way to the south.

Historical Operations

Industrial activities have been performed at this property since at least 1905. A U.S. Coast Guard base was historically located on the property (Foster 1945).

Seattle Steel Company constructed the original steel mill at the property and began operations in May 1905. Scrap steel was the principal feed stock. In 1913, Seattle Steel Company was renamed Pacific Coast Steel. Seattle Car Manufacturing originally operated at this property but moved to Renton in 1908 (HistoryLink 2001).

Bethlehem Steel purchased the steel mill from Pacific Coast Steel in 1930 (HistoryLink 2001) and initially operated as the Pacific Coast Forge Company. In the 1940s, Bethlehem Steel apparently began operating the mill under the name Bethlehem Pacific Coast Steel, and later as Bethlehem Steel.

The company manufactured nuts and bolts. The plant discharged waste cutting oil directly into the LDW and later into a sand pit located on the property. The 1945 Washington Pollution Control Commission Survey noted that the sand pit would eventually become saturated with oil, at which point the waste oil would seep into the LDW. A large amount of acid waste was generated through a galvanizing plant and dipping wire. Two tanks were used to hold the acid waste: one with an 875-cubic foot capacity (galvanizing waste) and one with a 58-cubic foot capacity (dipping waste). Acid waste in the larger tank was discharged to the sand pit every two weeks. Acid waste from the smaller tank was transferred to a settling box every 4 to 6 weeks. The settling box drained to the LDW (Foster 1945). Bethlehem Steel ceased operations in 1985 (HistoryLink 2001).

Seattle Steel purchased the facility from Bethlehem Steel in 1985. Seattle Steel manufactured bolts, railroad spikes, and steel fasteners. The facility operated a maintenance shop for metalworking and heat-treating of metal products; a machine shop used to fabricate machine parts for Seattle Steel; and fabrication areas, a metal finishing area, and a railroad spike forge. The product line was reduced to railroad spikes in 1986, which ended metal plating and finishing activities previously performed at the facility (Tetra Tech 1988). The Seattle Steel facility was also known as Birmingham Steel (GeoEngineers 1997).

Wastes generated by Seattle Steel included spent pickle liquor and spent halogenated solvent (Seattle Steel 1985) and waste petroleum naphtha. Seattle Steel recycled all of the scrap metal generated at another Seattle Steel facility. Seattle Steel maintained a sulfuric acid tank (Tank 28) and a waste acid crystal area. Waste acid was removed from the property in 1986 and the tank was decommissioned (Tetra Tech 1988).

Several storage tanks were present at the property. The storage tanks are listed in Table 11 and locations are shown on Figure 9. Facility plans from the 1960s and 1970s show that two spent acid tanks (Tank 29), the sulfuric acid tank (Tank 28), and two LPG tanks (Tank 59) were installed adjacent to the LDW at the southeast corner of the property. An 8,000-gallon standby oil UST (Tank 27) was present south of the manufacturing building and north of the current BNSF property (Bethlehem Steel 1975). Seattle Steel operated two additional USTs on the property, an 8,000-gallon diesel tank (Tank 27) and a 4,000-gallon cooling oil tank (Tank 36). The 4,000-gallon UST was installed beneath one of the buildings. The installation dates for these USTs are unknown. USTs 27 and 36 were removed in 1993 (Olympus 1993).

Seattle Steel ceased operations at this location in 1991 (GeoEngineers 1997). The name of the facility was changed to Duwamish Harbor Facilities (CEM Development 1992).

Pacific Cargo manufactured and repaired heavy-duty truck trailers at the facility in the 1990s (Ecology 1994b). Ecology records indicate that the property was redeveloped prior to June 1998 (Ecology 1998b). Information regarding the property redevelopment was not available for review.

In December 1995, a mix of oil and rainwater was accidentally discharged into a drainage ditch along the gravel road on the BNSF property via five drainage pipes from the Riverside Mill property. A remedial excavation was performed on the BNSF property (PGG 1996).

Current Operations

Bob's Boat Shop and United Motor Freight are the current operators at this property. United Motor Freight appears to sublet a portion of its facility to BASF.

Bob's Boat Shop repairs and rigs boats. Fiberglass repair, engine replacement, and painting are performed at the facility. Boats up to 30 tons in weight can be hauled out at the facility for repair (Bob's Boat Shop 2012). All work appears to be performed in its indoor repair facility.

United Motor Freight is a transportation, warehousing, and rigging company. The company transports containers from "pier to door" to points in Washington, Oregon, and British Columbia.

Warehouse space consists of 6 acres: 3 acres are covered and 3 acres are in the outdoor yard. Cranes, forklifts, and a railroad ramp are used in operations (United Motor Freight 2012).

BASF is a chemical manufacturing company. The EPA ID No. assigned to BASF became active on August 12, 2011. Information regarding BASF's operations at this property was not available for review.

Regulatory History

Tetra Tech, on behalf of EPA, conducted a RCRA compliance evaluation inspection at Seattle Steel on May 18, 1988. During the inspection the following wastes were found: acid crystals, caustic soda, PCB oil-bearing electrical capacitors, and unidentified sludge. Tetra Tech reported seven violations to EPA regarding improper storage, labeling, and inspection of hazardous wastes (Tetra Tech 1988). In 1998, Ecology indicated that cleanup of hazardous wastes generated at the property prior to redevelopment was complete and the RCRA Identification number (WAD980979819) was no longer needed for the property (Ecology 1998b).

In June 1994, Ecology determined that no further actions were necessary at the property with regard to the removal of the 4,000- and 8,000-gallon USTs. An NFA letter was issued to the property owner, SSI Real Estate (Ecology 1994c).

On October 13, 2011, EPA sent a Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Section 104(e) Request for Information Letter to Riverside Mill regarding its operations at the property (EPA 2011). Information from Riverside Mill's response that is pertinent to source control will be included in a Source Control Status Report.

Environmental Investigations and Cleanups

Two environmental investigations and cleanups have been performed at this property. Additional information is provided in the Spokane Street to Kellogg Island Data Gaps Report (SAIC 2012).

The 8,000-gallon diesel UST (Tank 27) was removed in June 1993. Soil samples collected from the stockpile and the bottom of the excavation were analyzed for diesel-range hydrocarbons, which were not detected in any of the samples. The excavated soil was used as backfill (Olympus 1993).

The 4,000-gallon cooling oil UST (Tank 36) was removed in August. In November 1993 a remedial excavation was performed. Approximately 5 cubic yards were excavated. One confirmation sample was collected and analyzed for heavy oil-range hydrocarbons, which exceeded the 1991 MTCA Method A cleanup level. Approximately 40 cubic yards of soil, from the August and November excavations, were removed from the property (Olympus 1993).

After reviewing the cleanup report and performing an inspection, Ecology issued an NFA designation with regard to the UST removals (Ecology 1994b).

An Owner/Agency Certification of Environmental Remedial Action submitted to Ecology in August 1999 indicates that soil contaminated with PCBs and lead was excavated and removed

from the property. No additional information regarding these removal activities was available for review (EPI 1999).

Potential for Sediment Recontamination

The potential for sediment recontamination via this property is summarized below. Sediment samples have not been collected in the LDW adjacent to or downstream of the property. The quality of the sediment in this area is unknown.

- Stormwater and surface runoff from at least the southern portion of the property appears to be conveyed to a drainage ditch on the adjacent BNSF property, which appears to discharge to the LDW. Contaminants in stormwater/surface runoff, if any, could recontaminate LDW sediments.
- United Motor Freight and Bob's Boat Shop perform overwater activities. Spills along the shoreline loading/unloading areas have the potential to enter the LDW. Spills from loading and unloading activities are a potential pathway for sediment recontamination.
- Previous environmental investigations indicate that soil contaminated with petroleum hydrocarbons, PCBs, and lead has been removed from the property. Records describing the nature and extent of the PCB and lead contamination were not available for review. Groundwater beneath the property has not been evaluated. The potential for sediment recontamination via groundwater discharge is unknown.
- The shoreline of the property is reinforced with riprap. Contaminants in bank soils, if any, may leach to the LDW. The potential for sediment recontamination via leaching is unknown.

Source Control Actions

- SPU will perform an initial inspection at the facility to verify compliance with applicable regulations and source control best management practices (BMPs).
- Ecology will request information from the property owner regarding the 1999 excavation and removal of soil contaminated with PCBs and lead, to evaluate the potential for sediment recontamination via the groundwater discharge pathway.

3.2.2 BNSF Railroad Right-of-Way

Current Operations	Railroad right-of-way
Historical Operations	Railroad right-of-way
Tax Parcel No.	7666703320
Address	None
Facility/Site ID	None
Chemicals of Concern	Petroleum hydrocarbons
Media Affected	Soil

This parcel is located to the south of the Riverside Mill property and to the north of Terminal 103. The parcel is bordered by West Marginal Way SW to the west and the LDW to the east (Figure 9).

Historical and Current Operations

Based on the aerial photograph review (SAIC 2012), a railroad spur has been present on the property since at least 1936. A rail trestle drawbridge spans the LDW from the eastern border of the right-of-way to the western shoreline of Harbor Island. The property is gravel-covered beneath the railroad tracks. The property is paved at the western side, adjacent to West Marginal Way SW. The remainder of the property is unpaved. Concrete footings are present at the shoreline to support the railroad trestle. A small area of exposed soil is present at the shoreline.

A drainage ditch is present along a gravel road on the property (PGG 1996). The ditch, which appears to be unlined, discharges to the LDW.

Regulatory History

On December 1, 2010, EPA sent a CERCLA Section 104(e) Request for Information Letter to the BNSF Railway Company with regard to the company's operations throughout the LDW (EPA 2010d). Information from BNSF Railway Company's response that is pertinent to source control will be included in a Source Control Status Report.

Environmental Investigations and Cleanups

In December 1995, a mix of oil and stormwater was accidentally discharged into a drainage ditch along the gravel road on the BNSF property via five drainage pipes from the Riverside Mill property. A remedial excavation was performed to remove oil-contaminated soil. Approximately 20 tons of soil were removed from the BNSF property. Seventeen confirmation soil samples were collected and analyzed for petroleum hydrocarbon identification. Diesel- and heavy oil-range hydrocarbons were identified at concentrations below MTCA cleanup levels (PGG 1996). Laboratory data were not available for review.

In July 2006, diesel fuel was spilled when a train collided with a tractor-trailer, damaging a saddle tank. The accident apparently occurred near one of the driveways onto the Riverside Mill property. Approximately 75 to 100 gallons of fuel were spilled. The release was contained and approximately 6 tons of diesel-contaminated soil was excavated. The contaminated soil was removed from the property (Emergency Response & Training Solutions 2006). Confirmation soil samples were not collected. The spill did not flow to the storm drains on the Riverside Mill property or to the drainage ditch on the BNSF property (Ecology 2006c).

Potential for Sediment Recontamination

The potential for sediment recontamination via this property is summarized below. PCB concentrations exceeded the SQS in a surface sediment sample collected immediately upstream of the property. Sediment samples have not been collected adjacent to or downstream from the property.

- Stormwater enters a drainage ditch on the property, which appears to discharge to the LDW. Contaminants in stormwater, if any, may represent a potential source for sediment recontamination.
- If a spill occurs at the property, contaminants may infiltrate the ground surface. Two remedial excavations have been performed to remove soils contaminated by spilled products. If a spill occurs during a storm, contaminants may be entrained in stormwater, rather than infiltrate the ground surface. Contaminants that have infiltrated the ground surface may be conveyed to the LDW via groundwater discharge. Cleanup activities in response to past spills appear to have been immediate and thorough, minimizing the potential impacts to the property and the LDW.
- The bank at the property is reinforced with concrete beneath the railroad trestle. Exposed soil is present to the south of the railroad trestle. Contaminants in bank soil, if any, may represent a potential source for sediment recontamination.

Source Control Actions

- Ecology or SPU will determine whether the drainage ditch discharges to the LDW and will identify if stormwater runoff is conveyed to the drainage ditch from Riverside Mill or other nearby facilities/properties.

3.2.3 Port of Seattle Terminal 103

Current Operations	Support for industrial marine operations, marine construction equipment storage and maintenance, loading/unloading and storage of aggregate
Historical Operations	Storage yard for marine construction equipment
Tax Parcel No.	7666703440
Address	3840 West Marginal Way SW 98106
Facility/Site ID	2302559: Glacier Northwest 7754458: Northwest Aggregates 94648691: General Construction
Chemicals of Concern	Arsenic, lead
Media Affected	Soil, groundwater

Terminal 103 is adjacent to the LDW and consists of an 8.07-acre parcel, which is owned by the Port of Seattle. Terminal 103 is bordered by the LDW to the east, the Terminal 105 Park to the south, Global Diving & Salvage and West Marginal Way SW to the west, and the BNSF Railroad Right-of-Way to the north.

Historical Operations

This property was developed around 1920. Since 1936 it has been used for the storage and maintenance of construction-related equipment (GeoEngineers 1997). The marine construction base was operated by Fletcher General Construction and General Construction. General Construction continues to operate the base at Terminal 103, as a tenant to the Port of Seattle.

Parcel 3442, currently occupied by Global Diving & Salvage (Section 3.2.4), was historically part of Terminal 103. The Port of Seattle sold the property to Marginal Group LLC in 1998. General Construction leased parcel 3442 prior to the sale (Port of Seattle 1998).

Current Operations

The Port of Seattle purchased the property and improvements from Fletcher General Construction in 1997 (General Construction 2009). The property is leased to General Construction Company and CalPortland Seattle Aggregate Yard (CalPortland, formerly known as Northwest Aggregates). Figure 10 shows the locations of the Terminal 103 tenants.

Terminal 103 supports industrial marine operations that are water-dependent. A marine construction base, operated by General Construction, is present on the northern portion of the terminal. Construction barges, mounting cranes, dock construction equipment, and dredging equipment are moored and maintained at the northern shoreline. A 330-foot long dock is present for transferring construction equipment and gear to and from land. An aggregate storage yard, operated by CalPortland, is located on the southern portion of the terminal. A 50-foot long loading ramp is present on the southern portion of the terminal. The loading ramp is used to unload bulk construction materials, such as sand and gravel, from barges. Six dolphins are available at the shoreline for barge moorage.

The bank at Terminal 103 is stabilized and reinforced with riprap adjacent to General Construction (Port of Seattle 2009). The shoreline of the terminal is constructed with metal sheetwall adjacent to CalPortland (CalPortland 2009).

In late 2006 and early 2007, Terminal 103 underwent a repair for the moorage of the cargo terminal. The work included the replacement of eight steel support pilings for the barge unloading ramp and conveyor system, the removal of the old steel 12-inch pipe piling and cross bracing on the piling, and the installation of new 12-inch steel pipe piling and bracing at the same location (City of Seattle 2006).

Stormwater

Stormwater from Terminal 103 is discharged to the LDW through four outfalls (Outfalls 8132 through 8135). The storm drain system at the terminal includes three manholes, 13 catch basins, two gravel drainage ditches, one monitoring sump, and one settling vault with a gravel swale. All catch basins and manholes are equipped with filter socks (Figure 11).

Stormwater at the General Construction facility is conveyed to the LDW via Outfalls 8132 and 8133. At least two storm drain catch basins, numbers 5272 and 5273, on the Global Diving & Salvage property (Section 3.2.4) appear to be connected to the storm drain system at the facility (Figure 11).

Stormwater at the CalPortland facility is conveyed to the gravel drainage channels, which are connected to Outfalls 8134 and 8135 (Figure 11) (Phoinix 2008). According to CalPortland's SWPPP, stormwater and process water are contained behind the metal sheetwall at the shoreline. Water can flow over the sheetwall (CalPortland 2009).

In March 2008, the Port of Seattle adopted Resolution No. 3596. This resolution prohibits the construction, use, maintenance, or continued existence of illicit connections to the storm drain system at Terminal 103 and other Port of Seattle properties, prohibits illicit discharges to surface water or the storm drain system, and prohibits illegal dumping on Port of Seattle property. Illicit connections to the storm drain system include sanitary sewer and floor drain connections (Port of Seattle 2008).

CalPortland has primary responsibility for maintaining the storm drain system at its facility on the terminal, in accordance with its NPDES permits. This includes cleaning and maintaining catch basins. General Construction is not required to obtain coverage under the ISGP, due to its SIC code. General Construction has completed a SWPPP that complies with City of Seattle stormwater pollution prevention code, which is required of all Port of Seattle tenants (Port of Seattle 2012b).

General Construction Company

General Construction began operating at this location in the 1920s. General Construction became a tenant to the Port of Seattle in February 1997, following the sale of the property to the Port of Seattle (General Construction 2009).

The company stores and maintains marine construction equipment at the property. Products used in the operation/maintenance of the heavy equipment include petroleum products, batteries, antifreeze, solvents, brake pads, and rubber tires. Other types of potential contaminants stored at the facility include fuels, paints, scrap metals, and cleaning products. Three cranes and six forklifts are used at the property (General Construction 2009).

General Construction maintains a wash bay, fueling station, vehicle repair shop, new and used oil storage stations, and a drum storage area (Phoinix 2008). Fletcher General Construction installed an oil/water separator in 1994. The oil/water separator is plumbed to the wash bay and the sanitary sewer (General Construction 2009).

CalPortland Seattle Aggregate Yard

In July 1995, Northwest Aggregates began leasing the southern portion of this property from Fletcher General Construction. Lone Star Northwest, Inc. was the parent company of Northwest Aggregates at this time (Lone Star 1995). In December 1999, Lone Star changed its name to Glacier Northwest (Glacier Northwest 2000). Between December 1999 and approximately 2009, the company operated at this location as Glacier Northwest Aggregates and Glacier Northwest, Seattle Aggregate Yard. Glacier Northwest was acquired by CalPortland in 2006. Since approximately 2009, the facility has been known as the CalPortland Seattle Aggregate Yard.

Aggregate is stockpiled at the yard and stored in bins after it is unloaded from barges moored at the terminal. Front end loaders are used to transport aggregate from the barges to the conveyer system and to load purchased aggregate into trucks. Stockpile aggregate is the only material at the facility that is exposed to stormwater. Small quantities of lubricating oils and grease are stored at the facility. Equipment maintenance and fueling operations are performed by outside

contractors (CalPortland 2009). A vehicle wheel wash is used at the entrance to the facility (Phoinix 2008).

Erosion and sediment control BMPs are employed at the facility to control discharge of sediment to the LDW. CalPortland inspects erosion and sediment control systems every seven days and after any storm that produces more than 0.5 inch of rain in 24 hours (CalPortland 2011).

Regulatory History

In November 1992, Fletcher General Construction was issued NPDES Permit number SO300227. When Glacier Northwest (now Northwest Aggregates) began leasing the southern portion of the property in July 1995, Fletcher General and Northwest Aggregates requested an amendment to the facility's NPDES permit to show Northwest Aggregates as the operator of the facility (Lone Star 1995).

In December 1994, Fletcher General Construction was issued NPDES Permit number WAG503222 for discharge of process water or stormwater associated with sand and gravel operations to the LDW (Ecology 1994d). Fletcher General also held NPDES Permit number WAG503215. Both of these permits were determined to be unnecessary because discharges from the facility were also covered under NPDES Permit number SO300227 (Fletcher General 1995).

In 1996, Lone Star requested termination of coverage under NPDES Permit number SO300227 (Lone Star 1996). Ecology denied the request because Ecology determined Glacier Northwest to be a significant contributor of pollutants to the LDW (Ecology 1996a).

Ecology performed a stormwater quality compliance inspection of Glacier Northwest in August 2002. A wiper was installed on the conveyer belt used to offload materials from barges to eliminate build up under the edge of the belt and minimize spillage of materials into the LDW (Ecology 2002d).

On September 11, 2002, a barge owned by the Island Tug & Barge Company capsized offshore of Glacier Northwest. The barge was carrying 2,000 tons of crushed aggregate material, which was spilled into the LDW. After this event, Island Tug & Barge recovered their capsized barge, and USACE directed Island Tug & Barge to recover as much of the spilled material from the river as possible without disturbing the sediments. A total of 500 tons of aggregate was recovered and transported to one of Glacier Northwest's upland facilities (Glacier Northwest 2002). No legal action was taken because the discharge of the material was deemed to be an accident (USACE 2002).

Ecology performed a stormwater quality compliance inspection of Glacier Northwest on September 11, 2002, after the barge owned by Island Tug & Barge had capsized earlier that day. During this inspection another barge, also owned by Island Tug & Barge, was in the process of being unloaded. The inspector noticed that there were holes in the side of the barge that allowed material to fall through the lip of the deck and into the river. Turbidity was observed once the materials entered the water. The inspector determined that the SWPPP for the facility be amended to incorporate source control methods to prevent material discharge to the LDW and that facility operations be changed to eliminate the possibility of barges capsizing during low tides (Ecology 2002e).

Ecology performed a stormwater compliance inspection of Glacier Northwest in November 2006. During the first and second quarters of 2006, all parameters measured in stormwater discharge were above benchmark levels. The catch basins were not being cleaned on a regular basis. Due to the high permeability of the gravel-covered property, there was a high potential that spills from fueling and equipment maintenance could be discharged to the LDW (Ecology 2006b).

Between January 2009 and December 2010, EPA sent CERCLA Section 104(e) Request for Information Letters to General Construction, the Port of Seattle, and Fletcher General Construction regarding operations at Terminal 103 (EPA 2009a, 2010a, 2010b). The responses were requested from EPA for inclusion in the Spokane Street to Kellogg Island Data Gaps Report; however, the responses were not available at that time. Information from the responses that is pertinent to source control will be included in a Source Control Status Report.

Environmental Investigations and Cleanups

Two environmental investigations and cleanups have been performed at the property and are summarized below. Additional information regarding these investigations and cleanups is available in the Spokane Street to Kellogg Island Data Gaps Report (SAIC 2012).

Prior to the removal of the USTs (Tanks 7, 8, and 9) from the property in May 1994 (Figure 9), Fletcher General Construction advanced 13 borings around the USTs to evaluate soil conditions. Diesel-range hydrocarbons were detected at concentrations below MTCA cleanup levels in soil near Tank 7 (10,000-gallon diesel UST). The soil removed from the Tank 8 and 9 (600- and 6,000-gallon gasoline USTs) excavations was used as backfill. Soil removed from the Tank 7 excavation was removed from the property. In groundwater, concentrations of lead and diesel-range hydrocarbons exceeded the MTCA Method A cleanup levels (Coastal Tank Cleaning 1994).

A Phase I Environmental Site Assessment (ESA) was performed at the Fletcher General Construction property in 1996. The Phase I ESA indicated that a potential for groundwater and/or soil contamination existed at the property (GeoEngineers 1997).

The Phase II ESA was conducted to characterize potential soil and groundwater contamination on the property, including the portion that is now occupied by Global Diving & Salvage. Arsenic exceeded the current MTCA Method B cleanup level in one soil sample. Arsenic, chromium, and lead were detected in groundwater (GeoEngineers 1997). Lead concentrations exceeded the MTCA Method A cleanup level and the draft groundwater-to-sediment screening level. Arsenic concentrations exceeded the MTCA Method B cleanup level but were below the draft groundwater-to-sediment cleanup level. Petroleum hydrocarbons and metals were detected in catch basin solids samples (GeoEngineers 1997). None of the metals concentrations exceeded the storm drain screening values (SAIC 2012).

COC	Soil (mg/kg)	Groundwater (µg/L)
Metals		
Arsenic	♦	♦
Lead		●♦

● Chemical detected at a concentration that exceeds the draft soil-to-sediment or groundwater-to-sediment screening level

♦ Chemical detected at a concentration that exceeds the MTCA Method A or B cleanup level

Potential for Sediment Recontamination

PCB and BEHP concentrations exceeded the SQS in a surface sediment sample collected near the property. The BEHP concentration in sample DR076 also exceeded the CSL. Contaminants in products, materials, and scrap metals stored outdoors at Terminal 103, if any, may become entrained in stormwater and conveyed to the LDW. The potential for sediment recontamination associated with operations at Terminal 103 is summarized below.

- General Construction: Metals concentrations in historical catch basin solids samples were below storm drain screening values. Source control BMPs implemented by General Construction are unknown. The potential for sediment recontamination via this pathway is low.
- CalPortland: Stormwater runoff from the CalPortland facility is contained behind the metal sheetwall at the shoreline and can flow over the wall (CalPortland 2009). Based on the SWPPP, CalPortland appears to maintain appropriate source control BMPs to prevent stormwater contamination. The potential for sediment recontamination via this pathway is low.
- Overwater activities are performed by CalPortland and General Construction. Spills to the LDW may occur during these activities. Aggregate spills to the LDW may be harmful to the overall river environment but are not likely to represent a potential source of sediment recontamination. Spills from General Construction's activities may represent a potential source of sediment recontamination, particularly if scrap metals were spilled. The potential for sediment recontamination via this pathway is low to moderate.
- An environmental investigation at the property confirmed the presence of petroleum hydrocarbons and metals in soil and groundwater. Lead concentrations in groundwater exceed the MTCA Method A cleanup level and the draft groundwater-to-sediment screening level. Metals concentrations in sediment samples collected near Terminal 103 have not exceeded the SQS or CSL, indicating that the potential for sediment recontamination via this pathway is low.

Source Control Actions

- The General Construction facility has not been inspected. A facility inspection will be performed to verify compliance with applicable regulations and source control BMPs.
- CalPortland has not been inspected since 2006. A facility inspection will be performed to verify continued compliance applicable regulations and source control BMPs.

3.2.4 Global Diving & Salvage

Current Operations	Marine construction and infrastructure support services
Historical Operations	Storage yard for marine construction equipment
Tax Parcel No.	7666703442
Address	3840 West Marginal Way SW 98106
Facility/Site ID	None
Chemicals of Concern	Arsenic
Media Affected	Groundwater

Global Diving & Salvage is located at the northwest corner of Terminal 103 (Figure 9). Parcel 3442 was historically owned by the Port of Seattle and was sold to the current property owner in February 1998. The parcel is bordered by the BNSF Railroad Right-of-Way to the north, Terminal 103 to the east and south, and West Marginal Way SW to the west. Two buildings are present on the property, a 1,152-square foot (sq ft) storage building constructed in 1953 and an 8,624 sq ft office built in 1929.

Historical Operations

This property was part of Terminal 103 until February 1998. Additional information regarding historical operations at the property is provided in Section 3.2.3.

Current Operations

Global Diving & Salvage is a diving contractor providing marine construction and infrastructure support services. The company's northwest region and corporate office operate at this facility (Global Diving & Salvage 2012).

The outdoor storage area is paved. Vehicle fueling and washing is performed outdoors. Two 55-gallon aboveground storage tank (ASTs) containing gasoline and diesel are used in the fueling area (SPU 2006e). Materials typically stored on site include the following items (Grennan 2006):

- Three 55-gallon barrels of diesel fuel,
- Six 6-gallon jugs of diesel fuel,
- One 55-gallon barrel of gasoline,
- Eight 6-gallon jugs of gasoline,
- Twelve 6-gallon jugs of mixed gas,
- One 15-gallon barrel of solvents,
- Four 55-gallon barrels of marine engine and hydraulic oils, and
- Twenty 5-gallon pails of hydraulic oil.

A wash area with an oil/water separator that discharges to the sanitary sewer is located inside the storage building. There are four catch basins located on the site. All the catch basins are

equipped with outlet traps (SPU 2006e). Stormwater from the property appears to discharge to the LDW via the Terminal 103 storm drain system, based on the Terminal 103 Storm Drain Plan. At least two storm drain catch basins, numbers 5272 and 5273, on the Global Diving & Salvage property appear to be connected to the storm drain system at the General Construction facility (Figure 11).

Regulatory History

SPU performed an initial inspection at Global Diving on July 20, 2006. A variety of waste materials were being stored onsite for disposal, including antifreeze, batteries, caustic bases, dyes and inks, fluorescent light tubes, paints, pesticides, petroleum oils, photo chemicals, phthalate-containing materials, and PCB-containing materials. The materials were stored inside the storage building in waste drums. Spill materials were kept on site, but a spill plan had not been developed for the facility. Evidence of soap was observed in one of the catch basins (SPU 2006e). SPU identified corrective actions to prepare and post a spill plan, provide secondary containment for hazardous materials and fuel storage areas, and to properly label waste containers (SPU 2006f). SPU re-inspected the facility on October 26, 2006. SPU determined that Global Diving satisfactorily completed the corrective actions and was found to be in compliance (SPU 2006g).

On April 23, 2009, EPA sent a CERCLA Section 104(e) Request for Information Letter to Marginal Group LLC regarding its operations at the property (EPA 2009e). The response was requested from EPA for inclusion in the Spokane Street to Kellogg Island Data Gaps Report; however, the response was not available at that time. Information from Global Diving & Salvage's response that is pertinent to source control will be included in a Source Control Status Report.

Environmental Investigations and Cleanups

The Phase II ESA that was performed in November 1996 at Terminal 103 included this property. At the time of the ESA, this property was still owned by the Port of Seattle. Soil borings were advanced on the property. Petroleum hydrocarbons, cadmium, chromium, lead, and mercury were detected in soil at concentrations below MTCA cleanup levels and the draft soil-to-sediment screening levels (SAIC 2012). Arsenic and lead were detected in groundwater; arsenic exceeded the MTCA Method B cleanup level. Additional information regarding the Phase II ESA is provided in Section 3.2.3.

COC	Groundwater (µg/L)
Metals	
Arsenic	10.6♦

♦ Chemical detected at a concentration that exceeds the MTCA Method A or B cleanup level

Potential for Sediment Recontamination

The potential for sediment recontamination associated with operations at Global Diving & Salvage is summarized below:

- Global Diving & Salvage stores some petroleum products and solvents outdoors. These materials have the potential to come into contact with stormwater. The facility complied with SPU's corrective actions in 2006, which included providing secondary containment for hazardous materials and fuel storage areas (SPU 2006g). If the Global Diving & Salvage has continued to maintain appropriate BMPs for source control, the potential for sediment recontamination via the stormwater pathway is low.
- Environmental investigations performed at the property in 1996 indicated that petroleum hydrocarbons and metals are present in soil and groundwater beneath the property. Arsenic exceeded the MTCA Method B cleanup level in one groundwater sample. Metals concentrations in sediment samples collected near the property did not exceed the SQS or CSL. The potential for sediment recontamination via this pathway is low.

Source Control Actions

- Ecology will request that Global Diving & Salvage provide information to determine if catch basins at the facility are plumbed to the storm drain system at Terminal 103 or the SW Dakota Street SD system.
- Global Diving & Salvage has not been inspected for compliance with source control BMPs since 2006. An inspection of the facility will be performed to verify that the company continues to be in compliance.

3.2.5 Port of Seattle Terminal 105

Current Operations	Public park
Historical Operations	Bulk oil tank facility, marinas, shipyard, small boat building, steel mills and other metalworking, tug, barge and automobile maintenance and repair, rock and shell grinding, foundry, fertilizer plant
Tax Parcel No.	Terminal 105 Park: 7666703460, 7666703532 Former Terminal 105: 7666703462, 7666703464, 7666703530, 7666703540,7666703630
Address	4014 West Marginal Way SW 98106
Facility/Site ID	21179265: Duroboat Manufacturing Company 24172765: Crowley Marine Services 44375557: Bird Johnson Port 53456833: Puget Sound Tug & Barge Company 66711778: Seattle Port Terminal 105 76453385: HW Blackstock Co 97821669: The Boeing Company, Terminal 105
Chemicals of Concern	PCBs, PAHs, BEHP, arsenic, cadmium, copper, lead, mercury, silver, zinc, petroleum hydrocarbons
Media Affected	Soil, groundwater, stormwater, storm drain solids

The Port of Seattle operates the Terminal 105 Park, which includes parcels 3460 and 3532. The L-shaped park property is bordered by the LDW to the east, Pacific Rendering and Ferguson to

the south and the west, General Recycling to the southwest, West Marginal Way SW to the west, and Terminal 103 to the north. There are no buildings on the property.

Historical Operations

Terminal 105 historically included the properties listed below. The Port of Seattle acquired these properties between 1967 and the early 1980s. The Port of Seattle began using Terminal 105 for handling of logs and containers and berthing when a portion of the former terminal was acquired in 1967 (Port of Seattle 1985b, 1989). Development of Terminal 105 began in 1982 (Seattle Times 1982). Current facilities and operations at these properties are shown on Figure 10 and discussed in the sections listed below.

Parcel(s)	Year Sold	Current Occupant
7666703464	1997	Encore Oils (Section 3.2.6)
7666703462 7666703530	1997	Ferguson Enterprises (Section 3.2.7)
7666703540 7666703630	2002	General Recycling of Washington (Section 3.2.8)

Industrial activities have been performed at the former Terminal 105 property since the 1910s. Little information was available for review about most historical activities. Historical operators and activities are listed in Table 12. Additional information is summarized by parcel in the following sections.

Parcels 3460 and 3532 (Currently Terminal 105 Park)

From approximately 1969 to the 1980s, Liquid Disposal Corporation operated a bulk oil tank facility at the northeast corner of this property, immediately adjacent to the LDW. Four USTs (Tanks 13 through 16) were present at the facility (Figure 9). It is not known if these tanks remain at the property or if they have been removed (SoundEarth 2011b).

From the 1940s to 1983, Riverside Marina was present on parcel 3532 (Figure 12) (Kennedy/Jenks 1991b).

Parcel 3464 (Currently Encore Oils)

From 1984 to 1986, approximately 10,000 cubic yards of soil excavated from Terminal 5[7] was stored at parcel 3464 (Figure 12). The soil was removed in 1986 and used as cover material at Coal Creek Landfill (Kennedy/Jenks 1991b).

[7] Approximately 20,000 cubic yards of soil were excavated from Terminal 5 and stockpiled at Terminal 105: approximately 10,000 cubic yards of soil were stockpiled on parcel 3464 and approximately 10,000 cubic yards of soil were stockpiled on parcel 3530 (Kennedy/Jenks 1991b).

From approximately 1980 to 1988, Duroboat Manufacturing (Duroboat) operated at 1140 SW Dakota Street. Duroboat manufactured small aluminum boats (Port of Seattle 1989; Kennedy/Jenks 1991b). Prior to November 1988, Building W-13, a large warehouse (approximately 320,000 sq ft) spanned parcels 3464 and 3462 (Figure 12). A fire destroyed approximately 25,600 sq ft of the building in November 1988. Duroboat was in the process of moving out of the building at the time of the fire (Port of Seattle 1988). The remaining portion of the building was demolished in December 1988 (Port of Seattle 1989). Duroboat was operating at the property again in 1991 (Kennedy/Jenks 1991a), but the duration of its operations is unknown.

All historical buildings on this parcel were demolished by 1988 (Kennedy/Jenks 1991b).

Parcels 3462 and 3530 (Currently Ferguson Enterprises)

From the 1920s to 1934, Marine Construction Company, a shipyard, operated on the western portion of parcel 3530. Equipment at the property included a marine railway, launching skidways, and an electric traveling crane. The structures were destroyed during a storm in 1934 and not rebuilt (Kennedy/Jenks 1991b). Seattle Lumber Milling Company also operated at this location during this time (GeoEngineers 1990).

From the 1940s to 1983, a small marina and boatyard, which included docks and a boat-lift elevator, operated on parcel 3530 (Kennedy/Jenks 1991b).

In 1953, Soule Steel Company purchased Building I-1 (Figure 12). Coolidge Propeller Company, the successor to Bird Johnson, purchased the building in 1968 (GeoEngineers 1990). The Port of Seattle bought the building in 1975.

In 1983, the Port of Seattle initiated an improvement project at Terminal 20. Dredge spoils from the Terminal 20 improvements were disposed of at Terminal 105 on parcel 3530 (Figure 12). The elevation of the area was increased by approximately 4 feet (SoundEarth 2011b). The EPA determined that PCB concentrations in the dredge spoils were too high to allow for open-water disposal of the spoils; therefore, approximately 16,000 cubic yards of dredge spoils were disposed of at Terminal 105 in January 1983 (Port of Seattle 1985a). In 1998 or 2004, the Ferguson Enterprises warehouse was built in this area. The PCB-contaminated dredge spoils may have been removed during warehouse construction as the base of the building does not appear to be 4 feet higher than the surrounding property.

From 1984 to 1986, approximately 10,000 cubic yards of soil excavated from Terminal 5[8] was stored at parcel 3530 (Figure 12). The soil was removed in 1986 and used as cover material at Coal Creek Landfill (Kennedy/Jenks 1991b).

The Port of Seattle sold these parcels to the Lipsett Company LLC in July 1997.

[8] See footnote 7, above.

Parcels 3540 and 3630 (Currently General Recycling)

In the 1910s, Erickson Shipbuilding, Elliott Bay Yacht & Engine Company, Elliott Bay Shipbuilding, and North Pacific Shipbuilding operated on these parcels. The companies' operations extended onto present-day parcels 3670 (currently Herring's House Park), 3680 (currently Evergreen Trails), and 9018 (currently General Recycling) (Port of Seattle 1985c; SoundEarth 2011b).

From the 1920s to the 1940s, Manufacturers Mineral Company and Waterman Slate Company operated on the south side of SW Idaho Street (parcel 3630). Rock and shell grinding was performed at the northeast corner of the property, adjacent to the LDW (Figure 12) (GeoEngineers 1990; SoundEarth 2011b). Waste fine sands were used as fill along the LDW shoreline. Cunningham Steel Foundry also operated in this area and used waste foundry sand as fill along the shoreline (Foster 1945).

From the 1920s to 1940s, Manganese Products, Inc., a fertilizer plant producing up to 200,000 tons per year of calcium magnesium phosphate fertilizer, operated at the property, using 4260 West Marginal Way SW as its operating address (Manganese Products Inc. 1948; Kennedy/Jenks 1991b).

From the 1920s to 1950s, Pacific Stove and Foundry Company operated on parcel 3540 (Figure 12). The facility included a lumber shed, fuel yard, enameling building, stove foundry, warehouse, manufacturing building, and spray-painting building (Kennedy/Jenks 1991b). The foundry maintained small 50-gallon tanks of caustic cleaners, sulfuric acid, muriatic acid, sodium borate, cyanide, and zinc salts, all of which were used in metal treatment. The tanks were cleaned once a year and the contents of the tanks were dumped onto an adjacent lot (Foster 1945). Pacific Stove and Stamping Company also operated in this location (GeoEngineers 1990).

From the 1920s to 1950s, Wallace Bridge and Structural Steel Company, which included painting, plating, and machining shops, operated on parcel 3630 (Figure 12) (Kennedy/Jenks 1991b; SoundEarth 2011b).

From 1970 to 1975, parcel 3630 was a log storage yard. Container storage in this area began in approximately 1978. In the 1990s, the storage lot was operated by American President Lines (APL) (Kennedy/Jenks 1991b).

From 1969 to 1994 or 1998, Crowley Marine Services[9] leased the waterfront areas for docking, loading/unloading, and maintenance of tugs and barges. The maintenance activities consisted of cutting, welding, and servicing (Kennedy/Jenks 1991b; Crowley 1999, 2008). Prior to 1990, Crowley removed "a considerable volume" of surface soil to remove sandblasting grit from the

[9] Drummond Lighterage owned parcel 9018 (currently General Recycling) from 1969 to 2001. Drummond Lighterage was a subsidiary of Puget Sound Tug & Barge from 1929 to 1984, when it merged into Puget Sound Tug & Barge. Puget Sound Tug & Barge merged into Crowley Marine Services in 1992 (Cascadia 2008). In the 1970s, the property leases were administered through Crowley's former subsidiaries, Hawaiian Marine Lines, Inc. and Pacific Alaska Line, Inc. (Crowley 2008).

property and removed approximately 80 to 100 cubic yards of soil that was contaminated by waste oil spilled to the ground surface (GeoEngineers 1990).

Boeing began operating at Terminal 105 in approximately 2002. Information regarding the operations at Terminal 105 was not available for review; however, in April 2002 Boeing requested to have the EPA ID assigned to Crowley (WAD980976310) reactivated. The waste stream was water with flammable fuels, benzene, and petroleum distillates (Boeing 2002).

Underground and Aboveground Storage Tanks

Fifteen storage tanks were installed on Terminal 105 property, including 13 USTs and two ASTs. Seven USTs have been removed, one UST was closed-in-place, and the status of four USTs and two ASTs is unknown. The locations of these storage tanks are shown on Figure 9. Additional details for these storage tanks are provided in Table 11.

Current Operations

The Terminal 105 Park is open to the public. Through the park, the public has access to 220 feet of shoreline, a boat launch, and a 50-foot fishing pier (Figure 10). A salmon habitat is located within the park (Port of Seattle 2012a). A drainage channel flows through the park from West Marginal Way SW at the western side of the park to the LDW. The stream is tidally influenced (Phoinix 2007b). Outfalls 2149, 2148, and 2150 (from west to east, respectively) are located in the drainage channel. The park has been present since at least 1990 (Kennedy/Jenks 1991b). Between 1994 and 1995, approximately 12,500 cubic yards of fill material were excavated and removed from the park (Port of Seattle 1995).

Regulatory History

Ecology performed a Dangerous Waste Compliance inspection at Crowley in November 1998. Crowley was in the process of moving its operations from Terminal 105 to another facility at Pier 17. In January 1999, Crowley notified Ecology that waste was no longer generated at the Terminal 105 facility (Ecology 1998c; Crowley 1999).

EPA has sent CERCLA Section 104(e) letters to several companies which historically operated on parcels at former Terminal 105.

Parcel(s)	Date of Letter(s)	Responsible Party	Reference
7666703460	01/29/09	Fraser, Inc.	EPA 2009c
		GDS Holding Company	EPA 2009b
		Global Diving & Salvage	EPA 2009d
	9/17/10	Port of Seattle	EPA 2010a
7666703532 7666703464 7666703462	9/17/10	Port of Seattle	EPA 2010a

Parcel(s)	Date of Letter(s)	Responsible Party	Reference
7666703530	07/17/08	Key Industries, Inc.	EPA 2008m
			EPA 2009f
	9/17/10	Port of Seattle	EPA 2010a
7666703540	07/17/08	Harbor Marine Enterprises	EPA 2008e
		Puget Sound Tug & Barge	EPA 2008d
	9/17/10	Port of Seattle	EPA 2010a
7666703630	07/17/08	American President Lines	EPA 2008l
		Northwest Container Services	EPA 2008g
	9/17/10	Port of Seattle	EPA 2010a

Information from the Puget Sound Tug & Barge response[10] to the request (Cascadia 2008; Crowley 2008) was reviewed and included in this SCAP. The remaining responses were requested from EPA for inclusion in the Spokane Street to Kellogg Island Data Gaps Report; however, the responses were not available at that time. Information from the parties' responses that is pertinent to source control will be included in a Source Control Status Report.

Environmental Investigations and Cleanups

Several environmental investigations have been conducted at the Terminal 105 property. Additional information is provided in the Spokane Street to Kellogg Island Data Gaps Report (SAIC 2012). A summary of the chemicals detected in soil and groundwater above MTCA cleanup levels and/or the draft soil-to-sediment and groundwater-to-sediment screening levels is presented at the end of this section.

In December 1982, a groundwater study was performed at Terminal 105 to provide a baseline understanding of environmental conditions at the terminal, prior to the disposal of dredging spoils from the Terminal 20 improvement project. Groundwater samples were collected in December 1982, and March, April, June, and September 1983 (Harding Lawson 1983). Metals concentrations in groundwater initially increased following disposal of the dredged materials, which was attributed to dewatering of the dredged materials. Seven months after the disposal, metals concentrations in groundwater were at or below the pre-disposal concentrations (Port of Seattle 1985a).

Nine shallow soil borings were advanced on the property in June 1985. Arsenic concentrations in soil exceeded the current MTCA Method B cleanup level but did not exceed the draft soil-to-sediment screening levels.

Tank 105F (Tank 22) was removed from Terminal 105 in May 1989 (Figure 9). The gasoline tank had not been used since 1982. Petroleum hydrocarbons and benzene, toluene, ethylbenzene, and xylenes (BTEX) were detected in soil at concentrations below current MTCA Method A cleanup levels (Port of Seattle 1989).

[10] Information regarding Puget Sound Tug and Barge's operations was included with Crowley Marine Services' responses dated July 10 and September 17, 2008, to a separate CERCLA 104(e) request and the request cited above.

Tank 105A (Tank 24), a 2,000-gallon gasoline UST, was removed from the property in 1989 (Figure 9). Petroleum hydrocarbon concentrations in soil exceeded the current MTCA Method A cleanup level for gasoline. Ethylbenzene was also detected in soil (Kennedy/Jenks 1991b). Chemical data were not available for review.

Four hand auger borings (HA-1 through HA-4) were advanced inside Building I-1 to depths between 6 and 7 feet below ground surface (bgs). Benzene and petroleum hydrocarbons were detected in soil; benzene exceeded the current MTCA Method B cleanup level. Benzene, toluene, and zinc were detected in groundwater at concentrations below the MTCA cleanup levels (GeoEngineers 1990).

A Phase I ESA was performed in March 1991 to assess baseline conditions at Terminal 105 prior to occupation by new tenants. Oil- and paint-stained soils were observed at Building W-2 (Crowley Marine Maintenance Shop) and the lean-to structure adjacent to the building. Workers at the maintenance shop poured waste paint thinner on the ground around the maintenance shop. Sandblasting was performed in the maintenance yard. A 600-gallon waste oil UST (Tank 33) was present in the yard (Figure 9). Oil-stained soils were present near the UST (Kennedy/Jenks 1991b).

Four test pits were excavated in the proposed footprint of a Dry Boat Storage Building on parcel 3462 in December 1992. PCB and PAH concentrations exceeded current MTCA cleanup levels in one soil sample (Port of Seattle 1993). The PCB concentration also exceeded the draft soil-to-sediment screening level. The proposed building was not constructed.

An assessment of the property was performed in 1993 to identify and assess the historical activities that may have resulted in contamination of environmental media at the property. Asbestos, PCB ballasts, and lead-painted surfaces were present in Buildings A-4, A-5, I-1, W-2, and W-3. Soil, groundwater, catch basin solids, sediment, and stormwater runoff samples were collected and analyzed for PCBs, SVOCs, volatile organic compound (VOCs), metals, and petroleum hydrocarbons (Olympus 1994). In soil, concentrations of metals, PAHs, PCBs, and petroleum hydrocarbons exceeded MTCA cleanup levels and/or draft soil-to-sediment screening levels. In groundwater, arsenic exceeded the MTCA Method B cleanup level, but was below the draft groundwater-to-sediment screening level. Copper, lead, mercury, and zinc were detected above the Marine Chronic WQS in stormwater samples. Arsenic, cadmium, lead, zinc, and heavy oil-range hydrocarbons were detected above the storm drain screening values in the catch basin solids samples. Contaminants in stormwater and catch basin solids were likely associated with the companies operating at Terminal 105 at the time of the assessment, Crowley Marine and American President Lines.

Between July 1994 and February 1995, approximately 12,500 cubic yards of fill were removed from a former estuarine aquatic area, which is part of the current Terminal 105 Park (parcel 3460). The project was performed by the Port of Seattle and sponsored by USACE, EPA, and U.S. Fish and Wildlife Service (Port of Seattle 1995). An assessment was performed to evaluate the nature and extent of contaminants remaining in the intertidal area following the removal of the 12,500 cubic yards of fill and the remedial excavations in parts of the restored area (Erda Environmental 1996). Concentrations of PCBs, PAHs, and metals exceeded MTCA cleanup levels and the draft soil-to-sediment screening levels.

An environmental investigation was performed on parcels 3462, 3464, and 3450 in January 1997. Arsenic, copper, and zinc were detected in groundwater; arsenic exceeded the current MTCA Method B cleanup level. Concentrations of PCBs, PAHs, metals, pentachlorophenol, and heavy oil-range petroleum hydrocarbons in soil exceeded MTCA cleanup levels and/or the draft soil-to-sediment screening levels.

In May 2011, five bank soil samples were collected from the Terminal 105 Park (former Riverside Marina area) (Hart Crowser 2012). Concentrations of PCBs, PAHs, and metals exceeded MTCA cleanup levels. Concentrations of PCBs, PAHs, metals, di-n-butyl phthalate, and phenol exceeded the draft soil-to-sediment screening levels (EcoChem 1997).

	Soil						
	Terminal 105 Park		**Former Terminal 105**				
COC	**Parcel 3460**	**Parcel 3532**	**Parcel 3462**	**Parcel 3464**	**Parcel 3530**	**Parcel 3540**	**Parcel 3630**
Metals							
Antimony			●	♦		♦	♦
Arsenic	♦	♦	♦	♦	♦	♦	♦
Cadmium	●♦		●♦	♦	♦	●♦	●♦
Copper	●	●			●♦*	●	●
Lead	●♦	●♦*	●♦		♦*	●	●♦
Mercury	●	●✓*			●✓*		●✓
Silver						●	●
Zinc	●✓	●			●	●	●✓
PAHs							
2-Methylnaphthalene		●					
Acenaphthene	●✓	●✓		●✓			●
Acenaphthylene		●					
Anthracene	●	●					
Benzo(a)anthracene	●♦	●♦	♦	●♦	♦		●
Benzo(a)pyrene	●♦	●♦	♦	●♦	♦		●♦
Benzo(b)fluoranthene	●♦		♦	●♦	♦		●
Benzo(g,h,i)perylene	●✓	●✓		●✓			●
Benzo(k)fluoranthene	●♦			●			
Benzofluoranthene, total		●♦					
Chrysene	●✓	●♦✓		●✓			●
Dibenzo(a,h)anthracene		●♦	♦	♦			
Fluoranthene	●✓	●✓		●✓			●✓
Fluorene	●✓	●✓	●✓	●✓			●✓
Indeno(1,2,3-cd)pyrene	●♦✓	●♦✓		●♦✓			●

COC	Soil						
	Terminal 105 Park		Former Terminal 105				
	Parcel 3460	Parcel 3532	Parcel 3462	Parcel 3464	Parcel 3530	Parcel 3540	Parcel 3630
Naphthalene		●♦			●♦		
Phenanthrene	●✓	●✓	●✓	●✓	●✓		●✓
Pyrene	●	●			●		●
Total cPAHs		♦		♦		♦	♦
Other SVOCs							
Dibenzofuran		●♦					
Di-n-butyl phthalate		●					
Pentachlorophenol					●♦		
Phenol		●					
PCBs							
Total PCBs	●♦✓	●♦✓		●♦✓	♦✓	●♦✓	●♦✓
Petroleum Hydrocarbons							
Heavy Oil-Range				♦	♦		
VOCs							
Benzene					♦		
Methylene Chloride				♦	♦	♦	♦

● Chemical detected in soil at a concentration that exceeds the draft soil-to-sediment screening level

♦ Chemical detected in soil at a concentration that exceeds the MTCA Method A or B cleanup level

✓ COC in sediment near this parcel.

* COC in seep near this parcel.

COC	Groundwater	
	Former Terminal 105	
	Parcel 3530	Parcel 3540
Metals		
Arsenic	♦	♦
Cadmium	●♦	
Lead	●♦*	
Mercury	●✓*	
Zinc	●	
Phthalates		
BEHP	●♦	
Pesticides		
Dieldrin	♦	

COC	Groundwater	
	Former Terminal 105	
	Parcel 3530	Parcel 3540
VOCs		
Methylene Chloride	♦	

- ● Chemical detected in groundwater at a concentration that exceeds the draft groundwater-to-sediment screening level
- ♦ Chemical detected in groundwater at a concentration that exceeds the MTCA Method A or B cleanup level
- ✓ COC in sediment near this parcel.
- * COC in seep near this parcel.

Potential for Sediment Recontamination

Concentrations of zinc, phthalates, PCBs, and benzyl alcohol exceeded the SQS in sediment samples collected near the outfalls in the Terminal 105 Park stream. The dioxin/furan TEQ in the sample collected near Outfall 2150 exceeded the LDW background level. In sediment samples collected from the LDW offshore of the Terminal 105 Park, concentrations of mercury, PAHs, phenols, and PCBs exceeded the SQS. Concentrations of copper, lead, and mercury exceeded the Marine Chronic WQS in Seep 71, which is located on the Terminal 105 Park. Bank soil samples collected from the Terminal 105 Park contained concentrations of arsenic and PCBs that exceeded the LDW background and mercury that exceeded the SQS. In addition, the cPAH TEQ and dioxin/furan TEQ exceeded the LDW background.

The potential for sediment recontamination associated with the Terminal 105 Park and the former Terminal 105 property is summarized below.

- Stormwater at the Terminal 105 Park infiltrates the ground surface. Contaminants in stormwater, if any, may be conveyed to groundwater and released to the LDW via the groundwater discharge and leaching pathways. The potential for sediment recontamination via stormwater at the former Terminal 105 parcels is discussed in the sections for the current owners/operators of these parcels (Sections 3.2.6 through 3.2.8).
- Although no industrial activities are performed at the Terminal 105 Park, there is potential that spills or leaks of hazardous materials such as petroleum products could occur in the parking area. The potential for sediment recontamination via this pathway is low. The potential for sediment recontamination via spills at the former Terminal 105 parcels is discussed in the sections for the current owners/operators of these parcels (Sections 3.2.6 through 3.2.8).
- Previous environmental investigations have confirmed the presence of PCBs, PAHs, metals, pentachlorophenol, benzene, and heavy oil-range petroleum hydrocarbons in soil at concentrations above MTCA cleanup levels and/or the draft soil-to-sediment screening levels. Metals, BEHP, and pesticides were detected in groundwater in the 1980s at concentrations above MTCA cleanup levels and/or the draft groundwater-to-sediment screening levels. In 1997, arsenic was detected above the MTCA Method B cleanup level

in one groundwater sample. The potential for sediment recontamination via this pathway is low to moderate.

- The banks along the Terminal 105 Park stream and the shoreline with the LDW include areas of vegetated and exposed soil. Bank soil samples collected in 2011 confirmed the presence of arsenic, mercury, PAHs, PCBs, and dioxins/furans at concentrations above the SQS and LDW background levels. Mercury in seep water at the park (Seep 71) exceeded the Marine Chronic WQS and mercury in sediment offshore of the park has exceeded the SQS. The potential for sediment recontamination via the bank erosion/leaching pathway is high.

Source Control Actions

Information needed to assess the potential for sediment recontamination associated with current or historical operations at this facility was summarized in the Spokane Street to Kellogg Island Data Gaps Report (SAIC 2012). The following source control actions will be conducted to fill the identified data gaps and reduce the potential for recontamination of sediments:

- The Port of Seattle will determine if the Liquid Disposal Corporation USTs (Tanks 13 through 16) have been removed from the Terminal 105 Park.
- Ecology will request that the Port of Seattle and Ferguson Enterprises provide information to determine if PCB-bearing dredge spoils were removed from parcel 3530 prior to the construction of the warehouse over the disposal area.
- Ecology will assess the need for an environmental investigation at the Terminal 105 Park to characterize the nature and extent of soil and groundwater contaminated by PCBs, PAHs, and metals in order to determine the potential for sediment recontamination associated with bank erosion/leaching and groundwater discharge.

3.2.6 Encore Oils (former Pacific Rendering)

Current Operations	Meat rendering to produce tallow, grease and feed oil for biodiesel
Historical Operations	Organic oil recycling, pet food manufacturing
Tax Parcel No.	7666703464
Address	4034 West Marginal Way SW 98106
Facility/Site ID	6869: General Biodiesel Inc. 10287: Pacific Rendering Co Inc.
Chemicals of Concern	PCBs, PAHs
Media Affected	Soil

Encore Oils purchased Pacific Rendering Co Inc. (Pacific Rendering) in early 2012 and currently operates the facility on parcel 3464 (Tiffany 2012). The parcel is bordered by the Terminal 105 Park to the north, Ferguson to the east and south, and West Marginal Way SW to the west. A 29,639 sq ft warehouse/open office building, built in 2000, is present on the parcel.

Historical Operations

Pacific Rendering recycled organic oils and manufactured pet food. The company moved to this location from Harbor Island in 2000 (Sea Con 2011). Pacific Rendering held KCIW permit number 7751-03 for waste discharges to the sanitary sewer system.

General Biodiesel operated at this facility for an unknown length of time in the 2000s. The company collected used cooking oil for recycling and the production of biodiesel. The company moved to 6333 1st Avenue S, which is located in the Slip 2 to Slip 3 source control area, in the late 2000s.

This property was historically part of former Terminal 105. Additional information regarding historical operations at the property is provided in Section 3.2.5.

Current Operations

Encore Oils operates a meat rendering facility, which produces tallow, grease, and feed oils for its Salem, Oregon, biodiesel production facility, as well as meat and bone meal (SPU 2012b; Tiffany 2012). Encore Oils appears to be a subsidiary of SeQuential Biofuels.

Tanker trucks, box trucks, and van trailers are loaded and unloaded in covered areas on the northern and eastern sides of the facility. In the eastern loading area, drums and bins are cleaned and repaired. Drains in these areas are plumbed to a wastewater treatment system at the facility (SPU 2012b).

A wet scrubber system is operated to remove odors from air discharges. Wastewater from the wet scrubber system is drained to the wastewater treatment system on a monthly basis (SPU 2012b). Encore Oils is registered with PSCAA; the registration number is 18429.

The wastewater treatment system discharges to the sanitary sewer. Encore Oils holds KCIW discharge permit number 7751-04 to cover this discharge. The permit is effective from March 21, 2012, through March 20, 2017 (SPU 2012b; Tiffany 2012).

Four storm drain catch basins are present on the facility. Stormwater from this facility discharges to the stream in the Terminal 105 Park via Outfalls 2148 and 2149. A storm drain is present beneath the truck scale on the southern side of the facility (SPU 2012b).

Regulatory History

<u>Encore Oils</u>

SPU performed an inspection at Encore Oils on May 18, 2012 (SPU 2012a). SPU inspectors observed residual oil and grease stains in two parking lots where used oil collection bins, tanker trucks, and trailers were stored. One catch basin required repairs; spill response plans were not posted; and an open pan of oil, grease, and water was present near the northern fence, adjacent to the Terminal 105 Park. SPU requested corrective actions regarding spill prevention and response, proper waste handling and storage, housekeeping improvements, and storm drain system maintenance. In addition SPU referred the facility to Ecology for an evaluation for coverage

under the Industrial Stormwater General Permit (ISGP) or eligibility for a Certificate of No Exposure (CNE) (SPU 2012b).

SPU re-inspected the Encore Oils facility on July 12, 2012. The open pan of oil, grease, and water had been removed; however, the facility had not completed the remaining corrective actions identified during the May 2012 inspection (SPU 2012c).

General Biodiesel

Ecology performed an inspection at General Biodiesel on May 20, 2009. The inspectors noted that containers of grease were stored outside and determined that the facility may require coverage under the ISGP or need a CNE certificate. General Biodiesel indicated that the facility would soon move to a location on the eastern side of the LDW (Jeffers 2009).

Pacific Rendering

Ecology performed an inspection at Pacific Rendering on April 11 and May 20, 2008, and determined that the facility needed to obtain coverage under the ISGP (Wright 2010). Pacific Rendering obtained a CNE certificate on March 17, 2010.

On July 17, 2008, EPA sent a CERCLA Section 104(e) Request for Information Letter to JD Anderson LLC regarding its operations at the property (beginning in 2004) (EPA 2008k). The response was requested from EPA for inclusion in the Spokane Street to Kellogg Island Data Gaps Report; however, the response was not available at that time. Information from the response that is pertinent to source control will be included in a Source Control Status Report.

Environmental Investigations and Cleanups

Information regarding environmental investigations and cleanups at this property is provided in Section 3.2.5.

Potential for Sediment Recontamination

The potential for sediment recontamination associated with operations at Encore Oils is summarized below:

- Stormwater from this facility is conveyed to the stream on the Terminal 105 Park, which is connected to the LDW. In May and July 2012, SPU identified corrective actions for Encore Oils to improve housekeeping and maintenance of the storm drain system at the facility in order to meet the minimum requirements for source control (SPU 2012b, 2012c). Fats, grease, and oil are not sediment COCs; however, these contaminants are harmful to the river environment.
- Spills that occur on the property may be conveyed to the stream on the Terminal 105 Park, which is connected to the LDW. Materials used at Encore Oils may be harmful to the river environment but may not contain sediment COCs. The potential for sediment recontamination via this pathway is low.

- Previous environmental investigations have confirmed the presence of PCBs, PAHs, metals, and heavy oil-range petroleum hydrocarbons in soil at concentrations above MTCA cleanup levels and/or the draft soil-to-sediment screening levels. The potential for sediment recontamination via this pathway is low to moderate.

Source Control Actions

Information needed to assess the potential for sediment recontamination associated with current or historical operations at this facility was summarized in the Spokane Street to Kellogg Island Data Gaps Report (SAIC 2012). The following source control actions will be conducted to fill the identified data gaps and reduce the potential for recontamination of sediments:

- SPU will perform a follow-up inspection to determine if Encore Oils has implemented the corrective actions identified during the inspections performed in May and July 2012.
- Ecology will determine if Encore Oils is required to obtain coverage under the ISGP or is eligible for a CNE certificate.
- Ecology will assess the need for additional environmental investigations and/or cleanup of contaminated soil at this property.

3.2.7 Ferguson Enterprises Inc.

Current Operations	Bath, kitchen, and lighting supply gallery
Historical Operations	Shipyard, steel mill
Tax Parcel No.	7666703530, 7666703462
Address	4100 West Marginal Way SW 98106
Facility/Site ID	18675
Chemicals of Concern	PCBs, PAHs, metals
Media Affected	Soil, groundwater

Ferguson Enterprises operates on parcels 3462 and 3530. Encore Oils is north of parcel 3530 and west of parcel 3462. Terminal 105 Park is north and east of parcel 3462 and east of parcel 3530, General Recycling is to the south, and West Marginal Way SW is west of the property.

Historical Operations

This property was historically part of former Terminal 105. In 1998 or 2004, the Ferguson Enterprises warehouse was built in the area where PCB-contaminated dredge spoils from Terminal 20 were disposed of in 1983. Disposal of the spoils increased the elevation of the area by 4 feet. The PCB-contaminated dredge spoils may have been removed during warehouse construction as the base of the building does not appear to be 4 feet higher than the surrounding property.

Additional information regarding historical operations at the property is provided in Section 3.2.5.

Current Operations

Ferguson Enterprises is a building and construction supply company. A bath, kitchen, and lighting gallery is present at this property.

Eighteen storm drain catch basins are present on the property (SPU 2010c). The catch basins are connected to Outfalls 2150 and 2232.

Regulatory History

Stormwater Inspections (April 2010)

SPU performed an inspection at Ferguson Enterprises on April 5, 2010. There was no spill plan in place, but spill response materials were kept at the facility. The catch basins on the property were not equipped with outlet traps. Many of the catch basins were either partially or completely filled with sediment or debris. Large trucks (greater than 10 tons) were being washed on the property on a weekly basis; wash water was discharged to the facility's storm drain system. The outdoor storage areas were paved and contained new equipment and materials awaiting disposal. These materials included 1,000 new polyvinyl chloride (PVC) pipes and old fluorescent light tubes. Housekeeping was rated as good; however, sweeping of the outdoor areas was not being conducted on a regular basis (SPU 2010c). SPU identified corrective actions regarding spill prevention and response; storm drain system maintenance; housekeeping improvements; and removing old equipment from the property. In addition, SPU directed Ferguson Enterprises to cease discharge of wash water to the storm drain system (SPU 2010e).

SPU re-inspected the facility on July 8, 2010, and determined that not all corrective actions had been implemented. On July 22, 2010, SPU confirmed that all corrective actions had been implemented and that the facility was in compliance (SPU 2010h).

On July 17, 2008, EPA sent CERCLA Section 104(e) Request for Information Letters to Ferguson Enterprises and Lipsett Company LLC with regard to operations at the property since 1997 (EPA 2008f, 2008n). The responses were requested from EPA for inclusion in the Spokane Street to Kellogg Island Data Gaps Report; however, the responses were not available at that time. Information from the responses that is pertinent to source control will be included in a Source Control Status Report.

Environmental Investigations and Cleanups

Information regarding environmental investigations and cleanups at this property is provided in Section 3.2.5.

Potential for Sediment Recontamination

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

- SPU conducted an inspection in April 2010 and identified corrective actions related to stormwater, spill prevention, and wastes. In July 2010, SPU determined that the facility had implemented the corrective actions and was in compliance. The potential for sediment

recontamination via the stormwater and spills pathways is therefore low, provided that Ferguson Enterprises maintains appropriate source control BMPs.

- Previous environmental investigations have confirmed the presence of PCBs, PAHs, metals, and pentachlorophenol in soil at concentrations above MTCA cleanup levels and/or the draft soil-to-sediment screening levels. Concentrations of metals, BEHP, and pesticides in 1980s groundwater samples exceeded MTCA cleanup levels and/or the draft groundwater-to-sediment screening levels. Concentrations of metals, PAHs, and phthalates were detected in 1990s groundwater samples at concentrations below MTCA cleanup levels and draft groundwater-to-sediment screening levels. The potential for sediment recontamination via this pathway is low.

Source Control Actions

Information needed to assess the potential for sediment recontamination associated with the property was summarized in the Spokane Street to Kellogg Island Data Gaps Report (SAIC 2012). The following source control actions will be conducted to fill the identified data gaps and reduce the potential for recontamination of sediments:

- Ecology will request that the Port of Seattle and Ferguson Enterprises provide information to determine if PCB-bearing dredge spoils were removed from the property prior to the construction of the warehouse over the disposal area.
- Ecology will assess the need for additional environmental investigations and/or cleanup of contaminated soil and groundwater at this property.

3.2.8 General Recycling of Washington

Current Operations	Ferrous scrap metal storage
Historical Operations	Shipyard, steel scrap yard, rock crushing and mineral processing
Tax Parcel No.	7666703540, 7666703630, 1824049018
Address	4200 West Marginal Way SW 98106
Facility/Site ID	18553
Chemicals of Concern	PCBs, PAHs, metals
Media Affected	Soil, groundwater

General Recycling operates on three parcels that are adjacent to the LDW. This property is bordered by the LDW to the east, Gray Line and Herring's House Park to the south, West Marginal Way SW to the west, and Ferguson Enterprises to the north. The former SW Idaho Street runs east-west between parcels 3540 and 3630.

Historical Operations

Parcels 3540 and 3630, which are now part of the General Recycling property, were historically part of former Terminal 105. Birmingham Steel obtained the parcels from the Port of Seattle between 1995 and 2002. In King County tax assessor records, the property names for parcels

3540 and 3630 are listed as the Birmingham Steel Scrap Yard and Port-Terminal 105, respectively. Additional information on the historical operations at these parcels is summarized in Section 3.25.

In the 1910s, Erickson Shipbuilding, Elliott Bay Yacht & Engine Company, Elliott Bay Shipbuilding, and North Pacific Shipbuilding operated on parcel 9018. The companies' operations extended onto present-day parcels 3670 (Herring's House Park), 3680 (Gray Line), and former Terminal 105 (Port of Seattle 1985c; SoundEarth 2011b).

Manganese Products Inc. operated on parcel 9018 in the 1930s and 1940s. Rock crushing and mineral processing were performed at the northeast corner of the property (Kennedy/Jenks 1991b; SoundEarth 2011b).

Crowley began operating on parcels 9018, 3540, and 3630 in 1969 under the name Puget Sound Tug & Barge[11] and as Crowley Marine Services in 1992. The property was paved by Crowley in 1969. Crowley performed vessel outfitting, maintenance, and repair work (Crowley 2008), and operated maintenance shops, a paint shed, and a tool shed. The company maintained two 1,000-gallon USTs to store gasoline and diesel fuel for the forklifts, cranes, and welding machines used in its operations. A gas pump on the property was abandoned in 1968. It is not known if fuel from the pump was stored in an AST or UST (Kennedy/Jenks 1991b). The 1,000-gallon USTs were removed from the property in 1994 (Crowley 2008).

Tow wires were inspected and maintained at parcel 9018, approximately 200 feet from the LDW. These activities included spooling and lubricating wires, pouring sockets, and fitting towlines. Lubricating was performed in an area with secondary containment to collect waste oil and oily materials. The wastes were disposed of offsite through a third party. Tow sockets were installed by melting zinc and pouring the molten metal into sockets. The melting pot and pour areas were fitted with secondary containment to collect spills and overflows. Scrap metal was sent to Seattle Iron & Metals for recycling (Crowley 2008).

Crowley sold parcel 9018 to Rodgers Industrial in 2001. The property name is listed as WACO Scaffolding Storage Yard in King County tax assessor records. WACO Scaffolding began leasing parcel 9018 from Crowley in or around 2000 (Crowley 2008). The lease continued under Rodgers Industrial (RDT 2001). General Recycling purchased parcels 3540, 3630, and 9018 in 2007.

Current Operations

General Recycling began operating at this property in 2002, when its parent company (Nucor Steel) purchased Birmingham Steel (SDJC 2002; Ecology 2007b). General Recycling receives, stores, and ships preprocessed ferrous scrap at its facility. Scrap is delivered by truck, rail, and barge transportation and shipped off the property via truck and rail transportation to the Nucor

[11] Drummond Lighterage owned parcel 9018 (currently General Recycling) from 1969 to 2001. Drummond Lighterage was a subsidiary of Puget Sound Tug & Barge from 1929 to 1984, when it merged into Puget Sound Tug & Barge. Puget Sound Tug & Barge merged into Crowley Marine Services in 1992 (Cascadia 2008).

Steel mill[12] as feed stock material. Material that is unloaded from barges has the potential to spill to the LDW. Scrap is sorted and stored outdoors on a paved surface. Oily scrap is stored on a concrete pad, which was installed in 2001. Vehicle maintenance is performed on the concrete pad. Oil filter scrap is stored in a container to prevent contact with stormwater (General Recycling 2010, 2011a; Ecology 2011a).

There are 37 catch basins on the property (Figure 13). The catch basins are equipped with compost socks and are inspected and maintained on a bimonthly schedule (General Recycling 2011a).

Thirty-three of the catch basins are connected to the facility stormwater collection, recycling, and treatment system, which is designed for a 25-year storm. The system was installed in 2003 and upgraded in 2006 to include recycling capabilities. The collection system slopes away from the LDW. Berms are used to direct stormwater flow into the collection system. Prior to recycling, stormwater is conveyed through multiple oil/water separators and detention tanks to remove solids, silt, and metals. Stormwater from the oily-scrap collection pad is conveyed to an oil/water separator and then to a propane-fired evaporation tank. When the capacity of the collection system is exceeded during storm events, stormwater is discharged to the LDW via Outfall 2157. Groundwater and waste water generated during fire protection system flushing, testing, and maintenance may be included in discharges to the LDW. No discharges occur between April and September as all stormwater is recycled for dust control during these months (General Recycling 2010; Ecology 2011a).

Groundwater infiltrates the stormwater collection system and is retained for dust control. Waste water generated during fire protection system flushing, testing, and maintenance is also discharged to the stormwater collection system. During storm events, the groundwater and the fire-protection system waste water may commingle with stormwater and be discharged to the LDW via Outfall 2157 (General Recycling 2010).

Regulatory History

Ecology performed a stormwater compliance inspection at the facility in January 2007. Ecology noted that General Recycling had made substantial capital improvements to the property to improve the quality of stormwater discharges. However, silt and mud covered much of the facility, which led to turbidity and zinc contamination in stormwater discharges from the facility (Ecology 2007b).

Ecology identified the following corrective actions (Ecology 2007b):

- Increase sweeping frequency to remove silty sediment and debris from the property.
- Cover scrap piles that are not undergoing active work.
- Retain Discharge Monitoring Reports (DMRs) at the facility for 5 years.

In May 2007, General Recycling submitted a Level 2 Response report, addressing the conditions that resulted in zinc exceedances in the facility's stormwater discharges. General Recycling had

[12] The Nucor Steel mill is located at 2424 SW Andover Street, Seattle 98106, which is within the Chelan CSO basin.

the stormwater collection system cleaned, which reduced copper, lead, and zinc concentrations in the discharge, and proposed adding chemical treatments to the stormwater treatment system (General Recycling 2007).

Ecology performed a stormwater compliance inspection in April 2011. General Recycling recycled all stormwater during the second and third quarters of 2010. Copper and zinc concentrations in stormwater discharges exceeded the ISGP benchmarks during the fourth quarter of 2010 and the first quarter of 2011. Representatives of General Recycling expressed interest in installing a chemical treatment system that would reduce metals concentrations in the facility's discharges. Ecology requested that General Recycling submit an engineering report and request approval for the chemical treatment system. In addition, Ecology requested that the facility update its SWPPP to include the oily metals area and municipal waste storage areas and prepare a Level 2 Response report (Ecology 2011a, 2011b).

In June 2011, General Recycling requested an extension for completing the Level 2 corrective actions. The company had decided to upgrade the stormwater treatment system to include chemical treatment. Additional time was needed to perform bench-scale and whole effluent toxicity (WET) testing, evaluate the results to select appropriate chemical treatment, and finally implement the selected treatment and install a sand filter system, which would require a retrofit of the existing stormwater treatment system (General Recycling 2011b). In November 2011, Ecology granted the request under Administrative Order 8888. Level 2 corrective actions are to be completed during fall 2012 (Ecology 2011d).

In addition to the companies that operated on the historical Terminal 105 property, EPA has sent CERCLA Section 104(e) letters to several companies that previously operated on the current General Recycling facility. These include:

Parcel(s)	Date of Letter(s)	Responsible Party	Reference
1824049018	03/25/08	Marcia A. Rodgers Industrial LLC	EPA 2008b
		S. Michael Rodgers Industrial LLC	EPA 2008c
		Crowley Marine Services	EPA 2008a
	07/17/08	Drummond Lighterage	EPA 2008h
7666703540, 7666703630, 1824049018	7/17/08	General Recycling of Washington	EPA 2008i
	07/21/09	Nucor Steel, with regard to Birmingham Steel	EPA 2009g

Information from the Crowley Marine Services (which includes Drummond Lighterage) response to the request (Cascadia 2008; Crowley 2008) was reviewed and included in this SCAP. The remaining responses were requested from EPA for inclusion in the Spokane Street to Kellogg Island Data Gaps Report; however, the responses were not available at that time. Information from the parties' responses that is pertinent to source control will be included in a Source Control Status Report.

Environmental Investigations and Cleanups

Information regarding environmental investigations and cleanups on parcels 3530 and 3630 is included in Section 3.2.5. One environmental investigation has been performed at parcel 9018. Information regarding this investigation is summarized below. A detailed investigation map and data tables are provided in the SCAP, as this information was not available when the Spokane Street to Kellogg Island Data Gaps Report was prepared. In addition, one facility-wide investigation of the storm drain system has been performed and is described below.

Parcel 9018

A Phase II ESA was performed at parcel 9018 in May 1999. Seven soil borings were advanced and six test pits were excavated (Figure 14). Soil and groundwater samples were collected from the borings and test pits. Soil gas samples were also collected. Storm drain solids were collected from several catch basins and composited into a single sample. The facility buildings were inspected for asbestos and lead-based paint. In soil, arsenic, cadmium, lead, benzo(a)pyrene, and PCBs exceeded MTCA cleanup levels (Table 13). Concentrations of arsenic, zinc, and PCBs exceeded MTCA cleanup levels in groundwater; zinc concentrations also exceeded the draft groundwater-to-sediment screening level (Table 14). In storm drain solids, copper, zinc, PCBs, and PAHs exceeded the storm drain screening values (Table 15). Concentrations of MEK and ethanol in soil gas indicated the potential for a petroleum release but could also be attributed to biological activity or imported fill materials. Building samples tested for asbestos and lead-based paint were positive (Golder 1999).

In January 2001, 17 storm drain solids samples were collected from 14 catch basins on the parcel. Concentrations of PCBs, PAHs, arsenic, chromium, lead, zinc, and petroleum hydrocarbons exceeded the storm drain screening values (Table 15) (Golder 2001).

Facility-Wide

In 2010, General Recycling collected 28 water samples from various catch basins on the property in order to identify sources of zinc on the property and to reduce concentrations in stormwater to below ISGP benchmark levels. Elevated levels of metals were present in water at multiple catch basins. General Recycling concluded that chemical and/or engineering stormwater treatment was needed to reduce zinc concentrations (General Recycling 2011a).

General Recycling completed bench-scale testing of Chitosan sand filtration treatment in late 2011/early 2012. This treatment is effective in reducing turbidity in the facility's stormwater discharges. A pilot study to evaluate the effectiveness of Chitosan in reducing copper concentrations in stormwater discharges was initiated on April 9, 2012 (General Recycling 2012).

Potential for Sediment Recontamination

Mercury, PCBs, BEHP, PAHs, phenol, and benzyl alcohol have been detected at concentrations above the SQS in sediment samples collected near the General Recycling property. The dioxin/furan TEQ exceeded the LDW background in two samples. The potential for sediment recontamination via this property is summarized below by transport pathway.

- General Recycling is currently working to complete Level 2 corrective actions to address stormwater quality problems at the facility. The company will upgrade its stormwater treatment system to include chemical treatment during fall 2012. Once the chemical treatment system is installed, the potential for sediment recontamination via this pathway will be decreased.
- Scrap metal is unloaded from barges at the facility and spills of scrap metals to the LDW may occur; however, no records of spills were identified, indicating that General Recycling performs the unloading activities with appropriate precautions to prevent spills. The potential for sediment recontamination via this pathway appears to be low.
- Previous environmental investigations have confirmed the presence of PCBs, PAHs, and metals in soil at concentrations above MTCA cleanup levels and/or the draft soil-to-sediment screening levels. Concentrations of arsenic, zinc, and PCBs detected in 1990s groundwater samples exceeded the MTCA cleanup levels, and zinc concentrations exceeded the draft groundwater-to-sediment screening levels. Concentrations of PAHs and phthalates were detected below screening levels. PCBs, PAHs, and zinc concentrations in sediment samples collected near the facility have exceeded the SQS. The potential for sediment recontamination via this pathway is low to moderate.
- Exposed soil is present at the shoreline north of the pier, at the terminus of SW Idaho Street. Sediment COCs were not detected above the SQS/CSL in LDW sediment samples collected immediately offshore of this area (Figure 7b). The potential for sediment recontamination via this pathway is low.

Source Control Actions

Information needed to assess the potential for sediment recontamination associated with the property was summarized in the Spokane Street to Kellogg Island Data Gaps Report (SAIC 2012). The following source control actions will be conducted to fill the identified data gaps and reduce the potential for recontamination of sediments:

- Ecology will request that General Recycling update the facility SWPPP to include the chemical treatment upgrades to the stormwater treatment system. General Recycling will be required to provide the updated SWPPP to Ecology.
- Ecology will assess the need for additional environmental investigations and/or cleanup of contaminated soil and groundwater at this property.

3.2.9 Former Seaboard Lumber Property

Current Operations	Evergreen Trails: Vehicle fueling, washing, servicing, maintenance, and repair Herring's House Park: Public Park
Historical Operations	Shipyard, steel scrap yard, rock crushing and mineral processing
Tax Parcel No.	Evergreen Trails: 7666703680 Herring's House Park: 7666703670, 1924049104

Address	Evergreen Trails: 4500 West Marginal Way SW 98106 Herring's House Park: West Marginal Way SW & SW Alaska Street
Facility/Site ID	75577212: Gray Line of Seattle Marginal Way 83317575: Evergreen Trails 88471591: Seattle City Seaboard Lumber former site
Chemicals of Concern	PCBs, PAHs, metals
Media Affected	Soil, groundwater

This property is the former location of the Seaboard Lumber Company (Seaboard Lumber). It consists of three parcels, two of which are owned by Seattle Parks (parcels 3670 and 9104) and one of which is now owned by Evergreen Trails Inc. (parcel 3680). The property is bordered by General Recycling to the north, the LDW to the east, Terminal 107 Park to the south, and West Marginal Way SW to the west.

Historical Operations

Initial development occurred on this site in 1912. Previous occupants of the facility include Seaboard Lumber, the Port of Seattle, Seattle North Pacific Ship Building Company, Wallace Bridge and Structural Steel Company, and PACCAR and its tenants. Historical ownership of the property is shown on Figures 15a and 15b.

Operator	Activities	Years
Seattle North Pacific Ship Building Company	Ship Building; boiler and machinery building was later known as the Alaska Freight Building.	1920–1927
Wallace Bridge & Structural Steel Co.	Steel manufacturer; used the Alaska Freight Building for steel storage and a smaller warehouse on the property for materials storage.	1920–1940
Seaboard Lumber Company	Sawmill; the original mill was located on parcel 3670. The Alaska Freight Building was used as the lumber shed and kiln (beginning in 1969/1970).	1929–1984
Crowley Maritime	Equipment and supply storage, barge staging	
Seahawk	Container storage, possibly leased from PACCAR	1985–1991
PACCAR	Offices, leased property to various tenants	1987–1994 (Parcel 3680) 1987–1997 (Parcel 3670)
McMc Resources	Office space, leased from PACCAR	1987–1993
Northwest Container Services	Container storage and repair, leased from PACCAR	approximately 1987–1994
Pacific Commercial Pallets	Pallet storage and repair	approximately 1987–1997
J.L. Scrap Metal	Scrap metal	approximately 1987–1997
John Sjong Enterprises	Unknown	approximately 1987–1997

Sources: Kennedy/Jenks 1991c; ESL 1995; Herrera 1995; USACE 1995

Seaboard Lumber

In 1929, Seaboard Lumber began operating a lumber mill on the southern portion of the facility (parcel 3670). Seaboard Lumber acquired the Alaska Freight Building from the Port of Seattle in 1969 or 1970. The Alaska Freight Building spanned parcels 3670 and 3680 (Figure 16). The property was paved in 1970. Seaboard Lumber enlarged the property using fill materials between 1974 and 1980. Seaboard became a subsidiary of PACCAR in the 1980s (ESL 1992).

Lubricating oils, fungicide, and lumber dye were used in Seaboard Lumber's operations. Wastes generated in operations included: waste sawdust, wood chips, used motor oil, spent fungicide solution, and waste/scrap metal from saws (ESL 1992). Additional information is provided in the Spokane Street to Kellogg Island Data Gaps Report (SAIC 2012).

Seaboard Lumber ceased operations in May 1984 (ESL 1992). In 1985, the mill was dismantled and the transformers that were installed in 1980 were removed by Seattle City Light (Herrera 1996). Seaboard Lumber is currently known as Norcliffe Company (EPA 2010c).

PACCAR

PACCAR purchased the property in 1987. PACCAR leased the facility to various tenants, including Northwest Container Services. Little information regarding the tenants' operations was available for review; however, the operations appear to have been primarily shipping container storage and repair, pallet storage and repair, and use of the buildings for offices. In 1990, the Alaska Freight Building was demolished (ESL 1992).

Northwest Container Services

Northwest Container Services operated on the property from approximately 1987 to 1994. The company maintained refrigerated containers. Waste generated by these operations included used paint thinner, used oil, used freon, and used lead-acid batteries. In 1991, solvent was spilled on parcel 3670 in the area leased by Northwest Container Services (ESL 1992).

Underground and Aboveground Storage Tanks

This property has had various storage tanks in operation throughout its history, including five known ASTs and six USTs (Figure 16).

Tank No.	Type	Size (Gallons)	Contents	Dates	Status
43	UST	2,100	Heating oil	Unknown–1999	Removed
44	UST	500	Gasoline	Unknown–1986	Unknown
45	UST	8,000	Diesel	1968–1988	Removed
46	UST	10,000	Diesel	1974–1988	Removed
47	UST	10,000	Diesel	1974–1988	Removed
48	UST	300	Heating oil	Unknown–1999	Removed
49	AST	1,000	Diesel	1960s–1980	Removed

Tank No.	Type	Size (Gallons)	Contents	Dates	Status
50-54	AST	300	Lubricating oil	1974–1984	Removed
55-58	AST	Unknown	Diesel	~1972–1974	Removed

Sources: ESL 1992, 1995; Herrera 1996; Shannon & Wilson 2001

Current Operations

Evergreen Trails

Evergreen Trails conducts business as Horizon Coach Lines and as Gray Line. The company's business office and maintenance facility are located on parcel 3680. The operating address is 4500 West Marginal Way SW (Evergreen Trails 2012). Evergreen Trails purchased the property from PACCAR in January 1994 (Shannon & Wilson 2001).

Vehicle fueling, washing, servicing, maintenance, and repair are performed at the facility. All activities are performed indoors except fueling. Wash water is discharged to a floor drain and is then conveyed to an oil/water separator before discharge to the sanitary sewer. Used antifreeze, degreasers, solvents, paints, fuels, and oils are generated through these activities. Dead-end sumps are present in the maintenance shops to contain spills. These sumps are cleaned every three months (SPU 2006a; Evergreen Trails 2012).

Two USTs are installed on the property, a 20,000- to 30,000-gallon diesel UST and a 5,000- to 10,000-gallon diesel UST. New antifreeze and oil is stored in four 900-gallon ASTs. Used oil is stored in a 3,000-gallon AST. The ASTs are equipped with secondary containment. Stormwater that collects in the secondary containment is inspected for contaminants and then discharged to the facility storm drain system (Evergreen Trails 2012).

There are 13 storm drain catch basins on the property (Figure 17). The catch basins are outfitted with oil absorbing pillows. Stormwater is conveyed from the catch basins into a diversion structure, then a four bay vault, and then to an oil/water separator. The stormwater is then conveyed to a discharge vault, which is equipped with oil-absorbing pillows, prior to discharge. The catch basins and oil/water separator are inspected each month and cleaned annually, or as needed based on the monthly inspection results. The stormwater outfall is also inspected on a monthly basis (Evergreen Trails 2012). Stormwater from the property appears to discharge to the intertidal bay at Herring's House Park through either Outfall 2140 or 2141. Discharges are covered under NPDES Permit No. WAR002966.

The EPA ID number associated with this facility was active for Gray Line as a hazardous waste generator until December 2004. Evergreen Trails continues to use the EPA ID number as a TIER2 reporter for storage of hazardous chemicals.

Herring's House Park

Seattle Parks performed a habitat restoration project to develop Herring's House Park on parcels 3670 and 9104, which were purchased from PACCAR in October 1997. The property was vacant

following the purchase. The habitat restoration project was conducted between 1997 and 2001 under Consent Decree C90-395WD[13] and Nationwide Permit 38 (Shannon & Wilson 2001).

The park has open grass areas, walking trails through forested habitat and upland meadows, and an intertidal bay. The banks of the bay are planted with marsh plants. Two armored spits were constructed to protect the intertidal bay and habitat. The spits form a mouth opening to the LDW.

Regulatory History

Seaboard Lumber

In 1979, cooling waters for the boiler blowdown were found to be directly discharging into the LDW. This discharge was a violation of Seaboard Lumber's NPDES permit (ESL 1992). Ecology performed an inspection in December 1980 and determined that the blow-down discharge had been connected to the sanitary sewer, but non-contact cooling discharge was still discharged to the LDW (Ecology 1980).

Seaboard Lumber ceased operations in May 1984 and began dismantling the lumber mill (ESL 1992). Ecology cancelled NPDES Permit No. WA-002230-6 on October 5, 1984 (Ecology 1984).

In March 2003, Ecology stated that groundwater monitoring wells, confirmation sampling, and a restrictive covenant were required at Herring's House Park in order to issue an NFA for the property with regard to the cleanup activities that were performed prior to the restoration of the park (Ecology 2003).

On December 1, 2010, EPA sent a CERCLA Section 104(e) Request for Information Letter to PACCAR regarding its own and Seaboard Lumber's operations at the property (EPA 2010c). Information from the response that is pertinent to source control will be included in a Source Control Status Report.

Ecology issued an NFA for the property in October 2011; however, the requirements for an NFA stated by Ecology in March 2003 have not been met.

PACCAR/Northwest Container Services

Puget Sound Air Pollution Control Agency (PSAPCA) issued a Notice of Violation (NOV) on September 10, 1992, to PACCAR for fugitive dust emissions by Northwest Container (ESL 1992).

In November 1996, PACCAR notified Ecology that free oil product was discovered on parcel 3670 during construction of a storm drain that crossed parcels 3680 and 3670 (present day Evergreen Trails and Herring's House Park properties). Ecology noted that parcel 3670 would be remediated during the habitat restoration project (Ecology 1996d).

[13] Entered into by the United States of America, the State of Washington, the Suquamish Indian Tribe, the Muckleshoot Indian Tribe, the City of Seattle, and METRO in 1991.

Evergreen Trails/Gray Line of Seattle

Stormwater discharges from the facility are covered under NPDES Permit No. WAR002966.

SPU and Ecology performed a joint stormwater compliance inspection at Gray Line on February 7, 2006. Bus parts were being stored both inside the facility and outside. Parts stored outside were not covered. The catch basins and oil/water separators needed to be cleaned. Ecology requested that the facility resume submitting DMRs, which had not been submitted since the first quarter of 2005 (Ecology 2006a; SPU 2006a). SPU identified the following corrective actions (SPU 2006b):

- Prepare and implement a spill prevention and cleanup plan, post it next to the spill kits at the facility, and train employees on the plan and use of spill kits.
- Clean all catch basins and the oil/water separators on a regular basis.
- Cover all engine and oily bus parts that are stored outside.

SPU performed a follow-up inspection on March 23, 2006. All corrective actions had been implemented and the facility was in compliance (SPU 2006c, 2006d).

Ecology performed a stormwater compliance inspection in May 2008 to determine if Gray Line was eligible for a CNE certificate. The potential for stormwater contamination via the bus terminal and servicing operations made the facility ineligible for the CNE certification under conditions of the ISGP. Ecology determined that Gray Line could suspend analyzing stormwater discharges for oil and grease and copper. Several vehicles were leaking fluids and heavy oil stains were observed in the parking area. Vehicle parts stored outdoors were covered with plastic tarps. Ecology identified the following corrective actions (Ecology 2008b):

- Clean up areas with accumulated sediment.
- Inspect and clean all catch basins as needed.
- Identify and fix the sources of vehicle leaks.
- Ensure that drip pans are not exposed to stormwater.
- Stop pollutants from entering the catch basin near the trash compactor.
- Prepare and implement spill prevention and cleanup plan.
- Resume analyzing stormwater discharges for turbidity and pH.

On July 17, 2008, EPA sent a CERCLA Section 104(e) Request for Information Letter to Holland America and Gray Line of Seattle with regard to Evergreen Trails' operations at the property (EPA 2008j). The response was requested from EPA for inclusion in the Spokane Street to Kellogg Island Data Gaps Report; however, the response was not available at that time. Information from the response that is pertinent to source control will be included in a Source Control Status Report.

Environmental Investigations and Cleanups

Evergreen Trails Property (Parcel 3680)

Five environmental investigations and cleanups have been performed at parcel 3680. Additional information is provided in the Spokane Street to Kellogg Island Data Gaps Report (SAIC 2012).

Three diesel USTs (Tanks 45, 46, and 47) were removed from the property in January 1988 (Figure 16). TPH concentrations were below current MTCA Method A cleanup levels. An attempt was made to locate and remove the 500-gallon gasoline UST (Tank 44) near the former office building. It was not located and it was decided to abandon the effort since the tank had been pumped out by METRO during excavation of the Renton sewer line at the western property line (Hart Crowser 1988).

A Phase I & II environmental audit was performed in 1992 for this parcel. An audit of the property (Northwest Container's operations) indicated that waste detergent containing dodecylbenzene sodium sulfonate was discharged to the ground in an area with no pavement or low-quality pavement, stormwater runoff from shop areas mixed with waste oil and possibly solvents and paint were collecting in low spots on the pavement, and numerous spills were in the oil storage area. Several areas of petroleum-contaminated soil were identified on former Seaboard Lumber parcels 3670 and 3680. Lead contamination was confined to the top 2.5 feet of soil (ESL 1992). Concentrations of arsenic, lead, zinc, PAHs, pentachlorophenol, 1,2-dichlorobenzene, and petroleum hydrocarbons in soil exceeded MTCA cleanup levels and/or the draft soil-to-sediment screening levels. PAHs, phthalates, other SVOCs and toluene were detected in groundwater; concentrations of these chemicals were below MTCA cleanup levels and/or the draft groundwater-to-sediment screening levels.

After Evergreen Trails purchased the property, an extensive remedial excavation was performed to remove soil contaminated by petroleum hydrocarbons, lead, and PAHs. An area of 114,224 sq ft (about 2.6 acres) was excavated to approximately 2 to 2.5 feet bgs. Confirmation soil sampling indicated that all soil with lead concentrations greater than 250 mg/kg had been removed from the property. Approximately 2,745 tons of petroleum-contaminated soils and 225 tons of lead/PAH-contaminated soils were removed from the property (ESL 1995).

Following the remedial excavation, groundwater samples were collected from wells MW-1 through MW-6. The samples were analyzed for lead and petroleum hydrocarbons, which were not detected (ESL 1995).

Herring's House Park (Parcels 3670 and 9104)

Extensive sampling, remediation, and restoration activities have been performed at the Herring's House Park property. A brief summary of each investigation is provided in the following sections. Additional information is provided in the Spokane Street to Kellogg Island Data Gaps Report (SAIC 2012).

Between March 12 and April 7, 1996, a Phase II site investigation was performed to determine whether contaminants were present in the upland and subtidal areas of this property. Potential

areas of concern were identified based on the results of the 1992 Phase I environmental audit and 1993–1994 remedial actions performed at the Evergreen Trails property (Herrera 1996).

Concentrations of arsenic, cadmium, lead, mercury, benzo(a)pyrene, benzo(g,h,i)perylene, cPAHs, petroleum hydrocarbons, pentachlorophenol, and silver in soil exceeded MTCA cleanup levels and/or the draft soil-to-sediment screening levels. Diesel- and heavy oil-range hydrocarbon concentrations in groundwater exceeded MTCA Method A cleanup levels. In sediment, concentrations of PCBs, phenol, and zinc exceeded the SQS. PCB concentrations also exceeded the CSL (Herrera 1996).

A Phase III investigation was performed in November and December 1996 to further characterize the chemical composition, concentration, and extent of contamination in the impacted areas identified through previous investigations. In soil, concentrations of metals, pentachlorophenol, PAHs, and PCBs exceeded the MTCA cleanup levels and/or the draft soil-to-sediment screening levels. In groundwater, concentrations of arsenic and heavy oil-range hydrocarbons exceeded the MTCA cleanup levels (Herrera 1997).

The goals of the habitat restoration project were to maximize the aquatic habitat of the property, create a low-wave energy environment, provide a perimeter buffer of upland vegetation, remove and/or contain residual contaminants, and develop public access areas. To achieve this goal an intertidal basin was developed, shoreline protection was constructed, improvements were made to the aquatic and upland habitats, and the following remedial actions were performed (Shannon & Wilson 2001):

- Removal of a 9,200 sq ft dock structure and approximately 302 supporting piles,
- Extension of the 30-inch storm drain line to allow for shoreline revetment construction,
- Removal of two heating oil USTs (Tanks 43 and 48),
- Removal and off-property disposal of soil with concentrations of non-petroleum contaminants that exceeded MTCA Method A cleanup levels,
- Removal and off-property disposal of soil with concentrations of petroleum contaminants that exceeded MTCA Method B cleanup levels, and
- Capping any remaining contaminated soil with 2 feet of clean material.

Soil removal activities were performed in the following areas (Shannon & Wilson 2001).

Location	Contaminated Materials Removed (tons)
Former Spray Booth (Area 3)	417
Former Spray Booth (Area 4)	1,358
Alaska Freight Building (Area 6)	9,119
Former Service Pit (Area 7)	5,096

Approximately 15,590 tons of impacted soil were excavated and disposed of at the Olympic View Landfill. After completion of the habitat restoration, soil contaminated with arsenic,

cadmium, chromium, lead, mercury, PAHs, pentachlorophenol, and petroleum hydrocarbons was left in place. A 2-foot cap of clean material was installed above the contaminated soil (Shannon & Wilson 2001).

Confirmation soil samples were collected in the soil removal areas. Concentrations of arsenic, lead, mercury, pentachlorophenol, and diesel-range hydrocarbons remaining in soil exceeded MTCA cleanup levels and/or draft soil-to-sediment screening levels.

Chemical	> MTCA Method A	> MTCA Method B	> Soil-to-Sediment Screening Level
Arsenic		●	
Lead	●		●
Mercury	●		●
Pentachlorophenol	●		●
Diesel-range hydrocarbons	●		

Potential for Sediment Recontamination

Lead, mercury, zinc, PCBs, PAHs, n-nitroso-di-n-propylamine, and benzyl alcohol have been detected at concentrations above the SQS in sediment samples collected near the former Seaboard Lumber property. The dioxin/furan TEQ exceeded the LDW background in one sample. Copper exceeded the Marine Chronic WQS in Seep 69, which is offshore of the property. The potential for sediment recontamination via this property is summarized below.

Evergreen Trails

- Stormwater from Evergreen Trails is discharged to the intertidal bay at Herring's House Park, which is hydraulically connected to the LDW. Industrial operations at Evergreen Trails are performed indoors, with the exception of fueling activities. In May 2008, Ecology inspected the Evergreen Trails facility and determined that stormwater was exposed to fuel and oil and that the storm drain system needed to be cleaned. Evergreen Trails' SWPPP indicates that appropriate source control BMPs have been implemented. The potential for LDW sediment recontamination via this pathway is low.
- Evergreen Trails is not immediately adjacent to the LDW. Spills at the property may be conveyed to the intertidal bay at Herring's House Park via the storm drain system. The potential for LDW sediment recontamination is low.
- Previous environmental investigations have confirmed the presence of PAHs, pentachlorophenol and other SVOCs, metals, and petroleum hydrocarbons in soil at concentrations exceeding the MTCA Method A cleanup levels and/or the draft soil-to-sediment screening levels. Extensive remedial activities have been performed at the property to remove contaminated soil to 2.5 feet bgs. The potential for sediment recontamination via this pathway is low.

Herring's House Park

- Stormwater at Herring's House Park infiltrates the ground surface. Contaminants in stormwater, if any, may be conveyed to groundwater and released to the LDW via the groundwater discharge and leaching pathways.
- Although no industrial activities are performed at Herring's House Park, there is potential that spills or leaks of hazardous materials such as petroleum products could occur in the parking area. The potential for sediment recontamination via this pathway is low.
- The banks along the Herring's House Park intertidal bay are vegetated. The LDW shoreline is armored. Soil contaminated with PAHs, metals, and petroleum hydrocarbons were left in place at the shoreline following the intertidal restoration. Diesel-range hydrocarbon concentrations exceeded the MTCA Method A cleanup level and lead concentrations in soil exceeded the draft soil-to-sediment screening level. The potential for sediment recontamination via bank erosion/leaching pathway is low to moderate.
- Concentrations of arsenic, lead, mercury, pentachlorophenol, and diesel-range hydrocarbons above MTCA cleanup levels and/or the draft soil-to-sediment screening levels remain in soil. Groundwater samples collected in the 1990s contained concentrations of arsenic and petroleum hydrocarbons exceeding MTCA cleanup levels. More recent groundwater data, if any, were not available for review. The potential for sediment recontamination via this pathway is low to moderate.

Source Control Actions

Information needed to assess the potential for sediment recontamination associated with the property was summarized in the Spokane Street to Kellogg Island Data Gaps Report (SAIC 2012). The following source control actions will be conducted to fill the identified data gaps and reduce the potential for recontamination of sediments:

- Ecology will perform a follow-up inspection at Evergreen Trails to verify that corrective actions identified during the May 2008 inspection have been implemented and that the facility is maintaining appropriate source control BMPs.
- Ecology will request that Evergreen Trails verify which outfall (Outfall 2140 or 2141 or other) the facility uses to discharge stormwater to the intertidal bay at Herring's House Park.
- Ecology will assess the need for additional environmental investigations at Evergreen Trails and Herring's House Park to define the nature and extent of residual soil and groundwater contamination at the properties to determine if LDW sediment near the properties is or has the potential to become contaminated via the groundwater discharge and bank erosion pathways.

3.2.10 Port of Seattle Terminal 107

Current Operations	Terminal 107 Park: Public Park Kellogg Island: marine animal and bird sanctuary Alaska Marine Lines: semi-trailer storage
Historical Operations	Brick manufacturing, scrap metal yard, paint production, construction contractor with fueling area, auto salvage and junk yard, residential/commercial properties
Tax Parcel No.	0213000046, 1924049103, 2840201235, 7666703705, 7666703710
Address	5402 West Marginal Way SW 98106
Facility/Site ID	15472775: 4800 W Marginal 96168526: Vacant UST 2482 Marginal Way SW
Chemicals of Concern	Arsenic, lead, zinc, dioxins/furans
Media Affected	Soil

Terminal 107 is comprised of five parcels that are adjacent to the LDW, including most of the tidelands between Kellogg Island and the western bank of the LDW between RM 0.5 and 1.0 West. The Duwamish Bike Way and West Marginal Way SW are west of the property. Herring's House Park is north of the property and Lafarge Cement is to the south. Terminal 107 consists of property on the western shoreline of the LDW (upland Terminal 107) and Kellogg Island (Figure 18).

Historical Operations

Historical features at Terminal 107, including USTs, are shown on Figure 19.

Upland Terminal 107

A. Abrahamson Brick Co. operated a brick company on Terminal 107 property from the 1880s to around 1965, in the area currently occupied by Alaska Marine Lines. The factory included an engine house and a dry brick kiln. Broken bricks were used as fill along the shoreline. All buildings associated with the brick factory were removed by 1968 (A. Abrahamson Brick Co. 1917; Foster 1945; SoundEarth 2011a). The Mutual Materials Company used the landing at the brick factory for loading its materials (Little & Leader 1941). Lafarge later placed CKD fill in this area (Dames & Moore 1968).

Lipsett Steel Products operated a scrap metal yard in the area north of the A. Abrahamson Brick Co. and south of the Goodspeed's Addition from as early as the 1950s until the 1960s (SoundEarth 2011a). This area is currently occupied by Alaska Marine Lines.

The Terminal 107 Park was initially developed as part of the Goodspeed's Addition in 1890. A house and church were built on the property. Four additional residences were added by 1908. By 1930, 20 residential structures and a general store were present on the property and several houseboats were present along the shoreline. In the 1960s, 56 residential and commercial structures were present on the property (SoundEarth 2011a).

In 1957, L.E. Carter Paint Company purchased three lots on Block 7 of the Goodspeed's Addition (currently the southwest corner of Terminal 107 Park). The company added a warehouse and storage shed in 1962. This facility maintained a 6,000-gallon UST (Tank 37), a 4,000-gallon UST (Tank 38), and two 7,500-gallon USTs (Tanks 39 and 40); the status of these tanks is unknown. These tanks contained a variety of chemicals used in the production of paint thinning agents, solvents, and paint binders including: toluene, xylene, paint thinner, butyl alcohol, isobutyl alcohol, isopropyl alcohol, methyl amyl alcohol, butyl acetate, 2-butoxyethanol, 2-ethoxythylacetate, diisobutyl ketone, ethyl acetate, isobutyl acetate, isopropyl acetate, and methyl isobutyl ketone. The buildings associated with the paint company were demolished between 1985 and 1989 (SoundEarth 2011a).

In 1967, two 3,000-gallon fuel USTs (Tanks 41 and 42) and two dispenser pump islands were installed at the northwest corner of Block 7 of the Goodspeed's Addition. The fueling area was apparently used only by D.V. Klier, a brick-laying contractor. The status of the USTs is unknown. The dispenser pump islands were demolished in 1976 (SoundEarth 2011a).

An auto salvage and junk yard was operated by Riverside Auto Wrecking on Blocks 6 and 7 of the Goodspeed's Addition until 1969. The auto salvage and junk yard was razed and filled in 1969 (SoundEarth 2011a).

Between the late 1960s and 1976, the Port of Seattle began purchasing the properties that comprised the Goodspeed's Addition. Following the acquisition, the Port of Seattle demolished the remaining structures at Goodspeed's Addition (UW OPA 1977; SoundEarth 2011a).

In May 1985, the Port of Seattle Commission adopted a resolution to preserve and restore fish and wildlife habitats at Terminal 107 instead of developing the property as a terminal (Parametrix 1990).

Kellogg Island

Kellogg Island was originally part of the larger Edwards Island. From the late 1890s to the 1910s, a barn was present at the southern end of the island (UW OPA 1977). Between 1914 and 1916, the navigable channel was dredged through the LDW; Kellogg Island was formed when the channel was dredged through Edwards Island. The dredging spoils were placed on Kellogg Island (SoundEarth 2011a). The Port of Seattle purchased Kellogg Island from Foss Tug Company in 1969. Foss Tug most likely used the island for moorage (UW OPA 1977).

In August 1968, a preliminary soils investigation was performed in preparation for the proposed development of the area as a marine shipping terminal. Kellogg Island was planned to be developed for heavy industrial use. Kellogg Island was found to be composed of a mixture of hydraulic fill, sand, silt, and sediments (Dames & Moore 1968).

In May 1985, the Port of Seattle Commission adopted a resolution to preserve and restore fish and wildlife habitats at Terminal 107 instead of developing the property as a terminal. The original Kellogg Island was once a very large wetland area (over 100 acres); however, by 1985 only 5 acres of wetland area remained (Parametrix 1990).

Fill History

Extensive fill material is present at Terminal 107. Fill activities were performed from the 1880s through the 1920s and from the 1950s through 1976. The maximum thickness of fill encountered at the terminal is 50 feet. Fill material on Kellogg Island consists of fine to medium sand. Fill materials on the upland portion of the terminal consist of sand, gravel, clay, brick fragments, and CKD. The CKD is present on the southern portion of the terminal, near Lafarge Cement. Dredge spoils from Terminals 19 and 20 and the 16th Avenue Bridge were also used as fill at Terminal 107 (SoundEarth 2011a). Dredge spoils from Terminal 20 that were disposed of at Terminal 105 were contaminated with PCBs; however, no records were found to indicate whether the spoils used as fill at upland Terminal 107 were contaminated.

In 1938, the eastern shore of Kellogg Island was dredged. The dredge spoils were deposited at Terminal 108. This dredging gave Kellogg Island its present-day eastern shoreline. In 1966, the channel between Kellogg Island and the west bank of the LDW was dredged and a levee was built around the island. Dredge spoils were disposed of on the island. Approximately 126,200 cubic yards of dredge spoils from Terminal 20 were deposited on Kellogg Island between 1973 and 1976. PCBs, PAHs, BEHP, and metals were present in the dredge spoils (Port of Seattle 1973; Parametrix 1990; SoundEarth 2011a).

Current Operations

The northern end of upland Terminal 107 is the Terminal 107 Park and comprises 15.5 acres. The southern end of Terminal 107 is leased to Alaska Marine Lines and comprises 3.3 acres. Railroad tracks are present along the western boundary of the property. Kellogg Island is a marine animal and bird sanctuary and comprises 15 acres. The remaining 25.9 acres is submerged land. The shoreline of Terminal 107 is over 8,500 linear feet and consists of exposed soil and vegetated slopes. The street address for Terminal 107 is 5402 West Marginal Way SW (SoundEarth 2011a). The Port of Seattle historically used 4700 West Marginal Way SW as the address for Terminal 107 (Port of Seattle 1976).

Alaska Marine Lines stores semi-trailers on a gravel-covered parking surface. A paved driveway and turnaround area is present (SoundEarth 2011a). Lafarge Cement maintains a lease with the Port of Seattle for use of the railroad tracks along the southern end of the property (Port of Seattle 2012b).

The marine animal and bird sanctuary on Kellogg Island was developed in the 1980s (SoundEarth 2011a).

Stormwater runoff flows generally to the east towards the channel between upland Terminal 107 and Kellogg Island (Figure 20). A catch basin (7092) is present in the parking area in the central portion of the Terminal 107 Park. Stormwater from the parking area is conveyed to a grass swale. In the southern portion of the Terminal 107 Park, stormwater flows to two swales before discharging to drain fields (Phoinix 2007a; SoundEarth 2011a). During a reconnaissance visit in April 2011, a pipe outlet was observed near a ravine on the northern portion of the Terminal 107 Park. No discharge was observed from the pipe. The origin of the pipe is unknown (SoundEarth 2011a).

Regulatory History

In September 2010, EPA sent a CERCLA Section 104(e) Request for Information Letter to the Port of Seattle regarding operations at Terminal 107 and other Port of Seattle-owned properties (EPA 2010a). Information from the response that is pertinent to source control will be included in a Source Control Status Report.

Additional information regarding regulatory history for this property was not available for review.

Environmental Investigations and Cleanups

One environmental investigation has been performed at Terminal 107. Additional information is provided in the Spokane Street to Kellogg Island Data Gaps Report (SAIC 2012).

In May 2011, five bank soil samples were collected at Terminal 107 (Figure 7d). The samples at Terminal 107 were collected from a layer that was identified as possible CKD. Soil samples were analyzed for metals, PCBs, PAHs, other SVOCs, TPH, TBT, polybrominated diethyl ethers, pesticides, and dioxins/furans. Concentrations of arsenic, lead, and zinc exceeded the SQS and CSL. Concentrations of arsenic and the dioxin/furan TEQ exceeded LDW background levels (Table 6) (Hart Crowser 2012). Metals, PAHs, and PCBs also exceeded MTCA cleanup levels and/or the soil-to-sediment screening levels, as summarized below.

Chemical	Terminal 107
Metals	
Arsenic	♦
Cadmium	●♦
Copper	●
Lead	●♦ ✓
Silver	●
Zinc	● ✓
PAHs	
Acenaphthylene	●
Benzo(a)anthracene	●♦ ✓
Benzo(g,h,i)perylene	● ✓
Chrysene	● ✓
Fluoranthene	● ✓
Indeno(1,2,3-cd)pyrene	●♦ ✓
Naphthalene	●
Phenanthrene	● ✓
Pyrene	● ✓
Total cPAHs	♦
PCBs	
Total PCBs	●♦ ✓

● Chemical detected in soil at a concentration that exceeds the draft soil-to-sediment screening level

♦ Chemical detected in soil at a concentration that exceeds the MTCA Method A or B cleanup level

✓ COC in sediment near this parcel.

Potential for Sediment Recontamination

Lead, mercury, zinc, PCBs, PAHs, butyl benzyl phthalate, phenol, n-nitroso-di-n-propylamine, and benzyl alcohol have been detected at concentrations above the SQS in sediment samples collected between upland Terminal 107 and Kellogg Island. Phenol and 4-methylphenol concentrations exceeded the SQS in sediment samples collected near the eastern shore of Kellogg Island. The dioxin/furan TEQ exceeded the LDW background in three samples collected between upland Terminal 107 and Kellogg Island. Copper exceeded the Marine Chronic WQS in Seep 69, which is offshore of the property. In bank soil samples collected from upland Terminal 107, concentrations of arsenic, lead, and zinc exceeded the SQS and CSL. The dioxin/furan TEQ exceeded the LDW background level in one bank soil sample. The potential for sediment recontamination via this property is summarized below.

- There are no outfalls located on Terminal 107 (Phoinix 2007a). Sheet flow is observed toward the southeast side of the property and runs out of two swales that convey stormwater to drain fields. The potential inputs to a pipe located near the ravine on the northern portion of the Terminal 107 Park are unknown (SoundEarth 2011a). Contaminants in stormwater, if any, may be conveyed to groundwater and released to the LDW via the groundwater discharge and leaching pathways.
- Overwater activities are not performed at Terminal 107. There is potential that spills or leaks of hazardous materials such as petroleum products could occur in the parking area. The potential for sediment recontamination via this pathway is low.
- Historical operations at the property may have resulted in releases of petroleum hydrocarbons, metals, industrial cleaners, and solvents to soil and groundwater at this property. No environmental investigations have been performed to evaluate the potential impacts. Historical operations performed by A. Abrahamson Brick Yard, Riverside Auto Wrecking, and the metal salvage yard represent potential sources of sediment COCs. Contaminants in soil and groundwater, if any, may represent a potential source of sediment recontamination.
- Over 8,500 linear feet of unimproved shoreline is present at Terminal 107. Recent bank soil samples collected from the CKD fill contained arsenic, lead, and zinc at concentrations exceeding the SQS and CSL. No other areas of the shoreline have been investigated. Contaminants in bank soil, if any, may represent a potential source of sediment recontamination.

Source Control Actions

Information needed to assess the potential for sediment recontamination associated with the property was summarized in the Spokane Street to Kellogg Island Data Gaps Report (SAIC 2012). The following source control actions will be conducted to fill the identified data gaps and reduce the potential for recontamination of sediments:

- The Port of Seattle will determine the potential inputs to a pipe located near the ravine in the northern portion of the Terminal 107 Park.

- In order to determine the potential for sediment recontamination via the soil and groundwater and bank erosion/leaching pathways, the Port of Seattle will perform an environmental investigation to determine if soil and groundwater are contaminated due to the historical industrial operations and fill activities performed at Terminal 107.

3.3 Upland Properties in the SW Dakota Street SD Basin

Upland properties and facilities within the SW Dakota Street SD basin that could potentially affect sediments near the Spokane Street to Kellogg Island source control area include the following:

- Former Fraser Properties
- Tryg Winquist
- West Seattle Recycling Center
- Active Environmental
- Former Concrete Restoration
- Heathco and Penthouse Drapery
- Raynroof Roofing
- 4101 West Marginal Way Business Park and its tenants
    - Aquatic Enterprises
    - Cohesive Garage
    - Metal Shorts
    - Wheelchairs Plus
- Strutz Property
- Seattle Parks and Recreation Westbridge Maintenance Facility

Relevant information about these facilities was summarized in the Spokane Street to Kellogg Island Data Gaps Report (SAIC 2012). Additionally, an unknown number of undocumented industrial operations may take place within the SW Dakota Street SD basin. Undocumented industrial activities may be an ongoing source of contaminants to sediments adjacent to the Spokane Street to Kellogg Island source control area.

No facility-specific data gaps were identified for the facilities listed below. These facilities have been inspected by Ecology or SPU within the past four years (2008 or later) or the potential sediment recontamination pathways associated with the facility are incomplete. During recent inspections, Ecology and SPU inspectors identified corrective actions for the facilities and verified that the facilities complied with the corrective actions during a re-inspection. For some of these facilities, no corrective actions related to source control were identified during the inspection. The following facilities are in compliance and no source control actions have been identified.

Facility or Property Name	Address	Facility/ Site ID	King County Tax Parcel
4101 West Marginal Way Business Park	4101 West Marginal Way SW 98106	11229: Aquatic Enterprises 14517: West Seattle Radiator Service 39342192: Dakota Street 1916: Wheelchairs Plus Inc.	7547800565, 7547800575, 7547800585, 7547800615, 7666703805
Active Environmental Inc.	4001 16th Avenue SW 98106	20843	7547300520, 7547300645, 7547301700
Heathco International Inc./ Penthouse Drapery	4025 16th Avenue SW 98106	12698: Heathco 24724: Penthouse Drapery	7547300595
Raynproof Roofing	4117 16th Avenue SW 98106	23451	7547800510, 7547800520, 7547800525
Seattle Parks and Recreation Westbridge Maintenance Facility	4201 W Marginal Way SW 98106	2999235 59252684	1824049020
Strutz Property [a]	4201 16th Avenue SW	2438	1324039025
Tryg Winquist Construction	3839 West Marginal Way SW 98106	20891	7666703900
West Seattle Recycling Center	3881 16th Avenue SW 98106	2981502	7547300666

All Facility/Site ID numbers associated with a facility/property are listed in the table.
a – The potential pathways for sediment recontamination related to historical petroleum contamination at this property are incomplete.

The upland properties listed below were identified as potential sediment recontamination sources. Additional information regarding source control actions for these upland properties is provided in Sections 3.3.1 and 3.3.2.

Facility	Address	Potential Contaminant Pathways
Former Fraser Properties	3601 & 3801 West Marginal Way SW 98106	Stormwater; groundwater discharge/infiltration
Former Concrete Restoration	4025 West Marginal Way SW 98106	Groundwater discharge/infiltration

3.3.1 Former Fraser Properties

Current Operations	Unknown
Historical Operations	Diesel equipment repair
Tax Parcel No.	9349900331, 7547300667, 7666703920
Address	3601 & 3801 West Marginal Way SW 98106
Facility/Site ID	72321478
Chemicals of Concern	Potential for PAHs, metals
Media Affected	Soil, groundwater

Fraser Inc. formerly operated in the facilities at parcels 0331, 0667, and 3920 (Figure 6b). Parcel 0331 is bordered by Marginal Place SW to the east, SW Charlestown Street to the south, and properties owned by Seattle Parks and Recreation to the west and north. Parcel 0667 is located to the south of parcel 0331 and is bordered by Marginal Place SW to the east, Kruse Brothers Construction to the south, 18th Avenue SW to the west, and SW Charlestown Street to the north. Parcel 3920 is located to the east of Parcel 0331. The triangular-shaped parcel is bordered by West Marginal Way SW to the east, Marginal Place SW to the west, and a right-of-way area to the north. The Spokane Street Bridge passes over the right-of-way area situated between West Marginal Way and Marginal Place SW.

Historical Operations

Fraser Inc. operated three businesses on parcels 0331, 0667, and 3920. Fraser Boiler operated on parcel 3920. Pacific Rim Diesel and Olympic Diesel operated on parcels 0331 and 0667. The companies began operating at these facilities in approximately 1995. Pacific Rim Diesel and Olympic Diesel declared bankruptcy in May 2000 and ceased operations in March 2001 (Ecology 2002b, 2002c). Fraser Inc. later moved to 8000 5th Avenue S (within the Riverside Drive source control area) under new ownership (Walton 2002).

Fraser Boiler repaired boilers for ships and on-shore industries. Fraser Boiler was classified as a small quantity hazardous waste generator (SQG). Waste streams generated during repair activities included boiler pressure test waste water, used lead-acid batteries, spent paint thinner, and shop rags (Ecology 1998a).

Current Operations

Global Diving & Salvage operates in the building located on parcel 0667 and may use parcel 0331 for storage or employee parking. Rehabitat Northwest, a residential developer and builder, currently operates in the facility on parcel 3920 (Rehabitat Northwest 2012). No additional information regarding current operations at these facilities was available for review.

Regulatory History

Ecology performed a dangerous waste compliance inspection of Fraser Boiler on January 22, 1998. Spent lead acid batteries were stored outdoors and without cover. The area was subject to stormwater runoff and occasional high water flooding. Waste paint thinner was improperly stored and two batteries were broken open with their contents spilling onto the pavement (Ecology 1998a). Fraser Boiler cleaned up spills and began properly storing batteries by February 1998 (Fraser Boiler 1998).

During this inspection, floor drains were identified inside of the warehouse. Water from boilers undergoing pressure testing was discharged to the floor drains. Ecology directed Fraser Boiler to contact KCIW to help determine if the floor drains were connected to the sanitary sewer (Ecology 1998a).

On August 17, 1999, Fraser Inc. and Pacific Rim Diesel were found to be in violation of WAC 173-303-070 for failure to designate solid wastes (Ecology 2002a). Ecology records indicate that compliance was achieved in September 2000 (Ecology 2002c).

Ecology and the City of Seattle performed a Hazardous Waste and Toxics Reduction (HWTR) Program compliance inspection at the property on February 11, 2002, following receipt of a complaint regarding waste materials stored at the property and a Notice of Motion to Abandon the property, which included the waste materials (Ecology 2002c; Foster Pepper 2002). A tank and unmarked 55-gallon drums were stored within 15 feet of a storm drain catch basin without proper secondary containment. Paint cans, roofing compounds, and more 55-gallon drums were stored under cover and on pallets. Tires, office furniture, lockers, appliances, and scrap metal were inside the Fraser Boiler building. Grease, oil, sealers, and paint thinners in original containers, unmarked 55-gallon drums, and a 500-gallon tank (half-filled with a caustic solution) were stored inside the Pacific Rim Diesel building. Ecology identified the nine compliance problems related to the improper designation, accumulation, containment, and management of wastes (Ecology 2002c).

EPA performed an inspection on March 7, 2002. The EPA inspector reported the presence of numerous waste containers (including 55-gallon drums) and seven tanks on the property. The inspector noted that waste containers and tanks were easily accessible to the public (Barber 2002).

Ecology performed an inspection of Fraser Boiler and Pacific Rim Diesel on March 26 and 27, 2002, to inventory the waste containers that remained on the property. Over 500 waste containers were present (Armbruster 2002). Stained soil was observed in the fenced area directly north of the entrance of the Pacific Rim Diesel building. The inspector noted that this soil could potentially have been contaminated. The caustic tank in the Pacific Rim Diesel building was full of caustic liquid. This liquid also appeared to have spilled in the grating in front of the tank (Yelton 2002).

Ecology performed an inspection on August 7, 2002. A new tenant had begun occupying the inside area of the warehouse. No drums containing dangerous waste remained on the property at the time of the visit (Harding & Walton 2002). The only materials left from Fraser Boiler were two empty 350-gallon totes, several empty 5-gallon buckets, and several empty 50- to 60-gallon oil tanks (Walton 2002).

Potential for Sediment Recontamination

The potential for sediment contamination associated with this property is summarized below:

- No information regarding the current operations performed by Global Diving and Rehabitat Northwest was available for review. The potential for sediment recontamination related to stormwater from these facilities is unknown.
- Soil and groundwater contamination has not been identified at the property; however, in 2002, Ecology inspectors identified potentially contaminated soil (Yelton 2002). Given the historical operations at this property, there is a potential for soil and groundwater contamination. Potential contaminants in soil and groundwater include, but are not limited to, PAHs, petroleum hydrocarbons, solvents, and metals. The potential for sediment recontamination via groundwater discharge is unknown.

Source Control Actions

Information needed to assess the potential for sediment recontamination associated with current or historical operations at this facility was summarized in the Spokane Street to Kellogg Island Data Gaps Report (SAIC 2012). The following source control actions will be conducted to fill the identified data gaps and reduce the potential for recontamination of sediments:

- Ecology or SPU will perform inspections at Global Diving & Salvage and Rehabitat Northwest to ensure compliance with applicable regulations and source control BMPs to prevent the release of contaminants to the LDW.
- Ecology will assess the need for additional investigations and/or cleanup of suspected soil and groundwater contamination at this property.

3.3.2 Former Concrete Restoration

Current Operations	Impound lot, construction equipment and materials storage
Historical Operations	Auto wrecking, concrete restoration and patching
Tax Parcel No.	7666703835, 7666703845, 7666703855, 7666703865, 7666703870
Address	4025 West Marginal Way SW 98106
Facility/Site ID	9688: Concrete Restoration Inc. 31119678: Brys Auto Wrecking
Chemicals of Concern	Metals, phthalates
Media Affected	Soil and groundwater

The parcels that comprise the former Concrete Restoration property occupy an entire block. The property is bordered by West Marginal Way SW to the east, SW Dakota Street to the south, 16th Avenue SW to the west, and SW Andover Street to the north. The Terminal 105 Habitat Restoration area is east of the property, across West Marginal Way SW.

Historical Operations

A-1 Auto Parts and Wrecking and Brys Auto Wrecking historically operated at this property (GeoEngineers 1990). Information regarding operations at this location was not available for review.

Concrete Restoration operated at this property from 2003 (SPU 2010a) until summer 2010 (SPU 2010i). The company restored and patched concrete. Materials used in operations included methyl epoxy, acrylic resins and powder catalysts, acetone, paint strippers, and curing agents (SPU 2010a).

Current Operations

Gary Westside Towing currently operates an impound lot at parcel 3835. Global Diving & Salvage currently uses the remaining parcels to store materials and equipment. The entire

property was gravel covered until summer 2010, when the southern half of the lot was paved by Global Diving & Salvage (Wisdom 2010d).

A trench drain is present on parcel 3865, adjacent to the warehouse, and wash water is conveyed to this drain. SPU performed a dye test in 2010 and confirmed that the drain is connected to the sanitary sewer (SPU 2010b).

There are no known connections to the storm drain system from the property. Stormwater infiltrates the ground surface; however, during heavy rainfall, stormwater runoff may be conveyed to the storm drain catch basins in the rights-of-way (Wisdom 2010a; Ecology 2010). A berm in the street appears to prevent stormwater runoff from the property from entering the right-of-way catch basin (Wisdom 2010b), but the effectiveness of the berm is unknown.

Regulatory History

Brys Auto Wrecking

The property was listed on the CSCSL in 1998, receiving a WARM ranking of 3. According to the Integrated Site Information System (ISIS) database, metals and petroleum contamination is present in soil and is suspected to be present in groundwater and air. The property was in the Voluntary Cleanup Program (VCP) from June 2002 to June 2006; the VCP ID was NW0914.

Concrete Restoration

SPU performed an initial inspection at Concrete Restoration on March 18, 2010. Concrete Restoration was beginning to move its business to a new location in South Park. Stockpiled materials, used equipment, and equipment/materials awaiting disposal were stored outdoors without proper labels, cover, or containment. Leakage, with visible oil sheen, was observed from the waste containers in the storage areas. The condition of the housekeeping in the storage areas was deemed “unacceptable” by SPU (SPU 2010a).

SPU performed a dye test and follow-up inspection at Concrete Restoration on March 26, 2010. During the dye test of the trench drain, it was determined that the drain was plumbed to the sanitary sewer. In addition, the SPU inspector discovered that the sanitary sewer line was 50 to 75 percent full of concrete and barely flowing. A strong pesticide odor was noticed outside of the fence of 16th Avenue SW and SW Dakota Street. The vegetation in this area was dead and the area was discolored (SPU 2010b).

SPU performed a second follow-up inspection on April 8, 2010. Liquid wastes were consolidated into 5-gallon buckets but were not covered. Wash water from cleaning buckets and equipment was discharged to the trench train. The SPU inspector observed diesel fuel leaking from a 30-gallon drum and pooling on the ground and track out from the facility. The spill was cleaned up during the inspection (SPU 2010d).

SPU referred the company to KCIW for review of the discharge authorization of process water to the sanitary sewer. SPU identified corrective actions regarding proper storage and management

of materials and hazardous wastes, spill prevention and response, and housekeeping improvements (SPU 2010f).

On April 28, 2010, SPU and King County collected soil samples from the right-of-way area outside the fence at 16th Avenue SW and SW Dakota Street. The soil was discolored; petroleum and pesticide odors were present in the soil (SPU 2010g). Pesticides were detected (Wisdom 2010c).

In April 2010, SPU notified Ecology of the potential for soil contamination at the property due to the improper chemical storage by Concrete Restoration. SPU reported the diesel spill observed on April 8, the dead vegetation and discolored area in the right-of-way adjacent to the property, and many stains on the gravel lot (Ecology 2010).

SPU returned to the site on August 2, 2010. Concrete Restoration had moved out of the facility. The gravel lot had been paved by Global Diving & Salvage (SPU 2010i; Wisdom 2010d).

Environmental Investigations and Cleanups

Records for Brys Auto Wrecking in the ISIS database indicate that at least one environmental investigation has been performed at this property. The investigation confirmed metals and petroleum contamination in soil. Environmental investigation reports were not available for review.

Potential for Sediment Recontamination

The potential for sediment contamination associated with this property is summarized below:

- Stormwater from this facility infiltrates the ground surface but may be conveyed to the storm drain system during periods of heavy rainfall. A berm in the street appears to prevent stormwater from reaching the storm drain system (Wisdom 2010b); however, the effectiveness of the berm is unknown. Stormwater is likely to be conveyed to the LDW only during a CSO event. The potential for sediment recontamination via this pathway is very low.
- The current operations performed by Global Diving & Salvage and Gary's Westside Towing have not been evaluated by SPU or Ecology for compliance with source control BMPs. However, Global Diving & Salvage has previously complied with corrective actions identified by SPU for its other locations near the LDW (SPU 2006g).
- Previous environmental investigations have confirmed that soil beneath the property is contaminated by metals and petroleum. SPU reported a diesel spill and numerous stains on the property during the time that Concrete Restoration was operating at the property (Ecology 2010). This spill and staining indicates the potential for additional soil and/or groundwater contamination. Potential contaminants include petroleum, VOCs, and phthalates (SPU 2010a; Wisdom 2010a). In addition, SPU and King County confirmed the presence of pesticides in soil adjacent to the property (Wisdom 2010c).
- Groundwater contamination is suspected at this property. Groundwater likely flows towards the stream channel at the Terminal 105 Park, which is immediately east of the

property. Concentrations of zinc, BEHP, butyl benzyl phthalate, and PCBs have exceeded the SQS in sediment samples collected from the stream channel (Figure 7b). The potential for sediment recontamination via this pathway is unknown.

Source Control Actions

Information needed to assess the potential for sediment recontamination associated with current or historical operations at this facility was summarized in the Spokane Street to Kellogg Island Data Gaps Report (SAIC 2012). The following source control actions will be conducted to fill the identified data gaps and reduce the potential for recontamination of sediments:

- Ecology or SPU will perform business inspections at Gary's Westside Towing and Global Diving & Salvage to verify compliance with applicable regulations and source control BMPs to prevent the release of contaminants to the LDW.
- Ecology will request additional information from Brys Auto Wrecking regarding the previous environmental investigation(s) at the property to determine if LDW sediment COCs are present in soil and groundwater at concentrations indicating a potential for sediment recontamination.
- Ecology will assess the need for additional investigations and/or cleanup of suspected soil and groundwater contamination at this property.

3.4 Upland Properties in the SW Idaho Street SD Basin

Upland properties and facilities within the SW Idaho Street SD basin that could potentially affect sediments near the Spokane Street to Kellogg Island source control area include the following:

- New Finishes/Pacifica
- Continental Van Lines
- Airclean Technologies
- Former Central Painting property/Expert Marble & Granite
- Fog Tite Meter and Seal
- Evergreen Building Products
- Heath Landscape
- West Seattle Estates
- Ortega Property
- South Seattle Community College
- King Residence

Relevant information about these facilities was summarized in the Spokane Street to Kellogg Island Data Gaps Report (SAIC 2012). Additionally, an unknown number of undocumented industrial operations may take place within the SW Idaho Street SD basin. Undocumented industrial activities may be an ongoing source of contaminants to sediments adjacent to the Spokane Street to Kellogg Island source control area.

No facility-specific data gaps were identified for the facilities listed below. These facilities have been inspected by Ecology or SPU within the past four years (2008 or later) or the potential sediment recontamination pathways associated with the facility are incomplete. During recent inspections, Ecology and SPU inspectors identified corrective actions for the facilities and verified that the facilities complied with the corrective actions during a re-inspection. For some of these facilities, no corrective actions related to source control were identified during the inspection. The following facilities are in compliance and no source control actions have been identified.

Facility or Property Name	Address	Facility/ Site ID	King County Tax Parcel
New Finishes/Pacifica	4229 West Marginal Way SW 98106	9627: New Finishes 23704: Pacifica	1824049044
Continental Van Lines	4501 West Marginal Way SW 98106	10412	1824049022, 1824049046, 1824049078, 1824049096
AirClean Technologies Inc.	4725 West Marginal Way SW	8547	2840200650
Former Central Painting/Expert Marble & Granite	4749 West Marginal Way SW 98106	2185	2840200490
Fog Tite Meter and Seal	4819 West Marginal Way SW 98106	1184778	2840201500, 2840201575
Evergreen Building Products LLC	4835 West Marginal Way SW 98106	6697	2840201475
Heath Landscape Services Inc.	4849 West Marginal Way SW 98106	16129	2840201470
South Seattle Community College [a]	6000 16th Avenue SW 98106	43445813	6171900005, 2135200050
Ortega Property [a]	5235 18th Avenue SW 98106	9581551	3438500191
King Residence [a]	6518 16th Avenue SW 98106	3121499	2428200191

All Facility/Site ID numbers associated with a facility/property are listed in the table.
a – The potential pathways for sediment recontamination related to historical petroleum contamination at this property are incomplete.

West Seattle Estates was identified as a potential sediment recontamination source. Additional information regarding source control actions for this upland property is below.

3.4.1 West Seattle Estates

Current Operations	Residential and undeveloped properties
Historical Operations	Unknown
Tax Parcel No.	2840200005, 2840200015, 2840200050, 2840200055, 2840200165, 2840200170, 2840200175, 2840200180, 2840200185, 2840200190, 2840200195, 2840200200, 2840200205, 2840200210, 2840200215, 2840200220, 2840200225, 2840200230, 2840200235, 2840200240, 2840200245, 2840200250, 2840200255, 2840200260, 2840200265, 2840200270, 2840200275, 2840200280, 2840200285, 2840200290, 2840200295
Address	4699 15th Avenue SW 98106
Facility/Site ID	3858982
Chemicals of Concern	Metals
Media Affected	Groundwater

West Seattle Estates is located north of SW Edmunds Street, between 14th and 16th Avenue SW. Residential properties and forested land owned by Seattle Parks are adjacent to the tract. The McFarland Property is located to the south, on the southern side of SW Edmunds Street.

Historical Operations

The parcels in the West Seattle Estates tract were historically owned by Pankrantz Lumber and the McFarland family. Information regarding historical operations at the property was not available for review.

Current Operations

West Seattle Estates is composed of 31 0.06- to 0.11-acre residential and undeveloped parcels.

Regulatory History

According the ISIS database, groundwater at the property was contaminated by priority pollutant metals. The property was part of the VCP (ID NW1722). On July 6, 2009, Ecology granted an NFA for the property and indicated that the cleanup was complete with active monitoring ongoing. No additional information regarding this property was available for review.

Potential for Sediment Recontamination

The potential for sediment contamination associated with this property is summarized below:

- Stormwater at West Seattle Estates infiltrates the ground surface. Contaminants in stormwater, if any, infiltrating the ground surface may be conveyed to groundwater and released to the LDW via the groundwater discharge pathway.
- Stormwater also collects in ditches along 16th Avenue SW. The ditches convey stormwater to a culvert installed on the eastern side of Puget Way SW, which discharges to the LDW at SW Idaho Street.

- Cleanup activities have been performed to remediate priority pollutant metals in groundwater. Active monitoring is apparently ongoing; however, no records of the environmental investigations and cleanups at this property were available for review. Concentrations of priority pollutant metals remaining in groundwater, if any, are unknown. Groundwater is likely to flow to the south towards Puget Creek. Puget Creek discharges to the LDW at SW Idaho Street. The potential for sediment recontamination via this pathway is unknown.

Source Control Actions

Information needed to assess the potential for sediment recontamination associated with current or historical operations at this facility was summarized in the Spokane Street to Kellogg Island Data Gaps Report (SAIC 2012). The following source control actions will be conducted to fill the identified data gaps and reduce the potential for recontamination of sediments:

- Ecology will request information regarding cleanup and groundwater monitoring at West Seattle Estates in order to evaluate the potential for sediment recontamination via the groundwater discharge pathway.
- Ecology will assess the need for additional investigations and/or cleanup of soil and groundwater contamination at this property.

3.5 Properties with Cement Kiln Dust Fill

CKD was used as fill at several properties in the LDW basin, including the following properties in the Spokane Street to Kellogg Island source control area:

- Puget Park and the McFarland Property
- Washington Federal Savings & Loan

No source control actions were identified for the Washington Federal Savings & Loan property.

These properties are geographically located within the SW Idaho Street SD basin; however, based on information from SPU, no storm drain structures are present on these properties (SAIC 2012). Stormwater likely infiltrates the ground surface at these properties, which are mostly unpaved forested and undeveloped land. Groundwater may discharge through seeps into the natural streams that are present on Puget Park and the McFarland Property. The streams are tributaries to the LDW. Groundwater beneath the Washington Federal Savings & Loan property is discharged to the combined sewer.

3.5.1 Puget Park and the McFarland Property

Current Operations	Puget Park: Public Parks McFarland Property: Private residence
Historical Operations	Same as current
Tax Parcel No.	Puget Park: 2424039020, 2840700135 McFarland Property: 2840700005
Address	Puget Park: 4767 16th Avenue SW 98106 McFarland Property: 4818 15th Avenue SW 98106
Facility/Site ID	2479: Puget Park 2575: McFarland Property 6149702: Upper Hudson Street Site
Chemicals of Concern	Arsenic, cadmium, lead, mercury
Media Affected	Soil, groundwater, surface water

Puget Park is part of the West Duwamish Green Belt (Figure 5). The park is west of the West Seattle Estates and south of Pigeon Point Park. The McFarland Property is a private residence that is south of West Seattle Estates and east of Puget Park. The Washington Federal Savings & Loan property is southeast of Puget Park and the McFarland Property.

Historical Operations

Parcel 9020 of Puget Park was used as a landfill for CKD in 1969 by the Ideal Cement Company (currently Lafarge). A portion of the McFarland property was also used for disposal of CKD. Approximately 11,000 to 40,000 cubic yards of CKD were disposed of on the properties (Seattle Parks 1993; Ecology 1996c; Hart Crowser 1996).

The Mayer family, who owned parcel 1324039019[14] in the 1990s, planned to construct apartments on the parcel. Development of the parcel required widening of Puget Way SW. Two proposed routes for widening the road traversed parcels 0005 and 0135, both of which were owned by the McFarland family (GTHMPD 1994; Atkinson 1994).

In December 1997, the McFarland family granted a 50-foot-wide street easement through parcel 0005 for Puget Way SW to the City of Seattle. In March 2000, the easement was amended to include slope easements and temporary construction easements over parcel 0005 to the City of Seattle and the Mayer family (King County 2000). The purpose for the amendment was to allow widening of Puget Way SW.

In June 2002, the McFarland family gave ownership of parcel 0135 to the City of Seattle, with the intent that the parcel would become part of Puget Park (McFarland 2002).

[14] Parcel 1324039019 is currently part of Pigeon Point Park.

Current Operations

Puget Park, which is part of the West Duwamish Green Belt (Figure 5), is open to the public. The McFarland Property is a private residence.

Regulatory History

In June 1993, Seattle Parks notified Ecology that CKD had been dumped on Puget Park (Seattle Parks 1993). In May 1994, Ecology notified Seattle Parks that Puget Park had been added to the CSCSL (Ecology 1994a).

In August 1994, the attorney for the Pigeon Point property (parcel 9019) notified Ecology that tens of thousands of tons of CKD had been dumped on the McFarland property and Puget Park. CKD was not present on the Pigeon Point Property (GTHMPD 1994).

In 1995, Ecology determined that CKD at the property would not be designated as a dangerous waste after reviewing the results of a fish bioassay test (Ecology 1995).

In April 1996, Ecology notified the McFarlands that their property (parcel 0135) had been added to the CSCSL due to the presence of CKD (Ecology 1996b).

In July 2003, the McFarland family notified Ecology that CKD fill was uncovered on parcel 0005. Mr. McFarland stated that the fill originated at Ideal Cement (now Lafarge) and was placed at the property in 1969 or 1970 by the same individual who placed the CKD fill at the Puget Park and McFarland properties. Mr. McFarland had excavated approximately 1,000 cubic yards of CKD from the property (McFarland 2003).

During a meeting with Ecology in December 2003, Seattle Parks indicated that plans were being developed to construct a leachate collection trench downgradient of CKD-fill area of Puget Park. Collected water would be discharged to the sanitary sewer (Cargill 2003). In January 2005, Seattle Parks submitted the plans to Ecology for review (Seattle Parks 2005). Records documenting the installation of the leachate collection trench were not found during the file review. It is not known if the trench was installed.

In January 2007, Ecology notified Seattle Parks that additional remedial actions were required at Puget Park. The lateral and vertical extents of arsenic and lead contamination in soil and groundwater had not been determined (Ecology 2007a).[15]

Environmental Investigations and Cleanups

Several environmental investigations and cleanups have been performed at parcel 3680. Additional information is provided in the Spokane Street to Kellogg Island Data Gaps Report (SAIC 2012). Figure 21 shows the property condition following the completion of remedial actions in 1997.

[15] The January 2007 letter lists PCBs as a contaminant associated with the CKD fill. In November 2007, Ecology indicated that PCBs were not a chemical of concern in "virgin" CKD (Myers 2007).

In June 1993, Seattle Parks collected water samples from a seep that flowed through the CKD-fill area of Puget Park towards Puget Creek. Arsenic, mercury, and selenium were detected in the seep samples (Seattle Parks 1993). Mercury concentrations exceeded the draft groundwater-to-sediment screening levels.

In July 1994, soil/CKD samples were collected from two areas of the McFarland property that were being evaluated for a proposed road-widening project (RZA AGRA 1994). Concentrations of arsenic, cadmium, lead, mercury, and silver were detected in the samples at concentrations exceeding MTCA cleanup levels and/or the draft soil-to-sediment screening levels.

A remedial evaluation was performed in August 1996 to characterize the nature and extent of CKD fill at Puget Park and the McFarland property. Based on historical geotechnical data and field observations, approximately 30,000 sq ft of CKD was estimated to be present on the McFarland Property (referred to as the McFarland Lobe). Approximately 100,000 sq ft of CKD was estimated to be present on the Puget Park property (referred to as the Puget Park Lobe). The maximum thickness of the fill was 20 feet. A 5- to 10-foot thick layer of silty clay/clayey silt is present beneath the fill (Hart Crowser 1996).

Two surface water samples were collected from Puget Creek and a seep sample was collected to determine the potential impact of CKD fill to water quality. Three rounds of sampling were performed in August and October 1996 and July 1997 (Hart Crowser 1997a). Lead concentrations in the seep samples exceeded the Marine Chronic WQS and the draft groundwater-to-sediment screening level. Concentrations of cadmium and lead in calcium carbonate formations in soil exceeded MTCA cleanup levels and the draft soil-to-sediment screening levels. Arsenic concentrations exceeded the MTCA Method B cleanup level.

Remedial actions were performed in 1997 to eliminate the potential for human contact with CKD and calcium carbonate formations, eliminate potential dust generation and releases to the atmosphere from CKD, control runoff, further sedimentation, and precipitation of the CKD to the environment, and maintain and enhance the wooded greenbelt. To achieve these goals, the following actions were performed (Hart Crowser 1997b):

- Approximately 7.5 tons of waste, including used tires, appliances, and other household items were removed from the property.
- Approximately 250 feet of hay bale sediment fences and 200 feet of geotextile silt fences were installed for erosion control.
- Temporary gravel construction roads were graded with clean soil and hydroseeded.
- A 2-foot-thick enhanced soil cover consisting of slightly gravelly, sandy silt was installed over the CKD fill and hydroseeded. An approximately 6,200 sq ft area on the Puget Park Lobe and 26,500 sq ft area on the McFarland Lobe were covered.
- Precipitate chambers were installed in two areas of active calcium carbonate precipitation to enhance the removal of dissolved carbonates and other inorganic compounds from seep waters.
- A culvert was installed under Puget Way SW to direct stormwater runoff from residential properties from entering a drainage ravine between the Puget Park and McFarland properties. The culvert directed runoff to the eastern side of Puget Way SW.

- Barrier plants, such as huckleberry and dogwood, were planted at the perimeter of the fill areas, and wooded plants, such as maple and alder trees, were planted in the open spaces to discourage public access to the CKD fill area.
- A temporary fence was installed to allow sufficient time for the barrier and wooded plants to develop. The fence was meant to be left in place for two years.

The precipitate chambers were inspected in March 1998. Seep water had become trapped in the chambers and burst through the surface, allowing seep water to flow towards Puget Creek. The chambers were clogged with silt. Holes were punched in the geotextile fabric lining the chambers to allow the sediment to flow through the chamber. Samples of seep and creek water were collected in June 1998 and 1999. Seep samples were collected upgradient and downgradient from the precipitate chambers. Dissolved lead concentrations were higher in the outflow samples (Geo Group 2003a). Lead concentrations exceeded the Marine Chronic WQS and draft groundwater-to-sediment screening levels.

In October 2003, six CKD samples were collected from the Puget Park and McFarland Lobes to determine if dioxins/furans were present in the CKD fill. Samples of Puget Creek sediment, the calcium carbonate precipitate, and seep water were also collected. Dioxins/furans were detected in all environmental media that were sampled (Geo Group 2003b). The dioxin/furan TEQ for the Puget Creek sediment sample exceeded the LDW background TEQ.

COC	Seep & Creek Water	CKD & Precipitate	Creek Sediment
Arsenic		♦	
Cadmium		●♦	
Lead	■	●♦	
Mercury	■	●	
Silver		●	
Dioxin/Furan TEQ			▲

■ Chemical detected at a concentration that exceeds the Marine Chronic WQS
● Chemical detected at a concentration that exceeds the draft soil-to-sediment screening level
♦ Chemical detected at a concentration that exceeds MTCA Method A or B cleanup levels
▲ Exceeds LDW background level (Windward 2010a)

Potential for Sediment Recontamination

The potential for sediment contamination associated with this property is summarized below:

- Stormwater at Puget Park and the McFarland property infiltrates the ground surface. The potential for sediment recontamination via this pathway is incomplete.
- Soil and groundwater beneath the property are contaminated with metals and creek sediment is contaminated with dioxins/furans. The lateral and vertical extents of contamination have not been determined. Groundwater discharges to Puget Creek, which enters the LDW near SW Idaho Street. Lead and arsenic concentrations have not exceeded

sediment screening levels in sediment samples collected near Outfall 2147; however, the dioxin/furan TEQ in LDW sediment has exceeded the LDW background level.

Source Control Actions

Information needed to assess the potential for sediment recontamination associated with current or historical operations at this facility was summarized in the Spokane Street to Kellogg Island Data Gaps Report (SAIC 2012). The following source control actions will be conducted to fill the identified data gaps and reduce the potential for recontamination of sediments:

- Ecology will request information from Seattle Parks to determine if the leachate collection trench was installed downgradient of the Puget Park Lobe.
- Ecology will assess the need for additional environmental investigations and/or cleanup of contaminated soil and groundwater at this property.

4.0 Monitoring

Monitoring efforts by SPU, Ecology, and King County will continue to assist in identifying and tracing ongoing sources of COCs present in LDW sediments or in upland media. This information will be used to focus source control efforts on specific problem areas within the Spokane Street to Kellogg Island source control area and to track the progress of the source control program. The following types of samples will be collected:

- In-line sediment trap samples from storm drain systems,
- Onsite catch basin sediment samples, and
- Soil and groundwater samples as necessary.

If monitoring data indicate the presence of additional sources that could result in recontamination of sediments associated with the Spokane Street to Kellogg Island source control area, then Ecology will identify source control activities as appropriate.

Because source control is an iterative process, monitoring is necessary to identify trends in concentrations of COCs. Monitoring is anticipated to continue for some years. Any decisions to discontinue monitoring will be made jointly by Ecology and EPA, based on the best available information. At this time, Ecology plans to review the progress and data associated with source control action items for each SCAP at least annually, and to summarize this information in the LDW Source Control Status Reports, which are scheduled for publication periodically. In addition, Ecology may prepare Technical Memoranda to update the Data Gaps Reports and SCAPs, as needed.

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5.0 Tracking and Reporting of Source Control Activities

Ecology is the lead for tracking, documenting, and reporting the status of source control to EPA and the public. Each agency involved in source control will document its source control activities and provide regular updates to Ecology. Ecology will prepare periodic LDW Source Control Status Reports that summarize recent activities for each source control area and the overall status of source control in the LDW.

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Tables

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Table 1
Facilities and Properties within the Spokane Street to Kellogg Island Source Control Area

Map ID[a]	Ecology Facility/ Site ID	Facility Name	Alternate Name(s)	Facility Address	Zip	Active EPA ID No.	Ecology CSCSL	NPDES Permit	KCIW Discharge Permit	Ecology LUST List	Ecology UST List	Ecology NFA	104(e) Request
Adjacent Facilities/Properties													
32	15472775	4800 W Marginal	Terminal 107, Vacant UST 2482 Marginal Way SW	4800 West Marginal Way SW	98106								
1	4091	BASF at United Motor Freight	Riverside Mill	3800 West Marginal Way SW, Bldg 3	98106	●							●
9	44375557	Bird Johnson Port	Boeing Company Terminal 105, Crowley Marine Services Inc T105, Ferguson Enterprises, Seattle Port Terminal 105, Terminal 105	4100 West Marginal Way SW	98106								●
1	10931	Bob's Boat Shop	Riverside Mill	3800 West Marginal Way SW, Bldg 4	98106	●							●
17	97821669	Boeing Company Terminal 105	Birmingham Steel Corporation, Crowley Marine Services Inc T105, Crowley Marine Services Inc Marginal Way, General Recycling of Washington, Seattle Port Terminal 105, Terminal 105	4260 West Marginal Way SW	98106								●
	NA	Burlington Northern Santa Fe Railroad Right-of-Way	BNSF RR ROW	None									
17	24172765	Crowley Marine Services Inc Marginal Way	Bird Johnson Port, Boeing Company Terminal 105, Crowley Marine Services Inc T105, Ferguson Enterprises, General Recycling of Washington, Seattle Port Terminal 105, Terminal 105	4154 West Marginal Way SW	98106								●
12	21179265	Duroboat Manufacturing Company	Terminal 105	1140 SW Dakota Street	98106						●		●
20	83317575	Evergreen Trails	Gray Line of Seattle, Horizon Coach Lines, Northwest Container Services, PACCAR Seaboard Lumber Property, Seattle City Seaboard Lumber former site	4500 West Marginal Way SW	98106	●		●			●		●
9	18675	Ferguson Enterprises Inc.	Bird Johnson Port, Boeing Company Terminal 105, Crowley Marine Services Inc T105, Seattle Port Terminal 105, Terminal 105	4100 West Marginal Way SW	98106								●
12	6869	General Biodiesel Inc	Duroboat Manufacturing Company, Pacific Rendering	4034 West Marginal Way SW	98106								●
3	94648691	General Construction Co Seattle Site	Fletcher General Inc, General Construction Rock Products, Northwest Aggregates, Glacier Northwest, Terminal 103	3838 West Marginal Way SW	98106	●							●
17	18553	General Recycling of Washington	Birmingham Steel Corporation, Nucor Steel, Boeing Company Terminal 105, Crowley Marine Services Inc T105, Crowley Marine Services Inc Marginal Way, Seattle Port Terminal 105, Terminal 105	4260 West Marginal Way SW	98106			●					●

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Adjacent Facilities/Properties													
3	2302559	Glacier Northwest, Inc. Seattle	Fletcher General Inc, General Construction Co Seattle Site, General Construction Rock Products, Northwest Aggregates, Terminal 103	3838 West Marginal Way SW	98124	●		●					●
4	NA	Global Diving & Salvage	None	3840 West Marginal Way SW	98106								●
20	75577212	Gray Line of Seattle Marginal Way	Evergreen Trails Inc, Horizon Coach Lines, Northwest Container Services, PACCAR Seaboard Lumber Property, Seattle City Seaboard Lumber former site	4500 West Marginal Way SW	98106								●
9	76453385	HW Blackstock Co	Birmingham Steel Corporation, Nucor Steel, Boeing Company Terminal 105, Crowley Marine Services Inc T105, Crowley Marine Services Inc Marginal Way, Seattle Port Terminal 105, Terminal 105	4000 West Marginal Way SW	98106								●
3	7754458	Northwest Aggregates	CalPortland, Fletcher General Inc, General Construction Rock Products, General Construction Company, Glacier Northwest,Terminal 103	3838 West Marginal Way SW	98106			●		●	●		
12	10287	Pacific Rendering Co Inc	Duroboat Manufacturing Company, Encore Oils, General Biodiesel	4034 West Marginal Way SW	98106				●				●
17	53456833	Puget Sound Tug & Barge Company	Bird Johnson Port, Birmingham Steel Corporation, Boeing Company Terminal 105, Crowley Marine Services Inc T105, Crowley Marine Services Inc Marginal Way, Ferguson Enterprises, General Recycling of Washington, Terminal 105	4620 West Marginal Way SW	98104						●		
20, 21	88471591	Former Seaboard Lumber	Evergreen Trails Inc, Gray Line of Seattle Marginal Way, Horizon Coach Lines, Northwest Container Services, Paccar Seaboard Lumber Property, Seattle City Seaboard Lumber former site	4540 West Marginal Way SW	98106					●	●	●	●
9, 10, 12, 17	66711778	Seattle Port Terminal 105	Bird Johnson Port, Birmingham Steel Corporation, Boeing Company Terminal 105, Crowley Marine Services Inc T105, Crowley Marine Services Inc Marginal Way, Ferguson Enterprises, General Recycling of Washington, Puget Sound Tug & Barge Company, Terminal 105	4260 West Marginal Way SW	98106	●				●	●		●

Table 1
Facilities and Properties within the Spokane Street to Kellogg Island Source Control Area

Map ID[a]	Ecology Facility/ Site ID	Facility Name	Alternate Name(s)	Facility Address	Zip	Active EPA ID No.	Ecology CSCSL	NPDES Permit	KCIW Discharge Permit	Ecology LUST List	Ecology UST List	Ecology NFA	104(e) Request
Adjacent Facilities/Properties													
1	2093	Seattle Steel Industrial Fasteners	Riverside Mill, Industrial Fasteners Plant, Seattle Steel Inc Industrial Fastener Division, SSI Real Estate Co Inc	3800 West Marginal Way SW	98106		●			●	●	●	●
3	NA	Terminal 103	Fletcher General Inc, General Construction Rock Products, General Construction Seattle Site, Northwest Aggregates, Glacier Northwest	3838 West Marginal Way SW	98106								●
32	NA	Terminal 107	4800 W Marginal, Vacant UST 2482 Marginal Way SW	5402 West Marginal Way SW	98106								
1	89431534	United Motor Freight	Riverside Mill	3800 West Marginal Way SW	98106	●							●
32	96168526	Vacant UST 2482 Marginal Way SW	4800 W Marginal, Terminal 107	4842 West Marginal Way SW	98106						●		
Upland Facilities/Properties: SW Dakota Street SD Basin													
7	20843	Active Environmental Inc 16th Ave	None	4001 16th Avenue SW	98106								
14	11229	Aquatic Ent Inc	4101 West Marginal Way SW Business Park	4101 West Marginal Way SW, Ste A6	98106								
8	31119678	Brys Auto Wrecking	Bryans Volkswagon Auto Wrecking, Concrete Restoration, Inc.	4025 West Marginal Way SW	98106		●						
14	NA	Cohesive Garage	4101 West Marginal Way SW Business Park	4101 West Marginal Way SW	98106								
8	9688	Concrete Restoration Inc	Brys Auto Wrecking, Bryans Volkswagon Auto Wrecking	4025 West Marginal Way SW	98106								
14	39342192	Dakota Street	AABLE Auto Wrecking, 4101 West Marginal Way SW Business Park	4101 West Marginal Way SW	98106							●	
2	72321478	Fraser Inc	None	3801 Marginal Place SW	98106								
11	12698	Heathco Intl Inc	Penthouse Drapery (shared building)	4033 16th Avenue SW, Ste B	98106								
14	NA	Metal Shorts	4101 West Marginal Way SW Business Park	4101 West Marginal Way SW	98106								
11	24724	Penthouse Drapery 16th Ave	Heathco Intl Inc. (shared building)	4033 16th Avenue SW, Ste A	98106								
13	23451	Raynproof Roofing	None	4117 16th Avenue SW	98106								
16	59252684	Seattle Parks and Recreation Westbridge Facility	Bank of America Central Services Bldg, Central Services Bldg, Seafirst Bank Central Svcs, Westbridge Building	4209 West Marginal Way SW	98106	●							
15	2438	Strutz Property	None	4201 16th Avenue SW	98106		●					●	
5	20891	Tryg Winquist Construction Co	None	3839 West Marginal Way SW	98106								
14	14517	West Seattle Radiator Service W Marginal Way	4101 West Marginal Way SW Business Park	4101 West Marginal Way SW, A3	98106								
6	2981502	West Seattle Recycling Center	None	3881 16th Avenue SW	98106								

Table 1
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Upland Facilities/Properties: SW Dakota Street SD Basin													
16	2999235	Westbridge Building	Bank of America Central Services Bldg, Central Services Bldg, Seafirst Bank Central Svcs, Seattle Parks and Recreation Westbridge Facility	4201 West Marginal Way SW	98106		●			●	●		
14	1916	Wheelchairs Plus Inc	4101 West Marginal Way SW Business Park	4101 West Marginal Way SW, A2	98106								
Upland Facilities/Properties: SW Idaho Street SD Basin													
35	93395933	17th SW Drums	None	5934 17th Avenue SW	98106								
22	8547	Airclean Technologies Inc	None	4725 West Marginal	98106								
24	2185	Central Painting	Expert Marble & Granite Inc	4749 West Marginal Way SW	98106	●	●						
19	10412	Continental Van Lines	None	4501 West Marginal Way SW	98106								
29	6697	Evergreen Building Products LLC	None	4835 West Marginal Way SW	98106								
28	1184778	Fog Tite Inc	Fog Tite Meter and Seal, Inc.	4819 West Marginal Way SW	98106			●	●				
30	16129	Heath Landscape Services Inc	None	4849 West Marginal Way SW	98106								
37	3121499	King Residence	None	6518 16th Avenue SW	98106		●						
18	9627	New Finishes Inc W Marginal Way	Pacifica Marine Inc. (shared property)	4235 West Marginal Way SW	98106								
34	9581551	Ortega Property	None	5235 18th Avenue SW	98106		●						
18	23704	Pacifica Marine Inc	New Finishes Inc. W Marginal Way (shared property)	4233 West Marginal Way SW	98106								
36	43445813	WA CC South Seattle Community College	South Seattle Community College UST 5966	6000 16th Avenue SW	98106	●				●	●		
23	3858982	West Seattle Estates LLC	None	4699 15th Avenue SW	98106		●					●	
Upland Facilities/Properties: Properties with Cement Kiln Dust Fill													
26	2575	McFarland Property	Hudson St Site, Mayer Hudson St Project, Pigeon Point, Puget Park	SW Edmunds Street & 15th Avenue SW	98016								
27	2479	Puget Park	Hudson St Site, Mayer Hudson St Project, McFarland Property, Pigeon Point	16th Avenue SW	98106		●						
26, 27	6149702	Upper Hudson Street Site	Mayer Hudson St Project, Pigeon Point, Puget Park	4815 15th Avenue SW	98106								
33	NA	Washington Federal Savings & Loan-Cement Kiln Dust site	SW Hudson & West Marginal Way SW Site, Surplus Items Inc.	SW Hudson & West Marginal Way	98106				●				

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Facilities and Properties within the Spokane Street to Kellogg Island Source Control Area

Map ID[a]	Ecology Facility/ Site ID	Facility Name	Alternate Name(s)	Facility Address	Zip	Active EPA ID No.	Ecology CSCSL	NPDES Permit	KCIW Discharge Permit	Ecology LUST List	Ecology UST List	Ecology NFA	104(e) Request

a - Facilities/properties are identified by the Map ID on Figure 6a
All facilities are located within the Duwamish West CSO Basin, with the following exceptions: King Residence, McFarland Property, Puget Park, Upper Hudson Street Site, and WA CC South Seattle Community College. The properties with Cement Kiln Dust Fill are located in the SW Idaho Street SD Basin.

EPA - U.S. Environmental Protection Agency
CSCSL - Confirmed or Suspected Contaminated Sites List
NPDES - National Pollutant Discharge Elimination System
KCIW - King County Industrial Waste
LUST - Leaking Underground Storage Tank
UST - Underground Storage Tank
NFA - No Further Action
104(e) Request - Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Section 104(e) Request for Information Letter was sent to the owners and/or operators of the property/facility

Table 2
Sediment Samples Collected Near the Spokane Street to Kellogg Island Source Control Area

Event Name	Location Name	Date Collected	Collection Depth (feet)	Analyses							Source
				Metals	SVOCs[a]	PCBs	Dioxins/ Furans	Organo-metals	VOCs	Pesticides	
Harbor Island RI[b]	K-05	09/27/91	Surface	●	●	●		●		●	Windward 2003b
Terminal 105 Site Assessment[b]	SS1	11/23/93	Surface	●	●	●			●		Olympus 1994
	SS2	11/17/93		●	●	●			●		
	SS3	11/17/93		●	●	●			●		
Seaboard Lumber-Phase 2 Investigation	SD-1	03/28/96	Surface	●	●	●					Windward 2003b
	SD-2	03/28/96		●	●	●					
	SD-3	03/28/96		●	●	●					
	SD-4	03/28/96		●	●	●					
	SD-5	03/28/96		●	●	●					
	SD-6	03/28/96		●	●	●					
	SD-7	03/28/96		●	●	●					
	SD-8	03/28/96		●	●	●					
	SD-9	03/28/96		●	●	●					
	SD-10	03/28/96		●	●	●					
	SD-11	03/28/96		●	●	●					
	SD-12	03/28/96		●	●	●					
	SD-13	03/28/96		●	●	●					
	SD-14	03/28/96		●	●	●					
	SD-15	03/28/96		●	●	●					
	SD-16	03/28/96		●	●	●					
	SD-17	03/28/96		●	●	●					
	SD-18	03/28/96		●	●	●					
	SD-19	03/28/96		●	●	●					
	SD-20	03/28/96		●	●	●					
NOAA Site Characterization[c]	WIT282	11/12/97	Surface			●					Windward 2003b
	WIT283	09/16/97				●					
	WIT286	09/15/97				●					
	WIT287	09/15/97				●					
	WIT288	09/15/97				●					
	WIT289	09/15/97				●					
	WIT290	09/16/97				●					
	WIT291	09/16/97				●					
	WIT292	09/16/97				●					
	WIT293	09/18/97				●					
	WIT294	09/16/97				●					
	WIT295	09/16/97				●					
	WIT296	09/18/97				●					
	WIT297	09/19/97				●					
	WIT298	10/17/97				●[d]					
	WIT299	10/14/97				●[d]					
	WST358	11/12/97				●					
	WST359	09/18/97				●					
	WST363	09/15/97				●					
	WST366	09/15/97				●					
	WST367	09/19/97				●					

Table 2
Sediment Samples Collected Near the Spokane Street to Kellogg Island Source Control Area

Event Name	Location Name	Date Collected	Collection Depth (feet)	Analyses							Source
				Metals	SVOCs[a]	PCBs	Dioxins/ Furans	Organo-metals	VOCs	Pesticides	
NOAA Site Characterization[c], continued	WST368	09/16/97	Surface			●					Windward 2003b
	WST370	09/18/97				●					
	WST371	09/18/97				●					
	WST372	10/15/97				●					
	WST373	10/14/97				●[d]					
	WST374	10/14/97				●[d]					
KC CSO Water Quality Assessment	KI-1	09/24/97	Surface	●	●	●		●[e]			Windward 2003b
	KI-2	09/24/97		●	●	●		●[e]			
	KI-3	09/24/97		●[f]	●	●		●[e]			
	KI-4	09/24/97		●	●	●		●[e]			
	WQAKELL	03/06/97		●[g]	●	●					
	WQAKELL	03/12/97		●[g]	●	●					
	WQAKELL	03/27/97		●[g]							
	WQAKELL	04/03/97		●[g]	●	●					
	WQAKELL	04/08/97		●[g]							
	WQAKELL	04/17/97		●[g]	●	●					
	WQAKELL	04/24/97		●[g]							
	WQAKELL	05/01/97		●[g]	●	●					
	WQAKELL	05/08/97		●[g]							
Puget Sound Sediment Quality/ NOAA Site Characterization	203	06/22/98	Surface	●	●	●		●[h]		●	Windward 2003b
EPA Site Inspection	DR031	08/11/98	Surface	●	●	●					Windward 2003b
	DR032	08/11/98		●	●	●					
	DR033	08/11/98		●	●	●	●	●	●	●	
	DR034	08/11/98		●	●	●					
	DR035	08/11/98		●	●	●					
	DR036	08/12/98		●	●	●					
	DR037	08/18/98		●	●	●					
	DR038	09/02/98		●	●	●		●			
	DR039	08/12/98		●	●	●					
	DR040	08/12/98		●	●	●					
	DR041	08/12/98		●	●	●					
	DR042	08/12/98		●	●	●	●	●	●	●	
	DR043	08/12/98		●	●	●					
	DR044	08/12/98		●	●	●					
	DR045	09/14/98		●	●	●					
	DR046	08/12/98		●	●	●	●	●		●	
	DR047	09/14/98		●	●	●	●	●	●		
	DR048	08/12/98		●	●	●					

Table 2
Sediment Samples Collected Near the Spokane Street to Kellogg Island Source Control Area

Event Name	Location Name	Date Collected	Collection Depth (feet)	Analyses							Source
				Metals	SVOCs[a]	PCBs	Dioxins/ Furans	Organo-metals	VOCs	Pesticides	
EPA Site Inspection, continued	DR066	08/18/98	Surface	●	●	●					Windward 2003b
	DR067	08/18/98		●	●	●		●	●	●	
	DR068	08/18/98		●	●	●		●			
	DR069	08/18/98		●	●	●					
	DR070	08/12/98		●	●	●		●			
	DR076	08/24/98		●	●	●					
	DR077	08/24/98		●	●	●					
	DR078	08/24/98		●	●	●					
	DR079	08/24/98		●	●	●					
	DR080	08/24/98		●	●	●					
LDWRI-Benthic	B1a	08/13/04	Surface	●	●	●		●		●	Windward 2005a, 2005b, 2010b
	B2a	08/13/04		●	●	●		●		●	
	B3a	08/26/04		●	●	●		●		●	
	C1	08/26/04		●	●	●		●		●	
	C2-1	08/26/04		●	●	●		●		●	
	C2-2	08/26/04		●	●	●		●		●	
	C3-1	08/27/04		●	●	●		●		●	
	C3-2	08/27/04		●	●	●		●		●	
LDWRI-Surface Sediment Round 1	LDW-SS10	01/17/05	Surface	●	●	●					Windward 2005a, 2005b, 2010b
	LDW-SS12	01/17/05		●	●	●					
	LDW-SS14	01/17/05		●	●	●	●	●			
	LDW-SS15	01/17/05		●	●	●		●			
	LDW-SS23	01/18/05		●	●	●					
	LDW-SS28	01/24/05		●	●	●	●	●		●	
	LDW-SS33	01/26/05		●	●	●		●			
	LDW-SS36	01/24/05		●	●	●	●			●	
LDWRI-Surface Sediment Round 2	LDW-SSC1	03/15/05	Surface	●	●	●				●	Windward 2005b, 2005c, 2010b
	LDW-SS3	03/09/05		●	●	●		●			
	LDW-SS9	03/14/05		●	●	●				●	
	LDW-SS16	03/08/05		●	●	●				●	
	LDW-SS19	03/08/05		●	●	●					
	LDW-SS24	03/14/05		●	●	●					
	LDW-SS29	03/14/05		●	●	●					
	LDW-SS34	03/14/05		●	●	●		●			
LDWRI-Surface Sediment Round 3	LDW-SS306	10/03/06	Surface	●	●	●					Windward 2005b, 2005c, 2010b
	LDW-SS308	10/03/06		●	●	●					
	LDW-SS309	10/03/06		●	●	●					
	LDW-SS310	10/03/06		●	●	●		●			

Table 2
Sediment Samples Collected Near the Spokane Street to Kellogg Island Source Control Area

Event Name	Location Name	Date Collected	Collection Depth (feet)	Analyses							Source
				Metals	SVOCs[a]	PCBs	Dioxins/ Furans	Organo-metals	VOCs	Pesticides	
LDWRI-Surface Sediment Round 3, continued	LDW-SS311	10/03/06	Surface	●	●	●					Windward 2005b, 2005c, 2010b
	LDW-SS312	10/03/06		●	●	●					
	LDW-SS313	10/04/06		●	●	●					
	LDW-SS314	10/04/06		●	●	●					
	LDW-SS315	10/04/06		●	●	●					
LDW Subsurface Sediment 2006	LDW-SC5	02/09/06	0.0 - 1.0	●	●	●					Windward 2007
		02/09/06	1.0 - 2.2	●	●	●					
		02/09/06	2.2 - 4.0	●	●	●					
	LDW-SC6	02/09/06	0.0 - 0.5			●					
		02/09/06	0.0 - 2.0	●	●	●					
		02/09/06	0.5 - 1.0			●					
		02/09/06	1.0 - 1.5			●					
		02/09/06	1.5 - 2.0			●					
		02/09/06	2.0 - 2.5			●					
		02/09/06	2.0 - 4.5	●	●	●					
		02/09/06	2.5 - 3.0			●					
		02/09/06	3.0 - 3.5			●					
		02/09/06	3.5 - 4.0			●					
		02/09/06	4.0 - 4.5			●					
		02/09/06	6.0 - 8.0	●	●	●					
	LDW-SC11	02/13/06	0.0 - 0.8	●	●	●					
		02/13/06	0.8 - 2.0	●	●	●					
		02/13/06	2.0 - 3.4	●	●	●					
		02/13/06	3.4 - 4.1	●	●	●					
	LDW-SC12	02/16/06	0.0 - 0.5			●					
		02/16/06	0.0 - 2.0	●	●	●		●			
		02/16/06	0.5 - 1.0			●					
		02/16/06	1.0 - 1.5			●					
		02/16/06	1.5 - 2.0			●					
		02/16/06	2.0 - 2.5			●					
		02/16/06	2.0 - 4.0	●	●	●		●			
		02/16/06	2.5 - 3.0			●					
		02/16/06	3.0 - 3.5			●					
		02/16/06	3.5 - 4.0			●					
		02/16/06	4.0 - 6.6	●[i]		●					
		02/16/06	6.6 - 8.7	●[i]		●					
	LDW-SC19	02/24/06	0.0 - 1.0	●	●	●	●				
		02/24/06	1.0 - 2.0	●	●	●	●				

Table 2
Sediment Samples Collected Near the Spokane Street to Kellogg Island Source Control Area

Event Name	Location Name	Date Collected	Collection Depth (feet)	Analyses							Source
				Metals	SVOCs[a]	PCBs	Dioxins/ Furans	Organo-metals	VOCs	Pesticides	
LDW Subsurface Sediment 2006, continued	LDW-SC19	02/24/06	2.0 - 4.0	●	●	●	●				Windward 2007
		02/24/06	4.0 - 6.0			●					
		02/24/06	6.0 - 7.0			●					
		02/24/06	9.0 - 11.9			●					
Ecology SPI	TRI-010	08/08/06	Surface	●	●	●		●			Ecology 2007c
	TRI-015T	08/08/06		●	●	●		●			
	TRI-016	08/08/06		●	●	●		●			
	SPI-108	08/11/06		●	●	●		●			
LDW Dioxin Sampling	LDW-SS509	12/15/09	Surface	●[j]	●	●	●				Windward 2010a
	LDW-SS507	12/16/09					●				
	LDW-SS514	12/16/09					●				
LDW Outfall Sampling	LDW-SS2144-A	03/14/11	Surface	●	●	●					SAIC 2011
	LDW-SS2146-A	03/14/11		●	●	●					
	LDW-SS2147-D	03/14/11		●	●	●					
	LDW-SS2148-A	04/20/11		●	●	●					
	LDW-SS2149-A	04/20/11		●	●	●					
	LDW-SS2150-A	04/20/11		●	●	●	●				
	LDW-SS2157-A	03/24/11		●	●	●	●				
	LDW-SS2232-A	04/20/11		●	●	●					
	LDW-SS2232-D	04/20/11		●	●	●					
	LDW-SS2232-U	04/20/11		●	●	●					
	LDW-SS2233-D	04/20/11		●	●	●					
	LDW-SS2233-U	04/20/11		●	●	●					
	LDW-SSSWCSO-A	04/08/11		●	●	●					
	LDW-SSSWCSO-U	04/08/11		●	●	●					

PCBs - Polychlorinated biphenyls
SVOCs - Semi-volatile organic compounds
VOCs - Volatile organic compounds
a - SVOCs includes polycyclic aromatic hydrocarbons (PAHs) and phthalates
b - Samples also analyzed for petroleum hydrocarbons (Harbor Island RI), heavy oil-range petroleum hydrocarbons (Terminal 105 Site Assessment)
c - Samples also analyzed for polychlorinated terphenyls
d - Samples analyzed for PCB congeners only
e - Samples analyzed for tetrabutyltin only
f - Mercury was not analyzed in this sample
g- Samples also anaylzed for methylmercury
h - Sample analyzed for tributyltin and tripentyltin chloride
i - Mercury was the only metal analyzed in this sample
j - Arsenic was the only metal analyzed in this sample

Table 3
Chemicals Detected Above Screening Levels in Surface Sediment Samples
Near the Spokane Street to Kellogg Island Source Control Area

Event Name	Location Name	Date Collected	Chemical	Conc'n (mg/kg DW)	TOC %	Conc'n (mg/kg OC)	SQS	CSL	Units	Exceedance Factors	
										SQS	CSL
Metals											
LDWRI-Surface Sediment Round 3	LDW-SS310	10/03/06	Mercury	1.80E+00	1.63		0.41	0.59	mg/kg DW	4.4	3.1
LDWRI-Surface Sediment Round 3	LDW-SS309	10/03/06	Mercury	1.55E+00	2.02		0.41	0.59	mg/kg DW	3.8	2.6
LDWRI-Surface Sediment Round 2	LDW-SS24	03/14/05	Mercury	6.30E-01	5.99		0.41	0.59	mg/kg DW	1.5	1.1
LDWRI-Surface Sediment Round 1	LDW-SS15	01/17/05	Mercury	6.00E-01	1.79		0.41	0.59	mg/kg DW	1.5	1.0
LDWRI-Surface Sediment Round 3	LDW-SS312	10/03/06	Mercury	6.00E-01	4.2		0.41	0.59	mg/kg DW	1.5	1.0
Ecology SPI	TRI-015T	08/08/06	Mercury	5.51E-01	2.16		0.41	0.59	mg/kg DW	1.3	<1
EPA Site Inspection	DR035	08/11/98	Mercury	5.20E-01	2.29		0.41	0.59	mg/kg DW	1.3	<1
EPA Site Inspection	DR044	08/12/98	Mercury	5.00E-01	2.22		0.41	0.59	mg/kg DW	1.2	<1
Terminal 105 Site Assessment	SS1	11/23/93	Zinc	5.30E+02 T	1.9		410	960	mg/kg DW	1.3	<1
LDW Outfall Sampling	LDW-SS2149-A	04/20/11	Zinc	4.78E+02 J	9.22		410	960	mg/kg DW	1.2	<1
Seaboard Lumber-Phase 2 Investigation	SD-10	03/28/96	Zinc	4.40E+02	2.57		410	960	mg/kg DW	1.1	<1
LDWRI-Surface Sediment Round 2	LDW-SS24	03/14/05	Zinc	4.35E+02 J	5.99		410	960	mg/kg DW	1.1	<1
PAHs											
EPA Site Inspection	DR037	08/18/98	Acenaphthene	5.50E-01	2.02	2.72E+01	16	57	mg/kg OC	1.7	<1
EPA Site Inspection	DR033	08/11/98	Acenaphthene	3.10E-01	1.72	1.80E+01	16	57	mg/kg OC	1.1	<1
LDWRI-Surface Sediment Round 2	LDW-SS24[a]	03/14/05	Benzo(a)anthracene	2.60E+00	5.99		1.3	1.6	mg/kg DW	2.0	1.6
LDWRI-Surface Sediment Round 3	LDW-SS312[a]	10/03/06	Benzo(a)anthracene	2.20E+00	4.2		1.3	1.6	mg/kg DW	1.7	1.4
LDW Dioxin Sampling	LDW-SS509[a]	12/15/09	Benzo(a)anthracene	1.80E+00	7.08		1.3	1.6	mg/kg DW	1.4	1.1
LDWRI-Surface Sediment Round 3	LDW-SS312[a]	10/03/06	Benzo(a)pyrene	3.20E+00	4.2		1.6	3.0	mg/kg DW	2.0	1.1
LDWRI-Surface Sediment Round 2	LDW-SS24[a]	03/14/05	Benzo(a)pyrene	2.10E+00	5.99		1.6	3.0	mg/kg DW	1.3	<1
LDW Dioxin Sampling	LDW-SS509[a]	12/15/09	Benzo(a)pyrene	2.10E+00	7.08		1.6	3.0	mg/kg DW	1.3	<1
LDWRI-Surface Sediment Round 3	LDW-SS312[a]	10/03/06	Benzo(g,h,i)perylene	1.60E+00	4.2		0.67	0.72	mg/kg DW	2.4	2.2
LDW Dioxin Sampling	LDW-SS509[a]	12/15/09	Benzo(g,h,i)perylene	1.40E+00	7.08		0.67	0.72	mg/kg DW	2.1	1.9
LDWRI-Surface Sediment Round 2	LDW-SS24[a]	03/14/05	Benzo(g,h,i)perylene	1.10E+00	5.99		0.67	0.72	mg/kg DW	1.6	1.5
EPA Site Inspection	DR033	08/11/98	Benzo(g,h,i)perylene	6.20E-01	1.72	3.60E+01	31	78	mg/kg OC	1.2	<1
LDWRI-Surface Sediment Round 3	LDW-SS312[a]	10/03/06	Benzofluoranthenes (total-calc'd)	4.70E+00	4.2		3.2	3.6	mg/kg DW	1.5	1.3
LDWRI-Surface Sediment Round 2	LDW-SS24[a]	03/14/05	Benzofluoranthenes (total-calc'd)	3.80E+00	5.99		3.2	3.6	mg/kg DW	1.2	1.1
EPA Site Inspection	DR044	08/12/98	Chrysene	4.60E+00	2.08	2.21E+02	110	460	mg/kg OC	2.0	<1
LDWRI-Surface Sediment Round 2	LDW-SS24[a]	03/14/05	Chrysene	3.60E+00	5.99		1.4	2.8	mg/kg DW	2.6	1.3
LDWRI-Surface Sediment Round 3	LDW-SS312[a]	10/03/06	Chrysene	3.00E+00	4.2		1.4	2.8	mg/kg DW	2.1	1.1
LDW Dioxin Sampling	LDW-SS509[a]	12/15/09	Chrysene	2.60E+00	7.08		1.4	2.8	mg/kg DW	1.9	<1
EPA Site Inspection	DR033	08/11/98	Chrysene	2.40E+00	1.72	1.40E+02	110	460	mg/kg OC	1.3	<1
EPA Site Inspection	DR040[a]	08/12/98	Chrysene	2.10E+00	4.69		1.4	2.8	mg/kg DW	1.5	<1
LDWRI-Surface Sediment Round 3	LDW-SS311[a]	10/03/06	Chrysene	1.80E+00	4.36		1.4	2.8	mg/kg DW	1.3	<1
LDW Dioxin Sampling	LDW-SS509[a]	12/15/09	Dibenzo(a,h)anthracene	5.00E-01	7.08		0.23	0.54	mg/kg DW	2.2	<1
LDWRI-Surface Sediment Round 2	LDW-SS24[a]	03/14/05	Dibenzo(a,h)anthracene	3.50E-01	5.99		0.23	0.54	mg/kg DW	1.5	<1
LDWRI-Surface Sediment Round 3	LDW-SS312[a]	10/03/06	Dibenzo(a,h)anthracene	3.20E-01	4.2		0.23	0.54	mg/kg DW	1.4	<1
EPA Site Inspection	DR044	08/12/98	Fluoranthene	2.30E+01	2.08	1.11E+03	160	1,200	mg/kg OC	6.9	<1
EPA Site Inspection	DR038	09/02/98	Fluoranthene	7.80E+00	2.62	2.98E+02	160	1,200	mg/kg OC	1.9	<1
EPA Site Inspection	DR033	08/11/98	Fluoranthene	6.40E+00	1.72	3.72E+02	160	1,200	mg/kg OC	2.3	<1
LDWRI-Surface Sediment Round 2	LDW-SS24[a]	03/14/05	Fluoranthene	5.20E+00	5.99		1.7	2.5	mg/kg DW	3.1	2.1

Table 3
Chemicals Detected Above Screening Levels in Surface Sediment Samples
Near the Spokane Street to Kellogg Island Source Control Area

Event Name	Location Name	Date Collected	Chemical	Conc'n (mg/kg DW)	TOC %	Conc'n (mg/kg OC)	SQS	CSL	Units	Exceedance Factors	
										SQS	CSL
LDWRI-Surface Sediment Round 3	LDW-SS312[a]	10/03/06	Fluoranthene	4.90E+00	4.2		1.7	2.5	mg/kg DW	2.9	2.0
LDW Dioxin Sampling	LDW-SS509[a]	12/15/09	Fluoranthene	4.10E+00	7.08		1.7	2.5	mg/kg DW	2.4	1.6
LDWRI-Surface Sediment Round 3	LDW-SS311[a]	10/03/06	Fluoranthene	3.90E+00	4.36		1.7	2.5	mg/kg DW	2.3	1.6
Terminal 105 Site Assessment	SS1	11/23/93	Fluoranthene	3.70E+00	1.9	1.95E+02	160	1,200	mg/kg OC	1.2	1.5
EPA Site Inspection	DR037	08/18/98	Fluoranthene	3.60E+00	2.02	1.78E+02	160	1,200	mg/kg OC	1.1	<1
EPA Site Inspection	DR040[a]	08/12/98	Fluoranthene	2.90E+00	4.69		1.7	2.5	mg/kg DW	1.7	1.2
LDW Outfall Sampling	LDW-SSSWCSO-U	04/08/11	Fluoranthene	2.90E+00	1.2	2.42E+02	160	1,200	mg/kg OC	1.5	<1
EPA Site Inspection	DR047	09/14/98	Fluoranthene	2.50E+00	1.4	1.79E+02	160	1,200	mg/kg OC	1.1	<1
EPA Site Inspection	DR037	08/18/98	Fluorene	8.80E-01	2.02	4.36E+01	23	79	mg/kg OC	1.9	<1
EPA Site Inspection	DR033	08/11/98	Fluorene	5.70E-01	1.72	3.31E+01	23	79	mg/kg OC	1.4	<1
LDWRI-Surface Sediment Round 3	LDW-SS312[a]	10/03/06	Indeno(1,2,3-cd)pyrene	1.60E+00	4.2		0.6	0.69	mg/kg DW	2.7	2.3
LDWRI-Surface Sediment Round 2	LDW-SS24[a]	03/14/05	Indeno(1,2,3-cd)pyrene	1.20E+00	5.99		0.6	0.69	mg/kg DW	2.0	1.7
LDW Dioxin Sampling	LDW-SS509[a]	12/15/09	Indeno(1,2,3-cd)pyrene	1.20E+00	7.08		0.6	0.69	mg/kg DW	2.0	1.7
EPA Site Inspection	DR033	08/11/98	Indeno(1,2,3-cd)pyrene	7.70E-01	1.72	4.48E+01	34	88	mg/kg OC	1.3	<1
EPA Site Inspection	DR038	09/02/98	Phenanthrene	3.60E+00	2.62	1.37E+02	100	480	mg/kg OC	1.4	<1
EPA Site Inspection	DR037	08/18/98	Phenanthrene	3.50E+00	2.02	1.73E+02	100	480	mg/kg OC	1.7	<1
LDWRI-Surface Sediment Round 3	LDW-SS312[a]	10/03/06	Phenanthrene	3.40E+00	4.2		1.5	5.4	mg/kg DW	2.3	<1
EPA Site Inspection	DR044	08/12/98	Phenanthrene	3.00E+00	2.08	1.44E+02	100	480	mg/kg OC	1.4	<1
EPA Site Inspection	DR033	08/11/98	Phenanthrene	2.60E+00	1.72	1.51E+02	100	480	mg/kg OC	1.5	<1
LDW Outfall Sampling	LDW-SSSWCSO-U	04/08/11	Phenanthrene	2.20E+00	1.2	1.83E+02	100	480	mg/kg OC	1.8	<1
LDW Dioxin Sampling	LDW-SS509[a]	12/15/09	Phenanthrene	2.20E+00	7.08		1.5	5.4	mg/kg DW	1.5	<1
LDWRI-Surface Sediment Round 2	LDW-SS24[a]	03/14/05	Phenanthrene	1.90E+00	5.99		1.5	5.4	mg/kg DW	1.3	<1
LDWRI-Surface Sediment Round 3	LDW-SS312[a]	10/03/06	Pyrene	4.80E+00	4.2		2.6	3.3	mg/kg DW	1.8	1.5
LDWRI-Surface Sediment Round 2	LDW-SS24[a]	03/14/05	Pyrene	4.40E+00	5.99		2.6	3.3	mg/kg DW	1.7	1.3
LDW Dioxin Sampling	LDW-SS509[a]	12/15/09	Pyrene	4.00E+00	7.08		2.6	3.3	mg/kg DW	1.5	1.2
LDWRI-Surface Sediment Round 3	LDW-SS311[a]	10/03/06	Pyrene	2.80E+00	4.36		2.6	3.3	mg/kg DW	1.1	<1
EPA Site Inspection	DR044	08/12/98	Total HPAH (calc'd)	5.08E+01	2.08	2.44E+03	960	5,300	mg/kg OC	2.5	<1
LDWRI-Surface Sediment Round 3	LDW-SS312[a]	10/03/06	Total HPAH (calc'd)	2.63E+01	4.2		12	17	mg/kg DW	2.2	1.5
LDWRI-Surface Sediment Round 2	LDW-SS24[a]	03/14/05	Total HPAH (calc'd)	2.44E+01	5.99		12	17	mg/kg DW	2.0	1.4
LDW Dioxin Sampling	LDW-SS509[a]	12/15/09	Total HPAH (calc'd)	2.09E+01 J	7.08		12	17	mg/kg DW	1.7	1.2
EPA Site Inspection	DR033	08/11/98	Total HPAH (calc'd)	1.96E+01	1.72	1.14E+03	960	5,300	mg/kg OC	1.2	<1
LDWRI-Surface Sediment Round 3	LDW-SS311[a]	10/03/06	Total HPAH (calc'd)	1.41E+01	4.36		12	17	mg/kg DW	1.2	<1
Phthalates											
EPA Site Inspection	DR076[a]	08/24/98	Bis(2-ethylhexyl)phthalate	6.10E+00	0.1	6.10E+03	1.3	1.9	mg/kg DW	4.7	3.2
LDW Outfall Sampling	LDW-SS2150-A[a]	04/20/11	Bis(2-Ethylhexyl)phthalate	1.70E+00	9.22		1.3	1.9	mg/kg DW	1.3	<1
EPA Site Inspection	DR079	08/24/98	Bis(2-ethylhexyl)phthalate	1.10E+00	2.18	5.05E+01	47	78	mg/kg OC	1.1	<1
Terminal 105 Site Assessment	SS1	11/23/93	Bis(2-Ethylhexyl)phthalate	1.00E+00 J	1.9	5.26E+01	47	78	mg/kg OC	1.1	<1
LDW Outfall Sampling	LDW-SSSWCSO-U	04/08/11	Bis(2-Ethylhexyl)phthalate	6.60E-01	1.2	5.50E+01	47	78	mg/kg OC	1.2	<1
LDW Outfall Sampling	LDW-SS2150-A[a]	04/20/11	Butyl benzyl phthalate	2.20E-01 J	9.22		0.063	0.9	mg/kg DW	3.5	<1
Terminal 105 Site Assessment	SS1	11/23/93	Butyl benzyl phthalate	1.50E-01 J	1.9	7.89E+00	4.9	64	mg/kg OC	1.6	<1
EPA Site Inspection	DR043[a]	08/12/98	Butyl benzyl phthalate	1.00E-01	4.48		0.063	0.9	mg/kg DW	1.6	<1

Table 3
Chemicals Detected Above Screening Levels in Surface Sediment Samples
Near the Spokane Street to Kellogg Island Source Control Area

Event Name	Location Name	Date Collected	Chemical	Conc'n (mg/kg DW)	TOC %	Conc'n (mg/kg OC)	SQS	CSL	Units	Exceedance Factors	
										SQS	CSL
Phenols											
Ecology SPI	SPI-108	08/11/06	2,4-Dimethylphenol	5.20E-02	1.55		0.029	0.029	mg/kg DW	1.8	1.8
Ecology SPI	TRI-010	08/08/06	2,4-Dimethylphenol	4.50E-02	2.2		0.029	0.029	mg/kg DW	1.6	1.6
Ecology SPI	TRI-016	08/08/06	2,4-Dimethylphenol	4.40E-02	2.38		0.029	0.029	mg/kg DW	1.5	1.5
LDWRI-Benthic	C2-2	08/26/04	4-Methylphenol	1.60E-01	1.06		0.067	0.067	mg/kg DW	2.4	2.4
Harbor Island RI	K-05	09/27/91	Phenol	2.00E+00 J	1.6		0.42	1.2	mg/kg DW	4.8	1.7
EPA Site Inspection	DR047	09/14/98	Phenol	7.40E-01	1.4		0.42	1.2	mg/kg DW	1.8	<1
LDWRI-Benthic	C1	08/26/04	Phenol	6.00E-01	0.47		0.42	1.2	mg/kg DW	1.4	<1
Ecology SPI	TRI-016	08/08/06	Phenol	5.73E-01	2.38		0.42	1.2	mg/kg DW	1.4	<1
LDWRI-Benthic	C2-1	08/26/04	Phenol	4.50E-01	1.82		0.42	1.2	mg/kg DW	1.1	<1
Other SVOCs											
Puget Sound Sediment Quality/ NOAA Site Characterization	203	06/22/98	Benzoic acid	5.33E+00 J	1.5		0.65	0.65	mg/kg DW	8.2	8.2
LDWRI-Surface Sediment Round 2	LDW-SS24	03/14/05	Benzyl alcohol	6.70E-01	5.99		0.057	0.073	mg/kg DW	12	9.2
LDW Outfall Sampling	LDW-SS2157-A	03/24/11	Benzyl alcohol	2.90E-01	1.81		0.057	0.073	mg/kg DW	5.1	4.0
LDW Outfall Sampling	LDW-SSSWCSO-A	04/08/11	Benzyl alcohol	2.70E-01	2.69		0.057	0.073	mg/kg DW	4.7	3.7
LDW Outfall Sampling	LDW-SSSWCSO-U	04/08/11	Benzyl alcohol	2.40E-01	1.2		0.057	0.073	mg/kg DW	4.2	3.3
LDW Outfall Sampling	LDW-SS2149-A	04/20/11	Benzyl alcohol	1.00E-01	9.22		0.057	0.073	mg/kg DW	1.8	1.4
Terminal 105 Site Assessment	SS2	11/17/93	Benzyl alcohol	7.30E-02 J	0.98		0.057	0.073	mg/kg DW	1.3	1.0
Ecology SPI	TRI-016	08/08/06	Benzyl alcohol	6.40E-02	2.38		0.057	0.073	mg/kg DW	1.1	<1
EPA Site Inspection	DR037	08/18/98	Dibenzofuran	4.10E-01	2.02	2.03E+01	15	58	mg/kg OC	1.4	<1
PCBs											
EPA Site Inspection	DR044	08/12/98	PCBs (total calc'd)	1.93E+00	2.22	8.70E+01	12	65	mg/kg OC	7.3	1.3
LDWRI-Surface Sediment Round 3	LDW-SS312[a]	10/03/06	PCBs (total calc'd)	1.01E+00	4.2		0.13	1.0	mg/kg DW	7.8	1.0
EPA Site Inspection	DR040[a]	08/12/98	PCBs (total calc'd)	7.76E-01	4.69		0.13	1.0	mg/kg DW	6.0	<1
NOAA Site Characterization	WIT282[a]	11/12/97	PCBs (total calc'd)	7.70E-01	4.64		0.13	1.0	mg/kg DW	5.9	<1
NOAA Site Characterization	WIT286	09/15/97	PCBs (total calc'd)	6.60E-01	3.68	1.79E+01	12	65	mg/kg OC	1.5	<1
LDW Dioxin Sampling	LDW-SS509[a]	12/15/09	PCBs (total calc'd)	5.60E-01	7.08		0.13	1.0	mg/kg DW	4.3	<1
NOAA Site Characterization	WIT290	09/16/97	PCBs (total calc'd)	5.40E-01	1.67	3.23E+01	12	65	mg/kg OC	2.7	<1
EPA Site Inspection	DR035	08/11/98	PCBs (total calc'd)	5.16E-01 J	2.29	2.25E+01	12	65	mg/kg OC	1.9	<1
Ecology SPI	SPI-108	08/11/06	PCBs (total calc'd)	4.40E-01 J	1.55	2.84E+01	12	65	mg/kg OC	2.4	<1
LDWRI-Surface Sediment Round 3	LDW-SS311[a]	10/03/06	PCBs (total calc'd)	3.70E-01	4.36		0.13	1.0	mg/kg DW	2.8	<1
LDWRI-Surface Sediment Round 3	LDW-SS310	10/03/06	PCBs (total calc'd)	3.70E-01	1.63	2.27E+01	12	65	mg/kg OC	1.9	<1
LDWRI-Surface Sediment Round 3	LDW-SS309	10/03/06	PCBs (total calc'd)	3.70E-01	2.02	1.83E+01	12	65	mg/kg OC	1.5	<1
EPA Site Inspection	DR034	08/11/98	PCBs (total calc'd)	3.47E-01 J	1.84	1.89E+01	12	65	mg/kg OC	1.6	<1
EPA Site Inspection	DR031	08/11/98	PCBs (total calc'd)	3.42E-01	2.07	1.65E+01	12	65	mg/kg OC	1.4	<1
NOAA Site Characterization	WIT288	09/15/97	PCBs (total calc'd)	3.40E-01	1.66	2.05E+01	12	65	mg/kg OC	1.7	<1
EPA Site Inspection	DR038	09/02/98	PCBs (total calc'd)	3.36E-01 J	2.62	1.28E+01	12	65	mg/kg OC	1.1	<1
NOAA Site Characterization	WIT283	09/16/97	PCBs (total calc'd)	3.30E-01	1.77	1.86E+01	12	65	mg/kg OC	1.6	<1
NOAA Site Characterization	WIT283	09/16/97	PCBs (total calc'd)	3.23E-01	1.77	1.82E+01	12	65	mg/kg OC	1.5	<1
NOAA Site Characterization	WIT283	09/16/97	PCBs (total calc'd)	3.20E-01	1.77	1.81E+01	12	65	mg/kg OC	1.5	<1
LDWRI-Surface Sediment Round 2	LDW-SS16	03/08/05	PCBs (total calc'd)	3.20E-01	2.11	1.52E+01	12	65	mg/kg OC	1.3	<1
NOAA Site Characterization	WST370	09/18/97	PCBs (total calc'd)	3.00E-01	1.72	1.74E+01	12	65	mg/kg OC	1.5	<1
LDWRI-Surface Sediment Round 2	LDW-SS24[a]	03/14/05	PCBs (total calc'd)	2.90E-01	5.99		0.13	1.0	mg/kg DW	2.2	<1

Table 3
Chemicals Detected Above Screening Levels in Surface Sediment Samples
Near the Spokane Street to Kellogg Island Source Control Area

Event Name	Location Name	Date Collected	Chemical	Conc'n (mg/kg DW)	TOC %	Conc'n (mg/kg OC)	SQS	CSL	Units	Exceedance Factors	
										SQS	CSL
LDWRI-Surface Sediment Round 3	LDW-SS308	10/03/06	PCBs (total calc'd)	2.80E-01	1.86	1.51E+01	12	65	mg/kg OC	1.3	<1
EPA Site Inspection	DR043[a]	08/12/98	PCBs (total calc'd)	2.70E-01	4.48		0.13	1.0	mg/kg DW	2.1	<1
NOAA Site Characterization	WIT291	09/16/97	PCBs (total calc'd)	2.30E-01	0.6	3.83E+01	12	65	mg/kg OC	3.2	<1
EPA Site Inspection	DR033	08/11/98	PCBs (total calc'd)	2.25E-01 J	1.72	1.31E+01	12	65	mg/kg OC	1.1	<1
NOAA Site Characterization	WIT287	09/15/97	PCBs (total calc'd)	2.10E-01	1.17	1.79E+01	12	65	mg/kg OC	1.5	<1
Puget Sound Sediment Quality/ NOAA Site Characterization	203	06/22/98	PCBs (total calc'd)	2.07E-01	1.5	1.38E+01	12	65	mg/kg OC	1.2	<1
EPA Site Inspection	DR042[a]	08/12/98	PCBs (total calc'd)	1.82E-01	9.23		0.13	1.0	mg/kg DW	1.4	<1
LDW Outfall Sampling	LDW-SS2150-A[a]	04/20/11	PCBs (total calc'd)	1.50E-01	9.22		0.13	1	mg/kg DW	1.2	<1

mg/kg - Milligram per kilogram
DW - Dry weight
TOC - Total Organic Carbon
OC - Organic carbon normalized
SQS - SMS Sediment Quality Standard
CSL - SMS Cleanup Screening Level
SMS - Sediment Management Standard (Washington Administrative Code 173-204)
PAHs - Polycyclic aromatic hydrocarbons
SVOCs - Semi-volatile organic compounds
PCB - Polychlorinated biphenyl
J - Estimated value between the method detection limit and the laboratory reporting limit

Table presents detected chemicals only.

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

Sampling events are listed in Table 2.

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

Table 4
Chemicals Detected Above Screening Levels in Subsurface Sediment Samples
Near the Spokane Street to Kellogg Island Source Control Area

Event Name	Location Name	Date Collected	Sample Depth (feet)	Chemical	Conc'n (mg/kg DW)	TOC %	Conc'n (mg/kg OC)	SQS	CSL	Units	Exceedance Factors	
											SQS	CSL
Metals												
LDW Subsurface Sediment 2006	LDW-SC11	02/13/06	0.0 - 0.8	Lead	6.39E+02	4.23	1.51E+04	450	530	mg/kg DW	1.4	1.2
LDW Subsurface Sediment 2006	LDW-SC12	02/16/06	4.0 - 6.6	Mercury	7.40E-01	1.92	3.85E+01	0.41	0.59	mg/kg DW	1.8	1.3
LDW Subsurface Sediment 2006	LDW-SC11	02/13/06	0.0 - 0.8	Mercury	6.40E-01	4.23	1.51E+01	0.41	0.59	mg/kg DW	1.6	1.1
LDW Subsurface Sediment 2006	LDW-SC5	02/09/06	1.0 - 2.2	Mercury	5.10E-01	3.93	1.30E+01	0.41	0.59	mg/kg DW	1.2	<1
LDW Subsurface Sediment 2006	LDW-SC12	02/16/06	2.0 - 4.0	Mercury	4.50E-01	1.58	2.85E+01	0.41	0.59	mg/kg DW	1.1	<1
LDW Subsurface Sediment 2006	LDW-SC6	02/09/06	2.0 - 4.5	Mercury	4.40E-01	1.65	2.67E+01	0.41	0.59	mg/kg DW	1.1	<1
LDW Subsurface Sediment 2006	LDW-SC11	02/13/06	0.0 - 0.8	Zinc	4.82E+02	4.23	1.14E+04	410	960	mg/kg DW	1.2	<1
PAHs												
LDW Subsurface Sediment 2006	LDW-SC11[a]	02/13/06	0.0 - 0.8	Benzo(a)pyrene	3.10E+00	4.23	7.33E+01	1.6	3.0	mg/kg DW	1.9	1.0
LDW Subsurface Sediment 2006	LDW-SC11[a]	02/13/06	0.0 - 0.8	Benzo(b)fluoranthene	4.10E+00	4.23	9.69E+01	3.2	3.6	mg/kg DW	1.3	1.1
LDW Subsurface Sediment 2006	LDW-SC11[a]	02/13/06	0.0 - 0.8	Benzo(k)fluoranthene	3.50E+00	4.23	8.27E+01	3.2	3.6	mg/kg DW	1.1	<1
LDW Subsurface Sediment 2006	LDW-SC11[a]	02/13/06	0.0 - 0.8	Benzofluoranthenes (total-calc'd)	7.60E+00	4.23	1.80E+02	3.2	3.6	mg/kg DW	2.4	2.1
LDW Subsurface Sediment 2006	LDW-SC11[a]	02/13/06	0.0 - 0.8	Chrysene	4.30E+00	4.23	1.02E+02	1.4	2.8	mg/kg DW	3.1	1.5
LDW Subsurface Sediment 2006	LDW-SC11[a]	02/13/06	0.0 - 0.8	Fluoranthene	8.10E+00	4.23	1.91E+02	1.7	2.5	mg/kg DW	4.8	3.2
LDW Subsurface Sediment 2006	LDW-SC11[a]	02/13/06	0.0 - 0.8	Indeno(1,2,3-cd)pyrene	6.70E-01	4.23	1.58E+01	0.6	0.69	mg/kg DW	1.1	<1
LDW Subsurface Sediment 2006	LDW-SC11[a]	02/13/06	0.0 - 0.8	Pyrene	6.70E+00	4.23	1.58E+02	2.6	3.3	mg/kg DW	2.6	2.0
LDW Subsurface Sediment 2006	LDW-SC11[a]	02/13/06	0.0 - 0.8	Total HPAH (calc'd)	3.47E+01	4.23	8.20E+02	12	17	mg/kg DW	2.9	2.0
Other SVOCs												
LDW Subsurface Sediment 2006	LDW-SC6	02/09/06	2.0 - 4.5	Bis(2-ethylhexyl)phthalate	1.10E+00	1.65	6.67E+01	47	78	mg/kg OC	1.4	<1
LDW Subsurface Sediment 2006	LDW-SC11[a]	02/13/06	0.0 - 0.8	N-Nitroso-di-n-propylamine	3.60E-02	4.23	8.51E-01	0.028	0.04	mg/kg DW	1.3	<1
PCBs												
LDW Subsurface Sediment 2006	LDW-SC11[a]	02/13/06	0.0 - 0.8	PCBs (total calc'd)	3.00E+00	4.23	7.09E+01	0.13	1.0	mg/kg DW	23	3.0
LDW Subsurface Sediment 2006	LDW-SC6	02/09/06	4.0 - 4.5	PCBs (total calc'd)	2.60E+00	2.23	1.17E+02	12	65	mg/kg OC	9.7	1.8
LDW Subsurface Sediment 2006	LDW-SC12	02/16/06	2.0 - 4.0	PCBs (total calc'd)	2.50E+00	1.58	1.58E+02	12	65	mg/kg OC	13	2.4
LDW Subsurface Sediment 2006	LDW-SC19	02/24/06	6.0 - 7.0	PCBs (total calc'd)	2.40E+00	1.54	1.56E+02	12	65	mg/kg OC	13	2.4
LDW Subsurface Sediment 2006	LDW-SC12	02/16/06	2.0 - 2.5	PCBs (total calc'd)	2.00E+00 J	2.24	8.93E+01	12	65	mg/kg OC	7.4	1.4
LDW Subsurface Sediment 2006	LDW-SC6	02/09/06	2.0 - 4.5	PCBs (total calc'd)	1.64E+00	1.65	9.94E+01	12	65	mg/kg OC	8.3	1.5
LDW Subsurface Sediment 2006	LDW-SC6	02/09/06	3.5 - 4.0	PCBs (total calc'd)	1.59E+00	0.814	1.95E+02	12	65	mg/kg OC	16	3.0
LDW Subsurface Sediment 2006	LDW-SC12	02/16/06	3.5 - 4.0	PCBs (total calc'd)	7.90E-01	1.61	4.91E+01	12	65	mg/kg OC	4.1	<1
LDW Subsurface Sediment 2006	LDW-SC12	02/16/06	2.5 - 3.0	PCBs (total calc'd)	6.30E-01	1.67	3.77E+01	12	65	mg/kg OC	3.1	<1
LDW Subsurface Sediment 2006	LDW-SC5	02/09/06	0.0 - 1.0	PCBs (total calc'd)	5.10E-01	1.68	3.04E+01	12	65	mg/kg OC	2.5	<1
LDW Subsurface Sediment 2006	LDW-SC6	02/09/06	3.0 - 3.5	PCBs (total calc'd)	4.90E-01	1.58	3.10E+01	12	65	mg/kg OC	2.6	<1
LDW Subsurface Sediment 2006	LDW-SC19	02/24/06	4.0 - 6.0	PCBs (total calc'd)	4.40E-01	1.26	3.49E+01	12	65	mg/kg OC	2.9	<1
LDW Subsurface Sediment 2006	LDW-SC12	02/16/06	4.0 - 6.6	PCBs (total calc'd)	4.20E-01	1.92	2.19E+01	12	65	mg/kg OC	1.8	<1
LDW Subsurface Sediment 2006	LDW-SC6	02/09/06	2.5 - 3.0	PCBs (total calc'd)	3.50E-01	1.37	2.55E+01	12	65	mg/kg OC	2.1	<1
LDW Subsurface Sediment 2006	LDW-SC12	02/16/06	0.0 - 2.0	PCBs (total calc'd)	3.50E-01	1.92	1.82E+01	12	65	mg/kg OC	1.5	<1
LDW Subsurface Sediment 2006	LDW-SC12	02/16/06	1.5 - 2.0	PCBs (total calc'd)	3.20E-01	1.98	1.62E+01	12	65	mg/kg OC	1.3	<1
LDW Subsurface Sediment 2006	LDW-SC19	02/24/06	2.0 - 4.0	PCBs (total calc'd)	2.50E-01	1.56	1.60E+01	12	65	mg/kg OC	1.3	<1
LDW Subsurface Sediment 2006	LDW-SC19	02/24/06	1.0 - 2.0	PCBs (total calc'd)	2.33E-01	1.7	1.37E+01	12	65	mg/kg OC	1.1	<1

Table 4
Chemicals Detected Above Screening Levels in Subsurface Sediment Samples
Near the Spokane Street to Kellogg Island Source Control Area

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

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

SQS - SMS Sediment Quality Standard
CSL - SMS Cleanup Screening Level
SMS - Sediment
PAHs - Polycyclic

SVOCs - Semi-volatile organic compounds
PCB - Polychlorinated biphenyl
J - Estimated

Table presents detected chemicals only.
Exceedance factors are the ratio of the detected concentrations to
Sampling events are listed in Table 2.

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

Table 5
Chemicals Detected Above Screening Levels in Seep Samples
Near the Spokane Street to Kellogg Island Source Control Area

Source	Sample Location	Date Sampled	Chemical	Conc'n (ug/L)	Units	Marine Chronic WQS	Marine Acute WQS	Chronic WQS Exceedance Factor	GW-to-Sediment Screening Level[a]	Exceedance Factor
Metals										
LDWRI-Seep	SP-71	06/29/04	Copper	12.1 J	ug/L	3.1	4.8	3.9	120	<1
LDWRI-Seep	SP-69	06/29/04	Copper	8.06 J	ug/L	3.1	4.8	2.6	120	<1
LDWRI-Seep	SP-71	06/29/04	Lead	15.2	ug/L	8.1	210	1.9	13	1.2
LDWRI-Seep	SP-71	06/29/04	Mercury	0.0322	ug/L	0.025	1.8	1.3	0.0074	4.4
LDWRI-Seep	SP-69	06/29/04	Mercury	0.0127	ug/L	0.025	1.8	<1	0.0074	1.7
PCBs										
LDWRI-Seep	SP-64	07/02/04	PCBs (total calc'd)	0.46 J	ug/L	0.030	10	15	1.5	<1

ug/L - micrograms per liter

mg/L - milligrams per liter

WQS - Water Quality Standards

CSL - Sediment Management Standards Cleanup Screening Level

PCB - Polychlorinated biphenyl

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

Table presents detected chemicals only. All samples were unfiltered.

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

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

Table 6
Chemicals Detected Above Screening Levels in Bank Soil Samples
Near the Spokane Street to Kellogg Island Source Control Area

Sample Location	Date Sampled	Chemical	Conc'n (mg/kg)	SQS	CSL	Units	SQS Exceedance Factor	CSL Exceedance Factor	LDW Background	Units	LDW Background Exceedance Factor
T107-BS-5	5/10/2011	Arsenic	324	57	93	mg/kg	5.7	3.5	7.3	mg/kg	44
T107-BS-4	5/10/2011	Arsenic	313	57	93	mg/kg	5.5	3.4	7.3	mg/kg	43
T107-BS-2	5/10/2011	Arsenic	310	57	93	mg/kg	5.4	3.3	7.3	mg/kg	42
T107-BS-1	5/10/2011	Arsenic	197	57	93	mg/kg	3.5	2.1	7.3	mg/kg	27
T107-BS-3	5/10/2011	Arsenic	190	57	93	mg/kg	3.3	2.0	7.3	mg/kg	26
RM-BS-4	5/12/2011	Arsenic	43	57	93	mg/kg	<1	<1	7.3	mg/kg	5.9
RM-BS-5	5/12/2011	Arsenic	8.5	57	93	mg/kg	<1	<1	7.3	mg/kg	1.2
T107-BS-5	5/10/2011	Lead	1610	450	530	mg/kg	3.6	3.0			
T107-BS-2	5/10/2011	Lead	1140	450	530	mg/kg	2.5	2.2			
T107-BS-4	5/10/2011	Lead	970	450	530	mg/kg	2.2	1.8			
T107-BS-1	5/10/2011	Lead	730	450	530	mg/kg	1.6	1.4			
T107-BS-3	5/10/2011	Lead	640	450	530	mg/kg	1.4	1.2			
RM-BS-1	5/12/2011	Mercury	1.05	0.41	0.59	mg/kg	2.6	1.8			
T107-BS-5	5/10/2011	Zinc	2480	410	960	mg/kg	6.0	2.6			
T107-BS-4	5/10/2011	Zinc	1440	410	960	mg/kg	3.5	1.5			
T107-BS-2	5/10/2011	Zinc	1280	410	960	mg/kg	3.1	1.3			
T107-BS-3	5/10/2011	Zinc	603	410	960	mg/kg	1.5	<1			
T107-BS-1	5/10/2011	Zinc	440	410	960	mg/kg	1.1	<1			

Sample Location	Date Sampled	Chemical	Conc'n (ug/kg)	LAET	2LAET	Units	LAET Exceedance Factor	2LAET Exceedance Factor	LDW Background	Units	LDW Background Exceedance Factor
RM-BS-1	5/12/2011	cPAHs TEQ	1041.4						8.9	ug/kg	117
RM-BS-2	5/12/2011	cPAHs TEQ	241.2						8.9	ug/kg	27
RM-BS-5	5/12/2011	cPAHs TEQ	214.2						8.9	ug/kg	24
RM-BS-3	5/12/2011	cPAHs TEQ	68.52						8.9	ug/kg	7.7
RM-BS-4	5/12/2011	cPAHs TEQ	35.89						8.9	ug/kg	4.0
RM-BS-1	5/12/2011	Dioxin/Furans TEQ (ng/kg)	25.56						1.6	ng/kg	16
RM-BS-2	5/12/2011	Dioxin/Furans TEQ (ng/kg)	11.43						1.6	ng/kg	7.1
RM-BS-4	5/12/2011	Dioxin/Furans TEQ (ng/kg)	4.48						1.6	ng/kg	2.8
RM-BS-5	5/12/2011	Dioxin/Furans TEQ (ng/kg)	3.47						1.6	ng/kg	2.2
T107-BS-3	5/10/2011	Dioxin/Furans TEQ (ng/kg)	1.87						1.6	ng/kg	1.2
RM-BS-5	5/12/2011	Total PCBs	78	130	1,000	mg/kg	<1	<1	6.5	ug/kg	12
RM-BS-1	5/12/2011	Total PCBs	47	130	1,000	mg/kg	<1	<1	6.5	ug/kg	7.2
RM-BS-4	5/12/2011	Total PCBs	47	130	1,000	mg/kg	<1	<1	6.5	ug/kg	7.2
RM-BS-2	5/12/2011	Total PCBs	16	130	1,000	mg/kg	<1	<1	6.5	ug/kg	2.5

Table 6
Chemicals Detected Above Screening Levels in Bank Soil Samples
Near the Spokane Street to Kellogg Island Source Control Area

mg/kg - Milligram per kilogram
ug/kg - Micrograms per kilogram
ng/kg - Nanograms per kilogram
SMS - Sediment Management Standard (Washington Administrative Code 173-204)
SQS - SMS Sediment Quality Standard
CSL - SMS Cleanup Screening Level
LAET - Lowest Apparent Effects Threshold
2LAET - Second LAET
cPAHs - Carginogenic polycyclic aromatic hydrocarbons
PCB - Polychlorinated biphenyl
LDW - Lower Duwamish Waterway
TEQ - Toxic Equivalency

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

Table 7
Chemicals Detected Above Storm Drain Screening Values at
Storm Drain Sample Locations in the SW Dakota Street SD Basin

Chemical	SQS/ LAET	CSL/ 2LAET	CB52 02/04/05 CB SD	CB41C 04/16/10 CB SD	RCB43 02/04/05 RCB SD	RCB185 04/16/10 RCB SD	RCB200a 08/28/08 RCB SD
Metals (mg/kg)							
Zinc	410	960	--	***3,740***	--	202	**424**
PAHs (mg/kg DW)							
2-Methylnaphthalene	0.063	0.072	<0.12	***0.29***	<0.075	***0.091***	<0.019
Chrysene	1.4	2.8	0.65	**1.6**	0.21 J	0.14	0.18
Phthalates (mg/kg DW)							
Bis(2-ethylhexyl)phthalate	1.3	1.9	***7.3***	***37***	1.0 J	***2.9***	0.88
Butyl benzyl phthalate	0.063	0.9	***1.3***	***1.8***	**0.52 J**	***19***	0.028
Diethyl phthalate	0.2	1.2	**0.48**	<0.23	<0.075	<0.074	<0.019
Dimethyl phthalate	0.071	0.16	<0.12	***0.22 J***	<0.075	0.066 J	<0.019
Di-n-butylphthalate	1.4	5.1	0.29	0.20 J	<0.075	**1.7**	<0.019
Other SVOCs (mg/kg DW)							
Benzoic acid	0.65	0.65	<1.2	<2.3	<0.75	***1.9***	<0.19
Benzyl alcohol	0.057	0.073	<0.12	<2.3	<0.075	***3.7***	<0.019
PCBs (mg/kg DW)							
Total PCBs	0.13	1.0	**0.223**	**0.317**	0.0158 J	**0.61**	**0.133**
Petroleum Hydrocarbons (mg/kg)							
Heavy-oil range	2,000	--	1,700	**2,000**	1100	460	330

CB - Private catch basin
RCB - Right-of-way catch basin
SD - Storm Drain
SQS - Sediment Quality Standard from Washington SMS
CSL - Cleanup Screening Level from Washington SMS
SMS - Sediment Management Standards
LAET - Lowest Apparent Effects Threshold
2LAET - Second LAET
mg/kg - milligrams per kilogram

DW - dry weight
PAHs - polycyclic aromatic hydrocarbons
PCBs - polychlorinated biphenyls
MTCA - Model Toxics Control Act
J - Estimated value between the method detection limit & the laboratory reporting limit
-- - Not analyzed

424 Exceeds the SQS/LAET, MTCA
7.3 Exceeds CSL/2LAET

Chemicals were not detected above storm drain screening values in the samples collected from CB49, CB50 and CB51.
Samples from these catch basins were analyzed for arsenic, lead, mercury, and zinc.

Table 8
Chemicals Detected Above Storm Drain Screening Values at Storm Drain Sample Locations in the SW Idaho Street SD Basin

Chemical	SQS/ LAET	CSL/ 2LAET	ID-ST1 03/06/09 Trap SD	ID-ST1 11/18/10 Trap SD	ID-ST2 09/05/08 Inline SD	ID-ST2 11/18/10 Inline SD	ID-ST2 03/06/09 Trap SD	ID-ST2 11/18/10 Trap SD	ID-ST3 09/10/08 Inline SD	ID-ST3 03/06/09 Inline SD	ID-ST3 11/04/10 Inline SD	ID-ST3 03/06/09 Trap SD	ID-ST3 11/04/10 Trap SD	MH237 06/02/09 Inline SD	MH238 06/02/09 Inline SD	MH242 02/02/11 Inline SD
Metals (mg/kg)																
Zinc	410	960	**836**	**794**	74	409	100	141	170	122	154	228	270	222 J	243 J	155
LPAH (mg/kg DW)																
Phenanthrene	1.5	5.4	**3.6**	***6.7***	0.067	0.41	0.16	0.47	<0.019	<0.02	0.0099 J	<0.059	0.042	0.034 J	0.036 J	0.27
LPAH	5.2	13	4.19	**8.31 J**	0.067	0.41	0.16	0.536	<0.019	<0.02	0.0099 J	0.059	0.042	0.034 J	0.036 J	0.27
HPAH (mg/kg DW)																
Benzo(a)anthracene	1.3	1.6	***5.6***	***5.0***	0.069	0.30	0.22	0.47	<0.019	<0.02	<0.02	<0.059	0.023	0.04 J	0.039 J	0.21
Benzo(a)pyrene	1.6	3.0	***8.3***	***7.4***	0.11	0.60	0.32	0.76	<0.019	<0.02	0.016 J	<0.059	0.041	0.051 J	0.056 J	0.29
Benzo(g,h,i)perylene	0.67	0.72	***8.8***	***28***	0.12	***1.4***	0.43	***2.8***	<0.019	<0.02	0.032	<0.059	0.088	0.11 J	0.094 J	0.79
Total benzofluoranthenes	3.2	3.6	***39***	***6.4***	0.49	1.1	1.4	0.73	0.040	0.03 J	<0.02	0.034 J	<0.02	0.11 J	0.123 J	0.39
Chrysene	1.4	2.8	***17***	***12***	0.19	0.67	0.64	1.1	<0.019	0.011 J	0.019 J	0.035 J	0.054	0.076 J	0.07 J	0.43
Dibenzo(a,h)anthracene	0.23	0.54	***2.1***	***2.1***	0.02	<0.23	0.11	<0.059	<0.019	<0.02	<0.02	<0.059	<0.02	<0.058	<0.058	<0.14
Fluoranthene	1.7	2.5	***9.9***	***12***	0.20	1.0	0.48	1.2	<0.019	<0.02	0.022	<0.059	0.082	0.094 J	0.097 J	0.48
Indeno(1,2,3-cd)pyrene	0.6	0.69	***8.3***	***6.1***	0.12	***0.75***	0.39	***0.69***	<0.019	<0.02	<0.02	<0.059	<0.02	0.046 J	0.048 J	0.29
Pyrene	2.6	3.3	***9.8***	***9.6***	0.17	0.83	0.45	0.95	<0.019	<0.02	0.016 J	<0.059	0.060	0.068 J	0.061 J	0.37
HPAH	12	17	***148***	***89***	1.98	6.7	5.84	8.7	0.061	0.051 J	0.105 J	0.103 J	0.348	0.705 J	0.711 J	3.25
Phthalates (mg/kg DW)																
Bis(2-ethylhexyl)phthalate	1.3	1.9	***20***	***12 B***	0.13	1.1 B	0.86	**1.3 B**	0.063	0.059	0.16 B	0.22	0.52 B	0.17 J	0.12 J	**1.4 B**
Butyl benzyl phthalate	0.063	0.9	***1.2***	**0.55**	0.013 J	**0.47**	**0.063**	**0.10**	<0.019	<0.02	0.016 J	<0.059	0.057	0.047 J	0.036 J	<0.14
PCBs (mg/kg DW)																
Total PCBs	0.13	1.0	**0.28**	**0.31**	0.02	**0.36**	0.042	**0.391**	<0.019	<0.02	<0.02	<0.02	<0.02	<0.02	<0.019	0.025
Other organic compounds (mg/kg DW)																
4-Methylphenol	0.67	0.67	***1.4***	0.28 J	<0.02	<0.23	<0.059	<0.059	<0.019	<0.02	<0.02	0.20	0.013 J	<0.058	<0.058	0.20
Benzoic acid	0.65	0.65	<5.1	<4.6	0.20	<2.3	<0.59	<0.59	<0.19	0.20	0.087 J	0.59	0.11 J	<0.58	<0.58	<1.4
Benzyl alcohol	0.057	0.073	<0.51	<0.46	<0.02	<0.23	<0.059	<0.059	<0.019	0.018 J	<0.02	<0.059	0.044	<0.058	<0.058	<0.68
Hexachlorobenzene	0.022	0.07	<0.51	<0.46	<0.02	<0.23	<0.059	<0.059	<0.019	<0.02	<0.02	<0.059	<0.02	<0.058	<0.058	<0.14
Total petroleum hydrocarbons (mg/kg)																
TPH-diesel	2,000	--	1,200	350	<65	660	86	46	<56	<65	<77	<95	<97	520	<61	260
TPH-Oil	2,000	--	**7,700**	**2,700**	<130	**2,500**	600	260	270	280	<150	480	280	380	340	1,200
Dioxins/furans (ng/kg) TEQ																
Dioxins/furans TEQ	1.6	--	--	--	--	**13.9 J**	--	--	--	--	--	--	--	--	--	--

SD - Storm Drain
SQS - Sediment Quality Standard from Washington SMS
CSL - Cleanup Screening Level from Washington SMS
SMS - Sediment Management Standards
LAET - Lowest Apparent Effects Threshold
2LAET - Second LAET
mg/kg - Milligrams per kilogram
DW - Dry weight
ng/kg - Nanograms per kilogram
TEQ - toxic equivalency

B- the analyte was detected in the method blank
J - Estimated value between the method detection limit & the laboratory reporting limit
-- - Not analyzed
TPH - Total petroleum hydrocarbons
LPAH - Low molecular weight polycyclic aromatic hydrocarbon
HPAH - High molecular weight polycyclic aromatic hydrocarbon
PCBs - Polychlorinated biphenyls
MTCA - Model Toxics Control Act

738	Exceeds the SQS/LAET, MTCA, LDW dioxin/furan background
0.74	Exceeds CSL/2LAET

Table 8

Chemicals Detected Above Storm Drain Screening Values at Storm Drain Sample Locations in the SW Idaho Street SD Basin

Chemical	SQS/ LAET	CSL/ 2LAET	RCB158 10/24/08 RCB SD	RCB219 06/02/09 RCB SD	RCB220 06/02/09 RCB SD	RCB230 03/11/11 RCB SD	RCB259 04/22/11 RCB SD
Metals (mg/kg)							
Zinc	410	960	128	80 J	58 J	323	276 J
LPAH (mg/kg DW)							
Phenanthrene	1.5	5.4	0.049 J	0.062 J	0.045 J	0.12	0.12
LPAH	5.2	13	0.049 J	0.062 J	0.079 J	0.173 J	0.155 J
HPAH (mg/kg DW)							
Benzo(a)anthracene	1.3	1.6	<0.058	0.05 J	0.035 J	0.069	<0.058
Benzo(a)pyrene	1.6	3.0	<0.058	0.058 J	0.05 J	0.089	0.05 J
Benzo(g,h,i)perylene	0.67	0.72	<0.058	0.06 J	0.052 J	0.16 J	0.13
Total benzofluoranthenes	3.2	3.6	0.091 J	0.17 J	0.176 J	0.059	0.038 J
Chrysene	1.4	2.8	0.069	0.13 J	0.12 J	0.13 J	0.11
Dibenzo(a,h)anthracene	0.23	0.54	<0.058	<0.066	<0.058	<0.02	<0.058
Fluoranthene	1.7	2.5	0.073	0.12 J	0.092 J	0.27	0.13
Indeno(1,2,3-cd)pyrene	0.6	0.69	<0.058	0.049 J	0.034 J	0.045	<0.058
Pyrene	2.6	3.3	0.063	0.077 J	0.061 J	0.16 J	0.16
HPAH	12	17	0.387 J	0.884 J	0.796 J	0.982 J	0.618 J
Phthalates (mg/kg DW)							
Bis(2-ethylhexyl)phthalate	1.3	1.9	**1.6**	0.62 J	0.78 J	0.43	***7.8***
Butyl benzyl phthalate	0.063	0.9	***1.4***	<0.066	<0.058	**0.33 J**	0.18
PCBs (mg/kg DW)							
Total PCBs	0.13	1.0	<0.019	<0.02	<0.02	0.020	<0.02
Other organic compounds (mg/kg DW)							
4-Methylphenol	0.67	0.67	0.053 J	***1.4 J***	***1.7 J***	0.011 J	***1.0***
Benzoic acid	0.65	0.65	0.58	<0.66	<0.58	0.048 J	***1.3***
Benzyl alcohol	0.057	0.073	<0.058	<0.066	<0.058	0.016 J	***0.70***
Hexachlorobenzene	0.022	0.07	***4.3***	<0.066	<0.058	<0.02	**0.052 J**
Total petroleum hydrocarbons (mg/kg)							
TPH-diesel	2,000	--	110	150	160	<58	<130
TPH-Oil	2,000	--	900	980	940	410	620
Dioxins/furans (ng/kg) TEQ							
Dioxins/furans TEQ	1.6	--	--	--	--	--	--

SD - Storm Drain
SQS - Sediment Quality Standard from Washington SMS
CSL - Cleanup Screening Level from Washington SMS
SMS - Sediment Management Standards
LAET - Lowest Apparent Effects Threshold
2LAET - Second LAET
mg/kg - Milligrams per kilogram
DW - Dry weight
ng/kg - Nanograms per kilogram
TEQ - toxic equivalency

B- the analyte was detected in the method blank
J - Estimated value between the method detection limit & the laboratory reporting limit
-- - Not analyzed
TPH - Total petroleum hydrocarbons
LPAH - Low molecular weight polycyclic aromatic hydrocarbon
HPAH - High molecular weight polycyclic aromatic hydrocarbon
PCBs - Polychlorinated biphenyls
MTCA - Model Toxics Control Act

738 Exceeds the SQS/LAET, MTCA, LDW dioxin/furan background
0.74 Exceeds CSL/2LAET

Table 9
CSO/EOF Discharges to the Lower Duwamish Waterway

Outfall	Type (Owner)	Discharge Serial Number	Location	Average Overflow Frequency (events/year) 2000 to 2007	Annual Average Volume (mgy) 2000 to 2007
Diagonal Avenue S.[a]	CSO (SPU) SD (SPU)	NA	RM 0.5 E	20.1	15.8[b]
Hanford No. 1[c]	CSO (King County)	031	RM 0.5 E	9	18.75
Duwamish pump station East	CSO (King County)	035	RM 0.5 E	<1.0	0.51
Duwamish pump station West	CSO (King County)	034	RM 0.5 W	<1.0	0.60
S. Brandon Street	CSO (King County)	041	RM 1.1 E	23	31.63
Terminal 115	CSO (King County)	038	RM 1.9 W	3	3.52
S. Brighton Street	CSO (SPU) SD (SPU)	NA	RM 2.1 E	NA[g]	NA
King County Airport SD#3/PS44 EOF[d]	SD (King County) EOF (SPU)	NA	RM 2.8 E	NA	NA
E. Marginal Way S. pump station	EOF (King County)	043	RM 2.8 E	None recorded	NA
8th Avenue S.	CSO (King County)	040	RM 2.8 W	0	0
King County Airport SD#2/PS78 EOF[e]	SD (King County) EOF (SPU)	NA	RM 3.8 E	NA	NA
Michigan Street	CSO (King County)	039	RM 1.9 E	11	17.58
W. Michigan	CSO (King County)	042	RM 2.0 W	4	1.23
Norfolk	CSO (King County) SD (King County) EOF (SPU)[f]	044	RM 4.8 E	4	0.28

Source: King County 2008

a - The Diagonal Avenue S. SD outfall is shared by stormwater and seven separate overflow points, including the City's Diagonal CSOs and the County's Hanford No. 1 CSO. The overflow frequency and volume listed are for the Diagonal CSOs only.

b - This average volume does not include the contribution from King County's Hanford No. 1 CSO, but does include the remaining seven overflow points that discharge through the Diagonal Avenue S. CSO/SD.

c - Hanford No. 1 discharges to the LDW through the Diagonal Avenue S. SD.

d – SPU Pump Station 44 discharges via EOF No. 117 to King County Airport SD#3 at Slip 4.

e – SPU Pump Station 78 discharges via EOF No. 156 to King County Airport SD#2, near Boeing Isaacson.

f – SPU Pump Station 17 discharges to the Norfolk CSO/SD.

g – Has not overflowed since monitoring began in March 2000.

mgy – million gallons per year

NA – Not available

Table 10
Chemicals Detected in Duwamish West CSO
In-Pipe Water Samples
2007 and 2009

Chemical	Sample Date			
	9/30/2007	12/2/2007	4/2/2009	5/5/2009
Metals				
Arsenic, dissolved	NA	1.6 J	3.02	1.71 J
Arsenic, total	2.4 J	2.94	8.06	4.6 J
Cadmium, total	0.3 J	0.22 J	0.831	2.1 J
Chromium, dissolved	NA	0.62 J	0.5 J	0.43 J
Chromium, total	6.5	7.18	23	12.1 J
Copper, dissolved	NA	2.62	2.94	3.06 J
Copper, total	80.7	51.3	78.1	54.9 J
Lead, dissolved	NA	0.4 J	0.694	0.511 J
Lead, total	96.3	14.2	96.4	39.2 J
Mercury, total	NA	0.051 J	0.164	0.0817
Silver, total	0.22 J	<0.2	0.558	0.278 J
Zinc, dissolved	NA	26.3	13.3	11.5 J
Zinc, total	232	107	326	205 J
PAHs				
2-Methylnaphthalene	NA	0.549	0.234	0.148
Acenaphthene	NA	<0.0094	0.0449	0.0394
Anthracene	NA	<0.0094	0.0528	<0.0094
Benzo(a)anthracene	NA	0.116	0.11	0.0454
Benzo(a)pyrene	NA	0.159	0.135	0.0659
Benzo(b)fluoranthene	NA	<0.0094	0.188	0.08
Benzo(g,h,i)perylene	NA	0.0652	0.105	0.0549
Benzo(k)fluoranthene	NA	0.126	0.129	0.069
Chrysene	NA	0.0415	0.181	0.0723
Dibenzo(a,h)anthracene	NA	<0.0094	0.0302	<0.0094
Fluoranthene	NA	0.115	0.265	0.0864
Fluorene	NA	<0.0094	0.0619	0.0546
Indeno(1,2,3-cd)pyrene	NA	0.0724	0.093	0.0466
Naphthalene	NA	0.687	0.34	0.0861
Phenanthrene	NA	0.125	0.25	0.123
Pyrene	NA	0.0722	0.33	0.133
Phthalates				
BEHP	NA	3.3 B	3.9	<2.3
Butyl benzyl phthalate	NA	0.876	0.721	0.468
Diethyl phthalate	NA	1.68	1.73	0.629
Dimethyl phthalate	NA	0.173	<0.024	0.306
Di-n-butyl phthalate	NA	0.831 B	0.243 B	0.237
Other SVOCs				
1,4-Dichlorobenzene	NA	0.506	1.03	0.629
4-Methylphenol	NA	5.72	6.93	0.354
Benzyl alcohol	NA	3.28	1.2	<0.047
Dibenzofuran	NA	NA	<0.0094	0.0251
Pentachlorophenol	NA	1.23	<0.094	0.267
Phenol	NA	1.16	1.18	<0.047
PCBs				
PCBs, total	0.136	0.035	0.032	0.043

Source: King County 2009, 2011b

All concentrations listed in micrograms per liter (μg/L)
NA – not analyzed
B – detected in method blank
J – estimated concentration between the method detection limit (MDL) and laboratory reporting limit.
< - chemical not detected at or above the listed MDL.

Table 11
Underground and Aboveground Storage Tanks
Adjacent Properties

Tank #	Contents	Type	Capacity (Gallons)	Status	Description
Riverside Mill					
27	Diesel	UST	8,000	Removed	Bethlehem Steel UST
28	Sulfuric Acid	UST	Unknown	Removed	Bethlehem Steel Acid Tanks
29	Waste Acid	UST	Unknown	Removed	2 USTs, Bethlehem Steel Acid Tanks
36	Cooling Oil	UST	4,000	Removed	Bethlehem Steel UST
59	LPG	UST	Unknown	Unknown	Bethlehem Steel Tanks
Terminal 103					
1	Motor Oil	AST	500	Active	General Construction ASTs
2	Hydraulic Oil	AST	500	Active	General Construction ASTs
3	Used Oil	AST	600	Active	General Construction ASTs
4	Used Antifreeze	AST	200	Active	General Construction ASTs
5	Diesel	AST	500	Active	General Construction ASTs
6	Heating Oil	UST	500	Removed	General Construction UST
7	Diesel	UST	10,000	Removed	General Construction Refueling UST
8	Gasoline	UST	600	Removed	General Construction Refueling UST
9	Gasoline	UST	6,000	Removed	General Construction Refueling UST
10	Unknown	UST	Unknown	Removed	Unknown UST
11	Fuel Oil	UST	Unknown	Removed	Unknown Fuel Tank
12	Diesel	AST	2,000	Removed	Diesel AST
30	Heating Oil	UST	Unknown	Unknown	Unknown UST
31	Unknown	UST	Unknown	Unknown	Unknown UST
32	Unknown	UST	Unknown	Unknown	Unknown UST
33	Waste Oil	UST	600	Unknown	Crowley Maintenance Yard UST
Global Diving & Salvage					
25	Heating Oil	UST	Unknown	Removed	Global Diving UST
26	Unknown	UST	Unknown	Unknown	Global Diving Suspected UST
Terminal 105					
13	Waste Oil	UST	8,000	Unknown	Liquid Disposal Corporation UST
14	Waste Oil	UST	8,000	Unknown	Liquid Disposal Corporation UST
15	Gasoline	UST	1,000	Unknown	Liquid Disposal Corporation UST
16	Gasoline	UST	1,000	Unknown	Liquid Disposal Corporation UST
17	Unknown	UST	500	Closed in Place	Jeffries Sandblasting
18	Heating Oil	UST	300	Removed	Terminal 105 Unknown UST
19	Unknown	UST	200	Removed	Terminal 105 Unknown UST
20	Septic	UST	300	Removed	Terminal 105 Septic Tank
21	Diesel	UST	2,000	Removed	Terminal 105 Diesel Tank
22	Diesel	UST	1,200	Removed	T105 UST-F
23	Unknown	UST	300	Removed	Former Terminal 105 Unknown UST
24	Gasoline	UST	2,000	Removed	T105 UST-A, Riverside Marina
34	Diesel	AST	180	Unknown	Fife Forge AST
35	Unknown	AST	Unknown	Unknown	Building I-1 AST
Former Seaboard Lumber					
43	Lube Oil/Waste Oil	UST	2,100	Removed	Seaboard Oil Service Tank
44	Gasoline	UST	500	Unknown	Seaboard Forklift Refueling Tank
45	Diesel	UST	8,000	Removed	Former Seabord Lumber Tanks
46	Diesel	UST	10,000	Removed	Former Seabord Lumber Tanks
47	Diesel	UST	10,000	Removed	Former Seabord Lumber Tanks
48	Heating Oil	UST	300	Removed	Former Seabord Lumber Tanks
49	Diesel	AST	1,000	Removed	Former Seabord Lumber Tanks
50-54	Lubricating Oil	ASTs	300	Removed	Former Seabord Lumber Tanks
55-58	Diesel	ASTs	Unknown	Removed	Former Seabord Lumber Tanks
Terminal 107					
37	Paint Solvents	UST	6,000	Unknown	LE Carter Tanks
38	Paint Solvents	UST	4,000	Unknown	LE Carter Tanks
39	Paint Solvents	UST	7,500	Unknown	LE Carter Tanks
40	Paint Solvents	UST	7,500	Unknown	LE Carter Tanks
41	Unknown	UST	3,000	Unknown	Goodspeed Fuel Tanks
42	Unknown	UST	3,000	Unknown	Goodspeed Fuel Tanks

UST - Underground storage tank
AST - Aboveground storage tank

Table 12
Historical Operators and Activities
Terminal 105

Operator	Approximate Years of Operation	Address	Operations	Building	Parcel(s)
Amadine Industrial Coatings	1976	1124 SW Idaho Street			
American President Lines	1993		Container Storage Lot		
Appliance Building Company	1966	1120 SW Idaho Street			
Arctic Gulf Marine	1982	4000 West Marginal Way			
Bird Johnson Company Annex	1990	4100 West Marginal Way SW	Manufactured shafts and propellors	I-1	3530
The Boeing Company	2002	4260 West Marginal Way SW	Aircraft manufacturing		3630
C&C Crating Company	1976	1124 SW Idaho Street			
C.H. Rasmussen Company, Inc.	1966		Warehousing		3540
C.M. Lovested & Company, Inc.	1950s-1960s		Dry kiln assembling, included a warehouse, office, storage buildings, planer shop, dry kiln, boiler house and fuel bin		3462 3464
Chemithon Company	1990s	4100 West Marginal Way SW	Stored parts, materials, and some chemicals associated with the fabircation and assembly of chemical process equipment	I-1	3530
Commercial Marine and Industrial	1982	1140 SW Dakota Street			
Constance Machine	1980s-1991	1101 SW Dakota Street	Custom machining work	W-5	3530
Container Renewal Corporation	1976	4000 West Marginal Way SW			
Coolidge Propellor Company, later the Copro Corporation (successor to Bird Johnson Company)	1968	4100 West Marginal Way SW			3530
Corrugated Metals Inc.	1976	4154 West Marginal Way SW			
Crowley Maritime Services, later Crowley Marine Services	1984-1998	4260 West Marginal Way SW	Cutting, welding, servicing, and rigging repairs on tugs and barges, sandblasting, heavy equipment maintenance and storage	A-4	3530 3630
Cunningham Steel Foundry	1946	4260 West Marginal Way SW			
Duroboat, Inc.	1980-1988, 1991	1140 SW Dakota Street 4100 West Marginal Way	Manufactured small aluminum boats	W-13	3462 3464
Elliott Bay Plywood Machine	1966	1130 SW Idaho Street		A-1	
Elliott Bay Shipbuilding	1910s				3540 3630
Elliott Bay Yacht & Engine Company	1910s				3540 3630
Erickson Shipbuilding	1910s				3540 3630
Fife Forge	1990s	1101 SW Dakota Street	Manufactured anchors	W-5	3530
Fraser Boiler Service, Inc.	1982-	4104 West Marginal Way SW	Offices	A-5	
Garrett Metals	1980s-1990s	1101 SW Dakota Street	Fabricated ornamental iron and steel works	W-5	3530
Gene Summy Lumber	1966	1140 SW Idaho Street			3540
Groger Lumber Company	1929				3464
Harbor Island Supply, Inc.		1101 SW Dakota Street			
Homes Inc.	1984		Sandblasting and storage		3464
H.R.L. Machine Works Inc.	1946	4200 West Marginal Way SW			
H.W. Blackstock Company	??-1990	4000 West Marginal Way			

Table 12
Historical Operators and Activities
Terminal 105

Operator	Approximate Years of Operation	Address	Operations	Building	Parcel(s)
Jeffrey Sandblasting (aka Jeffries Sandblasting)	1969-1980	4000 West Marginal Way			3464
J.W. Cox and Company Inc.	1982	1130 SW Idaho Street	Plastics recycling, fabrication and storage	W-3	
Kalamazoo Railway Supply Company	1956	4000 West Marginal Way			
Keramco Refractories	1976	1120 SW Idaho Street			
Lien Chemical	1969-1980	4000 West Marginal Way			3464
Liquid Disposal Corporation		4000 West Marginal Way	Bulk oil storage		3460
Macotech Corporation	1976	4104 West Marginal Way			
Manganese Products	1946	4260 West Marginal Way SW	Fertilizer plant		3630
Manufacturers Mineral Company	1928	1107 SW Idaho Street			3630
Marine Construction Company	1928-1934	4100 Iowa Avenue	Shipyard		3530
Miller Axling	1966				3540
Millfra Tube	1982	4104 West Marginal Way			
Mineral Products Corporation	1928-	1107 SW Idaho Street			3630
National Bearing Metals Corporation	1956-	4000 West Marginal Way			
National Builders Inc.	1966	4142 West Marginal Way SW			3540
National Steel Construction	1966	1120 SW Idaho Street			
Native American Spills	1993				
North Coast Dry Kiln	1956-	4000 West Marginal Way			
North Pacific Shipbuilding Company	1920s				
Northern Steel Buildings	1976	4154 West Marginal Way SW			
Northwest Container Services	1993				3630
Northwest Fiberglass, Inc.	1986-1989	4100 West Marginal Way SW	Fiberglass and insulation manufacturing	I-1	3530
Pacific Coast Forge Company	1929				3464
Pacific Metals and Salvage	1929-1941	4014 Iowa Avenue (later 4014 West Marginal Way)			3464
Pacific Steel Company	1976	4100 West Marginal Way			
Pacific Stove and Foundry Company/ Pacific Stove and Stamping Company	1928-	North of SW Idaho Street at the LDW	Lumber shed, fuel yard, enameling building, stove foundry, warehouse, manufacturing building and spray-painting building		3540
Pioneer Marine Yard	1946	1101 SW Dakota Street		W-5	3530
Porcelain Enamelers, Inc.	1966	1124 SW Idaho Street			
Port of Seattle Terminal 105		4260 West Marginal Way			
Puget Sound Tug and Barge Company	1972	4154 West Marginal Way 4260 West Marginal Way		W-2	
Robert Johnson Company	1966	4260 West Marginal Way			3540
Riverside Marina	1956	1100 SW Idaho Street			3540
Riverside Welding	1966	4260 West Marginal Way			
Seaman's Chapel (aka Seaman's Club Ministry)	1993		Offices	A-5	
Seattle Center	1993				
Seattle Lumber Milling Company	1928-1934	4100 Iowa Avenue			3530

Table 12
Historical Operators and Activities
Terminal 105

Operator	Approximate Years of Operation	Address	Operations	Building	Parcel(s)
Sentinel Anode	1976	1101 SW Dakota Street			
Soule Steel (aka Souli Steel)	1956-1968	4100 West Marginal Way SW		I-1	3530
Spectrum Glass Company	1976	1120 SW Idaho Street			
Stack Steel Metal Fabrication	1975-1986	4100 West Marginal Way SW	Steel fabrication	I-1	3530
Sweeper Service	1969-1980	4000 West Marginal Way			3464
Tacoma Boatbuilding Company		1101 SW Dakota Street	Boat builders	W-5	3530
Tri-County Sandblasting	1976	4000 West Marginal Way SW			
Upland Wood Sales Company	-1946	SW Idaho Street			
Viking Freight	1980s				3530
Wagner Machine Works	1966	1101 SW Dakota Street			3540
Wallace Bridge and Structural Steel Company	1920s-1950s		Steel fabrication, painting, plating, machining, and assembly		3630
Washington Electronic Instrument	1982	1101 SW Dakota Street			
Washington State Department of Transportation			Marine division storage	W-3	
Waterman Slate Company, later named Geo Waterman	1928	1107 SW Idaho Street			3630
Wayne Hart	1986-1992	1101 SW Dakota Street	Race car maintenance and repair	W-5	3530
West Coast Specialties	1976	1120 SW Idaho Street			

Blank cells indicate that the information was not found in or could not be determined from the information available for review.

Sources:

GeoEngineers 1990
Historical Research Associates, Inc. 1993
Kennedy/Jenks 1991a, 1991b
Olympus 1994
Port of Seattle 1989, 1992, 1995
SoundEarth 2011b

Table 13
Chemicals Detected Above Screening Levels in Soil
General Recycling of Washington

Source	Sample Date	Sample Location	Sample Depth (ft bgs)	Chemical	Soil Conc'n (mg/kg)	MTCA Cleanup Level[a] (mg/kg)	Soil-to-Sediment Screening Level[b] (mg/kg)	Exceedance Factor
Golder 1999 [9212]	5/27/1999	TP5-3	2.7-5.0	Arsenic	54	0.67	12,000	81
Golder 1999 [9212]	5/25/1999	GP2-1	0.5	Arsenic	34	0.67	12,000	51
Golder 1999 [9212]	5/25/1999	GP3-2	4	Arsenic	18	0.67	12,000	27
Golder 1999 [9212]	5/25/1999	GP5-3	5	Arsenic	16	0.67	12,000	24
Golder 1999 [9212]	5/25/1999	GP3-1	0.6	Arsenic	11	0.67	12,000	16
Golder 1999 [9212]	5/27/1999	TP1-3	1.4-3.6	Benzo(a)pyrene	0.33	0.137	4.2	2.4
Golder 1999 [9212]	5/25/1999	GP2-1	0.5	Cadmium	2.2	2	34	1.1
Golder 1999 [9212]	5/25/1999	GP3-2	4	Lead	1,100	250	1,300	4.4
Golder 1999 [9212]	5/25/1999	GP2-1	0.5	Lead	290	250	1,300	1.2
Golder 1999 [9212]	5/25/1999	GP2-1	0.5	PCBs (Aroclor 1260)	1.2	0.5	1.3	2.4

ft bgs - Feet below ground surface
mg/kg - Milligrams per kilogram
MTCA - Model Toxics Control Act
CSL - Cleanup Screening Level from Washington Sediment Management Standards

a - The lower of MTCA Method A or B cleanup levels was selected, from CLARC database.
b - Based on CSL. Where two screening levels are listed for a single chemical, the higher screening levels are for soil samples collected from the vadose zone and the lower screening levels are for soil samples collected from the saturated zone (SAIC 2006).
Depth to groundwater is tidally influenced at this property, and was observed between 3 and 7 ft bgs.
Table presents detected chemicals only.
Exceedance factors are the ratio of the detected concentration to the MTCA Cleanup Level or Soil-to-Sediment Screening Level, whichever is lower.

Table 14
Chemicals Detected Above Screening Levels in Groundwater
General Recycling of Washington

Source	Sample Date	Sample Location	Chemical	GW Conc'n (ug/L)	MTCA Cleanup Level[a] (ug/L)	GW-to-Sediment Screening Level[b] (ug/L)	MTCA Exceedance Factor	GW-to-Sediment SL Exceedance Factor
Golder 1999 [9212]	5/25/1999	GP3	Arsenic	11	0.058	370	190	<1
Golder 1999 [9212]	5/25/1999	GP4	Arsenic	11	0.058	370	190	<1
Golder 1999 [9212]	5/25/1999	TP2	Arsenic	11	0.058	370	190	<1
Golder 1999 [9212]	5/25/1999	TP1	Arsenic	6.3	0.058	370	109	<1
Golder 1999 [9212]	5/25/1999	GP5	PCBs (Aroclor 1260)	0.088	0.044	0.31	2	<1
Golder 1999 [9212]	5/25/1999	GP1	Zinc	99	4,800	76	<1	1.3
Golder 1999 [9212]	5/25/1999	GP5	Zinc	81	4,800	76	<1	1.1

GW - Groundwater
ug/L - Micrograms per liter
MTCA - Model Toxics Control Act
CSL - Cleanup Screening Level from Washington Sediment Management Standards

a - The lower of MTCA Method A or B cleanup levels was selected, from CLARC database.
b - Based on CSL (SAIC 2006).
Table presents detected chemicals only.
Exceedance factors are the ratio of the detected concentration to the MTCA Cleanup Level or Groundwater-to-Sediment Screening Value, whichever is lower.

Table 15
Chemicals Detected Above Storm Drain Screening Values in Storm Drain Solids
General Recycling of Washington

Source	Sample Date	Sample Location	Chemical	Storm Drain Solids Conc'n (mg/kg DW)	SQS/MTCA Method A (mg/kg DW)	CSL (mg/kg DW)	SQS Exceedance Factor	CSL Exceedance Factor
Golder 2001	1/23/2001	CMDR-9-B	2-Methylnaphthalene	14	0.67	1.4	21	10
Golder 2001	1/23/2001	CMDR-7-B	2-Methylnaphthalene	1.3	0.67	1.4	1.9	<1
Golder 2001	1/23/2001	CMDR-12-B	2-Methylnaphthalene	0.72	0.67	1.4	1.1	<1
Golder 2001	1/23/2001	CMDR-S1	Acenaphthene	1.6	0.5	0.73	3.2	2.2
Golder 2001	1/23/2001	CMDR-9-B	Acenaphthene	1.3	0.5	0.73	2.6	1.8
Golder 2001	1/23/2001	CMDR-11	Acenaphthene	0.54	0.5	0.73	1.1	<1
Golder 2001	1/23/2001	CMDR-S1	Anthracene	2.0	0.96	4.4	2.1	<1
Golder 2001	1/23/2001	CMDR-10	Arsenic	560	57	93	9.8	6.0
Golder 2001	1/23/2001	CMDR-11	Arsenic	220	57	93	3.9	2.4
Golder 2001	1/23/2001	CMDR-3	Arsenic	200	57	93	3.5	2.2
Golder 2001	1/23/2001	CMDR-13	Arsenic	190	57	93	3.3	2.0
Golder 2001	1/23/2001	CMDR-S1	Arsenic	180	57	93	3.2	1.9
Golder 2001	1/23/2001	CMDR-6	Arsenic	140	57	93	2.5	1.5
Golder 2001	1/23/2001	CMDR-2	Arsenic	130	57	93	2.3	1.4
Golder 2001	1/23/2001	CMDR-14-B	Arsenic	110	57	93	1.9	1.2
Golder 2001	1/23/2001	CMDR-9-B	Arsenic	99	57	93	1.7	1.1
Golder 2001	1/23/2001	CMDR-4-O	Arsenic	87	57	93	1.5	<1
Golder 2001	1/23/2001	CMDR-4-I	Arsenic	84	57	93	1.5	<1
Golder 2001	1/23/2001	CMDR-1	Arsenic	79	57	93	1.4	<1
Golder 2001	1/23/2001	CMDR-5	Arsenic	72	57	93	1.3	<1
Golder 2001	1/23/2001	CMDR-S1	Benzo(a)anthracene	12	1.3	1.6	9.2	7.5
Golder 2001	1/23/2001	CMDR-14-B	Benzo(a)anthracene	5.6	1.3	1.6	4.3	3.5
Golder 2001	1/23/2001	CMDR-10	Benzo(a)anthracene	4.8	1.3	1.6	3.7	3.0
Golder 2001	1/23/2001	CMDR-11	Benzo(a)anthracene	4.4	1.3	1.6	3.4	2.8
Golder 2001	1/23/2001	CMDR-2	Benzo(a)anthracene	2.7	1.3	1.6	2.1	1.7
Golder 2001	1/23/2001	CMDR-8-B	Benzo(a)anthracene	2.6	1.3	1.6	2.0	1.6
Golder 1999	5/28/1999	DRN	Benzo(a)anthracene	2.4	1.3	1.6	1.8	1.5
Golder 2001	1/23/2001	CMDR-12-B	Benzo(a)anthracene	2.1	1.3	1.6	1.6	1.3
Golder 2001	1/23/2001	CMDR-7-B	Benzo(a)anthracene	1.6	1.3	1.6	1.2	1.0
Golder 2001	1/23/2001	CMDR-9-B	Benzo(a)anthracene	1.6	1.3	1.6	1.2	1.0
Golder 2001	1/23/2001	CMDR-S1	Benzo(a)pyrene	25	1.6	3.0	16	8.3
Golder 2001	1/23/2001	CMDR-11	Benzo(a)pyrene	12	1.6	3.0	7.5	4.0
Golder 2001	1/23/2001	CMDR-7-B	Benzo(a)pyrene	4.6	1.6	3.0	2.9	1.5
Golder 2001	1/23/2001	CMDR-8-B	Benzo(a)pyrene	4.1	1.6	3.0	2.6	1.4
Golder 2001	1/23/2001	CMDR-2	Benzo(a)pyrene	3.8	1.6	3.0	2.4	1.3
Golder 2001	1/23/2001	CMDR-10	Benzo(a)pyrene	3.4	1.6	3.0	2.1	1.1
Golder 2001	1/23/2001	CMDR-14-B	Benzo(a)pyrene	3.1	1.6	3.0	1.9	1.0
Golder 2001	1/23/2001	CMDR-9-B	Benzo(a)pyrene	2.6	1.6	3.0	1.6	<1
Golder 2001	1/23/2001	CMDR-S1	Benzo(b)fluoranthene	28	3.2	3.6	8.8	7.8

Table 15
Chemicals Detected Above Storm Drain Screening Values in Storm Drain Solids
General Recycling of Washington

Source	Sample Date	Sample Location	Chemical	Storm Drain Solids Conc'n (mg/kg DW)	SQS/MTCA Method A (mg/kg DW)	CSL (mg/kg DW)	SQS Exceedance Factor	CSL Exceedance Factor
Golder 2001	1/23/2001	CMDR-11	Benzo(b)fluoranthene	9.7	3.2	3.6	3.0	2.7
Golder 2001	1/23/2001	CMDR-10	Benzo(b)fluoranthene	4.9	3.2	3.6	1.5	1.4
Golder 2001	1/23/2001	CMDR-2	Benzo(b)fluoranthene	3.5	3.2	3.6	1.1	<1
Golder 2001	1/23/2001	CMDR-8-B	Benzo(b)fluoranthene	3.5	3.2	3.6	1.1	<1
Golder 2001	1/23/2001	CMDR-S1	Benzo(g,h,i)perylene	17	0.67	0.72	25	24
Golder 2001	1/23/2001	CMDR-11	Benzo(g,h,i)perylene	10	0.67	0.72	15	14
Golder 2001	1/23/2001	CMDR-2	Benzo(g,h,i)perylene	5.9	0.67	0.72	8.8	8.2
Golder 2001	1/23/2001	CMDR-10	Benzo(g,h,i)perylene	3.4	0.67	0.72	5.1	4.7
Golder 2001	1/23/2001	CMDR-8-B	Benzo(g,h,i)perylene	2.7	0.67	0.72	4.0	3.8
Golder 2001	1/23/2001	CMDR-9-B	Benzo(g,h,i)perylene	1.4	0.67	0.72	2.1	1.9
Golder 2001	1/23/2001	CMDR-6	Benzo(g,h,i)perylene	0.84	0.67	0.72	1.3	1.2
Golder 2001	1/23/2001	CMDR-S1	Benzo(k)fluoranthene	9.7	3.2	3.6	3.0	2.7
Golder 2001	1/23/2001	CMDR-11	Benzo(k)fluoranthene	6.7	3.2	3.6	2.1	1.9
Golder 2001	1/23/2001	CMDR-S1	Chrysene	16	1.4	2.8	11	5.7
Golder 2001	1/23/2001	CMDR-10	Chrysene	9.1	1.4	2.8	6.5	3.3
Golder 2001	1/23/2001	CMDR-11	Chrysene	8.1	1.4	2.8	5.8	2.9
Golder 2001	1/23/2001	CMDR-12-B	Chrysene	5.6	1.4	2.8	4.0	2.0
Golder 1999	5/28/1999	DRN	Chrysene	5.5	1.4	2.8	3.9	2.0
Golder 2001	1/23/2001	CMDR-8-B	Chrysene	3.8	1.4	2.8	2.7	1.4
Golder 2001	1/23/2001	CMDR-9-B	Chrysene	3.3	1.4	2.8	2.4	1.2
Golder 2001	1/23/2001	CMDR-14-B	Chrysene	3.3	1.4	2.8	2.4	1.2
Golder 2001	1/23/2001	CMDR-21-B	Chrysene	2.8	1.4	2.8	2.0	1.0
Golder 2001	1/23/2001	CMDR-2	Chrysene	2.7	1.4	2.8	1.9	<1
Golder 2001	1/23/2001	CMDR-13	Chrysene	2.4	1.4	2.8	1.7	<1
Golder 2001	1/23/2001	CMDR-7-B	Chrysene	2.1	1.4	2.8	1.5	<1
Golder 2001	1/23/2001	CMDR-6	Chrysene	1.5	1.4	2.8	1.1	<1
Golder 1999	5/28/1999	DRN	Copper	430	390	390	1.1	1.1
Golder 2001	1/23/2001	CMDR-11	Dibenzo(a,h)anthracene	1.7	0.23	0.54	7.4	3.1
Golder 2001	1/23/2001	CMDR-4-I	Diesel range-hydrocarbons	9,700	2,000		4.9	
Golder 2001	1/23/2001	CMDR-14-B	Diesel range-hydrocarbons	6,100	2,000		3.1	
Golder 2001	1/23/2001	CMDR-2	Diesel range-hydrocarbons	5,400	2,000		2.7	
Golder 2001	1/23/2001	CMDR-9-B	Diesel range-hydrocarbons	4,900	2,000		2.5	
Golder 2001	1/23/2001	CMDR-12-B	Diesel range-hydrocarbons	3,200	2,000		1.6	
Golder 2001	1/23/2001	CMDR-21-B	Diesel range-hydrocarbons	2,600	2,000		1.3	
Golder 2001	1/23/2001	CMDR-S1	Fluoranthene	28	1.7	2.5	16	11
Golder 2001	1/23/2001	CMDR-11	Fluoranthene	14	1.7	2.5	8.2	5.6
Golder 2001	1/23/2001	CMDR-14-B	Fluoranthene	14	1.7	2.5	8.2	5.6
Golder 2001	1/23/2001	CMDR-8-B	Fluoranthene	7.8	1.7	2.5	4.6	3.1
Golder 1999	5/28/1999	DRN	Fluoranthene	7.4	1.7	2.5	4.4	3.0
Golder 2001	1/23/2001	CMDR-10	Fluoranthene	6.8	1.7	2.5	4.0	2.7

Table 15
Chemicals Detected Above Storm Drain Screening Values in Storm Drain Solids
General Recycling of Washington

Source	Sample Date	Sample Location	Chemical	Storm Drain Solids Conc'n (mg/kg DW)	SQS/MTCA Method A (mg/kg DW)	CSL (mg/kg DW)	SQS Exceedance Factor	CSL Exceedance Factor
Golder 2001	1/23/2001	CMDR-9-B	Fluoranthene	6.6	1.7	2.5	3.9	2.6
Golder 2001	1/23/2001	CMDR-21-B	Fluoranthene	6.2	1.7	2.5	3.6	2.5
Golder 2001	1/23/2001	CMDR-12-B	Fluoranthene	5.2	1.7	2.5	3.1	2.1
Golder 2001	1/23/2001	CMDR-2	Fluoranthene	4.7	1.7	2.5	2.8	1.9
Golder 2001	1/23/2001	CMDR-6	Fluoranthene	3.9	1.7	2.5	2.3	1.6
Golder 2001	1/23/2001	CMDR-7-B	Fluoranthene	3.8	1.7	2.5	2.2	1.5
Golder 2001	1/23/2001	CMDR-5	Fluoranthene	1.9	1.7	2.5	1.1	<1
Golder 2001	1/23/2001	CMDR-9-B	Fluorene	3.1	0.54	1.0	5.7	3.1
Golder 2001	1/23/2001	CMDR-S1	Fluorene	1.9	0.54	1.0	3.5	1.9
Golder 2001	1/23/2001	CMDR-12-B	Fluorene	1.2	0.54	1.0	2.2	1.2
Golder 2001	1/23/2001	CMDR-7-B	Fluorene	1.1	0.54	1.0	2.0	1.1
Golder 2001	1/23/2001	CMDR-21-B	Fluorene	1.1	0.54	1.0	2.0	1.1
Golder 2001	1/23/2001	CMDR-14-B	Fluorene	0.95	0.54	1.0	1.8	<1
Golder 2001	1/23/2001	CMDR-11	Fluorene	0.83	0.54	1.0	1.5	<1
Golder 2001	1/23/2001	CMDR-4-I	Heavy oil-range hydrocarbons	30,000	2,000		15	
Golder 2001	1/23/2001	CMDR-14-B	Heavy oil-range hydrocarbons	29,000	2,000		15	
Golder 2001	1/23/2001	CMDR-9-B	Heavy oil-range hydrocarbons	11,000	2,000		5.5	
Golder 2001	1/23/2001	CMDR-3	Heavy oil-range hydrocarbons	9,400	2,000		4.7	
Golder 2001	1/23/2001	CMDR-12-B	Heavy oil-range hydrocarbons	8,500	2,000		4.3	
Golder 2001	1/23/2001	CMDR-21-B	Heavy oil-range hydrocarbons	8,400	2,000		4.2	
Golder 2001	1/23/2001	CMDR-7-B	Heavy oil-range hydrocarbons	8,000	2,000		4.0	
Golder 2001	1/23/2001	CMDR-13	Heavy oil-range hydrocarbons	7,900	2,000		4.0	
Golder 2001	1/23/2001	CMDR-8-B	Heavy oil-range hydrocarbons	7,800	2,000		3.9	
Golder 2001	1/23/2001	CMDR-1	Heavy oil-range hydrocarbons	7,600	2,000		3.8	
Golder 2001	1/23/2001	CMDR-5	Heavy oil-range hydrocarbons	7,600	2,000		3.8	
Golder 1999	5/28/1999	DRN	Heavy oil-range hydrocarbons	4,300	2,000		2.2	
Golder 2001	1/23/2001	CMDR-6	Heavy oil-range hydrocarbons	4,100	2,000		2.1	
Golder 2001	1/23/2001	CMDR-S1	Heavy oil-range hydrocarbons	3,500	2,000		1.8	
Golder 2001	1/23/2001	CMDR-10	Heavy oil-range hydrocarbons	3,000	2,000		1.5	
Golder 2001	1/23/2001	CMDR-4-O	Heavy oil-range hydrocarbons	2,700	2,000		1.4	
Golder 2001	1/23/2001	CMDR-S1	Indeno(1,2,3-cd)pyrene	24	0.60	0.69	40	35
Golder 2001	1/23/2001	CMDR-11	Indeno(1,2,3-cd)pyrene	12	0.60	0.69	20	17
Golder 2001	1/23/2001	CMDR-10	Indeno(1,2,3-cd)pyrene	5.8	0.60	0.69	9.7	8.4
Golder 2001	1/23/2001	CMDR-8-B	Indeno(1,2,3-cd)pyrene	4.3	0.60	0.69	7.2	6.2
Golder 2001	1/23/2001	CMDR-2	Indeno(1,2,3-cd)pyrene	3.2	0.60	0.69	5.3	4.6
Golder 2001	1/23/2001	CMDR-7-B	Indeno(1,2,3-cd)pyrene	1.7	0.60	0.69	2.8	2.5
Golder 2001	1/23/2001	CMDR-14-B	Indeno(1,2,3-cd)pyrene	1.7	0.60	0.69	2.8	2.5
Golder 2001	1/23/2001	CMDR-6	Indeno(1,2,3-cd)pyrene	0.94	0.60	0.69	1.6	1.4
Golder 2001	1/23/2001	CMDR-10	Lead	1,000	450	530	2.2	1.9
Golder 2001	1/23/2001	CMDR-3	Lead	990	450	530	2.2	1.9

Table 15
Chemicals Detected Above Storm Drain Screening Values in Storm Drain Solids
General Recycling of Washington

Source	Sample Date	Sample Location	Chemical	Storm Drain Solids Conc'n (mg/kg DW)	SQS/MTCA Method A (mg/kg DW)	CSL (mg/kg DW)	SQS Exceedance Factor	CSL Exceedance Factor
Golder 2001	1/23/2001	CMDR-6	Lead	920	450	530	2.0	1.7
Golder 2001	1/23/2001	CMDR-S1	Lead	850	450	530	1.9	1.6
Golder 2001	1/23/2001	CMDR-2	Lead	760	450	530	1.7	1.4
Golder 2001	1/23/2001	CMDR-14-B	Lead	760	450	530	1.7	1.4
Golder 2001	1/23/2001	CMDR-4-I	Lead	690	450	530	1.5	1.3
Golder 2001	1/23/2001	CMDR-13	Lead	680	450	530	1.5	1.3
Golder 2001	1/23/2001	CMDR-4-O	Lead	530	450	530	1.2	1.0
Golder 2001	1/23/2001	CMDR-11	Lead	490	450	530	1.1	<1
Golder 2001	1/23/2001	CMDR-9-B	Naphthalene	11	2.1	2.4	5.2	4.6
Golder 2001	1/23/2001	CMDR-14-B	PCBs, total	4.1	0.13	1.0	32	4.1
Golder 2001	1/23/2001	CMDR-7-B	PCBs, total	1.5	0.13	1.0	12	1.5
Golder 2001	1/23/2001	CMDR-6	PCBs, total	1.3	0.13	1.0	10	1.3
Golder 2001	1/23/2001	CMDR-4-I	PCBs, total	1.2	0.13	1.0	9.2	1.2
Golder 2001	1/23/2001	CMDR-10	PCBs, total	0.81	0.13	1.0	6.2	<1
Golder 2001	1/23/2001	CMDR-3	PCBs, total	0.7	0.13	1.0	5.4	<1
Golder 2001	1/23/2001	CMDR-S1	PCBs, total	0.59	0.13	1.0	4.5	<1
Golder 2001	1/23/2001	CMDR-4-O	PCBs, total	0.55	0.13	1.0	4.2	<1
Golder 2001	1/23/2001	CMDR-13	PCBs, total	0.55	0.13	1.0	4.2	<1
Golder 2001	1/23/2001	CMDR-2	PCBs, total	0.46	0.13	1.0	3.5	<1
Golder 2001	1/23/2001	CMDR-8-B	PCBs, total	0.39	0.13	1.0	3.0	<1
Golder 2001	1/23/2001	CMDR-9-B	PCBs, total	0.38	0.13	1.0	2.9	<1
Golder 2001	1/23/2001	CMDR-11	PCBs, total	0.38	0.13	1.0	2.9	<1
Golder 2001	1/23/2001	CMDR-5	PCBs, total	0.28	0.13	1.0	2.2	<1
Golder 2001	1/23/2001	CMDR-12-B	PCBs, total	0.27	0.13	1.0	2.1	<1
Golder 1999	5/28/1999	DRN	PCBs, total	0.26	0.13	1.0	2.0	<1
Golder 2001	1/23/2001	CMDR-21-B	PCBs, total	0.24	0.13	1.0	1.8	<1
Golder 2001	1/23/2001	CMDR-1	PCBs, total	0.23	0.13	1.0	1.8	<1
Golder 2001	1/23/2001	CMDR-S1	Phenanthrene	20	1.5	5.4	13	3.7
Golder 2001	1/23/2001	CMDR-9-B	Phenanthrene	12	1.5	5.4	8.0	2.2
Golder 2001	1/23/2001	CMDR-11	Phenanthrene	11	1.5	5.4	7.3	2.0
Golder 2001	1/23/2001	CMDR-14-B	Phenanthrene	6.5	1.5	5.4	4.3	1.2
Golder 1999	5/28/1999	DRN	Phenanthrene	5.7	1.5	5.4	3.8	1.1
Golder 2001	1/23/2001	CMDR-21-B	Phenanthrene	5.3	1.5	5.4	3.5	<1
Golder 2001	1/23/2001	CMDR-12-B	Phenanthrene	5.0	1.5	5.4	3.3	<1
Golder 2001	1/23/2001	CMDR-8-B	Phenanthrene	4.4	1.5	5.4	2.9	<1
Golder 2001	1/23/2001	CMDR-7-B	Phenanthrene	3.6	1.5	5.4	2.4	<1
Golder 2001	1/23/2001	CMDR-10	Phenanthrene	3.4	1.5	5.4	2.3	<1
Golder 2001	1/23/2001	CMDR-2	Phenanthrene	2.1	1.5	5.4	1.4	<1
Golder 2001	1/23/2001	CMDR-6	Phenanthrene	1.7	1.5	5.4	1.1	<1
Golder 2001	1/23/2001	CMDR-S1	Pyrene	24	2.6	3.3	9.2	7.3

Table 15
Chemicals Detected Above Storm Drain Screening Values in Storm Drain Solids
General Recycling of Washington

Source	Sample Date	Sample Location	Chemical	Storm Drain Solids Conc'n (mg/kg DW)	SQS/MTCA Method A (mg/kg DW)	CSL (mg/kg DW)	SQS Exceedance Factor	CSL Exceedance Factor
Golder 2001	1/23/2001	CMDR-10	Pyrene	11	2.6	3.3	4.2	3.3
Golder 2001	1/23/2001	CMDR-11	Pyrene	11	2.6	3.3	4.2	3.3
Golder 2001	1/23/2001	CMDR-14-B	Pyrene	11	2.6	3.3	4.2	3.3
Golder 2001	1/23/2001	CMDR-12-B	Pyrene	9.6	2.6	3.3	3.7	2.9
Golder 1999	5/28/1999	DRN	Pyrene	6.1	2.6	3.3	2.3	1.8
Golder 2001	1/23/2001	CMDR-8-B	Pyrene	5.4	2.6	3.3	2.1	1.6
Golder 2001	1/23/2001	CMDR-9-B	Pyrene	4.7	2.6	3.3	1.8	1.4
Golder 2001	1/23/2001	CMDR-21-B	Pyrene	3.9	2.6	3.3	1.5	1.2
Golder 2001	1/23/2001	CMDR-2	Pyrene	3.4	2.6	3.3	1.3	1.0
Golder 2001	1/23/2001	CMDR-7-B	Pyrene	3.2	2.6	3.3	1.2	<1
Golder 2001	1/23/2001	CMDR-13	Pyrene	3.0	2.6	3.3	1.2	<1
Golder 2001	1/23/2001	CMDR-4-I	Zinc	23,000	410	960	56	24
Golder 2001	1/23/2001	CMDR-3	Zinc	18,000	410	960	44	19
Golder 2001	1/23/2001	CMDR-13	Zinc	4,700	410	960	11	4.9
Golder 2001	1/23/2001	CMDR-14-B	Zinc	4,200	410	960	10	4.4
Golder 2001	1/23/2001	CMDR-2	Zinc	3,700	410	960	9.0	3.9
Golder 2001	1/23/2001	CMDR-4-O	Zinc	3,400	410	960	8.3	3.5
Golder 2001	1/23/2001	CMDR-11	Zinc	3,400	410	960	8.3	3.5
Golder 2001	1/23/2001	CMDR-1	Zinc	3,000	410	960	7.3	3.1
Golder 2001	1/23/2001	CMDR-10	Zinc	3,000	410	960	7.3	3.1
Golder 2001	1/23/2001	CMDR-S1	Zinc	2,800	410	960	6.8	2.9
Golder 2001	1/23/2001	CMDR-5	Zinc	2,600	410	960	6.3	2.7
Golder 2001	1/23/2001	CMDR-6	Zinc	2,600	410	960	6.3	2.7
Golder 2001	1/23/2001	CMDR-12-B	Zinc	2,400	410	960	5.9	2.5
Golder 2001	1/23/2001	CMDR-7-B	Zinc	2,200	410	960	5.4	2.3
Golder 2001	1/23/2001	CMDR-9-B	Zinc	2,000	410	960	4.9	2.1
Golder 1999	5/28/1999	DRN	Zinc	1,900	410	960	4.6	2.0
Golder 2001	1/23/2001	CMDR-8-B	Zinc	1,800	410	960	4.4	1.9
Golder 2001	1/23/2001	CMDR-21-B	Zinc	1,800	410	960	4.4	1.9

mg/kg - Milligrams per kilogram
DW - Dry weight
SQS - SMS Sediment Quality Standard
MTCA - Model Toxics Control Act
CSL - SMS Cleanup Screening Level

Table presents detected chemicals only.
Organic chemicals were not normalized for organic carbon content during testing and these chemicals were compared with the LAET and 2LAET instead of the SQS and CSL.
Exceedance factors are the ratio of the detected concentrations to the SQS or CSL, exceedance factors are shown only if they are greater than 1.

Figures

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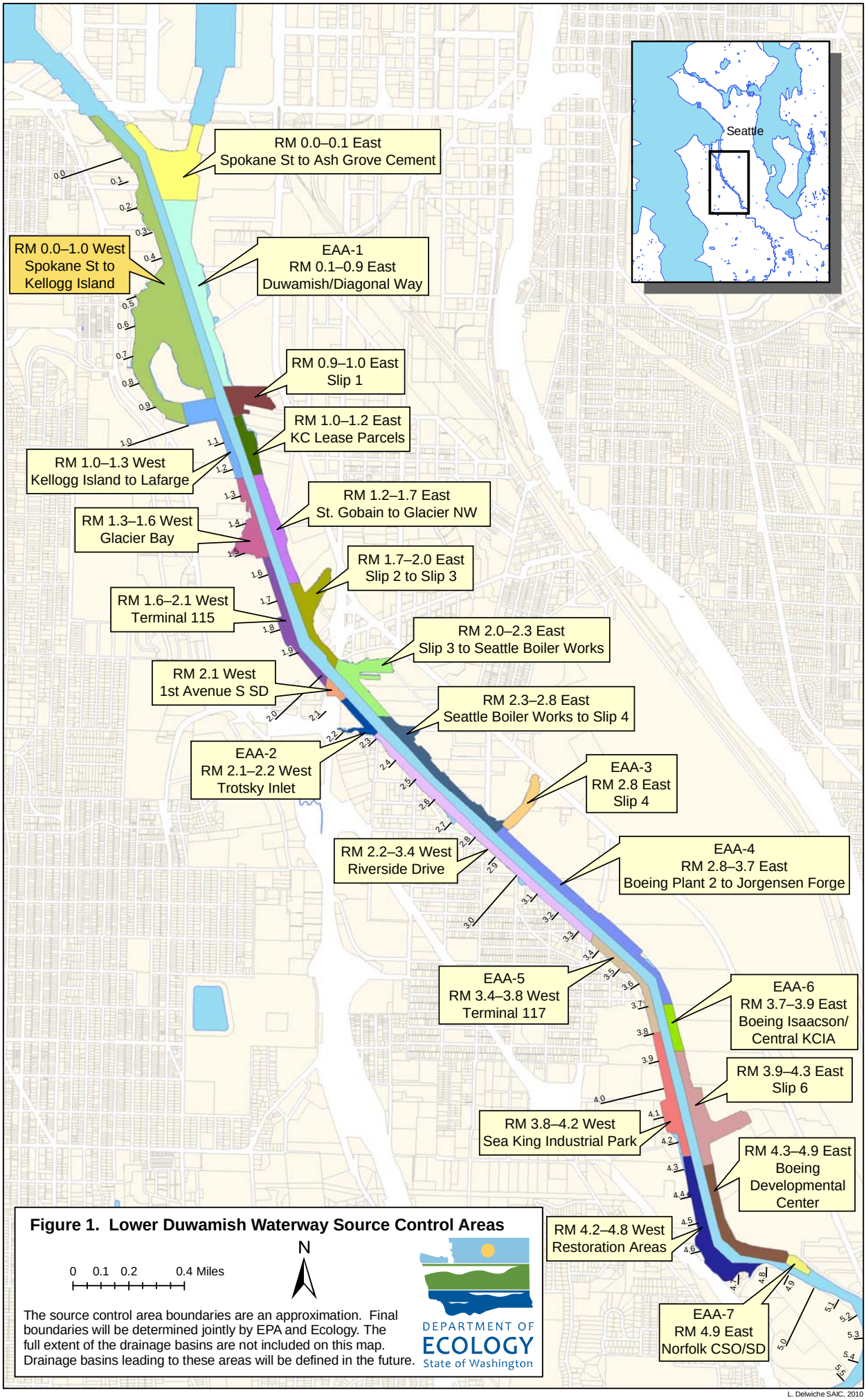

Figure 1. Lower Duwamish Waterway Source Control Areas

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

L. Delwiche SAIC, 2010

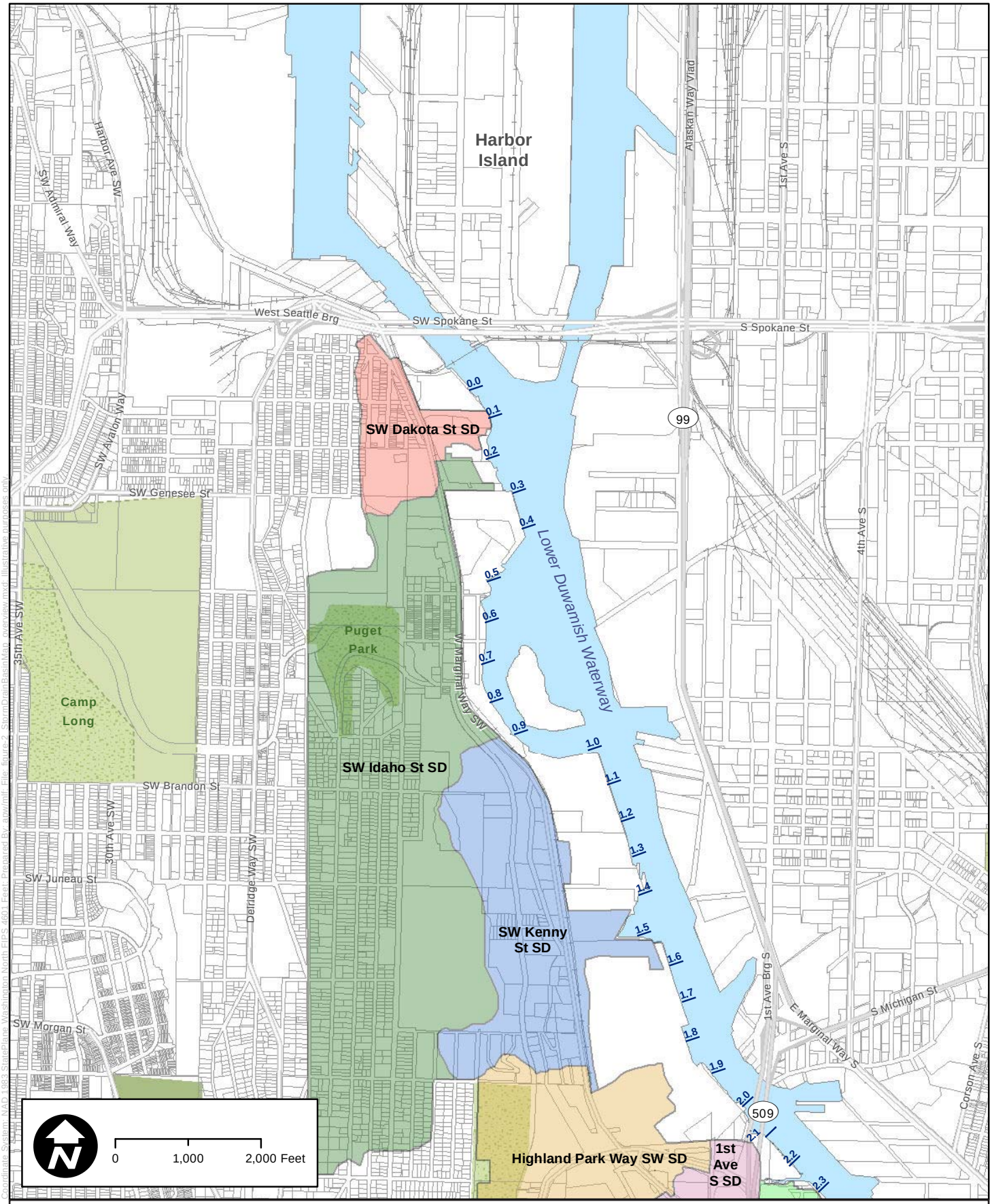

Figure 2. Lower Duwamish Waterway Storm Drain Basins – West Side

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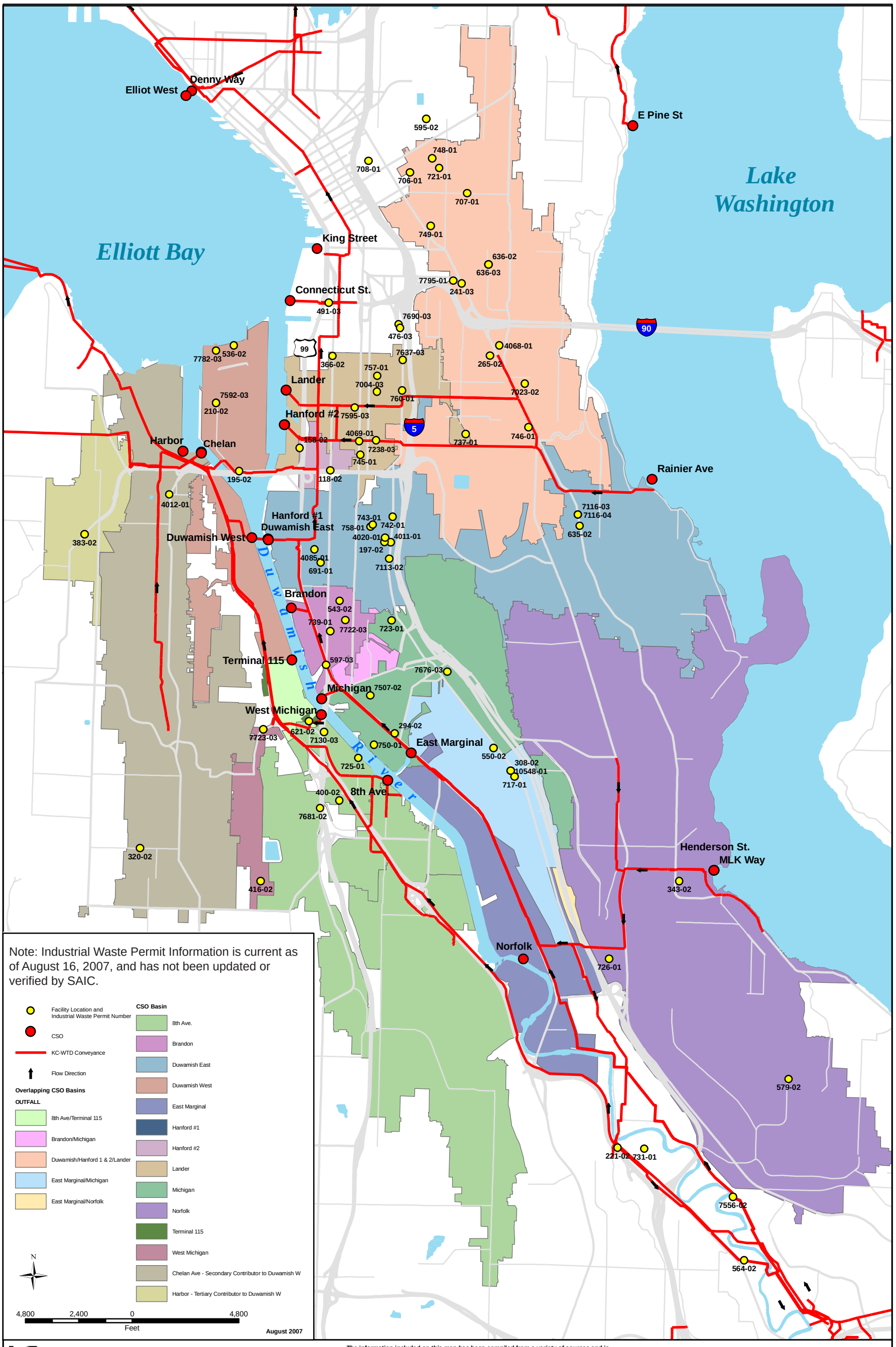

Note: Industrial Waste Permit Information is current as of August 16, 2007, and has not been updated or verified by SAIC.

Facility Location and Industrial Waste Permit Number

CSO

KC-WTD Conveyance

Flow Direction

Overlapping CSO Basins

OUTFALL

- 8th Ave/Terminal 115
- Brandon/Michigan
- Duwamish/Hanford 1 & 2/Lander
- East Marginal/Michigan
- East Marginal/Norfolk

CSO Basin

- 8th Ave.
- Brandon
- Duwamish East
- Duwamish West
- East Marginal
- Hanford #1
- Hanford #2
- Lander
- Michigan
- Norfolk
- Terminal 115
- West Michigan
- Chelan Ave - Secondary Contributor to Duwamish W
- Harbor - Tertiary Contributor to Duwamish W

N

4,800 2,400 0 4,800

Feet

August 2007

King County
Department of
Natural Resources and Parks
Wastewater Treatment Division

File Name: Q:\Projects\WTD/Projects\DiagDuam\Graphics\LDWCSOBasins.pdf - Alyssa Benson 08/16/07

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State of Washington

Source: King County 2007

Figure 3. Lower Duwamish Waterway Combined Sewer Overflow Basins

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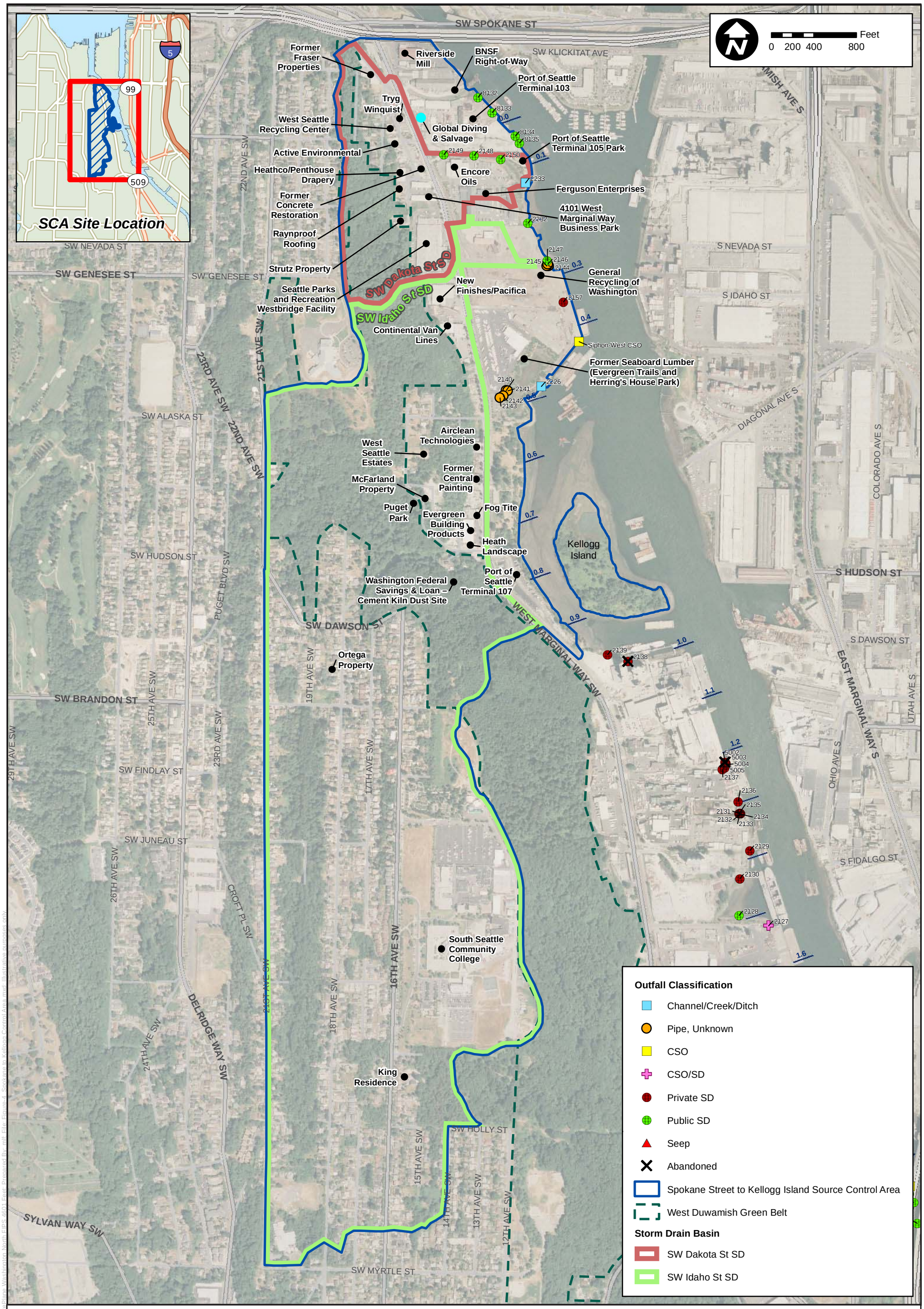

Coordinate System: NAD 1983 State Plane Washington North FIPS 4601 Feet Projected By .mxd File: Figure 4 Spokane to Kellogg Control Area.mxd Illustrative purposes only.

Figure 4. Spokane Street to Kellogg Island Source Control Area

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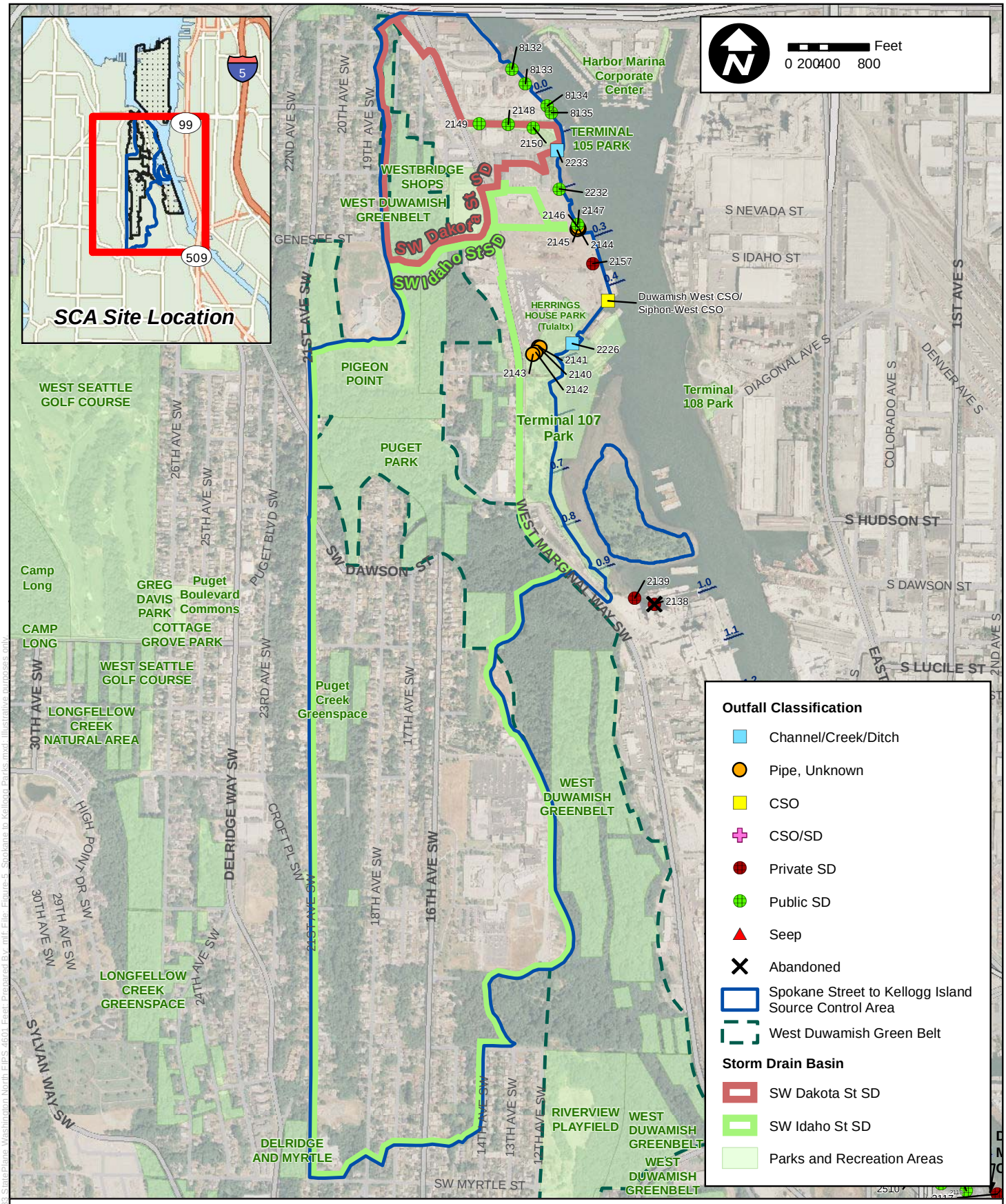

Coordinate System: NAD 1983 StatePlane Washington North FIPS 4601 Feet Prepared By our File: Figure 5_ Spokane to Kellogg Parks.mxd Illustrative Purposes only

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Figure 5. Parks within the Spokane Street to Kellogg Island Source Control Area

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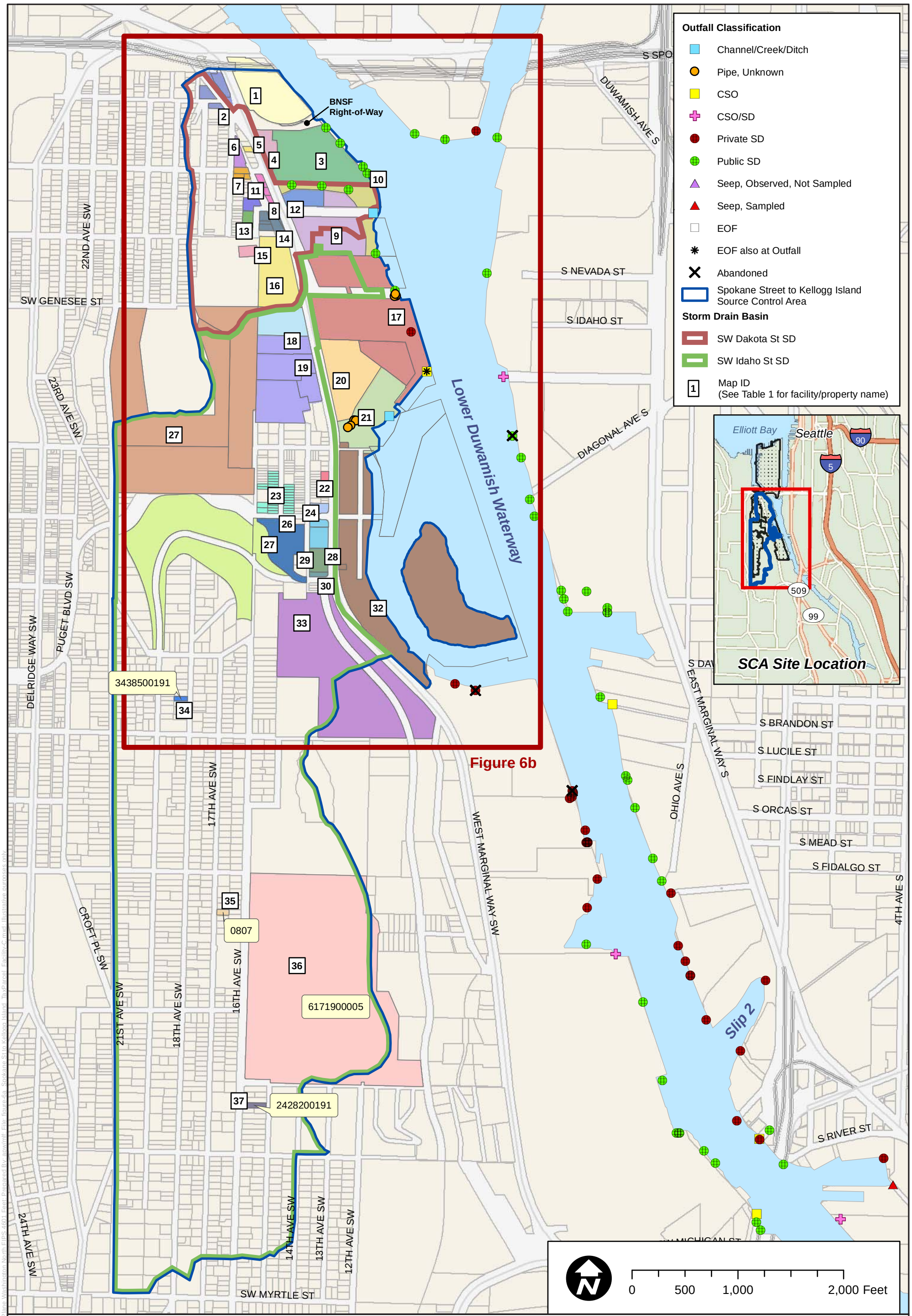

Figure 6b

Coordinate System: NAD 1983 StatePlane Washington North FIPS 4601 Feet Prepared By: ppwilf File: figure6a_Spokane St to Kellogg Island_TaxParcel_FacilitySiteID_Illustrative purposes only

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Figure 6a. Tax Parcels for Properties with Ecology Facility/Site Identification Numbers in the Spokane Street to Kellogg Island Source Control Area

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Figure 6b. Tax Parcels for Properties with Ecology Facility/Site Identification Numbers in the Northern Portion of the Spokane Street to Kellogg Island Source Control Area

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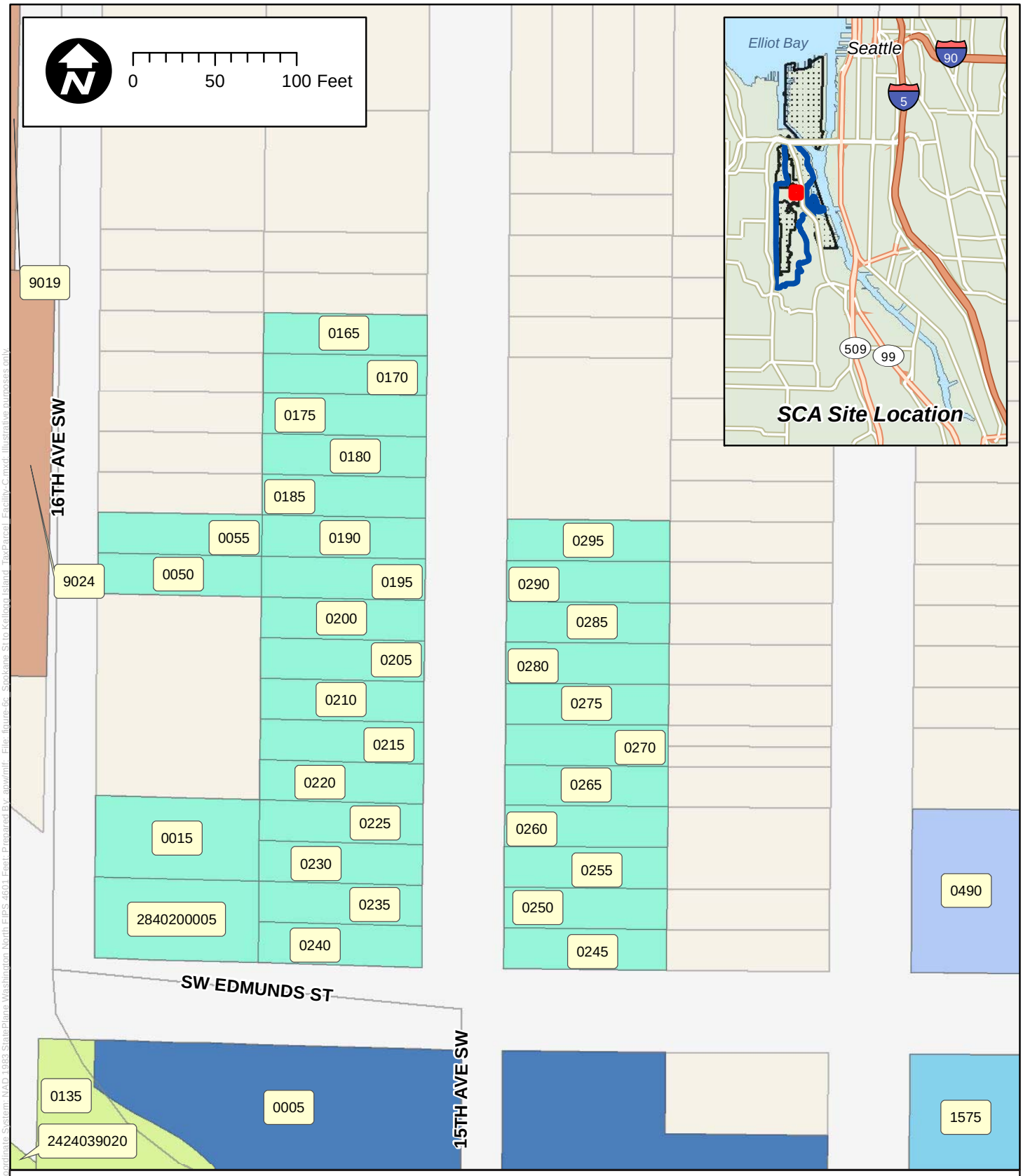

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Figure 6c. Tax Parcels for Properties with Ecology Facility/Site Identification Numbers in the Spokane Street to Kellogg Island Source Control Area – West Seattle Estates

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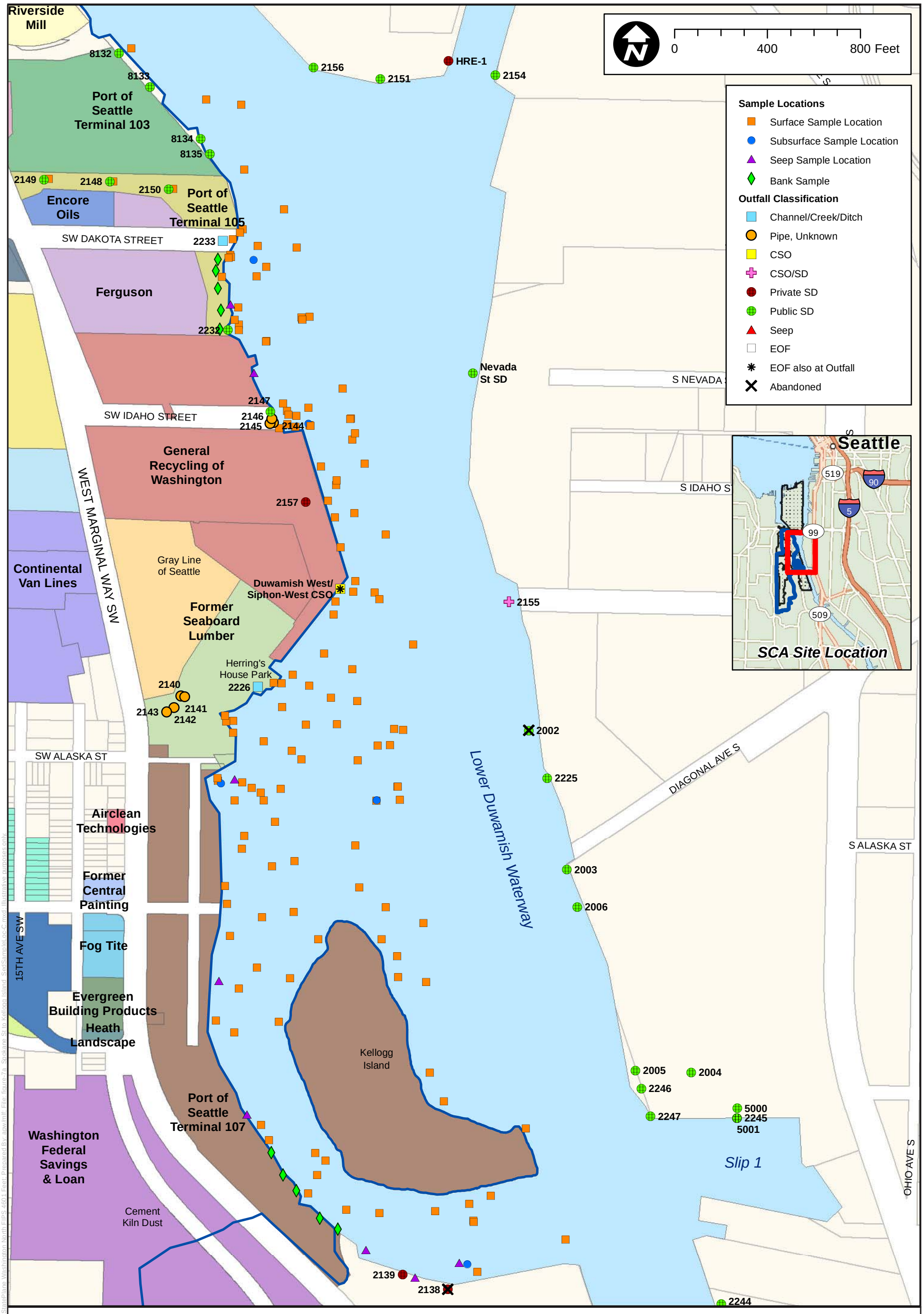

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Figure 7a. Sediment, Seep, and Bank Soil Sample Locations Adjacent to Spokane Street to Kellogg Island Source Control Area (RM 0.0 to 0.3 West)

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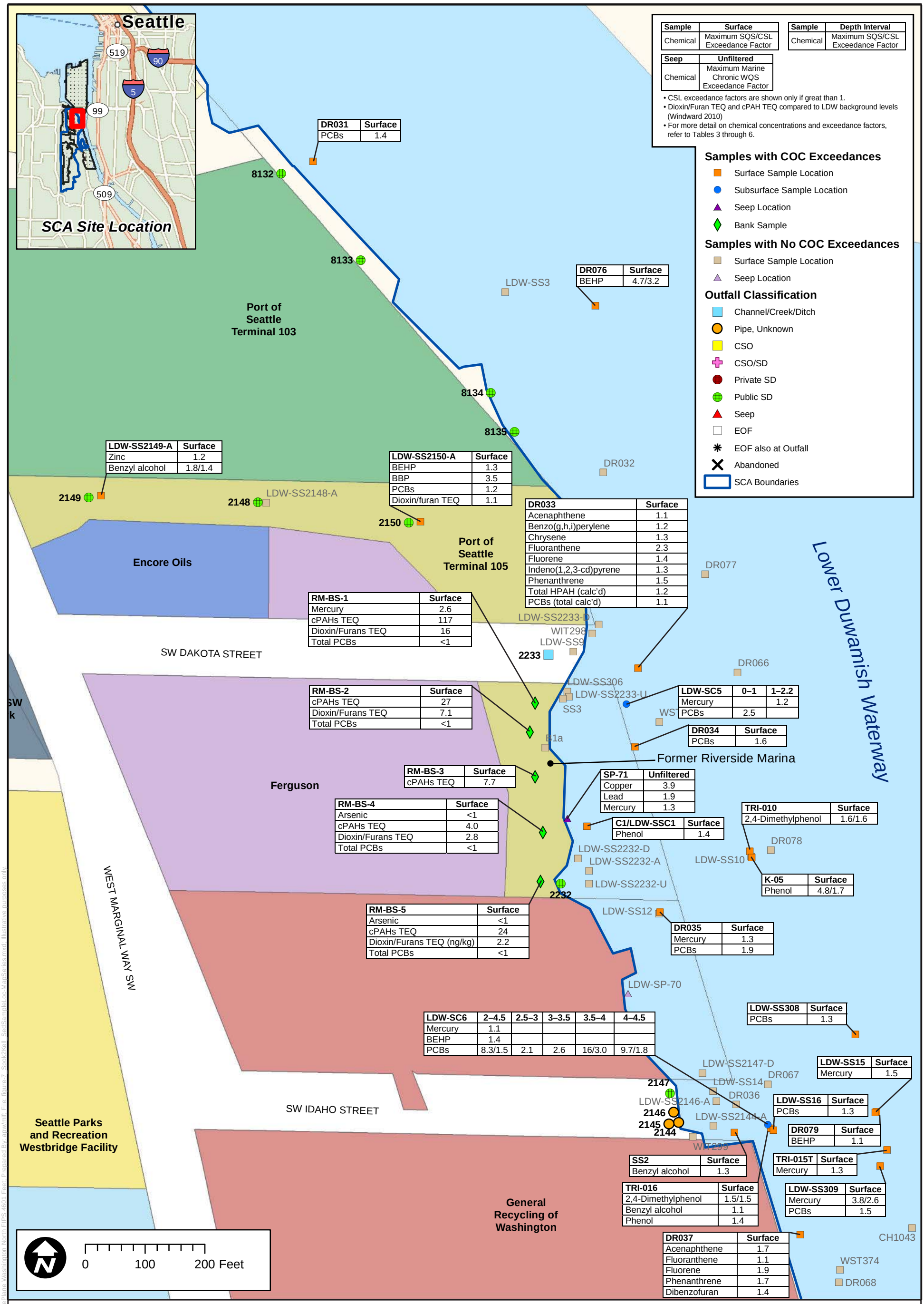

Coordinate System: NAD 1983 StatePlane Washington North FIPS 4601 Feet Prepared By: jpowell File: Figure 7_SpokKell_SedSampleLoc-MapSeries.mxd Illustrative purposes only.

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State of Washington

Figure 7b. Sediment, Seep, and Bank Soil Sample Locations Adjacent to Spokane Street to Kellogg Island Source Control Area (RM 0.0 to 0.3 West)

SAIC
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Sample	Surface
Chemical	Maximum SQS/CSL Exceedance Factor

Sample	Depth Interval
Chemical	Maximum SQS/CSL Exceedance Factor

Seep	Unfiltered
Chemical	Maximum Marine Chronic WQS Exceedance Factor

- CSL exceedance factors are shown only if great than 1.
- Dioxin/Furan TEQ and cPAH TEQ compared to LDW background levels (Windward 2010)
- For more detail on chemical concentrations and exceedance factors, refer to Tables 3 through 6.

Samples with COC Exceedances

- Surface Sample Location
- Subsurface Sample Location
- Seep Location
- Bank Sample

Samples with No COC Exceedances

- Surface Sample Location
- Seep Location

Outfall Classification

- Channel/Creek/Ditch
- Pipe, Unknown
- CSO
- CSO/SD
- Private SD
- Public SD
- Seep
- EOF
- EOF also at Outfall
- Abandoned
- SCA Boundaries

LDW-SC6	2–4.5	2.5–3	3–3.5	3.5–4	4–4.5
Mercury	1.1				
BEHP	1.4				
PCBs	8.3/1.5	2.1	2.6	16/3.0	9.7/1.8

LDW-SS15	Surface
Mercury	1.5

LDW-SS16	Surface
PCBs	1.3

DR079	Surface
BEHP	1.1

TRI-015T	Surface
Mercury	1.3

LDW-SS309	Surface
Mercury	3.8/2.6
PCBs	1.5

SS2	Surface
Benzyl alcohol	1.3

TRI-016	Surface
2,4-Dimethylphenol	1.5/1.5
Benzyl alcohol	1.1
Phenol	1.4

DR037	Surface
Acenaphthene	1.7
Fluoranthene	1.1
Fluorene	1.9
Phenanthrene	1.7
Dibenzofuran	1.4

LDW-SS310	Surface
Mercury	4.4/3.1
PCBs	1.9

LDW-SS2157-A	Surface
Benzyl alcohol	5.1/4.0
Dioxin/furan TEQ	4.4

SS1	Surface
Zinc	1.3
Fluoranthene	1.2/1.5
BEHP	1.1
BBP	1.6

DR038	Surface
Fluoranthene	1.9
Phenanthrene	1.4
PCBs (total calc'd)	1.1

LDW-SSSWCSO-A	Surface
Benzyl alcohol	4.7/3.7

LDW-SSSWCSO-U	Surface
Fluoranthene	1.5
Phenanthrene	1.8
BEHP	1.2
Benzyl alcohol	4.2/3.3

LDW-SS507	Surface
Dioxin/furan TEQ	5.5

SPI-108	Surface
2,4-Dimethylphenol	1.8/1.8
PCBs	2.4

DR040	Surface
Chrysene	1.5
Fluoranthene	1.7/1.2
PCBs (total calc'd)	6.0

WST370	Surface
PCBs	1.5

LDW-SS509	Surface
Benzo(a)anthracene	1.4/1.1
Benzo(a)pyrene	1.3
Benzo(g,h,i)perylene	2.1/1.9
Chrysene	1.9
Dibenzo(a,h)anthracene	2.2
Fluoranthene	2.4/1.6
Indeno(1,2,3-cd)pyrene	2.0/1.7
Phenanthrene	1.5
Pyrene	1.5/1.2
Total HPAH (calc'd)	1.7/1.2
PCBs (total calc'd)	4.3

LDW-SC11	0.0-0.8
Lead	1.4/1.2
Mercury	1.6/1.1
Zinc	1.2
Benzo(a)pyrene	1.9
Benzo(b)fluoranthene	1.3/1.1
Benzo(k)fluoranthene	1.1
Benzofluoranthenes (total-calc'd)	2.4/2.1
Chrysene	3.1/1.5
Fluoranthene	4.8/3.2
Indeno(1,2,3-cd)pyrene	1.1
Pyrene	2.6/2.0
Total HPAH (calc'd)	2.9/2.0
N-Nitroso-di-n-propylamine	1.3
PCBs (total calc'd)	23/3.0

SD-10	Surface
Zinc	1.1

203	Surface
Benzoic acid	8.2/8.2
PCB	1.2

LDW-SS24	Surface
Mercury	1.5/1.1
Zinc	1.1
Benzyl alcohol	12/9.2
Benzo(a)anthracene	2.0/1.6
Benzo(a)pyrene	1.3
Benzo(g,h,i)perylene	1.6/1.5
Benzofluoranthenes (total-calc'd)	1.2/1.1
Chrysene	2.6/1.3
Dibenzo(a,h)anthracene	1.5
Fluoranthene	3.1/2.1
Indeno(1,2,3-cd)pyrene	2.0/1.7
Phenanthrene	1.3
Pyrene	1.7/1.3
Total HPAH (calc'd)	2.0/1.4
PCBs (total calc'd)	2.2

LDW-SS311	Surface
Chrysene	1.3
Fluoranthene	2.3/1.6
Pyrene	1.1
Total HPAH (calc'd)	1.2
PCBs (total calc'd)	2.8

LDW-SC12	0–2	1.5–2	2–2.5	2.5–3	2–4	3.5–4	4–6.6
Mercury					1.1		1.8/1.3
PCBs	1.5	1.3	7.4/1.4	3.1	13/2.4	4.1	1.8

SP-69	Unfiltered
Copper	2.6

WIT282	Surface
PCBs	5.9

DR042	Surface
PCBs	1.4

DR044	Surface
Mercury	1.2
Chrysene	2.0
Fluoranthene	6.9
Phenanthrene	1.4
Total HPAH (calc'd)	2.5
PCBs (total calc'd)	7.3/1.3

General Recycling of Washington

Former Seaboard Lumber

Gray Line of Seattle

Duwamish West/ Siphon-West CSO

Herring's House Park

Lower Duwamish Waterway

WEST MARGINAL WAY SW

Seattle

SCA Site Location

519 90 5 99 509

2147 2146 2145 2144 2157 2226

LDW-SS2147-D DR067 LDW-SS14 LDW-SS2146-A DR036 LDW-SS2144-A WIT299 CH1043 WST374 DR068 DR080 LDW-SS19 DR069 DR039 SD-6 SD-7 SD-17 SD-5 SD-8 WST358 SD-1 SD-9 DR041 KI-1 DR070 LDW-SS23 WST371 WST359 SD-2 SD-11 WST372 KI-2 WQAKELL KI-3

0 100 200 Feet

Coordinate System: NAD 1983 StatePlane Washington North FIPS 4601 Feet Prepared By: gpw/mlf File: figure 7 Spo2Kell SedSampleLoc MapSeries.mxd Illustrative purposes only

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Figure 7c. Sediment, Seep, and Bank Soil Sample Locations Adjacent to Spokane Street to Kellogg Island Source Control Area (RM 0.3 to 0.5 West)

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Sample	Surface
Chemical	Maximum SQS/CSL Exceedance Factor

Sample	Depth Interval
Chemical	Maximum SQS/CSL Exceedance Factor

Seep	Unfiltered
Chemical	Maximum Marine Chronic WQS Exceedance Factor

- CSL exceedance factors are shown only if great than 1.
- Dioxin/Furan TEQ and cPAH TEQ compared to LDW background levels (Windward 2010)
- For more detail on chemical concentrations and exceedance factors, refer to Tables 3 through 6.

Samples with COC Exceedances

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- Seep Location
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Samples with No COC Exceedances

- Surface Sample Location
- Seep Location

Outfall Classification

- Channel/Creek/Ditch
- Pipe, Unknown
- CSO
- CSO/SD
- Private SD
- Public SD
- Seep
- EOF
- EOF also at Outfall
- Abandoned
- SCA Boundaries

DR044	Surface
Mercury	1.2
Chrysene	2.0
Fluoranthene	6.9
Phenanthrene	1.4
Total HPAH (calc'd)	2.5
PCBs (total calc'd)	7.3/1.3

LDW-SC12	0–2	1.5–2	2–2.5	2.5–3	2–4	3.5–4	4–6.6
Mercury					1.1		1.8/1.3
PCBs	1.5	1.3	7.4/1.4	3.1	13/2.4	4.1	1.8

WIT282	Surface
PCBs	5.9

DR042	Surface
PCBs	1.4

LDW-SS312	Surface
Mercury	1.5
Benzo(a)anthracene	1.7/1.4
Benzo(a)pyrene	2.0/1.1
Benzo(g,h,i)perylene	2.4/2.2
Benzofluoranthenes (total calc'd)	1.5/1.3
Chrysene	2.1/1.1
Dibenzo(a,h)anthracene	1.4
Fluoranthene	2.9/2.0
Indeno(1,2,3-cd)pyrene	2.7/2.3
Phenanthrene	2.3
Pyrene	1.8/1.5
Total HPAH (calc'd)	2.2/1.5
PCBs (total calc'd)	7.8

DR043	Surface
BBP	1.6
PCBs	2.1

WIT283	Surface
PCBs	1.6

C2-1	Surface
Phenol	1.1

WIT286	Surface
PCBs	1.5

WIT287	Surface
PCBs	1.5

WIT288	Surface
PCBs	1.7

LDW-SS28	Surface
Dioxin/furan TEQ	6.0

C2-2	Surface
4-Methylphenol	2.4/2.4

T107-BS-5	Surface
Arsenic	5.7
Lead	3.6
Zinc	6.0

DR047	Surface
Fluoranthene	1.1
Phenol	1.8

T107-BS-4	Surface
Arsenic	5.5
Lead	2.2
Zinc	3.5

WIT290	Surface
PCBs	2.7

T107-BS-3	Surface
Arsenic	3.3
Lead	1.4
Zinc	1.5
Dioxin/Furans TEQ	1.2

WIT291	Surface
PCBs	3.2

LDW-SS514	Surface
Dioxin/furan TEQ	7.0

T107-BS-2	Surface
Arsenic	5.4
Lead	2.5
Zinc	3.1

SP-64	Unfiltered
PCBs	15

LDW-SC19	1–2	2–4	4–6	6–7
PCBs	1.1	1.3	2.9	13/2.4

T107-BS-1	Surface
Arsenic	3.5
Lead	1.6
Zinc	1.1

LDW-SS36	Surface
Dioxin/furan TEQ	13

SD-10, WST371, WST359, LDW-SS509, LDW-SS24, LDW-SC11, SP-69, LDW-SS311, SD-2, SD-11, WST372, KI-2, WQAKELL, KI-3, SD-12, SD-1, WIT292, SD-13, WIT293, KI-4, SD-14, WST363, LDW-SS313, WIT294, SD-15, LDW-SP-68, LDW-SS314, B3a, DR046, DR045, Kellogg Island, WIT295, Port of Seattle Terminal 107, LDW-SP-67, LDW-SS29, WIT296, WIT289, B2a, LDW-SS33, WIT297, LDW-SS34, WST366, WST367, DR048, WST368, LDW-SP-66, 2139, LDW-SP-65, 2138, Lower Duwamish Waterway

Seattle, 519, 90, 5, 99, 509, SCA Site Location

0 100 200 Feet

Coordinate System: NAD 1983 StatePlane Washington North FIPS 4601 Feet Prepared by: anwinif File: figure 7_SpokaneIl_SedSampleLoc_MapSeries.mxd Illustrative purposes only.

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Figure 7d. Sediment, Seep, and Bank Soil Sample Locations Adjacent to Spokane Street to Kellogg Island Source Control Area (RM 0.5 to 1.0 West)

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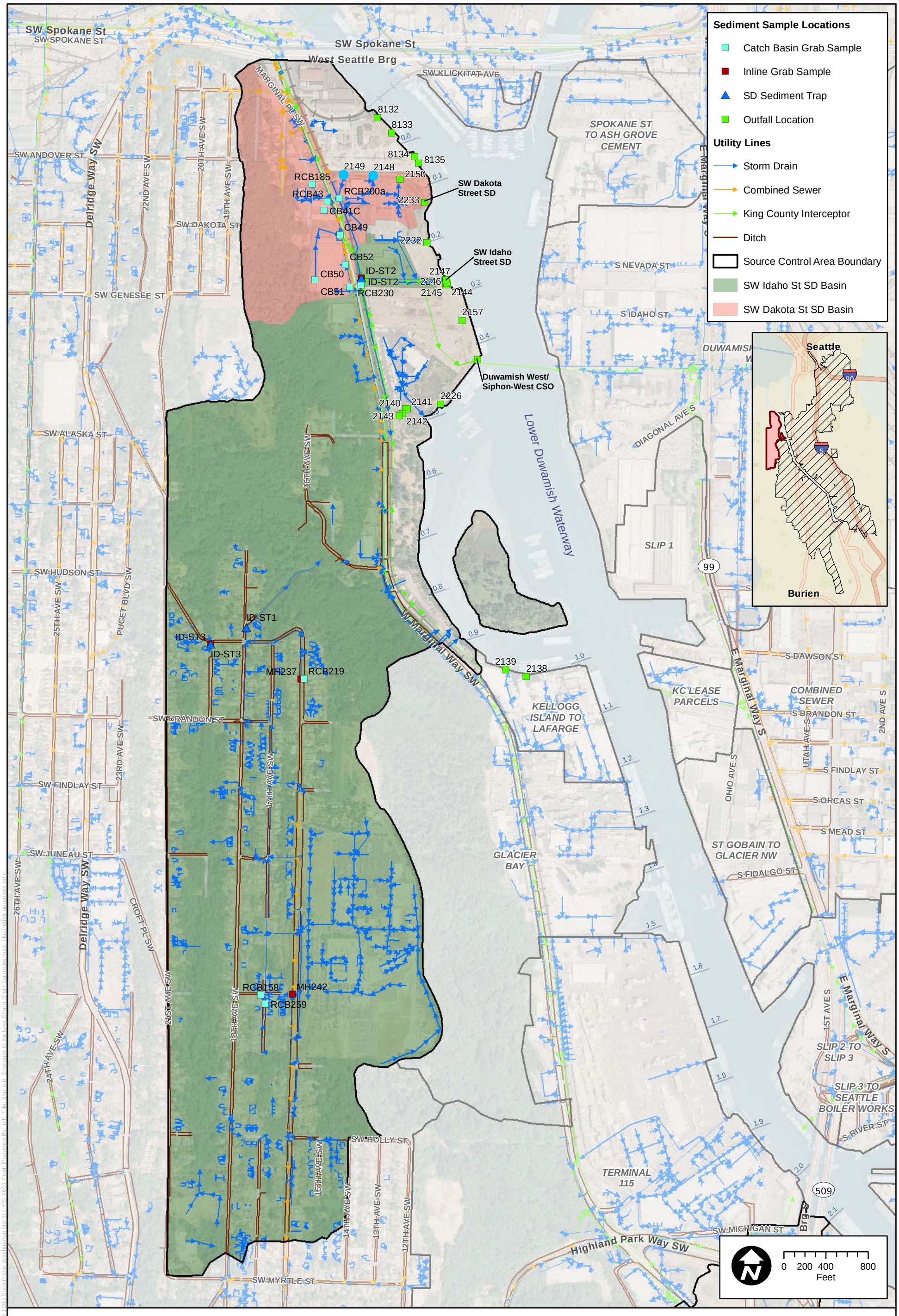

Figure 8. Storm Drain Sample Locations
Spokane Street to Kellogg Island Source Control Area
(RM 0.0 to 0.3 West)

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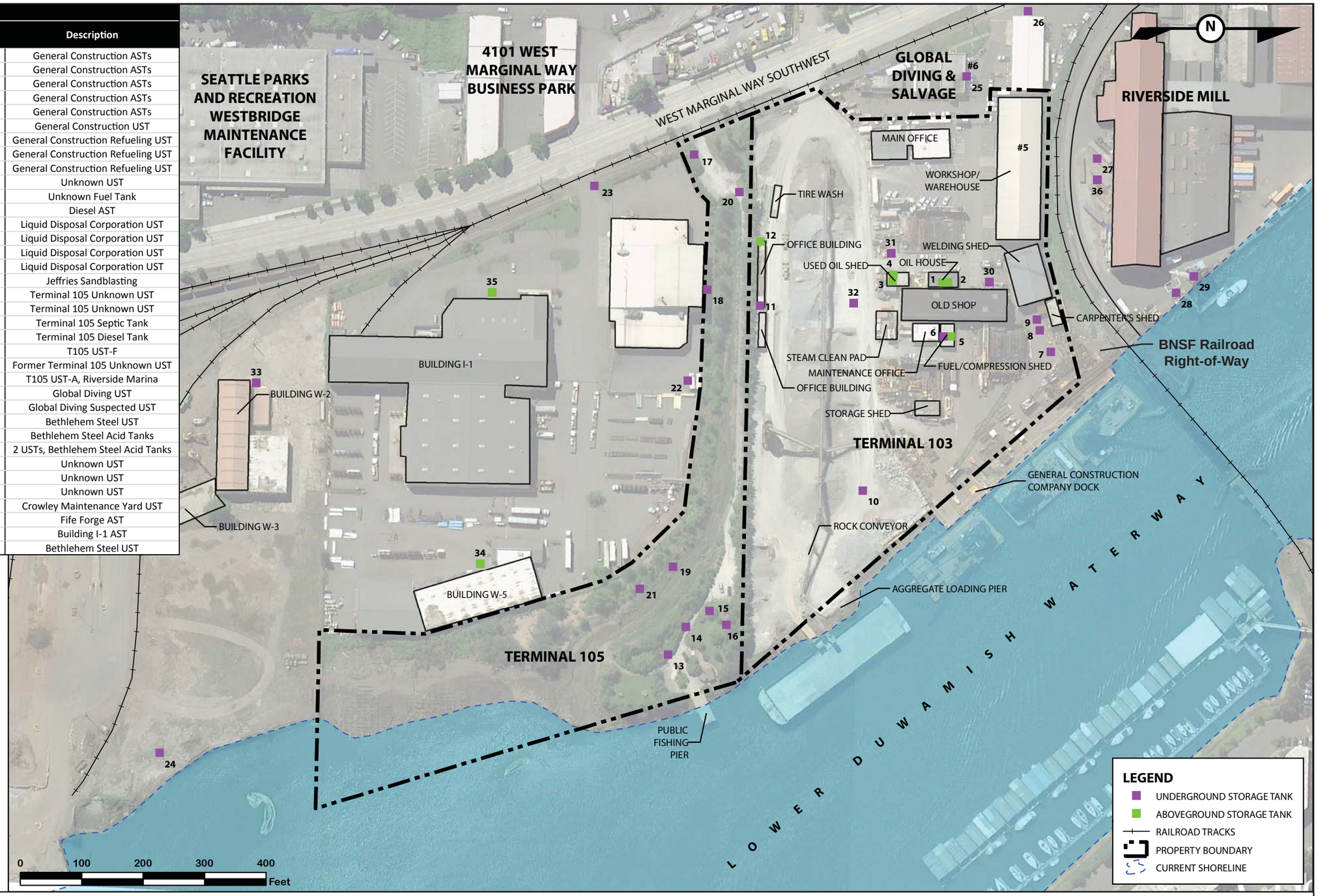
Tank Identification				
Tank #	**Contents**	**Capacity (Gallons)**	**Status**	**Description**
1	Motor Oil	500	Active	General Construction ASTs
2	Hydraulic Oil	500	Active	General Construction ASTs
3	Used Oil	600	Active	General Construction ASTs
4	Used Antifreeze	200	Active	General Construction ASTs
5	Diesel	500	Active	General Construction ASTs
6	Heating Oil	500	Removed	General Construction UST
7	Diesel	10,000	Removed	General Construction Refueling UST
8	Gasoline	600	Removed	General Construction Refueling UST
9	Gasoline	6,000	Removed	General Construction Refueling UST
10	Unknown	Unknown	Removed	Unknown UST
11	Fuel Oil	Unknown	Removed	Unknown Fuel Tank
12	Diesel	2,000	Removed	Diesel AST
13	Waste Oil	8,000	Unknown	Liquid Disposal Corporation UST
14	Waste Oil	8,000	Unknown	Liquid Disposal Corporation UST
15	Gasoline	1,000	Unknown	Liquid Disposal Corporation UST
16	Gasoline	1,000	Unknown	Liquid Disposal Corporation UST
17	Unknown	500	Closed in Place	Jeffries Sandblasting
18	Heating Oil	300	Removed	Terminal 105 Unknown UST
19	Unknown	200	Removed	Terminal 105 Unknown UST
20	Septic	300	Removed	Terminal 105 Septic Tank
21	Diesel	2,000	Removed	Terminal 105 Diesel Tank
22	Diesel	1,200	Removed	T105 UST-F
23	Unknown	300	Removed	Former Terminal 105 Unknown UST
24	Gasoline	2,000	Removed	T105 UST-A, Riverside Marina
25	Heating Oil	Unknown	Removed	Global Diving UST
26	Unknown	Unknown	Unknown	Global Diving Suspected UST
27	Diesel	8,000	Removed	Bethlehem Steel UST
28	Acid	Unknown	Removed	Bethlehem Steel Acid Tanks
29	Waste Acid	Unknown	Removed	2 USTs, Bethlehem Steel Acid Tanks
30	Heating Oil	Unknown	Unknown	Unknown UST
31	Unknown	Unknown	Unknown	Unknown UST
32	Unknown	Unknown	Unknown	Unknown UST
33	Waste Oil	600	Unknown	Crowley Maintenance Yard UST
34	Diesel	180	Unknown	Fife Forge AST
35	Unknown	Unknown	Unknown	Building I-1 AST
36	Cooling Oil	4,000	Removed	Bethlehem Steel UST



Sources: Olympus 1993; SoundEarth 2011a,b

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Figure 9. Riverside Mill, Terminal 103 and Terminal 105 Storage Tanks

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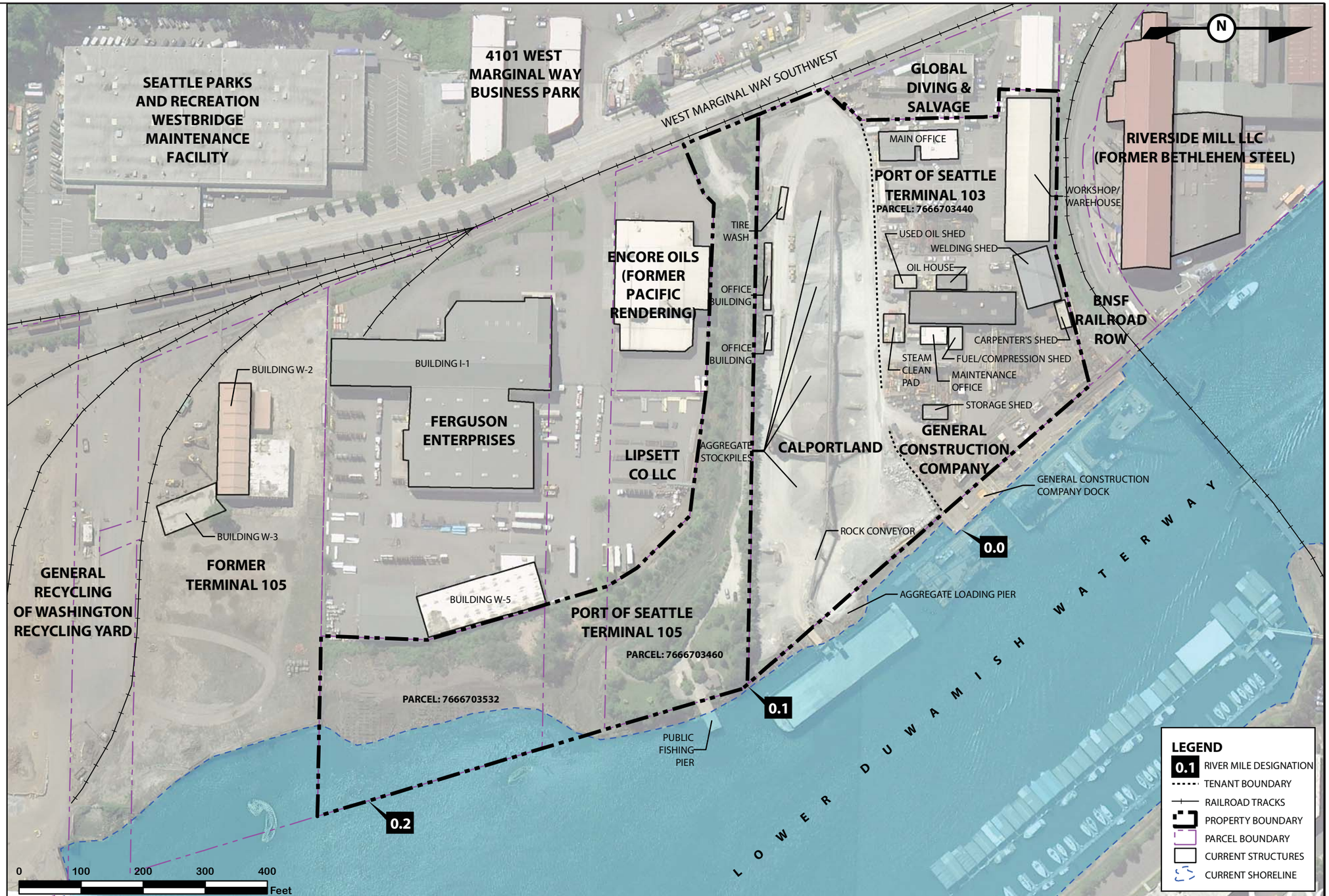

Source: SoundEarth 2011a,b

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Figure 10. Terminal 103 and Terminal 105 Current Features

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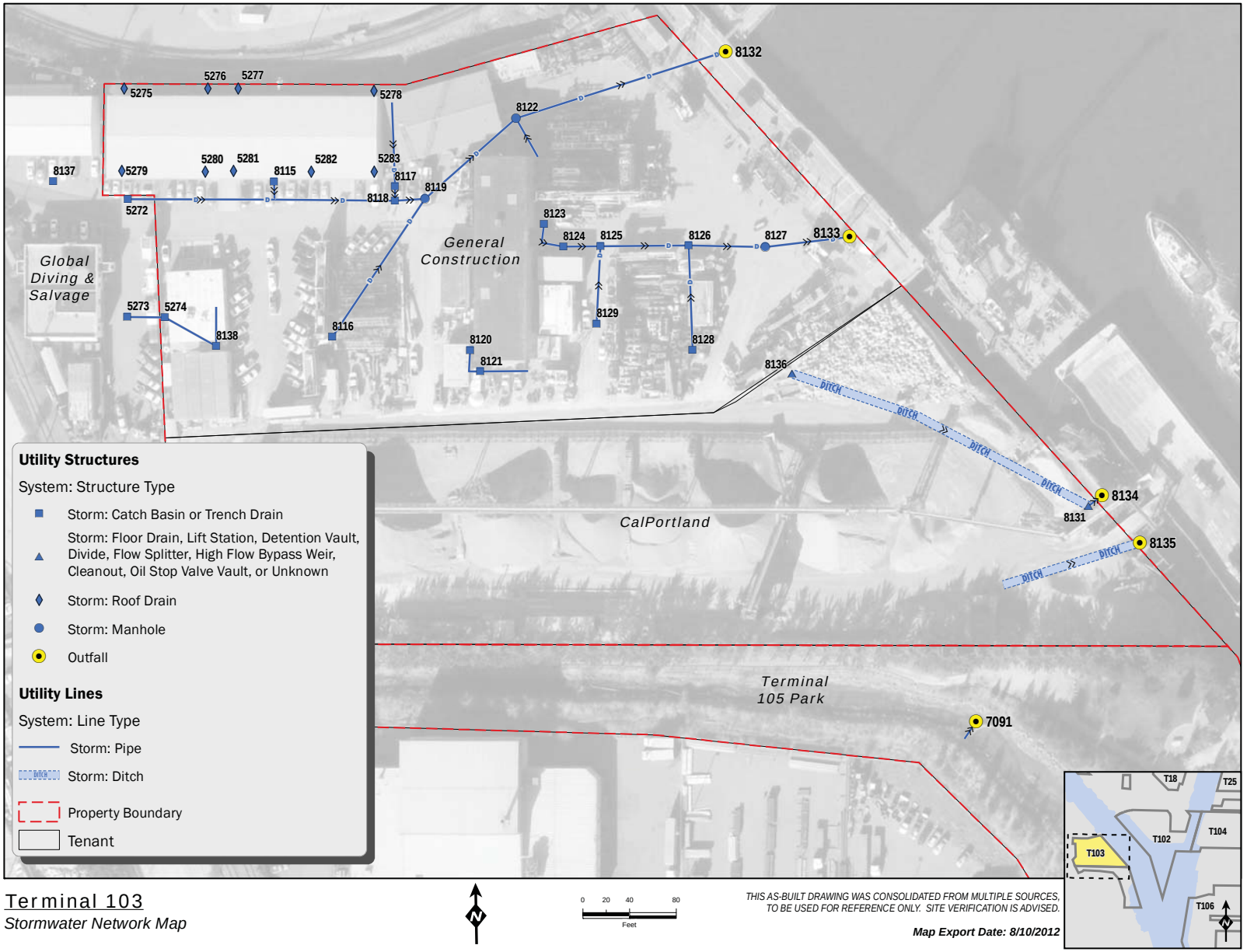

Terminal 103

Stormwater Network Map

THIS AS-BUILT DRAWING WAS CONSOLIDATED FROM MULTIPLE SOURCES, TO BE USED FOR REFERENCE ONLY. SITE VERIFICATION IS ADVISED.

Map Export Date: 8/10/2012

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Figure 11. Terminal 103 Facility Storm Drain Plan

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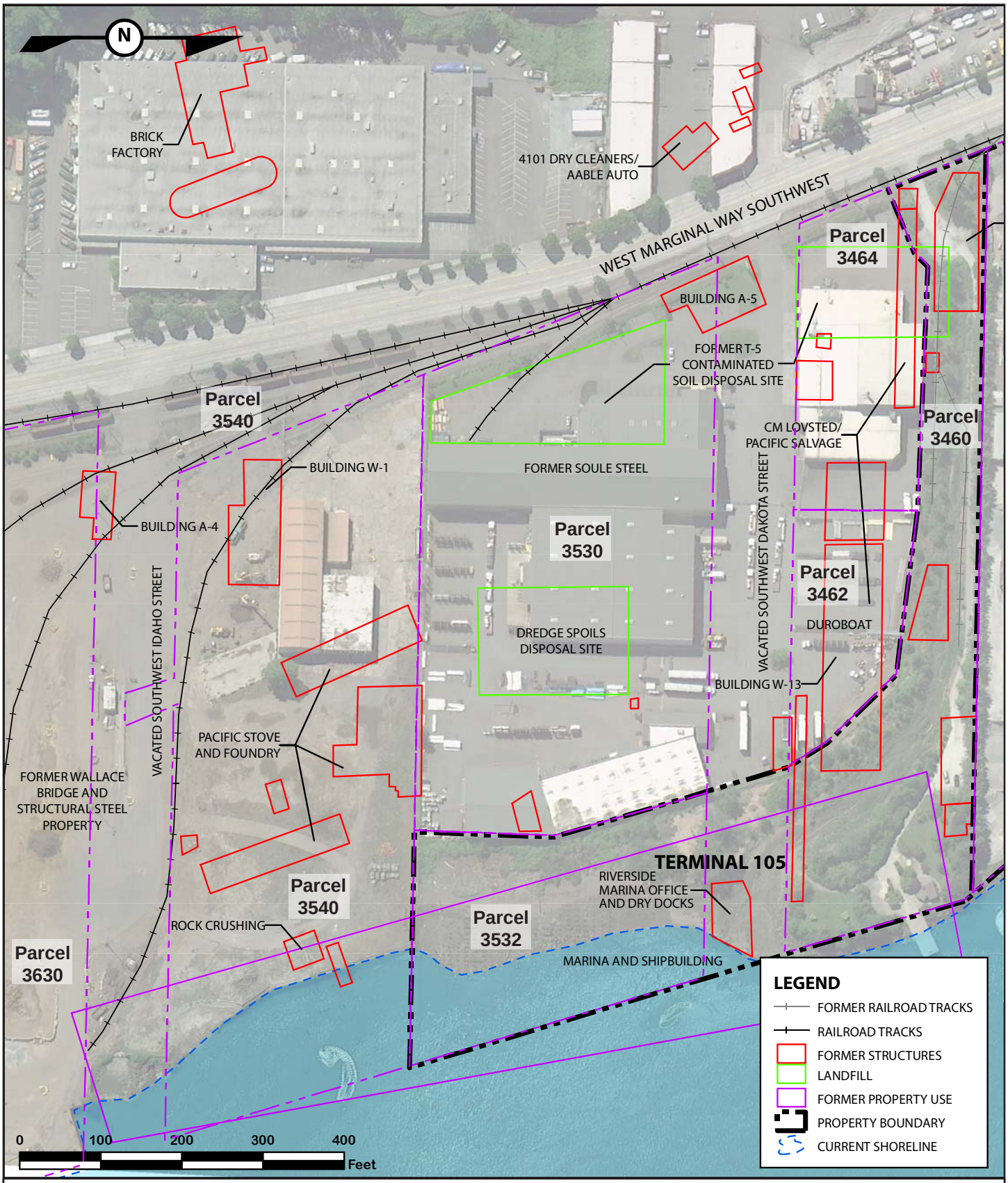

Source: SoundEarth 2011b

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Figure 12. Terminal 105 Historical Features

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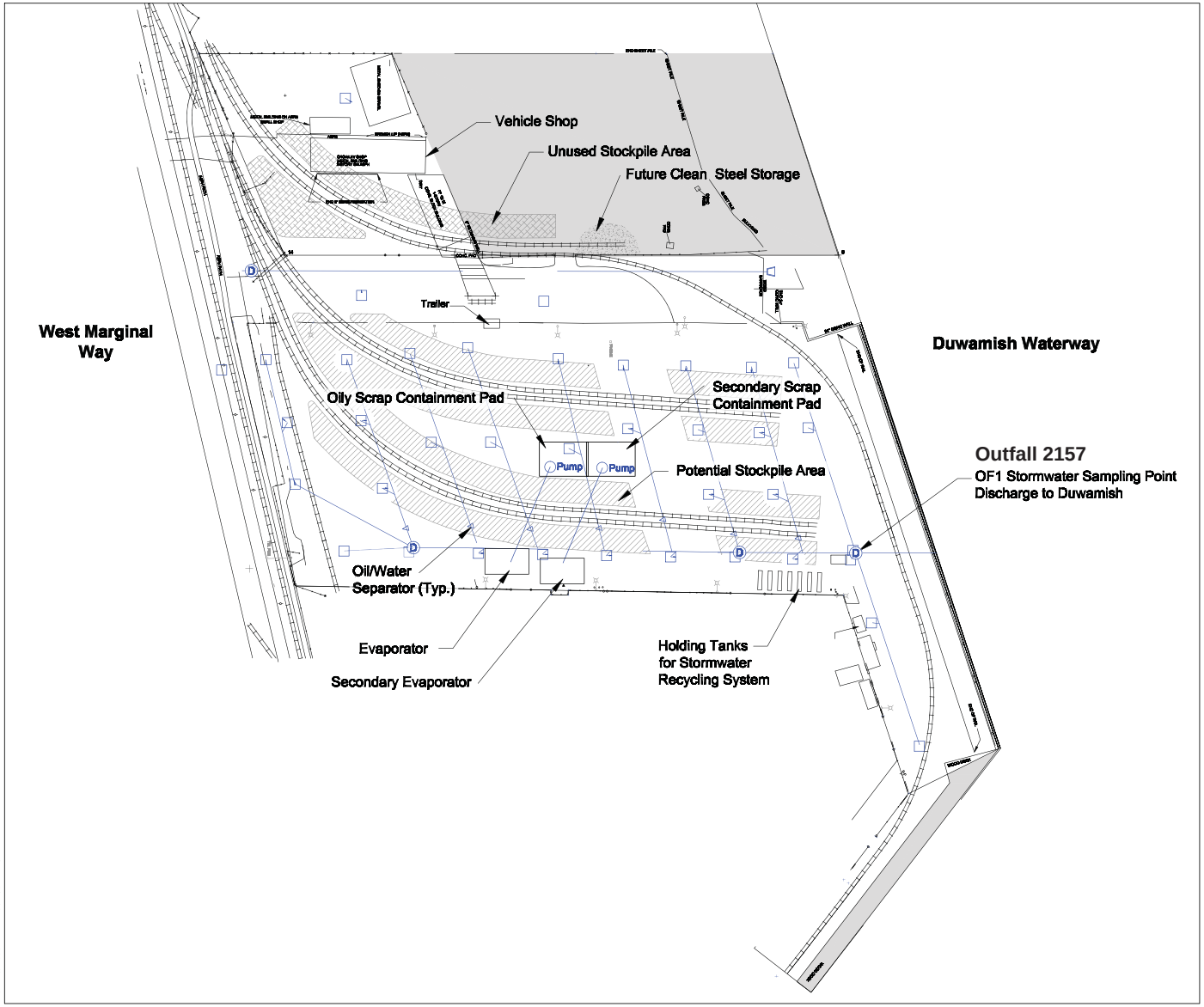
SWPPP Plan



Storm Drain
Oil/Water Separator
Catch Basin
Non-Paved Area
Scrap Stockpile Area

Notes:
1. No stockpiles are stored on catch basins.
2. Site covered with asphalt or concrete except in non-paved areas.
3. No surface water exists on site.

N

0 150 300
Scale in Feet

JMK 5/12/06 1722001-001.DWG

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Figure 1

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Figure 13. General Recycling of Washington Facility Plan

Source: General Recycling 2010

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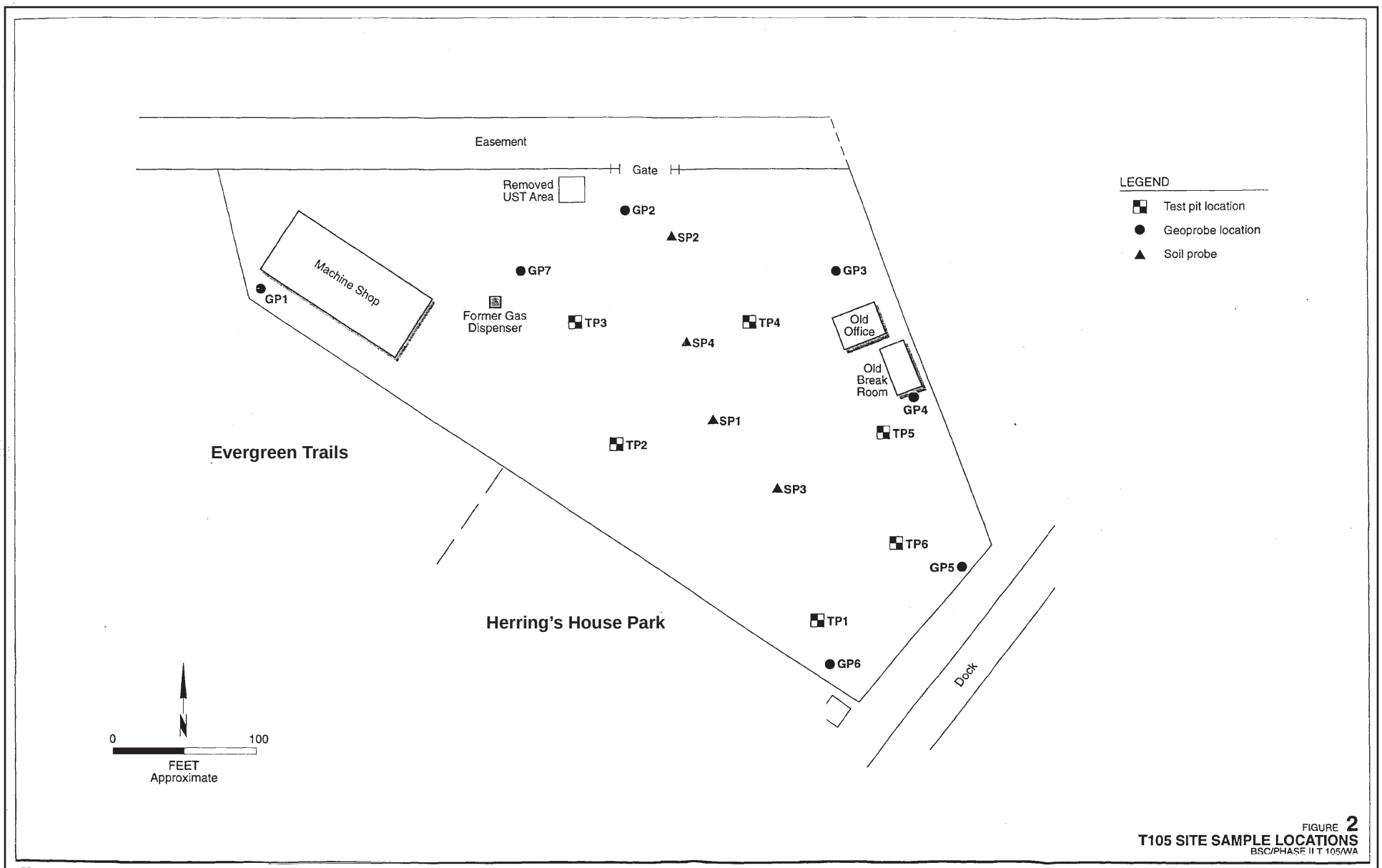

FIGURE 2
T105 SITE SAMPLE LOCATIONS
BSC/PHASE II T 105/WA

PROJECT NO. 993 1520.400 DRAWING NO. 84565 DATE 7/2/99 DRAWN BY EA

Golder Associates

Source: Golder 1999

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Figure 14. Environmental Investigation General Recycling of Washington

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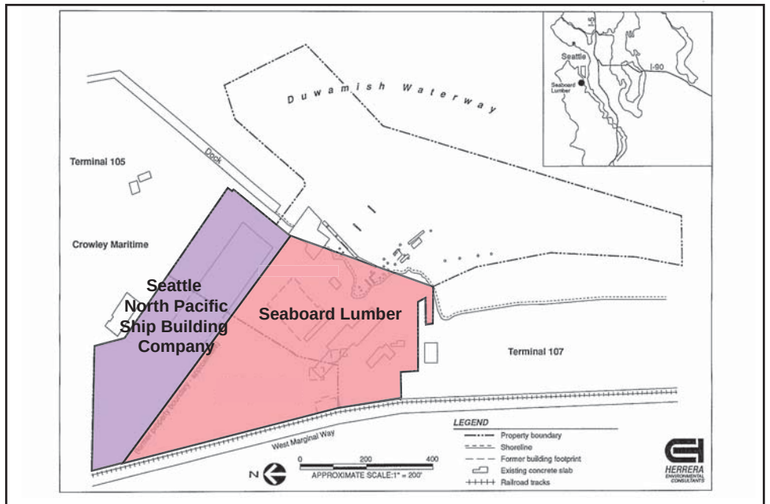
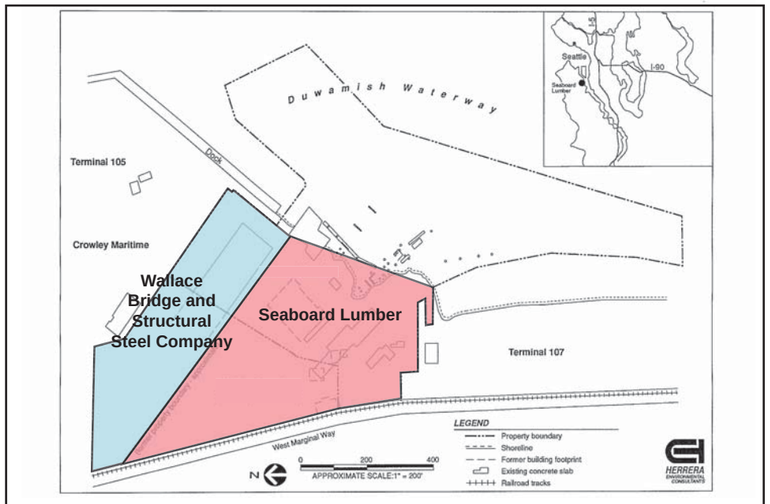
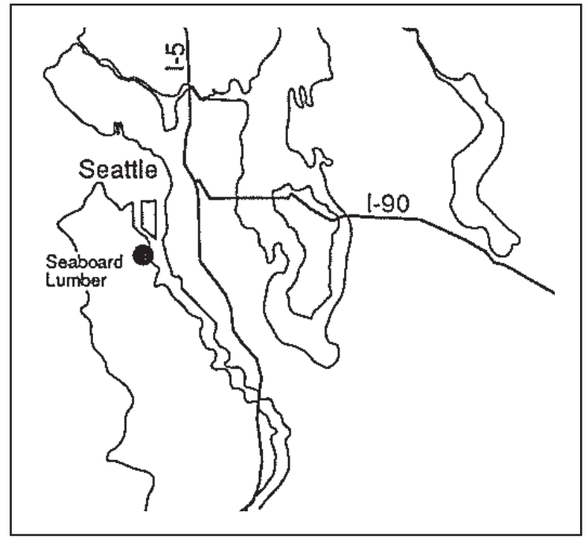


Property Owners from 1920 to 1927

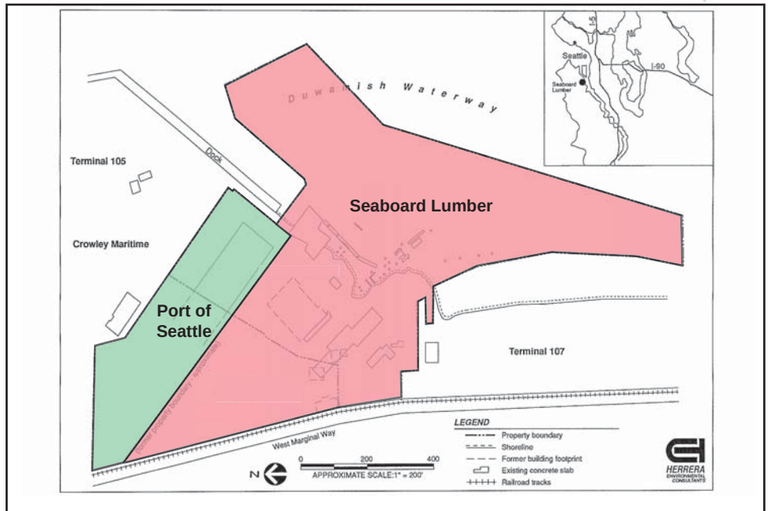


Property Owners from 1927 to 1964

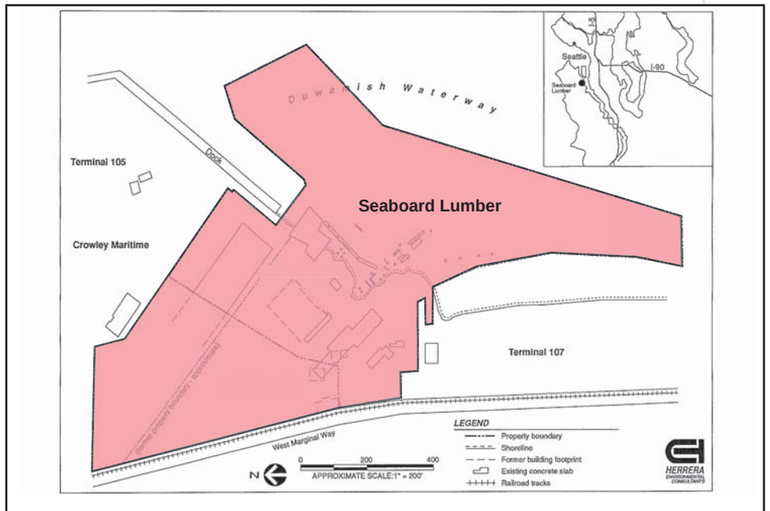


Property Owners

- Seaboard Lumber
- Seattle North Pacific Ship Building Company
- Wallace Bridge and Structural Steel Company
- Port of Seattle



Property Owners from 1965 to 1969



Property Owners from 1970 to 1984

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Figure 15a. Historical Property Owners, Seaboard Lumber, 1920–1984

Source: Herrera 1996

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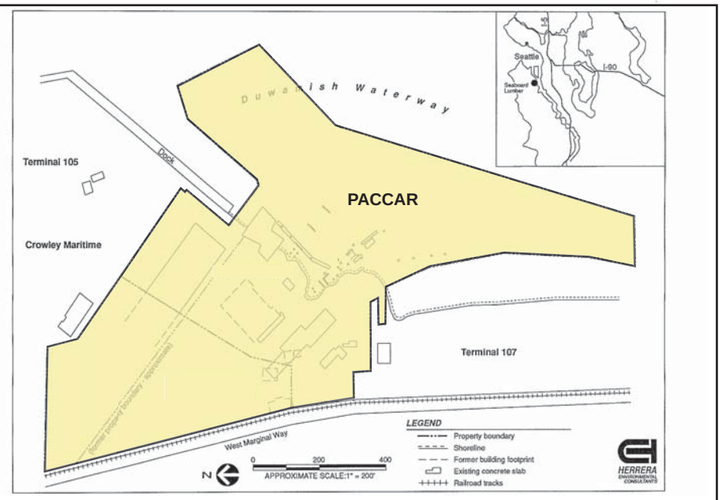
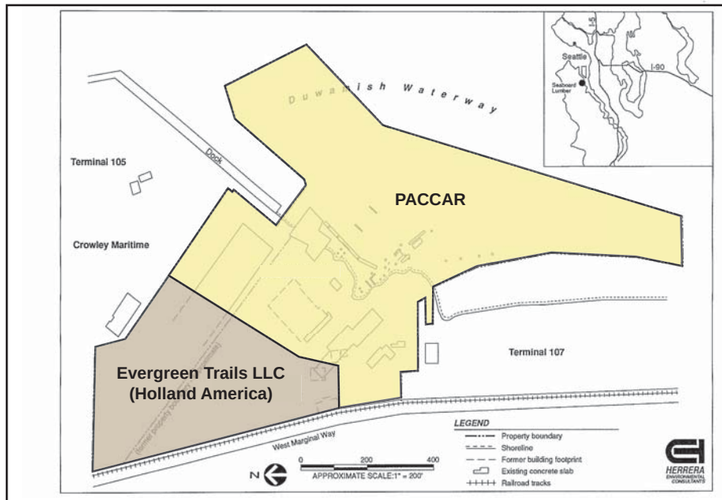
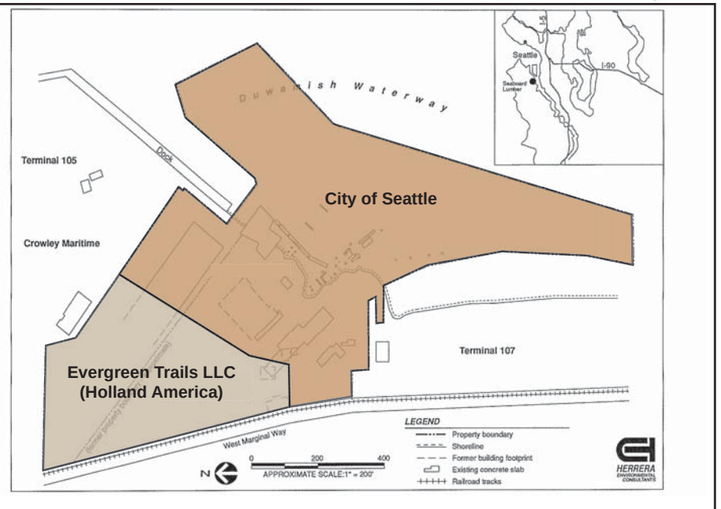


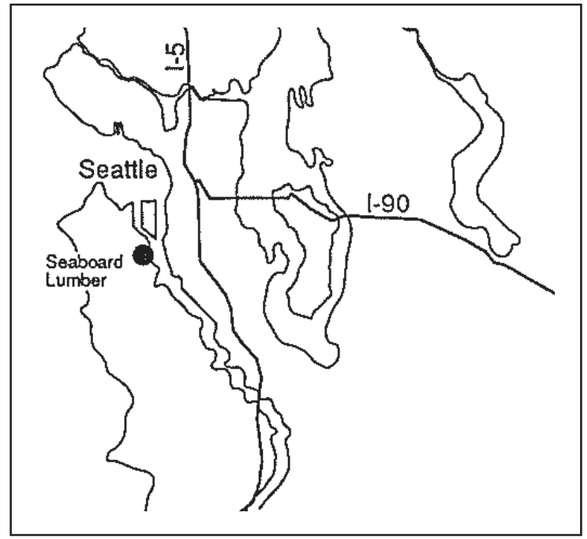
Property Owners from 1987 to 1992



Property Owners from 1994 to 1997



Property Owners from 1998 to Present



Property Owners

- PACCAR
- Evergreen Trails LLC
- City of Seattle

Source: Herrera 1996

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Figure 15b. Historical Property Owners, Seaboard Lumber, 1987–Present

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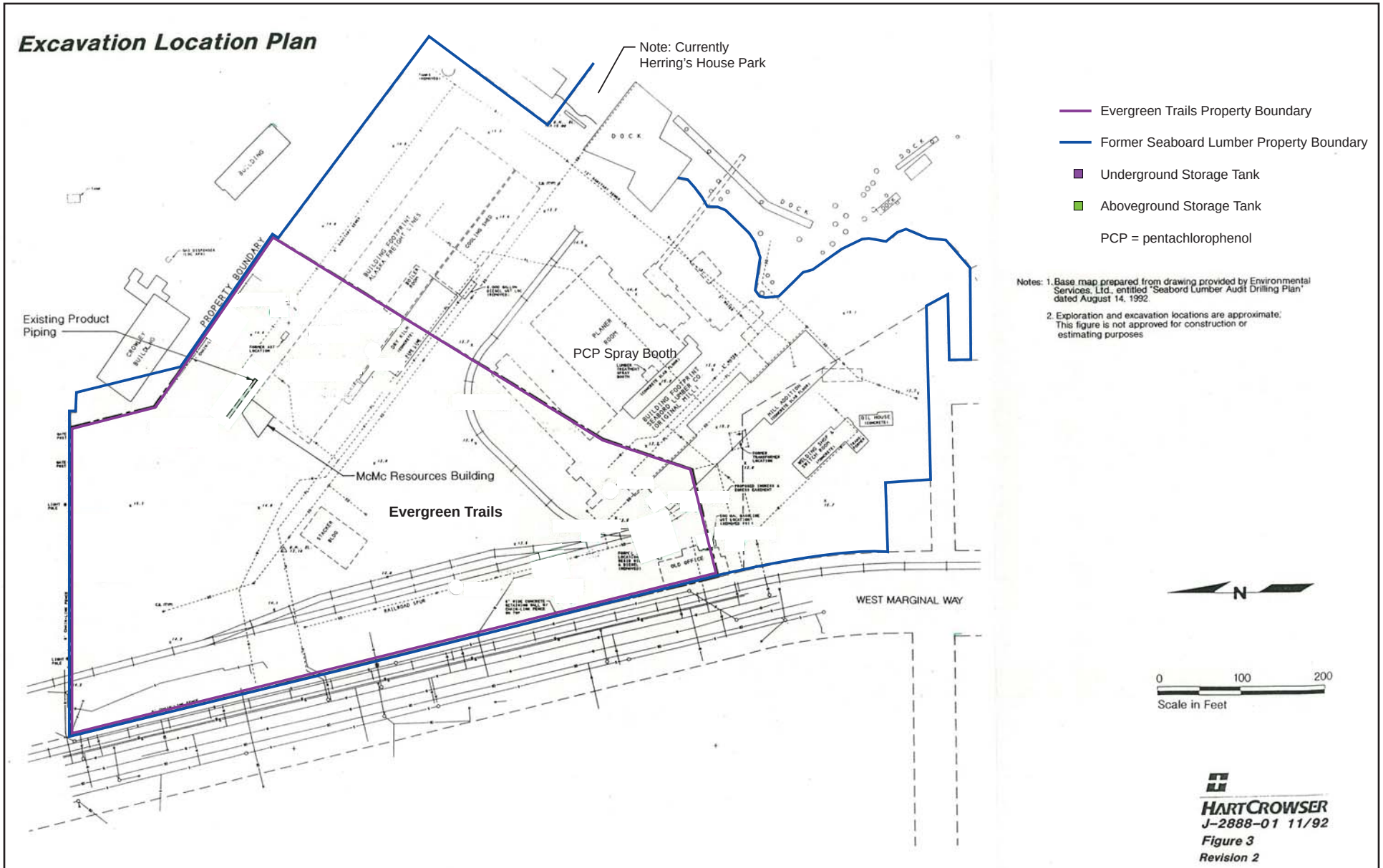
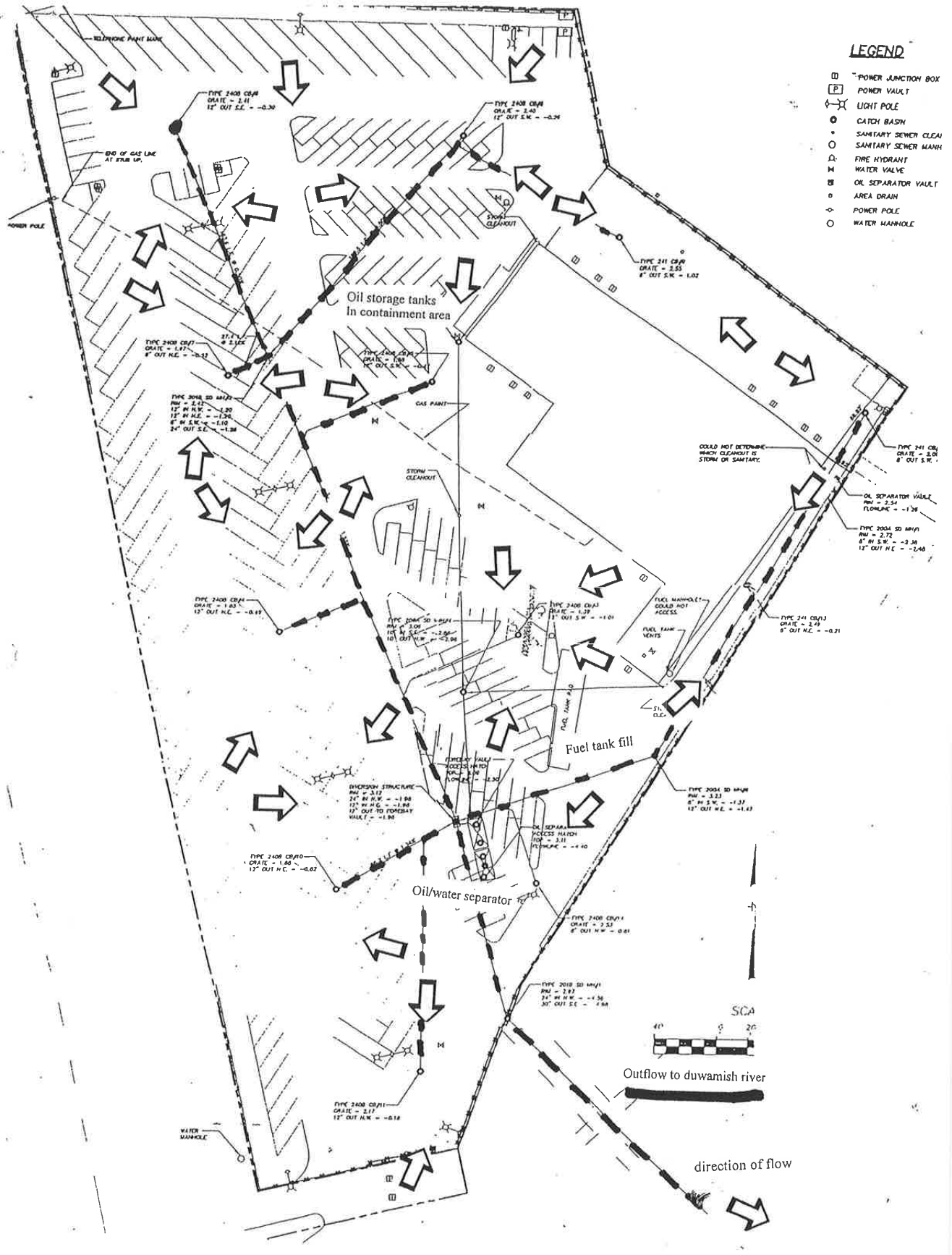


Source: Hart Crowser 1992

Figure 16. Former Seaboard Lumber Property Plan



Source: Evergreen Trails 2012

Figure 17. Evergreen Trails Facility Plan

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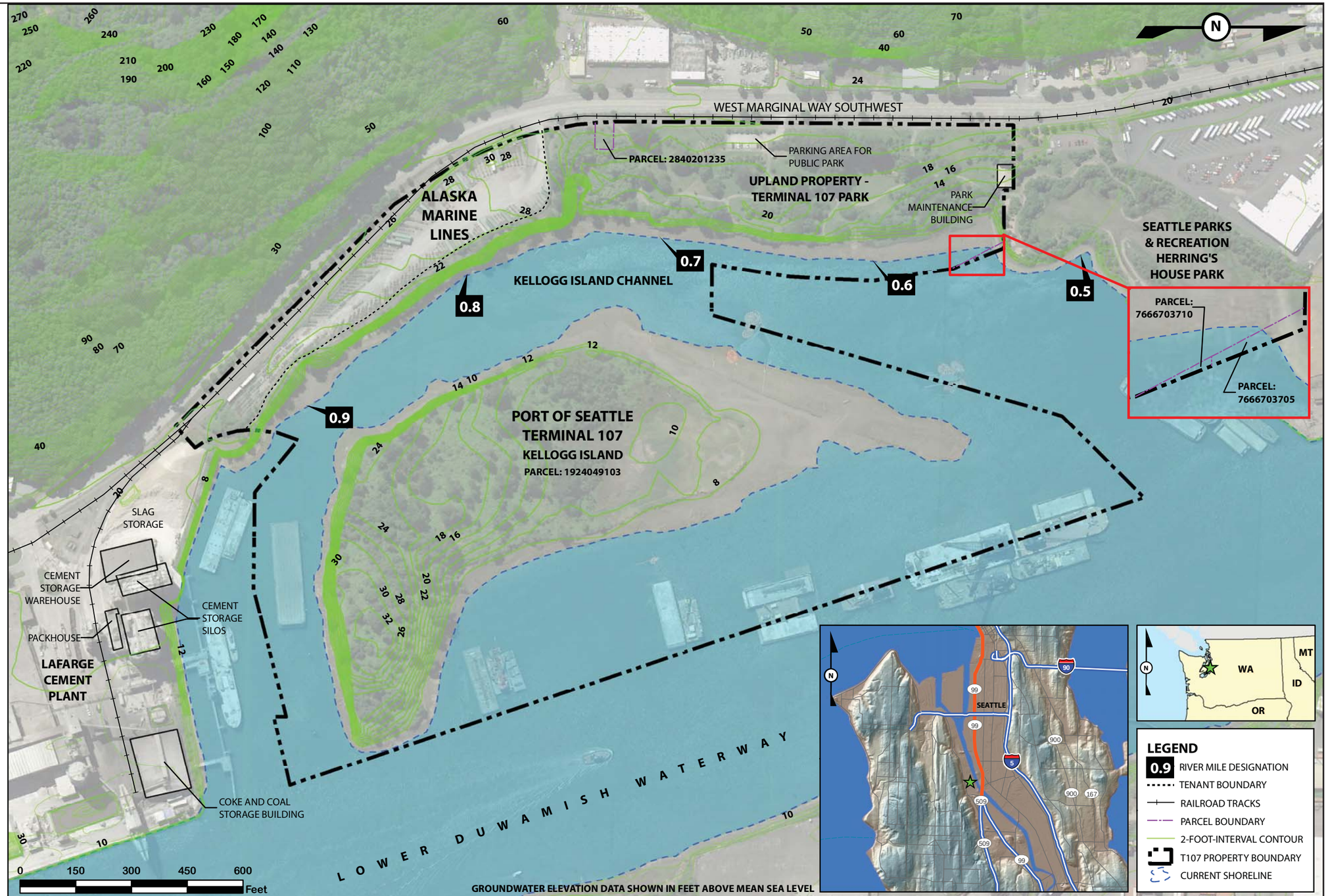

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Source: SoundEarth 2011a

Figure 18. Terminal 107 Property Plan and Vicinity Map

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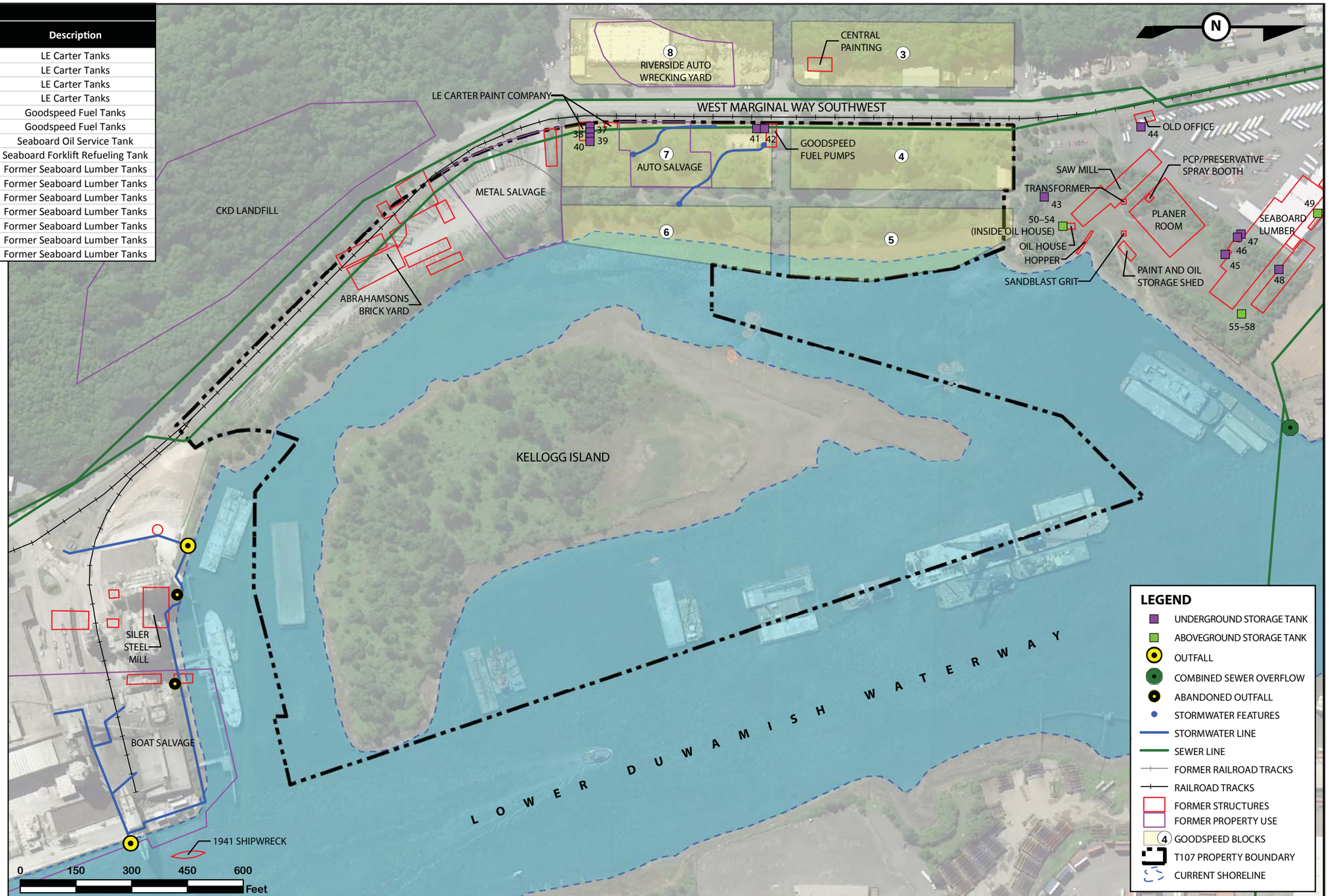
Tank Identification				
Tank #	**Contents**	**Capacity (Gallons)**	**Status**	**Description**
37	Paint Solvents	6,000	Unknown	LE Carter Tanks
38	Paint Solvents	4,000	Unknown	LE Carter Tanks
39	Paint Solvents	7,500	Unknown	LE Carter Tanks
40	Paint Solvents	7,500	Unknown	LE Carter Tanks
41	Unknown	3,000	Unknown	Goodspeed Fuel Tanks
42	Unknown	3,000	Unknown	Goodspeed Fuel Tanks
43	Lube Oil/Waste Oil	2,100	Removed	Seaboard Oil Service Tank
44	Gasoline	500	Unknown	Seaboard Forklift Refueling Tank
45	Diesel	8,000	Removed	Former Seaboard Lumber Tanks
46	Diesel	10,000	Removed	Former Seaboard Lumber Tanks
47	Diesel	10,000	Removed	Former Seaboard Lumber Tanks
48	Heating Oil	300	Removed	Former Seaboard Lumber Tanks
49	Diesel	1,000	Removed	Former Seaboard Lumber Tanks
50-54	Lubricating Oil	300	Removed	Former Seaboard Lumber Tanks
55-58	Diesel	Unknown	Removed	Former Seaboard Lumber Tanks



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Source: SoundEarth 2011a

Figure 19. Terminal 107 Historical Features

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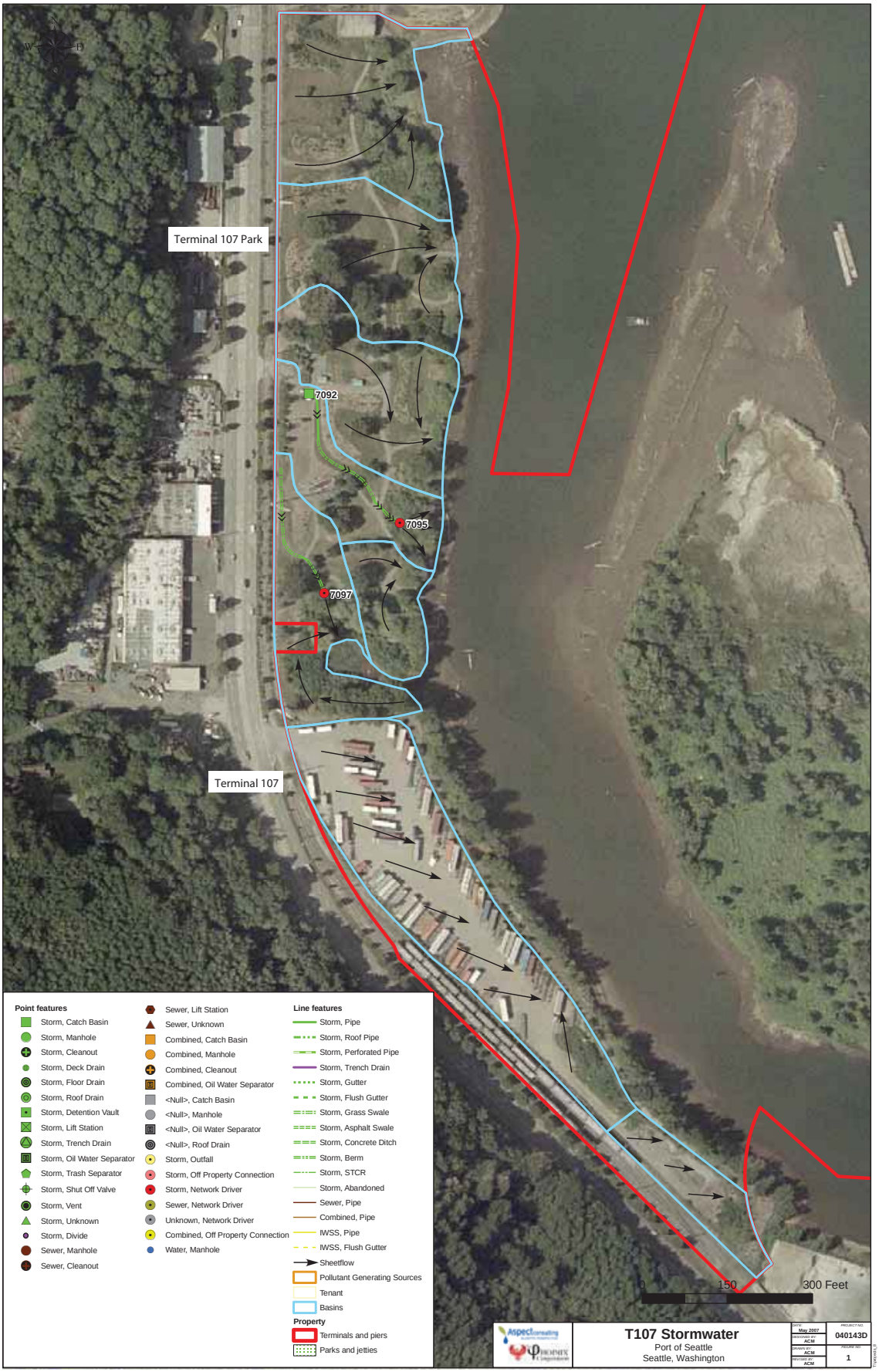
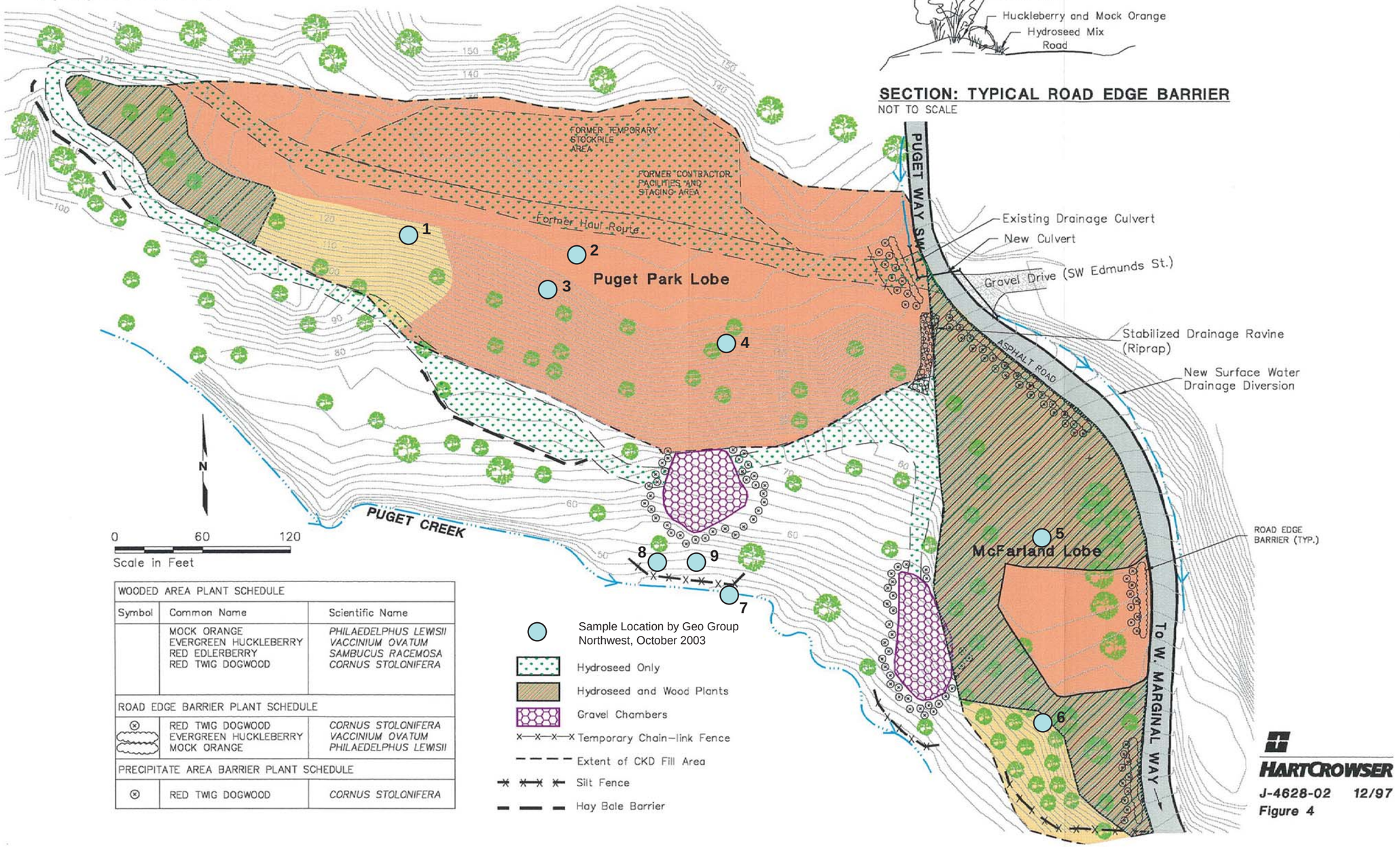


Source: Phoinix 2007a

Figure 20. Terminal 107 Stormwater Map

Site Condition after Remedial Action - As-Built Revegetation Plan

Hudson Street Site



WOODED AREA PLANT SCHEDULE		
Symbol	Common Name	Scientific Name
	MOCK ORANGE EVERGREEN HUCKLEBERRY RED EDLERBERRY RED TWIG DOGWOOD	*PHILAEDELPHUS LEWISII* *VACCINIUM OVATUM* *SAMBUCUS RACEMOSA* *CORNUS STOLONIFERA*
ROAD EDGE BARRIER PLANT SCHEDULE		
⊗	RED TWIG DOGWOOD EVERGREEN HUCKLEBERRY MOCK ORANGE	*CORNUS STOLONIFERA* *VACCINIUM OVATUM* *PHILAEDELPHUS LEWISII*
PRECIPITATE AREA BARRIER PLANT SCHEDULE		
⊗	RED TWIG DOGWOOD	*CORNUS STOLONIFERA*

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J-4628-02 12/97
Figure 4

Sources: Hart Crowser 1997b; Geo Group 2003a

Figure 21. Property Condition after Remedial Action, Hudson Street Site (Puget Park and the McFarland Property)

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