



DEPARTMENT OF
ECOLOGY
State of Washington

**Lower Duwamish Waterway
RM 2.3–2.8 East
(Seattle Boiler Works to Slip 4)**

Source Control Action Plan

June 2009

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Lower Duwamish Waterway RM 2.3–2.8 East (Seattle Boiler Works to Slip 4)

Source Control Action Plan

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Executive Summary

The purpose of this Source Control Action Plan (SCAP) is to identify potential sources of contaminants to sediments associated with the Lower Duwamish Waterway (LDW) River Mile (RM) 2.3–2.8 East source control area, and to identify the actions necessary to prevent recontamination of sediment after cleanup. This SCAP is based on a thorough review of information pertinent to sediment recontamination, as documented in the *Summary of Existing Information and Identification of Data Gaps* (SAIC 2008).

The LDW, located in Seattle, Washington, was added to the National Priorities List (Superfund) by the United States Environmental Protection Agency (USEPA or EPA) on September 13, 2001. Chemicals of concern (COCs) found in waterway sediments include polychlorinated biphenyls (PCBs), polycyclic aromatic hydrocarbons (PAHs), mercury 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 used existing data to identify potential human health and ecological risks, information needs, and high priority areas for cleanup. Seven candidate early action areas (or “Tier 1” sites) were identified. Data collected during Phase 2 of the RI were used to identify additional sites where long-term cleanup actions may be necessary. The RM 2.3–2.8 East Source Control Area (Seattle Boiler Works to Slip 4) was identified as one of these “Tier 2” sites.

As part of the source control efforts in the LDW, Ecology works with other members of the Source Control Work Group to develop SCAPs for areas of sediment contamination that will or may require cleanup. The SCAP for each of these sediment areas identifies potential sources of sediment contaminants and 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 RM 2.3–2.8 East source control area. Mercury, PCBs, PAHs, dioxins/furans, and organo-tin compounds are considered to be the major COCs in sediments associated with the RM 2.3–2.8 East 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 describes potential sources of contamination that may affect sediments associated with the RM 2.3–2.8 East source control area, including outfalls, spills to the waterway, and releases from adjacent or upland properties; evaluates the significance of these potential sources; and identifies 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. Section 5 describes how source control efforts will be tracked and reported.

Table ES-1 lists the source control actions that have been identified for the RM 2.3–2.8 East 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 sediments associated with the RM 2.3–2.8 East source control area was not scheduled at the time this SCAP was prepared.

Table ES-1. Action Items for the RM 2.3–2.8 East Source Control Area

Potential Sources	Action Items	Priority	Responsible Party(ies)	Status	Target Date
Seattle Public Utilities [SPU] Storm Drains and Outfalls					
Potential ongoing source: Stormwater discharges from two public outfalls may represent an ongoing source of COCs to sediments associated with the RM 2.3–2.8 East source control area. City storm drains are located at the ends of S Myrtle Street and S Garden Street.	Collect additional solids samples from catch basins and maintenance holes in city-owned storm drains as needed to evaluate concentrations of COCs in the drainage basin.	High	SPU	Planned	June 2009
	Conduct source tracing to identify potential contaminant sources to stormwater discharging to the LDW through the S Myrtle Street and S Garden Street outfalls.	High	SPU	Planned	December 2009
Guimont Parcel (Dawn Foods/former Bunge Foods)					
Potential ongoing source: A recent inspection indicates the facility is in compliance with applicable regulations. However, very little information regarding past operations at this property was available.	Review responses to EPA’s Request for Information 104(e) letters sent to William P. Guimont, Fox Avenue Warehouse Corporation, Bunge Foods Processing LLC, and Dawn Food Products, Inc.	High	Ecology	Planned	September 2009
Seattle Boiler Works, Inc.					
Potential historical source: No environmental investigations have been conducted at this property. LDW sediment samples collected nearby indicated the presence of PCBs above the sediment quality standards (SQS).	Review responses to EPA’s Request for Information 104(e) letters sent to Fred Hopkins/Seattle Boiler Works, Inc., Frank H. Hopkins Family LLC, and National Steel Construction Company, and identify additional data gaps/source control action items as needed.	High	Ecology	Planned	September 2009
Potential ongoing source: Seattle Boiler Works discharges stormwater to the LDW and a 2007 inspection noted stormwater permit violations. Spills on the property may enter the onsite storm drain system and be discharged to the LDW. There are six outfalls on the Seattle Boiler Works property; only one of these outfalls is identified on the facility’s National Pollution Discharge Elimination System (NPDES) permit.	Conduct follow-up inspections to the June 2007 stormwater compliance inspection as needed to verify that deficiencies noted during the inspection have been corrected. Obtain an updated facility plan showing the locations of all catch basins, maintenance holes, storm drain lines, stormwater conveyance lines, and outfalls and field verify the locations of these drainage system features.	High	Ecology	Planned	August 2009
	Determine if the five outfalls that are not included in Seattle Boiler Work’s NPDES permit are in use. If in use and Seattle Boiler Works is the source of discharge, modify the facility’s stormwater permit to include these outfalls.	High	Ecology	Planned	December 2009
	If Seattle Boiler Works is not the source of discharges to these five outfalls, perform source tracing to identify potential sources discharging to the outfalls.	High	Ecology/SPU	Planned	December 2009

Potential Sources	Action Items	Priority	Responsible Party(ies)	Status	Target Date
Seattle Iron & Metals Corporation					
<p>Potential historical source: Past operations at the facility have resulted in soil and groundwater contamination. Due to residual concentrations of copper and petroleum hydrocarbons in soil and groundwater, a restrictive covenant was placed on the property.</p> <p>PCBs above the SQS are present in sediments adjacent to the facility; in addition, metals, PAHs, furans, and tributyltin have been detected in sediment samples.</p>	Review responses to EPA's Request for Information 104(e) letters sent to Seattle Iron & Metals, Manson Construction Company, Othello Street Warehouse Corporation, and The Maust Corporation.	High	Ecology	Planned	September 2009
	Locate and review Hart Crowser's 1998 <i>Voluntary Cleanup Action Report, 606 South Myrtle Street, Seattle, Washington</i> to evaluate the extent of soil and groundwater sampling that has been conducted at this property, identify whether sediment COCs were detected in soil or groundwater samples, and evaluate the potential pathways for sediment recontamination.	Medium	Ecology	Planned	August 2009
	Obtain records from the soil removal and remediation performed by U.S. SeaCon and determine if the action was the Independent Remedial Action that was performed prior to 1998 or an additional remedial action performed at the property. Determine if additional sampling is needed to characterize site for sediment COCs.	Medium	Ecology	Planned	September 2009
<p>Potential ongoing source: Seattle Iron and Metals discharges stormwater to the LDW under an individual NPDES permit. A Notice of Violation was issued by Ecology in August 2008 for stormwater effluent violations (TPH, zinc, lead, copper, and turbidity) and for unauthorized discharge of turbid wastewater to the LDW. An Administrative Order was issued in November 2008 requiring the facility to take corrective actions to prevent future violations.</p>	Monitor compliance with Ecology Follow-Up Order No. 6185.	High	Ecology	In Progress	October 2009
	Investigate means to determine if ASR is reaching the LDW directly or via the Seattle Iron & Metals or Seattle Boiler Works storm drain systems.	Medium	Ecology	Planned	December 2009
	Obtain information documenting the status of the furnace to determine if it was relocated from the Harbor Island facility to Seattle Iron & Metals' current facility. Current furnace operations, if any, will be identified.	Medium	Ecology/PSCAA	Planned	July 2009
	Request information from the facility operator regarding the source of discharge, if any, to Outfall 2034, observed along the Seattle Iron & Metals shoreline during SPU's outfall survey.	High	Ecology	Planned	July 2009
Puget Sound Truck Lines					
<p>Potential historical source: Past facility operations resulted in soil contamination. Soil cleanup activities were completed in 1995; however, data indicating the type and concentrations of contaminants in soil were not available for review.</p>	Review responses to EPA's Request for Information 104(e) letters sent to Puget Sound Truck Lines and R&A Properties LLC.	High	Ecology	Planned	August 2009
	Review records of soil cleanup activities completed in 1995 to verify that groundwater discharge from this property is not a potential sediment recontamination source.	Medium	Ecology	Planned	October 2009
<p>Potential ongoing source: Puget Sound Truck Lines discharges stormwater to the LDW under an Industrial Stormwater General Permit. A facility inspection in</p>	Perform a follow-up stormwater compliance inspection to determine whether catch basins are cleaned regularly and if housekeeping has improved. Obtain a facility plan that shows the locations of all catch basins and storm drain lines at the facility.	Medium	Ecology	Planned	July 2009

Potential Sources	Action Items	Priority	Responsible Party(ies)	Status	Target Date
2005 noted that the facility was not in compliance with discharge monitoring and sampling requirements and that the onsite catch basins needed to be cleaned, along with other housekeeping deficiencies.	Determine whether the five outfalls identified at the property are active, and identify the source of discharge from these outfalls, if any.	High	Ecology, Property owner/operator	Planned	October 2009.
Seattle City Light					
Potential ongoing source: A 2006 property plan indicates that a drainage ditch or pipe runs from the northeast corner of the property at 8 th Avenue S to approximately the northwest shoreline of the property.	Determine if the drainage ditch/pipe is active and if it discharges to the LDW. If active, determine the area drained by the drainage ditch/pipe and determine the potential for sediment COCs to reach the LDW.	High	Ecology, SPU	Planned	July 2009
	Obtain and review information about any groundwater sampling that has been conducted at this property. Based on this review, evaluate the need for further source control actions.	Medium	Ecology	Planned	December 2009
Crowley Marine Services					
Potential historical source: Soil and groundwater contamination is present at the property above soil-to-sediment and groundwater-to-sediment screening levels. Copper has been detected above the chronic marine water quality standard (WQS) in a seep sample collected adjacent to the property.	In conjunction with an Agreed Order for the Crowley Marine Services site, perform additional investigations that include collection of data on chemical concentrations in soil and groundwater at the western and southern portions of the property.	High	Crowley Marine Services	Planned	TBD
	Review information submitted to EPA in response to the Request for Information 104(e) letters sent to Crowley Marine Services, Samson Tug and Barge Company, Northland Services, and Evergreen Marine Leasing.	High	Ecology	Planned	August 2009
Potential ongoing source: Two storm drain lines and outfalls located on the west side of the property discharge to the LDW. Stormwater, spills, and releases may reach the LDW via these storm drain lines and outfalls.	Conduct facility inspections for current tenants at the Crowley Marine Services property to determine if operations could be a source of LDW sediment recontamination.	Medium	Ecology, SPU	Planned	July 2009
	Require the owner and/or tenants to obtain an NPDES permit if facility inspections conclude that business operations require a stormwater discharge permit.	Medium	Ecology	Planned	August 2009
Activities at the Crowley Marine Services property include loading and unloading of cargo containers and liquid fuels. Accidental releases during loading or unloading operations may occur.	Collect stormwater and/or solids samples from storm drain system to determine if onsite system is source of COCs found in waterway sediment.	High	Ecology	Planned	August 2009
	Review the Environmental Investigation Report, Crowley Marine Services Site, dated August 1, 2008 (prepared by SLR International Corp) and identify remaining data gaps and source control actions for the property.	High	Ecology	In Progress	TBD

Potential Sources	Action Items	Priority	Responsible Party(ies)	Status	Target Date
Fox Avenue Building and Fox Avenue Building #2/Former Great Western Chemical Company					
Potential historical source: Soil and groundwater contamination has been documented at the property. Groundwater flows towards the S Myrtle Street Embayment and the LDW. Previous environmental investigations document that the contaminant plume extends to the S Myrtle Street Embayment. An RI/FS is in progress at the property, under Agreed Order with Ecology, to investigate and remediate soil and groundwater contamination.	Monitor the progress of the RI/FS to investigate and remediate soil and groundwater contamination beneath the property.	Medium	Ecology	Ongoing	TBD
	Review responses to EPA's Request for Information 104(e) letter sent to Great Western Chemical Company, including evaluation of the presence and/or potential for generation of dioxin associated with former activities at the property.	High	Ecology	Planned	August 2009
Whitehead Company, Inc./Former Tyee Industries					
Potential historical source: Soil and groundwater contamination has been documented at the property. Groundwater flows toward the S Myrtle Street Embayment and the LDW. Previous environmental investigations document that the contaminant plume extends to the S Myrtle Street Embayment.	Require the property owner/operator to address the pentachlorophenol contamination in groundwater discovered by Cascade Columbia Distributions' consultant.	Medium	Ecology	Planned	December 2009
Potential ongoing source: The property is currently used for parking by Seattle Iron & Metals. It is not known if any additional activities or operations are performed at the property.	Perform a business inspection to identify current operations at this property, and to evaluate whether operations could be an ongoing source of contaminants to LDW sediments.	Medium	Ecology, SPU	Planned	December 2009
Whitehead Company, Inc./Former Perkins Lot					
Potential ongoing source: Stormwater from a portion of this property discharges to the LDW via the S Myrtle Street outfall.	Conduct facility inspection to determine if activities conducted by businesses at this location require an NPDES permit, and to ensure compliance with regulations and stormwater best management practices (BMPs).	Medium	Ecology, KCIW	In Progress	July 2009
	Assist Svendsen Brothers with obtaining coverage under the Industrial Stormwater General Permit and King County Industrial Waste (KCIW) discharge authorization or permit.	Medium	Ecology, KCIW	In progress	July 2009

Potential Sources	Action Items	Priority	Responsible Party(ies)	Status	Target Date
	Perform a follow-up inspection at Taxi King to ensure that corrective actions identified in July 2008 have been implemented.	Medium	Ecology, SPU	Planned	December 2009
Potential historical and ongoing source: Little information regarding operations at the property was available. Operations by at least one previous tenant (Perkins) resulted in soil contamination beneath the property.	Obtain a list of previous tenants from the property owner to evaluate historical operations and to determine if these operations could have resulted in soil or groundwater contamination.	Medium	Ecology, Property owner/operator	Planned	December 2009
Former Trim Systems					
Potential ongoing source: Stormwater from this property may discharge to the LDW. Spills and releases that occur in the uncovered areas of the property may be conveyed to the LDW via storm drains. The Shalmar Group purchased this property in March 2008 and it is currently used by Seattle Iron & Metals.	Inspect site to ensure that operations at the facility are in compliance with applicable regulations and BMPs to prevent the release of contaminants to the LDW. Obtain a facility plan showing the locations of all catch basins and storm drains (if any).	Medium	Ecology, SPU	Planned	December 2009
	Review responses to EPA's Request for Information 104(e) letters sent to Seattle Iron & Metals, Manson Construction, and Northwest Container Services.	High	Ecology	Planned	December 2009
Nitze-Stagen/Frye Parcels					
Potential ongoing source: Stormwater from these parcels may discharge to the LDW.	Inspect site to ensure that operations at Pioneer Distribution are in compliance with applicable regulations and BMPs to prevent the release of contaminants to the LDW. Obtain facility plans showing the locations of all catch basins and storm drain lines (if any). Require property owner to obtain NPDES permit, as necessary.	Medium	Ecology, SPU	Planned	December 2009
	Review responses to EPA's Request for Information 104(e) letters sent to Nitze-Stagen and Pioneer Human Services.	High	Ecology	Planned	December 2009
Former Sternoff Parcel					
Potential historical source: Soil, groundwater, and catch basin solids samples collected from the facility are contaminated with PCBs, PAHs, metals, and total petroleum hydrocarbons (TPH) at concentrations above soil-to-sediment and groundwater-to-sediment screening levels. Groundwater beneath the property flows towards the LDW.	Evaluate the need for additional soil and groundwater samples and analyze them for sediment COCs to determine the potential for sediment recontamination via the groundwater discharge pathway.	Medium	Ecology	Planned	December 2009
	Locate documentation verifying that a PCB-contaminated "trash pile" and approximately 52,187 pounds of contaminated soil have been removed from the property.	Medium	Ecology	Planned	December 2009
	Determine the disposition of petroleum contaminated soil stockpiled at the property by Remedco and provide the documentation to Ecology.	Low	Ecology	Planned	December 2009

Potential Sources	Action Items	Priority	Responsible Party(ies)	Status	Target Date
Potential ongoing source: The property is currently occupied by CDL Recycle. Little information about operations at this facility was available.	Inspect facility to confirm that stormwater does not drain to the RM 2.3–2.8 East source control area and ensure that operations are in compliance with applicable regulations and BMPs.	Medium	Ecology, SPU	Planned	August 2009

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

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Acronyms/Abbreviations

ASR	auto shredder residue
AST	aboveground storage tank
BBP	butyl benzyl phthalate
BEHP	bis(2-ethylhexyl)phthalate
bgs	below ground surface
BMP	best management practice
BTEX	benzene, ethylbenzene, toluene, and xylenes
CDL	construction, demolition, and land-clearing debris
COC	chemical of concern
cPAH	carcinogenic polycyclic aromatic hydrocarbon
CSCSL	Confirmed and Suspected Contaminated Sites List
CSL	Cleanup Screening Level
CSO	combined sewer overflow
DAF	dissolved air flotation
DCA	dichloroethane
dCAP	draft Cleanup Action Plan
DCB	dichlorobenzene
DCE	dichloroethene
EAA	Early Action Area
Ecology	Washington State Department of Ecology
EOF	emergency overflow
EPA	United States Environmental Protection Agency
EPS	expanded pilot study
ERD	Enhanced Reductive Dechlorination
ERM	Environmental Resources Management
FS	Feasibility Study
GIS	Geographic Information Systems
GWCC	Great Western Chemical Company
HPAH	high molecular weight PAH
HWTR	Hazardous Waste and Toxic Reduction
ISIS	Integrated Site Information System
ISO	International Standards Organization
KCIW	King County Industrial Waste
LDW	Lower Duwamish Waterway
LDWG	Lower Duwamish Waterway Group
LPAH	low molecular weight PAH
LPG	Liquefied Petroleum Gas
LUST	leaking underground storage tank
MEK	2-butanone or methyl ethyl ketone
MTCA	Washington State Model Toxics Control Act
NOAA	National Oceanic and Atmospheric Administration
NOV	Notice of Violation
NPDES	National Pollutant Discharge Elimination System
OC	organic carbon
PAH	polycyclic aromatic hydrocarbon

Acronyms/Abbreviations (Cont'd)

PCB	polychlorinated biphenyl
PCE	tetrachloroethene
PLP	Potentially Liable Person
PSCAA	Puget Sound Clean Air Agency
PSTL	Puget Sound Truck Lines
PVC	polyvinyl chloride
RCRA	Resource Conservation and Recovery Act
REC	Recognized Environmental Condition
RI	Remedial Investigation
RM	River Mile
ROD	Record of Decision
SAIC	Science Applications International Corporation
SBW	Seattle Boiler Works
SCAP	Source Control Action Plan
SCWG	Source Control Work Group
SD	storm drain
SHA	Site Hazard Assessment
SIC	standard industrial classification
SKCDPH	Seattle/King County Department of Public Health
SMC	Seattle Municipal Code
SMS	Sediment Management Standards
SPU	Seattle Public Utilities
sq ft	square feet
SQS	Sediment Quality Standards
SVE	soil vapor extraction
SVOC	semivolatile organic compound
TBD	to be determined
TCA	trichloroethane
TCE	trichloroethylene
TMB	trimethylbenzene
TPH	total petroleum hydrocarbons
TSS	total suspended solids
UPRR	Union Pacific Railroad
USEPA	U.S. Environmental Protection Agency
UST	underground storage tank
UWI	Urban Waters Initiative
VCP	Voluntary Cleanup Program
VOC	volatile organic compound
WAC	Washington Administrative Code
WQS	Water Quality Standards
WWTP	Wastewater Treatment Plant

1.0 Introduction

The Lower Duwamish Waterway (LDW), located in Seattle, Washington, was added to the National Priorities List (Superfund) by the United States Environmental Protection Agency (USEPA or EPA) on September 13, 2001. This Source Control Action Plan (SCAP) describes potential sources of contamination that may affect sediments in and adjacent to the River Mile (RM) 2.3–2.8 East Source Control Area (Seattle Boiler Works to Slip 4) of the LDW.¹

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 sediments associated with the RM 2.3–2.8 East 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:

- *Lower Duwamish Waterway, RM 2.3–2.8 East (Seattle Boiler Works to Slip 4) Summary of Existing Information and Identification of Data Gaps*, Science Applications International Corporation (SAIC), May 2008, located on the Washington State Department of Ecology's (Ecology) website:
http://www.ecy.wa.gov/programs/tcp/sites/lower_duwamish/sites/slip4_RM%202-3_2-8/dataGapsReport/data_gaps_report.htm
- *Lower Duwamish Waterway Source Control Strategy*, Washington State Department of Ecology, January 2004, located on Ecology's website:
<http://www.ecy.wa.gov/pubs/0409043.pdf>

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 RM 2.3–2.8 East source control area, including a description of the chemicals of concern (COCs) for sediments. Section 3 provides an overview of potential sources of contaminants that may affect sediments associated with the RM 2.3–2.8 East source control area, including outfalls, spills, properties adjacent to the LDW, and upland properties. Section 3 also describes actions planned or currently underway to control potential sources of contaminants, while Sections 4 and 5 describe monitoring and tracking/reporting activities, respectively. References are listed in Section 6, and Tables and Figures are presented at the end of the document.

¹ This SCAP incorporates data published through April 30, 2009. Section 5, Tracking and Reporting of Source Control Activities, describes how newer data will be disseminated.

As new information about the sites and potential sources discussed in this document becomes available and as source control progress is made, Ecology will update the information in this SCAP by publishing Technical Memoranda or by including updates in the LDW Source Control Status Reports, as appropriate. The current status of source control actions is summarized in the LDW Source Control Status Reports (Ecology 2007c, 2008c, 2008g, 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 Turning Basin 3 (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 airplane parts 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 House Park/Terminal 107, Turning Basin 3, Hamm Creek, and Terminal 105.

The presence of chemical contamination in the LDW has been recognized since the 1970s (Windward 2003a). In 1988, EPA 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 combined sewer overflow (Weston 1999). This study confirmed the presence of PCBs, PAHs, phthalates, mercury, and other metals. These contaminants may 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 a feasibility study (FS) of the LDW to assess potential risks to human health and the environment and to evaluate cleanup alternatives. The RI for the site is being done in two phases. Results of Phase 1 were published in July 2003 (Windward 2003a). The Phase 1 RI used existing data to provide an understanding of the nature and extent of chemical distributions in LDW sediments, develop preliminary risk estimates, and identify candidates for early cleanup action. The Phase 2 RI is currently underway and is designed to fill critical data gaps identified in Phase 1. Based on the results of the Phase 2 RI, additional areas for cleanup may be identified. During Phase 2, an FS is being conducted that will address cleanup options for contaminated sediments in the LDW.

On September 13, 2001, EPA added the LDW to the 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 (USEPA and Ecology 2002, 2004). EPA is the lead for the RI/FS, while Ecology is the lead for source control issues.

In June 2003, the *Technical Memorandum: Data Analysis and Candidate Site Identification* (Windward 2003b) was issued. Seven candidate sites for early action (Early Action Areas [EAAs]) were recommended (Figure 1). The sites are:

- Area 1: Duwamish/Diagonal combined sewer overflow (CSO) and storm drain (SD)
- Area 2: West side of the waterway, just south of the First Avenue S Bridge, approximately 2.2 miles from the south end of Harbor Island
- Area 3: Slip 4, approximately 2.8 miles from the south end of Harbor Island
- Area 4: South of Slip 4, on the east side of the waterway, just offshore of the Boeing Plant 2 and Jorgensen Forge properties, approximately 2.9 to 3.7 miles from the south end of Harbor Island
- Area 5: Terminal 117 and adjacent properties, approximately 3.6 miles from the south end of Harbor Island, on the west side of the waterway
- Area 6: East side of the waterway, approximately 3.8 miles from the south end of Harbor Island
- Area 7: Norfolk CSO/SD, on the east side of the waterway, approximately 4.9 to 5.5 miles from the south end of Harbor Island.

Of the seven recommended 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 (EAA-3), Terminal 117 (EAA-5), Boeing Plant 2 (EAA-4), Duwamish/Diagonal CSO/SD (EAA-1), and Norfolk CSO/SD (EAA-7). EPA is the lead 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 EPA Resource Conservation and Recovery Act (RCRA) management, is currently in the planning stage. The Duwamish/Diagonal and Norfolk CSO/SD cleanups are under King County management as part of the Elliott Bay-Duwamish Restoration Program. Cleanup at Duwamish/Diagonal CSO/SD was partially completed in March 2004; a partial sediment cleanup was conducted at Norfolk CSO/SD in 1999. 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 Phase 2 RI/FS.

In 2007, Ecology, in consultation with EPA, identified eight other 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. The RM 2.3–2.8 East source control area is one of these eight source control areas. In February 2008, Ecology identified the subdrainage basins for the areas of the LDW that were not already included in a SCAP or planned SCAP. Using the same criteria as in 2007, eight additional potential source control areas were added to the list (Ecology 2008c). The seven EAAs and 16 additional source control areas are shown in Figure 1.

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/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 Sediment Management Standards (SMS).²

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 EAAs. Each SCAP will document what is known about the area, the potential sources of recontamination, 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 site will vary, it will be necessary to adapt each plan to the specific situation at that site.

Existing administrative and legal authorities will be used to perform inspections and require necessary source control actions. 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 EAA sediment cleanups. Tier 2 consists of source control actions associated with cleanup areas identified in Phase 2 of the RI/FS and EPA's ROD. Tier 3 consists of source control necessary to prevent 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 2008c). This document is a SCAP for a Tier 2 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/lower_duwamish/lower_duwamish_hp.html.

² Washington Administrative Code (WAC) 173-204

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, Port of Seattle, city of Tukwila, and EPA. The city of Seattle, King County, and EPA were directly involved in the development of source control activities for this SCAP.

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 (USEPA 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 RM 2.3–2.8 East (Seattle Boiler Works to Slip 4)

RM 2.3–2.8 East (Seattle Boiler Works to Slip 4) source control area is located along the eastern side of the LDW Superfund Site as measured from the southern tip of Harbor Island (Figure 1). Sediments associated with the RM 2.3–2.8 East source control area have accumulated chemical contaminants from several sources, both historical and potentially ongoing. These chemicals may have entered the LDW through direct discharges, spills, bank erosion, groundwater discharges, surface water runoff, atmospheric deposition, or other non-point source discharges.

The RM 2.3–2.8 East source control area is located adjacent to a former tidal marsh that was reclaimed when the Duwamish River was straightened and channelized to form the current LDW in the late 1800s and early 1900s. Available information indicates that a meander of the Duwamish River once flowed in an east-to-west direction south of the Crowley Marine Services property (Windward 2007c). Extensive dredge and fill efforts in the early 1900s straightened the LDW channel in its present position between RM 2.3 and 2.8. A portion of the historical meander formed the present day Slip 4 as shown in Figure 1.

The RM 2.3–2.8 East source control area includes several properties that are located directly adjacent to the LDW: Seattle Boiler Works, Inc., Seattle Iron & Metals Corporation, Puget Sound Truck Lines/Phil's Finishing Touch, Seattle City Light's Georgetown Pump Station, and Crowley Marine Services (Figure 2).

The Guimont parcel is located immediately to the north of the RM 2.3–2.8 East source control area, at approximately RM 2.2 (Figure 2). The property was included in the RM 2.3–2.8 East Data Gaps Report (SAIC 2008), and was not discussed in a SCAP for any other source control area; therefore, the Guimont parcel has been included in this SCAP.

These properties are bounded by Glacier Marine Services to the north, several upland properties to the east, Slip 4 to the south, and the LDW to the west.

Upland properties in the RM 2.3–2.8 East source control area include the Fox Avenue Building/Fox Avenue Building #2 (former Great Western Chemical Company [GWCC]), Whitehead Company/Former Tye Industries, the Whitehead Company/Former Perkins Lot, Former Trim Systems, the Nitze-Stagen/Frye parcels, Nelson Trucking, the Former Sternoff Parcel, Markey Machinery Company, and El Gallo D'Oro/James Dore property. These properties are located between East Marginal Way S and the properties adjacent to the LDW identified above.

Groundwater flow in the northern portion of the RM 2.3–2.8 East source control area is generally toward the LDW and the S Myrtle Street Embayment (Figure 3). Two water-bearing zones have been identified in the vicinity of the RM 2.3–2.8 East source control area. Groundwater in the shallow, first water-bearing zone is encountered between 7 and 13 feet below ground surface (bgs). In the deeper, second water-bearing zone, groundwater is encountered between 15 and 45 feet bgs. Groundwater flow at the Crowley Marine Services property is mainly toward Slip 4; however, groundwater in the southwest corner of the property appears to flow directly toward the LDW (Figure 3).

2.1 Chemicals of Concern in the RM 2.3–2.8 East Source Control Area

Several environmental investigations have included the collection of sediment data near the RM 2.3–2.8 East source control area, including a National Oceanic and Atmospheric Administration (NOAA) sediment characterization of the Duwamish River (NOAA 1998), an EPA Site Inspection (Weston 1999), and the LDW Phase 2 RI (Windward 2005a, 2005b, 2007a, 2007b, 2007c).

Sediment data are listed in *Summary of Existing Information and Identification of Data Gaps* for RM 2.3–2.8 East (SAIC 2008), referred to in this document as the RM 2.3–2.8 East Data Gaps Report. Chemical data were compared to the Washington State 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. Chemicals detected in sediment for which no SQS/CSL values are available may be identified as COCs on a case-by-case basis.

Concentrations of contaminants in soil and groundwater were compared to regulatory criteria and/or soil-to-sediment or groundwater-to-sediment screening levels (SAIC 2006a). These screening levels were initially developed to assist in the identification of upland properties that may pose a risk for recontamination of sediments at Slip 4. The screening levels incorporate a number of conservative assumptions, including the absence of contaminant dilution and ample time for contaminant concentrations in soil, sediment, and groundwater to achieve equilibrium. In addition, the screening levels do not address issues of contaminant mass flux from upland 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.

Storm drain sediment data were compared to the SMS to provide a rough indication of overall quality. It should be emphasized that the SQS and CSL values do not directly apply to data from in-line storm drain solids. It is important to note that any comparison of this kind is most likely conservative given that solids discharged from storm drains are highly dispersed in the receiving environment and are mixed with the natural sedimentation taking place in the system.

Although not explicitly addressed in the SMS, volatile organic compounds (VOCs) in pore water may cause adverse effects on benthic invertebrates and other aquatic biota, and are therefore considered additional COCs for source control efforts in the LDW.

As described in the RM 2.3–2.8 East Data Gaps Report, surveys conducted during 1998 and 1999 included collection of surface sediment samples at 34 locations in this area. More recently, sediment sampling conducted as part of the Phase 2 RI included nine surface sediment samples collected during three rounds of surface sediment sampling in 2005/2006 and 24 samples collected from five coring locations in 2006. Sediment sampling locations are shown in Figure 4.

Chemicals that exceeded the SQS in at least one surface or subsurface sediment sample near the RM 2.3–2.8 East source control area are listed below.

Chemical	Above SQS in Surface Sediment	Above SQS in Subsurface Sediment
Metals		
Mercury	●	
PAHs		
Acenaphthene	●	
Benzo(a)anthracene	●	
Chrysene	●	
Fluoranthene	●	
Fluorene	●	
Indeno(1,2,3-cd)pyrene	●	
Phenanthrene	●	
Total HPAH	●	
Total LPAH	●	
Dibenzofuran	●	
PCBs		
PCBs (total)	●	●

Mercury, fluorene, phenanthrene, and PCBs exceeded both the SQS and CSL. In general, COCs were present in sediment samples at concentrations only slightly above the SQS or CSL values (Figure 4); the greatest exceedances were observed for PCBs at locations LDW-SS89 (near Puget Sound Truck Lines), LDW-SS92 (near the Seattle City Light parcel), and DR113 (near the Guimont parcel), and for PAHs at location DR175 (near the Crowley Marine Services property).

Although no sediment quality standards have been promulgated, dioxins and furans are of concern because they were detected in sediments associated with the RM 2.3–2.8 East source control area at relatively high concentrations, particularly within the S Myrtle Street Embayment. In addition, organo-tin compounds were detected at various locations, particularly offshore of Seattle Boiler Works, Seattle Iron & Metals, and Puget Sound Truck Lines.

In groundwater, 33 VOCs and semivolatile organic compounds (SVOCs) have been detected at concentrations exceeding Washington State Model Toxics Control Act (MTCA) cleanup levels within the RM 2.3–2.8 East source control area. Sixteen VOCs/SVOCs have been

detected in seep samples collected in the S Myrtle Street Embayment and 14 VOCs/SVOCs have been detected in sediment samples collected from the S Myrtle Street Embayment. These VOCs/SVOCs are considered potential COCs for the RM 2.3–2.8 East source control area.

Based on the results of sediment sampling conducted near the RM 2.3–2.8 East source control area, the following chemicals are considered to be COCs with regard to potential sediment recontamination:

- Mercury,
- PCBs,
- PAHs and other SVOCs,
- Dioxins/furans,
- Organo-tin compounds, and
- VOCs, including chlorinated solvents.

2.2 Potential Pathways to Sediment

Transport pathways that could contribute to the recontamination of sediments near the RM 2.3–2.8 East source control area following remedial activities include direct discharges via outfalls, surface runoff (sheet flow) from adjacent properties, groundwater discharges, spills directly to the LDW, bank erosion, and air deposition. These pathways are described below, and are discussed in more specific detail in Section 3.

2.2.1 Direct Discharges via Outfalls

Direct discharges to the LDW may occur from public and private storm drain systems, CSOs, and emergency overflows (EOFs). No CSOs or EOFs discharge to the LDW along the RM 2.3–2.8 East shoreline.

Public and Private Storm Drains

The LDW area is served by a combination of separated storm drain and sanitary sewer, 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 are served by privately owned systems that discharge directly to the waterway. The upland areas are served by a combination of privately and publicly owned systems.

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 stormwater permits), vehicle washing, runoff from landscaped areas, erosion of contaminated soil, groundwater infiltration, and materials illegally dumped into the system.

The sanitary sewer system collects municipal and industrial wastewater from throughout the LDW area and conveys it to King County's West Point wastewater treatment plant (WWTP), where it is treated before being discharged to Puget Sound. The smaller trunk sewer lines, which collect wastewater from individual properties, are owned and operated by the individual municipalities (e.g., cities of Seattle and Tukwila) and local sewer districts. The large interceptor system that collects wastewater from the trunk lines is owned and operated by King County. A King County interceptor extends along the east side of East Marginal Way S (Figure 5).

Sixteen outfalls are present along the LDW shoreline at RM 2.3–2.8 East, including two publicly owned outfalls and 14 private outfalls. City of Seattle storm drain outfalls are located at the ends of S Myrtle Street and S Garden Street. Private outfalls exist at Seattle Boiler Works (six outfalls), Seattle Iron & Metals (one outfall), Puget Sound Truck Lines (five outfalls), and Crowley Marine Services (two outfalls). Contaminants discharged via these outfalls could directly affect sediments.

NPDES Permits

Based on a comprehensive survey of outfall or outfall-like structures terminating in the LDW, conducted in 2003 by Seattle Public Utilities (SPU), along with information from the Phase 1 RI, and updated information from Ecology, EPA, the city of Seattle, the city of Tukwila, the Port of Seattle, King County, and Boeing, approximately 250 outfalls were identified within the LDW study area (Windward 2007c). Many of these discharges are permitted under the NPDES. There are four types of NPDES permits that cover discharges to the LDW within the RM 2.3–2.8 East source control area, as described below.

Phase I Municipal Stormwater Permit

Stormwater runoff into Municipal separated storm drains that discharge to surface waters is required to have a NPDES permit under the federal Clean Water Act. Phase I of the municipal stormwater program went into effect in 1990 and applies to municipalities with populations of more than 100,000, including the city of Seattle and King County.

The original Phase I permit was issued in 1995; it was reissued on January 17, 2007. The new permit represents a significant shift in approach to stormwater monitoring. Stormwater sampling is required during both wet and dry seasons. Each municipality is required to monitor stormwater at up to three sites at locations representing different land use conditions (i.e., low and high density residential, commercial, industrial) in their respective drainage systems. Samples are required to be analyzed for a number of pollutants including many of the sediment COCs identified in the LDW, and also include toxicity testing. The new Phase 1 permit also requires that permittees collect an inline sediment sample at each monitoring location once each year during the monitoring program.

Contaminants to be monitored include the State's SMS list, as well as toxicity testing for whole water effluent and receiving sediments. The permit requires all permittees to monitor one stormwater drainage/outfall representing one of each type of land use: residential, commercial, industrial. Complete monitoring requirements are in Special Condition S.8 of the permit, which is available online at:

<http://www.ecy.wa.gov/programs/wq/stormwater/municipal/phaseIpermit/phipermit.html>.

In addition to the expanded monitoring described above, the Phase I permit also contains more traditional requirements such as system maintenance, business inspections, education/outreach, best management practices (BMPs), and the development of municipal stormwater regulations/code.

Before the Phase I municipal stormwater permit was reissued and as the Superfund sediment RI process was beginning, the city of Seattle and King County formed a joint program to conduct source control inspection throughout the 20,000 acres of the LDW drainage basin. The City's source control authorities come from the City Stormwater, Grading, and Drainage Control Code (Seattle Municipal Code [SMC] 22.800), which was established in part to meet the requirements of its NPDES municipal stormwater permit. King County's source control authorities associated with the joint program stem from its authorized pretreatment program and attendant industrial and hazardous waste management programs. For King County storm drain outfalls in unincorporated King County, source control authority derives from the King County Water Quality Code (Chapter 9.12 KCC).

The joint LDW city-county source control program initiated in 2003 is an aggressive effort to reduce the amount of pollution entering public storm drains and sanitary/combined sewer systems that discharge to the LDW. LDW source control activities generally go beyond what is required under the NPDES program. In particular, the level of source tracing and characterization being conducted through the joint program far exceeds what is required by NPDES. Since 2005, SPU has taken over the lead for business inspections. King County Industrial Waste (KCIW) continues to conduct inspections and provide technical assistance to SPU inspectors as needed. KCIW is no longer involved in the large geographic sweeps that SPU conducts for source control.

There are two direct discharges to the LDW that are regulated under this NPDES permit – these are the city outfalls for the S Myrtle Street and S Garden Street storm drain subbasins.

Industrial Stormwater General Permit

This permit covers 103 industries within the natural drainage basin of the LDW. Coverage under the Industrial Stormwater General Permit requires a facility to monitor its stormwater discharge for copper, zinc, oils, and total suspended solids. The permit covers Seattle Boiler Works (SO3-002208), Puget Sound Truck Lines (SO3-000949), and Alaska Logistics, LLC, (SO-3-009728A), a Crowley property tenant, within the RM 2.3–2.8 East source control area. Bunge Foods Corporation, a former tenant on the Guimont parcel, was previously covered under this permit (SO3-000098). Northland Services, Inc., a former tenant at the Crowley Marine Services property, was also covered under this permit (SO3-003646).

Construction Stormwater General Permit

This permit covers operators of construction activities, including clearing, grading, or excavation that results in the disturbance of one or more acres and discharges stormwater to surface waters and facilities that provide construction support activities, such as equipment staging areas and materials storage areas, to a single NPDES-permitted construction site. The Construction Stormwater General Permit generally requires a facility to monitor for pH, turbidity, total suspended solids, and oils. Crowley Marine Services was previously covered under this permit (WAR009728) during a construction project.

Individual Permit

Individual permits are issued to some businesses in the LDW drainage basin. While the permits limit and control the discharge of a number of pollutants, they do not necessarily control contaminants that pose a threat to the sediments, such as PCBs, phthalates, arsenic, mercury, and PAHs. An industrial individual permit is written for a specific activity or facility to regulate discharges at a specific location. Seattle Iron & Metals (WA0031968A) is the only individually permitted facility located in the RM 2.3–2.8 East source control area.

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. The Seattle Boiler Works, Seattle Iron & Metals, Puget Sound Truck Lines, and Crowley Marine Services properties are served by stormwater drainage systems. It is not clear whether the Guimont parcel is also served by a stormwater drainage system (Figure 5). The Seattle City Light property is not served by a stormwater drainage system and the parcel is covered with grass (i.e., not an impervious surface).

2.2.3 Groundwater Discharges

Contaminants in soil resulting from spills and releases to adjacent (and possibly upland) properties may be transported to groundwater and subsequently be released to the LDW. Seeps have been sampled along the LDW shoreline within the S Myrtle Street Embayment and near the southern Crowley Marine Services property boundary. Concentrations of VOCs and SVOCs below the groundwater-to-sediment screening levels were detected in samples collected from seeps in the S Myrtle Street Embayment (Figure 6). Copper was detected at a concentration above the marine chronic water quality standard (WQS) in a seep water sample collected adjacent to Crowley Marine Services (Figure 4) (Windward 2004). Groundwater discharges represent a potential pathway for transport of contaminants to the LDW.

2.2.4 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. None of the properties within the RM 2.3–2.8 East source control area are currently regulated as a point source of air emissions. Additional information on recent and ongoing atmospheric deposition studies in the LDW is summarized in the LDW Source Control Status Reports (Ecology 2007c, 2008c, 2008g, and subsequent updates); Ecology will continue to monitor these efforts.

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. Over-water activities are currently conducted at Seattle Iron & Metals; near-water spills at the facility would be contained within the stormwater treatment system. Near-water spills at Seattle Boiler Works, Puget Sound Truck Lines, and Crowley Marine Services would most likely enter the onsite storm drain systems at these properties instead of flowing directly to the LDW. It is not clear if there is a storm drain system at the Guimont parcel.

2.2.6 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 RM 2.3–2.8 East source control area could be released directly to sediments via erosion.

3.0 Potential Sources of Sediment Recontamination

Potential sources of sediment recontamination are described in detail in the RM 2.3–2.8 East Data Gaps Report (SAIC 2008). Relevant information obtained after completion of the Data Gaps Report is presented in this SCAP. This section summarizes the information on public and private outfalls (Section 3.1), adjacent properties (Sections 3.2 to 3.7), and upland properties (Sections 3.8 to 3.13). Adjacent and upland properties are shown in Figure 2.

Six properties located in the RM 2.3–2.8 East source control area adjacent to the LDW were identified as potential sources of contaminants to waterway sediments:

- Guimont Parcel (Section 3.2),
- Seattle Boiler Works (Section 3.3),
- Seattle Iron & Metals (Section 3.4),
- Puget Sound Truck Lines/Phil’s Finishing Touch (Section 3.5),
- Seattle City Light – Georgetown Pump Station (Section 3.6), and
- Crowley Marine Services (Section 3.7).

These adjacent properties may contribute contaminants to the LDW through stormwater discharge, discharge of contaminated groundwater, bank erosion/leaching, and surface runoff/spills.

Upland properties may also be a source of contaminants to sediments near the RM 2.3–2.8 East source control area. Facilities located on upland properties that were identified as potential sources of contaminants to sediments associated with the RM 2.3–2.8 East source control area in the Data Gaps Report (SAIC 2008) are discussed in Sections 3.8 through 3.13. Potential contaminant transport pathways include stormwater drainage, infiltration of contaminated groundwater into a stormwater system that discharges to the LDW, or transport of contaminated groundwater to the LDW.

The following upland properties are located within the RM 2.3–2.8 East source control area:

- Fox Avenue Building/Fox Avenue Building #2 (Section 3.8),
- Whitehead Company/Former Tyee Industries (Section 3.9),
- Whitehead Company/Former Perkins Lot (Section 3.10),
- Former Trim Systems (Section 3.11),
- Nitze-Stagen/Frye Parcels (Section 3.12), and
- Former Sternoff Parcel (Section 3.13).

The following upland properties are situated within the RM 2.3–2.8 East source control area; however, no potential sources of contaminants to sediments from these properties were identified in the Data Gaps Report:

- Nelson Trucking,
- Markey Machinery Company, and
- El Gallo D’Oro/James Dore.

These properties are not discussed further in this SCAP.

3.1 Outfalls

Sixteen outfalls are present along the shoreline within the RM 2.3–2.8 East source control area, including two publicly owned outfalls and 14 private outfalls (Figure 5). City-owned storm drain outfalls are located at the ends of S Myrtle Street and S Garden Street. Private outfalls exist at Seattle Boiler Works (six outfalls), Seattle Iron & Metals (one outfall), Puget Sound Truck Lines (five outfalls), and Crowley Marine Services (two outfalls).

3.1.1 Public Storm Drains

City storm drain outfalls are located at the ends of S Myrtle Street and S Garden Street.

Outfall No.	Secondary ID	Location	Pipe Diameter/Material
2026	141E	S Myrtle Street	30-inch ductile iron
2035	153E	S Garden Street	30-inch; reinforced concrete

Source: Windward 2007c and Schmoyer 2008b

Solids samples were collected from two right-of-way catch basins and one manhole in the S Myrtle Street storm drain basin, and from one right-of-way catch basin in the S Garden Street storm drain basin in September 2008; sampling locations are shown in Figure 5 (Robinson 2009). Chemicals detected in these solids samples at concentrations above the SQS³ are listed in Table 1.

Catch basins RCB147 and RCB148 are located adjacent to the Seattle Iron & Metals facility and drain to the S Myrtle Street outfall. Solids samples from these catch basins contained phthalates (bis[2-ethylhexyl]phthalate [BEHP], butylbenzyl phthalate [BBP], di-n-octyl phthalate), metals (lead, mercury, zinc), PCBs (primarily Aroclors 1254 and 1248), and phenols (4-methylphenol, total phenol) at concentrations above the SQS. Chemical concentrations were lower in solids from MH100, located near the S Myrtle Street outfall; however, BBP, PCBs, copper, lead, mercury, and zinc exceeded the SQS at this location.

Catch basin RCB146 is located on the south side of the Seattle Iron & Metals facility; it drains to the S Garden Street outfall. The solids sample collected from this catch basin contained phthalates (BEHP, BBP), metals (copper, lead, mercury, zinc), and PCBs (primarily Aroclor 1248 and 1254) at concentrations above the SQS.

3.1.2 Private Stormwater Outfalls

Private outfalls exist at Seattle Boiler Works (six outfalls), Seattle Iron & Metals (one outfall), Puget Sound Truck Lines (five outfalls), and Crowley Marine Services (two outfalls).

³ It should be emphasized that the SQS and CSL values do not apply to storm drain 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.

Outfall No.	Secondary ID	Facility	Pipe Diameter/Material
2027	150E	Seattle Boiler Works	6-inch clay
2028	149E	Seattle Boiler Works	18-inch concrete
2029	147E	Seattle Boiler Works	3-inch aluminum
2030	148E	Seattle Boiler Works	3-inch aluminum
2032	146E	Seattle Boiler Works	3-inch aluminum
2033	145E	Seattle Boiler Works	3-inch polyvinyl chloride (PVC)
2034	152E	Seattle Iron & Metals	6-inch steel
2036	154E	Puget Sound Truck Lines	8-inch steel
2037	155E	Puget Sound Truck Lines	10-inch steel
2038	162E	Puget Sound Truck Lines	6-inch concrete
2039	161E	Puget Sound Truck Lines	6-inch concrete
2040	164E	Puget Sound Truck Lines	12-inch concrete
2042	174E	Crowley/Alaska Logistics	8-inch PVC
5006	175E	Crowley/Alaska Logistics	8-inch PVC

Source: Windward 2007c

The potential for releases of COCs to the LDW from these private outfalls is discussed in Sections 3.3, 3.4, 3.5, and 3.7.

3.1.3 Potential for Future Releases to RM 2.3–2.8 East

Contaminants in stormwater from the following properties may be discharged to the LDW through the S Myrtle Street and S Garden Street public outfalls:

- Seattle Boiler Works,
- Seattle Iron & Metals,
- Whitehead Company, Inc./Former Perkins Lot,
- Former Trim Systems parcel, and
- Nitze-Stagen/Frye Parcels.

Solids samples have been collected from right-of-way catch basins near the Seattle Iron & Metals facility, and from manholes near the S Myrtle Street and S Garden Street municipal outfalls. Sediment COCs were detected in all samples at concentrations above the SQS, particularly phthalates, phenols, PCBs, and metals. Therefore, there is a potential for recontamination of sediments associated with the RM 2.3–2.8 East source control area from discharges via the municipal storm drain outfalls.

According to the RM 2.3–2.8 East Data Gaps Report (SAIC 2008), no other recent storm drain solids sampling has been conducted.

3.1.4 Source Control Actions

Stormwater discharges from public and private outfalls may represent an ongoing source of COCs to sediments near the RM 2.3–2.8 East source control area. Source control actions related to private outfalls are presented in Sections 3.3, 3.4, 3.5, and 3.7. To minimize the

potential for discharge of COCs from the public (SPU) storm drain outfalls, the following source control actions will be conducted:

- SPU will collect additional solids samples from catch basins and maintenance holes in city-owned storm drains, as necessary, to evaluate the concentrations of COCs in this drainage basin.
- SPU will conduct source tracing to identify potential contaminant sources to stormwater discharging to the LDW through the S Myrtle Street and S Garden Street outfalls.

In addition, SPU and Ecology will conduct source control inspections of adjacent and upland facilities as needed. Ecology’s Water Quality Program will continue to review and update NPDES permits.

3.2 Guimont Parcel

Current Operations	Food distribution warehouse
Historical Operations	Food packaging, manufacture of wooden igloos, possibly shipyard and fueling operations
Address	6901 Fox Avenue S
Facility/Site ID	57331171 (Bunge Foods Corp)
NPDES Permit No.	SO3000098 (Industrial Stormwater General Permit)
Chemicals of Concern	None identified
Media Affected	None identified

The Guimont parcel (Figure 7) is 5.42 acres in size and was purchased by William P. Guimont from the Fox Avenue Warehouse Corporation in November 1996.⁴ The property is bordered on the north by Glacier Marine Services, on the west by the LDW, on the south by Seattle Boiler Works, and on the east by Fox Avenue S.

3.2.1 Current Site Use

Dawn Food Products, Inc. (Dawn Foods) currently operates a distribution warehouse at this parcel. Dawn Foods carries KCIW Authorization No. 11009, which is effective from April 21, 2008, and will expire on April 20, 2013 (Tiffany 2008). Dawn Foods previously carried KCIW Discharge Permit No. 7043 from July 28, 2002, to July 28, 2007. Based on SPU Geographic Information Systems (GIS) maps, wastewater discharge from the facility is conveyed to the West Point WWTP. Stormwater originating on the extreme eastern edge of the property is discharged to the S Brighton Street outfall. Stormwater from the majority of the property appears to discharge directly to the LDW.

⁴ King County GIS Center Parcel Viewer:
<http://www.kingcounty.gov/operations/GIS/PropResearch/ParcelViewer.aspx>

Recent Regulatory Activities

In 2008, EPA sent Request for Information 104(e) letters to William P. Guimont (current property owner), Fox Avenue Warehouse Corporation (previous property owner), Bunge Foods Processing LLC (Bunge), and Dawn Food Products, Inc.

SPU conducted a source control inspection at the Dawn Foods facility on November 12, 2008. The facility was in compliance with local stormwater, industrial pretreatment, and hazardous waste regulations at that time.

3.2.2 Past Site Use

Historical operations at this property included **Bunge Foods Processing** (1991 to approximately 2003), **Pacific Huts, Inc.** (during the 1940s; Time Magazine 1943), and reportedly a shipyard and gasoline station. No other information on historical operations at this location was identified. Bunge Foods was assigned Ecology Facility/Site ID 57331171. During its occupation at the facility, stormwater from Bunge Foods was discharged to the LDW under an Industrial Stormwater General Permit (No. SO3-000098; Ecology 1992). The permit is not currently active.

3.2.3 Environmental Investigations and Cleanups

No records of environmental investigations or cleanups for the Guimont parcel were found in the files reviewed by SAIC.

3.2.4 Potential for Future Releases to RM 2.3–2.8 East

Three sediment samples collected in the LDW immediately downstream from the Guimont parcel contained PCBs (sample EST188) and PCBs, PAHs, and metals (samples SS81 and DR113); PCBs exceeded the SQS at sample location DR113 (Figure 4). This exceedance *may or may not* be related to activities associated with the Guimont parcel.

No potential contaminant sources associated with current operations at this property were identified. Little information was available regarding past operations at this property, however, including materials used or wastes produced.

3.2.5 Source Control Actions

Information needed to assess the potential for sediment recontamination associated with current or historical operations at the Guimont parcel was summarized in the RM 2.3–2.8 East Data Gaps report (SAIC 2008).

The following source control actions will be conducted to fill the identified data gaps and reduce the potential for recontamination of sediments associated with the RM 2.3–2.8 East source control area:

- Ecology will review responses to EPA's Request for Information 104(e) letters sent to William P. Guimont, Fox Avenue Warehouse Corporation, Bunge Foods Processing LLC, and Dawn Food Products, Inc.

3.3 Seattle Boiler Works

Current Operations	Metal products fabrication
Historical Operations	Steel mill
Address	500 S Myrtle Street
Facility/Site ID	17577864 (Seattle Boiler Works Inc Myrtle Street)
NPDES Permit No.	SO3002208 (Industrial Stormwater General Permit)
Chemicals of Concern	None identified
Media Affected	None identified

Seattle Boiler Works, located adjacent to the LDW at 500 S Myrtle Street, is bordered on the north by the Guimont parcel, on the south by S Myrtle Street and Seattle Iron & Metals, and on the east by Fox Avenue S. The property is owned by the Frederick J. Hopkins Family Trust (Figure 7). The parcel is 4.4 acres in size and is zoned for industrial use. According to the Ecology's underground storage tank (UST) list, there is one exempt UST on the property; the UST site ID is 8147. The property is partially paved.

3.3.1 Current Site Use

Seattle Boiler Works, the current tenant of the property, began operating at this location in 1949. Seattle Boiler Works specializes in fabrication of metal products such as storage tanks, pressure vessels, boilers, heat exchangers, columns, stacks, and tank heaters. The company serves the petrochemical, pulp and paper, crude oil drilling, hydroelectric, cogeneration, aerospace, general construction, defense, and manufacturing industries (SBW 2009).

The facility operates under Industrial Stormwater General Permit No. SO3-002208D (Ecology 2007b).

Water Discharges

There are several catch basins at the facility, including a catch basin in the forming shop, which is attached to a stormwater conveyance system (Ecology 2007b). A facility drawing from 2001 shows at least 10 drains; however, a formal facility plan showing the locations of these catch basins was not found in the files reviewed by SAIC.

There are six outfalls to the LDW located on the Seattle Boiler Works property, as listed in Section 3.2. Seattle Boiler Works is permitted for only one outfall. According to the draft LDW Phase 2 RI, some of these outfalls may be permitted under Shultz Distributing (four outfalls permitted) and Seattle Iron & Metals (one outfall permitted) (Windward 2007c).

Seattle Boiler Works is concerned that vehicle shredding operations at Seattle Iron & Metals, resulting in the deposition of a film on vehicles parked at Seattle Boiler Works, may elevate chemical concentrations in stormwater discharges originating from Seattle Boiler Works (Ecology 2007b).

Recent Regulatory Activities

Ecology performed an NPDES stormwater compliance inspection on June 26, 2007. The Ecology inspector reported that Seattle Boiler Works was not sampling stormwater at the facility, which was in violation of its stormwater permit. The Ecology inspector noted that catch basins needed to be inspected and cleaned; pollutants were entering the catch basin in the forming shop; many accumulations of sediment, waste, waste containers, and empty drums were present throughout the facility; storage containers were improperly stored; and aboveground storage tanks (ASTs) did not have proper containment. Ecology made the following recommendations (Ecology 2007b):

- Inspect and clean all catch basins and properly dispose of sediment;
- Take necessary actions to stop pollutants from entering the catch basin in the forming shop;
- Remove and properly dispose of accumulations of sediment, waste, waste containers, and empty drums;
- Clean areas of the facility where these items were allowed to accumulate;
- Review the BMP for Storage of Liquid, Food Waste, or Dangerous Waste Containers and implement these practices at the site;
- Provide employee training concerning the facilities SWPPP; and
- Provide secondary containment for existing ASTs or replace with double-walled ASTs.

No information on follow-up inspections (if any) was available.

In 2008, EPA sent Request for Information 104(e) letters to Fred Hopkins/Seattle Boiler Works, Inc., Frank H. Hopkins Family LLC, and National Steel Construction Company, a previous operator at this property.

3.3.2 Past Site Use

National Steel Construction Company formerly occupied this parcel. The company's name is still visible on the main building facing Fox Avenue S. National Steel stored sulfuric acid in a 1,250-gallon tank and hydrofluoric acid in a 250-gallon tank at their facility. Any spills or drainage from these tanks would go directly into the LDW. The 1945 report *Sources of Pollution in the Duwamish-Green River Drainage Area* estimated that approximately 1,200 to 1,500 gallons of acid were dumped into the river each month (Foster 1945).

A 1955 Pollution Control Commission report stated that National Steel Construction Co. discharged acid pickling liquor directly to the LDW. The Commission required the acid to be neutralized prior to discharge. The company had 200 employees and their sewage was directly discharged to the LDW (Pollution Control Commission 1955).

3.3.3 Environmental Investigations and Cleanups

No records of environmental investigations or cleanups at the Seattle Boiler Works parcel were found in the files reviewed by SAIC for the RM 2.3–2.8 East Data Gaps Report.

However, environmental investigations performed at the Fox Avenue Building property indicate that groundwater contamination associated with former GWCC operations may have migrated to the Seattle Boiler Works property (Figure 8; see Section 3.8).

3.3.4 Potential for Future Releases to RM 2.3–2.8 East

Activities at Seattle Boiler Works may have resulted in releases of contaminants to the environment. Seattle Boiler Works is a potential source of COCs that may contribute to recontamination of sediments associated with the RM 2.3–2.8 East source control area for the following reasons:

- **Previous facility inspections have noted stormwater permit violations and housekeeping deficiencies.**

Based on Ecology’s 2007 facility inspection report, Seattle Boiler Works has not regularly cleaned sediments from the catch basins or performed discharge monitoring sampling, in violation of its stormwater permit. Ecology identified housekeeping deficiencies and noted that “pollutants” were entering the catch basin in the facility’s forming shop (Ecology 2007b). The sediment-filled catch basins and unknown water quality of the facility’s discharge are two sources of potential sediment recontamination. The above-ground storage tanks (ASTs) at the facility do not have secondary containment features; therefore, a spill or leak from these ASTs and other improperly stored containers could enter the facility’s stormwater conveyance system and be discharged to the LDW. Spills that may occur at the property could enter the onsite storm drain system and be discharged to the LDW through the outfalls located on the west side of the parcel and the north side of the S Myrtle Street Embayment.

- **COCs have been detected above the SQS values in LDW sediments adjacent to the property.**

Environmental investigations at an adjacent facility indicate a potential for contamination of soils and groundwater; however, no soil or groundwater sampling has been conducted at the Seattle Boiler Works property. Sediment samples collected in the LDW near this property indicated the presence of PCBs in one surface sample at a concentration above the SQS, and dioxins and furans were detected in this area; however, the presence of these COCs *may or may not* be related to activities at Seattle Boiler Works.

3.3.5 Source Control Actions

Information needed to assess the potential for sediment recontamination associated with current or historical operations at Seattle Boiler Works was summarized in the RM 2.3–2.8 East Data Gaps Report (SAIC 2008).

The following source control actions will be conducted to fill the identified data gaps and reduce the potential for recontamination of sediments associated with the RM 2.3–2.8 East source control area:

- Ecology will review responses to EPA’s Request for Information 104(e) letters sent to Fred Hopkins/Seattle Boiler Works, Inc., Frank H. Hopkins Family LLC, and National

Steel Construction Company, and will identify data gaps and/or source control action items as needed.

- Ecology will conduct additional stormwater compliance inspections to verify that deficiencies noted during the June 2007 inspection have been corrected. Information needed to evaluate the potential for sediment recontamination associated with current activities at this property includes an updated facility plan showing locations of catch basins, maintenance holes, storm drain lines, and outfalls.
- Of the six outfalls on the Seattle Boiler Works property, only one is identified in the facility’s NPDES permit. Ecology and Seattle Boiler Works will determine if the other five outfalls are in use. If stormwater originating at Seattle Boiler Works is discharged to these outfalls, Seattle Boiler Works will request Ecology to add these outfalls to the facility’s NPDES permit.
- If the outfalls mentioned above are in use and if the source of discharges to these outfalls is not Seattle Boiler Works, then Ecology/SPU will perform a source tracing survey to determine the potential sources discharging to these outfalls.

Ecology will continue to monitor operations at Seattle Boiler Works to ensure compliance with NPDES permit requirements and stormwater BMPs to prevent the release of contaminants to the LDW.

3.4 Seattle Iron & Metals Corporation

Current Operations	Metals recycling
Historical Operations	Various industrial operations including seafood packing, trucking support, construction support, pipe manufacturing, and a machine shop
Address	601 S Myrtle Street, 620 S Othello Street
Facility/Site ID	12153465 (Myrtle Street Property) 94727791 (Seattle Iron & Metals) 9872313 (Whitehead Company) 6368989 (All Alaskan Seafoods)
NPDES Permit	WA-003196-8 (Individual Permit)
Chemicals of Concern (Media Affected)	Petroleum hydrocarbons, copper (soil) Total petroleum hydrocarbons (TPH), pH, zinc, lead, copper (stormwater)

Seattle Iron & Metals Corporation operates on two parcels adjacent to the LDW, which are owned by the Shalmar Group (Figure 7). The addresses for the parcels are 601 S Myrtle Street and 620 S Othello Street. The larger of the two parcels (0076) is 8.22 acres in size with 10 buildings erected on the property. The smaller parcel (9089) is 1.44 acres in size with one building erected on the property. In March 2008, the Shalmar Group purchased the former Trim Systems parcel (0380), and Seattle Iron & Metals is currently using the yard area for storage (see Section 3.11).

Parcel 0076 is listed on the Confirmed and Suspected Contaminated Sites List (CSCSL) as “The Myrtle Street Property” at 606 S Myrtle Street. The Ecology Facility/Site ID is 12153465. Petroleum contamination in soil and groundwater has been confirmed for the

property. The Myrtle Street property is part of Ecology's Voluntary Cleanup Program (VCP); the VCP ID is NW0093.

Parcel 0076 has also been assigned Ecology Facility/Site ID 9872313 under the name "Whitehead Company" at 600 S Myrtle Street. Two leaded gasoline USTs with capacities up to 1,100 gallons were removed from the property at an unknown date (UST Site ID 9634).

Seattle Iron & Metals has been assigned Ecology Facility/Site ID 94727791.

3.4.1 Current Site Use

Seattle Iron & Metals is a full-service metals recycler. Iron, steel, aluminum, brass, copper, and other non-ferrous metals are processed, sorted, and packed. Seattle Iron & Metals uses a 4,000-horsepower metal shredder to break up larger pieces of ferrous and non-ferrous metals into smaller pieces, which are then sold to metal recyclers for further processing (Ecology 2007a). Mixed metals, such as automobiles and appliances, are processed then separated magnetically, electrically, and by air to refine the ferrous and non-ferrous metal components into a uniform size and grade of recycled material. The facility's guillotine shear is one of the largest in the northwest and has the ability to slice through steel plate and beams up to 5 inches thick (Seattle Iron & Metals 2009). Over-sized scrap, such as ship plate, is processed by torch cutters.

The property was capped prior to Seattle Iron & Metals' occupancy; however, the cap was cracked. Seattle Iron & Metals planned to install a new cap, which required Ecology's approval under Section 3 of the Restrictive Covenant for the property (Ecology 1998; Matlock 1998). Seattle Iron & Metals installed a 10-inch thick layer of concrete over the 9.5-acre property (Seattle Iron & Metals 2009). "Significant" contaminated soil was removed prior to installing the concrete platform. The costs associated with removal and treatment of contaminated soil was over \$1 million. U.S. SeaCon, Inc. installed 1,110 stone pile columns to support the 10-inch concrete platform (U.S. SeaCon, Inc. date unknown).

Process Wastewater

The receiving area for non-ferrous materials is covered and all runoff (i.e., fluids from materials mixed with process water) and process water drained from the shredder are conveyed to the process water treatment area and then discharged to the King County sanitary sewer (Matlock 1998). Trucks bringing salvage to the facility are hosed down in a covered and bermed vehicle wash down area so wash water is not mixed with stormwater. Wash water is directed to the sanitary sewer (Ecology 2007a). The grinding mill of the automobile shredder is sprayed with clean water for dust suppression and contact cooling. Water that does not evaporate is discharged to the sanitary sewer. The combined wastewater discharge average flow rate is estimated to be 500 gallons per day, with a maximum flow rate of 1,000 gallons per day. All of the wastewater is discharged through an oil/water separator to the sanitary system.

Seattle Iron & Metals operates under KCIW Discharge Authorization No. 705 as a minor discharger.

Stormwater Discharges

Seattle Iron & Metals operates under an individual stormwater discharge permit (WA-003196-8), issued in December 2007⁵ (Ecology 2007e). The permit includes the following effluent limitations:

Parameter	Maximum Daily Effluent Limitation
Total Recoverable Copper	5.8 µg/L
Total Recoverable Lead	220.8 µg/L
Total Recoverable Zinc	95.1 µg/L
Total PCBs	10 µg/L
TPH	5 mg/L
Turbidity	5 NTU
pH	6.5 to 8.5

In addition to the above parameters, the permit requires monthly monitoring of 1,2-dichlorobenzene (DCB), 1,4-DCB, 1,2,4-trichlorobenzene, BBP, fluoranthene, hexachlorobenzene, hexachlorobutadiene, n-nitrosodiphenylamine, and phenol (Ecology 2007e).

Stormwater passes through fabric filters installed in each stormwater catch basin. The fabric filters remove gross particulates and are specially treated to absorb oil and grease. All stormwater catch basins are plumbed to an empty 45,000-gallon stormwater detention chamber. Stormwater is then pumped from the detention chamber to the beginning of the treatment system. After each storm event, the detention chamber is emptied and cleaned in preparation for the next storm event (Ecology 2007d).

The treatment system includes pH adjustment, coagulation/flocculation, and metals precipitation. The system includes a dissolved air flotation (DAF) unit, four multi-media pressure filtration units, and two modified clay/activated carbon media vessels. The system is designed to remove primarily heavy metals, total suspended solids (TSS) of 5 microns or larger, or about 90 percent of all filterable suspended solids, and oil and grease from the influent (Ecology 2007d).

Sludge from the DAF unit is pumped to a 5,000-gallon, conical-bottom settling tank. The sludge is pumped to a filter press, and the solid filter cake is removed by a waste contractor. Supernatant water in the sludge tank and water from the filter press is recycled back to the underground detention chamber. Treated stormwater is discharged to the LDW.

Parking lot and roof drain stormwater on the northwest side of the facility is discharged to the S Myrtle Street outfall.

Seattle Iron & Metals has one permitted stormwater outfall. According to a recent facility map (Figure 9), the stormwater treatment system discharges to the LDW via the S Garden Street

⁵ The facility previously operated under the Industrial Stormwater General Permit (No. SO3-003645C).

outfall (Outfall No. 2035). It is not clear what, if anything, discharges to the LDW through Outfall No. 2034 (Figure 5).

Recent Regulatory Activities

A December 2007 water compliance inspection noted excessive stockpiles of recyclable materials at the site, and observed that stormwater “appeared to be extremely contaminated and viscous” (Ecology 2009b). Adequate catch basin inlet protection was missing, and the catch basins appeared to be filled with oily runoff. The inspectors also noted oily stormwater on the dock that may flow to the river instead of to the treatment system.

In June 2008, Ecology’s Hazardous Waste & Toxic Reduction (HWTR) inspector for the Urban Waters Initiative (UWI) noted that truck traffic waiting to enter the Seattle Iron & Metals yard backs up onto S Myrtle Street for hours at a time. Contamination from the trucks may enter the storm drains located on S Myrtle Street between 8th Avenue S and the LDW (Jeffers 2008a). (Note: As discussed in Section 3.1.1, a catch basin solids sample collected by SPU in September 2008 from catch basin RCB148, located adjacent to the Seattle Iron & Metals facility along S Myrtle Street, contained 4-methylphenol, BEHP, BBP, lead, mercury, PCBs, phenol, and zinc at concentrations above the SQS. In addition, a grab sample from maintenance hole MH-100, near the S Myrtle Street outfall, contained BBP, copper, lead, mercury, PCBs, and zinc at concentrations above the SQS.)

On July 22, 2008, Ecology received a complaint about a foamy white discharge to the LDW near Seattle Iron & Metals. Ecology and SPU inspectors determined that Seattle Iron & Metals’ stormwater treatment system was operating during the period of the foamy discharge. Ecology requested that Seattle Iron & Metals contact Ecology before the next planned operation and discharge from the stormwater treatment system. In August 2008, an Ecology inspector met with company officials to observe the startup and operation of the treatment system. Samples were collected and the Ecology inspector observed a very foamy discharge from the treatment system (Wright 2008).

On August 13, 2008, Ecology issued Notice of Violation (NOV) No. 5858 to Seattle Iron & Metals Corporation (Ecology 2008f) for stormwater effluent violations (TPH, zinc, lead, copper, and turbidity) from December 2007 through June 2008, and for the unauthorized discharge of turbid wastewater to the LDW on July 21, 2008. Seattle Iron & Metals submitted a response to the NOV on August 19, 2008, acknowledging the effluent violations and unauthorized discharge, and describing the steps which had been taken and/or were proposed by the facility to correct the violations (Ecology 2008f).

In November 2008, Ecology issued Follow-up Order No. 6185, requiring Seattle Iron & Metals to take corrective actions to prevent further violations of its NPDES permit (Ecology 2008f). The Order requires submittal of an engineering report and compliance schedule, including the following:

- Evaluation of the adequacy and appropriateness of the existing DAF and filtration treatment unit, and submittal of an engineering report to Ecology for review and approval; and
- Evaluation, through a comprehensive engineering study, of the drainage, topology, and hydrology of the site to identify the quantity of potentially contaminated

stormwater runoff and its potential entrance to the receiving water, and submittal of an engineering report to Ecology for review and approval. This includes an examination of the site for cracks and leaks, evaluation of roads adjacent to the facility for pollutants tracked out by vehicles, and other pollution/contamination caused by its operations.

A Stormwater Quality Improvement Report was scheduled to be submitted on May 30, 2009. A mixing zone study is required to be completed by July 30, 2009 (Ecology 2008f). Seattle Iron & Metals has begun implementing improvements to the stormwater treatment system in compliance with the Order.

In July 2008, EPA sent Request for Information 104(e) letters to Seattle Iron & Metals, Manson Construction Company, Othello Street Warehouse Corporation, and the Maust Corporation. Manson Construction Company and Maust Trucking are historical operators at this property. Othello Street Warehouse Corporation is a historical owner of the property.

3.4.2 Past Site Use

Prior to their purchase by the Shalmar Group, the two parcels that make up this property were owned by the **Othello Street Warehouse Corporation**. No information regarding operations at the property during its ownership by the Othello Street Warehouse Corporation was available for review during preparation of the Data Gaps Report (SAIC 2008).

All Alaskan Seafoods, Inc. formerly occupied a portion of parcel 0076 with an address at 501 S Myrtle Street in Seattle. The facility was adjacent to Seattle Boiler Works and Seattle Iron & Metals. The business operated under EPA ID No. WA0000229062 (inactive). The Ecology Facility/Site ID is 6368989.

In February 1988, **Northland Services, Inc.** filed a first Notification of Dangerous Waste Activities form with Ecology. The form indicates that Northland was operating as a transporter of dangerous waste. The address for these activities is listed as 601 S Myrtle Street, which indicates that Northland was operating at this property. Manson Construction and Engineering (Manson Construction) is listed as the property owner (Northland 1988).

In October 1994, Northland filed a revised Notification of Dangerous Waste Activities form with Ecology. The form indicates that Northland was operating as a transporter of dangerous waste via highway and waterway transportation. The EPA Site ID is listed as WAD981773005. Northland is listed as the property owner (Northland 1994).

Manson Construction and Engineering operated on the 601 S Myrtle Street property from 1982 to 1988. According to Ecology's Integrated Site Information System (ISIS) database, there are two USTs on the property, which may have been installed during Manson's occupancy. One UST is used for heating fuel and the other has been closed in place on an unknown date. The UST Site ID is 10855.

According to the 1945 report *Sources of Pollution in the Duwamish-Green River Drainage Area*, **Continental Can Co.**, one of the largest machine shops in the Northwest, was located on this parcel (Foster 1945). Cooling water from their compressor was discharged directly to the LDW. Some cutting oil may have also been spilled on the ground and could have reached the LDW after filtering through the soils.

Seattle Concrete Pipe Company may have been located on one of these parcels or further south along the Duwamish, within the RM 2.3–2.8 East source control area. Waste from the pipe company included machine cleanings consisting of dry mixture concrete, which was dumped on the river bank to create fill above the high tide line (Foster 1945).

Maust Trucking is mentioned as a previous operator at the current Seattle Iron & Metals facility in the City of Seattle’s Analysis and Decision Document for Seattle Iron & Metals’ construction and land use permit (City of Seattle 1998). No additional information regarding this company was available in the files reviewed by SAIC.

3.4.3 Environmental Investigations and Cleanups

Operations at the facility prior to Seattle Iron & Metals’ occupancy resulted in soil and groundwater contamination beneath the property. According to City of Seattle records, soil studies were conducted to determine the nature and extent of contamination and environmental cleanup at the property (City of Seattle 1998). Othello Street Warehouse Corporation conducted an Independent Remedial Action at the 606 S Myrtle Street property (Ecology Facility/Site ID 12153465) prior to 1998. Residual concentrations of petroleum hydrocarbons and copper in soil and groundwater exceeded the MTCA residential cleanup levels for soil and groundwater following the completion of the Independent Remedial Action. The property was capped and a restrictive covenant was placed on the property. From the information available during the preparation of this SCAP, the types, concentrations, and extent of other COCs potentially present in soil and groundwater beneath the property cannot be determined.

Following cleanup activities, Ecology issued a “No Further Action” letter for the property. The restrictive covenant states that the property is restricted to industrial use, the groundwater cannot be used without prior approval from Ecology, and no release or removal of soil that may result in an exposure pathway is allowed (City of Seattle 1998; Ecology 1998). The Independent Remedial Action is documented in Hart Crowser’s *Voluntary Cleanup Action Report, 606 South Myrtle Street, Seattle, Washington*, dated March 23, 1998 (Hart Crowser 1998, as cited in Ecology 1998). Hart Crowser’s report was not available to SAIC for review.

A 1998 e-mail from Ecology indicates that there are six monitoring wells on the property (Matlock 1998).

Over \$1 million was spent removing and remediating contaminated soil in preparation for Seattle Iron & Metals’ relocation to the property in 1999 (U.S. SeaCon, date unknown). It is not clear if this soil removal and remediation action was part of the Independent Remedial Action performed at the 606 S Myrtle Street property prior to 1998, or if this action was a separate remedial activity. Records documenting the amount of soil removed (i.e., volume or weight), the type of contamination present in the soil, the final disposition of the soil (i.e., disposed of, used as backfill at the property, etc.), and estimates of the contamination left in place (if any) were not available during the preparation of this SCAP.

3.4.4 Potential for Future Releases to RM 2.3–2.8 East

Seattle Iron & Metals has been operating at this location since 1999. Prior to that time, an independent cleanup was conducted and, due to the presence of residual concentrations of

petroleum hydrocarbons and copper in soil and groundwater, a restrictive covenant was placed on the property. PCBs above the SQS are present in sediments near the Seattle Iron & Metals facility; in addition, metals (including copper), PAHs, furans, and tributyltin have been detected in sediment samples.

Seattle Iron & Metals is a potential source of COCs that may contribute to recontamination of sediments associated with the RM 2.3–2.8 East source control area for the following reasons:

- **The facility has previously violated the conditions of its NPDES permit.**

Operations at the facility resulted in violations of the facility's general stormwater permit in May 2000 (Ecology 2000). Total zinc concentrations reported during Second Quarter 2005 exceeded permit limits (Ecology 2006a).

Seattle Iron & Metals currently has an individual NPDES industrial stormwater discharge permit, which was issued in November 2007. Violations of the permit conditions between December 2007 and June 2008 (discharge of TPH, zinc, lead, copper, and turbidity above permit limits) and an unauthorized discharge in July 2008 resulted in issuance of a Notice of Violation and an Administrative Order by Ecology (Ecology 2008f).

- **Previous operations at the facility resulted in a spill to the LDW.**

Scrap metal from the facility spilled into the LDW in March 2006. Following the scrap metal spill, Seattle Iron & Metals installed an additional barrier to prevent future material overflow (Ecology 2006a). However, recent inspections indicate that operations continue to occur too close to the LDW (Ecology 2008a).

- **Operations having the potential to recontaminate LDW sediments have been observed during previous Ecology stormwater compliance inspections.**

Several facility inspections were completed during 2007 by Ecology prior to issuing the individual NPDES permit. During a December 2007 inspection, Ecology inspectors expressed concern about processing too close to the LDW and the capacity of the facility's stormwater treatment system during heavy rain events (Ecology 2008a). During the same inspection, inspectors noted that adequate catch basin inlet protection was missing, and the catch basins appeared to be filled with oily runoff. The inspectors also noted oily stormwater on the dock that may flow to the river instead of to the treatment system (Ecology 2009b).

Contamination from trucks waiting to enter the Seattle Iron & Metals yard may enter the storm drains located on S Myrtle Street between 8th Avenue S and the LDW. Stormwater discharges to the LDW at the S Myrtle Street outfall.

- **Sediment COCs have been detected above the SQS values in LDW sediments adjacent to the property.**

Past operations at the property have resulted in contamination of soil and groundwater. Sediment samples collected in the LDW near this property indicated the presence of PCBs in two surface samples at concentrations above the SQS, and furans and tributyltin were detected in this area. PCBs have not been detected in stormwater effluent from this facility. Although copper concentrations in sediment samples adjacent to the property have not exceeded the

SQS, residual copper concentrations above MTCA Method A cleanup levels are present at the property. The presence of COCs in sediment *may or may not* be related to historical or current operations at this property.

- **Auto Shredder Residue has not been characterized for sediment COCs, and has the potential to reach the LDW via stormwater discharge and air deposition pathways.**

In August 2006, Ecology expressed concern regarding an auto shredder residue (ASR) sample, which failed standards for lead, and advised Seattle Iron & Metals that if future samples failed, additional sampling would be required (Ecology 2006c). Seattle Iron & Metals reportedly plans to install processing equipment to extract a greater percentage of recoverable metals from the ASR (Abbasi 2009).

The adjacent facility, Seattle Boiler Works, has expressed concern that ASR migrating to its facility from Seattle Iron & Metals' automobile shredder will elevate chemical concentrations in stormwater originating from Seattle Boiler Works. ASR and particulates reportedly emanating from auto shredder explosions have the potential to enter the LDW and may be a source of sediment recontamination.

3.4.5 Source Control Actions

Information needed to assess the potential for sediment recontamination associated with current or historical operations at Seattle Iron & Metals was summarized in the RM 2.3–2.8 East Data Gaps Report (SAIC 2008), and more recent information is summarized in Section 3.4.1 above.

The following source control actions will be conducted to fill the identified data gaps and reduce the potential for recontamination of sediments associated with the RM 2.3–2.8 East source control area:

- Ecology will review responses to EPA's Request for Information 104(e) letters sent to Seattle Iron & Metals, Manson Construction Company, Othello Street Warehouse Corporation, and The Maust Corporation.
- Ecology will locate and review Hart Crowser's 1998 *Voluntary Cleanup Action Report, 606 South Myrtle Street, Seattle, Washington* to evaluate the extent of soil and groundwater sampling that has been conducted at this property and to identify whether sediment COCs, in addition to copper, were detected in soil or groundwater samples. Sediment COCs will be compared to the soil-to-sediment and groundwater-to-sediment screening levels to evaluate the potential for sediment recontamination via groundwater discharge, bank erosion, and leaching pathways.
- Ecology will obtain records from the soil removal and remediation action performed by U.S. SeaCon to determine if the action was the Independent Remedial Action that was performed prior to 1998 or an additional remedial action performed at the property.
- Ecology will monitor compliance with Follow-Up Order No. 6185.
- Ecology will investigate the means to determine whether ASR from Seattle Iron & Metals is reaching the LDW directly or via the Seattle Iron & Metals or Seattle Boiler Works storm drain systems.

- Ecology and PSCAA will obtain documentation regarding the status of the furnace used to burn insulation off electrical wire, to determine if it was relocated from the Harbor Island facility to Seattle Iron & Metals Corporation’s current facility. Additionally, current furnace operations, if any, will be identified.
- Ecology will request information regarding the source of discharge, if any, to Outfall 2034, observed along the Seattle Iron & Metals shoreline during SPU’s outfall survey.

Ecology will continue to monitor operations at Seattle Iron & Metals to ensure compliance with the requirements of the NPDES permit to prevent the release of contaminants to the LDW. Additionally, Ecology will ensure that the buffer area between the LDW and Seattle Iron & Metals’ operations is maintained.

3.5 Puget Sound Truck Lines

Current Operations	Motor freight transportation terminal and maintenance facility; automobile painting and body repair
Historical Operations	No information
Address	7303 8 th Avenue S (Puget Sound Truck Lines) 7401 8 th Avenue S (Phil’s Finishing Touch)
Facility/Site ID	41684823 (Puget Sound Truck Lines) 26468911 (Phil’s Finishing Touch)
NPDES Permit	SO3000949D
Chemicals of Concern (Media Affected)	No information

Puget Sound Truck Lines occupies two parcels (0681 and 0670), adjacent to the LDW (Figure 7). Puget Sound Truck Lines leases the northern parcel (0681) from R&A Properties LLC and owns the southern parcel (0670). The operating address is 7303 8th Avenue S. An automobile detailing business, Phil’s Finishing Touch, operates in a building on the southern parcel. The two parcels form a triangle that is bordered on the north by Seattle Iron & Metals and S Othello Street, on the west by the LDW, and on the south and east by Seattle City Light and 8th Avenue S.

3.5.1 Current Site Use

Puget Sound Truck Lines is a regional truckload carrier of general freight commodities and bulk wood residuals (PSTL 2009). The company operates at this property under Standard Industrial Classification (SIC) Codes 7538 (General Automotive Repair Shops) and 4231 (Terminal and Joint Terminal Maintenance Facilities for Motor Freight Transportation). Ecology Facility/Site ID 41684823 is assigned to Puget Sound Truck Lines. The UST Site ID is 7820.

Phil’s Finishing Touch, which specializes in paint and auto body repair and services to classic automobiles, is located at 7401 8th Avenue S. The business operates in a building on parcel 0670, which is owned by Puget Sound Truck Lines. Ecology Facility/Site ID 26468911 is assigned to Phil’s Finishing Touch.

Stormwater Discharges

The facility has a stormwater conveyance system (Ecology 2005). There are five stormwater outfalls on the Puget Sound Truck Lines parcels (Herrera 2004). Outfall 2036 is owned by Puget Sound Truck Lines, while outfalls 2037, 2038, 2039, and 2040 are owned by R&A Properties. According to the Draft LDW Phase 2 RI, Outfall 2036 may also drain the adjacent street surfaces (Windward 2007c).

Puget Sound Truck Lines operates under Industrial Stormwater General Permit No. SO3-000949D.

In 2008, EPA sent Request for Information 104(e) letters to Puget Sound Truck Lines, Inc., and R&A Properties LLC.

3.5.2 Past Site Use

One of these two parcels may have been the historical location of **Seattle Concrete Pipe Company** (Foster 1945). No other information on historical operations was available.

3.5.3 Environmental Investigations and Cleanups

According to Ecology's Leaking Underground Storage Tank (LUST) list, soil cleanup activities at parcel 0681 were completed in September 1995. Presumably the cleanup was related to petroleum hydrocarbon contaminated soils; however, environmental data from the cleanup activities were not available for review.

3.5.4 Potential for Future Releases to RM 2.3–2.8 East

Puget Sound Truck Lines conducts truck maintenance and repair at this location; Phil's Finishing Touch operates an auto body repair shop on a portion of the property. There is potential for future releases of COCs to sediments associated with the RM 2.3–2.8 East source control area from the Puget Sound Truck Lines facility for the following reasons:

- **Previous facility inspections have noted stormwater permit violations and housekeeping deficiencies.**

This facility operates under an Industrial Stormwater General Permit. The most recent stormwater compliance inspection (June 2005) indicated that Puget Sound Truck Lines is not in compliance with discharge sampling and monitoring requirements. Ecology inspectors noted that the catch basins needed to be cleaned, in addition to other housekeeping deficiencies. Therefore, contaminants may enter the onsite storm drain system and be discharged to the LDW through the outfalls located on the west side of the facility (Ecology 2005).

- **PCBs and other COCs have been detected above the SQS values in LDW sediments adjacent to the property.**

PCBs, PAHs, and mercury have been detected at concentrations above the SQS in LDW sediments adjacent to this property. Mercury was detected at a concentration above the SQS in one sample (LDW-SS88); chrysene and fluoranthene were also detected above the SQS in

one sample (DR174). PCB concentrations in seven surface sediment samples exceeded the SQS. Furans and tributyltin were detected in one sample (DR174). Past operations at the facility resulted in soil contamination, although soil cleanup activities were reportedly completed in 1995. Because there is the potential for residual soil and groundwater contamination at this property, groundwater discharge, bank erosion, and leaching are considered potential pathways for sediment recontamination; however, the presence of these COCs in sediment *may or may not* be related to operations at Puget Sound Truck Lines.

3.5.5 Source Control Actions

Information needed to assess the potential for sediment recontamination associated with current or historical operations at the Puget Sound Truck Lines facility was summarized in the RM 2.3–2.8 East Data Gaps Report (SAIC 2008).

The following source control actions will be conducted to fill the identified data gaps and reduce the potential for recontamination of LDW sediments:

- Ecology will review responses to EPA’s Request for Information 104(e) letters sent to Puget Sound Truck Lines and R&A Properties LLC.
- Ecology will perform a follow-up inspection to determine whether catch basins have been cleaned and housekeeping has been improved, and whether the facility is in compliance with discharge monitoring and other permit requirements and stormwater BMPs. A facility plan showing the locations of all catch basins and stormwater conveyance lines will be obtained.
- Ecology and the property owner/operator will determine if the five outfalls present on the Puget Sound Truck Lines parcels are active, and the source of discharge from these outfalls, if any.
- Ecology and the property owner/operator will locate records of soil cleanup activities that were completed in 1995. Ecology will confirm that Puget Sound Truck Lines achieved satisfactory completion of cleanup activities to eliminate groundwater discharge as a potential sediment recontamination pathway for this property.

In addition, Ecology will continue to monitor operations at Puget Sound Truck Lines to ensure compliance with NPDES permit requirements and stormwater BMPs to prevent the release of contaminants to the LDW.

3.6 Seattle City Light – Georgetown Pump Station

Current Operations	Vacant
Historical Operations	No information
Address	7551 8 th Avenue S
Facility/Site ID	None
NPDES Permit	None
Chemicals of Concern	Petroleum hydrocarbons, cadmium, chromium
Media Affected	Soil

Seattle City Light owns a 0.27-acre (11,761 sq ft) parcel (0666), which is bordered by the LDW to the south, Puget Sound Truck Lines to the west, and 8th Avenue S to the east. A pump station and a valve shed are present on the property. The pump station was built in about 1900 and was used to supply cooling water from the LDW to the former Georgetown Steam Plant. Additional information and data regarding this property has become available since the final Data Gaps Report was published; the new information is summarized below (HWA GeoSciences 2006; Raven 1989).

3.6.1 Current Site Use

A pump station and a valve shed are present on the property. The pump house was built in about 1900 and was used to supply cooling water from the LDW to the former Georgetown Steam Plant (HWA GeoSciences 2006).

The property is relatively flat and is accessible to the public, although the pump station and shed are boarded up. The bank is accessible during low tide.

A 4-inch diameter concrete pipe, previously listed as Outfall 2041 (171E), is located on this parcel. This pipe is not an outfall but is the old water intake for the Georgetown Steam Plant (Windward 2007c).

Stormwater Discharges

According to the property plan from HWA Geosciences, a drainage pipe or ditch extends from the northeast corner to approximately the northwest shoreline of the property (Figure 10). Since this property is not paved, it is likely that rain water infiltrates the ground. It is possible that during heavy rain storms, stormwater may erode channels into the surface. Stormwater may discharge to the LDW via these channels.

There is no formal drainage system in the street adjacent to this property. Stormwater runoff on 8th Avenue S ponds in the street. During large storm events, stormwater may run along the northwest side of the street and across the Seattle City Light property to reach the LDW (Schmoyer 2008b).

3.6.2 Past Site Use

Historical property plans show that an 8-inch oil line, two 36-inch diameter water lines, and a transformer rack were present on the property (HWA GeoSciences 2006). No other information on past use was available.

3.6.3 Environmental Investigations and Cleanups

Several environmental investigations have been performed at the property. Chemicals detected in soil samples collected from the property are listed in Table 2.

PCB Study (1989)

Raven Services Corporation (Raven) collected three surface soil samples and one subsurface soil sample near the pump house, and performed wipe tests on electrical equipment inside the pump station (Raven 1989). A capped standpipe was observed at the northeast corner of the

pump house; the standpipe was observed to be approximately 9 feet deep, with one foot of rusty (but not oily) water. A test hole was dug 3 feet north of the pipe to a depth of about 6.5 feet; no evidence of a tank was found. One water sample was collected from the standpipe. PCB concentrations were below the reporting limit in all samples collected (Raven 1989).

Phase I Environmental Site Assessment (2004)

The Phase I Environmental Site Assessment identified recognized environmental conditions (RECs) on and near the Seattle City Light property. An 8- to 12-inch layer of cinder-like material present on the northern and southern sections of the property was considered an REC due to its unknown source and composition (Sound Environmental Strategies 2004 as cited in HWA GeoSciences 2006).

Lead Paint Sampling (2004)

The Seattle Parks Department collected five paint samples from the interior surfaces of the pump station. Lead concentrations in three of the samples exceeded 5,000 parts per million, which “triggers” Dangerous Waste disposal protocols (HWA GeoSciences 2006).

Environmental Site Assessment Summary (2005)

HWA Geosciences collected subsurface soil samples around the buildings, 8-inch diameter oil line, and former transformer rack area on the Seattle City Light parcel (sample locations HH-1 through HH-8, TP-1 through TP-4, and TR-1 through TR-3 on Figure 10). Aroclor 1254, Aroclor 1260, arsenic, cadmium, chromium, lead, and diesel- and heavy oil-range hydrocarbons were detected in the soil samples (Table 2) (HWA GeoSciences 2006).

The pump station building materials were sampled and analyzed for asbestos. Electrical wiring, black tar roofing, and silver roofing sealant contained 7 to 65 percent asbestos. Cement asbestos board insulator and a gasket material were not sampled but were assumed to contain asbestos. The exterior paint on the pump station and shed and black sealant were sampled for lead. The paint samples contained 0.0079 to 2.4 percent lead (HWA GeoSciences 2006).

Environmental Sampling (2007)

HWA Geosciences collected soil samples from five hand auger borings (HA-1 through H-5, Figure 10). Eight soil samples were analyzed for metals. Arsenic, beryllium, cadmium, chromium, copper, lead, mercury, nickel, silver, and zinc were detected in the soil samples (Table 2) (HWA GeoSciences 2007).

No information on the installation or sampling of groundwater monitoring wells at this site was available.

3.6.4 Potential for Future Releases to RM 2.3–2.8 East

The potential for sediment recontamination associated with the Seattle City Light – Georgetown Pump Station property is unknown; however, future releases of sediment COCs may occur for the following reasons:

- **Stormwater may drain to the LDW.**

A 2006 property plan indicates that a drainage ditch or pipe extends from the northeast corner of the property at 8th Avenue S to approximately the northwest shoreline of the property. From the available information, it could not be determined if this drainage outfalls to the LDW. If the drainage outfalls to the LDW, stormwater from the property or 8th Avenue S may be conveyed to the LDW through this drainage feature. The potential for sediment recontamination via this pathway is unknown.

- **Environmental investigations indicate the presence of COCs in shallow soil.**

Previous environmental investigations indicate that cadmium, chromium, and heavy oil-range hydrocarbons are present in shallow soil (1 to 4 feet bgs) at concentrations exceeding MTCA cleanup values. Chemicals detected in soil did not exceed the soil-to-sediment screening levels. No information on groundwater sampling at this property was available.

- **PCBs have been detected above the SQS values in LDW sediments near the property.**

PCBs have been detected at concentrations above the SQS in LDW sediments adjacent to and downgradient of this property. The presence of PCBs in sediment *may or may not* be related to operations at the Seattle City Light – Georgetown Pump Station property.

3.6.5 Source Control Actions

The following source control actions will be conducted to fill the identified data gaps and reduce the potential for recontamination of sediments associated with the RM 2.3–2.8 East source control area:

- Ecology and SPU will determine if the drainage ditch or pipe on the property is active and if it discharges to the LDW.
- If the drainage ditch/pipe is active and discharges to the LDW, SPU will determine the area drained by this feature and determine the potential for sediment COCs to reach the LDW.
- Ecology will obtain and review information about any groundwater sampling and testing that has been conducted at this property. Based on this review, Ecology will evaluate the need for additional source control actions.

3.7 Crowley Marine Services

Current Operations	Container storage and shipment, truck transportation, vehicle maintenance
Historical Operations	Wood treating, pipe dipping, log storage, aluminum window manufacturing
Address	7400 8 th Avenue S
Facility/Site ID	1940187 (Crowley Marine Services) 63123962 (Alaska Logistics, LLC)
NPDES Permit	WAR009728 (Construction Stormwater General Permit)

Chemicals of Concern	PAHs, PCBs, phthalates, arsenic, chromium, petroleum hydrocarbons
Media Affected	Soil, groundwater

Crowley Marine Services owns the property at 7400 8th Avenue S (Figures 2 and 7). The 15.86-acre property was formerly subdivided into two parcels, D and F. Crowley Marine Services recently combined Parcels D and F and currently refers to the property as Parcel A; however, previous documents related to source control for the LDW use the Parcel D and F designations. For the purposes of source control, the Parcel D and F designations are retained. Parcel D comprises the southern two-thirds of the property and Parcel F forms the northern third of the property. Crowley Marine Services currently leases the parcels to Alaska Logistics, LLC (Alaska Logistics) and Union Pacific Railroad Domestic Container Terminal (UPRR). Crowley Marine Services has been assigned Ecology Facility/Site ID 1940187.

According to tax records, there are no permanent structures on the property. Business offices are housed in semi-permanent trailers. There is a covered area at the northern end of the property, which appears to be used by UPRR. Buildings adjacent to East Marginal Way S appear to be abandoned.

A Site Hazard Assessment (SHA) was completed in February 2008 and the facility received a ranking of 2 on a scale of 1 to 5, where 1 represents the highest risk and 5 represents the lowest (Ecology 2008b).

The Crowley Marine Services property is included in two source control areas. Stormwater and groundwater from the northern and eastern portions of the facility flow toward Slip 4; therefore, it is included in the RM 2.8 East (Slip 4) source control area. Stormwater and groundwater from the southwestern portion of the property flow toward the LDW within the RM 2.3–2.8 East source control area; therefore, the Crowley Marine Services property is also included in the current SCAP for RM 2.3–2.8 East. Source control actions identified in the current SCAP focus on potential releases directly to the LDW; source control actions associated with potential recontamination of sediments in Slip 4 are provided in the Slip 4 SCAP.

Additional information on this property is provided in the following documents:

- Summary of Existing Information and Identification of Data Gaps, Slip 4 (SEA 2004);
- Lower Duwamish Waterway Source Control Action Plan for Slip 4 (Ecology 2006b); and
- Technical Memorandum, Crowley and First South Properties, Potential for Slip 4 Sediment Recontamination via Groundwater Discharge (SAIC 2006b).

3.7.1 Current Site Use

Alaska Logistics, LLC, a current tenant at the property, transfers containers for shipment to and from Alaska. The upland area of the parcel is used by Alaska Logistics for cargo container storage. Most of the facility is paved, with only the area adjacent to East Marginal Way S remaining unpaved. Some minor vehicle maintenance occurs on the site. Equipment and vehicles being transported occasionally leak oils and other fluids. During a recent inspection, spill control materials were available onsite, but no spill response plan was available (SPU 2004, as cited in Ecology 2006b). Ecology Facility/Site ID 63123962 has been assigned to Alaska Logistics, LLC.

Alaska Logistics, LLC is covered by the Industrial Stormwater General Permit (Permit No. SO3-009728A), under the facility name “Crowley Terminal – 8th Ave S.”

Union Pacific Railroad leases the northern portion of Parcel D for container storage and transport by trucks. Ecology has not determined if the General Industrial Stormwater Permit requirements apply to Union Pacific at this location. Crowley Marine Services recently notified UPRR that they must develop and implement a stormwater management program at their facility, including sweeping of paved areas and cleaning of stormwater catch basins on a regular basis (SLR 2009).

SLR performed a bank survey along the Crowley Marine Services property in July 2008. The property is bordered by a seawall constructed from interlocking sheets of steel plate. Boulder riprap is piled along the wall. SLR noted a 1-inch long crack and 3/4-inch diameter hole along a weld in the sheet piling (SLR 2008). In September 2008, Crowley plugged the crack and hole by welding a steel plate over the area (SLR 2009).

Wastewater

Wastewater is presumably discharged to the sanitary sewer. It is not clear if Crowley Marine Services, Alaska Logistics, or Union Pacific perform any vehicle or container washing activities at the property, and if so, where wash water is discharged.

Stormwater Discharges

Surface drainage for this property discharges to six 8-inch outfalls located along the north side of Slip 4 and the LDW (Figure 11). Two of these outfalls (2042 and 5006) are within the RM 2.3–2.8 East source control area. Alaska Logistics has submitted Discharge Monitoring Reports, in compliance with its NPDES permit, since January 2008. According to Ecology’s Water Quality Permit Life Cycle System database,⁶ zinc concentrations at the discharge monitoring location have ranged from 80 to 500 µg/L. No violations are noted.

Recent Regulatory Activities

In June 2008, Ecology determined that Crowley Marine Services is a Potentially Liable Person (PLP) for the release of arsenic, petroleum hydrocarbons, carcinogenic PAHs (cPAHs), and PCBs to soil at the property; and cPAHs, arsenic, and copper to groundwater at the property; and PAHs and PCBs to sediment in the LDW and Slip 4. Ecology and Crowley Marine Services are currently negotiating a draft Agreed Order to perform an RI/FS and prepare a draft cleanup plan (Ecology 2008d).

SPU inspected Alaska Logistics in June 2008 and found a number of problems related to spill containment and control, housekeeping practices, outdoor storage of leachable materials, and secondary containment for liquid storage areas. SPU also requested that the owner clean onsite catch basins. During a follow-up inspection in August 2008, SPU found that all corrective actions had been implemented (Schmoyer 2008b). In July, SPU also collected composite samples from two catch basins on the portion of the property that drains to Slip 4.

⁶ <http://www.ecy.wa.gov/programs/wq/permits/wplcs/index.html>

In 2008, EPA sent Request for Information 104(e) letters to Crowley Marine Services, Samson Tug and Barge Company, Inc. and Northland Services, Inc. (former operators at this property), and Evergreen Marine Leasing, Inc. (a former property owner). Crowley Marine Services submitted their response in July 2008.

A report describing environmental investigations conducted at the Crowley Marine Services property by SLR International was submitted to Ecology in August 2008 (SLR 2008). Ecology is currently reviewing this document. Results are described briefly in Section 3.7.3.

3.7.2 Past Site Use

Samson Tug and Barge previously leased a portion of Parcel D and moved to the Duwamish Marine Center in August 2008 (Samson Tug and Barge 2008). Samson Tug and Barge provided shipment of 20-foot and 40-foot dry containers and 20-foot shipping platforms and transported 5,000-gallon International Standards Organization (ISO) tanks and bulk Liquefied Petroleum Gas (LPG) tanks. Samson Tug and Barge offered trucking services in Seattle as well as connecting carrier agreements to transport cargo around the world.

Samson Tug and Barge continues to operate in leased warehouse space at the Pioneer Distribution facility (see Section 3.12).

Northland Services, Inc. previously leased a portion of this parcel. Northland carried an Industrial Stormwater General Permit (No. SO3-003646) while operating at this property.

Historical sources indicate other operations conducted at this property include wood treating, pipe dipping, log storage, and aluminum window manufacturing operations. Portions of the property were unpaved for much of its history. Large equipment has been used at the facility for much of its history. Soil and groundwater contamination is associated with USTs at the property. Companies that have previously operated at this property are (Foster 1945; Ecology 2007c):

- Pankrantz Lumber,
- Washington Excelsior and Manufacturing,
- Puget Timber,
- Washington Supply Manufacturing Company,
- Layrite Concrete Products,
- Hydraulic Supply Manufacturing,
- Port of Seattle (part of Terminal 118),
- Marine Power & Equipment, and
- Evergreen Marine Leasing.

3.7.3 Environmental Investigations and Cleanups

Environmental investigations were conducted at the Crowley Marine Services property in 1988, 1990, and 2008 to characterize soil and groundwater contamination. A summary of investigations is provided below; details of the 1988 and 1990 investigations are provided in the RM 2.3–2.8 East Data Gaps Report (SAIC 2008), the *Lower Duwamish Waterway Slip 4 Early Action Area, Engineering Evaluation/Cost Analysis* (Integral 2006), and the *LDW Source Control Action Plan for the Slip 4 Early Action Area* (Ecology 2006b). The 2008

investigation was completed after publication of the RM 2.3–2.8 East Data Gaps Report; information about this investigation follows the summary table.

Date	Investigation	Description	Chemicals with Concentrations Above MTCA Cleanup Levels or Sediment Screening Levels ⁷
1988	Report of Environmental Assessment – Parcel F, Soil and Groundwater Conditions (Hart Crowser 1989a)	Two USTs removed. Soil samples collected from the UST excavations and five surface soil samples collected. Two groundwater monitoring wells installed and sampled.	Soil: None Groundwater: Antimony, arsenic, bis(2-ethylhexyl)phthalate (BEHP)
1988	Report of Environmental Assessment – Parcel D, Soil and Groundwater Conditions (Hart Crowser 1989b)	Eighteen soil borings and four groundwater monitoring wells installed.	Soil: Arsenic Groundwater: Antimony, arsenic
1990	Report of Environmental Site Assessment (Landau Associates 1990)	Twenty-three soil borings advanced and nine groundwater monitoring wells installed.	Soil: 1,4-DCB, 2-methylnaphthalene, 2-methylphenol, 4-methylphenol, acenaphthene, acenaphthylene, anthracene, arsenic, benzo(a)anthracene, benzo(a)pyrene, benzo(g,h,i)perylene, benzofluoranthenes, BEHP, cadmium, chromium, chrysene, copper, dibenz(a,h)anthracene, dibenzofuran, fluoranthene, fluorene, indeno(1,2,3-cd)pyrene, lead, methylene chloride, naphthalene, PCBs, pentachlorophenol, phenanthrene, phenol, pyrene, TPH, zinc Groundwater: 2-methylnaphthalene, acenaphthene, arsenic, BEHP, dibenzofuran, fluorene, naphthalene, pentachlorophenol, phenanthrene
1990	Report of Supplemental Site Characterization – Parcel D (Hart Crowser 1990b)	Ten soil borings advanced and eight groundwater monitoring wells sampled.	Soil: 2-methylnaphthalene, acenaphthene, acenaphthylene, anthracene, arsenic, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, chrysene, dibenz(a,h)anthracene, fluoranthene, fluorene, indeno(1,2,3-cd)pyrene, naphthalene, phenanthrene, pyrene Groundwater: Arsenic, naphthalene

⁷ From RM 2.3–2.8 East Data Gaps Report (SAIC 2008), Tables 4 and 5

Date	Investigation	Description	Chemicals with Concentrations Above MTCA Cleanup Levels or Sediment Screening Levels ⁷
2008	Environmental Investigation Report, Crowley Marine Services Site (SLR 2008)	Installed seven groundwater monitoring wells, performed two groundwater sampling events, performed tidal study, performed bank survey and seep sampling.	Soil: 2-methylnaphthalene, acenaphthene, anthracene, arsenic, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, chrysene, dibenz(a,h)anthracene, fluoranthene, fluorene, indeno(1,2,3-cd)pyrene, naphthalene, phenanthrene, pyrene Groundwater: Arsenic, naphthalene

Environmental Investigation (2008)

In a study performed for Crowley Marine Services by SLR (2008), the following activities were conducted at the Crowley property in June and July 2008: installation of seven groundwater monitoring wells, two groundwater sampling events, a tidal study, a bank survey, and seep sampling. Chemicals detected in soil and groundwater are listed in Tables 2 and 3. Metals, PAHs, PCBs, SVOCs, and petroleum hydrocarbons were detected in soil and groundwater samples collected during the investigation (SLR 2008). Ecology is currently reviewing this report.

The study found that the bank along the southern and eastern edges of the Crowley property consists of a sheet-pile seawall that is approximately 1,035 feet long and extends to a depth of 43 feet below ground surface. The bank along the southwestern edge of the property consists of boulder riprap that is approximately 100 feet long and extends to the bottom of the bank; no exposed soil was observed (SLR 2009).

According to the SLR report, groundwater elevation data collected during the tidal study indicates that during high tides, water from the LDW flows onto the Crowley Marine Services property around the edges of the sheet pile wall, while during low tides groundwater flows from the Crowley property to the LDW around the edges of the sheet pile wall (SLR 2008).

During the bank survey, a seep was discovered at a crack around one of the welds in the sheet pile wall near the southwest loading ramp. The seep was flowing from an approximate 1-inch long crack and 3/4-inch diameter hole along a weld in the sheet piling (SLR 2009). A sample collected from the seep contained arsenic, barium, and selenium (Table 4) (SLR 2008). The seep was plugged in September 2009 by welding a piece of steel over the crack and hole (SLR 2009).

3.7.4 Potential for Future Releases to RM 2.3–2.8 East

The Crowley Marine Services property has a long history of industrial operations that may have resulted in soil and groundwater contamination. There is high potential for future releases of COCs to sediments associated with the RM 2.3–2.8 East source control area from the Crowley property for the following reasons:

- **Two outfalls connected to the property storm drain system discharge to the LDW.**

Spills and releases from current operations at the property could enter the onsite storm drain system and be discharged to the LDW through the outfalls located on the west side of the parcel. Zinc exceeded the SQS in a sediment sample collected from one of the onsite catch basins (SPU 2004). During a previous facility inspection, spill control materials were available onsite, but no spill response plan was available (SPU 2004).

- **Over-water operations are performed at the property.**

Activities at the Crowley Marine Services property include loading and unloading of cargo containers and liquid fuels. Accidental releases during loading or unloading operations may occur.

- **Soil and groundwater contamination has been documented.**

Past activities at the Crowley Marine Services property have resulted in soil and groundwater contamination. PAHs are of particular concern; historical acenaphthene and naphthalene concentrations in soil have exceeded soil-to-sediment screening levels by factors greater than 10,000; concentrations of 2-methylnaphthalene, benzo(a)anthracene, benzo(a)pyrene, benzofluoranthenes, dibenz(a,h)anthracene, dibenzofuran, fluoranthene, fluorene, indeno(1,2,3-cd)pyrene, and phenanthrene in soil have exceeded screening levels by factors of 1,000 and greater. Soil samples collected near the shoreline of the Crowley property in 2008 contained concentrations of PAHs, phthalates, and metals that slightly exceeded screening levels – the maximum exceedance factor was 23 (fluorene at 10 feet bgs in well CMW-3). If contaminants are present in soils not protected by the sheet pile wall, they could be released directly to sediments via erosion.

Historically, acenaphthene, arsenic, and BEHP concentrations in groundwater have exceeded the groundwater-to-sediment screening levels by factors of 10 and greater. Concentrations of COCs in the 2008 groundwater samples did not exceed the groundwater-to-sediment screening levels, although the MTCA cleanup level for arsenic was exceeded in wells CMW-1 through CMW-7.

Well CMW-7 was the only well installed on the Crowley Marine Services property that is within the RM 2.3–2.8 East source control area. Well CMW-7 is located to the west of the sheet pile wall; during low tides, groundwater from this area discharges to the LDW. Concentrations of PAHs and Aroclor 1254 slightly exceeded the soil-to-sediment screening levels in the soil sample collected from the saturated zone at well CMW-7. However, these chemicals were not detected in the groundwater samples collected from well CMW-7; only metals were detected and these concentrations *did not* exceed groundwater-to-sediment screening levels. COCs detected in soil and groundwater collected from well CMW-6 (near the RM 2.3–2.8 East source control area) did not exceed the soil-to-sediment or groundwater-to-sediment screening levels.

- **Groundwater beneath the western and southern portions of the property flows toward the LDW during low tide.**

Groundwater in the western and southern portions of the property discharges to the LDW within the RM 2.3–2.8 East source control area (Figure 3). Based on groundwater flow directions, COCs could be transported to the LDW during low tide.

Groundwater in this area is shallow, and the area reportedly has a high seepage level. Copper exceeded the chronic marine WQS in a sample collected adjacent to the Crowley Marine Services property within the RM 2.3–2.8 East source control area (Windward 2004).

- **PAHs and other COCs have been detected above the SQS values in LDW sediments adjacent to the property.**

PCBs and PAHs (benzo(a)anthracene, chrysene, dibenzofuran, fluoranthene, fluorene, indeno(1,2,3-cd)pyrene, phenanthrene, total high molecular weight PAH [HPAH], total low molecular weight PAH [LPAH] concentrations) have been detected at concentrations above the SQS and/or CSL in LDW sediments adjacent to this property. The presence of COCs in sediment *may or may not* be related to operations at the Crowley Marine Services property.

3.7.5 Source Control Actions

Information needed to assess the potential for sediment recontamination associated with current or historical operations at the Crowley Marine Services was summarized in the RM 2.3–2.8 East Data Gaps Report (SAIC 2008).

The following source control actions will be conducted to fill the identified data gaps and reduce the potential for recontamination of sediments associated with the RM 2.3–2.8 source control area:

- Ecology and SPU will conduct facility inspections for each of the current property occupants (Alaska Logistics and UPRR) to determine if current operations at the property could be a source of LDW sediment recontamination.
- Ecology will determine whether Crowley and/or UPRR are required to obtain NPDES industrial stormwater permits and will work with the property owners, as needed, to ensure compliance with NPDES requirements and stormwater BMPs to prevent the release of contaminants to the LDW.
- Ecology will request that the property owner/operator collect stormwater and/or solids data from the storm drain lines that discharge to the LDW to evaluate the potential for transport of contaminants to the LDW via stormwater.
- Ecology will request that Crowley Marine Services perform additional investigations, which will include collection of data on chemical concentrations in soil and groundwater at the western and southern portions of the property. These data are needed to evaluate the potential for groundwater from this property to recontaminate sediment associated with the RM 2.3–2.8 East source control area.
- Ecology will review responses to EPA's Request for Information 104(e) letters sent to Crowley Marine Services, Samson Tug and Barge Company, Inc., Northland Services, Inc., and Evergreen Marine Leasing, Inc.

- Ecology will review the Environmental Investigation Report dated August 1, 2008 (SLR 2008) and identify remaining data gaps and source control actions for the property.

3.8 Fox Avenue Building and Fox Avenue Building #2/Former Great Western Chemical Company

Current Operations	Chemical warehouse and distribution
Historical Operations	Chemical manufacturing
Address	6900 Fox Avenue S
Facility/Site ID	2282
NPDES Permit	None
Chemicals of Concern (Media Affected)	VOCs , phthalates, phenols, arsenic, chromium, lead, mercury, zinc, petroleum hydrocarbons (soil and groundwater)

The Fox Avenue Building (parcel 0087) is located at 6900 Fox Avenue S, with the Fox Avenue Building #2 (parcel 0089) immediately adjacent to the east. No address is listed for Fox Avenue Building #2. The properties are bordered by Shultz Distributing and S Willow Street to the north, East Marginal Way S to the east, the Whitehead Company, Inc./Former Tyee Industries parcel to the south, and the Guimont Parcel and Fox Avenue S to the west (Figure 2).

Parcel 0087 is owned by Fox Avenue Building LLC; parcel 0089 is owned by Fox Avenue Building #2 LLC. There are two buildings on the 2.53-acre parcel, a 38,650 sq ft warehouse and office building built in 1959 and a 4,000 sq ft warehouse built in 1929. This parcel is listed on the CSCSL as the “Fox Avenue Building” for confirmed halogenated organics, non-halogenated solvent, petroleum product, and PAH contamination in soil and groundwater. The Ecology Facility/Site ID is 2282.

This facility is included in two source control areas. Stormwater from the facility is conveyed to the S Brighton Street outfall; therefore, it is included in the RM 2.0-2.3 East Source Control Area. Source control actions relating to stormwater are discussed in the *Lower Duwamish Waterway, RM 2.0–2.3 East (Slip 3 to Seattle Boiler Works), Source Control Action Plan* (Ecology 2009c). Groundwater beneath this property, however, flows towards the S Myrtle Street Embayment, which is within the RM 2.3–2.8 East source control area. Thus, the facility and property are also included in the current source control area. Source control actions relating to soil and groundwater contamination are discussed in this SCAP.

3.8.1 Current Site Use

Cascade Columbia Distribution Company currently operates at 6900 Fox Avenue S. Cascade Columbia is a Northwest-based company that provides chemicals for aerospace, electronics, food manufacturing, personal care, metal plating, and water treatment industries.⁸

⁸ Cascade Columbia Distribution Company website:
<http://www.cascadecolumbia.com/Home/tabid/58/Default.aspx>

Recent Regulatory Activities

In July 2008, EPA sent General Notice 107(e) and Request for Information 104(e) letters to Great Western Chemical Company (historical operator).

Ecology performed a facility inspection of Cascade Columbia Distribution in July 2008. The Ecology inspector directed Cascade Columbia to update its Dangerous Waste Activity Notification and noted an excessive accumulation of outdated chemicals (Jeffers 2008b). Cascade Columbia achieved compliance for these corrective actions in August 2008 (Jeffers 2008c). The complete inspection reports are not yet available for review.

3.8.2 Past Site Use

Great Western Chemical Company (GWCC), a Division of McCall Oil and Chemical Corporation (Ecology 1986c), formerly operated at 6900 Fox Avenue S from about the mid-1950s; the company was engaged in the commercial repackaging and distribution of chemicals and petroleum products (Ecology 2009a). GWCC handled the following chemical classes and product types at the property (Terra Vac and Floyd|Snider 2000a):

- Ketones: MEK, methyl iso-butyl ketone, and acetone;
- Monocyclic aromatic solvents: toluene and xylenes;
- Alcohols and glycols: isopropyl alcohol, ethyl alcohol, methyl alcohol, ethylene glycol, and propylene glycol;
- Mineral spirits/petroleum solvents: kerosene and Chevron solvents 325, 350-B, 410, and 450;
- Chlorinated compounds: methylene chloride, PCE, pentachlorophenol, TCE, and 1,1,1-TCE;
- Acids: nitric, sulfuric, and muriatic (hydrochloric) acids;
- Dry products: phosphates, soda ash, titanium dioxide, borax and boric acid, calcium chloride, and calcium sulfate;
- Miscellaneous chemicals: ferric and ammonium chloride etchants, phenols, hydrogen peroxide, and linseed oil;
- Stoddard solvents;
- Sodium chlorate;
- Potassium carbonate; and
- Caustic soda.

3.8.3 Environmental Investigations and Cleanups

Several environmental investigations or cleanup actions have been conducted at the Fox Avenue Building/Fox Avenue Building #2 property. Since 1989, investigation activities have identified several contaminants in soil and groundwater at this property and locations to the south and west (Guimont Parcel, Seattle Boiler Works, Whitehead Company, Inc./Former Tyee Industries, and Seattle Iron & Metals). Figure 8 depicts the estimated extent of contaminated groundwater. Much of this contamination is attributed to the historical handling and storage of materials by the former GWCC. The primary contaminants identified in soil

and groundwater are chlorinated solvents (PCE, TCE and their associated degradation products), pentachlorophenol, and petroleum hydrocarbons (Ecology 2009a).

In 1991, Ecology and GWCC signed an Agreed Order (No. DE TC91-N203), which required GWCC to conduct an RI/FS at the site. GWCC and its contractors submitted a Remedial Investigation/Preliminary Risk Assessment in 1993 and a Supplemental Remedial Investigation and Feasibility Study in 2000. Activities conducted at the property between 1990 and 2000 are summarized below. Additional information is provided in the RM 2.3–2.8 East Data Gaps Report (SAIC 2008) and the Slip 3 Data Gaps Report (E&E 2008).

Date	Investigation/ Cleanup	Description	Chemicals with Elevated Concentrations
1990	Soil Samples from Loading Dock (Hart Crowser 1990a)	Three soil borings advanced around a diesel UST.	Soil: Benzene, toluene, ethylbenzene and xylenes (BTEX), gasoline-range hydrocarbons, methylene chloride, PCE, TCE Groundwater: TCE
1990	UST Removal and Initial Site Assessment (Hart Crowser 1990c)	Soil and groundwater assessment performed.	Soil: 1,1,1- TCA, BTEX, methylene chloride, PCE, TCE, light-range TPH Groundwater: Benzene, chloroform, methylene chloride, PCE, TCE, light-range TPH, vinyl chloride
1991-1993	Technical Memorandum No. 5 (Hart Crowser 1992a) Monitoring Well Installation (ATI 1991a, b; Ecology 1991a, b) Technical Memorandum No. 4, Preliminary Development of Baseline Risk Assessment (Hart Crowser 1992b) Technical Memorandum No. 8, IRM Progress Report and Proposed Pilot Test Design (Hart Crowser 1993a) Remedial Investigation and Preliminary Risk Assessment (Hart Crowser 1993b)	Three soil borings and one groundwater monitoring well installed. Collection of shallow soil samples. Two observation monitoring wells installed. Ecology collected split soil samples during the well installation and monitoring activities. Fifteen soil borings and monitoring wells installed at the facility.	Soil: 1,1,1-TCA, 1,1- DCE, 1,2-DCB, 1,4-DCB, 1,4-dimethylbenzene, 2,4-dimethylphenol, 2-methylnaphthalene, 4-methylphenol, acenaphthylene, arsenic, BTEX, benzo(a)pyrene, BEHP, butylbenzylphthalate, cadmium, chromium, dibenzofuran, diesel-, gasoline-, and heavy oil-range hydrocarbons, light-range TPH, di-n-butyl phthalate, dioxins, fluorene, furans, lead, mercury, methylene, chloride, naphthalene, PCE, pentachlorophenol, phenanthrene, styrene, TCE, zinc Groundwater: 1,1,1-TCA, 1,1,2-TCA, 1,1-DCE, 1,2-DCA, 1,2-DCE, 1,2-DCB, 1,2-dichloropropane, 1,4-DCB, 2,4-dimethylphenol, MEK, 2-methylnaphthalene, 2-methylphenol, 4-methyl-2-pentanone, acetone, arsenic, BTEX, benzo(a)anthracene, BEHP, cadmium, carbazole, chloroform, chromium, chrysene, cis-1,2-DCE, copper, dibenzofuran, diesel- and gasoline-range hydrocarbons, light-range TPH, ethylene glycol, fluorene, gasoline-range hydrocarbons, lead, mercury, methanol, methylene chloride, naphthalene, PCE, pentachlorophenol, phenanthrene, styrene, TCE, vinyl chloride, zinc

Date	Investigation/ Cleanup	Description	Chemicals with Elevated Concentrations
1995	Soil Contamination Discovered During Interim Remedial Measures (Hart Crowser 1995)	Contaminated soil discovered approximately 50 feet to the east and west of a wooden "catch basin."	Soil: 2-methylnaphthalene, BEHP, dibenzofuran, di-n-butyl phthalate, fluorene, naphthalene, PCE, pentachlorophenol, phenanthrene, TCE, toluene, xylenes (total)
1995-1996	Annual Groundwater Monitoring (Hart Crowser 1997)	Groundwater was monitored at selected wells both on and off the GWCC property.	Groundwater: 1,1,1-TCA, 1,1,2-TCA, 1,2-DCA, 1,2-DCE (total), 1,2-dichloropropane, 4-methyl-2-pentanone, BTEX, BEHP, chloroform, methylene chloride, PCE, pentachlorophenol, styrene, TCE, vinyl chloride
1997-1999	Supplemental Remedial Investigation and Feasibility Study (Terra Vac and Floyd Snider 2000a)	Groundwater monitoring continued at the property. Twenty-three permanent and temporary groundwater monitoring wells installed.	Soil: Benzene, PCE, TCE Groundwater: 1,1,1-TCA, 1,2,4-TMB, 1,2-DCA, 1,2-DCB, 1,2-dichloropropane, 1,3,5-TMB, 1,4-DCB, 2-methylphenol, BTEX, BEHP, chloroform, cis-1,2-DCE, methylene chloride, naphthalene, PCE, pentachlorophenol, phosphorus (total), styrene, TCE, trans-1,2-DCE, vinyl chloride
2000	Supplemental Investigation Report on the S Willow Street Right-of-Way (Terra Vac and Floyd Snider 2001a)	Soil and groundwater samples collected from 12 temporary groundwater monitoring wells.	Soil: PCE Groundwater: Diesel- and gasoline-range hydrocarbons, PCE, TCE

In 2001, GWCC filed for bankruptcy. Fox Avenue Building LLC purchased the property in 2003, and Amendment No. 1 to the Agreed Order substituted Fox Avenue Building LLC for GWCC. The new property owner was also required to conduct a supplemental investigation and a pilot study to evaluate in situ chemical oxidation technologies, and prepare a feasibility addendum and a draft Cleanup Action Plan (dCAP) (Ecology 2009a).

Between 2003 and 2007, Environmental Resources Management (ERM) conducted supplemental investigations and feasibility studies on behalf of Fox Avenue Building LLC. This work culminated in a three-year long expanded pilot study (EPS) to evaluate in situ chemical oxidation technologies. In December 2007, ERM submitted a Draft Fox Avenue Expanded Pilot Study Phase III Memorandum, which concluded that in situ chemical oxidation technology was not likely to be effective in permanently reducing solvent concentrations to the maximum extent feasible, and would not be selected as the permanent cleanup alternative for the site. Ecology reviewed the memorandum and concurred with this conclusion (Ecology 2009a).

In March 2008, Ecology and Fox Avenue Building LLC agreed that the company would proceed with a groundwater Enhanced Reductive Dechlorination (ERD) interim action and would conduct additional evaluation of source controls in a Supplemental Feasibility Study (Ecology 2009a). A new Agreed Order (DE 6486) was signed by Ecology and Fox Avenue

Building LLC in May 2009, which requires Fox Avenue Building LLC to perform the following actions:

- Conduct a groundwater ERD interim measure to control the discharge of the chlorinated solvent groundwater plume to the LDW.
- Conduct a data gaps investigation of the source area silts.
- Conduct a vapor intrusion evaluation to assess the potential for onsite exposure to PCE at the office portion of the property due to vapor intrusion.
- Evaluate the option of restarting operation of the existing Soil Vapor Extraction (SVE) system if it found that a vapor intrusion pathway exists.
- Prepare a new FS to develop and evaluate cleanup action alternatives to enable selection of a cleanup action for the site, in accordance with MTCA.
- Prepare a dCAP, which will detail the proposed cleanup action.

A draft Feasibility Study report is scheduled to be completed in August 2009; the dCAP is scheduled to be completed in November 2009 (Ecology 2009a).

Potential for Future Releases to RM 2.3–2.8 East

The potential for sediment recontamination associated with these properties is high, for the following reasons:

- **Soil and groundwater contamination have been documented.**

Soil and groundwater contamination have been documented at the Fox Avenue Building/Fox Avenue Building #2 property. Available data indicate that chlorinated solvents, pentachlorophenol, phthalates, petroleum hydrocarbons, and other contaminants are present at this property at concentrations significantly above MTCA cleanup levels and/or soil-to-sediment or groundwater-to-sediment screening levels. Dioxins and furans were detected in some environmental soil samples collected from the property.

- **Groundwater beneath the facility flows towards the S Myrtle Street Embayment and the LDW.**

Previous environmental investigations have shown that contaminants originating from soil and groundwater beneath this property are transported via groundwater to the S Myrtle Street Embayment. Therefore, contaminated groundwater from this facility may be an ongoing source of contamination to sediments associated with the RM 2.3–2.8 East source control area.

- **COCs have been detected in LDW sediments downgradient from the property.**

Dioxins and furans were detected in one surface and three subsurface sediment samples (from a single station) in the S Myrtle Street Embayment, and in a surface sediment sample just downstream of the embayment. Organo-tin compounds were detected in one surface sample in the S Myrtle Street Embayment. Metals, PAHs, and PCBs were detected in both surface and subsurface sediment samples; however, the concentrations did not exceed the SQS/CSL.

The presence of these COCs in sediment *may or may not* be related to the groundwater contaminant plume emanating from the former GWCC.

3.8.4 Source Control Actions

Information needed to assess the potential for sediment recontamination associated with current or historical operations at the Fox Avenue Building property was summarized in the RM 2.3–2.8 East Data Gaps Report (SAIC 2008). Investigation and remediation activities are currently underway at this property, in accordance with Ecology Agreed Order No. DE 6486.

The following source control actions will be conducted to fill the identified data gaps and reduce the potential for recontamination of sediments associated with the RM 2.3–2.8 East source control area:

- Ecology will continue to monitor the progress of actions required under the Agreed Order to investigate and remediate soil and groundwater contamination at the property.
- Ecology will review responses to EPA’s Request for Information 104(e) letter sent to Great Western Chemical Company, including evaluation of the presence and/or potential for generation of dioxin associated with former activities at the property.

In addition, Ecology and SPU will conduct periodic source control inspections to ensure compliance with all applicable BMPs.

3.9 Whitehead Company, Inc./Former Tye Industries

Current Operations	Parking, truck storage
Historical Operations	Pentachlorophenol dip tank; no other information available
Address	730 S Myrtle Street
Facility/Site ID	48578491
NPDES Permit	None
Chemicals of Concern	VOCs, pentachlorophenol, petroleum hydrocarbons (groundwater)
Media Affected	Groundwater

The Whitehead Company, Inc./Former Tye Industries property is located at 730 S Myrtle Street. The 3.22-acre, vacant parcel is owned by Whitehead Company, Inc. The parcel is bordered by the Fox Avenue Building parcels to the north; El Gallo d’Oro Restaurant to the east; the Whitehead Company, Inc./Former Perkins Lot parcel, Seattle Iron & Metals, and S Myrtle Street to the south; and Seattle Boiler Works and Fox Avenue S to the west (Figure 2).

3.9.1 Current Site Use

Seattle Iron & Metals leases the parcel for employee parking and truck storage. Based on a reconnaissance visit conducted in January 2008, the parcel appears to be unpaved. SPU GIS maps indicate that stormwater from this parcel drains to the combined sewer system. (Figure 5).

3.9.2 Past Site Use

Tyee Industries (Tyee) previously operated at this property and used 765 S Myrtle Street as its operating address. Tyee operated at the property from approximately 1906. The improvements on the property were purchased by CECO Corporation in 1982. The property owners, Messrs. Paul Duncan and Arnie Thorson, were operating a pentachlorophenol dip tank at the property. CECO discontinued use of the tank when it took over operations in 1982 (Ecology 1986a).

3.9.3 Environmental Investigations and Cleanups

An environmental investigation was performed at the property in 2000 to assess contamination at the property boundary with the Fox Avenue Building/GWCC. A summary of the investigation is provided below; details are provided in the RM 2.3–2.8 East Data Gaps Report (SAIC 2008).

Date	Investigation/ Cleanup	Description	Chemicals with Elevated Concentrations
2000	Supplemental Investigation (Terra Vac and Floyd Snider 2001b)	An investigation was conducted at the Whitehead Property to further assess and document VOC and SVOC contamination in soil and groundwater on the property.	Soil: PCE, pentachlorophenol, TCE, vinyl chloride Groundwater: Gasoline-range hydrocarbons, PCE, pentachlorophenol, TCE, toluene, vinyl chloride

3.9.4 Potential for Future Releases to RM 2.3–2.8 East

Soil and groundwater contamination have been documented at the Whitehead Company/Former Tyee Industries property. Available data indicate that VOCs, pentachlorophenol, and petroleum hydrocarbons are present at this property above MTCA cleanup levels and soil-to-sediment or groundwater-to-sediment screening levels.

Groundwater beneath this property is contaminated with VOCs and other chemicals. Contamination may be related to former activities at the Fox Avenue Building property to the north (see Section 3.8 and Figure 8). Based on previous environmental investigations, groundwater flow direction in this area is towards the S Myrtle Street Embayment and the LDW. VOCs have also been detected in seep water samples collected at the S Myrtle Street Embayment (Terra Vac and Floyd|Snider 2000b). Contaminated groundwater from this facility may be an ongoing source of contamination to sediments associated with the RM 2.3–2.8 East source control area.

3.9.5 Source Control Actions

Information needed to assess the potential for sediment recontamination associated with current or historical operations at the Whitehead Company, Inc./Former Tyee Industries property was summarized in the RM 2.3–2.8 East Data Gaps Report (SAIC 2008).

The following source control actions will be conducted to fill the identified data gaps and reduce the potential for recontamination of sediments associated with the RM 2.3–2.8 East source control area:

- Ecology will require the property owner/operator to address the pentachlorophenol contamination in groundwater discovered by Cascade Columbia Distribution’s consultant Floyd|Snider.
- Ecology and SPU will perform a business inspection to determine if the property is used for operations other than employee parking and determine if operations at the property could be an ongoing source of contaminants to LDW sediments.

3.10 Whitehead Company, Inc./Former Perkins Lot

Current Operations	Metal fabrication, coffee roasting, auto wrecking
Historical Operations	Auto disassembly and repair, hardwood veneer and plywood manufacturing, industrial gases
Address	719 S Myrtle Street, 711 S Myrtle Street, 700 S Orchard Street, 745 S Myrtle Street
Facility/Site ID	56476471 (Commercial Welding & Fabrication) 43114188 (Perkins Lot) 65495133 (Royal Line Cabinet Company) 29782814 (American Dry Ice Corporation)
NPDES Permit	None
Chemicals of Concern (Media Affected)	Chromium (soil)

The Whitehead Company, Inc./Former Perkins Lot is located at 719 S Myrtle Street (Figure 2). The property is bordered by the Seattle Iron & Metals employee parking lot and S Myrtle Street to the north; Nelson Trucking and 8th Avenue S to the east; former Trim Systems, the smaller of the two Frye parcels, and S Orchard Street to the south; and Seattle Iron & Metals and 7th Avenue S to the west.

There are five buildings on the property:

- A 9,000 sq ft industrial light manufacturing building constructed in 1940,
- A 25,190 sq ft industrial light manufacturing building constructed in 1936,
- A 6,000 sq ft warehouse built in 1967,
- A 5,064 sq ft warehouse and office built in 1981, and
- A 3,888 sq ft office building constructed in 1951.

3.10.1 Current Site Use

Commercial Welding and Fabrication operates at 711 S Myrtle Street. The Ecology Facility/Site ID is 56476471 and EPA ID is WAD988484556 (inactive). SPU and Ecology inspected the facility on July 17, 2008; no corrective actions were assigned to the facility (Jeffers 2008b).

Caffe D'Arte Roasting Plant currently operates at 719 S Myrtle Street. Caffe D'Arte began operations in 1985. Caffe D'Arte coffee blends are roasted in small wood-fired roasters and gas-fired roasters.

Taxi King Auto Wrecking currently operates at 720 S Orchard Street. According to Ecology's Perkins Lot file, this is the same address as 719 S Myrtle Street. Taxi King Auto Wrecking apparently subleased a portion of its facility to Sam Perkins. The facility is a salvage yard primarily for police cars and taxis (SPU 2005). Car parts including doors, tires, steering wheels, and other parts are removed from the cars and sold.

United Rentals Trench Safety currently operates at 7135 8th Avenue S. Nelson Trucking formerly occupied this portion of the Whitehead parcel (Whitehead Company 1992).

Svendsen Brothers Fish Company, a fish processing facility, currently operates at 745 S Myrtle Street (Jeffers 2008d). Several storm drains and floor drains are present at the facility. SPU conducted a dye test in July 2008. Four storm drains discharge to the LDW through the S Myrtle Street Outfall. Indoor floor drains and one outdoor storm drain and a trench drain discharge to the sanitary sewer (Ecology 2008e).

Recent Regulatory Activities

In July 2008, SPU and Ecology inspected Svendsen Brothers Fish Company and Taxi King. Several corrective actions were identified for both facilities. SPU and Ecology directed Taxi King to obtain an NPDES permit for discharge, improve spill management procedures, properly dispose of waste, and properly label containers (Schmoyer 2008a). The full inspection report for Taxi King was not available for review.

SPU and Ecology directed Svendsen Brothers to obtain an NPDES permit for discharge to the storm drain and a KCIW discharge authorization or permit for discharges to the sanitary sewer, improve spill response procedures, improve housekeeping, clean facility storm drains, and cease discharge of process water to the sanitary sewer (SPU 2008a, 2008b). SPU re-inspected the facility on September 17, 2008. Svendsen Brothers had implemented all corrective actions, although the company is still in the process of obtaining NPDES and KCIW discharge permits (SPU 2008c).

3.10.2 Past Site Use

The **Former Perkins Lot** is an area of the Whitehead parcel immediately east of Taxi King Auto Wrecking. It is called the Perkins Lot because a Mr. Sam Perkins used the area to store, dismantle, and repair automobiles. Based on information in the files reviewed by SAIC, it appears that Mr. Perkins was not authorized to perform these activities by the property owner. In February 2006, the former Perkins Lot was listed on Ecology's CSCSL due to petroleum staining of soil at the property. Based on King County tax records, Ecology assigned the 719 S Myrtle Street address to this area of the property (SPU 2005).

Royal Line Cabinet Company operates or has previously operated on, the Whitehead Company, Inc./Former Perkins Lot parcel using the address 700 S Orchard Street. The Ecology Facility/Site ID is 65495133.

American Dry Ice Corporation, Repair Division operates or has previously operated on, the Whitehead Company, Inc./Former Perkins Lot parcel using the address 745 S Myrtle Street. The Ecology Facility/Site ID is 29782814.

Bigley’s hand-made furniture facility may have also operated at this property (Matlock 1998).

3.10.3 Environmental Investigations and Cleanups

Two environmental investigations have been performed at this property. A summary of the investigations is provided below; details are provided in the RM 2.3–2.8 East Data Gaps Report (SAIC 2008).

Date	Investigation/ Cleanup	Description	Chemicals with Elevated Concentrations
1991	UST Removal (Whitehead Company 1992)	A 12,000-gallon diesel UST removed from the property. Diesel-range hydrocarbons were reported in one soil sample.	None
2006	Perkins Lot Surface Soil Sampling (SKCDPH 2006)	Soil samples collected at the lot due to the presence of petroleum staining on the property. The samples were analyzed for petroleum hydrocarbons and metals.	Soil: Chromium

3.10.4 Potential for Future Releases to RM 2.3–2.8 East

There is a potential for future releases of COCs to the RM 2.3–2.8 East source control area from the Whitehead Company, Inc./Former Perkins Lot parcel. This property is used by multiple facilities and the onsite drainage system could have been modified by these tenants. However, based on information from SPU, stormwater from the eastern portion drains to the combined sewer on S Myrtle Street; stormwater from the western half of the property discharges to the city’s S Myrtle Street storm drain, which discharges to the LDW at the S Myrtle Street Embayment. Spills that may occur at the property could enter the onsite storm drain system and be discharged to the LDW through this outfall.

3.10.5 Source Control Actions

Information needed to assess the potential for sediment recontamination associated with current or historical operations at the Whitehead Company/Former Perkins Lot property was summarized in the RM 2.3–2.8 East Data Gaps Report (SAIC 2008).

The following source control actions will be conducted to fill the identified data gaps and reduce the potential for recontamination of sediments associated with the RM 2.3–2.8 East source control area:

- Ecology and SPU will perform facility inspections to determine if any of the activities at these businesses require an NPDES permit, and if required, to ensure compliance with permit requirements and stormwater BMPs to prevent release of contaminants to

the LDW. Ecology will obtain a facility plan from the property owner showing the locations of all catch basins and storm drains.

- Ecology and KCIW will continue to assist Svendsen Brothers with obtaining coverage under the Industrial Stormwater General Permit and KCIW discharge authorization or permit for discharges to the storm drain and sanitary sewer.
- Ecology and SPU will perform follow-up inspections at Taxi King as needed to ensure that corrective actions identified in July 2008 have been implemented.
- Ecology will obtain a list of previous tenants from the property owner and will evaluate the previous tenants' operations to determine if operations at the property could have resulted in soil and groundwater contamination.

In addition, Ecology and SPU will conduct periodic source control inspections to ensure compliance with all applicable BMPs.

3.11 Former Trim Systems

Current Operations	Storage yard
Historical Operations	Manufacture of hard and soft trim interior products for heavy-duty commercial vehicles; material and equipment storage
Address	701 S Orchard Street
Facility/Site ID	93184477
NPDES Permit	None
Chemicals of Concern (Media Affected)	No information

Trim Systems was formerly located at 701 S Orchard Street (Figure 2). The parcel is bordered by the Whitehead Company, Inc./Former Perkins Lot parcel and S Orchard Street to the north, the smaller of the two Frye parcels to the east, S Garden Street and Pioneer Distribution to the south, and Seattle Iron & Metals to the west.

The Shalmar Group purchased the property in March 2008 from Trim Systems (formerly Tempress).⁹ Tempress purchased the parcel from Manson Construction and Engineering in August 1986. There are five buildings on the 2.45-acre parcel. These include:

- A 131,400 sq ft office and factory built in 1933,
- A 2,160 sq ft industrial light manufacturing shop built in 1975,
- A 3,072 sq ft storage warehouse/shed built in 1975,
- A 720 sq ft materials storage shed built in 1980, and
- A 768 sq ft materials storage shed built in 1975.

⁹ King County Property Report:
http://www5.kingcounty.gov/kcgisreports/property_report.aspx?PIN=2136200380

3.11.1 Current Site Use

Trim Systems closed the Seattle facility in early 2008. The company's operations have recently moved to North Carolina, and Vancouver and Kent, Washington. The Ecology Facility/Site ID assigned to the former Trim Systems property is 93184477.

Seattle Iron & Metals is currently using the yard for storage. It is not clear if Seattle Iron & Metals is using the buildings at this time (SAIC 2008).

Trim Systems designed, engineered, manufactured, and delivered interior soft trim and hard trim products for the trucking industry. Electronic and electrical distribution systems from its wire harness business were also incorporated into the trim products. Soft trim products were produced using 2D, dielectric, and cut-and-sew processes. Hard trim products were manufactured using rotary thermoforming, injection molding, vacuum forming, six axis router cutting, reinforced vinyl clad RIM, and 3D compression molding processes (Trim Systems 2009).

Recent Regulatory Activities

In July 2008, EPA sent Request for Information 104(e) letters to Seattle Iron & Metals, Manson Construction, and Northwest Container Services, Inc. Manson Construction and Northwest Container Services, Inc. are previous operators at this property.

3.11.2 Past Site Use

Manson Construction previously operated at this parcel. Manson Construction's activities included material and equipment storage, cargo marshaling, packing, shop and storage buildings, and vessel moorage (City of Seattle 1984).

Northwest Container Services, Inc. (Northwest Container) previously operated at 600 S Garden Street. The company currently operates at 110 West Marginal Way SW (Terminal 115) and 635 S Edmunds, Seattle. Ecology Facility/Site ID 4524834 was assigned to Northwest Container for this property.

In March 1992, **Northland Services, Inc.** filed a Notification of Dangerous Waste Activities form with Ecology. The form indicates that Northland was operating as a generator and transporter of dangerous waste. The EPA Site ID is listed as WAD981773005. The address for these activities is listed as 600 S Garden Street, which indicates that Northland was operating at this parcel (Northland 1992).

The following businesses have also operated at the former Trim Systems parcel; however, the period of operations was not identified:

Business Name	Address	EPA ID	Ecology Facility/Site ID
Orchard Street Drums	701 S Orchard Street	WAD988474557 (inactive)	None
AT&T Wireless Tempress	701 S Orchard Street	None	6254510
Coastal Alaska Marine Lines	745 S Orchard Street	WAD980834527 (inactive)	67744521

3.11.3 Environmental Investigations and Cleanups

No records of environmental investigations or cleanups for the former Trim Systems parcel were found in the files reviewed by SAIC.

3.11.4 Potential for Future Releases to RM 2.3–2.8 East

There is potential for future releases of COCs to the RM 2.3–2.8 East source control area from the former Trim Systems property via city storm drains. SPU GIS maps show that onsite catch basins on the eastern side of the property are connected to the city's S Garden Street storm drain. The western side of the property could drain to either the S Myrtle Street or the S Garden Street storm drains. Spills that occur at uncovered areas of the property could enter the city of Seattle storm drain system and be discharged to the LDW through the storm drain outfalls located at S Garden Street and S Myrtle Street.

One previous site tenant, Northwest Container Services, may have had an NPDES permit for operations at this facility.

3.11.5 Source Control Actions

Information needed to assess the potential for sediment recontamination associated with future, current, or historical operations at the former Trim Systems property was summarized in the RM 2.3–2.8 East Data Gaps Report (SAIC 2008).

The following source control actions will be conducted to fill the identified data gaps and reduce the potential for recontamination of sediments associated with the RM 2.3–2.8 East source control area:

- Ecology and SPU will perform a facility inspection to ensure that operations at the facility are in compliance with applicable regulations and BMPs to prevent the release of contaminants to the LDW. Additionally, Ecology will determine if operations at the property require an NPDES permit.
- Ecology will review responses to EPA's Request for Information 104(e) letters sent to Seattle Iron & Metals, Manson Construction, and Northwest Container Services, Inc.

In addition, Ecology will monitor operations at the facility to ensure compliance with NPDES permit requirements and stormwater BMPs to prevent the release of contaminants to the LDW.

3.12 Nitze-Stagen/Frye Parcels

Current Operations	Warehouse
Historical Operations	Car care product distribution
Address	660 S Othello Street; 7101 8 th Avenue S
Facility/Site ID	41689573 (Pacific Terminals, Ltd.) 76518153 (Dinol US)
NPDES Permit	None
Chemicals of Concern (Media Affected)	None identified

The Nitze-Stagen/Frye Parcels are at 660 S Othello Street (large parcel) and 7101 8th Avenue S (small parcel) in an industrial area of Seattle (Figures 2 and 7). The large parcel is bordered by former Trim Systems, the smaller of the two Frye Parcels, and S Garden Street to the north; Markey Machinery Company and 8th Avenue S to the east; Puget Sound Truck Lines and S Othello Street to the south; and Seattle Iron & Metals to the west. The small parcel is bordered by the Whitehead parcel and S Orchard Street to the north, the former Sternoff parcel and 8th Avenue S to the east, Pioneer Distribution (larger Frye parcel) and S Garden Street to the south, and by Trim Systems to the west.

The large parcel is 3.54 acres in size with one building on the property, a 119,661 sq ft warehouse that was built in 1960. The small parcel is 0.46-acre in area and is vacant. The taxpayer is Nitze-Stagen & Co. Inc., a real estate investment firm. The parcels were purchased by Charles & Emma Frye Free Public Art Museum in November 2004.

3.12.1 Current Site Use

As of January 2008, building signage is for **Pioneer Distribution**. Samson Tug and Barge leases warehouse space at the Pioneer Distribution facility. No other information on current site use was available.

Recent Regulatory Activities

In July 2008, EPA sent Request for Information 104(e) letters to Nitze-Stagen and Pioneer Human Services (owner of Pioneer Distribution).

3.12.2 Past Site Use

Pacific Terminals Ltd. previously operated the warehouse at the large parcel. In June 1989, Pacific Terminals was assigned EPA ID No. WAD988467700 as a generator of hazardous waste. In October 1989 this number was cancelled. Pacific Terminals is currently located between Port of Seattle Terminals 5 and 18. Ecology Facility/Site ID 41689573 is assigned to Pacific Terminals.

Dinol US previously operated at 650 S Othello Street. Dinol US produces products for the aerospace and automotive aftermarket industries and general industry. Aerospace products include corrosion inhibiting compounds for prolonging the life of commercial, military, and private aircraft. Automotive aftermarket products include car care, body repair products, and

bonding products for auto glass replacement and for the manufacturing of buses and trucks. Industrial products include Dinitrol rust preventative waxes, paint primers, lacquers, and corrosion preventative fluids. Ecology Facility/Site ID 76518153 is assigned to Dinol US.

3.12.3 Environmental Investigations and Cleanups

No records of environmental investigations or cleanups for the Nitze-Stagen/Frye parcels were found in the files reviewed by SAIC.

3.12.4 Potential for Future Releases to RM 2.3–2.8 East

The potential for future releases of COCs to the RM 2.3–2.8 East source control area from the Nitze-Stagen/Frye parcels cannot be determined. However, based on SPU GIS maps, onsite catch basins from the large parcel are connected to a private storm drain system (Outfall 2037 on Figure 5) and runoff from the small parcel discharges to the city’s S Garden Street storm drain (Figure 5). Therefore, spills that may occur at uncovered areas of the larger parcel could reach the LDW. Spills that may occur at the small parcel may enter the city storm drain system and be discharged to the LDW via the S Garden Street outfall.

3.12.5 Source Control Actions

Information needed to assess the potential for sediment recontamination associated with current or historical operations at the Nitze-Stagen/Frye parcels was summarized in the RM 2.3–2.8 Data Gaps Report (SAIC 2008).

The following source control actions will be conducted to fill the identified data gaps and reduce the potential for recontamination of sediments associated with the RM 2.3–2.8 East source control area:

- Ecology and SPU will perform business inspections to ensure that operations at the Pioneer Distribution facility are in compliance with applicable regulations and BMPs to prevent the release of contaminants to the LDW.
- Ecology will review responses to EPA’s Request for Information 104(e) letters sent to Nitze-Stagen and Pioneer Human Services.

Ecology will continue periodic inspections to ensure that operations are in compliance with applicable regulations and BMPs to prevent the release of contaminants to the LDW.

3.13 Former Sternoff Parcel

Current Operations	Construction, demolition, and land-clearing debris recycling
Historical Operations	Scrap metal salvage, truck and container storage, thermal soil treatment
Address	7201 East Marginal Way S
Facility/Site ID	2057
NPDES Permit	None
Chemicals of Concern (Media Affected)	PCBs, metals, VOCs, PAHs, TPH (soil) PCBs, metals (mercury, chromium, copper, lead), TPH (groundwater)

The former Sternoff Parcel is located at 7201 East Marginal Way S in an industrial area of Seattle (Figures 2 and 7). The property is currently owned by Ellis Garage, LLC. The parcel is bordered to the north by Nelson Trucking; to the east by East Marginal Way S; to the south by Markey Machinery Company, Crowley Parcel F, and S Garden Street; and to the north by the smaller Frye parcel and 8th Avenue S.

According to tax records, the parcel is 1.85 acres in size and there are no permanent structures on the property. However, previous environmental investigations describe the presence of asbestos-containing materials in the facility's aluminum smelter office, locker rooms, and office buildings. Additionally, in a 1995 aerial photograph, at least two buildings are present on the property (SAIC 2008).

Depth to groundwater is approximately 10 to 11 feet bgs and groundwater flows both westerly towards the LDW and southerly to Slip 4, and may be tidally influenced (Terra Associates [Terra] 1987; SEACOR 1991).

Stormwater Discharges

A stormwater collection system was installed at the site in the early 1950s. The system consisted of seven catch basins draining to a sump located on 8th Avenue S. The sump pump was activated by a water level switch. The pump conveyed the water to the city storm drains discharging to the METRO sewer (Ecology 1986b). As of the 1990s, the pump had not been operational in "several years" and SEACOR reported that the system was filled with sediment and water, which resulted in water puddles forming on the property (SEACOR 1991).

During a March 2006 SPU and Ecology inspection, the loading area was full of water because the catch basin was not draining properly. SPU subsequently conducted a dye test and determined that the four catch basins at this property drain to the combined sewer system and therefore do not flow to the RM 2.3–2.8 East source control area (SPU 2006a).

3.13.1 Current Site Use

CDL Recycle is a receiver and processor of construction, demolition, and land-clearing debris (CDL). CDL Recycle receives co-mingled loads of recyclable waste materials from construction projects and sorts those loads into re-usable and recyclable commodities. CDL Recycle's Material Recovery Facility is a full-scale facility capable of processing up to 60,000 tons of fully co-mingled CDL material per year. CDL Recycle recovers wood, metals, old corrugated cardboard, plastics, carpeting, soil mix, concrete, and aggregates (CDL 2009).

3.13.2 Past Site Use

Sternoff Metals Corporation/Remedco. The parcel was vacant farmland until it was purchased by the Sternoff family in the early 1940s. The Sternoff family manufactured trailers for logging trucks and operated a metal salvage yard at the property. Except for areas covered by buildings, the site was unpaved until the 1970s (SEACOR 1991). The scrap metal salvage yard operated at the property for 45 years until approximately 1986. Until the 1970s, the facility received electrical transformers and capacitors, which were sometimes filled with oils potentially containing PCBs (Terra 1987; SEACOR 1991). The salvage yard's facilities included an aluminum smelter (SEACOR 1991), an auto crusher near 8th Avenue S (Ecology 1987), and a nonferrous metal building in the northwest portion of the property.

In the early 1980s, a tenant used the property for equipment storage and metal storage container fabrication. The tenant’s manufacturing process included painting, and xylenes were stored near the painting area (SEACOR 1991). In the 1990s, the Sternoff family leased the property to Nelson Trucking for truck and container storage. Nelson Trucking used the property for dead storage of trucks and containers.

Nelson left the property in the mid 1990s. Ecology records indicate that Darrin Pickering of the Pickering Farms family occupied the property as early as February 1996. Mr. Pickering operated Remedco, a thermal soil treatment company. Remedco eventually went bankrupt and it is unclear whether the accumulated soils were ever treated or disposed of properly (Edens 2005).

Auburn West Enterprises was a dump truck hauler that previously operated at the property. The company operated 19 to 20 trucks. Three buildings were present at the site, and a loading dock area had a catch basin. SPU conducted a dye test and determined that the four catch basins at this property drain to the combined sewer system and therefore do not flow to the RM 2.3–2.8 East source control area (SPU 2006b).

Commercial Renovators, LLC and **D and P McLeod, LLC** are other companies associated with the 7201 East Marginal Way S address. D and P McLeod, LLC owned the property prior to Ellis Garage, LLC (the current property owner).

3.13.3 Environmental Investigations and Cleanups

Environmental investigation and cleanup actions were performed at the former Sternoff property between 1986 and 1999 to address the extent of PCB and other COCs in soil and groundwater at the property. A summary of investigations and cleanups is provided below; details are provided in the RM 2.3–2.8 East Data Gaps Report (SAIC 2008).

Date	Investigation/ Cleanup	Description	Chemicals with Elevated Concentrations
1986	Soil and Groundwater Sampling and Testing, Sternoff Metals Site (Terra 1987)	Two groundwater monitoring wells, four soil test holes, and 10 test pits installed/excavated. Sample collected from a trash pile to determine if it should be designated as hazardous waste.	Soil: PCBs, cadmium, copper, lead, TPH Groundwater: PCBs, mercury
1990 - 1991	Soil and Groundwater Investigation (SEACOR 1990) and Feasibility Study Report (SEACOR 1991)	Nine soil borings and two groundwater monitoring wells installed. Four floor drain solids samples and seven storm drain solids samples collected. Storm drain solids samples collected from two storm drains by Ecology. Separate phase hydrocarbons were identified in two wells.	Soil: Arsenic, benzene, benzo(a)anthracene, benzo(a)pyrene, benzo(g,h,i)perylene, benzo(k)fluoranthene, cadmium, chromium, chrysene, copper, di-n-butylphthalate, fluorene, lead, mercury, naphthalene, PCBs, phenanthrene, TPH, xylenes, zinc Catch Basin/Storm Drain Solids: Antimony, arsenic, cadmium, chromium, copper, lead, mercury, PCBs, TPH, zinc Groundwater: Chromium, copper, lead, TPH

Date	Investigation/ Cleanup	Description	Chemicals with Elevated Concentrations
1999	Groundwater Well Monitoring Report (Environmental Hazards Control 1999a, as cited in Ecology 1999)	Groundwater sampled by Environmental Hazards Control during April 1999.	Groundwater: Diesel- and heavy oil-range hydrocarbons, PCBs
1999	Polychlorinated Biphenyls Contaminated Soils Report (Environmental Hazards Control 1999b, as cited in Ecology 1999)	Pile of debris and soil known as the “trash pile” sampled. The trash pile and underlying soils removed from the property. An estimated 52,187 pounds of soil disposed of. Sampling after removal showed soils at the sides and bottom of excavation still contained PCBs.	Soil: PCBs

3.13.4 Potential for Future Releases to RM 2.3–2.8 East

There is a potential for future releases of COCs via the groundwater discharge pathway to sediments associated with the RM 2.3–2.8 East source control area from the former Sternoff property for the following reasons:

- **Contamination of soil and groundwater with PCBs, mercury, and other COCs has been documented.**

Soil, groundwater, and sediment samples collected from this facility are contaminated with PCBs, PAHs, metals, and TPH at concentrations above soil-to-sediment and groundwater-to-sediment screening levels. Based on SAIC’s review of the available files, the former metal salvage yard that operated at this property may be a source of PCBs and other COCs to the RM 2.3–2.8 East source control area.

- **Groundwater flows towards the LDW.**

Historical groundwater investigations have shown that groundwater flow beneath the site has a westerly component and may discharge to the LDW between RM 2.3 and RM 2.8.

- **PCBs have been detected above the SQS value in LDW sediments downgradient of the property.**

Sediment samples in the LDW downgradient from the former Sternoff parcel contained concentrations of PCBs above the SQS.

3.13.5 Source Control Actions

Information needed to assess the potential for sediment recontamination associated with current or historical operations at the former Sternoff property was summarized in the RM 2.3–2.8 East Data Gaps Report (SAIC 2008).

The following source control actions will be conducted to fill the identified data gaps and reduce the potential for recontamination of sediments associated with the RM 2.3–2.8 East source control area:

- Ecology will require the property owner to collect additional soil and groundwater samples and analyze them for COCs to determine the potential for sediment recontamination via the groundwater discharge pathway.
- Ecology will locate documentation verifying that a PCB-contaminated “trash pile” and approximately 52,187 pounds of contaminated soil have been removed from the site.
- Ecology will determine the disposition of petroleum contaminated soil stockpiled at the property by Remedco.
- Ecology and/or SPU will perform business inspections at this property to confirm that stormwater does not drain to the LDW, and to ensure that operations at the CDL Recycle facility are in compliance with applicable regulations and BMPs.

4.0 Monitoring

Monitoring efforts by SPU, Ecology, KCIW, and the PSCAA will continue to assist in identifying and tracing ongoing sources of COCs present in LDW sediments. This information is being used to focus source control efforts on specific problem areas within the RM 2.3–2.8 East drainage basin and to track the progress of the source control program. The following types of samples will continue to be collected:

- Inline solids samples from storm drain systems,
- Right-of-way and onsite catch basin solids samples, and
- Soil and groundwater samples as necessary.

If monitoring data indicate that additional sources of sediment recontamination are present, then Ecology will identify additional 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 evidence. At this time, Ecology plans to review the progress and data associated with the source control action items for each SCAP annually, and to summarize this information in the LDW Source Control Status Reports, which are scheduled for publication twice a year. 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 prepares semiannual LDW Source Control Status Reports, which summarize recent activities for each source control area and the overall status of source control in the LDW. Updates to SCAPs and source control recommendations will be recorded as appropriate in Ecology's Source Control Status Reports, as well as in technical memoranda or decision documents to update Ecology's or EPA's records concerning the sources identified in the SCAPs.

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Tables

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Table 1
Chemicals Above Screening Levels in Storm Drain Solids Samples
S. Myrtle Street and S. Garden Street Drainage Basins

Drainage Basin	Sample Location	Date Sampled	Chemical	Conc'n (mg/kg DW)	TOC % dw	Conc'n (mg/kg OC)	SQS	CSL	Units	SQS Exceedance Factor ^a	CSL Exceedance Factor ^a
S. Myrtle Street	MH100	9/12/2008	Butylbenzylphthalate	1.5	6.89	21.8	4.9	64	mg/kg OC	4.4	<1
		9/12/2008	Copper	500	6.89		390	390	mg/kg DW	1.3	1.3
		9/12/2008	Lead	675	6.89		450	530	mg/kg DW	1.5	1.3
		9/12/2008	Mercury	1.88	6.89		0.41	0.59	mg/kg DW	4.6	3.2
		9/12/2008	PCBs, total	1.55	6.89	22.5	12	65	mg/kg OC	1.9	<1
		9/12/2008	Zinc	2420	6.89		410	960	mg/kg DW	5.9	2.5
	RCB147	9/12/2008	2-Methylnaphthalene	3.6	5.25	68.6	38	64	mg/kg OC	1.8	1.1
		9/12/2008	4-Methylphenol	18	5.25		0.67	0.67	mg/kg DW	27	27
		9/12/2008	Bis(2-ethylhexyl)phthalate	35	5.25	667	47	78	mg/kg OC	14	8.6
		9/12/2008	Butylbenzylphthalate	1.9	5.25	36.2	4.9	64	mg/kg OC	7.4	<1
		9/12/2008	Mercury	0.97	5.25		0.41	0.59	mg/kg DW	2.4	1.6
		9/12/2008	PCBs, total	37.87	0.69	101	12	65	mg/kg OC	8.4	1.6
		9/12/2008	Phenol	0.85	B	5.25	0.42	1.2	mg/kg DW	2.0	<1
	9/12/2008	Zinc	1540	5.25		410	960	mg/kg DW	3.8	1.6	
	RCB148	9/12/2008	4-Methylphenol	2.6	9.4		0.67	0.67	mg/kg DW	3.9	3.9
		9/12/2008	Bis(2-ethylhexyl)phthalate	36	9.4	383	47	78	mg/kg OC	8.1	4.9
		9/12/2008	Butylbenzylphthalate	4.4	9.4	46.8	4.9	64	mg/kg OC	9.6	<1
		9/12/2008	Lead	467	9.4		450	530	mg/kg DW	1.0	<1
		9/12/2008	Mercury	0.74	9.4		0.41	0.59	mg/kg DW	1.8	1.3
		9/12/2008	PCBs, total	3.7	9.4	39.4	12	65	mg/kg OC	3.3	<1
		9/12/2008	Phenol	0.89	B	9.4	0.42	1.2	mg/kg DW	2.1	<1
		9/12/2008	Zinc	1950	9.4		410	960	mg/kg DW	4.8	2.0
	RCB148 (Duplicate)	9/12/2008	4-Methylphenol	2	3.25		0.67	0.67	mg/kg DW	3.0	3.0
		9/12/2008	Bis(2-ethylhexyl)phthalate	36	3.25	1,110	47	78	mg/kg OC	24	14
		9/12/2008	Butylbenzylphthalate	4.9	3.25	151	4.9	64	mg/kg OC	31	2.4
		9/12/2008	Di-n-octyl phthalate	3.2	3.25	98.5	58	4,500	mg/kg OC	1.7	<1
		9/12/2008	Lead	496	3.25		450	530	mg/kg DW	1.1	<1
		9/12/2008	Mercury	0.72	3.25		0.41	0.59	mg/kg DW	1.8	1.2
		9/12/2008	PCBs, total	3.3	3.25	102	12	65	mg/kg OC	8.5	1.6
		9/12/2008	Phenol	1.0	B	3.25	0.42	1.2	mg/kg DW	2.4	<1
9/12/2008		Zinc	2040	3.25		410	960	mg/kg DW	5.0	2.1	
S. Garden Street	RCB146	9/12/2008	Bis(2-ethylhexyl)phthalate	47	6.85	686	47	78	mg/kg OC	15	8.8
		9/12/2008	Butylbenzylphthalate	2.1	6.85	30.7	4.9	64	mg/kg OC	6.3	<1
		9/12/2008	Copper	1020	6.85		390	390	mg/kg DW	2.6	2.6
		9/12/2008	Lead	670	6.85		450	530	mg/kg DW	1.5	1.3
		9/12/2008	Mercury	1.08	6.85		0.41	0.59	mg/kg DW	2.6	1.8

Table 1
Chemicals Above Screening Levels in Storm Drain Solids Samples
S. Myrtle Street and S. Garden Street Drainage Basins

Drainage Basin	Sample Location	Date Sampled	Chemical	Conc'n (mg/kg DW)	TOC % dw	Conc'n (mg/kg OC)	SQS	CSL	Units	SQS Exceedance Factor ^a	CSL Exceedance Factor ^a
		9/12/2008	PCBs, total	671.08	6.85	37.40	12	65	mg/kg OC	3.1	<1
		9/12/2008	Zinc	2900	6.85		410	960	mg/kg DW	7.1	3.0

Source: Robinson 2009

DW - Dry weight

OC - Organic carbon normalized

SQS - SMS Sediment Quality Standards

CSL - SMS Cleanup Screening Levels

SMS - Washington State Sediment Management Standards

PCB - Polychlorinated biphenyl

a - Exceedance factors are the ratio of the detected concentration to the SQS or CSL; chemicals with exceedance factors greater than 10 are shown in **bold**.

Table 2
Chemicals Detected in Soil - 2005 and 2007
Seattle City Light - Georgetown Pump Station

Source	Sample Date	Sample Location	Sample Depth (ft)	Chemical	Soil Conc'n (mg/kg DW)	MTCAL Cleanup Level ^a (mg/kg)	Soil-to-Sediment Screening Level (Based on CSL) ^b (mg/kg)	Exceedance Factor
HWA GeoSciences 2006	Dec-05	TR-3	1	Aroclor 1254	0.23		1.3	<1
HWA GeoSciences 2006	Dec-05	TR-2	1	Aroclor 1254	0.22		1.3	<1
HWA GeoSciences 2006	Oct-05	HH-4	1	Aroclor 1254	0.11		1.3	<1
HWA GeoSciences 2006	Oct-05	HH-5	1	Aroclor 1254	0.084		1.3	<1
HWA GeoSciences 2006	Dec-05	TR-1	1	Aroclor 1254	0.076		1.3	<1
HWA GeoSciences 2006	Oct-05	HH-4A	1	Aroclor 1254	0.060		1.3	<1
HWA GeoSciences 2006	Oct-05	HH-4	1	Aroclor 1260	0.15		1.3	<1
HWA GeoSciences 2006	Dec-05	TR-2	1	Aroclor 1260	0.10		1.3	<1
HWA GeoSciences 2006	Dec-05	TR-3	1	Aroclor 1260	0.10		1.3	<1
HWA GeoSciences 2006	Oct-05	HH-5	1	Aroclor 1260	0.084		1.3	<1
HWA GeoSciences 2007	Mar-07	HA-1	1	Arsenic	20	20	12,000	1.0
HWA GeoSciences 2006	Oct-05	HH-4A	1	Arsenic	17	20	12,000	<1
HWA GeoSciences 2007	Mar-07	HA-5	1.5	Arsenic	15	20	12,000	<1
HWA GeoSciences 2006	Oct-05	HH-4B	2	Arsenic	15	20	12,000	<1
HWA GeoSciences 2006	Oct-05	HH-5	1	Arsenic	15	20	12,000	<1
HWA GeoSciences 2006	Oct-05	HH-1	1	Arsenic	11	20	12,000	<1
HWA GeoSciences 2007	Mar-07	HA-5	4	Beryllium	1.7			
HWA GeoSciences 2007	Mar-07	HA-3	1.5	Beryllium	0.6			
HWA GeoSciences 2007	Mar-07	HA-1	4.5	Beryllium	0.2			
HWA GeoSciences 2006	Oct-05	HH-4	1	Cadmium	2.6	2	34	1.3
HWA GeoSciences 2006	Oct-05	HH-5	1	Cadmium	2.1	2	34	1.1
HWA GeoSciences 2007	Mar-07	HA-5	1.5	Cadmium	1.8	2	34	<1
HWA GeoSciences 2007	Mar-07	HA-1	1	Cadmium	1.2	2	34	<1
HWA GeoSciences 2006	Oct-05	HH-4B	2	Cadmium	0.88	2	34	<1
HWA GeoSciences 2006	Oct-05	HH-5	1	Chromium	61	19	5,400	3.2
HWA GeoSciences 2006	Oct-05	HH-4	1	Chromium	59	19	5,400	3.1
HWA GeoSciences 2007	Mar-07	HA-5	1.5	Chromium	41.9	19	5,400	2.2
HWA GeoSciences 2007	Mar-07	HA-5	4	Chromium	28	19	5,400	1.5

Table 2
Chemicals Detected in Soil - 2005 and 2007
Seattle City Light - Georgetown Pump Station

Source	Sample Date	Sample Location	Sample Depth (ft)	Chemical	Soil Conc'n (mg/kg DW)	MTCAL Cleanup Level ^a (mg/kg)	Soil-to-Sediment Screening Level (Based on CSL) ^b (mg/kg)	Exceedance Factor
HWA GeoSciences 2007	Mar-07	HA-1	1	Chromium	22.9	19	5,400	1.2
HWA GeoSciences 2007	Mar-07	HA-4	1.5	Chromium	20	19	5,400	1.1
HWA GeoSciences 2007	Mar-07	HA-3	1.5	Chromium	17	19	5,400	<1
HWA GeoSciences 2007	Mar-07	HA-1	4.5	Chromium	15.9	19	5,400	<1
HWA GeoSciences 2007	Mar-07	HA-3	0.5	Chromium	12	19	5,400	<1
HWA GeoSciences 2006	Oct-05	HH-4A	1	Chromium	11	19	5,400	<1
HWA GeoSciences 2006	Oct-05	HH-1	3	Chromium	11	19	5,400	<1
HWA GeoSciences 2007	Mar-07	HA-2	2.5	Chromium	9.7	19	5,400	<1
HWA GeoSciences 2006	Oct-05	HH-1	2	Chromium	9.1	19	5,400	<1
HWA GeoSciences 2006	Oct-05	HH-4B	2	Chromium	8.9	19	5,400	<1
HWA GeoSciences 2006	Oct-05	HH-1	1	Chromium	7.9	19	5,400	<1
HWA GeoSciences 2006	Oct-05	HH-6	3	Chromium	7.0	19	5,400	<1
HWA GeoSciences 2006	Oct-05	HH-8	2.5	Chromium	6.9	19	5,400	<1
HWA GeoSciences 2007	Mar-07	HA-5	1.5	Copper	146	3,000	780	<1
HWA GeoSciences 2007	Mar-07	HA-5	4	Copper	127	3,000	780	<1
HWA GeoSciences 2007	Mar-07	HA-4	1.5	Copper	113	3,000	780	<1
HWA GeoSciences 2007	Mar-07	HA-3	1.5	Copper	98.0	3,000	780	<1
HWA GeoSciences 2007	Mar-07	HA-1	1	Copper	73.1	3,000	780	<1
HWA GeoSciences 2007	Mar-07	HA-3	0.5	Copper	71.7	3,000	780	<1
HWA GeoSciences 2007	Mar-07	HA-1	4.5	Copper	25.4	3,000	780	<1
HWA GeoSciences 2007	Mar-07	HA-2	2.5	Copper	11.4	3,000	780	<1
HWA GeoSciences 2006	Dec-05	TP-4	6	Diesel-Range Hydrocarbons	170	2,000		<1
HWA GeoSciences 2006	Dec-05	TR-3	1	Diesel-Range Hydrocarbons	28	2,000		<1
HWA GeoSciences 2006	Oct-05	HH-4	1	Heavy Oil-Range Hydrocarbons	5,700	2,000		2.9
HWA GeoSciences 2006	Oct-05	HH-5	1	Heavy Oil-Range Hydrocarbons	4,900	2,000		2.5
HWA GeoSciences 2006	Dec-05	TP-4	6	Heavy Oil-Range Hydrocarbons	640	2,000		<1
HWA GeoSciences 2006	Dec-05	TR-3	1	Heavy Oil-Range Hydrocarbons	280	2,000		<1
HWA GeoSciences 2006	Dec-05	TR-2	1	Heavy Oil-Range Hydrocarbons	150	2,000		<1

Table 2
Chemicals Detected in Soil - 2005 and 2007
Seattle City Light - Georgetown Pump Station

Source	Sample Date	Sample Location	Sample Depth (ft)	Chemical	Soil Conc'n (mg/kg DW)	MTCAL Cleanup Level ^a (mg/kg)	Soil-to-Sediment Screening Level (Based on CSL) ^b (mg/kg)	Exceedance Factor
HWA GeoSciences 2006	Dec-05	TR-1	1	Heavy Oil-Range Hydrocarbons	130	2,000		<1
HWA GeoSciences 2007	Mar-07	HA-1	1	Lead	192	250	1,300	<1
HWA GeoSciences 2006	Oct-05	HH-4	1	Lead	180	250	1,300	<1
HWA GeoSciences 2007	Mar-07	HA-5	1.5	Lead	175	250	1,300	<1
HWA GeoSciences 2006	Oct-05	HH-5	1	Lead	160	250	1,300	<1
HWA GeoSciences 2007	Mar-07	HA-3	0.5	Lead	136	250	1,300	<1
HWA GeoSciences 2006	Oct-05	HH-4A	1	Lead	120	250	1,300	<1
HWA GeoSciences 2006	Oct-05	HH-4B	2	Lead	89	250	1,300	<1
HWA GeoSciences 2007	Mar-07	HA-5	4.0	Lead	50	250	1,300	<1
HWA GeoSciences 2007	Mar-07	HA-4	1.5	Lead	24	250	1,300	<1
HWA GeoSciences 2006	Oct-05	HH-1	1	Lead	22	250	1,300	<1
HWA GeoSciences 2006	Oct-05	HH-6	3	Lead	8.0	250	1,300	<1
HWA GeoSciences 2007	Mar-07	HA-1	4.5	Lead	7	250	1,300	<1
HWA GeoSciences 2006	Oct-05	HH-8	2.5	Lead	5.2	250	1,300	<1
HWA GeoSciences 2007	Mar-07	HA-2	2.5	Lead	3	250	1,300	<1
HWA GeoSciences 2007	Mar-07	HA-3	0.5	Mercury	0.14	2	0.59	<1
HWA GeoSciences 2007	Mar-07	HA-5	1.5	Mercury	0.14	2	0.59	<1
HWA GeoSciences 2007	Mar-07	HA-1	1	Mercury	0.13	2	0.59	<1
HWA GeoSciences 2007	Mar-07	HA-1	4.5	Mercury	0.07	2	0.59	<1
HWA GeoSciences 2007	Mar-07	HA-3	1.5	Mercury	0.07	2	0.59	<1
HWA GeoSciences 2007	Mar-07	HA-5	1.5	Nickel	40			
HWA GeoSciences 2007	Mar-07	HA-5	4	Nickel	23			
HWA GeoSciences 2007	Mar-07	HA-4	1.5	Nickel	21			
HWA GeoSciences 2007	Mar-07	HA-1	1	Nickel	20			
HWA GeoSciences 2007	Mar-07	HA-3	1.5	Nickel	15			
HWA GeoSciences 2007	Mar-07	HA-1	4.5	Nickel	12			
HWA GeoSciences 2007	Mar-07	HA-3	0.5	Nickel	9			
HWA GeoSciences 2007	Mar-07	HA-2	2.5	Nickel	8			

Table 2
Chemicals Detected in Soil - 2005 and 2007
Seattle City Light - Georgetown Pump Station

Source	Sample Date	Sample Location	Sample Depth (ft)	Chemical	Soil Conc'n (mg/kg DW)	MTCA Cleanup Level ^a (mg/kg)	Soil-to-Sediment Screening Level (Based on CSL) ^b (mg/kg)	Exceedance Factor
HWA GeoSciences 2007	Mar-07	HA-4	1.5	Silver	1.1	400	12	<1
HWA GeoSciences 2007	Mar-07	HA-5	1.5	Silver	0.7	400	12	<1
HWA GeoSciences 2007	Mar-07	HA-1	1.0	Silver	0.3	400	12	<1
HWA GeoSciences 2007	Mar-07	HA-5	1.5	Zinc	437	24,000	770	<1
HWA GeoSciences 2007	Mar-07	HA-1	1	Zinc	215	24,000	770	<1
HWA GeoSciences 2007	Mar-07	HA-5	4	Zinc	144	24,000	770	<1
HWA GeoSciences 2007	Mar-07	HA-4	1.5	Zinc	134	24,000	770	<1
HWA GeoSciences 2007	Mar-07	HA-3	1.5	Zinc	90	24,000	770	<1
HWA GeoSciences 2007	Mar-07	HA-3	0.5	Zinc	70	24,000	770	<1
HWA GeoSciences 2007	Mar-07	HA-1	4.5	Zinc	43	24,000	770	<1
HWA GeoSciences 2007	Mar-07	HA-2	2.5	Zinc	24	24,000	770	<1

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

b - From: SAIC 2006. 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.

DW - dry weight

CSL - Contaminant Screening Level from Washington Sediment Management Standards

NA - Not available

Notes:

(1) Table presents detected chemicals only.

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

Table 3
Chemicals Detected in Soil - June 2008
Crowley Marine Services

Source	Sample Date	Sample Location	Sample Depth (ft)	Chemical	Soil Conc'n (mg/kg DW)	MTCA Cleanup Level ^a (mg/kg)	Soil-to-Sediment Screening Level (Based on CSL) ^b (mg/kg)	Exceedance Factor
SLR 2008	Jun-08	CMW-7	7	1,2,4-Trimethylbenzene	0.31	4,000		<1
SLR 2008	Jun-08	CMW-7	7	1,3,5-Trimethylbenzene	0.10	4,000		<1
SLR 2008	Jun-08	CMW-3	10	2-Methylnaphthalene	0.66	320	0.073	9.0
SLR 2008	Jun-08	CMW-7	7	2-Methylnaphthalene	0.63	320	0.073	8.6
SLR 2008	Jun-08	CMW-3	10	Acenaphthene	0.76	4,800	0.060	13
SLR 2008	Jun-08	CMW-7	7	Acenaphthene	0.15	4,800	0.060	2.5
SLR 2008	Jun-08	CMW-6	5	Acenaphthene	0.034	4,800	1.2	<1
SLR 2008	Jun-08	CMW-4	5	Acenaphthene	0.019	4,800	1.2	<1
SLR 2008	Jun-08	CMW-5	5	Acenaphthene	0.011	4,800	1.2	<1
SLR 2008	Jun-08	CMW-4	5	Acenaphthylene	0.033		1.4	<1
SLR 2008	Jun-08	CMW-3	10	Anthracene	23	2,400	1.2	19
SLR 2008	Jun-08	CMW-7	7	Anthracene	0.35	2,400	1.2	<1
SLR 2008	Jun-08	CMW-7	5	Anthracene	0.34	2,400	24	<1
SLR 2008	Jun-08	CMW-6	5	Anthracene	0.096	2,400	24	<1
SLR 2008	Jun-08	CMW-4	5	Anthracene	0.066	2,400	24	<1
SLR 2008	Jun-08	CMW-5	5	Anthracene	0.064	2,400	24	<1
SLR 2008	Jun-08	CMW-7	5	Aroclor 1254	0.7		1.3	<1
SLR 2008	Jun-08	CMW-3	10	Aroclor 1254	0.3		0.065	4.6
SLR 2008	Jun-08	CMW-6	5	Aroclor 1254	0.3		1.3	<1
SLR 2008	Jun-08	CMW-7	7	Aroclor 1254	0.2		0.065	3.1
SLR 2008	Jun-08	CMW-4	5	Aroclor 1254	0.2		1.3	<1
SLR 2008	Jun-08	CMW-7	5	Arsenic	236	20	12,000	12
SLR 2008	Jun-08	CMW-5	5	Arsenic	184	20	12,000	9.2
SLR 2008	Jun-08	CMW-4	5	Arsenic	158	20	12,000	7.9
SLR 2008	Jun-08	CMW-6	5	Arsenic	121	20	12,000	6.1
SLR 2008	Jun-08	CMW-3	10	Arsenic	38.0	20	590	1.9

Table 3
Chemicals Detected in Soil - June 2008
Crowley Marine Services

Source	Sample Date	Sample Location	Sample Depth (ft)	Chemical	Soil Conc'n (mg/kg DW)	MTCA Cleanup Level ^a (mg/kg)	Soil-to-Sediment Screening Level (Based on CSL) ^b (mg/kg)	Exceedance Factor
SLR 2008	Jun-08	CMW-7	7	Arsenic	27.5	20	590	1.4
SLR 2008	Jun-08	CMW-3	5	Arsenic	4.66	20	12,000	<1
SLR 2008	Jun-08	CMW-1	5	Arsenic	2.17	20	12,000	<1
SLR 2008	Jun-08	CMW-2a	4	Arsenic	2.14	20	12,000	<1
SLR 2008	Jun-08	CMW-3	10	Barium	87.9	16,000		<1
SLR 2008	Jun-08	CMW-4	5	Barium	81.8	16,000		<1
SLR 2008	Jun-08	CMW-7	5	Barium	77.4	16,000		<1
SLR 2008	Jun-08	CMW-5	5	Barium	75.5	16,000		<1
SLR 2008	Jun-08	CMW-7	7	Barium	60.0	16,000		<1
SLR 2008	Jun-08	CMW-6	5	Barium	53.2	16,000		<1
SLR 2008	Jun-08	CMW-2a	4	Barium	32.6	16,000		<1
SLR 2008	Jun-08	CMW-3	5	Barium	32.1	16,000		<1
SLR 2008	Jun-08	CMW-1	5	Barium	31.7	16,000		<1
SLR 2008	Jun-08	CMW-3	10	Benzo(a)anthracene	1.00		0.27	3.7
SLR 2008	Jun-08	CMW-7	5	Benzo(a)anthracene	0.68		5.4	<1
SLR 2008	Jun-08	CMW-7	7	Benzo(a)anthracene	0.58		0.27	2.1
SLR 2008	Jun-08	CMW-6	5	Benzo(a)anthracene	0.33		5.4	<1
SLR 2008	Jun-08	CMW-4	5	Benzo(a)anthracene	0.18		5.4	<1
SLR 2008	Jun-08	CMW-5	5	Benzo(a)anthracene	0.081		5.4	<1
SLR 2008	Jun-08	CMW-3	5	Benzo(a)anthracene	0.011		5.4	<1
SLR 2008	Jun-08	CMW-3	10	Benzo(a)pyrene	0.78	0.1	0.21	7.8
SLR 2008	Jun-08	CMW-7	5	Benzo(a)pyrene	0.7	0.1	4.2	7.0
SLR 2008	Jun-08	CMW-7	7	Benzo(a)pyrene	0.6	0.1	0.21	6.0
SLR 2008	Jun-08	CMW-6	5	Benzo(a)pyrene	0.35	0.1	4.2	3.5
SLR 2008	Jun-08	CMW-4	5	Benzo(a)pyrene	0.24	0.1	4.2	2.4
SLR 2008	Jun-08	CMW-5	5	Benzo(a)pyrene	0.076	0.1	4.2	<1

Table 3
Chemicals Detected in Soil - June 2008
Crowley Marine Services

Source	Sample Date	Sample Location	Sample Depth (ft)	Chemical	Soil Conc'n (mg/kg DW)	MTCA Cleanup Level ^a (mg/kg)	Soil-to-Sediment Screening Level (Based on CSL) ^b (mg/kg)	Exceedance Factor
SLR 2008	Jun-08	CMW-7	5	Benzo(b)fluoranthene	0.84		9	<1
SLR 2008	Jun-08	CMW-3	10	Benzo(b)fluoranthene	0.82		0.45	1.8
SLR 2008	Jun-08	CMW-7	7	Benzo(b)fluoranthene	0.52		0.45	1.2
SLR 2008	Jun-08	CMW-6	5	Benzo(b)fluoranthene	0.37		9	<1
SLR 2008	Jun-08	CMW-4	5	Benzo(b)fluoranthene	0.34		9	<1
SLR 2008	Jun-08	CMW-5	5	Benzo(b)fluoranthene	0.1		9	<1
SLR 2008	Jun-08	CMW-7	5	Benzo(g,h,i)perylene	0.48		1.6	<1
SLR 2008	Jun-08	CMW-3	10	Benzo(g,h,i)perylene	0.46		0.078	5.9
SLR 2008	Jun-08	CMW-7	7	Benzo(g,h,i)perylene	0.46		0.078	5.9
SLR 2008	Jun-08	CMW-4	5	Benzo(g,h,i)perylene	0.26		1.6	<1
SLR 2008	Jun-08	CMW-6	5	Benzo(g,h,i)perylene	0.19		1.6	<1
SLR 2008	Jun-08	CMW-5	5	Benzo(g,h,i)perylene	0.074		1.6	<1
SLR 2008	Jun-08	CMW-3	10	Benzo(k)fluoranthene	0.37		0.45	<1
SLR 2008	Jun-08	CMW-7	5	Benzo(k)fluoranthene	0.35		9.0	<1
SLR 2008	Jun-08	CMW-7	7	Benzo(k)fluoranthene	0.22		0.45	<1
SLR 2008	Jun-08	CMW-6	5	Benzo(k)fluoranthene	0.12		9.0	<1
SLR 2008	Jun-08	CMW-4	5	Benzo(k)fluoranthene	0.11		9.0	<1
SLR 2008	Jun-08	CMW-5	5	Benzo(k)fluoranthene	0.035		9.0	<1
SLR 2008	Jun-08	CMW-4	5	Butyl benzyl phthalate	20	16,000	1.3	15
SLR 2008	Jun-08	CMW-4	5	Cadmium	1.11	2	34	<1
SLR 2008	Jun-08	CMW-3	10	Carbazole	6.10	50		<1
SLR 2008	Jun-08	CMW-7	5	Chromium	23.5	19	5,400	1.2
SLR 2008	Jun-08	CMW-3	10	Chromium	20.1	19	270	1.1
SLR 2008	Jun-08	CMW-5	5	Chromium	17.9	19	5,400	<1
SLR 2008	Jun-08	CMW-6	5	Chromium	16.5	19	5,400	<1
SLR 2008	Jun-08	CMW-4	5	Chromium	16.0	19	5,400	<1

Table 3
Chemicals Detected in Soil - June 2008
Crowley Marine Services

Source	Sample Date	Sample Location	Sample Depth (ft)	Chemical	Soil Conc'n (mg/kg DW)	MTCA Cleanup Level ^a (mg/kg)	Soil-to-Sediment Screening Level (Based on CSL) ^b (mg/kg)	Exceedance Factor
SLR 2008	Jun-08	CMW-7	7	Chromium	15.6	19	270	<1
SLR 2008	Jun-08	CMW-2a	4	Chromium	14.1	19	5,400	<1
SLR 2008	Jun-08	CMW-1	5	Chromium	11.3	19	5,400	<1
SLR 2008	Jun-08	CMW-3	5	Chromium	10.7	19	5,400	<1
SLR 2008	Jun-08	CMW-3	10	Chrysene	3.20		0.46	7.0
SLR 2008	Jun-08	CMW-7	5	Chrysene	0.97		9.2	<1
SLR 2008	Jun-08	CMW-7	7	Chrysene	0.55		0.46	1.2
SLR 2008	Jun-08	CMW-6	5	Chrysene	0.36		9.2	<1
SLR 2008	Jun-08	CMW-4	5	Chrysene	0.34		9.2	<1
SLR 2008	Jun-08	CMW-5	5	Chrysene	0.099		9.2	<1
SLR 2008	Jun-08	CMW-3	5	Chrysene	0.014		9.2	<1
SLR 2008	Jun-08	CMW-4	5	Dibenz(a,h)anthracene	0.05		0.66	<1
SLR 2008	Jun-08	CMW-6	5	Dibenz(a,h)anthracene	0.05		0.66	<1
SLR 2008	Jun-08	CMW-5	5	Dibenz(a,h)anthracene	0.014		0.66	<1
SLR 2008	Jun-08	CMW-3	10	Dibenzofuran	0.78	160	0.059	13
SLR 2008	Jun-08	CMW-7	5	Diesel-Range Hydrocarbons	5,000	2,000		2.5
SLR 2008	Jun-08	CMW-7	7	Diesel-Range Hydrocarbons	310	2,000		<1
SLR 2008	Jun-08	CMW-3	10	Diesel-Range Hydrocarbons	120	2,000		<1
SLR 2008	Jun-08	CMW-5	5	Diesel-Range Hydrocarbons	110	2,000		<1
SLR 2008	Jun-08	CMW-6	5	Diesel-Range Hydrocarbons	72	2,000		<1
SLR 2008	Jun-08	CMW-3	10	Fluoranthene	2.6	3,200	1.2	2.2
SLR 2008	Jun-08	CMW-7	7	Fluoranthene	1.7	3,200	1.2	1.4
SLR 2008	Jun-08	CMW-7	5	Fluoranthene	1.3	3,200	24	<1
SLR 2008	Jun-08	CMW-6	5	Fluoranthene	0.7	3,200	24	<1
SLR 2008	Jun-08	CMW-4	5	Fluoranthene	0.35	3,200	24	<1
SLR 2008	Jun-08	CMW-5	5	Fluoranthene	0.17	3,200	24	<1

Table 3
Chemicals Detected in Soil - June 2008
Crowley Marine Services

Source	Sample Date	Sample Location	Sample Depth (ft)	Chemical	Soil Conc'n (mg/kg DW)	MTCA Cleanup Level ^a (mg/kg)	Soil-to-Sediment Screening Level (Based on CSL) ^b (mg/kg)	Exceedance Factor
SLR 2008	Jun-08	CMW-3	5	Fluoranthene	0.021	3,200	24	<1
SLR 2008	Jun-08	CMW-3	10	Fluorene	1.90	3,200	0.081	23
SLR 2008	Jun-08	CMW-6	5	Fluorene	0.039	3,200	1.6	<1
SLR 2008	Jun-08	CMW-4	5	Fluorene	0.019	3,200	1.6	<1
SLR 2008	Jun-08	CMW-7	7	Gasoline-Range Hydrocarbons	110	30		3.7
SLR 2008	Jun-08	CMW-7	5	Heavy Oil-Range Hydrocarbons	7,500	2,000		3.8
SLR 2008	Jun-08	CMW-6	5	Heavy Oil-Range Hydrocarbons	570	2,000		<1
SLR 2008	Jun-08	CMW-5	5	Heavy Oil-Range Hydrocarbons	510	2,000		<1
SLR 2008	Jun-08	CMW-7	5	Indeno(1,2,3-cd)pyrene	0.49		1.8	<1
SLR 2008	Jun-08	CMW-3	10	Indeno(1,2,3-cd)pyrene	0.46		0.088	5.2
SLR 2008	Jun-08	CMW-7	7	Indeno(1,2,3-cd)pyrene	0.37		0.088	4.2
SLR 2008	Jun-08	CMW-4	5	Indeno(1,2,3-cd)pyrene	0.3		1.8	<1
SLR 2008	Jun-08	CMW-6	5	Indeno(1,2,3-cd)pyrene	0.19		1.8	<1
SLR 2008	Jun-08	CMW-5	5	Indeno(1,2,3-cd)pyrene	0.07		1.8	<1
SLR 2008	Jun-08	CMW-7	5	Lead	208	250	1,300	<1
SLR 2008	Jun-08	CMW-5	5	Lead	186	250	1,300	<1
SLR 2008	Jun-08	CMW-4	5	Lead	151	250	1,300	<1
SLR 2008	Jun-08	CMW-6	5	Lead	101	250	1,300	<1
SLR 2008	Jun-08	CMW-3	10	Lead	58.0	250	67	<1
SLR 2008	Jun-08	CMW-7	7	Lead	34.4	250	67	<1
SLR 2008	Jun-08	CMW-3	5	Lead	3.75	250	1,300	<1
SLR 2008	Jun-08	CMW-1	5	Lead	2.42	250	1,300	<1
SLR 2008	Jun-08	CMW-2a	4	Lead	2.05	250	1,300	<1
SLR 2008	Jun-08	CMW-7	5	Mercury	0.26	2	0.59	<1
SLR 2008	Jun-08	CMW-4	5	Mercury	0.25	2	0.59	<1
SLR 2008	Jun-08	CMW-3	10	Naphthalene	1.60	5	0.20	8.0

Table 3
Chemicals Detected in Soil - June 2008
Crowley Marine Services

Source	Sample Date	Sample Location	Sample Depth (ft)	Chemical	Soil Conc'n (mg/kg DW)	MTCA Cleanup Level ^a (mg/kg)	Soil-to-Sediment Screening Level (Based on CSL) ^b (mg/kg)	Exceedance Factor
SLR 2008	Jun-08	CMW-7	7	Naphthalene	0.15	5	0.20	<1
SLR 2008	Jun-08	CMW-6	5	Naphthalene	0.018	5	3.8	<1
SLR 2008	Jun-08	CMW-4	5	Naphthalene	0.013	5	3.8	<1
SLR 2008	Jun-08	CMW-3	10	Phenanthrene	3.7		9.7	<1
SLR 2008	Jun-08	CMW-7	7	Phenanthrene	1.6		0.49	3.3
SLR 2008	Jun-08	CMW-7	5	Phenanthrene	0.6		9.7	<1
SLR 2008	Jun-08	CMW-6	5	Phenanthrene	0.43		9.7	<1
SLR 2008	Jun-08	CMW-4	5	Phenanthrene	0.23		9.7	<1
SLR 2008	Jun-08	CMW-5	5	Phenanthrene	0.12		9.7	<1
SLR 2008	Jun-08	CMW-3	5	Phenanthrene	0.021		0.49	<1
SLR 2008	Jun-08	CMW-3	10	Pyrene	2	2,400	1.4	1.4
SLR 2008	Jun-08	CMW-7	7	Pyrene	1.4	2,400	1.4	1.0
SLR 2008	Jun-08	CMW-7	5	Pyrene	1.1	2,400	28	<1
SLR 2008	Jun-08	CMW-6	5	Pyrene	0.54	2,400	28	<1
SLR 2008	Jun-08	CMW-4	5	Pyrene	0.35	2,400	28	<1
SLR 2008	Jun-08	CMW-5	5	Pyrene	0.17	2,400	28	<1
SLR 2008	Jun-08	CMW-3	5	Pyrene	0.025	2,400	28	<1

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

b - From: SAIC 2006. 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.

DW - dry weight

CSL - Contaminant Screening Level from Washington Sediment Management Standards

NA - Not available

Notes:

Table 3
Chemicals Detected in Soil - June 2008
Crowley Marine Services

Source	Sample Date	Sample Location	Sample Depth (ft)	Chemical	Soil Conc'n (mg/kg DW)	MTCA Cleanup Level ^a (mg/kg)	Soil-to-Sediment Screening Level (Based on CSL) ^b (mg/kg)	Exceedance Factor
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(1) Table presents detected chemicals only.

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

(3) Chemicals with exceedance factors greater than 10 are shown in **Bold**.

Table 4
Chemicals Detected in Groundwater - June and July 2008
Crowley Marine Services

Source	Sample Date	Sample Location	Chemical	GW Conc'n (ug/L)	MTCA Cleanup Level ^a (ug/L)	GW-to-Sediment Screening Level (Based on CSL) ^b (ug/L)	Exceedance Factor
SLR 2008	Jun-08	CMW-3	2-Methylnaphthalene	4.4	32	31	<1
SLR 2008	Jun-08	CMW-2	2-Methylnaphthalene	1.5	32	31	<1
SLR 2008	Jun-08	CMW-3	Acenaphthene	4.9	960	9.3	<1
SLR 2008	Jun-08	CMW-2	Acenaphthene	4.5	960	9.3	<1
SLR 2008	Jun-08	CMW-4	Acenaphthene	2.10	960	9.3	<1
SLR 2008	Jun-08	CMW-5	Acenaphthene	0.13	960	9.3	<1
SLR 2008	Jun-08	CMW-3	Anthracene	1.8	4,800	59	<1
SLR 2008	Jun-08	CMW-4	Anthracene	0.44	4,800	59	<1
SLR 2008	Jun-08	CMW-2	Anthracene	0.42	4,800	59	<1
SLR 2008	Jun-08	CMW-4	Arsenic	177	5	370	35
SLR 2008	Jun-08	CMW-5	Arsenic	62.3	5	370	12
SLR 2008	Jun-08	CMW-2	Arsenic	41	5	370	8.2
SLR 2008	Jun-08	CMW-3	Arsenic	30.5	5	370	6.1
SLR 2008	Jun-08	CMW-6	Arsenic	21.4	5	370	4.3
SLR 2008	Jun-08	CMW-1	Arsenic	6.59	5	370	1.3
SLR 2008	Jun-08	CMW-7	Arsenic	6.22	5	370	1.2
SLR 2008	Jul-08	CMW-4	Arsenic	0.17	5	370	<1
SLR 2008	Jul-08	CMW-5	Arsenic	0.066	5	370	<1
SLR 2008	Jul-08	CMW-6	Arsenic	0.018	5	370	<1
SLR 2008	Jul-08	CMW-1	Arsenic	0.002	5	370	<1
SLR 2008	Jun-08	CMW-4	Barium	64.2	3,200		<1
SLR 2008	Jun-08	CMW-6	Barium	56.6	3,200		<1
SLR 2008	Jun-08	CMW-3	Barium	30.3	3,200		<1
SLR 2008	Jun-08	CMW-5	Barium	20	3,200		<1
SLR 2008	Jun-08	CMW-2	Barium	17.1	3,200		<1
SLR 2008	Jun-08	CMW-7	Barium	14.4	3,200		<1
SLR 2008	Jun-08	CMW-1	Barium	14.2	3,200		<1
SLR 2008	Jul-08	CMW-6	Barium	0.091	3,200		<1

Table 4
Chemicals Detected in Groundwater - June and July 2008
Crowley Marine Services

Source	Sample Date	Sample Location	Chemical	GW Conc'n (ug/L)	MTCA Cleanup Level ^a (ug/L)	GW-to-Sediment Screening Level (Based on CSL) ^b (ug/L)	Exceedance Factor
SLR 2008	Jul-08	CMW-4	Barium	0.085	3,200		<1
SLR 2008	Jul-08	CMW-1	Barium	0.038	3,200		<1
SLR 2008	Jul-08	CMW-5	Barium	0.024	3,200		<1
SLR 2008	Jul-08	CMW-7	Barium	0.01	3,200		<1
SLR 2008	Jun-08	CMW-2	Benzo(a)anthracene	0.14		0.63	<1
SLR 2008	Jun-08	CMW-4	Benzo(a)anthracene	0.11		0.63	<1
SLR 2008	Jun-08	CMW-3	Carbazole	2.1	4.4		<1
SLR 2008	Jun-08	CMW-4	Carbazole	1.30	4.4		<1
SLR 2008	Jun-08	CMW-2	Chloromethane	2.0	3.4		<1
SLR 2008	Jun-08	CMW-6	Chromium	3.56	50	320	<1
SLR 2008	Jun-08	CMW-2	Chromium	1.85	50	320	<1
SLR 2008	Jun-08	CMW-3	Chromium	1.63	50	320	<1
SLR 2008	Jun-08	CMW-4	Chromium	1.03	50	320	<1
SLR 2008	Jul-08	CMW-6	Chromium	0.09	50	320	<1
SLR 2008	Jul-08	CMW-5	Chromium	0.02	50	320	<1
SLR 2008	Jul-08	CMW-4	Chromium	0.007	50	320	<1
SLR 2008	Jul-08	CMW-1	Chromium	0.003	50	320	<1
SLR 2008	Jul-08	CMW-7	Chromium	0.003	50	320	<1
SLR 2008	Jun-08	CMW-2	Chrysene	0.13		1.9	<1
SLR 2008	Jun-08	CMW-4	Chrysene	0.12		1.9	<1
SLR 2008	Jun-08	CMW-4	Copper	46.1	590	120	<1
SLR 2008	Jun-08	CMW-6	Copper	26.8	590	120	<1
SLR 2008	Jun-08	CMW-1	Copper	25.2	590	120	<1
SLR 2008	Jun-08	CMW-3	Copper	17.8	590	120	<1
SLR 2008	Jun-08	CMW-2	Copper	9.16	590	120	<1
SLR 2008	Jun-08	CMW-7	Copper	6.15	590	120	<1
SLR 2008	Jul-08	CMW-6	Copper	0.11	590	120	<1
SLR 2008	Jul-08	CMW-4	Copper	0.004	590	120	<1

Table 4
Chemicals Detected in Groundwater - June and July 2008
Crowley Marine Services

Source	Sample Date	Sample Location	Chemical	GW Conc'n (ug/L)	MTCA Cleanup Level ^a (ug/L)	GW-to-Sediment Screening Level (Based on CSL) ^b (ug/L)	Exceedance Factor
SLR 2008	Jun-08	CMW-2	Dibenzofuran	2.5	32	5.1	<1
SLR 2008	Jun-08	CMW-3	Dibenzofuran	2.2	32	5.1	<1
SLR 2008	Jun-08	CMW-2	Diesel-Range Hydrocarbons	100	500		<1
SLR 2008	Jun-08	CMW-3	Diesel-Range Hydrocarbons	92	500		<1
SLR 2008	Jun-08	CMW-4	Diesel-Range Hydrocarbons	67	500		<1
SLR 2008	Jun-08	CMW-2	Fluoranthene	1.4	640	17	<1
SLR 2008	Jun-08	CMW-3	Fluoranthene	1.1	640	17	<1
SLR 2008	Jun-08	CMW-4	Fluoranthene	0.68	640	17	<1
SLR 2008	Jun-08	CMW-5	Fluoranthene	0.17	640	17	<1
SLR 2008	Jun-08	CMW-2	Fluorene	3.9	640	7.0	<1
SLR 2008	Jun-08	CMW-3	Fluorene	3.1	640	7.0	<1
SLR 2008	Jun-08	CMW-4	Fluorene	1.00	640	7.0	<1
SLR 2008	Jun-08	CMW-5	Fluorene	0.1	640	7.0	<1
SLR 2008	Jun-08	CMW-2	Lead	2.26	15	13	<1
SLR 2008	Jun-08	CMW-3	Lead	1.99	15	13	<1
SLR 2008	Jun-08	CMW-4	Lead	1.03	15	13	<1
SLR 2008	Jul-08	CMW-6	Lead	0.005	15	13	<1
SLR 2008	Jul-08	CMW-4	Lead	0.003	15	13	<1
SLR 2008	Jun-08	CMW-2	Naphthalene	11.0	160	92	<1
SLR 2008	Jun-08	CMW-3	Naphthalene	3.5	160	92	<1
SLR 2008	Jun-08	CMW-4	Naphthalene	3.3	160	92	<1
SLR 2008	Jun-08	CMW-5	Naphthalene	0.19	160	92	<1
SLR 2008	Jun-08	CMW-2	Phenanthrene	4.9		23	<1
SLR 2008	Jun-08	CMW-3	Phenanthrene	3.9		23	<1
SLR 2008	Jun-08	CMW-4	Phenanthrene	2.40		23	<1
SLR 2008	Jun-08	CMW-5	Phenanthrene	0.29		23	<1
SLR 2008	Jun-08	CMW-6	Phenanthrene	0.14		23	<1
SLR 2008	Jun-08	CMW-2	Pyrene	0.75	480	20	<1

Table 4
Chemicals Detected in Groundwater - June and July 2008
Crowley Marine Services

Source	Sample Date	Sample Location	Chemical	GW Conc'n (ug/L)	MTCA Cleanup Level ^a (ug/L)	GW-to-Sediment Screening Level (Based on CSL) ^b (ug/L)	Exceedance Factor
SLR 2008	Jun-08	CMW-4	Pyrene	0.53	480	20	<1
SLR 2008	Jun-08	CMW-3	Pyrene	0.48	480	20	<1
SLR 2008	Jun-08	CMW-5	Pyrene	0.14	480	20	<1
SLR 2008	Jun-08	CMW-6	Selenium	58.0	80		<1
SLR 2008	Jun-08	CMW-4	Selenium	41.9	80		<1
SLR 2008	Jun-08	CMW-1	Selenium	24.6	80		<1
SLR 2008	Jun-08	CMW-3	Selenium	17.6	80		<1
SLR 2008	Jun-08	CMW-2	Selenium	9.7	80		<1
SLR 2008	Jun-08	CMW-7	Selenium	8.2	80		<1
SLR 2008	Jun-08	CMW-5	Selenium	3.13	80		<1
SLR 2008	Jul-08	CMW-6	Selenium	0.04	80		<1
SLR 2008	Jul-08	CMW-1	Selenium	0.024	80		<1
SLR 2008	Jul-08	CMW-5	Selenium	0.02	80		<1
SLR 2008	Jul-08	CMW-4	Selenium	0.019	80		<1

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

b - From: SAIC 2006

DW - dry weight

CSL - Contaminant Screening Level from Washington Sediment Management Standards

NA - Not available

Notes:

(1) Table presents detected chemicals only.

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

(3) Chemicals with exceedance factors greater than 10 are shown in **Bold**.

Table 5
Chemicals Detected in Seep Sample - July 2008
Crowley Marine Services

Source	Date Sampled	Sample Location	Chemical	Conc'n (ug/L)	Marine Chronic WQS	Marine Acute WQS	Chronic WQS Exceedance Factor	GW-to-Sediment Screening Level (Based on CSL) ^a	Exceedance Factor
SLR 2008	7/15/2008	SEEP-1	Arsenic	0.003	36	69		370	
SLR 2008	7/15/2008	SEEP-1	Barium	0.008					
SLR 2008	7/15/2008	SEEP-1	Selenium	0.017	71	190			

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

WQS - Water Quality Standards

CSL - Sediment Management Standards Cleanup Screening Level

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

Figures

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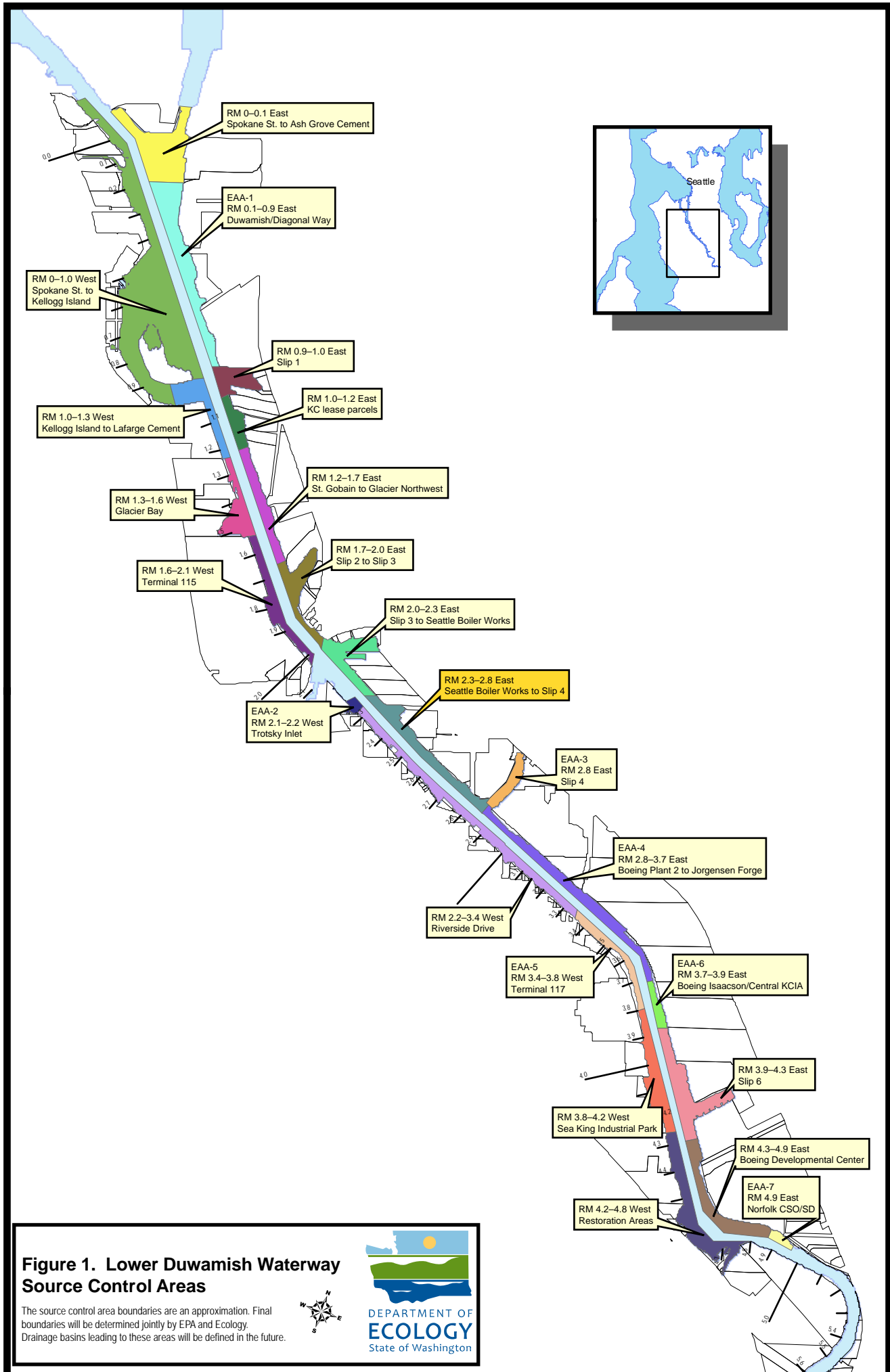
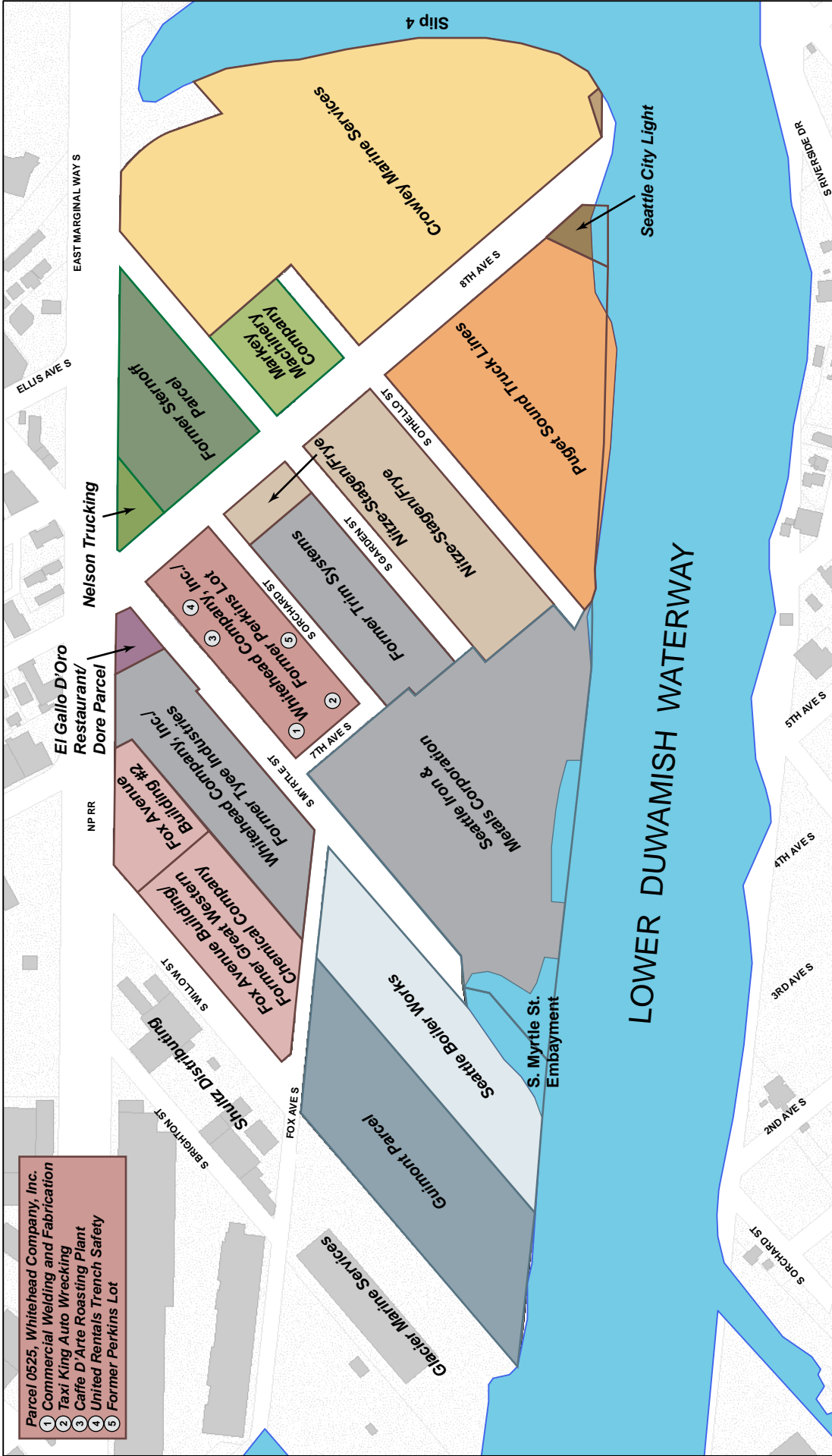


Figure 1. Lower Duwamish Waterway Source Control Areas

The source control area boundaries are an approximation. Final boundaries will be determined jointly by EPA and Ecology. Drainage basins leading to these areas will be defined in the future.





- Parcel 0525, Whitehead Company, Inc.
- 1 Commercial Welding and Fabrication
- 2 Taxi King Auto Wrecking
- 3 Caffe D'Arte Roasting Plant
- 4 United Rentals Trench Safety
- 5 Former Perkins Lot

Legend
■ Water

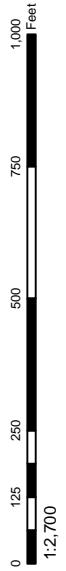
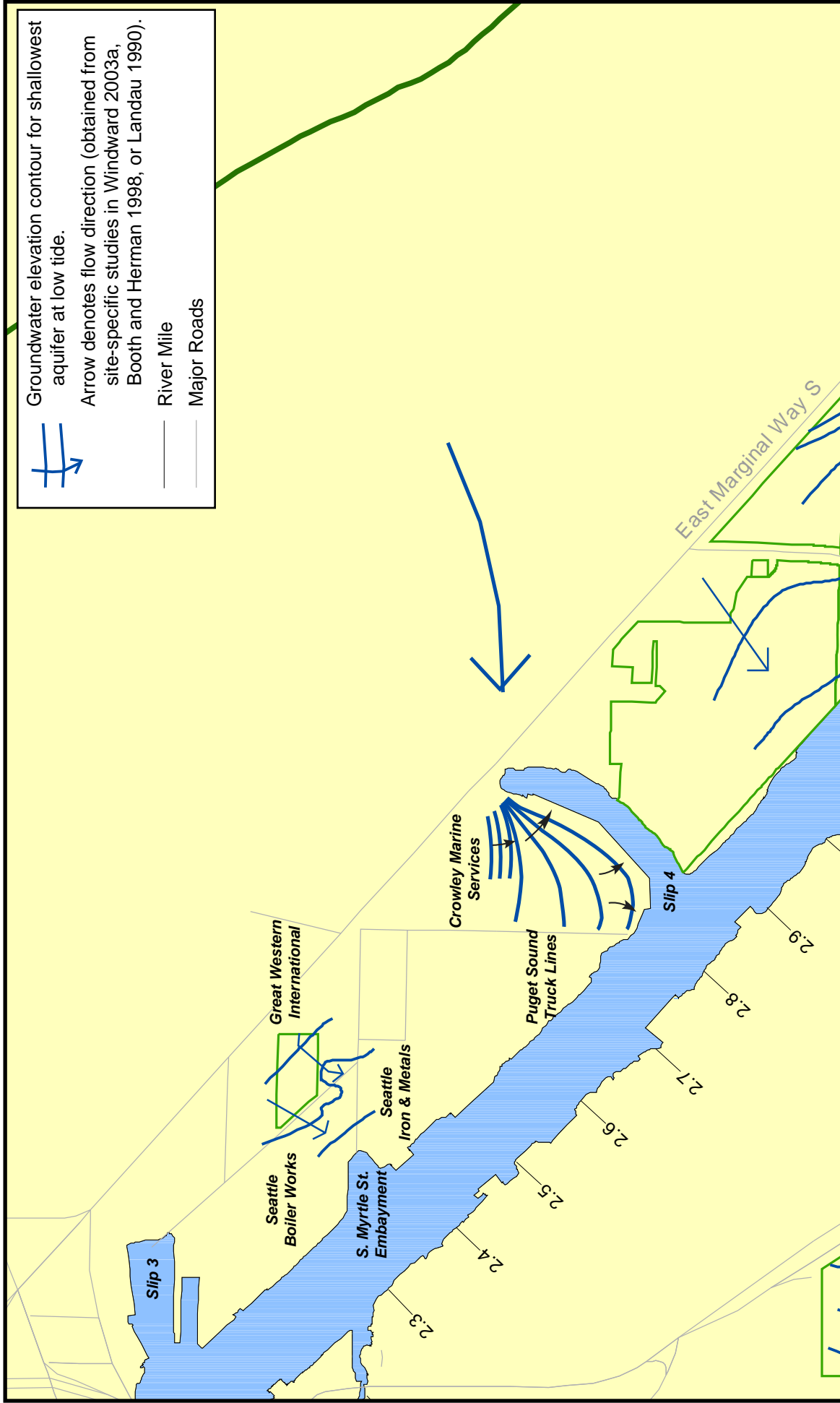


Figure 2. RM 2.3-2.8 East Source Control Area



Groundwater elevation contour for shallowest aquifer at low tide.

Arrow denotes flow direction (obtained from site-specific studies in Windward 2003a, Booth and Herman 1998, or Landau 1990).

River Mile

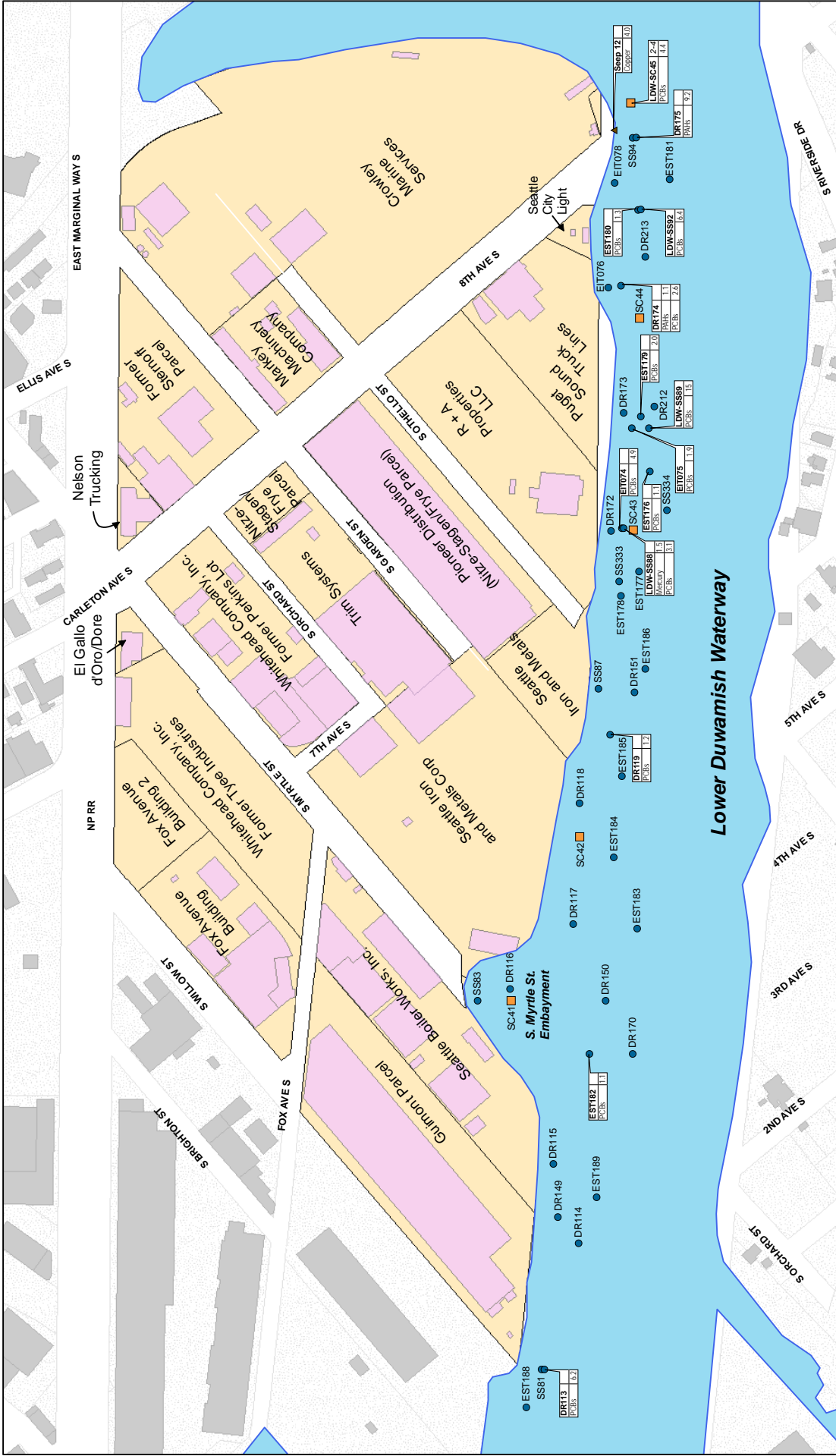
Major Roads

**Figure 3. Groundwater Flow Direction
RM 2.3-2.8 East Source Control Area**

Not to Scale

Source: Windward 2003a





Legend

■	Water
■	Building
■	Parcel

●	Surface Grab
Chemical	Sample ID
Maximum SCS	Exceedance Factor
Exceedance Factor	

■	Subsurface Core
Chemical	Sample ID
Maximum SCS	Exceedance Factor
Exceedance Factor	

▲	Seep Sample
Chemical	Sample ID
Chemical	Exceedance Factor
Exceedance Factor	

Figure 4. Sediment and Seep Sample Locations
RM 2.3-2.8 East Source Control Area

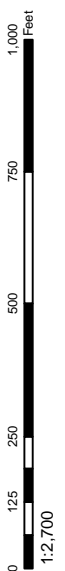
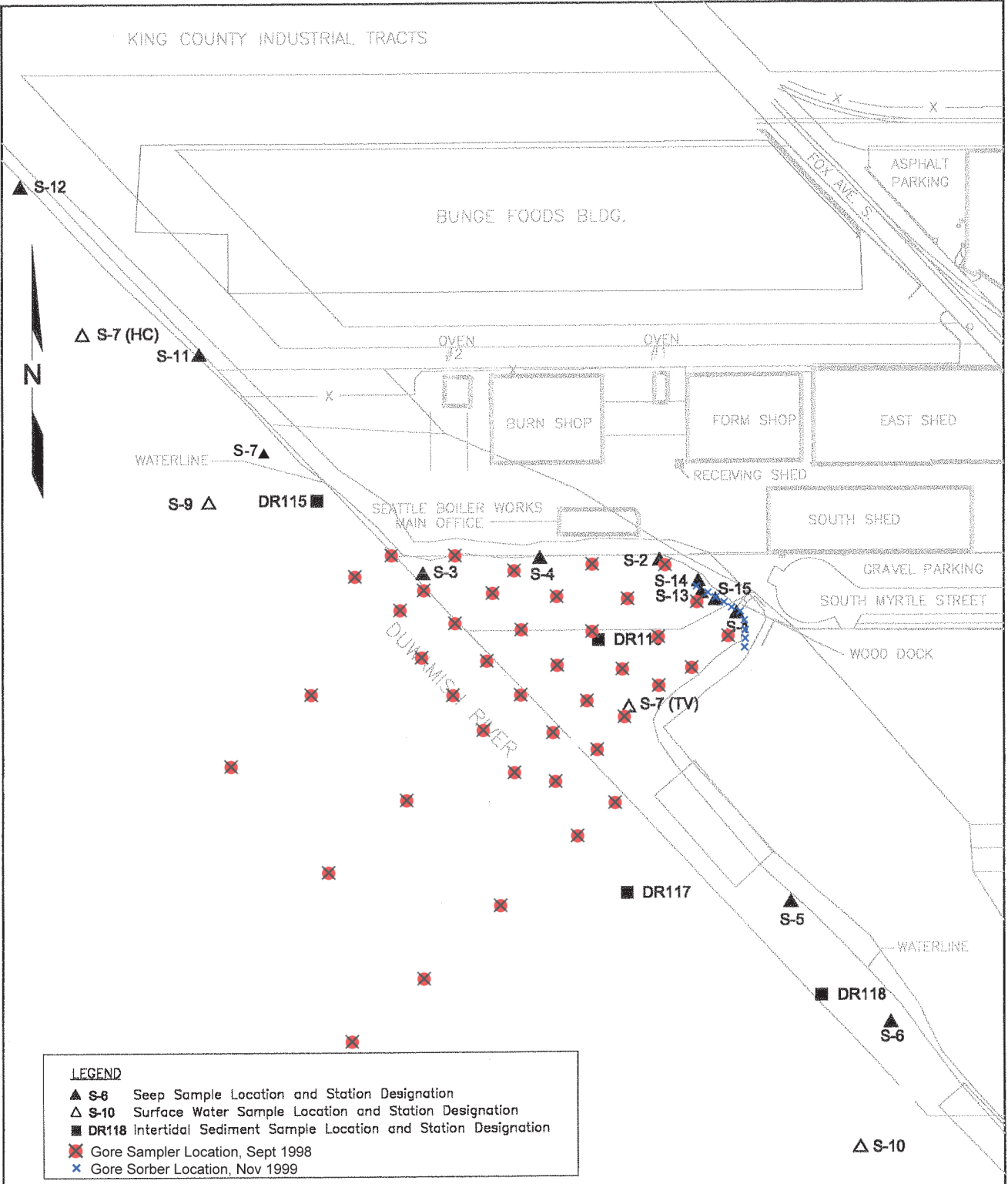




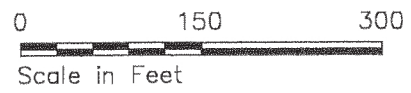
Figure 5. RM 2.3–2.8 East (Seattle Boiler Works to Slip 4) Storm Drain System and Sampling Locations



LEGEND

- ▲ S-8 Seep Sample Location and Station Designation
- △ S-10 Surface Water Sample Location and Station Designation
- DR118 Intertidal Sediment Sample Location and Station Designation
- ⊠ Gore Sampler Location, Sept 1998
- ⊠ Gore Sorber Location, Nov 1999

		Great Western Chemical Company Seattle, Washington
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<p>From Science to Solutions</p>

**Figure 6. Sediment and Seep Sample Stations
S. Myrtle Street Embayment**

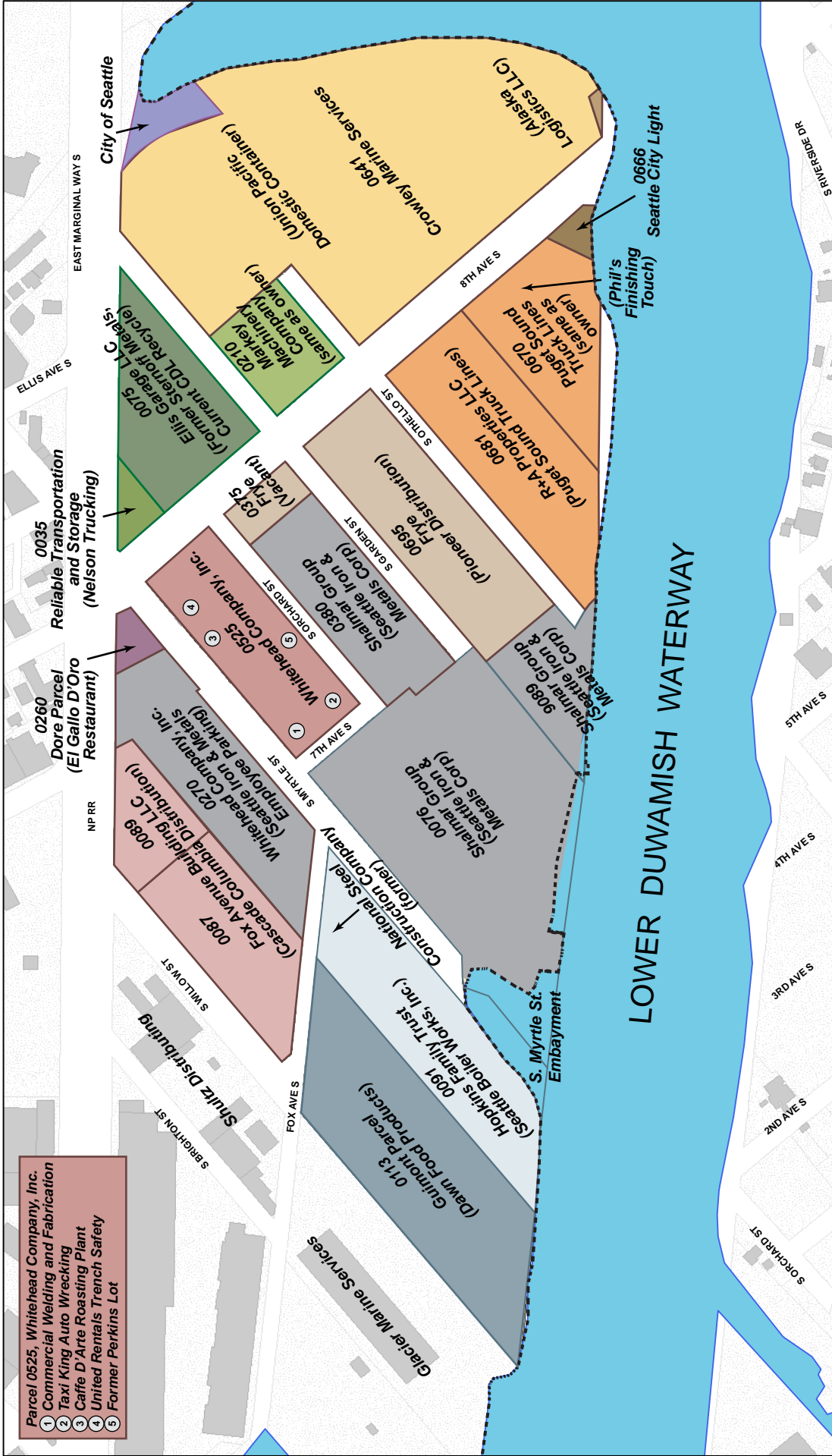
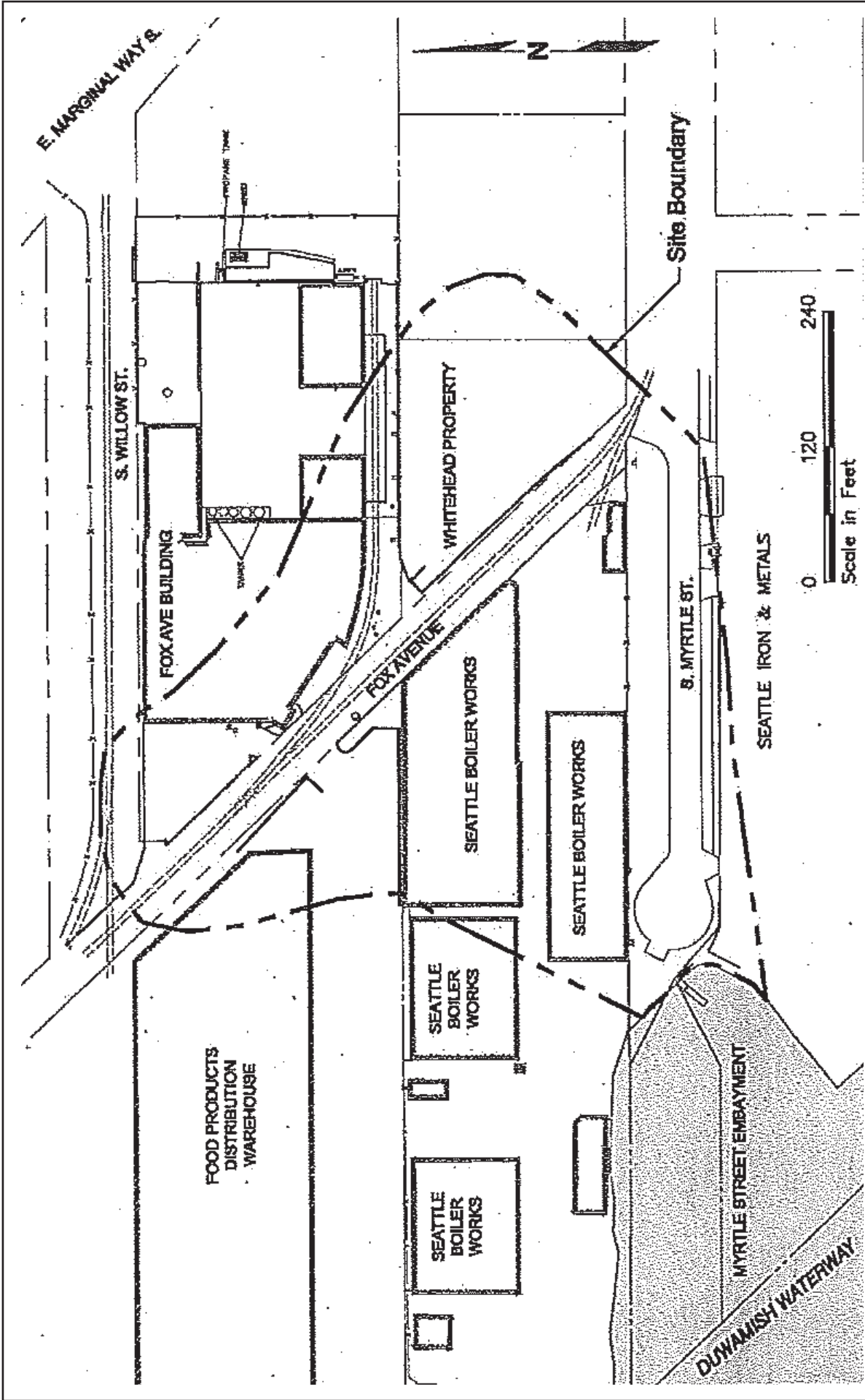


Figure 7. Parcel Ownership and Uses
RM 2.3-2.8 East Source Control Area



Source: Ecology 2009

Figure 8. Groundwater Contamination Associated with the Fox Avenue Building Property



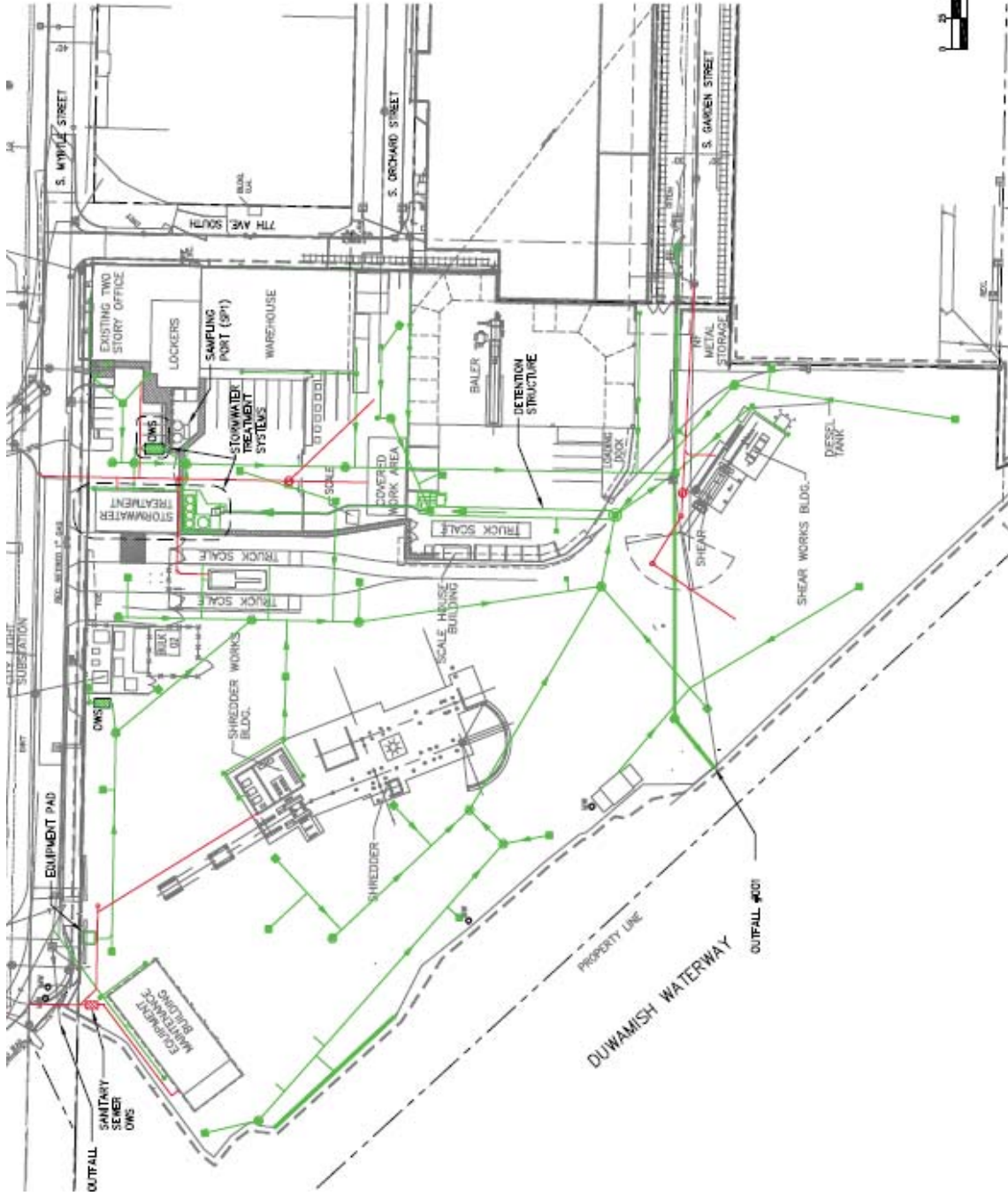


Figure 9. Stormwater Treatment System at Seattle Iron & Metals

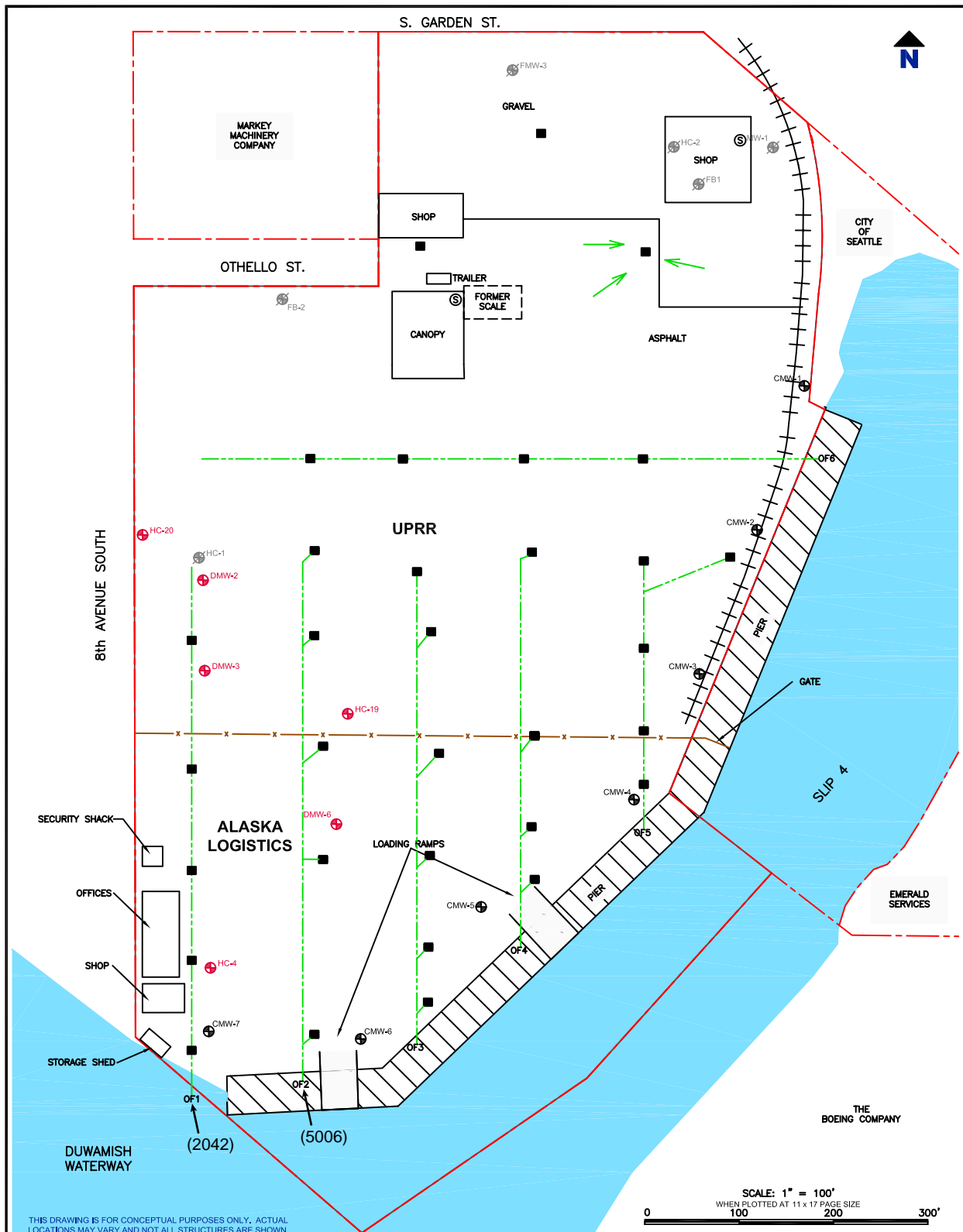
Source: Floyd | Snider 2009





Image from City of Seattle Department of Planning and Development

Figure 10. Georgetown Pump Station Sampling Locations



THIS DRAWING IS FOR CONCEPTUAL PURPOSES ONLY. ACTUAL LOCATIONS MAY VARY AND NOT ALL STRUCTURES ARE SHOWN.

SCALE: 1" = 100'
WHEN PLOTTED AT 11 x 17 PAGE SIZE
0 100 200 300'

NOTES
DRAWING COMPILED FROM TRIAD ASSOCIATES, KIRKLAND, WA. SURVEY PLAN, DRAWING 06133--CC052908.DWG

LOCATIONS OF STRUCTURES ARE APPROXIMATE

LEGEND

- SITE PROPERTY BOUNDARY
- - - NEIGHBORING PROPERTY BOUNDARIES
- + + + INACTIVE RAIL LINE
- x - x - FENCE
- - - - - STORMWATER CONVEYANCE

- STORMWATER CATCH BASIN
- ⊙ SUMP OR CATCH BASIN
- ➔ STORMWATER FLOW DIRECTION
- OF6 OUTFALL
- ⊕ 2008 GROUNDWATER MONITORING WELL
- ⊙ 1989 OR 1990 GROUNDWATER MONITORING WELL (ABANDONED OR DESTROYED)
- ⊕ 1989 OR 1990 GROUNDWATER MONITORING WELL

CROWLEY MARINE SERVICES SITE
7400 8TH AVENUE SOUTH
SEATTLE, WA

Report
SUBSURFACE INVESTIGATION REPORT

Drawing
STORMWATER SYSTEM



Date	July 21, 2008	Scale	AS SHOWN	Fig. No.	10
File Name	001-0205-00011-A3-9	Project No.	001-0205-00011		



Figure 11. 2008 Crowley Marine Services Environmental Investigation