



DEPARTMENT OF
ECOLOGY
State of Washington

Lower Duwamish Waterway Source Control Status Report January 2014 through December 2016

June 2018

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ECOLOGY
State of Washington

Lower Duwamish Waterway Source Control Status Report January 2014 through December 2016

Produced by

Toxics Cleanup Program
Northwest Regional Office
Washington State Department of Ecology
Bellevue, Washington

and

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Acronyms and Abbreviations

2LAET	Second Lowest Apparent Effects Threshold
BDC	Boeing Developmental Center
BEHP	bis(2-ethylhexyl)phthalate
BMP	best management practice
CAP	Cleanup Action Plan
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CJM	concrete joint material
CKD	cement kiln dust
COC	chemical of concern
cPAH	carcinogenic polycyclic aromatic hydrocarbon
CSL	cleanup screening level
CSO	combined sewer overflow
DNS	determination of nonsignificance
DSOA	Duwamish Sediment Other Area
DW	dry weight
EAA	early action area
Ecology	Washington State Department of Ecology
EE/CA	engineering evaluation/cost analysis
EIM	Environmental Information Management database
EMF	Electronics Manufacturing Facility
EOF	emergency overflow
EPA	U.S. Environmental Protection Agency
ERD	enhanced reductive dechlorination
FS	feasibility study
GTSP	Georgetown Steam Plant
HPAH	high molecular weight polycyclic aromatic hydrocarbon
ICS	Industrial Container Services
IDDE	illicit discharge detection and elimination
ISB	in-situ biological
ISCO	in-situ chemical oxidation
ISGP	Industrial Stormwater General Permit
KC	King County
KCIA	King County International Airport
KCIW	King County Industrial Waste
LAET	Lowest Apparent Effects Threshold
LDW	Lower Duwamish Waterway
LDWG	Lower Duwamish Waterway Group
LHWMP	Local Hazardous Waste Management Program
LPAH	low molecular weight polycyclic aromatic hydrocarbon
LTST	Long-Term Stormwater Treatment System
µg/kg	micrograms per kilogram
µg/L	micrograms per liter
mg/kg	milligrams per kilogram
MOA	Memorandum of Agreement

Acronyms and Abbreviations (Continued)

MOU	Memorandum of Understanding
MS4	municipal separate storm sewer system
MTCA	Model Toxics Control Act
NBF	North Boeing Field
NFA	No Further Action
ng/kg	nanograms per kilogram
NOAA	National Oceanic and Atmospheric Administration
NOV	Notice of Violation
NPDES	National Pollutant Discharge Elimination System
NTR	National Toxics Rule
OC	organic carbon
ODS	outside drainage system
OWS	oil/water separator
PAH	polycyclic aromatic hydrocarbon
PCB	polychlorinated biphenyl
PCE	tetrachloroethene
PCHB	Pollution Control Hearings Board
PLA	Pollutant Loading Assessment
PLP	potentially liable person
PSCAA	Puget Sound Clean Air Agency
QAPP	Quality Assurance Project Plan
RAL	remedial action level
RCRA	Resource Conservation and Recovery Act
RI	remedial investigation
RM	river mile
ROD	Record of Decision
SAP	Sampling and Analysis Plan
SBW	Seattle Boiler Works
SCAP	Source Control Action Plan
SCIP	Source Control Implementation Plan
SCL	Seattle City Light
SCO	sediment cleanup objective
SDOT	Seattle Department of Transportation
SD	storm drain
SEPA	Washington State Environmental Policy Act
SHA	Site Hazard Assessment
SIM	Seattle Iron and Metals
SMS	Washington State Sediment Management Standards
SPU	Seattle Public Utilities
SVE	soil vapor extraction
SVOC	semivolatile organic compound
SWMP	Stormwater Management Program
SWPPP	Stormwater Pollution Prevention Plan
TAC	Technical Advisory Committee

Acronyms and Abbreviations (Continued)

TBD	to be determined
TCE	trichloroethylene
TCP	Toxics Cleanup Program
TEQ	toxic equivalency quotient
TOC	total organic carbon
TPH	total petroleum hydrocarbons
TSCA	Toxic Substances Control Act
TSS	total suspended solids
UPRR	Union Pacific Railroad
USGS	U.S. Geological Survey
UST	underground storage tank
VCP	Voluntary Cleanup Program
VOC	volatile organic compound
WARM	Washington Ranking Method
WQC	water quality criteria
WSDOT	Washington State Department of Transportation

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Executive Summary

This report summarizes source control activities conducted by the Lower Duwamish Waterway (LDW) Source Control Work Group (SCWG) between January 1, 2014 and December 31, 2016. Previous status reports provided an overview of the LDW site and a summary of source control activities conducted between 2003 and December 2013. This report contains updated information related to LDW source control, including:

- A description of Ecology's 2016 Source Control Strategy;
- The status of source control action items, business inspections, and source tracing activities;
- The status of site assessments and cleanups;
- Public involvement and outreach activities; and
- Other source control activities conducted between January 2014 and December 2016 at each of the 24 identified source control areas.

Source Control Strategy

Ecology published the final (revised) Source Control Strategy in June 2016. The source control process is described in detail in the Strategy. The Strategy calls for the source control agencies to develop Source Control Implementation Plans (SCIPs) which will be included as appendices in an update to the Strategy. The SCIPs describe how each agency will manage its programs to address source control. The City of Seattle submitted a SCIP to Ecology in May 2016. King County submitted a draft SCIP to Ecology in March 2016.

Source Control Action Items

Ecology grouped the 24 source control areas that drain to the LDW Superfund site into three larger sub-areas: upper reach, middle reach, and lower reach. Ecology developed Source Control Action Plans (SCAPs) for each of the 24 source control areas between February 2003 and September 2013. The SCAP for each source control area includes a list of action items needed to identify and control contaminant sources.

A total of 693 source control action items have been identified; 434 of these action items have been completed (63 percent).

- 131 of 188 high priority action items (70 percent) have been completed;
- 177 of 323 medium priority action items (55 percent) have been completed;
- 126 of 182 low priority action items (69 percent) have been completed.

The status of 204 action items was updated to completed or canceled during the current reporting period. The current status of action items is shown in Figure ES-1.

A total of 57 high priority action items remain to be completed; of these, 19 action items are in the upper reach, 22 are in the middle reach, and 16 are in the lower reach. High priority action items that are not yet complete are listed in Table ES-1 at the end of this section.

Source Control Implementation

Business inspections and source tracing efforts continue. During the current reporting period, Ecology's Water Quality and Hazardous Waste inspectors and Ecology Toxics Cleanup Program staff continued to coordinate facility inspections and priorities with Seattle Public Utilities (SPU) and King County inspectors to avoid overlap in the field. SPU conducted 870 inspections/site visits at 482 facilities. King County conducted 64 inspections at 48 facilities in the LDW unincorporated area. King County funded a stormwater inspector position at Ecology; the County-funded stormwater inspector conducted 53 full facility assessments and 89 screening-level facility assessments. Ecology conducted 267 inspections at 233 facilities.

Source tracing activities also continued during the current reporting period. SPU and King County collected in-line storm drain sediment trap and grab samples and storm drain catch basin grab samples. King County collected solids samples in combined sewers. Ecology collected storm drain samples at facilities with stormwater discharge permits.

Site characterization or cleanup is in progress at several facilities that are known or suspected threats to LDW sediments. The U.S. Environmental Protection Agency (EPA) is managing sites under the Resource Conservation and Recovery Act (RCRA); Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA); and/or the Toxic Substances Control Act (TSCA). EPA is managing the Rainier Commons, Slip 4, Boeing Former Electronics Manufacturing Facility (EMF), Boeing Plant 2, Jorgensen Forge (outfall site and sediment site), Rhone-Poulenc, and Terminal 117 sites.

Ecology is managing the following sites under the Model Toxics Control Act (MTCA): Burlington Environmental/East of 4th Site, West of 4th Site, General Electric-Dawson Street Plant, Duwamish Marine Center, Fox Avenue Building, Whitehead Tyee Site, Crowley Marine Services 8th Avenue S, North Boeing Field/Georgetown Steam Plant (NBF-GTSP), Jorgensen Forge (upland of the EPA-managed area), Boeing Isaacson Thompson, 8801 Site, Boeing Field Chevron, Duwamish Shipyard, Glacier Northwest/Reichhold Chemical, Terminal 115 North, South Park Landfill, Douglas Management Dock, and Industrial Container Services (ICS)/Trotsky Property/Former Northwest Cooperage sites.

Other source control activities in progress or completed during this period include the following:

- Ecology conducted Site Hazard Assessments (SHAs) in the LDW basin;
- Ecology conducted groundwater sampling for polychlorinated biphenyl (PCB) analysis at 17 cleanup sites;
- The Port of Seattle, King County International Airport (KCIA), and SPU cleaned storm drain lines;
- SPU tested new sediment trap designs to provide more effective collection of storm drain solids in small diameter pipes; and
- Ecology and King County worked on several studies related to contaminants and potential chemical loads associated with upstream Green River sediments and surface water.

Major source control activities completed during this reporting period are summarized below by source control area. Additional information is provided in Sections 3 through 8.

Lower Reach - East Side

RM 0.0-0.1 East (Spokane Street to Ash Grove Cement)

- The Port of Seattle cleaned 27 storm drain structures and 2,649 feet of storm drain lines at Terminal 102 in November 2014.
- The Port of Seattle cleaned 42 storm drain structures and 2,600 feet of storm drain lines at Terminal 104 in December 2014.
- Lump coal was released onto the dock and into the LDW at Ash Grove Cement when a wall failed in an aboveground storage unit in April 2014. The remaining lump coal was moved away from the LDW, and product in the water was removed during low tide that evening.

RM 0.1-0.9 East (EAA-1: Duwamish/Diagonal Way)

- The Port of Seattle submitted a Source Control Data Evaluation report for Terminals 108W, 108E, and 106W to Ecology in June 2014.
- The Port of Seattle cleaned storm drain structures and lines at Terminals 106 and 108 in 2014 and 2015.
- Rainier Commons submitted a Phase II work plan to EPA in April 2015. Abatement was completed for Phases I and IIa, which includes the west side of Buildings 10 and 11, all of Building 13, and the south side of Building 15. A Phase IIb report was submitted to EPA.

RM 1.0-1.2 East (King County Lease Parcels)

- Ecology completed dispute resolution at the Burlington Environmental/East of 4th site in June 2014. Following dispute resolution, Ecology modified the facility's Dangerous Waste Permit for Corrective Action.
- In January 2015, PSC Georgetown completed a focused feasibility study of 1,4-dioxane remediation approaches in the area outside the barrier wall for the Burlington Environmental/East of 4th site.
- Ecology proposed an amendment to the 2010 Agreed Order at the East of 4th site (Stericycle Georgetown) to include requirements for a new cleanup action targeting 1,4-dioxane in site groundwater, consisting of application of an in-situ chemical oxidation compound (ISCO), performance of a 1,4-dioxane biodegradation study, and in-situ biological (ISB) degradation if the biodegradation study concludes that biodegradation is likely to be effective. In June 2015, Ecology issued a Determination of Nonsignificance (DNS) for the actions identified in the revised Agreed Order. The Agreed Order amendment was signed in August 2015.
- Ecology issued an Agreed Order to the West of 4th site potentially liable person (PLP) Group on April 23, 2014. The Agreed Order requires the joint performance of a feasibility study and the drafting of a Cleanup Action Plan (CAP).
- GE Aviation and Ecology entered into a Consent Decree on March 31, 2014, requiring GE Aviation to implement the CAP and clean up the GE Aviation site.

Middle Reach - East Side

RM 1.7-2.0 East (Slip 2 to Slip 3)

- Ecology approved the Duwamish Marine Center Remedial Investigation/Feasibility Study (RI/FS) work plan to begin RI activities. G-Logics performed the field investigation during 2015 and 2016 and began preparing the RI report in late 2016.
- As part of the RI activities at Duwamish Marine Center, one stormwater and five catch basin solids samples were collected in September 2015. Copper exceeded the marine water quality criterion (WQC). Zinc, several polycyclic aromatic hydrocarbons (PAHs) and other semivolatile organic compounds (SVOCs) exceeded storm drain screening levels in catch basin solids samples.

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

- Recology CleanScapes proactively implemented a Level 3 Corrective Action in 2015 to improve the quality of stormwater discharged from their facility. Recology CleanScapes submitted an engineering report to Ecology in September 2015 that describes the planned Level 3 Corrective Action. Ecology reviewed and approved the stormwater treatment system design engineering report in November 2015.
- Ecology issued a Notice of Penalty to Seattle Iron & Metals (SIM) on September 23, 2014 and fined SIM \$18,000 for allowing stormwater with excessive levels of PCBs and other pollutants to discharge to the LDW in violation of their stormwater discharge permit. The penalty covers 22 violations, from October 2013 through August 2014. In addition, Ecology expects SIM to complete a series of upgrades to improve their stormwater treatment system. The penalty was subsequently reduced to \$16,000.
- Ecology conducted an SHA for the Whitehead Tyee site in 2016. This site was ranked '1', or greatest risk, and it was added to the Hazardous Sites List in August 2016.

RM 2.8 East (EAA 3: Slip 4)

- In July 2014, Ecology issued a DNS to DeNovo, the current property owner of the Crowley Marine Services 8th Avenue S site, to conduct an interim action to remove contaminated soil from the site for construction of a new rail line and concrete foundation. On July 18, 2014, Ecology withdrew the DNS for the interim action project due to information submitted to Ecology during the public comment period. Ecology received a letter from the Washington Department of Archaeology and Historical Preservation identifying the project area as having a very high potential for archaeological resources.
- Ecology filed a lien against DeNovo on October 9, 2015, for failure to pay \$246,375.96 in remedial action costs for the Crowley Marine Services 8th Avenue S site.
- Ecology's contractor completed the final RI/FS Work Plan for the NBF-GTSP site.
- The first phase of RI work at the NBF site included installation of approximately 90 soil borings. Groundwater monitoring wells were installed in 25 of the borings, and vapor points were installed in 10 of the borings. Work also included sampling of solids in 53 storm drain structures and surface debris at 91 locations. Phase 1 RI work began in spring

2014 and was completed in September 2015. Phase 2 sampling was completed in March 2016. A preliminary draft RI report was submitted to Ecology in June 2016.

- King County International Airport (KCIA) completed a revised report summarizing results of sampling and testing of storm drain solids at 12 locations at KCIA, and incorporation of data from four sediment trap locations. Chemical concentrations were compared to the RI screening levels applied at the downstream NBF-GTSP site. Results showed exceedances of screening levels for PAHs, PCBs, metals, and several SVOCs.
- Boeing completed a draft final Engineering Evaluation/Cost Analysis (EE/CA) for the Former Boeing EMF site in December 2015. It evaluated the following removal action alternatives: no action, monitored natural attenuation, in-situ air sparging with soil vapor extraction (SVE), in-well stripping, and enhanced reductive dechlorination (ERD). The EE/CA provides the details of the comparative analysis of each removal alternative based on the established criteria. The recommended cleanup alternative presented in the EE/CA is treatment with ERD. The public review period for the EE/CA ended in August 2016.

Upper Reach - East Side

RM 2.8-3.7 East (EAA-4: Boeing Plant 2 to Jorgensen Forge)

- Boeing submitted a Corrective Measure Implementation Report for the Duwamish Sediment Other Area and Southwest Bank corrective measure for the Boeing Plant 2 to EPA in June 2016. The report describes work conducted during the third and final dredging construction season (between August 2014 and March 2015). The in-water work is now complete. Boeing continues to monitor the quality of sediment at the site.
- Boeing completed the majority of interim soil cleanups and installed stormwater treatment systems at the Boeing Plant 2 to control contaminants from entering the LDW. A proposed final cleanup plan (or Statement of Basis) for the upland area of the site will be published by EPA in 2018.
- In March 2015, Ecology issued an Enforcement Order requiring Jorgensen Forge to complete an RI/FS and to prepare a draft and final CAP for the upland portion of the site. Jorgensen Forge declared bankruptcy in 2016. As of the end of 2016, Ecology was negotiating an Agreed Order with the site's former owner and operator, the Earle M. Jorgensen Company.

RM 3.7-3.9 East (EAA-6: Boeing Isaacson/Central KCIA)

- Ecology completed a subsurface soil investigation of the sliver property located west of the Boeing Isaacson property in May 2015. Ten soil borings were advanced to a maximum depth of 25 feet below ground surface. Forty-one soil samples were collected where physical changes in the soil were observed. Twenty soil samples, identified as vertically and spatially representative of site soil, were analyzed for target analytes. Soil samples collected from near the ground surface to depths of 25 feet below ground surface contained concentrations of arsenic, cadmium, copper, lead, zinc, carcinogenic PAHs (cPAHs), petroleum hydrocarbons, and PCBs above site cleanup levels.

- KCIA performed independent cleanups at two former Standard Oil sites in 2014, and at the Former Hanger 5 site in 2015.

RM 3.9-4.3 East (Slip 6)

- KCIA conducted a Slip 6 source tracing investigation in April 2016, to assess three major lateral storm drain lines (east, central, and west) to KCIA's Slip 6 basin. Results of this effort will allow KCIA to focus source control investigations and mitigation. In the west lateral, zinc, PAHs, bis(2-ethylhexyl) phthalate (BEHP), and butylbenzyl phthalate exceeded storm drain screening levels. In the central lateral, zinc exceeded the screening levels. In the east lateral, zinc and PAHs exceeded the screening levels.

RM 4.9 East (EAA-7: Norfolk CSO/SD)

- Ecology issued a Notice of Violation (NOV) to the Military Flight Center for violations of its Industrial Stormwater General Permit (ISGP) by discharging PCBs to waters of the state in January 2014. Boeing requested that Ecology withdraw the NOV in February 2014 due to a lack of information or data establishing that a violation of water quality standards had occurred. Boeing agreed that continued source control actions were needed to ensure protection of sediment in the LDW. In April 2014 Ecology issued an Administrative Order that required Boeing to revise their Stormwater Monitoring Plan to identify four representative discharge locations and to include PCBs with a method detection limit of at least 0.03 micrograms per liter ($\mu\text{g/L}$).
- Boeing submitted a draft work plan to EPA and Ecology in April 2014 for the removal of soil containing PCBs on the eastern side of the Military Flight Center site and to add stormwater drainage system improvements to increase the quality of stormwater leaving the eastern flight line areas. The work plan was finalized and EPA provided a Risk-Based Approval in July 2014. Soil cleanup activities on the eastern side of the site were completed during fourth quarter of 2015. A final cleanup report was due to EPA and Ecology in 2016.
- Boeing collected and analyzed 84 concrete joint material (CJM) samples from flight line areas at the Military Flight Center site between March and May 2014. The highest concentrations of PCBs were found in one aircraft stall at the northeast corner of the flight line. PCBs were detected at one sample location at 2,600 milligrams per kilogram (mg/kg). In September 2014, 24 additional samples were collected from this aircraft stall to further delineate areas where CJM removal would be performed. PCB Aroclor concentrations ranged from non-detect to 1,800 mg/kg in these samples.
- Boeing completed removal of approximately 2,700 linear feet of PCB-containing CJM from the northeast flight line stall at the Military Flight Center site during October and November 2014. A technical memorandum describing the removal was submitted to EPA and Ecology on November 26, 2014.
- Ecology authorized G-Logics to begin RI field work at the Boeing Field Chevron site in September 2016. RI field activities included installation of 10 groundwater monitoring wells and collection of groundwater samples from 23 monitoring wells. Groundwater from well ME-16 contained gasoline-range hydrocarbons, benzene, toluene, and xylenes at concentrations exceeding MTCA Method A or B cleanup levels. In December 2016, G-

Logics decommissioned 18 wells, performed an initial vapor intrusion assessment for the site, and submitted a progress update to Ecology documenting the RI activities conducted.

Lower Reach - West Side

RM 0.0-1.0 West (Spokane Street to Kellogg Island)

- The Port of Seattle cleaned 17 structures and 1,337 feet of storm drain lines at Terminal 103 in November 2014. A total of 2.09 tons of solids were removed. Sediment traps were installed at locations CB8118 and CB8126 in December 2014; they were retrieved in April 2015 and solids were analyzed for metals, PCBs, SVOCs, grain size, and total solids. One sample was also analyzed for dioxins/furans. Detection limits were above the storm drain screening levels for many of the SVOCs. Fluoranthene, zinc, BEHP, and dioxins/furans exceeded screening levels in one or more samples.
- On February 11, 2015, Ecology issued an Administrative Order requiring General Recycling to conduct additional monitoring and to seek coverage under an individual National Pollutant Discharge Elimination System (NPDES) permit. A draft individual NPDES permit and fact sheet were published by Ecology on November 7, 2016.

RM 1.0-1.3 West (Kellogg Island to Lafarge Cement)

- In March 2014, Ecology issued an NOV to Lafarge Cement for a release of particulate material on January 23, 2014, which was deposited on surrounding area roofs, vehicles, yards, pavement, and other structures, including the adjacent Chemithon property. Ecology determined that the release posed a potential to pollute surface water through stormwater runoff. After submittal of a response by Lafarge in April 2014, Ecology issued a No Further Action letter indicating that Lafarge had taken necessary steps to correct the incident and prevent future similar accidents, and that effects on the LDW were minimal.

RM 1.3-1.6 West (Glacier Bay)

- Ecology issued an Administrative Order to Alaska Marine Lines in July 2015, which required submittal of an engineering report and installation of a stormwater treatment system by September 30, 2015.

Middle Reach - West Side

RM 1.6-2.1 West (Terminal 115)

- The Port of Seattle cleaned 249 structures and 27,000 feet of storm drain lines at Terminal 115 between July and November 2014. A total of 37.24 tons of solids were removed. Sediment traps were installed at six locations in November 2014 and they were retrieved in April 2015. Solids were analyzed for metals, PCBs, SVOCs, grain size, and total solids. One sample was also analyzed for dioxins/furans. Detection limits exceeded the storm drain screening levels for most SVOCs. Zinc (1,400-3,200 mg/kg) and BEHP (11-37 mg/kg dry weight [DW]) exceeded the sediment Cleanup Screening Level (CSL) at all locations. Chromium (520 mg/kg), copper (440 mg/kg), mercury (0.63 mg/kg), phenol (9.9 mg/kg DW), 4-methylphenol (35 mg/kg DW), butylbenzyl phthalate (1.5 mg/kg DW), and fluoranthene (2.9 mg/kg DW) exceeded the CSL in one or more samples. Total PCBs and

fluoranthene exceeded the Sediment Cleanup Objective (SCO), but not the CSL, in at least one sample each. The dioxin/furan toxic equivalency quotient (TEQ) (91.3 nanograms per kilogram [ng/kg]) exceeded the LDW-wide Remedial Action Level (RAL) of 25 ng/kg TEQ.

RM 2.1 West (1st Avenue S SD)

- The City of Seattle submitted an Interim Action Work Plan for the Former South Park Landfill, South Transfer Station Phase II to Ecology in July 2015. The preferred alternative for the interim action involved capping, landfill gas and surface water controls, and monitoring. A Washington State Environmental Policy Act (SEPA) DNS was issued for this interim action in November 2015. On February 1, 2016, Ecology and the City of Seattle signed an amendment to the Agreed Order to conduct an interim action at this site. The City of Seattle and South Park Property Development submitted a draft final RI/FS report to Ecology in June 2016.

RM 2.2-3.4 West (Riverside Drive)

- Ecology sent Early Notice Letters to the Independent Metals Plant 1, Independent Metals Plant 2, and Independent Metals Storage Lot facilities on February 24, 2014. The Early Notice Letters explain that Ecology added these facilities to the Washington State Hazardous Sites List and that further investigations or cleanup action will need to be performed to clean up known contamination at those facilities. Independent Metals declared bankruptcy and the sites are now vacant.

Upper Reach - West Side

RM 3.4-3.8 West (EAA-5: Terminal 117)

- South Park Marina collected soil, catch basin solids, and sediment samples in February 2016. Preliminary results indicate total PCBs at concentrations up to 22 mg/kg DW in soil, 1.5 mg/kg DW in catch basin solids, and 0.27 mg/kg DW in sediment.
- Terminal 117 upland and in-water construction was completed in December 2014. Contaminated soil and sediment were removed from the Terminal 117 property. The cleanup included removal of 27,800 tons of PCB-contaminated soil and over 32,000 tons of sediment. In-water work was conducted in December 2014 to finish backfilling, place riprap materials, and replace marine pilings.
- The City of Seattle conducted a non-time critical removal action to remove PCB-contaminated soil in the adjacent streets near the Terminal 117 site. In conjunction with the removal action, the City constructed new permanent stormwater infrastructure to manage runoff from the streets adjacent to the upland area. The adjacent streets and stormwater project includes portions of the rights-of-way of 16th Avenue S, 17th Avenue S, Dallas Avenue S, and S Donovan Street. In August 2016 a new outfall serving this area went online (17th Avenue S storm drain).

RM 3.8-4.2 West (Sea King Industrial Park)

- Precision Engineering completed an RI/FS work plan on March 25, 2014. The RI field investigations started in April 2014.
- In 2016, Ecology issued a fine to Puget Sound Coatings for \$80,000 for significant dangerous waste violations identified during inspections in July and August 2015. Ecology cited the facility for six violations, five of which were repeat violations from previous inspections.

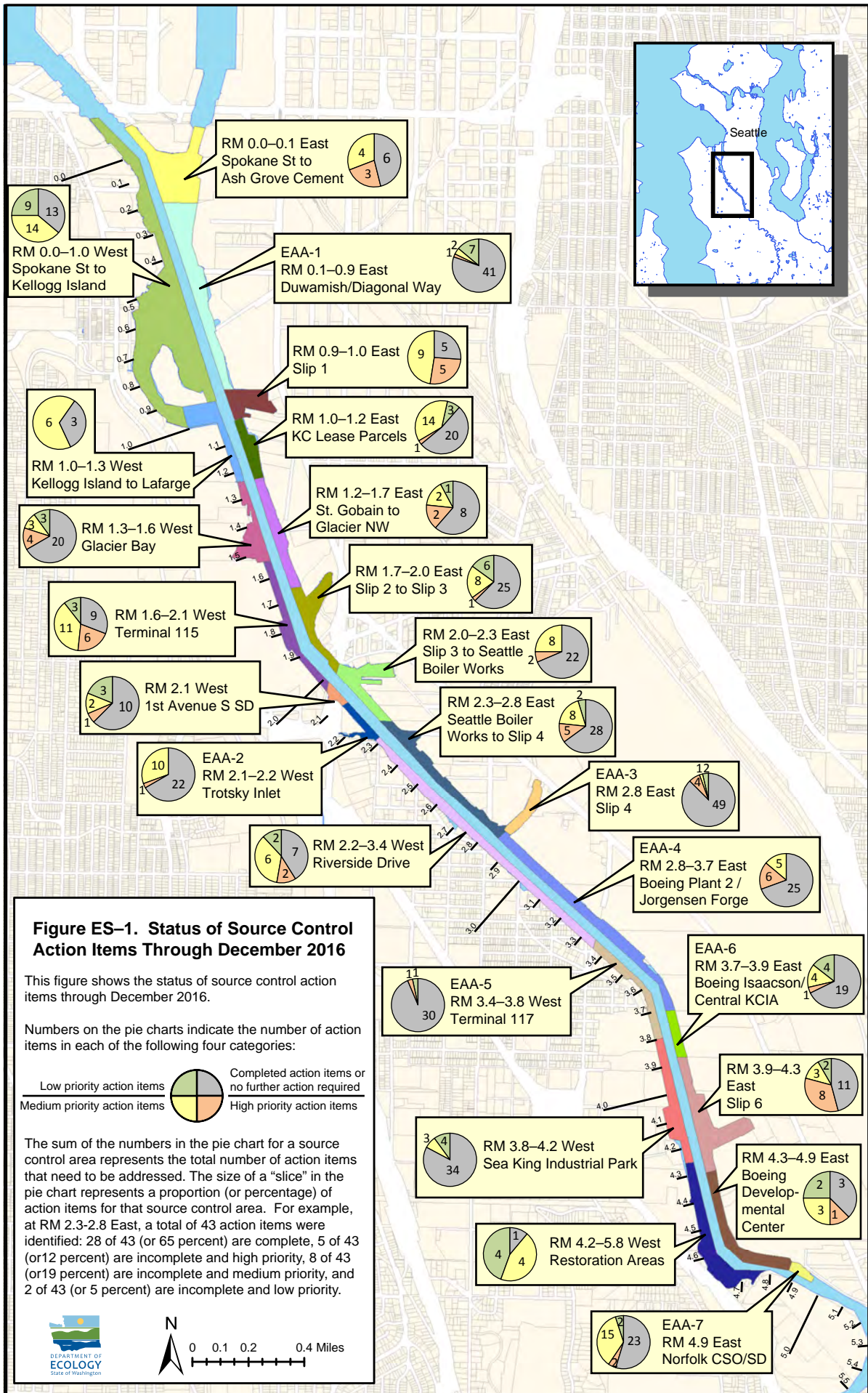


Table ES-1. High Priority Source Control Action Items to be Completed

Facility	Action Item	Type	Responsible Party	Status	Estimated Completion Date
Lower Reach – East Side					
RM 0.0-0.1 East (Spokane Street to Ash Grove Cement)					
Port of Seattle Terminal 104	Determine how to address identified data gaps in the western portion of T-104.	SCAP	Ecology, Port of Seattle	Planned	TBD
	Review post remediation reports and annual report as part of the VCP and determine whether further action is needed.	SCAP	Ecology	Planned	TBD
Ash Grove Cement	Negotiate an agreed order for a Remedial Investigation/ Feasibility Study that will focus on potential soil and groundwater contamination at the site.	SCAP	Ecology, Property owner/operator	Planned	TBD
RM 0.1-0.9 East (EAA-1: Duwamish/Diagonal Way)					
Rainier Commons / Former Rainier Brewery Property	Sample and remove PCB-contaminated building materials, including interior paint, as needed.	New	EPA/Property Owner	In Progress	Dec 2018
RM 0.9-1.0 East (Slip 1)					
Federal Center South	Perform Site Hazard Assessment	SCAP	Ecology	Planned	TBD
Former Snopac Products Property	Collect additional samples from Seep 76 to determine if the arsenic concentration reported in 2004 was an anomaly. Analyze sample for all sediment COCs.	SCAP	Ecology	Planned	TBD
Manson Construction Company	Obtain laboratory data and site plans from historical site assessment(s) and remediation performed at the property. Confirm that satisfactory completion of soil cleanup activities was achieved. Determine if arsenic or other sediment COCs are present in soil and groundwater beneath the facility at concentrations that may recontaminate sediments.	SCAP	Ecology	Planned	TBD
	If satisfactory soil cleanup was not achieved, require the property owner/operator to conduct a site assessment to determine residual concentrations of sediment COCs in soil and groundwater beneath the property.	SCAP	Ecology	Planned	TBD
	Collect additional samples from Seep 76 to determine if the arsenic concentration reported in 2004 was an anomaly. Analyze sample for all sediment COCs.	SCAP	Ecology	Planned	TBD
RM 1.0-1.2 East (KC Lease Parcels)					
Cadman Seattle, Inc.	Require Cadman to report when discharges to Outfall No. 2244 occur to allow Ecology to track overflow events and evaluate potential impacts to the LDW.	SCAP	Ecology	Planned	TBD

Facility	Action Item	Type	Responsible Party	Status	Estimated Completion Date
RM 1.2-1.7 East (Saint Gobain to Glacier Northwest)					
Saint Gobain Containers Inc.	Determine appropriate engineering controls for the inaccessible contamination located beneath the soil/water separator described in the 1991 Limited UST Assessment.	SCAP	Property Owner/Operator	Planned	TBD
Longview Fibre Paper and Packaging	Review the latest groundwater monitoring report regarding exceedances of diesel-range hydrocarbons.	SCAP	Ecology	Planned	TBD
Middle Reach – East Side					
RM 1.7-2.0 East (Slip 2 to Slip 3)					
Duwamish Marine Center	Require the property owner/operator to collect data on concentrations of chemical contaminants in river bank soils to assess the potential for sediment recontamination by erosion.	SCAP	Ecology	In Progress	TBD
RM 2.0-2.3 East (Slip 3 to Seattle Boiler Works)					
S Brighton Street SD	Conduct source tracing in the S Brighton Street SD basin.	Follow-On	SPU, Ecology	In Progress	TBD
S River Street SD	Conduct source tracing in the S River Street SD basin.	Follow-On	SPU, Ecology	In Progress	TBD
RM 2.3-2.8 East (Seattle Boiler Works to Slip 4)					
S Garden Street and S Myrtle Street Storm Drains	Conduct source tracing to identify potential contaminant sources to stormwater discharging to the LDW.	SCAP	SPU, Ecology	In Progress	TBD
Seattle Boiler Works, Inc.	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.	SCAP	Ecology	Planned	TBD
Puget Sound Truck Lines	Determine whether the five outfalls identified at the property are active, and identify the source of discharge from these outfalls, if any.	SCAP	Ecology, Property owner/operator	Planned	TBD
Crowley Marine Services 8 th Avenue S	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.	SCAP	Property owner/operator	In Progress	TBD
	Collect stormwater and/or solids samples from storm drain system to determine if onsite system is source of COCs found in waterway sediment.	SCAP	Ecology	In Progress	TBD
RM 2.8 East (EAA-3: Slip 4)					
North Boeing Field / KCIA / I-5 Storm Drains	Reinstall sediment traps and continue monitoring as needed.	SCAP	SPU, Boeing, King County	In Progress	Apr-17
North Boeing Field	Determine impact of remaining joint sealant material on PCB concentrations in stormwater.	Follow-On	Ecology	In Progress	2018
	Continue source tracing in north drain line to identify and/or eliminate transport of PCBs to Slip 4.	Follow-On	Boeing	In Progress	2018

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Facility	Action Item	Type	Responsible Party	Status	Estimated Completion Date
NBF-GTSP	Conduct RI/FS and implement interim actions (as needed).	New	Ecology, Boeing, City of Seattle, King County	In Progress	2018
Upper Reach – East Side					
RM 2.8-3.7 East (EAA-4: Boeing Plant 2/Jorgensen Forge)					
Boeing Plant 2	Continue shoreline groundwater monitoring.	SCAP	EPA, Boeing	In Progress	TBD
	Conduct a joint hydrologic investigation with Jorgensen Forge to provide additional hydrogeologic data at the boundary of the two facilities.	SCAP	Boeing, Jorgensen	Planned	TBD
	Collect in-line sediment samples in the City of Seattle and City of Tukwila systems immediately prior to discharge to Plant 2's storm drain system.	SCAP	EPA, Boeing	Ongoing	TBD
Jorgensen Forge	Contain and remove soils from upland outfall area of the 12-and 24-inch pipes.	Follow-On	EPA, Boeing, Jorgensen	In Progress	TBD
	Develop a hydrogeologic site model as part of the source control investigation to characterize the groundwater system on site, including tidal influence.	SCAP	Jorgensen, Boeing	In Progress	TBD
	Complete a Remedial Investigation/Feasibility Study of the upland site area	New	Jorgensen, Boeing	In Progress	TBD
RM 3.7-3.9 East (EAA-6: Boeing Isaacson/Central KCIA)					
Boeing Isaacson/Thompson Site	If COCs in soil and groundwater are present at concentrations that pose a risk of sediment recontamination, then develop a plan for controlling these contaminant sources.	SCAP	Ecology, Boeing	Planned	TBD
RM 3.9-4.3 East (Slip 6)					
8801 Site (Former PACCAR Site)	Re-evaluate existing soil and groundwater data and compare to site-specific screening levels (to be developed) for metals, PAHs, petroleum hydrocarbons, PCBs, SVOCs, and VOCs as COCs in the LDW, and test for dioxin/furans.	SCAP	Ecology, Property owner/operator	In Progress	TBD
	Complete Phase 2 of the Sediment Evaluation Work, which includes sediment core sampling in selected locations in the LDW adjacent to the site.	SCAP	Ecology, Property owner/operator	Planned	TBD
	Negotiate expanding the stormwater and storm drain solids monitoring to add COCs at the site. Review future monitoring results to determine if further actions are necessary.	SCAP	Ecology, Property owner/operator	In Progress	TBD

Facility	Action Item	Type	Responsible Party	Status	Estimated Completion Date
Former Rhône-Poulenc Site	Continue to monitor the effectiveness of the hydraulic interim control measure, and investigate the presence of elevated copper concentrations in groundwater outside the barrier wall and the potential leak in the barrier wall.	SCAP	EPA, Property owner/operator	In Progress	TBD
	Investigate and address shoreline bank contamination from historical site operations and releases (e.g. application of vanillin black liquor solids to the shoreline bank for weed control).	SCAP	EPA, Property owner/operator	In Progress	TBD
	Review the current SWPPP and Operations and Maintenance Plan. Make necessary changes and additions to prevent contaminants from potential upland sources (such as fuel leaks from damaged vehicles) from migrating to Slip 6 source control area sediments via the stormwater system.	SCAP	Ecology, Property owner/operator	Planned	TBD
Museum of Flight (MOF)	Monitor stormwater and/or storm drain solids at MOF and former BDC properties in the vicinity of USTs and associated groundwater contamination.	SCAP	Ecology, Property owner/operator	Planned	TBD
	Identify the source and extent of groundwater contamination on the former BDC property, and conduct remedial action, as necessary.	SCAP	Ecology, Property owner/operator	Planned	TBD
RM 4.3-4.9 East (Boeing Developmental Center)					
BDC Outfalls	If COCs are detected in the SD system at concentrations above the SCO, request Boeing to conduct source tracing and control as needed to reduce the potential for sediment recontamination.	SCAP	Ecology/Boeing	Planned	TBD
RM 4.9 East (EAA-7: Norfolk CSO/SD)					
Boeing Developmental Center (BDC) - South	Continue sediment monitoring in the vicinity of the south storm drain sediment removal activities.	SCAP	Boeing	In Progress	TBD
	Continue monitoring storm drain solids.	SCAP	Boeing	In Progress	TBD
Lower Reach – West Side					
RM 1.3-1.6 West (Glacier Bay)					
Duwamish Shipyard	Conduct site investigations as specified in the Agreed Order Statement of Work.	SCAP	Property owner/operator	In Progress	TBD
	Review site investigation results and assess potential for sediment recontamination and need for remedial actions.	SCAP	Ecology	In Progress	TBD
Glacier Northwest	Upon approval of work plans by Ecology, conduct site investigations as specified.	SCAP	Property owner/operator	In Progress	TBD
	Review site investigation results and assess potential for sediment recontamination and need for remedial actions.	SCAP	Ecology	In Progress	TBD

Facility	Action Item	Type	Responsible Party	Status	Estimated Completion Date
Middle Reach – West Side					
RM 1.6-2.1 West (Terminal 115)					
Terminal 115 - Port of Seattle Storm Drain Outfalls (Outfalls 2122, 2123, 2124, 2220, and POS 6146)	Negotiate an Agreed Order with the Port, to include Terminal-wide investigations to characterize the nature and extent of potential COC sources in fill material, soil, groundwater, and stormwater at Terminal 115, including specific areas identified in the Terminal 115 SCAP.	SCAP	Ecology, Port of Seattle	Planned	TBD
	Collect storm drain solids samples from the storm drain lines discharging to Outfalls 2122, 2123, 2124, 2128, 2220, and POS 6146 and provide the data to Ecology to identify potential contaminant sources. Samples were recently collected from the storm drain lines discharging to Outfalls 2123, 2124, 2128, and 2220.	SCAP	Port of Seattle	In Progress	TBD
	Perform a video inspection of storm drain lines to identify areas where groundwater infiltrates the storm drain system.	SCAP	Port of Seattle	Planned	TBD
	Provide information regarding discharges to the deck drains north of Berth 1 to Ecology. Information to be provided will include, at minimum, a description of BMPs employed to prevent pollution of the stormwater runoff that is conveyed to the deck drains.	SCAP	Port of Seattle	Planned	TBD
	Provide additional information to Ecology regarding stormwater drainage to the LDW from the 150 SW Michigan Street area of the Terminal 115 property. Information to be provided will include, at minimum, a map showing the area draining to the two small outfalls and a description of BMPs employed to prevent stormwater pollution.	SCAP	Port of Seattle	Planned	TBD
Former Foss Environmental Services	Request that Haslund MP perform an environmental investigation to characterize the nature and extent of potential sediment COCs in soil and groundwater beneath the property. Soil and groundwater contamination may be present due to historical operations by Boeing.	SCAP	Ecology	Planned	TBD
RM 2.1 West (1st Avenue S SD)					
1st Avenue S Bridge Drains (Outfalls 2505, 2507, 2510, 2512)	Request additional information from WSDOT regarding the quantity and quality of stormwater and solids discharged to the LDW through the bridge drains.	SCAP	Ecology	Planned	TBD
RM 2.1-2.2 West (EAA-2: Trotsky Inlet)					
2nd Avenue S SD	Continue source tracing to identify sources of phthalates and other COCs.	SCAP	SPU	In Progress	TBD

Facility	Action Item	Type	Responsible Party	Status	Estimated Completion Date
Upper Reach – West Side					
RM 2.2-3.4 West (Riverside Drive)					
Independent Metals Plant 2	Request drainage information from Independent Metals for Outfalls 2109 and 2111 to determine if the outfalls are operational and to identify the drainage areas associated with the outfalls, if any.	SCAP	Ecology	Planned	TBD
American Civil Constructors Barge Removal Ramp	Request American Civil Constructors to provide information about the fill used for a barge removal ramp, to determine if the fill is a potential source of contaminants to adjacent sediments.	SCAP	EPA, USACE	Planned	TBD
RM 3.4-3.8 West (EAA-5: Terminal 117)					
Adjacent Streets/Dallas Ave.	Continue monitoring of storm drain solids	Follow-On	SPU, Port of Seattle	In Progress	TBD

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

Type:

- Follow-On Action item is a follow-on to an action item identified in a SCAP
- New Action item identified after publication of the SCAP
- SCAP Action item identified in a SCAP

1.0 Introduction

This Source Control Status Report summarizes the source control activities conducted by the Lower Duwamish Waterway (LDW) Source Control Work Group¹ from January 1, 2014 through December 31, 2016. Previous status reports provided an overview of the LDW Superfund site, the strategy for controlling sources of pollutants to the LDW, the process for developing Source Control Action Plans (SCAPs), the methods and process for implementing SCAPs, issues associated with permitted discharges, and summaries of source control activities conducted between 2003 and December 2013 (Ecology 2007, 2008a, 2008d, 2009c, 2011c, 2012b, 2013, 2014h).

This report updates relevant information related to LDW source control, including the status of source control action items and sufficiency assessments; business inspections and source tracing activities conducted during the reporting period (2014 to 2016); status of site assessments and cleanups; public involvement and outreach activities; and other source control activities conducted during the current reporting period. Detailed background information on individual source control areas is provided in the Summary of Existing Information and Identification of Data Gaps (Data Gaps Reports) and SCAP for each area, as referenced in the text.

Section 1.0 summarizes background information on the LDW Superfund site. Section 2.0 describes the source control process and how it is being implemented. Sections 3.0, 4.0, and 5.0 describe site-specific source control activities for the lower, middle, and upper reach of the east side of the LDW, respectively. Sections 5.0, 6.0, and 7.0 describe site-specific activities for the lower, middle, and upper reach of the west side of the LDW, respectively. Section 9.0 contains a list of references. Figures are presented after each section.

Appendix A provides preliminary information on source control sufficiency worksheets being prepared by Ecology. Appendix B summarizes action items that were reported as complete during the current reporting period, and action items that have not yet been completed. Appendices C, D, and E list the Seattle Public Utilities (SPU), King County, and Washington State Department of Ecology (Ecology) source control inspections conducted during the current reporting period, respectively. Appendix F provides SPU source tracing sample results for 2014 through 2016.

1.1 Lower Duwamish Waterway Site

The LDW Superfund site is approximately 5 miles long and represents the downstream portion of the Duwamish River. The Site extends from the southern tip of Harbor Island in Seattle, Washington, to just south of the turning basin near S 102nd Street in Tukwila, Washington (Figure 1-1). The source area is defined by the combined stormwater/sanitary sewer service area and the separated stormwater drainage basins, and it encompasses 20,400 acres, or approximately 32 square miles.

¹ The Source Control Work Group includes the primary public agencies responsible for source control for the LDW: the Washington Department of Ecology, the City of Seattle, King County, the Port of Seattle, the City of Tukwila, the Puget Sound Clean Air Agency, the Washington State Department of Transportation and the U.S. Environmental Protection Agency.

Chemicals of concern (COCs) in the waterway include arsenic and other metals, polycyclic aromatic hydrocarbons (PAHs), polychlorinated biphenyls (PCBs), dioxins/furans, phthalates, and other organic compounds. These chemicals pose a health risk to people, fish, and wildlife.

The Lower Duwamish Waterway Group (LDWG), composed of the City of Seattle, King County, the Port of Seattle, and The Boeing Company (Boeing), completed a remedial investigation (RI) and feasibility study (FS) for the LDW Superfund site in July 2010 and October 2012, respectively (Windward 2010; AECOM 2012). In 2013, the U.S. Environmental Protection Agency (EPA) issued a Proposed Plan that included a summary of the cleanup alternatives and identified EPA's preferred cleanup option for the LDW (EPA 2013). In November 2014, EPA published a Record of Decision (ROD) for the site (EPA 2014c). The ROD provides an overview of the contamination present in the LDW, summarizes the associated risks to human health and the environment, describes the cleanup alternatives considered, and identifies EPA's Selected Remedy to address these risks. In August 2015, EPA added a correction memorandum to the LDW site file, which identified a few minor errors in the ROD (EPA 2015).

The Selected Remedy is the third component of an overall strategy for addressing contamination and the associated risks in the LDW. This strategy includes:

- Early identification and cleanup of the most contaminated areas in the LDW, referred to as early action areas (EAAs) (Figure 1-1).
- Controlling sources of contamination to the LDW.
- Cleanup of the remaining contamination in the LDW, including long-term monitoring to assess the success of the remedy in achieving cleanup goals.

Ecology is the lead agency for the second component of this strategy: controlling sources of contamination to the LDW. The Selected Remedy will be implemented after cleanup of the EAAs has been completed, source control has been implemented that is sufficient to minimize recontamination, additional sampling and analysis have been conducted, and a remedy design has been completed.

In July 2014, Ecology, EPA, and LDWG signed the second amendment to the Administrative Order on Consent for the RI/FS (EPA and Ecology 2014a). As part of this amendment, LDWG is conducting an enhanced natural recovery/activated carbon pilot study to evaluate the effectiveness and potential impacts of using this kind of treatment technology in the LDW, as well as to identify the areas that may be best suited for this technology. If pilot tests prove successful, activated carbon could be used in areas of the LDW where enhanced natural recovery remedial technology is applied (EPA 2014b; LDWG 2014, 2015a, 2015b; AMEC 2015b; Windward 2014).

Further information about the LDW can be found at EPA's LDW website² and the LDWG website.³

² <https://cumulis.epa.gov/supercpad/cursites/csinfo.cfm?id=1002020>

³ <http://www.ldwg.org/>

1.2 Memoranda of Understanding and Agreement

EPA and Ecology signed an interagency Memorandum of Understanding (MOU) in April 2002, which was revised in 2004. The MOU defined federal and state responsibilities for the LDW (EPA and Ecology 2002, 2004). Under the MOU, EPA is the lead agency for the sediment investigation and Ecology is the lead agency for coordinating and implementing source control.

In November 2014, in conjunction with publication of the ROD, EPA and Ecology clarified their responsibilities in a Memorandum of Agreement (MOA). The MOA expanded the coordination and cooperation effort to include additional EPA Region 10 and Ecology programs, particularly the water quality programs (EPA and Ecology 2014b). The MOA acknowledged that both source control and the in-waterway cleanup are complex, and described a collaboration framework between agencies to coordinate the in-waterway cleanup and source control activities. The MOA details both state involvement in the EPA-led cleanup of the LDW and EPA's involvement with the state-led source control work.

1.3 Lower Duwamish Waterway Source Control Strategy

Ecology developed a Source Control Strategy (herein referred to as the Strategy) for the LDW in 2004. In 2012, Ecology updated the Strategy, and a draft version was published as an appendix to EPA's Proposed Plan (EPA 2013). Responses to public review comments were included in EPA's Responsiveness Summary for the ROD (EPA 2014c). Ecology published the final (revised) Strategy in June 2016 (Ecology 2016c).

The Strategy is a framework for organizing the work of federal, state, and local source control agencies in the LDW as the Superfund project moves from the RI/FS phase into remedial design and construction activities for sediment cleanup. It identifies the goals and priorities of the LDW source control effort that will allow EPA to begin active sediment remediation, as described in the ROD. Implementation of these goals and priorities is largely influenced by the complex regulatory framework for controlling sources and pathways of contaminants within the 24 source control areas of the LDW basin (Figure 1-2). The Strategy clarifies the regulatory framework that Ecology and other source control partner agencies use to ensure regulatory controls are in place to minimize the potential for recontamination. The Strategy also describes the documentation, tracking, and reporting of the collective source control efforts and the external communication processes among the agencies.

The primary public agencies responsible for source control for the LDW are Ecology, the City of Seattle, King County, the Port of Seattle, the City of Tukwila, the Puget Sound Clean Air Agency (PSCAA), the Washington State Department of Transportation (WSDOT), and EPA. Together, they are known as the LDW Source Control Work Group.

Further information about LDW source control can be found at Ecology's LDW website.⁴

⁴ <https://ecology.wa.gov/Spills-Cleanup/Contamination-cleanup/Cleanup-sites/Toxic-cleanup-sites/Lower-Duwamish-Waterway/Source-control>

1.3.1 Source Control Implementation Plans

The Strategy calls for Ecology, King County, the City of Seattle, and EPA to develop Source Control Implementation Plans (SCIPs), which will be included as appendices in an update to the Strategy. The SCIPs describe how each agency will manage its programs to address source control.

The City of Seattle submitted its SCIP to Ecology in May 2016 (City of Seattle 2016). Seattle's SCIP is designed to meet the requirements of the 2013 National Pollutant Discharge Elimination System (NPDES) Phase I Municipal Stormwater Permit and Model Toxics Control Act (MTCA) requirements for contamination found in right-of-ways and on city-owned properties. The long-term goal of the City's source control program is to protect water and sediment quality in the LDW by controlling the amount of pollution discharged to and from the city-owned municipal separate storm sewer system (MS4). The City's objective for the first five years of the long-term effort is to develop tools to identify sources of pollutants to the city-owned MS4. The specific objectives of the City's SCIP are to:

- Document the source control actions that the City of Seattle will take over the next five years.
- Comply with Ecology's requirement to develop an adaptive management plan, as required by the NPDES Phase 1 permit.
- Manage municipal discharges to the LDW.
- Address contamination on city-owned properties and in the rights-of-way that may affect the LDW.
- Support Ecology in implementing its source control strategy, as required by the ROD for the LDW Superfund site.

King County submitted a draft SCIP to Ecology in March 2016. In December 2016, King County submitted its first annual report to document activities outlined in the SCIP. The annual report summarizes King County's LDW source control activities conducted in 2014 and 2015 (King County 2016b). The second annual report, for calendar year 2016, was submitted to Ecology in December 2017 (King County 2017). Relevant information from King County's annual reports has been incorporated into this LDW Source Control Status Report.

1.4 Understanding the Nature and Extent of PCB Contamination

PCBs are one of four human health risk drivers in the LDW. The other three risk drivers are arsenic, dioxins, and carcinogenic PAHs (cPAHs). Much of Ecology's work in the LDW has been focused on understanding the nature and extent of the PCB contamination and trying to identify sources. Studies and sampling have shown that PCBs are present at elevated concentrations in all environmental media in or near the LDW. Media-specific data may be in Aroclor or congener form, depending upon the media and the study. Media-specific information is summarized below:

- Air deposition – King County has led air deposition studies of PCBs involving multiple locations throughout the Green-Duwamish watershed (King County 2013, 2015d). PCBs

were found in all locations, with higher concentrations in the immediate LDW vicinity and lower concentrations in suburban and rural locations further upstream in the watershed.

- Surface water – Ecology funded three phases of the U.S. Geological Survey (USGS) sampling at river mile (RM) 11 to 12 to understand what pollutants are entering the LDW from upstream and under what conditions (USGS 2015, 2016a, 2016b). This work included the analysis of PCBs in filtered and unfiltered surface water. King County analyzed PCBs in surface water at multiple locations throughout the Green-Duwamish watershed (King County 2014a, 2015a, 2016b). Ecology also funded the limited collection of surface water samples, where possible, in close proximity to the locations of groundwater samples (Leidos 2017).
- Groundwater – Ecology funded the collection and analysis of PCBs in groundwater at multiple MTCA cleanup sites. The intent of this study was to identify if PCBs are present at concentrations lower than those detectable with analytical methods for PCB Aroclors and if PCB congeners are present in groundwater that are not found in Aroclor mixtures.
- Mammalian, avian, and aquatic species tissues or waste – As part of the Superfund process, fish and shellfish tissue were analyzed for PCBs. Ecology’s source control work resulted in PCB analysis of goose and otter scat (Leidos 2014c, Leidos and Wainstein 2017).
- Soil – PCBs are present in soil at contaminated sites throughout the LDW basin.
- Sediments, including suspended solids – The Superfund process resulted in the collection of bed sediment data for PCBs. This includes surface sediments as well as deep sediments. Ecology, as part of the upstream USGS sampling, funded the analysis of PCBs in bed sediments and in suspended solids under different flow conditions (USGS 2015, 2016a, 2016b). King County also collected suspended sediments in the Green River Watershed (King County 2016d).
- Stormwater and storm drain solids – Local source control partners routinely collect PCB data from storm drain solids on public and private lands for source tracing and trend analysis. Ecology requires certain NPDES permit holders to analyze stormwater runoff and storm drain solids for PCBs. Ecology also funded the collection and analysis of PCBs in stormwater and storm drain solids at targeted industries in the LDW basin (Leidos 2015a, 2015c).
- Combined sewer system solids and water – King County collected these data as part of efforts to support the LDW FS and source tracing analysis (King County 2011, 2016b, 2017).

The LDW source control work distinguishes between PCB sources and the pathways that PCBs take to reach environmental receptors. For example, stormwater is a pathway, not a source of PCBs. PCB sources found in the LDW area include building materials (e.g., paints and caulks), products processed by metal recyclers (e.g., cars and appliances), transformers, hydraulic fluids, light ballasts, and historical improper waste disposal locations. The LDW Source Control Work Group contributes to other PCB investigations that identify potential sources, including research into PCBs in consumer and commonly-used municipal products.

Ecology’s LDW source control and related Green-Duwamish watershed Pollutant Loading Assessment (PLA) programs have also funded studies on PCB congeners. Phase 1 of the PCB

Congener Study (Leidos 2016a) explains what PCBs are, describes the analytical methods that identify and measure PCB concentrations, and summarizes available PCB data in the Green-Duwamish watershed. Several sources of PCBs have been identified and regulatory actions are in place. Environmental sampling is underway to provide additional information on existing conditions in the LDW.

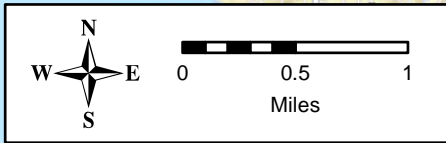
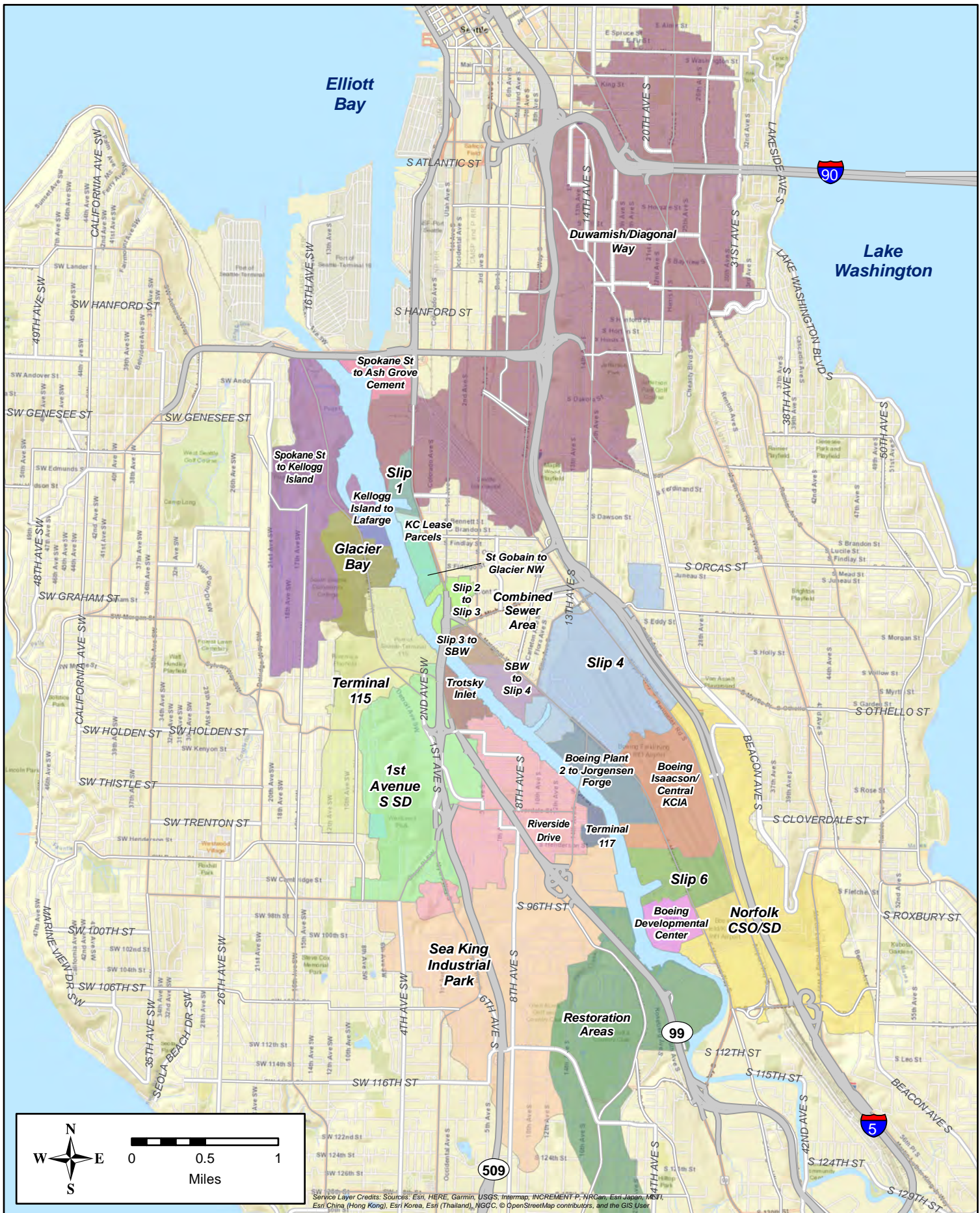


Figure 1-1. Lower Duwamish Waterway Source Area



Project: 1400 - M&T - Duwamish Waterway - Lower Duwamish Waterway - EAA - CSO Basin - LDW Source Area - Informational - 1/1/2014





Service Layer Credits: Sources: Esri, HERE, Garmin, USGS, Intermap, iPCREMENT P., NRCAn, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, © OpenStreetMap contributors, and the GIS User Community

Figure 1-2. Lower Duwamish Waterway Source Control Areas



2.0 Source Control Process and Implementation

2.1 Source Control Process

The source control process is described in detail in the Strategy (Ecology 2016c). Between February 2003 and September 2013, Ecology developed SCAPs for each of the 24 source control areas (sub-basins) that drain to the LDW Superfund site. The SCAPs identified potential contaminant sources and actions needed, and assessed the presence of ongoing sources that could recontaminate sediments after cleanup. SCAPs are available on Ecology's website.⁵

Ecology grouped the 24 source control areas into three larger sub-areas: upper reach, middle reach, and lower reach (Figure 2-1). Ecology plans to use an upstream-to-downstream approach to source control, such that EPA can most quickly begin active cleanup of LDW sediments. Ecology intends to focus on completing high-priority action items in the source control areas that comprise each sub-basin. For example, Ecology plans to complete high-priority actions first in the upper reach, then the middle reach, and finally the lower reach.

The 24 source control areas, by reach, are listed in Table 2-1.

Table 2-1. List of Source Control Areas, by Reach

Source Control Areas – East Side of LDW	Source Control Areas – West Side of LDW
Lower Reach	
RM 0.0-0.1 East (Spokane Street to Ash Grove Cement)	RM 0.0-1.0 West (Spokane Street to Kellogg Island)
RM 0.1-0.9 East (EAA-1: Duwamish/Diagonal Way)	RM 1.0-1.3 West (Kellogg Island to Lafarge Cement)
RM 0.9-1.0 East (Slip 1)	RM 1.3-1.6 West (Glacier Bay)
RM 1.0-1.2 East (King County Lease Parcels)	
RM 1.2-1.7 East (Saint Gobain to Glacier Northwest)	
Middle Reach	
RM 1.7-2.0 East (Slip 2 to Slip 3)	RM 1.6-2.1 West (Terminal 115)
RM 2.0-2.3 East (Slip 3 to Seattle Boiler Works)	RM 2.1 West (1 st Avenue South Storm Drain)
RM 2.3-2.8 East (Seattle Boiler Works to Slip 4)	RM 2.1-2.2 West (EAA-2: Trotsky Inlet)
RM 2.8 East (EAA-3: Slip 4)	RM 2.2-3.4 West (Riverside Drive)
Upper Reach	
RM 2.8-3.7 East (EAA-4: Boeing Plant 2/Jorgensen Forge)	RM 3.4-3.8 West (EAA-5: Terminal 117)
RM 3.7-3.9 East (EAA-6: Boeing Isaacson/Central King County International Airport [KCIA])	RM 3.8-4.2 West (Sea King Industrial Park)
RM 3.9-4.3 East (Slip 6)	RM 4.2-5.8 West (Restoration Areas)
RM 4.3-4.9 East (Boeing Developmental Center)	
RM 4.9 East (EAA-7: Norfolk CSO/SD)	

Note: Company names are used only to designate source control area locations; source control area names are not intended to assign responsibility for contamination or to identify properties that may need remediation.

⁵ <https://ecology.wa.gov/Spills-Cleanup/Contamination-cleanup/Cleanup-sites/Toxic-cleanup-sites/Lower-Duwamish-Waterway/Source-control-area-map>

2.2 Source Control Goals

The Strategy describes two primary goals for source control: a near-term goal to allow the start of active in-waterway cleanup, and a long-term goal to minimize the risk of recontaminating sediments above the sediment cleanup standards established in the ROD (Ecology 2016c). This Source Control Status Report is focused on describing progress toward the first goal.

The principal sources of information used to evaluate the status of source control, and whether sufficient source control progress has been made to proceed with in-waterway cleanup, include the following (from Section 6.3.2 of the Strategy):

- Status of high- and medium-priority action items identified in the SCAPs;
- Information collected through business inspections and spill investigations/response;
- Relevant information collected through other studies;
- Status of permit compliance, where applicable; and
- Status of upland site cleanups.

This Source Control Status Report summarizes new information obtained during the current reporting period (January 2014 through December 2016) in the categories listed above. Action item status is discussed in Section 2.3, and business inspections conducted during the current reporting period are summarized in Section 2.4. Section 2.5 describes source tracing sampling activities during the reporting period, and the status of upland site cleanups is discussed in Section 2.6. Section 2.7 describes other source control-related studies that have been performed during the current reporting period.

Information on permit compliance status was generally not available during preparation of this Source Control Status Report; specific programs within Ecology, including the Water Quality and the Hazardous Waste & Toxics Reduction programs, maintain information about permit compliance status.

As described in the Strategy, Ecology is responsible for evaluating and documenting source control sufficiency. Ecology is currently conducting evaluations to assess whether sources have been sufficiently controlled to proceed with active sediment remediation. Ecology will provide source control sufficiency evaluations and recommendations to EPA.

Ecology has begun documenting source control sufficiency in a series of worksheets for specific cleanup sites in the LDW. Ongoing source control sufficiency worksheets are presented in Appendix A. Ecology will update this information in future Source Control Status Reports.

2.3 Action Item Status

The SCAP for each source control area included a list of action items needed to identify and control contaminant sources. These action items have been updated as new information was obtained, as documented in previous Source Control Status Reports. Routine functions, such as ongoing inspections and review of NPDES permits, were originally included as action items but have since been removed from the action item list. In some cases, multiple action items have been consolidated into a single action item or an action item has been split into its component parts to allow more efficient tracking. Some action items have been edited for brevity and clarity.

Follow-on action items have been added based on the outcomes of original action items published in the SCAPs. In addition, action items have been added as new information about a facility or source control area has become available. For example, if an inspection was conducted that led to additional investigation activities at a facility, these activities were added as a new action item. This Source Control Status Report identifies the action items for each source control area that were completed during the current reporting period and the action items for each source control area that have not yet been completed.

Table 2-2 lists the number of action items as published in the original SCAPs and the number of action items currently identified for each source control area. In addition, it identifies the number of completed and incomplete high priority action items for each source control area.

Table 2-2. Number of Action Items by Source Control Area

Source Control Area	Total No. of Action Items ^a	Percent of Action Items Completed ^a	No. of High Priority Action Items	Percent of High Priority Action Items Completed	No. of Incomplete High Priority Action Items
Lower Reach					
RM 0.0-0.1 East (Spokane Street to Ash Grove Cement)	13	46%	7	57%	3
RM 0.1-0.9 East (EAA-1: Duwamish/Diagonal Way)	51	80%	7	86%	1
RM 0.9-1.0 East (Slip 1)	19	26%	6	17%	5
RM 1.0-1.2 East (King County Lease Parcels)	38	53%	8	88%	1
RM 1.2-1.7 East (Saint Gobain to Glacier Northwest)	13	62%	5	60%	2
RM 0.0-1.0 West (Spokane Street to Kellogg Island)	36	36%	0	NA	0
RM 1.0-1.3 West (Kellogg Island to Lafarge Cement)	9	33%	0	NA	0
RM 1.3-1.6 West (Glacier Bay)	30	67%	10	60%	4
Total – Lower Reach	209	56%	43	63%	16
Middle Reach					
RM 1.7-2.0 East (Slip 2 to Slip 3)	40	63%	5	80%	1
RM 2.0-2.3 East (Slip 3 to Seattle Boiler Works)	32	69%	12	83%	2
RM 2.3-2.8 East (Seattle Boiler Works to Slip 4)	43	65%	19	74%	5
RM 2.8 East (EAA-3: Slip 4)	56	88%	25	84%	4
RM 1.6-2.1 West (Terminal 115)	26	35%	7	14%	6
RM 2.1 West (1 st Avenue S SD)	16	63%	1	0%	1
RM 2.1-2.2 West (EAA-2: Trotsky Inlet)	33	67%	8	88%	1
RM 2.2-3.4 West (Riverside Drive)	17	41%	3	33%	2
Total – Middle Reach	263	65%	80	73%	22
Upper Reach					
RM 2.8-3.7 East (EAA-4: Boeing)	36	69%	24	75%	6

Source Control Area	Total No. of Action Items ^a	Percent of Action Items Completed ^a	No. of High Priority Action Items	Percent of High Priority Action Items Completed	No. of Incomplete High Priority Action Items
Plant 2/Jorgensen Forge)					
RM 3.7-3.9 East (EAA-6: Boeing Isaacson/Central KCIA)	28	68%	8	88%	1
RM 3.9-4.3 East (Slip 6)	24	46%	16	50%	8
RM 4.3-4.9 East (BDC)	9	33%	2	50%	1
RM 4.9 East (EAA-7: Norfolk CSO/SD)	42	55%	3	33%	2
RM 3.4-3.8 West (EAA-5: Terminal 117)	32	94%	9	89%	1
RM 3.8-4.2 West (Sea King Industrial Park)	41	83%	3	100%	0
RM 4.2-5.8 West (Restoration Areas)	9	11%	0	NA	0
Total – Upper Reach	221	66%	65	71%	19
Total – All Reaches	693	63%	188	70%	57

^a Includes action items that have been canceled because they were no longer needed (e.g., facility is no longer present, action is routine and ongoing, or is no longer relevant).

As of December 2016, 434 out of a total of 693 action items (63 percent) have been completed or canceled:

- 131 of 188 high priority action items (70 percent) have been completed;
- 177 of 323 medium priority action items (55 percent) have been completed;
- 126 of 182 low priority action items (69 percent) have been completed.

A total of 57 high priority action items remain to be completed; of these, 19 action items are in the upper reach, 22 are in the middle reach, and 16 are in the lower reach.

The 204 action items that were identified as complete or canceled (no longer needed) during the current reporting period are listed in Appendix B-1. Action items that have not been completed as of December 2016 are shown in Appendix B-2.

The high-priority action items that remain incomplete for each source control area are listed in Table ES-1.

2.4 Business Inspections and Spill Investigations

The City of Seattle operates the local sanitary/combined sewers that collect wastewater and stormwater and route it to the King County interceptor system, and it operates the municipal storm drains within the City. The City of Tukwila operates the municipal storm drains within its city limits. King County operates the large interceptor pipes that convey municipal and industrial wastewater, as well as stormwater, to the West Point treatment plant. King County operates its municipal separate storm sewer system in unincorporated King County, as well as on county-owned parcels within the incorporated municipal boundaries. The sanitary/combined sewer and storm drains (including private storm drains) serve an area of about 19,800 acres and 8,940 acres, respectively.

SPU, King County, and Ecology all conduct business inspections in the LDW basin:

- SPU focuses its business inspections in areas that discharge to the LDW through the City MS4 system. Inspections in the combined sanitary/storm sewer system are conducted in response to requests and complaints, and as additional resources allow. SPU's business inspection program conducts stormwater inspections and refers hazardous waste or industrial waste issues to Ecology and King County, respectively.
- King County provides technical support on industrial waste and hazardous waste issues as needed, and it inspects facilities permitted through the King County Industrial Waste (KCIW) program. King County inspects industrial users of the sanitary sewer system, including facilities within combined sewer systems in the LDW basin that discharge to the LDW during combined sewer overflow (CSO) events. King County CSO basins are shown in Figure 2-3. Through its Water and Land Resources Division Stormwater Services program, King County also inspects businesses in unincorporated areas and county facilities that discharge to the LDW.
- Ecology conducts water quality inspections for NPDES-permitted facilities; these inspections focus on stormwater permit compliance issues. Ecology also conducts dangerous waste inspections at regulated businesses and facilities. Under the Local Source Control Partnership, Ecology provides technical assistance and grants to local jurisdictions to conduct technical assistance visits to smaller business generators of hazardous/dangerous wastes.

In addition, Ecology, SPU, and King County work together to conduct source control inspections under the Urban Waters Initiative.

2.4.1 Seattle Public Utilities Inspections

In March 2016, the City updated its Stormwater Management Plan (SWMP), which describes activities in support of the NPDES Phase 1 municipal stormwater permit; the SWMP applies to the municipal separate storm sewers owned or operated by the City within the geographical boundaries established by the permit (SPU 2015a, 2016b).

During the current reporting period (2014 through 2016), SPU continued inspections of local businesses in the LDW service area to ensure that they are implementing appropriate pollution prevention practices and complying with local stormwater, industrial pretreatment, and hazardous waste regulations.

Facilities inspected by SPU in the LDW basin during the current reporting are listed in Appendix C, and locations are shown in Figure 2-2. This list includes screening visits, initial inspections, and follow-up inspections. Approximately 870 inspections/site visits at 482 facilities are listed in Appendix C. A summary of the number of facilities inspected by SPU between 2014 and 2016, by source control area, is shown in Table 2-3.

Table 2-3. Summary of SPU Inspections by Source Control Area

Source Control Area	Sub-Basin	No. of Facilities Inspected 2014 - 2016
Lower Reach		
RM 0.1-0.9 East (EAA-1: Duwamish/Diagonal Way)	Diagonal Avenue S SD, Diagonal CSO/SD, S Nevada Street SD	236
RM 0.9-1.0 East (Slip 1)	Duwamish East Direct	1
RM 1.0-1.2 East (KC Lease Parcels)	Brandon CSO	1
RM 1.2-1.7 East (Saint Gobain to Glacier Northwest)	Duwamish East Direct	1
RM 0.0-1.0 West (Spokane Street to Kellogg Island)	SW Dakota Street SD, SW Idaho Street SD	22
RM 1.3-1.6 West (Glacier Bay)	Duwamish Direct West, SW Kenny Street SD	5
Middle Reach		
RM 1.7-2.0 East (Slip 2 to Slip 3)	Duwamish East Direct, Head of Slip 2 SD	8
RM 2.0-2.3 East (Slip 3 to Seattle Boiler Works)	S Brighton Street SD, S River Street SD	20
RM 2.3-2.8 East (Seattle Boiler Works to Slip 4)	Duwamish East Direct, S Garden Street SD, S Myrtle Street SD	4
RM 2.8 East (EAA-3: Slip 4)	I-5 SD at Slip 4, KCIA SD#3/PS 44 EOF, Georgetown SD	7
RM 1.6-2.1 West (Terminal 115)	Duwamish West Direct, SW Kenny SD, Highland Park Way SW SD	11
RM 2.1 West (1st Avenue S SD)	1st Avenue S SD	25
RM 2.1-2.2 West (EAA-2: Trotsky Inlet)	Duwamish West Direct, Trotsky Inlet, 2nd Avenue S SD	19
RM 2.2-3.4 West (Riverside Drive)	Duwamish West Direct, 7 th Avenue S SD, 8 th Avenue S CSO	82
Upper Reach		
RM 4.9 East (EAA-7: Norfolk CSO/SD)	Norfolk CSO/SD	31
RM 3.8-4.2 West (Sea King Industrial Park)	S 96 th Street SD	9
Total		482

Note: Source control areas in which no inspections were performed during the reporting period are not included in this table.

Illicit Discharge Detection and Elimination

The Phase I permit requires the City's SWMP to include a plan to detect, remove, and prevent illicit connections and illicit discharges. SPU's Source Control and Pollution Prevention Division is responsible for developing and implementing the City's Illicit Discharge Detection and Elimination (IDDE) program. The goal of the IDDE is to detect, find, and remove non-permissible discharges to the MS4. The City currently implements IDDE through business inspections, water quality complaint response, and spill response, in addition to source tracing in

the LDW. The City also attempts to prevent illicit discharges through public education and outreach (SPU 2015d).

In 2014, SPU completed IDDE screening in the Lower Duwamish/East Waterway. SPU found a number of potential illicit connections, mostly sewer cross connections. SPU plans to follow up on potential problems identified by field testing to confirm and correct these issues (SPU 2015b). Information regarding the current status of this activity for each source control area is provided in Sections 3 through 8.

2.4.2 King County Inspections

King County Stormwater Services Inspections

King County conducted an inventory of parcels in the unincorporated area of the LDW drainage area, and ranked each parcel according to its potential to pollute and its history of stormwater inspection compliance (King County 2017). A total of 64 inspections were conducted at 48 facilities in the LDW unincorporated area during the current reporting period (King County 2016b, 2017). Source control business inspections conducted by Stormwater Services are listed in Appendix D and summarized in Table 2-4. In addition, King County responded to seven water quality complaints during the current reporting period.

Table 2-4. Summary of King County Stormwater Inspections by Source Control Area

Source Control Area ^b	No. of Facilities Inspected 2014 - 2016
Middle Reach	
RM 2.2-3.4 West (Riverside Drive)	5
Upper Reach	
RM 3.4-3.8 West (EAA-5: Terminal 117)	4
RM 3.8-4.2 West (Sea King Industrial Park)	38
RM 4.2-5.8 West (Restoration Areas)	1
Total	48

King County Industrial Waste Source Control Inspections

The KCIW Program is a state and federal delegated pretreatment program with the authority to regulate the discharge of industrial wastewater to the King County sanitary sewer system (King County 2015b). KCIW is required to conduct annual inspections of the significant industrial users of the sanitary sewer system. As of the end of the current reporting period, there were 17 facilities operating under waste discharge permits; these facilities are inspected on an annual basis. KCIW also issues lower level discharge authorizations; these facilities are inspected less frequently (e.g., every five years). In addition to the 17 waste discharge permits, King County listed 29 active major discharge authorizations, 35 minor discharge authorizations, and 24 letters of authorization as of December 2016 in the LDW drainage basin (King County 2017).

The lead investigator for the KCIW regularly attends meetings with inspectors from Ecology and SPU to coordinate and discuss source control issues at facilities in the LDW, and to identify

issues of regulatory overlap. KCIW also responds to referrals related to illicit discharges and spills to the sanitary sewer.

Illicit Discharge Detection and Elimination

The Phase I permit requires King County SWMP to include a plan to detect, remove, and prevent illicit connections and illicit discharges. King County's Stormwater Services Section is responsible for developing and implementing the County's IDDE program for unincorporated King County. The goal of the IDDE is to detect, find, and remove non-permissible discharges to the MS4. King County currently implements IDDE through business inspections, water quality complaint response, and spill response, in addition to source tracing in the LDW.

King County Support for Ecology Inspections

Until late 2015, the King County Wastewater Treatment Division continued to fund a stormwater inspector position at Ecology to conduct stormwater inspections in the separated stormwater system of the LDW and to conduct stormwater assessments of facilities that discharge to the combined sewer systems associated with King County CSO outfalls.

During the current reporting period, the Ecology/King County stormwater inspector conducted 53 full inspections in the Brandon CSO basin to assess stormwater conditions at facilities with discharge to the combined sewer. An additional 89 facilities were screened but did not require further action. In the South Michigan CSO basin, 751 parcels were reviewed; 141 of these were industrial facilities that would be candidates for a stormwater assessment. A total of 15 facilities were visited, and stormwater assessments were completed at four of them. Ecology estimated that completing the stormwater assessments in this basin would require an extensive level of effort.

The interagency agreement expired in November 2015. The most common findings communicated to facilities in follow-up letters were poor housekeeping, improper storage of hazardous materials, and condition of catch basin (Ecology 2015q). Additional information about the work conducted by the County-funded inspector can be found in King County's LDW Source Control Annual Report (King County 2016b).

Business Outreach Visits in the Brandon Combined Sewer Basin

Based on a list of facilities identified by the Ecology stormwater inspector, King County's Local Hazardous Waste Management Program (LHWMP) team conducted business visits in the Brandon combined sewer basin between August and December of 2014, with follow-ups in 2015 and 2016. This included facilities that generate or store hazardous wastes and materials that would benefit from additional technical assistance. King County's LHWMP team conducted a total of 217 visits in 2014, 109 in 2015, and 44 visits in 2016. The businesses receiving technical assistance made improvements in hazardous waste and material storage, spill prevention, and waste disposal. King County issued 60 vouchers, up to \$500 each, to reimburse businesses for 50 percent of the costs to purchase and install pollution prevention equipment or to cover full costs for secondary spill containment pallets (King County 2016b, 2017).

2.4.3 Ecology Inspections

As of December 2016, 99 active NPDES permits were on record for areas within the 24 LDW source control areas.⁶ These include four industrial individual permits, 87 facilities covered under the ISGP, six facilities covered under the sand and gravel general permit, and two facilities covered under the boatyard general permit. While the permits limit and control the discharge of a number of water quality pollutants, they do not necessarily control contaminants that pose a threat to sediments, such as PCBs, phthalates, arsenic, mercury, and PAHs.

The following facilities were granted coverage under a NPDES general permit between January 2014 and December 2016:

- Pacific Pile & Marine Main Yard (WAR301516)
- Recology CleanScapes MRF (WAR301608)
- Waste Management Duwamish Reload Facility (WAR302034)
- Emerald Services Inc 2 (WAR302045)
- Ultrablock Seattle (WAR302262)
- Seattle Housing Authority South Operations Facility (WAR303257)
- Greyhound Lines, Inc. \$780013 (WAR303332)
- CD SRVS (WAR303953)
- United Site Services of Nevada Inc Sea (WAR304003)

Ecology is continuing to inspect NPDES-permitted facilities to ensure compliance with permit conditions. In addition, Water Quality Program inspectors visit facilities to determine whether a permit is required. Inspections continue to identify facilities in the LDW that may need to apply for NPDES permits. Ecology will follow up with these facilities to ensure they submit an application for a stormwater permit or a Conditional No Exposure Certificate, as appropriate.

During the current reporting period (2014 through 2016), Ecology conducted 267 inspections at 233 facilities. Ecology inspections are listed in Appendix E and are summarized by source control area in Table 2-5 below.

Table 2-5. Summary of Ecology Inspections by Source Control Area

Source Control Area	No. of Facilities Inspected 2014 - 2016
Lower Reach	
RM 0.0-0.1 East (Spokane Street to Ash Grove Cement)	1
RM 0.1-0.9 East (EAA-1: Duwamish/Diagonal Way)	59
RM 1.0-1.2 East (KC Lease Parcels)	62
RM 0.0-1.0 West (Spokane Street to Kellogg Island)	7
RM 1.3-1.6 West (Glacier Bay)	4
Middle Reach	
RM 1.7-2.0 East (Slip 2 to Slip 3)	9
RM 2.0-2.3 East (Slip 3 to Seattle Boiler Works)	4

⁶ The 99 active permits do not include construction stormwater permits.

Source Control Area	No. of Facilities Inspected 2014 - 2016
RM 2.3-2.8 East (Seattle Boiler Works to Slip 4)	4
RM 2.8 East (EAA-3: Slip 4)	7
RM 1.6-2.1 West (Terminal 115)	3
RM 2.1 West (1 st Avenue S SD)	7
RM 2.1-2.2 West (EAA-2: Trotsky Inlet)	5
RM 2.2-3.4 West (Riverside Drive)	23
Upper Reach	
RM 2.8-3.7 East (EAA-4: Boeing Plant 2/Jorgensen Forge)	2
RM 3.7-3.9 East (EAA-6: Boeing Isaacson/Central KCIA)	2
RM 3.9-4.3 East (Slip 6)	1
RM 4.3-4.9 East (BDC)	1
RM 4.9 East (EAA-7: Norfolk CSO/SD)	12
RM 3.4-3.8 West (EAA-5: Terminal 117)	3
RM 3.8-4.2 West (Sea King Industrial Park)	16
RM 4.2-5.8 West (Restoration Areas)	1
Total	233

2.4.4 Urban Waters Initiative Inspections

The Urban Waters Initiative, a component of the Puget Sound Initiative since 2007, is a comprehensive, multi-program approach to accomplish the following:

- Identify potential sources of contamination.
- Ensure that facilities are both permitted (if applicable) and in compliance with permit conditions.
- Increase inspections of regulated facilities.
- Assist in the development of appropriate source control measures.
- Provide assistance on toxics reduction and pollution prevention.
- Build capacity at the local level to safely manage and reduce toxics at small businesses and households.

The initiative is described in more detail in the May 2008 LDW Source Control Status Report (Ecology 2008a).

During the current reporting period, Ecology's Water Quality and Hazardous Waste inspectors and Ecology Toxics Cleanup Program (TCP) staff continued to coordinate facility inspections and priorities with SPU and King County inspectors to avoid overlap in the field.

2.5 Source Tracing

Source tracing activities include identification and assessment of potential sources of contaminants to the LDW through the storm drain/combined sewer systems. Source tracing is

designed to identify sources by strategically collecting samples at key locations within the LDW drainage basin. A variety of sampling techniques are used because no single sampling method exists to effectively trace sources of contaminants to LDW sediments. The following source tracing activities were conducted during the current reporting period, and are discussed in more detail below:

- Collection of in-line storm drain sediment trap samples (SPU, King County),
- Collection of storm drain catch basin and in-line solids samples (SPU, King County),
- Collection of solids samples in combined sewers (King County), and
- Collection of storm drain samples at NPDES-permitted facilities (Ecology).

In this report, storm drain solids and combined sewer solids data are compared to the Washington State Sediment Management Standards (SMS) to provide a rough indication of overall quality. The SMS include the Sediment Cleanup Objectives (SCOs), which identify surface sediments that have no adverse effects on biological resources, and Cleanup Screening Levels (CSLs), which are used as an upper regulatory threshold for making decisions about source control and cleanup. For most organic compounds, the SCO and CSL are presented in the SMS as organic carbon (OC) normalized concentrations. For simplicity, in this report all concentrations are presented as dry weight (DW) concentrations; storm drain and combined sewer solids data for organics are compared to the Lowest Apparent Effects Threshold (LAET) or Second Lowest Apparent Effects Threshold (2LAET) values, which are functionally equivalent to the SCO and CSL, respectively (Ecology 2017a).

To determine whether source tracing should be initiated, SPU compares storm drain solids data to the CSL/2LAET values; King County compares combined sewer solids data to twice the 2LAET.

For petroleum hydrocarbons, MTCA Method A soil cleanup levels are used for comparison to storm drain solids concentrations. Concentrations of cPAHs are compared to the LDW-wide Remedial Action Level (RAL) of 1 milligram per kilogram (mg/kg) toxic equivalency quotient (TEQ). Dioxin/furan concentrations are compared to the LDW-wide RAL of 25 nanograms per kilogram (ng/kg) TEQ.

In this Source Control Status Report, the values described above that are used for comparison to storm drain and combined sewer solids data are referred to as “storm drain screening levels.” It should be emphasized that none of these values are applied as cleanup levels to storm drain or combined sewer solids. It is important to note that any comparison of this kind is most likely conservative given that sediments discharged from storm drains are highly dispersed in the receiving environment and mixed with the natural sedimentation taking place in the system. The storm drain screening levels are listed in Table 2-6.

Table 2-6. Storm Drain Screening Levels
(All concentrations expressed as mg/kg DW)

Chemical Class	Chemical Parameter	SCO	CSL	MTCA Method A	LDW RAL
PCBs	Total Aroclors	0.13	1.0		
Dioxins/Furans	Dioxin/furan TEQ (NDx0.5) ^a				0.000025
Metals	Arsenic	57	93		

Chemical Class	Chemical Parameter	SCO	CSL	MTCA Method A	LDW RAL
	Cadmium	5.1	6.7		
	Chromium	260	270		
	Copper	390	390		
	Lead	450	530		
	Mercury	0.41	0.59		
	Silver	6.1	6.1		
	Zinc	410	960		
HPAHs	Benzo(a)anthracene ^{b,c}	1.3	1.6		
	Benzo(a)pyrene ^{b,c}	1.6	1.6		
	Benzo(g,h,i)perylene ^b	0.67	0.72		
	Chrysene ^{b,c}	1.4	2.8		
	Dibenz(a,h)anthracene ^{b,c}	0.23	0.23		
	Fluoranthene ^b	1.7	2.5		
	Indeno(1,2,3-cd)pyrene ^{b,c}	0.60	0.69		
	Pyrene ^b	2.6	3.3		
	Total benzofluoranthenes ^{b,c}	3.2	3.6		
	Total cPAH TEQ (NDx0.5)				1.0
	Total HPAH	12	17		
LPAHs	2-Methylnaphthalene	0.67	0.67		
	Acenaphthene ^d	0.50	0.50		
	Acenaphthylene ^d	1.3	1.3		
	Anthracene ^d	0.96	0.96		
	Fluorene ^d	0.54	0.54		
	Naphthalene ^d	2.1	2.1		
	Phenanthrene ^d	1.5	1.5		
	Total LPAH	5.2	5.2		
Phthalates	Bis(2-ethylhexyl)phthalate	1.3	1.9		
	Butylbenzyl phthalate	0.063	0.90		
	Diethyl phthalate	0.20	>1.2		
	Dimethyl phthalate	0.071	0.16		
	Di-n-butyl phthalate	1.4	1.4		
	Di-n-octyl phthalate	6.2	6.2		
Phenols	2,4-Dimethylphenol	0.029	0.029		
	2-Methylphenol	0.063	0.063		
	4-Methylphenol	0.67	0.67		
	Pentachlorophenol	0.36	0.69		
	Phenol	0.42	1.2		
Other SVOCs	1,2,4-Trichlorobenzene	0.031	0.051		

Chemical Class	Chemical Parameter	SCO	CSL	MTCA Method A	LDW RAL
	1,2-Dichlorobenzene	0.035	0.050		
	1,4-Dichlorobenzene	0.11	0.11		
	Benzoic acid	0.65	0.65		
	Benzyl alcohol	0.057	0.073		
	Dibenzofuran	0.54	0.54		
	Hexachlorobenzene	0.022	0.070		
	Hexachlorobutadiene	0.011	0.12		
	N-nitrosodiphenylamine	0.028	0.040		
Petroleum Hydrocarbons	Diesel-range hydrocarbons			2,000	
	Gasoline-range hydrocarbons			30	
	Oil-range hydrocarbons			2,000	

Notes:

^a The LDW RAL for dioxins/furans is also expressed as 25 ng/kg TEQ.

^b Included in calculation of total HPAH.

^c Included in calculation of total cPAH TEQ.

^d Included in calculation of total LPAH.

Source tracing locations where samples were collected during the current reporting period (2014 to 2016) are shown on Figure 2-4. Results are discussed below and as relevant in subsequent sections for the specific source control areas in which they are located.

2.5.1 In-Line Sediment Trap Samples (SPU, King County, and Boeing)

In-line sediment traps consist of a wide-mouth sample bottle attached to a small bracket mounted inside the collection system pipe. Traps are installed at selected locations in the drainage system to identify and isolate problem areas. Samples represent contributions from relatively large areas (>50 acres). The traps are installed for a period of 12 months to passively collect solids in the stormwater flow passing that location.

Table 2-7 shows sediment trap locations, and the number of samples collected during the current reporting period (2014 through 2016), by drainage system. Sampling locations are shown in Figure 2-4.

Table 2-7. Sediment Trap Locations

Drainage System	No. of Traps	Year Installed	Responsible Agency	No. of Samples 2014-2016
Diagonal Avenue S CSO/SD ^a	2	2003	SPU	6
I-5 SD at Slip 4	1	2005	SPU	3
KCIA SD#3/PS44 EOF	9	2005	KCIA/Boeing ^b	27
KCIA SD at RM 3.6 ^c	1	2008 and 2009	KCIA	0
KCIA SD#2/PS 45 EOF	1	2008	KCIA	3
KCIA SD#1	1	2008	KCIA	3
Norfolk CSO/SD/PS17 EOF	5	2007	SPU	15

Drainage System	No. of Traps	Year Installed	Responsible Agency	No. of Samples 2014-2016
SW Idaho Street SD	3	2008	SPU	9
SW Kenny Street SD/T115 CSO	1	2008	SPU	3
Highland Park Way SW SD	2	2008	SPU	6
1 st Avenue S SD (west side of LDW)	4	2008	SPU	12
7 th Avenue S SD	3	2008	SPU	7
S 96 th Street SD	3	2008	SPU/Ecology/King County ^d	9
South Fork Hamm Creek	1	2008	SPU/Ecology/King County ^d	3
Total	39			

^a Traps removed in April 2010 after collection of 13 rounds of samples. SPU re-installed two traps in this system in May 2013.

^b Boeing maintains six of the traps and King County currently maintains three of the traps.

^c Storm drain that crosses between Boeing and Jorgensen properties. Existing trap moved in January 2010 after King County replumbed this drainage system.

^d King County took over operation of these sediment traps in 2015.

Analytical results for SPU's sediment trap samples are provided in Appendix F. The results are also summarized in subsequent sections for specific source control areas.

King County's Stormwater Services Section collected sediment trap samples from unincorporated areas of the LDW drainage area. Samples were collected in April 2016 from locations 96-ST1, 96-ST2, and 96-ST3, which are associated with stormwater flow to the North Fork of Hamm Creek; and location HC-ST1, which is associated with the South Fork of Hamm Creek. Results can be found in King County's LDW Source Control Annual Report (King County 2017) and are discussed in Sections 8.2 (RM 3.8-4.2 West [Sea King Industrial Park]) and 8.3 (RM 4.2-5.8 West [Restoration Areas]).

Boeing and King County collected sediment trap samples in the King County International Airport (KCIA) SD#3/PS44 EOF basin during the current reporting period; these are discussed in Section 4.4 (RM 2.8 East [EAA-3: Slip 4]). KCIA sediment trap data can be found in King County's LDW Source Control Annual Reports (King County 2016a, 2017).

2.5.2 In-Line Solids and Catch Basin Samples (SPU/King County)

In-line solids samples are grab samples collected from manholes (also known as maintenance holes) located on the storm drain mainline; they represent contributions from the entire drainage basin upstream of the sampling location. In-line grab samples typically represent the heavier particles that accumulate and are transported as part of bed load material that moves along the bottom of the pipe (City of Seattle 2016). In-line solids samples are usually collected prior to installing a sediment trap or before and after cleaning the storm drain mainline to characterize the chemical quality of storm drain solids.

A catch basin is a storm drain structure that contains a sump to capture solids and other debris before it can enter the conveyance system. Catch basin samples are grab samples of solids that have accumulated in the catch basin sump. Catch basins collect runoff from the nearby area (typically <0.5 acre). These samples are used to characterize contributions from specific sites and determine whether these contributions are sources of pollutants to the drainage system. On-site

catch basin samples are collected at sites of interest identified during business inspections or at sites where sufficient solids are available for chemical analysis.

Between January 2014 and December 2016, SPU collected a total of 41 in-line solids samples, 94 on-site catch basin samples, 53 right-of-way catch basin samples, and 38 samples of dirt or other material from outside the piped drainage system from various locations in the LDW study area (Appendix F). King County collected samples from three right-of-way catch basins in unincorporated LDW drainage areas not sampled by sediment traps, as well as from eight locations from King County properties (including KCIA and one Harbor Bond property) (King County 2017). The number of samples collected during the current reporting period in each storm drain basin is listed in Table 2-8. Results specific to each source control area are discussed in Sections 3 through 8.

Table 2-8. SPU In-line and Catch Basin Samples Collected During 2014-2016

Storm Drain Basin	No. of In-line Samples ^a	No. of On-site Catch Basin Samples	No. of Right-of-Way Catch Basin Samples	Total No. of Samples
LDW East Side				
Diagonal Avenue S CSO/SD	9	61	14	84
S River Street SD	2	3	7	12
S Myrtle Street SD			1	1
S Brighton Street SD			1	1
Georgetown SD	1			1
S Norfolk St CSO/PS17 EOF/SD	14	23	6	43
Combined sewer	2	4	2	8
LDW West Side				
Highland Park Way SW SD	2			2
1 st Avenue S SD, west	3			3
2 nd Avenue S SD		1	3	4
7 th Avenue S SD	3	2	11	16
S Webster Street SD			1	1
S 96th Street SD	3			3
8th Avenue CSO basin			6	6
Combined sewer basin (other)	2		1	3

Notes:

^a Does not include in-line sediment trap samples (see Table 2-7)

^b Does not include ODS (outside the drainage system) samples, such as dirt collected from the pavement, soil, and other materials (i.e., equipment wipe, caulk, paint chips).

2.5.3 Combined Sewer System Sampling (King County)

King County has collected solids samples from pipes, wet wells, or outfall weir structures located within the combined sewer collection system of the LDW basin since 2010. During the current reporting period, King County focused on sediment trap sampling in the Brandon CSO basin in 2014, the Brandon and Michigan CSO basins in 2015, and the 8th Ave CSO basin in 2016. King County collected four sediment trap samples from the Brandon combined sewer

system, two sediment trap samples from the Michigan combined sewer system, and one sediment trap and one in-line grab sample from the 8th Ave combined sewer system.

Sediment trap samples in the Brandon CSO basin exceeded storm drain screening levels for bis(2-ethylhexyl)phthalate (BEHP) in 2014 and BEHP and butylbenzyl phthalate in 2015. These two phthalates have exceeded screening levels in past sediment trap samples from the Brandon CSO basin and in solids grab samples from the CSO outfall structure. One sample in 2014 also exceeded the CSL for benzo(a)anthracene. Sediments near the CSO outfall exceeded the CSL for mercury at one station.

Sediment trap samples in the South Michigan CSO basin exceeded storm drain screening levels for BEHP, 2,4-dichlorobenzene, low molecular weight PAHs (LPAHs), and four PAH compounds (2-methylnaphthalene, fluorene, naphthalene, and phenanthrene). The CSL was also exceeded for mercury, total PCBs, benzo(a)pyrene, benzo(g,h,i)perylene, pyrene, and indeno(1,2,3-cd)pyrene. BEHP has exceeded screening levels in past samples from this basin, but PAHs and 1,4-dichlorobenzene have not. Sediments near the CSO outfall had only SCO exceedances for PCBs.

KCIW started an investigation to trace sources of these PAHs, which are believed to be related to fuel that is intermittently discharged to the combined sewer system. The investigation is ongoing. In addition, King County planned to deploy sediment traps in 2016 to determine if these elevated PAH concentrations continue (King County 2016b).

The in-line solids grab sample from the 8th Ave CSO basin had concentrations of mercury, BEHP, chromium, and zinc above the CSL. The sediment trap sample exceeded the CSL for mercury and BEHP. Sediments near the CSO outfall exceeded the SCO for total PCBs at one station.

2.5.4 Ecology NPDES Inspection Sampling

Ecology's Water Quality Program and TCP conducted joint inspections at 11 NPDES-permitted facilities that discharge to the LDW between March and June 2013 and at 13 additional NPDES-permitted facilities between September 2014 and February 2015. During the inspections, Ecology collected storm drain solids and water samples from manholes, catch basins, outfalls, treatment systems, and other stormwater conveyance structures at the facilities.

These sampling efforts were conducted to assess what types of pollutants are typically present in storm drain systems at industrial facilities with the potential to discharge to the LDW at concentrations above the SMS or state surface water quality criteria (WQC). In addition, Ecology wanted to collect data to evaluate whether industrial facilities should be required to monitor for additional COCs not currently required under the NPDES permits, and to identify additional locations recommended for sampling and analysis.

Storm drain solids samples were analyzed for PCB Aroclors and congeners, phthalates, PAHs, other semivolatile organic compound (SVOCs), pesticides, gasoline-range, diesel-range, and oil-range petroleum hydrocarbons, volatile organic compounds (VOCs), metals, and conventionals. A subset of samples was analyzed for dioxins/furans. Water samples were analyzed for PCB congeners, phthalates, PAHs, other SVOCs, pesticides, metals, pH, total suspended solids (TSS), specific conductance, alkalinity, anions, total organic carbon (TOC), and dissolved organic carbon. Sampling results for individual facilities are summarized in Sections 3.0 through 8.0.

In the 57 solids samples, concentrations exceeded the storm drain screening levels for the following contaminants in 50 percent or more of the samples collected: total PCB Aroclors, zinc, fluoranthene, BEHP, and butylbenzyl phthalate. The cPAH and dioxin/furan TEQs exceeded the screening level in 21 solids samples.

PCB congeners exceeded the National Toxics Rule (NTR) criteria for protection of human health in 38 of the 40 water samples. Total copper and zinc concentrations exceeded the chronic WQC in more than 50 percent of the water samples. Exceedance frequencies for other analytes were less than 50 percent for all relevant criteria.

Complete results documenting the sample collection methods and results for 2013 are available in *Lower Duwamish Waterway NPDES Inspection Sampling Support Technical Memorandum* (Leidos 2015a) and for 2014/2015 in *Lower Duwamish Waterway NPDES Inspection Sampling Support 2014/2015 Report* (Leidos 2015c).

2.5.5 Solids Sampling to Comply with 2014 Industrial Stormwater General Permit

The types of NPDES permits issued to facilities in the LDW basin are described in detail in the July 2007 Source Control Status Report (Ecology 2007). The ISGP was reissued on December 3, 2014. This permit became effective on January 2, 2015, and it expires on December 31, 2019.⁷ The updates to the ISGP include additional requirements for facilities discharging to a Puget Sound sediment cleanup site (including the LDW). Specifically, the permit requires removal of accumulated solids from storm drain lines and sampling of storm drain solids at least once prior to October 1, 2016. Solids must be analyzed for metals, PAHs, PCB Aroclors, petroleum hydrocarbons, TOC, and grain size.

ISGP sampling results have not been compiled, however initial results indicate frequent exceedances of storm drain screening levels for arsenic, copper, and zinc, and somewhat less frequent exceedances for cadmium, chromium, mercury, and PCBs.

2.5.6 Storm Drain Line Cleaning

SPU Storm Drain Line Cleaning

In 2015, SPU cleaned the Highland Park Way SW (19,848 feet) and S Nevada Street (2,118 feet) storm drains. All but 1,100 feet of the Highland Park Way SW storm drain, and all of the S Nevada Street system were cleaned. Cleaning stopped in September because the tides were no longer suitable for cleaning.

SPU discovered concrete slurry in a pipe entering the S Nevada Street system from a side sewer on the north side of the pipe. SPU inspected the Terminal 106 warehouse on the north side of S Nevada Street and video-inspected the adjacent sanitary line to check for potential problems (SPU 2016c). Two interior catch basins in the warehouse were connected to the storm drain system. SPU issued a notice of violation (NOV) for this illicit connection and required the Port of Seattle to disconnect all internal building drains from the City storm drain system, clean all

⁷ <https://ecology.wa.gov/DOE/files/f7/f72bcacb-c7f2-4b4c-8299-409c5d27855b.pdf>

the internal drain lines from Terminal 106, and map all the drains within the loading bays at Terminal 106 (SPU 2016a). This work was completed in February 2016.

In 2016, SPU cleaned the entire SW Dakota Street storm drain (2,529 feet) and all city-owned pipes in the S 96th Street drainage system.

King County Storm Drain Line Cleaning

In November 2015, King County International Airport (KCIA) cleaned lines and catch basins at the east side of the airport. Approximately 90 stormwater lines were cleaned; during 2016, line and catch basin cleaning was performed at the KCIA central area (runways and taxiways). Sediments were removed and stormwater pipe conditions were documented (King County 2016b, 2017). In 2017, line and catch basin cleaning was planned for the west side of KCIA (taxiways, parking lots, maintenance shops, airparks, and outfalls).

Port of Seattle Storm Drain Line Cleaning

The Port of Seattle signed an interagency agreement with Ecology on April 9, 2014. As part of the agreement, the Port conducted line cleaning on Port of Seattle-owned stormwater conveyance systems that discharge to the LDW to remove the legacy solids load in storm drain lines; to study the nature of current sources of stormwater solids; and to reduce inputs to the LDW. After line cleaning, the Port of Seattle installed sediment traps in manholes and catch basins that were located closest to the point of discharge. Sediment trap samples were collected and analyzed to determine the current chemical concentrations of re-accumulated sediment in the storm drain lines. The Port of Seattle conducted line cleaning, waste characterization, and post-line cleanup storm solids sampling at Terminals 102, 103, 104, 106, 108, and 115 (Port of Seattle 2015).

2.6 Site Assessment and Cleanup

During SCAP development, Ecology and its contractors identified contaminated properties that have the potential to cause sediment contamination. This included review of available information about each property and assessment of whether the site poses a threat to LDW sediments. The detailed information on each property is documented in either a Property Review Report (Duwamish/Diagonal Way, Terminal 117, and Slip 4 source control areas) or in a Data Gaps Report (all other source control areas). Property reviews and/or data gaps reports have been completed for all 24 source control areas. Site characterization or cleanup is in progress at several facilities that are known or suspected threats to LDW sediments.

EPA is managing sites under the Resource Conservation and Recovery Act (RCRA); Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA); and/or the Toxic Substances Control Act (TSCA). These are listed in Table 2-9. Ecology is managing the cleanup sites listed in Table 2-10 (as of December 31, 2016).

Table 2-9. Cleanup Sites Under EPA Oversight

Source Control Area	Facility Name	Regulatory Authority
RM 0.1-0.9 East (EAA-1: Duwamish/Diagonal Way)	Rainier Commons	TSCA
RM 2.8 East (EAA-3: Slip 4)	Slip 4 EAA cleanup, including Georgetown Flume outfall replacement (completed in 2009)	CERCLA
RM 2.8-3.7 East (EAA-4: Boeing Plant 2/Jorgensen Forge)	Boeing Former Electronics Manufacturing Facility (EMF)	RCRA
	Boeing Plant 2	RCRA
	Jorgensen Forge, Outfall Site (Time Critical Removal Action)	CERCLA
	Jorgensen Forge, Sediment Site	CERCLA
RM 3.9-4.3 East (Slip 6)	Rhone-Poulenc	RCRA
RM 3.4-3.8 West (EAA-5: Terminal 117)	Terminal 117	CERCLA

Table 2-10. Cleanup Sites Under Ecology Oversight

Source Control Area	Facility Name	Regulatory Authority
Combined sewer area	Burlington Environmental/East of 4 th Site	RCRA Agreed Order (May 2010)
	West of 4 th Site	RCRA Agreed Order (Apr 2014)
	General Electric-Dawson Street Plant	RCRA Agreed Order (May 2007)
RM 1.7-2.0 East (Slip 2 to Slip 3)	Duwamish Marine Center	MTCA Agreed Order (Sep 2011)
RM 2.3-2.8 East (Seattle Boiler Works to Slip 4)	Fox Avenue Building	MTCA Agreed Orders (May 2009, Jun 2012, amended Jun 2013)
	Whitehead Tye Site	MTCA Agreed Order (Aug 2016)
RM 2.8 East (EAA-3: Slip 4)	Crowley Marine Services 8 th Avenue S	MTCA Agreed Order (Oct 2009)
	NBF-Georgetown Steam Plant (GTSP)	MTCA Agreed Order (Aug 2008)
RM 2.8-3.7 East (EAA-4: Boeing Plant 2/Jorgensen Forge)	Jorgensen Forge, upland of the EPA-managed area	MTCA Agreed Order (Jul 2007, amended Jul 2013), Enforcement Order (Mar 2015)
RM 3.7-3.9 East (EAA-6: Boeing Isaacson/Central KCIA)	Boeing Isaacson Thompson	MTCA Agreed Order (Apr 2010)
RM 3.9-4.3 East (Slip 6)	8801 Site	MTCA Agreed Order (Sep 2008)
Combined sewer area	Boeing Field Chevron	MTCA Agreed Order (Jul 2015)
RM 1.3-1.6 West (Glacier Bay)	Duwamish Shipyard	MTCA Agreed Order (Sep 2010)
	Glacier Northwest/Reichhold	MTCA Agreed Order (May 2009)

Source Control Area	Facility Name	Regulatory Authority
	Chemical	
RM 1.6-2.1 West (Terminal 115)	Terminal 115 North	MTCA Agreed Order (Mar 2011)
RM 2.1 West (1 st Avenue S Storm Drain)	South Park Landfill	MTCA Agreed Order (May 2009, amended Jun 2013 and Feb 2016)
RM 2.1-2.2 West (EAA-2: Trotsky Inlet)	Douglas Management Dock	MTCA Agreed Order (May 2011)
	Industrial Container Services (ICS)/Trotsky Property/Formar Northwest Cooperage	MTCA Agreed Order (May 2010)

The current status of cleanup at each of these sites is shown in Table 2-11. The total number of sites that will require characterization and/or cleanup in the LDW basin is unknown at this time.

Table 2-11. Ecology Cleanup Site Status as of December 2016

Site Name	Agreed Order	Remedial Investigation	Feasibility Study	Cleanup Action Plan	Cleanup	Interim Action
Upper Reach						
8801 Site	2006, 2008	2011	In progress	In development		
Boeing Field Chevron	2015	In progress				
Boeing Isaacson/Thompson	2010	2014	In progress			
Jorgensen Forge	2017, 2015	In progress				2014
South Park Marina	2017 (planned)					
Middle Reach						
Crowley Marine Services 8th Avenue S	2009	In progress				
Douglas Management	2011	In progress				
Duwamish Marine Center	2011	In progress				
Fox Avenue Building	1991, 2009	2011	2012	Agreed Order 2012	In progress	2009
Industrial Container Services	2011	In progress				
NBF-GTSP	2008	In progress				2011
N Terminal 115	2011	In progress				
South Park Landfill	2009	In progress	In progress	In development		2014, 2016
Whitehead Tye	2016	In progress				
Lower Reach						
Duwamish Shipyard	2010	In progress				
Glacier Northwest/Reichhold	2009	In progress				

Table Notes: The following MTCA Cleanup Sites are not included in the schedule above; these are located in the LDW basin but are in the combined sewer area and not within the boundaries of a source control area: GE-Dawson Street Plant, East of 4th Site (Capital Industries, Art Brass Plating, Blaser Die Casting), and West of 4th Site (Burlington Environmental). The following EPA-lead sites are not included in the schedule above: Boeing Plant 2, Terminal 117, Rhone-Poulenc, Rainier Commons, and Boeing Former EMF. Source: Ecology 2017b.

2.7 Other Studies

2.7.1 Additional Studies by Ecology

Site Hazard Assessments in LDW Basin

A Site Hazard Assessment (SHA) is conducted to confirm the presence of hazardous substances and to determine the relative risk a site poses to human health and the environment. From 2013 to 2015, Ecology's contractor completed SHAs for 252 sites within the LDW; 172 of these SHAs were completed during the current reporting period. The results of the SHAs are used in the Washington Ranking Method (WARM) to yield a WARM score; this is a number between 1 and 5, where a "1" represents the highest level of risk and a "5" the lowest. Generally, sites ranked 1 or 2 are considered higher priority for cleanup. Readily available background information was reviewed, and a WARM score was developed for each site. Results are summarized below:

- 2 sites were identified as no further action (NFA)
- 39 sites were assigned a ranking score of '5'
- 58 sites were assigned a ranking score of '4'
- 46 sites were assigned a ranking score of '3'
- 7 sites were assigned a ranking score of '2'
- 20 sites were assigned the highest priority score of '1'

Review of Urban Canada Geese as Vectors of PCB Contamination

Canada geese are frequent visitors to the intertidal habitat areas in the LDW. Samples of Canada goose droppings collected by the Port of Seattle and Boeing contained PCBs. The levels of PCBs in these samples represent a possible recontamination source to any new or future habitat areas. Ecology's contractor, Leidos, prepared a report to expand the understanding of the significance of geese as contaminant vectors. The report reviewed background information on population abundance, feeding behavior, movements, and occurrence of industrial contaminants, including PCBs, in Canada geese. Goose droppings were collected at two upland sites adjacent to the LDW: Terminal 117 in June 2012 and Boeing Plant 2 in August 2013. Composite samples of goose droppings contained 25ppb-280 ppb total PCBs. Some of these samples exceeded action levels for long-term monitoring at these sites. The site-specific information was not sufficient to determine whether Canada geese pose a significant risk to remediation efforts in the LDW. It may be possible to extrapolate the amount of PCB deposited by geese with better site-specific information on population numbers, residence time, defecation rates, and PCB loads of pellets (Leidos 2014c).

Cement Kiln Dust Study

There are a large number of sites in the LDW that are affected by cement kiln dust (CKD), which was historically used as fill material at properties within the LDW drainage basin. Ecology's contractor, Leidos, compiled existing information about CKD sites in the LDW basin to help Ecology assess whether this material may represent a source of sediment contamination to the LDW. This study was completed in 2014 (Leidos 2015b). Ecology plans to use this information to focus sampling of storm drains and catch basins in the areas around CKD sites.

Slip 3/Fox Avenue S Source Investigation

A soil pile of unknown origin at the terminus of Fox Avenue S has been present since 1990. To determine whether the soil pile represents a potential source of contaminants to bank soil and sediment near Slip 3, Ecology's contractor, Leidos, collected samples from the soil pile. The samples were collected from different depths and locations on the soil pile and are likely representative of concentrations throughout the soil pile. All four soil pile samples analyzed contained concentrations of arsenic and benzo(a)pyrene that exceeded MTCA Method B and Method A cleanup levels for soil, respectively. Arsenic, zinc, total PCBs, and butylbenzyl phthalate were detected in one or more soil pile samples above SMS criteria. Contaminants in the soil pile may be transported to the bank soils and sediment of Slip 3 through erosion and/or surface runoff (Leidos 2014b).

Otter Scat Analysis for PCB Congeners

In 2016, otter scat samples were collected from eight locations within the Green-Duwamish watershed by Dr. Michelle Wainstein, in collaboration with the Woodland Park Zoo. Dr. Wainstein provided 73 scat samples to Ecology for analysis of PCB congeners by EPA Method 1668. River otters have been studied as indicators of environmental health in many portions of their geographic range; as apex predators in aquatic ecosystems, otters are vulnerable to biomagnification of persistent pollutants such as PCBs, and may potentially transport contaminants within their home ranges. Ecology's contractor, Leidos, began preparation of a Quality Assurance Project Plan (QAPP) for the otter scat analyses in 2016. The data report was completed in June 2017 and results will be included in the next Source Control Status Report.

PCBs in Groundwater Samples at LDW Cleanup Sites

In 2016, Ecology and its contractor, Leidos, began preparation of a Sampling and Analysis Plan for collection of groundwater samples for PCB analysis at 17 selected cleanup sites in the LDW basin. Groundwater at cleanup sites may be discharging PCBs to surface water and sediments; however, standard analytical methods for PCB Aroclors (EPA Method 8082) cannot measure concentrations low enough to determine if groundwater concentrations are protective of surface water and sediments. In addition to PCB Aroclors, groundwater samples and nearby surface water samples were collected and analyzed for PCB congeners using EPA Method 1668. This study also provides additional data for source tracing and fingerprinting analysis (see Section 2.7.4, Green-Duwamish River PCB Congener Study: Phase 1).

During development of the Sampling and Analysis Plan (SAP), Leidos prepared a technical memorandum on the potential for PCB contamination from sampling equipment tubing materials (Leidos 2016b). The memorandum summarized a literature survey on the presence of PCBs in silicone, platinum-cured silicone, polyethylene, Teflon, nylon, and vinyl/polyvinyl chloride flexible tubing. Results were used in the design of the LDW groundwater sampling activities.

Sampling was conducted in 2017; results will be included in the next Source Control Status Report.

2.7.2 Other Studies by Seattle Public Utilities

Detection Dog Pilot Test

SPU contracted with the University of Washington Conservation Canines and Windward Environmental in 2016 to conduct a pilot test to determine whether a specially trained detection dog can detect PCBs in the urban environment. This work was supported by an Ecology grant. In 2016, training and field testing was conducted at various sites in Seattle and Tacoma, Washington. The detection dog successfully identified PCB-contaminated caulk in buildings and in concrete pavement, as well as PCB-contaminated soil. A final report was submitted to Ecology in 2017. Results will be provided in the next Source Control Status Report.

Sediment Trap Pilot Test

SPU is testing a new sediment trap design to provide more effective collection of storm drain solids, particularly in small diameter pipes, in support of source tracing efforts. The first phase of the work was completed in 2016 under an interagency agreement with Ecology; this involved developing and testing several prototype designs in flumes to determine which style of trap performed best in collecting representative samples of suspended solids. The flume water was spiked with a known mixture of sand and silt-sized particles, which allowed a direct comparison with the material that accumulated in each trap.

In March 2016 two prototype traps were installed in the field; one in a 72-inch-diameter pipe in the Diagonal Avenue S CSO/SD system and the second in a 24-inch-diameter pipe in the S Myrtle Street storm drain system. Other trap styles that are commonly used in source tracing were also installed at each location for comparison, including the modified Norton trap, currently used by SPU, the Hamlin trap used in Spokane, and the screened inline flow-through sediment trap apparatus developed by the City of Portland. SPU removed the traps in March 2017 to test the accumulated material for grain size and submitted a report to Ecology. Traps were redeployed for further testing. Results will be provided in the next Source Control Status Report.

CSO Control Plan

In 2013, the City of Seattle signed a Consent Decree with EPA and the U.S. Department of Justice ensuring that the City's CSO control plan is implemented and completed. The City completed its Long-Term Control Plan in 2015 (SPU 2015c). The City has one active CSO in the LDW, the Diagonal CSO (#111). Under the plan, existing control structures will be modified, storm drains will be rerouted, and a storage pipe will be constructed to provide the necessary offline storage. Construction is expected to be completed by 2025. Completion of this project will meet federal and state regulations by controlling CSO discharges to the LDW to no more than one untreated overflow per year, on average, at this location.

2.7.3 Other Studies by King County

CSO Control Plan

In 2013, King County signed a Consent Decree with EPA and the U.S. Department of Justice ensuring that the County's CSO control plan is implemented and completed. Completion of the projects will meet federal and state regulations by controlling King County CSO locations to no more than one untreated overflow per year, on average, at each location. Under the plan, five

currently uncontrolled CSO outfalls in the LDW basin (Hanford #1, South Michigan, Brandon, West Michigan, and Terminal 115) will be controlled by 2025. During the current reporting period, King County began constructing the Georgetown Wet Weather Treatment Station, which will treat CSO discharges from the Brandon and Michigan CSOs (King County 2016c). In addition, King County conducted work to support green infrastructure to reduce stormwater flows to the West Michigan and Terminal 115 combined sewer basins. Seattle and King County's program, RainWise, has captured runoff from 2.65 acres.

CSO Basin Inputs Study

King County is performing a CSO basin inputs pilot study to examine pathways of contaminants to combined sewer basins in the LDW. Combined sewer basins include inputs from domestic and industrial wastewater (sewage), groundwater infiltration into combined sewer lines (infiltration), and stormwater runoff (inflow). This study aims to better understand the present-day pathways for loadings of select chemicals into combined sewer basins. Specifically, the study aims to identify primary pathways of LDW contaminants of concern in combined sewers to determine whether contaminants are primarily from stormwater, sewage, or groundwater infiltration entering the basins prior to CSO control. This is done by estimating the primary pathways of contaminant sources during stormflow conditions (storm events when sewage and stormwater are both present in the system) that could lead to CSO discharge. King County selected the Brandon and South Michigan combined sewer basins for this study, both of which are priorities for CSO control within the LDW.

In 2011 and 2012, King County sampled wastewater at three locations in the Brandon CSO basin. King County summarized the findings of the Brandon CSO basin study in a May 2016 data report (King County 2016d). A clear finding of the study was that, for most contaminants, stormwater contributes more of the chemical input into the Brandon CSO basin than sewage during periods of rainfall. This suggests that efforts to reduce pollution in stormwater runoff to a CSO basin would reduce the amount of pollution that is released to the LDW during an untreated CSO event. However, samples were collected within the combined sewer collection system, not discharges from the basin, so cannot be used to represent CSO discharges or to estimate loading rates of contaminants to the LDW.

In 2013 and 2014, King County collected wastewater samples from three locations in the South Michigan CSO basin. King County will summarize the findings of the South Michigan CSO basin study in a data report to be completed in late 2017.

2.7.4 Green River Studies Upstream of the LDW

Green River Compendium of Existing Information (Ecology)

Ecology's contractor, Leidos, prepared a report summarizing existing information for the Green-Duwamish River basin, located upstream of the LDW Superfund site (Leidos 2014e). The purpose of this report was to provide Ecology with:

- An overview of the Green-Duwamish River watershed upstream of the LDW site.
- A summary of relevant studies that have been performed to characterize sediments and surface water in the Green-Duwamish River and its tributaries.

- Maps of chemical data for sediment, suspended solids, and whole water upstream of the LDW site.
- Maps with locations of potential sources of LDW COCs to the Green-Duwamish River, including contaminated sites, facilities with NPDES permits, fully-regulated hazardous waste generators, underground storage tank sites, and facilities registered with PSCAA.
- Data gaps and recommendations for further source control activities.

As part of this effort, Leidos collected and compiled municipal stormwater system maps for 15 jurisdictions in the Green-Duwamish River watershed: Auburn, Black Diamond, Burien, Covington, Des Moines, Enumclaw, Federal Way, Kent, Maple Valley, Renton SeaTac, Seattle, Tukwila, King County, and the WSDOT. A Green River Basin GIS dataset was developed and used to assist in spatial location, map production, and GIS analysis. It was used to prepare a Green River Atlas, which depicts municipal stormwater system data from the jurisdictions listed above, locations of facilities that may represent sources of contaminants, sediment and surface water sampling locations, roads, study unit boundaries, natural areas, lakes and streams, and outfalls to 1st and 2nd order streams. The Green River Atlas consists of over 3,150 individual maps.

Assessing Sediment and Toxic Chemical Loads from the Green River to the LDW (Ecology/USGS)

Ecology contracted with USGS to quantify sediment and toxic chemical loads associated with upstream sources in the Green River to the LDW, including high flow/high turbidity events that may contribute more to the annual loading than average flow conditions. Between 2013 and 2015, USGS collected samples of water, suspended sediment, and bed sediment from the Duwamish River at RM 10.8 (Foster Links Golf Course). The samples were analyzed for a large suite of chemicals, including PCBs, PAHs, metals, dioxins/furans, SVOCs, VOCs, butyl tins, hexavalent chromium, and organic carbon. In addition, two new stream gages were installed at RM 10.8 and RM 6.3 (East Marginal Way Bridge). Both stations reported 15-minute, real-time data for stage, velocity, water temperature, turbidity, and specific conductance (East Marginal Way Bridge only). Results of these sampling efforts were published in two reports: *Data Compilation for Assessing Sediment and Toxic Chemical Loads from the Green River to the Lower Duwamish Waterway* (USGS 2014) and *Chemical Concentrations and Instantaneous Loads, Green River to the Lower Duwamish Waterway* (USGS 2015).

USGS planned to continue to operate and maintain the two stream gages through 2017; collect 12 to 15 additional water and suspended sediment samples to confirm results for chemical analysis and to provide percent fine sediment data needed to calculate chemical loads; measure dissolved PCB concentrations to support partition and loading estimates; and assess tidal dynamics (USGS 2016b).

Green-Duwamish Pollutant Loading Assessment (Ecology/EPA)

Ecology and EPA initiated a PLA for the Green-Duwamish watershed in 2014. The purpose of the PLA is to identify upstream pollution sources to the LDW and to identify strategies to reduce those sources of pollution to the entire Green-Duwamish watershed. To accomplish these goals, the PLA is developing a watershed-based model to evaluate the cumulative effects of toxic pollution, assess the relative contribution of toxic pollution from sources and pathways in the

watershed, and help prioritize efforts to control the release of pollutants in the watershed. The PLA models and future monitoring data will support cleanup and water quality decisions for the Green-Duwamish watershed. The project aims to have the calibrated modeling tool available for use following implementation of the in-waterway sediment remedy (Ecology 2014q).

Ecology and EPA evaluated data and environmental models currently available for the Green-Duwamish watershed. Based on this evaluation, they identified and recommended a comprehensive, computer-based modeling tool for the Green-Duwamish River watershed. The *Green-Duwamish River Watershed Pollutant Loading Assessment Technical Approach Report* summarizes the existing information and recommended modeling approach (Tetra Tech 2014).

Ecology and EPA are cooperatively developing the PLA with the participation of a Technical Advisory Committee (TAC). The TAC is made up of technical staff from public agencies or quasi-governmental groups. The Interested Parties Group provides input to Ecology, EPA, and the TAC; it is composed of agencies, businesses, nonprofit groups, and the general public. From 2014 through 2016, Ecology and EPA participated in meetings with the PLA-TAC and the Interested Parties Group. In the meetings, Ecology and EPA solicited TAC input on existing water quality monitoring data, modeling parameter selection, modeling boundaries, and the overall technical direction.

Ecology and EPA expect the PLA project to be a long-term project phased over many years. The project is working on developing a hydrologic QAPP database for development and assessment and a hydrologic model. Additional information related to this project is posted on Ecology's website.⁸

Green-Duwamish River Watershed PCB Congener Study: Phase 1 (Ecology)

In 2016, Ecology asked its contractor, Leidos, to prepare a concise and readable summary of available information on PCB congeners and Aroclors that identifies important issues to consider when evaluating historical PCB congener and/or Aroclor data and when collecting new data (Leidos 2016a). The summary report includes information on the origin and historical uses of PCBs, their persistence in the environment, health effects of PCBs, analytical methods for PCB analysis, and data comparisons between Aroclor and congener analysis. In addition, Leidos compiled analytical data for PCB congeners in sediment, surface water, fish and shellfish tissue, air deposition samples, storm drain solids, and stormwater from Ecology's Environmental Information Management (EIM) database and other sources. A total of 36 studies were reviewed, which included over 1,400 samples with data for some or all PCB congeners from over 900 sampling locations within the Green-Duwamish River, LDW, and East and West Waterways (Leidos 2016a).

Ecology planned a second phase of this study for 2017 to identify the types of contaminant sources that are contributing to PCB pollution in the Green-Duwamish River and the LDW, using multi-variate statistical techniques ("fingerprinting").

⁸ <https://ecology.wa.gov/Water-Shorelines/Water-quality/Water-improvement/Total-Maximum-Daily-Load-process/Directory-of-improvement-projects/Green-Duwamish-Watershed-PLA>

Suspended Solids Sampling in the Green River Watershed (King County)

King County conducted a suspended solids sampling study in the Green River Watershed. This study characterized chemical concentrations in suspended solids in four major tributary basins and the Green River during both dry season and wet season/storm events. In addition, filter bags collected suspended solids over approximately 24 hours during both base flow and storm conditions. Sampling began in 2012 and was completed in 2015. Samples were analyzed for arsenic, PCBs, PAHs, and dioxin/furans. A total of 27 sediment trap samples, 10 baseflow filter solids, and 34 storm event filter solids samples were collected during the study. The study compared chemical concentrations associated with suspended solids in the Green River and its major tributaries and provides useful information for future loading assessments. A data report was completed in December 2016 (King County 2016e).

Stream Sediment Sampling in the Green River Watershed (King County)

In 2014, King County completed a data report for stream sediment monitoring in the Green River watershed (King County 2014b). The monitoring was performed to evaluate sediment quality within streams in the watershed and to better understand the potential sources of sediment-associated chemicals to the Green-Duwamish River. A total of 58 sediment samples were collected between 2008 and 2012 from four locations in the main stem of the Green River and from locations in the following creeks: Newaukum, Soos, Springbook, Mill (Hill) in Auburn, Mill in Kent, Jenkins, and Covington. The samples were analyzed for metals, mercury, PCBs, PAHs, and other organic compounds (King County 2014b).

Green River Watershed Whole Water Study (King County)

King County completed two whole water studies during this reporting period.

In 2015, King County completed a study to characterize whole water in the middle and upper Green River (King County 2015a). The study was designed to improve the understanding of contaminant concentrations in the upper reach of the main stem of the Green River (below the Howard Hanson Dam), above most rural development, and the upper Green River Basin (above the Howard Hanson Dam) where access by anadromous salmon is restricted and contaminant sources are limited. Twenty-two surface water samples were collected between 2013 and 2014, representing both base flow and storm conditions. Samples were collected at Kanaskat-Palmer State Park and at two locations above the Howard Hanson Dam. A data report documenting study results was completed in 2015 (King County 2015a).

The County also completed a study to characterize whole water in the Green River watershed in 2014. The study compared concentrations of PCBs, arsenic, and PAHs in the Green River and its major tributaries, and provided information to assist in understanding upstream sources to the LDW. A total of 56 surface water samples were collected between 2011 and 2012 from four major tributaries to the Green River (Newaukum, Soos, and Mill Creeks, and the Black River), as well as at two locations on the main stem of the Green River, an upstream location at Flaming Geyser State Park (upriver of the four major tributaries), and a downstream location in Tukwila at Foster Links Golf Course (downstream of the tributaries). King County prepared a data report documenting the study results (King County 2014a).

Green River PCB Equipment Blank Study (King County)

King County is conducting a study to evaluate the potential for sampling equipment to cause contamination in samples analyzed for low-level PCBs (King County 2015c). Equipment blank samples collected for previous studies suggest that autosampler equipment may be contributing to PCBs in water samples. This study includes the collection of surface water samples from the Green River as well as autosampler and sample processing tubing equipment blank samples. These samples will allow a determination of specific PCB congeners associated with the contamination, which type of equipment tubing is the likely cause, and evaluate the potential bias to Middle and Lower Green River surface water samples collected in previous King County Green River watershed studies. The findings of this study are presented in a 2017 data report which will be discussed in the next Source Control Status Report.

Green-Duwamish Atmospheric Deposition Study (King County)

In 2015, King County completed a Supplemental Atmospheric Deposition Study which compares the measurements of bulk deposition (dry particulate and rainfall) in areas of different land use within the Green-Duwamish River watershed and provides information to assist in understanding atmospheric sources to the LDW (King County 2015d). The 2015 report presents data collected in 2013 at four stations: Georgetown (new station), Beacon Hill, Duwamish, and South Park. The report also includes an evaluation of all of the air deposition data collected in 2011 and 2013 at seven locations (the four listed above, plus two in Kent and one in Enumclaw).

2.7.5 Restoration-Related Activities

Habitat Restoration in an Urban Waterway, Lessons Learned from the Lower Duwamish River (NOAA)

The National Oceanic and Atmospheric Administration (NOAA) sponsored a workshop on lessons learned from recent habitat restoration efforts in the LDW on November 19, 2015. Recent efforts in the LDW have helped NOAA identify lessons and solutions that may help those who conduct habitat restoration in urban waterways. The information from the workshop was captured in a report which briefly describes the projects presented at the workshop; issues raised in the planning, designing, permitting, construction, and post-construction phases of these projects; the key points made in the workshop discussion about how project planners can move through the permitting and consultation process more efficiently; and best practices for entities interested in conducting restoration in urban estuaries (NOAA 2015).

Green Wall Installation in Georgetown (Grants from King County Wastewater Treatment Division and EPA)

King County and EPA awarded a grant to the Duwamish River Cleanup Coalition and Just Health Action to address air quality in Georgetown and South Park. The grant money was used to research air quality solutions in communities across the county. Vegetation growing on green walls has been found to do a remarkably good job of filtering toxins from the air in other industrial neighborhoods. Residents of the Georgetown and South Park selected green wall installation as the first project in their communities.

Duwamish River Cleanup Coalition and Just Health Action built the first green wall in front of the CDL Recycle facility on East Marginal Way S. Many local companies (including CDL Recycle), nonprofits, and individuals also contributed materials and in-kind support to this project. The green wall consists of a metal barrier that will eventually be entwined with vegetation. The wall is 126 feet long and 13 feet high, making it the largest green wall in Seattle. The project coordinators and community members expect the wall will filter out harmful pollutants from the air in the Georgetown neighborhood (Bernard 2016).

2.8 Source Control Area-Specific Activities

Ecology conducted source control evaluations for each of the 24 source control areas, including review of existing information, identification of data gaps, and preparation of a SCAP. The 24 source control areas are shown in Figure 1-2.

The potential for sediment recontamination associated with each source control area is described in detail in the Data Gaps Reports and SCAPs. These documents are available on Ecology's LDW Source Control website.⁹

Source control status reports describe source control activities that have been conducted since 2003, as follows:

- Report 1 – 2003 to June 2007 (Ecology 2007)
- Report 2 - July 2007 to March 2008 (Ecology 2008a),
- Report 3 - April to August 2008 (Ecology 2008d),
- Report 4 - September 2008 to June 2009 (Ecology 2009c),
- Report 5 - July 2009 to September 2010 (Ecology 2011c),
- Report 6 - October 2010 through December 2011 (Ecology 2012b),
- Report 7 - January 2012 through December 2012 (Ecology 2013), and
- Report 8 - January through December 2013 (Ecology 2014h).

This current Source Control Status Report (Report 9) describes source control actions that were conducted from January 2014 through December 2016.

Table B-1 lists action items that were completed during this reporting period. Table B-2 lists action items that have not yet been completed, including new source control action items that have been added since initial publication of the SCAPs. Source control activities conducted from January 2014 through December 2016 are described in Sections 3 through 8:

- Section 3: Lower Reach – East Side
- Section 4: Middle Reach – East Side
- Section 5: Upper Reach – East Side
- Section 6: Lower Reach – West Side
- Section 7: Middle Reach – West Side
- Section 8: Upper Reach – West Side

⁹ <https://ecology.wa.gov/Spills-Cleanup/Contamination-cleanup/Cleanup-sites/Toxic-cleanup-sites/Lower-Duwamish-Waterway>

Properties for which no source control activities were conducted during the reporting period are not discussed in this report. Site maps are presented for each of the 24 source control areas in Sections 3 through 8. These maps are intended to help identify locations discussed in the text and are presented at the end of each subsection. Additional figures are available in the referenced reports.

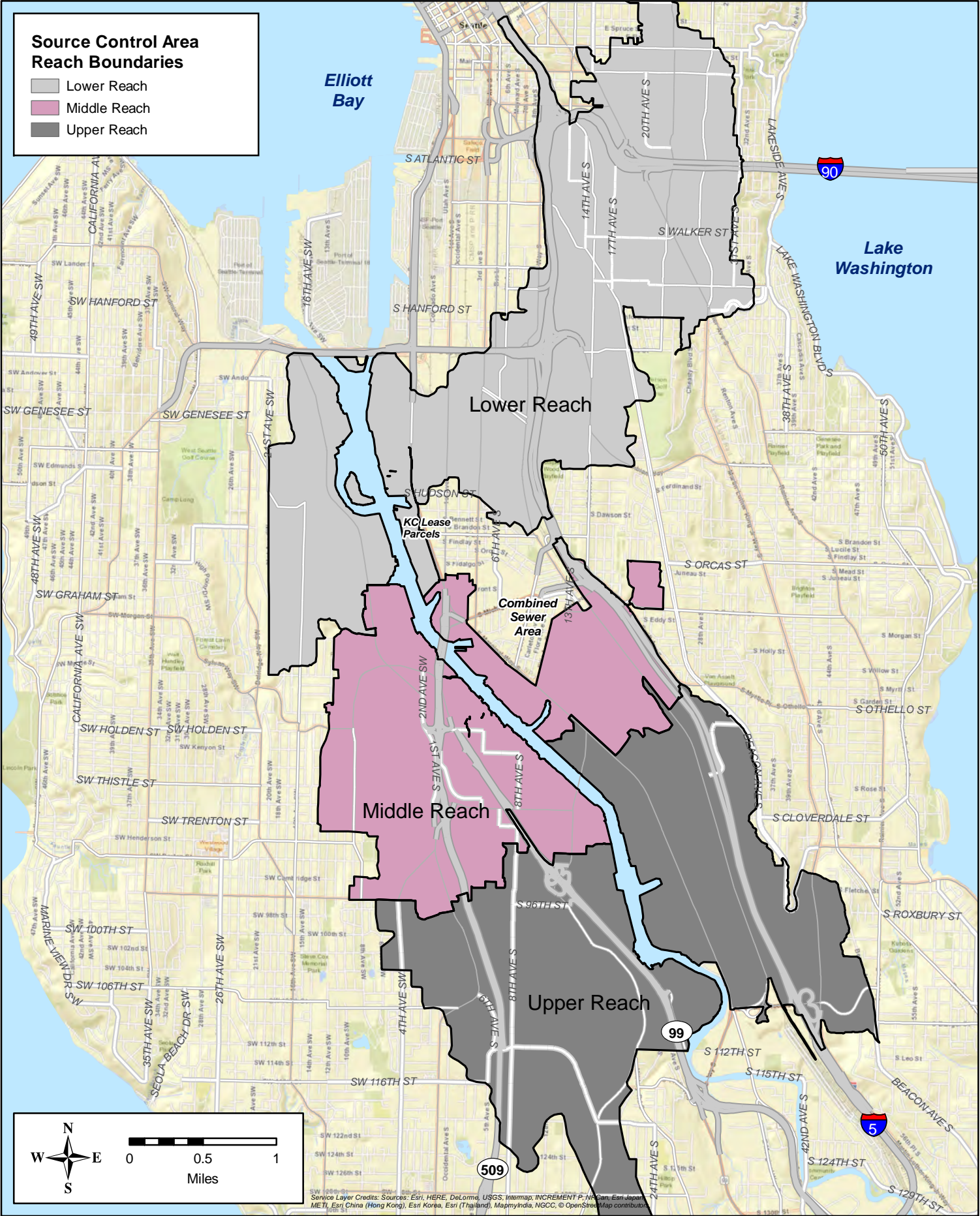
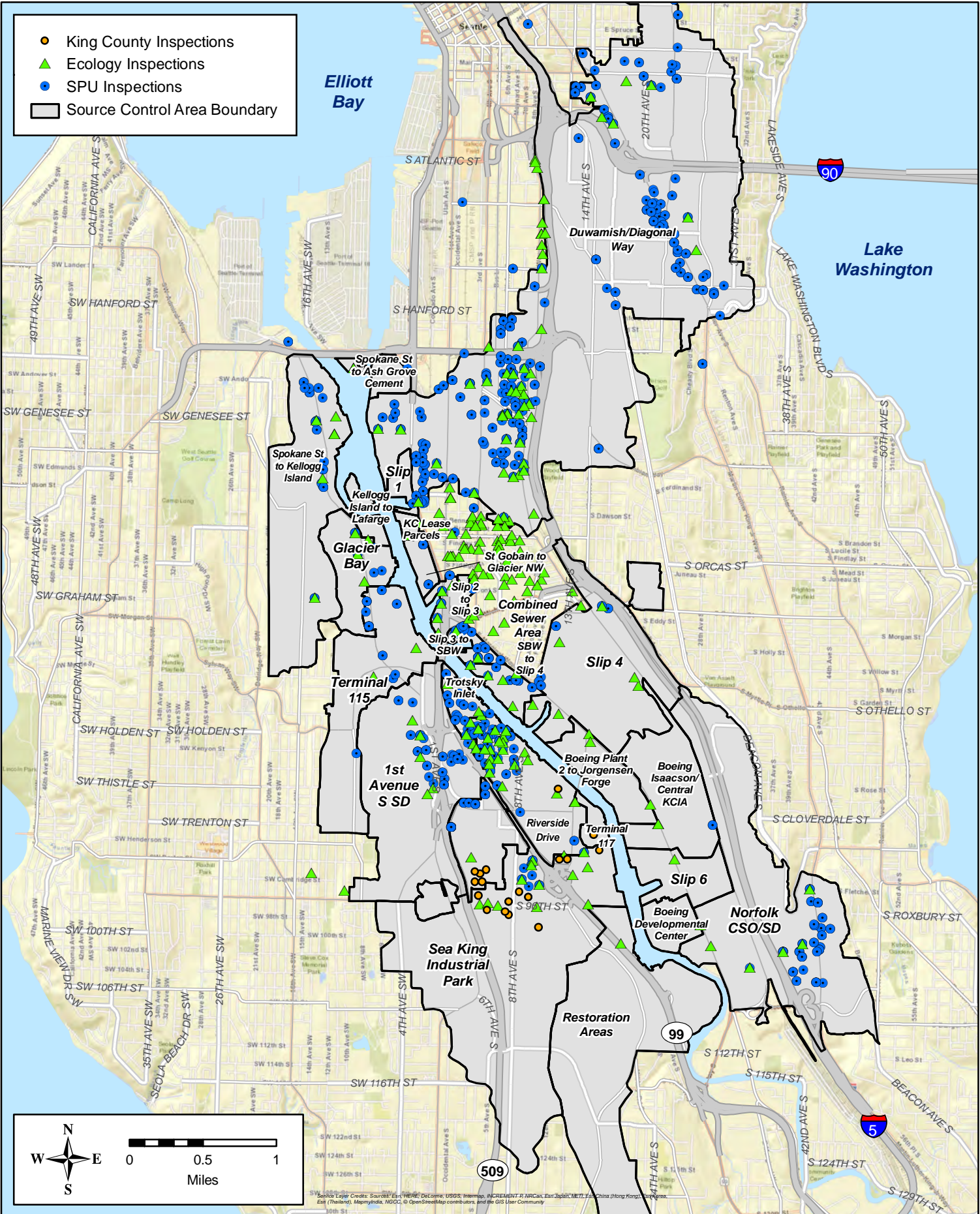


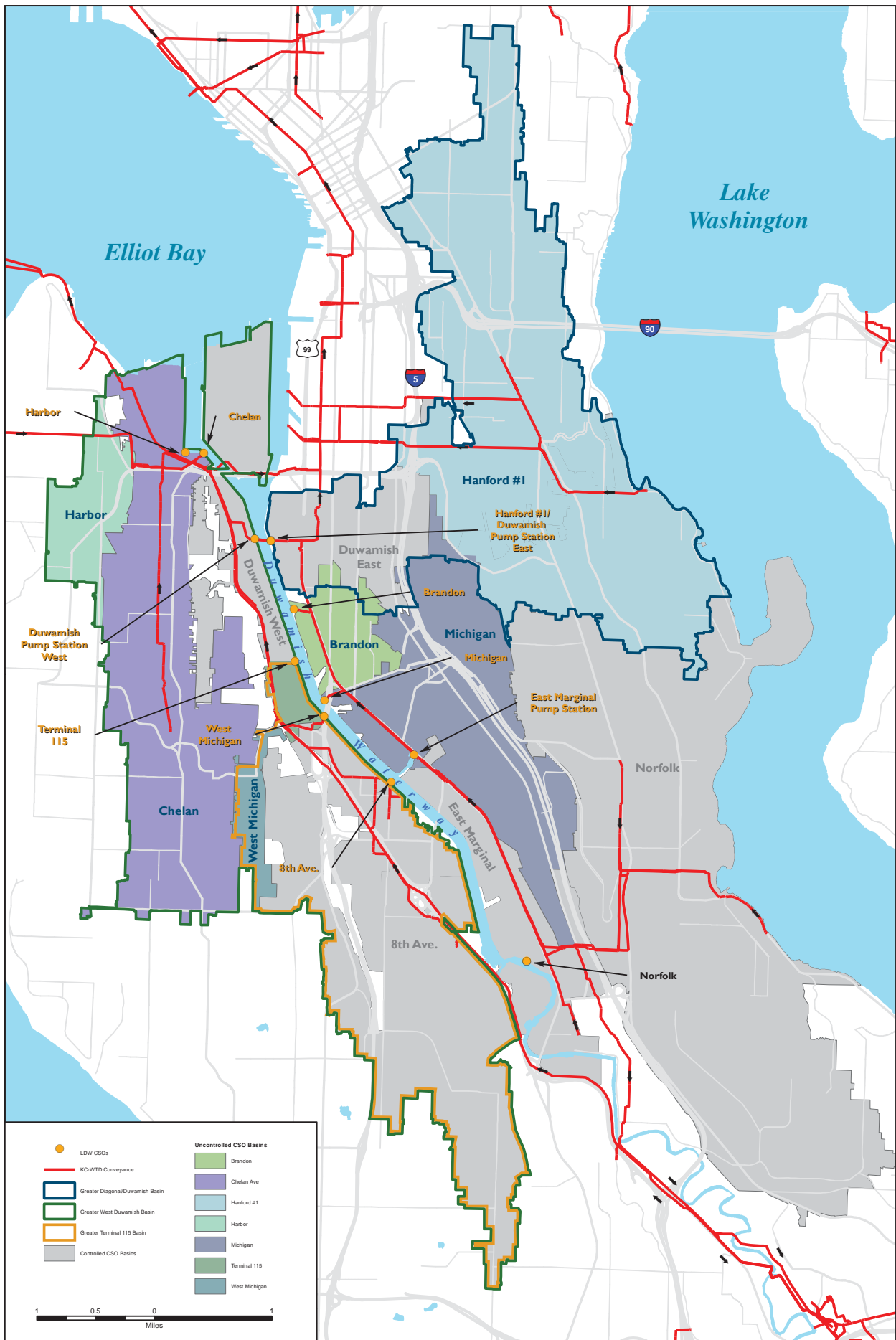
Figure 2-1. Lower Duwamish Waterway Reach Boundaries





**Figure 2-2. Inspections in the Lower Duwamish Waterway Basin
January 2014 through December 2016**





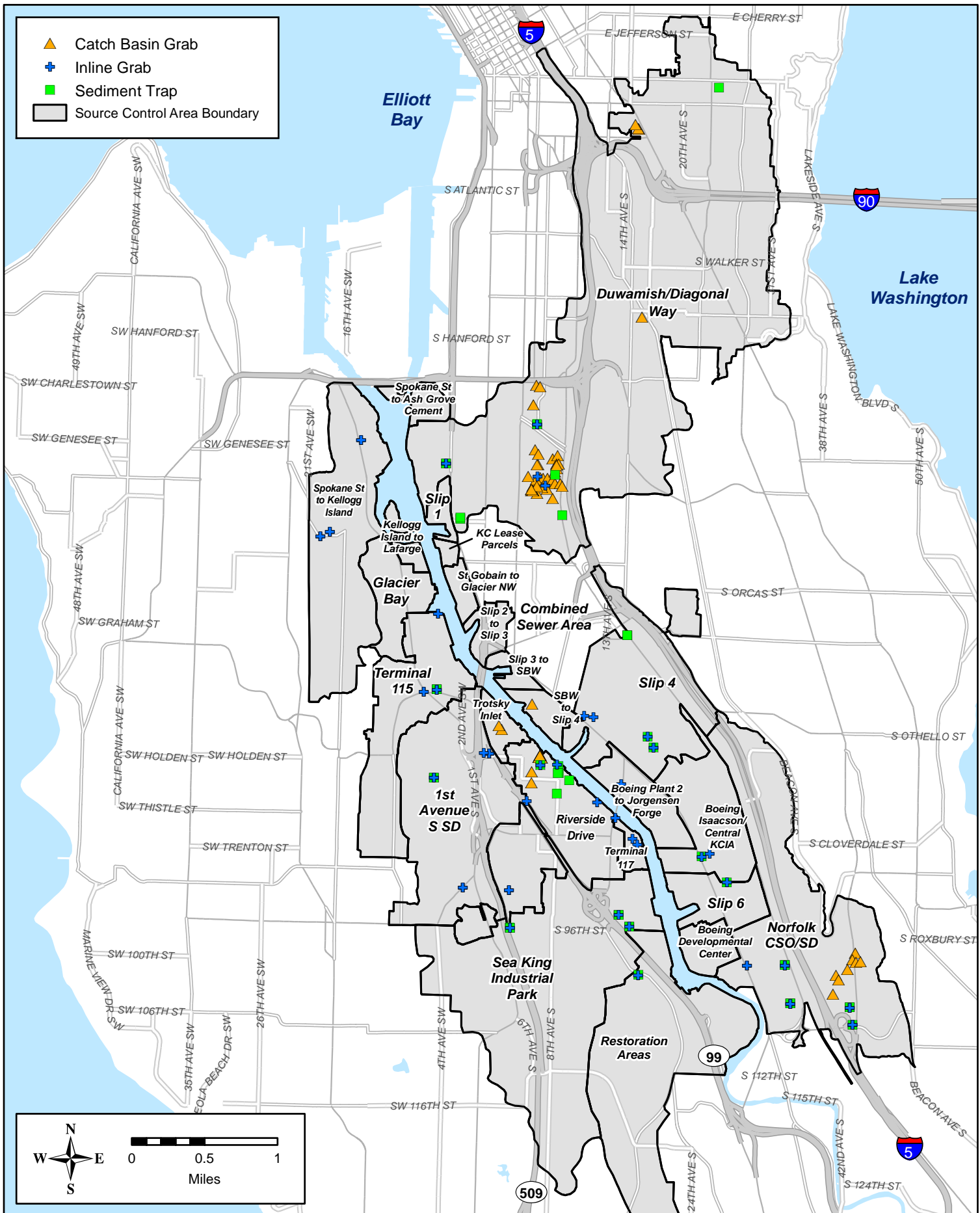


Figure 2-4. Source Tracing Sample Locations in the LDW Basin, January 2014 through December 2016

3.0 Lower Reach – East Side

This section includes the following source control areas:

- RM 0.0-0.1 East (Spokane Street to Ash Grove Cement)
- RM 0.1-0.9 East (EAA-1: Duwamish/Diagonal Way)
- RM 0.9-1.0 East (Slip 1)
- RM 1.0-1.2 East (King County Lease Parcels)
- RM 1.2-1.7 East (Saint Gobain to Glacier Northwest)

This area includes several cleanup sites with oversight by Ecology's Hazardous Waste Program: GE Aviation Division, West of 4th Site (Art Brass Plating, Blaser Die Casting, Capital Industries, and Burlington Environmental), and the Burlington Environmental/East of 4th Site.

3.1 RM 0.0-0.1 East (Spokane Street to Ash Grove Cement)

The RM 0.0-0.1 East (Spokane Street to Ash Grove Cement) source control area includes properties adjacent to the LDW, including Ash Grove Cement, the Port of Seattle's Terminal 104, and Terminal 102 (Harbor Marina Corporate Center) on the southern end of Harbor Island (Figure 3-1).

- Chemicals of concern for this source control area include metals, PAHs, phthalates, and PCBs.
- There are four Port of Seattle-owned storm drain outfalls associated with this source control area. Ash Grove Cement discharges stormwater to the East Waterway (downstream of the LDW) under an individual NPDES permit (WA0032221) via the City of Seattle's Hinds Street CSO/SD.
- Of the 13 action items identified for this source control area, five have been completed. Seven high priority action items were identified; three of these are complete.

3.1.1 Business Inspections

Ecology conducted one Urban Waters inspection at one facility, Puget Sound Institute of Pathology, in this source control area during this reporting period (Appendix E). SPU inspected Ash Grove Cement during this reporting period (Appendix C).

3.1.2 Source Tracing

No source tracing samples have been collected in this source control area.

3.1.3 Facility-Specific Source Control Actions

Terminal 102

The Port of Seattle's Terminal 102 property is located on the southern end of Harbor Island; this area is known as the Harbor Marina Corporate Center.

The Port of Seattle cleaned 27 structures and 2,649 feet of storm drain lines in November 2014 (Port of Seattle 2015). Sediment traps were installed at locations CB5501 and CB5487 in February 2015; they were retrieved in September 2015 and solids were analyzed for metals, PCBs, SVOCs, grain size, and total solids. One sample was also analyzed for dioxins/furans.

Detection limits were above the storm drain screening levels (Table 2-6) for many of the SVOCs. Zinc (3,600-4,900 mg/kg) and BEHP (6.5-7.5 mg/kg DW) exceeded the CSL at both locations; di-n-octyl phthalate (300 mg/kg DW) exceeded the CSL at CB5501 only. In addition, cadmium, phenol, and benzo(g,h,i)perylene exceeded the SCO at location CB5501; phenol and butylbenzyl phthalate exceeded the SCO at location CB5487. The dioxin/furan TEQ (48.6 ng/kg) exceeded the LDW-wide RAL of 25 ng/kg TEQ.

Terminal 104

The Port of Seattle's Terminal 104 property is currently leased to Pacific Coast Container, Inc.

The Port of Seattle cleaned 42 structures and 3,600 feet of storm drain lines at Terminal 104 in December 2014 (Port of Seattle 2015). A total of 4.53 tons of sediment was removed. Sediment traps were installed at three locations in February 2015: CB7021, MH7005, and MH6965. They were retrieved in September 2015; solids from locations MH7005 and CB7021 were analyzed for metals, PCBs, SVOCs, grain size, and total solids. The MH7005 sample was also analyzed for dioxins/furans. A sample from MH6965 was analyzed for metals, PCBs, grain size, and total solids only. Detection limits were above the screening levels for many of the SVOCs.

Total high molecular weight PAHs (HPAHs) (38-42 mg/kg DW) and total LPAHs (6.8-11 mg/kg DW), as well as many individual HPAH and LPAH compounds, exceeded the CSL at both locations sampled. BEHP (7.4-9.9 mg/kg DW) also exceeded the CSL at both locations. Other exceedances include zinc (860-2,100 mg/kg) at all three locations; lead and total PCBs at one location; and phenols and butylbenzyl phthalate at two locations. The dioxin/furan TEQ (321 ng/kg) exceeded the LDW-wide RAL of 25 ng/kg TEQ by more than an order of magnitude.

Ash Grove Cement

In April 2014, Ash Grove Cement completed the installation of an approved stormwater treatment system, as outlined in its NPDES permit (Ash Grove Cement 2014).

In March 2015, Ash Grove Cement reported that lump coal was released onto the dock and into the LDW when a wall failed in an aboveground storage unit. The remaining lump coal was moved away from the LDW.

Product in the water was removed during low tide that evening (Ecology 2015f).

Ash Grove Cement submitted a letter to Ecology in August 2015 with information clarifying some aspects of Ash Grove Cement's history. In addition, Ash Grove Cement submitted data that

Current Operations	Cement manufacturer; concrete plant that produces Type I, Type II, and Type III Portland cement
Historical Operations	Cement manufacturer since 1928
Address	3801 East Marginal Way S
Facility/Site ID	2142
NPDES Permit	WA0032221 (Industrial NPDES IP)
Chemicals of Concern	PAHs, metals, phthalates, SVOCs, asbestos, and PCBs
Media Affected	Soil and groundwater

were not found in Ecology’s files that may be helpful in the preparation of the SHA for this facility (Ash Grove Cement 2015).

In June 2016, SPU inspected the site and found that Ash Grove did not obtain the necessary City building and side sewer permits when they revised the drainage system and made other improvements as part of stormwater treatment system installation required under their NPDES permit. Drainage around the fuel station and replacement of the fuel tank was determined to qualify as a substantial alteration which triggered Seattle Stormwater Code requirements to upgrade the fuel area. Due to the length of time to design and obtain permits for the permanent structure, SPU and Ash Grove Cement entered into a voluntary compliance agreement and the necessary improvements were completed in November 2016.

3.2 RM 0.1-0.9 East (EAA-1: Duwamish/Diagonal Way)

The RM 0.1-0.9 East (EAA-1: Duwamish/Diagonal Way) source control area includes Port of Seattle Terminals 106 and 108, and the northern portion of Federal Center South (Figure 3-3). In addition, it includes facilities within the Diagonal Avenue S and S Nevada Street storm drain basins (Figure 3-2).

- Chemicals of concern for this source control area include BEHP, PAHs, lead, zinc, and PCBs.
- The RM 0.1-0.9 East source control area includes the Diagonal Avenue S CSO/SD outfall (outfall 2155), the S Nevada Street SD outfall (no number assigned), an inactive Port of Seattle outfall at Terminal 108 (outfall 2225), and an outfall near the terminus of Diagonal Avenue S at Federal Center South (outfall 2003).
- Of the 51 action items identified for this source control area, 41 have been completed. Seven high priority action items were identified; six of these are complete.

The Elliott Bay/Duwamish Restoration Program implemented the Duwamish/Diagonal Sediment Remediation Project in the vicinity of the Duwamish/Diagonal CSO/SD between November 2003 and March 2004. King County completed their sediment cleanup monitoring program in 2010 (King County 2015e). King County conducted two additional sediment monitoring rounds in 2011 and 2012 (King County 2016a). Samples were collected from 23 stations in four monitoring areas. Exceedances of SMS criteria are summarized in Table 3-1 below.

Table 3-1. Duwamish/Diagonal Sediment Remediation Project: Exceedances of SMS Criteria 2011-2012

Chemical	2011				2012			
	Cap Area A	Cap Area B	ENR Area	Perimeter Area	Cap Area A	Cap Area B	ENR Area	Perimeter Area
Total PCBs	x			☒				☒
Mercury								☒
Phenanthrene	x						x	
Total LPAHs	x							
Benzo(a)anthracene							x	
Benzo(a)pyrene							x	
Benzo(g,h,i)perylene							x	
Chrysene	x						x	

Chemical	2011				2012			
	Cap Area A	Cap Area B	ENR Area	Perimeter Area	Cap Area A	Cap Area B	ENR Area	Perimeter Area
Dibenzo(a,h)anthracen							x	
Fluoranthene	☒							
Indeno(1,2,3-cd)pyrene							x	
Pyrene	☒							
Total HPAHs	☒						x	
Butylbenzyl phthalate	x			x				
BEHP	☒			x				☒
4-Methylphenol								☒
Phenol					x	x		x
Pentachlorophenol						x		
Benzoic acid						☒		☒

ENR = enhanced natural recovery

x = chemical concentration in at least one sample exceeded the SCO (WAC 173-204-320)

☒ = chemical concentration in at least one sample exceeded the CSL (WAC 173-204-562)

Source: King County 2016a

3.2.1 Business Inspections

SPU conducted a total of 440 business inspections at 236 facilities in the Diagonal Avenue S CSO/SD, and the S Nevada Street drainage basins during the current reporting period (Appendix C).

- In December 2014, SPU received a complaint regarding noxious fumes at the Alaska Street Reload Facility (70 S Alaska Street). This is Waste Management's reload facility for transporting contaminated materials to landfills in Oregon. SPU and Ecology were concerned about leachate migrating through the ecology block walls to a storm drain. Ecology referred this site to EPA (SPU 2015b).
- On June 14, 2014, SPU reported that sediment samples collected at Western Waterproofing showed significantly elevated levels of PCBs. SPU collected two samples from solids in the storm drain. One sample contained PCB concentrations of 160 mg/kg. SPU resampled this storm drain and sampled a few areas around the site. Results from the second round of sampling showed PCB concentrations of 0.50 to 41 mg/kg PCBs. See Section 3.2.2 for the discussion of source tracing.
- In early 2015, North Star Casteel (3909 9th Avenue South) asked to discontinue its ISGP. SPU stated that this business continues to store equipment in the right-of-way on 9th Avenue S that drains to the storm drain, and track-out continues to be a problem at this site. As long as these issues remain, SPU considers the permit appropriate (SPU 2015b).

Ecology conducted 64 inspections at 59 facilities within this source control area during the current reporting period (Appendix E).

- In July 2014, Ecology recommended an enforcement action against North Star Casteel for violating the terms of its ISGP. North Star Casteel failed to submit Discharge Monitoring Reports for the 2nd quarter of 2011, all of 2013, and the 1st quarter of 2014. They also failed to submit annual reports for 2012 and 2013 (Ecology 2014n). In August 2014, Ecology

fined North Start Casteel \$3,000 for failing to submit stormwater reports as required under their ISGP (Ecology 2014o).

3.2.2 Source Tracing

SPU has collected hundreds of source tracing samples in the Diagonal Avenue S CSO/SD basin, including sediment trap samples, in-line solids samples, on-site catch basin samples, and right-of-way catch basin samples. During the current reporting period, 6 sediment trap samples; 11 in-line solids samples; 63 on-site catch basin samples; 15 right-of-way catch basin samples; and 16 samples of street dirt, soil, and other matter were collected in this drainage basin.

No samples were collected in S Nevada Street storm drain basin during the current reporting period. SPU cleaned this drainage system in 2015 (see Section 2.5.6).

In 2014, SPU initiated an intensive source tracing effort in the S Snoqualmie Street subbasin where elevated levels of mercury (0.44 mg/kg) and PCBs (3.1 mg/kg) were found in an in-line sediment sample (MH-18). The drain lines in this area were cleaned in 2010 after previous source tracing had failed to find the source of elevated levels of mercury (0.44 to 1.0 mg/kg) found at MH-18 in 2004 and 2008 samples.¹⁰ SPU cleaned this line in 2010 to facilitate source tracing by removing historical accumulations. MH18 was resampled in 2016 following cleaning and contained elevated levels of mercury (1.1 mg/kg) and PCBs (4.4 mg/kg DW).

As part of the intensive source tracing effort, SPU inspectors found evidence of several scrap metal operations taking place out of campers and trailers parked in the right-of-way (wire stripping and fluorescent lamp fixtures) along 6th Avenue S. Samples collected from three right-of-way catch basins contained low levels of PCBs (0.076, 0.17, and 0.68 mg/kg DW). Source tracing results are summarized below:

- Elevated levels of PCBs (6.0 to 32 mg/kg DW) were found in onsite catch basins on the Sun Foods property. A large amount of paint chips were observed in the samples. Paint chips from one of the catch basins contained 45 mg/kg DW PCBs. However, PCBs in two in-line structures downstream of Sun Foods (0.094 to 0.27 mg/kg DW) were low, indicating that materials were not migrating offsite.
- Elevated levels of PCBs (3.1 to 160 mg/kg DW) were found in catch basins and surface dirt at Western Waterproofing. SPU required the property owner, PJM III, to clean the pavement in their storage area, clean the onsite drainage system and the public drainage system between their site and MH18, and to install a filter sock in the onsite catch basin where the high levels of PCBs were found. PJM III completed the work in September 2014, but they did not agree that their site contributed PCBs to the drainage system. On December 9, 2014, PJM III resampled the onsite drainage and analyzed for PCBs to confirm that the cleanup was successful. PCB results for the confirmation testing were still elevated at 5.2 mg/kg and above SPU screening levels.

A new tenant moved onto the site after 2014. During the transition between tenants, the property owner performed additional cleaning and repaved part of the storage yard. In June 2016, SPU again collected a sample of the impacted private storm drain and analyzed for

¹⁰ PCBs in the 2004 and 2008 samples were relatively low (0.25 and 0.46 mg/kg DW, respectively).

PCBs with results of 0.86 mg/kg DW, which is below the SPU screening level of 1 mg/kg DW.

Complete sample results for the current reporting period are presented in Appendix F; sample locations are shown in Figures 3-2 and 3-3. Screening level exceedances are summarized in Table 3-2.

Table 3-2. RM 0.1-0.9 East: Screening Level Exceedances in SPU Source Tracing Samples

Chemical Class	Chemical	Sediment Traps	In-line Solids	On-site CB Solids	Right-of-Way CB Solids
Metals	Copper		☒	☒	☒
	Lead		☒	☒	
	Mercury	☒	☒	☒	
	Zinc	×	☒	☒	☒
PCBs	Total PCBs	×	☒	☒	☒
PAHs	LPAH		☒	☒	☒
	HPAH		☒	☒	☒
	Total cPAHs		☒	☒	☒
Phthalates	BEHP	☒	☒	☒	☒
	Butylbenzyl phthalate	×	☒	☒	☒
	Diethyl phthalate			☒	
	Dimethyl phthalate	☒	☒	☒	☒
	Di-n-butyl phthalate			☒	
	Di-n-octyl phthalate		☒	☒	
Other SVOCs	1,2,4-Trichlorobenzene				☒
	2-Methylphenol			☒	
	4-Methylphenol	☒	☒	☒	☒
	Benzoic acid	☒	☒	☒	☒
	Benzyl alcohol	☒		☒	☒
	Dibenzofuran			☒	
	N-Nitrosodiphenylamine		☒	☒	☒
	Phenol		×	☒	×
TPH	Diesel-range hydrocarbons		☒	☒	☒
	Oil-range hydrocarbons	☒	☒	☒	☒

Storm drain screening levels are listed in Table 2-6.

× = Exceedance of SCO (lower screening level) was observed during the current reporting period (2014 through 2016).
☒ = Exceedance of CSL (upper screening level) was observed during the current reporting period (2014 through 2016).
ns = not sampled

Of the 385 samples collected in the Diagonal Ave S CSO/SD prior to this reporting period, the CSLs were exceeded for arsenic (1 percent of the samples), copper (7 percent), lead (3 percent), mercury (4 percent), zinc (12 percent), PCBs (4 percent), LPAH (8 percent), HPAH (10 percent), oil-range hydrocarbons (50 percent), BEHP (66 percent), butylbenzyl phthalate (21 percent), and dimethyl phthalate (26 percent) (City of Seattle 2016).

SPU also conducted an IDDE investigation in this area in 2014. Findings are summarized below:

- NW of S Winthrop Street and Martin Luther King Way S (MH D052-403). SPU measured elevated levels of surfactants and observed sewage while source tracing upstream of this maintenance hole. Through multiple dye tests and CCTV footage, SPU identified six homes (1352, 1356 and 1362 Martin Luther King Way S; and 2705, 2707, and 2709 S Irving Street) that were illicitly connected to the storm system. SPU issued six NOV's for repair. The homes were repaired in September 2014 and confirmed via dye test.
- Hiawatha Place S and S Bush Place (MH D045-101). SPU measured elevated levels of fecal coliform bacteria. SPU source traced upstream maintenance holes and observed staining on the pipe and a sewage odor in D045-112. Further tracing combined with CCTV in this area showed a substantial amount of flow, which was more flow than previously observed in the line. SPU traced the flow to Franz Family Bakeries (2006 S Weller Street) and found that a floor drain in a freezer installed in 2013 was connected to the storm drain system. SPU issued an NOV and confirmed via dye test that the freezer was replumbed to the sanitary sewer.
- S Industrial Way and 6th Avenue S (MH D057-092). SPU measured elevated levels of surfactant and conductivity, and observed sewage and toilet paper in the storm drain line. Dye testing at 601 S Nevada Street confirmed an illicit connection, which contributed discharges from three toilets, five sinks, and eight floor drains into the storm drain. The business was issued an NOV and within two days, portable bathrooms had been delivered and the bathrooms onsite were no longer being used. The repair was made in September of 2014 and confirmed via a dye test.
- S Industrial Way and 4th Avenue S (MH D057-085). SPU measured elevated conductivity at this location. A subsequent investigation and business inspection at 3828 4th Avenue S revealed an illicit connection (utility sink). The property owner was informed of the cross connection and made the repair.
- S Dearborn Street and Hiawatha Place S (MH D045-037). MH D045-038 contained elevated levels of fluoride. SPU source traced this issue to a broken water line which crews repaired.

3.2.3 Facility-Specific Source Control Actions

Port of Seattle Terminals 106 and 108

ConGlobal Industries, Ash Grove Cement, and Arctic Commercial Refrigeration operate on portions of the Port of Seattle's Terminal 106. Terminal 108 is currently occupied by ConGlobal Industries.

During an April 2013 stormwater compliance inspection at ConGlobal Industries, Ecology collected a storm drain solids sample from manhole MH-010. Sampling results were published

during the current reporting period (Leidos 2015a). MH-010 is located in the Terminal 108 portion of the facility near the intermodal equipment storage area, and receives stormwater from the majority of Terminal 108. It discharges via Outfall 003 to the City's Diagonal Ave S CSO/SD. Zinc, BEHP, butylbenzyl phthalate, n-nitrosodiphenylamine, and petroleum hydrocarbons exceeded the storm drain screening levels (Table 2-6).

In June 2014, the Port of Seattle submitted a Source Control Data Evaluation report for Terminals 108W, 108E, and 106W to Ecology (AECOM 2014), to address the data gaps identified in the Port of Seattle's 2011 Source Control Strategy Plan. From 2013 to 2014, the Port sampled groundwater, storm drain solids, and bank soil. According to the report, zinc and PCBs in storm drain solids; arsenic, copper, manganese, nickel, zinc, and PCBs in groundwater; and PAHs and PCBs in bank soil exceeded the Port's screening criteria.

ConGlobal Industries is installing stormwater treatment at the facility.

- On September 30, 2014, ConGlobal Industries submitted an ISGP Stormwater Treatment System Design Engineering Report to Ecology (Farallon Consulting 2014). The report proposed installing an electrocoagulation treatment system with sedimentation processes and multiple pass-through high-capacity sand filters to treat the stormwater generated at the ConGlobal Industries facility and prior to discharge to the City of Seattle storm drain.
- At the time of an April 2015 stormwater compliance inspection, the facility was in the process of installing two electrocoagulation treatment systems – one for the northern portion of the site (Terminal 106) and one for the southern portion (Terminal 108). Both systems are preceded by a settling tank and followed by a sand filter. As an interim action prior to the treatment systems coming online, ConGlobal had installed a settling tank at outfall OF003 (Ecology 2015h).

The Port of Seattle cleaned storm drain structures and lines at Terminals 106 and 108 in 2014 and 2015.

- At Terminal 106, the Port of Seattle cleaned 41 storm drain structures and 7,526 feet of storm drain lines in December 2014, January 2015, and April 2015 (Port of Seattle 2015).

Current Operations	Shipping container and truck chassis storage and repair
Historical Operations	Same as current
Address	1 S Idaho Street
Facility/Site ID	54918197
NPDES Permit	ConGlobal: WAR010569 (ISGP); Port of Seattle: WAR044701 (Municipal SW Phase 1 GP)
Chemicals of Concern	Copper, zinc, phthalates, other SVOCs, and petroleum hydrocarbons
Media Affected	Stormwater and storm drain solids

Sediment traps were installed at locations MH4684 and MH4715 in May 2015; they were retrieved in September 2015. Solids from location MH4715 were analyzed for metals, PCBs, SVOCs, dioxins/furans, and total solids. The MH4684 sample was analyzed for metals, PCBs, and total solids only.

- Copper (440 mg/kg) and BEHP (32 mg/kg DW) exceeded the CSL at MH4715; zinc (3,100-3,200 mg/kg) exceeded the CSL at both locations. Total PCBs and mercury exceeded the SCO at MH4715. The dioxin/furan TEQ (41.3 ng/kg) exceeded the LDW-wide RAL of 25 ng/kg TEQ.
- At Terminal 108, the Port of Seattle cleaned 35 storm drain structures and 3,743 feet of storm drain lines in March 2015 (Port of Seattle 2015). Sediment traps were installed at locations MH7640 and MH7646 in May 2015; they were retrieved in September 2015. Solids from location MH7640 were analyzed for metals, PCBs, SVOCs, dioxins/furans, grain size, and total solids. The MH7646 sample was analyzed for metals, PCBs, and total solids only.
 - Detection limits exceeded the screening levels for many SVOCs. Zinc (1,100 mg/kg) and BEHP (10 mg/kg DW) exceeded the CSL at MH7640; other exceedances include phenol, 4-methylphenol, and butylbenzyl phthalate at MH7640; and cadmium and zinc at MH7646.
 - A total of 3.56 tons of solids were removed from Terminal 106 and 108 storm drains (Port of Seattle 2015).

In February 2016, SPU issued an NOV to the Port of Seattle after SPU source control inspectors discovered two catch basins within an internal loading dock. Dye testing confirmed that the drain in the western-most loading bay was connected to the municipal storm drain located in S Nevada Street with eventual discharge into the LDW. Drain lines from catch basins and drain inlets that are located under cover must connect to the sanitary sewer and not the storm drain. SPU required several corrective actions and imposed a fine of \$1,000, which was deferred pending completion of the corrective action by the required deadline (SPU 2016a). The Port of Seattle cleaned and sealed the catch basins and completed all corrective actions (Port of Seattle 2016).

Rainier Commons / Former Rainier Brewery Property

The former Rainier Brewery property is currently known as Rainier Commons. In 2004/2005, elevated concentrations of PCBs in a nearby catch basin led to the discovery of PCB-contaminated paint at this facility. The cleanup is being performed under EPA oversight.

Current Operations	Coffee roasting and storage, artist loft, and two restaurants
Historical Operations	Brewery
Address	3100 Airport Way S
Facility/Site ID	9192461
Chemicals of Concern	PCBs
Media Affected	Stormwater

In 2013, Rainier Commons prepared a general work plan for removal of paint from building exterior surfaces, sampling some substrates, and complete removal of paint from the interior

stairwell area. A Phase II work plan was submitted to EPA in April 2015; according to EPA's website,¹¹ abatement has been completed for Phases I and IIa, which includes the west side of Buildings 10 and 11, all of Building 13, and the south side of Building 15. A Phase IIb report has been submitted to EPA and is under review.

Catch basin sampling was conducted during the current reporting period:

- Catch basin samples were collected in June 2014, prior to paint abatement activities. Solids samples from CB1 and CB3 contained 4.3 to 9.9 mg/kg PCBs (NVL 2014a).
- Catch basins samples were also collected in July 2014, during paint abatement activities. Solids samples from CB1 and CB3 contained 5.7 to 8.4 mg/kg PCBs (NVL 2014b). No PCBs were detected in a water sample collected from CB3. Rainier Commons subsequently cleaned out the catch basins and replaced the filter sock in CB1 (Rainier Commons 2014a).
- Additional samples were collected in August 2014; water samples collected from CB3 and MH6 contained 0.90 to 4.1 micrograms per liter ($\mu\text{g/L}$) PCBs (above the screening concentration of 0.1 $\mu\text{g/L}$). A solids sample from CB3 contained 12.3 mg/kg PCBs (NVL 2014c). Rainier Commons proposed additional catch basin cleanout and other activities (Rainier Commons 2014b), however EPA requested that additional mitigation and sampling be performed (Mullin 2014).
- To address PCBs found in on-site catch basin solids, Rainier Commons implemented enhanced site source control work. This work included over 160 man-hours hand-vacuuming roofs and parking lots, replacing roof drain filters, replacing catch basin filters, and cleaning out catch basin solids.

Union Pacific Railroad – Dawson Street

During a June 2013 stormwater compliance inspection at Union Pacific Railroad (UPRR), also referred to as UPRR Argo Yard, Ecology collected one water sample and three solids samples from the storm drain system. Sampling results were published during the current reporting period (Leidos 2015a).

Current Operations	Railcar switching and intermodal station, maintenance facility for the railroad
Address	402 S Dawson Street
Facility/Site ID	74589256
NPDES Permit	WAR001155 (ISGP)
Chemicals of Concern	Metals, PAHs, phthalates, PCBs, and other SVOCs
Media Affected	Stormwater and storm drain solids

- The water sample was collected from catch basin CB-B8, located upstream of storm drain Vault B. This catch basin receives stormwater from the southern portion of the facility.
 - BEHP, multiple PAH compounds, and total PCB congeners exceeded the human health WQC. In addition, copper, dissolved copper, lead, mercury, nickel, dissolved nickel, zinc, and dissolved zinc exceeded the chronic marine WQC in this sample.
- Solids samples were collected from the following locations:

¹¹ <https://www.epa.gov/pcbs/rainier-commons-pcb-removal-project-seattle-washington#sampling>

- Catch basin CB-A6, located upstream of storm drain Vault A. This catch basin receives stormwater from the central portion of the facility.
- Catch basin CB-B8, as described above.
- Manhole MHF-165, located at the western portion of the facility. There are three influent pipes at this location, which is representative of the System F drainage area.
- Zinc, BEHP, butylbenzyl phthalate, n-nitrosodiphenylamine, and petroleum hydrocarbons exceeded the storm drain screening levels (Table 2-6) at all three sampling locations. In addition, total PCBs, fluoranthene, phenanthrene, total LPAHs, dimethyl phthalate, benzoic acid, and benzyl alcohol exceeded the screening levels in at least one sample. The highest exceedances were for phthalates.

South Service Center (Seattle City Light)

Ecology conducted a stormwater compliance inspection at Seattle City Light's (SCL) South Service Center on December 11, 2014. One water sample and three solids samples were collected from the facility's storm drain system (Leidos 2015c).

Current Operations	Electrical transmission equipment storage and maintenance facility
Address	3613 4 th Avenue S
Facility/Site ID	2171
NPDES Permit	WAR044503 (Municipal SW Phase I GP)
Chemicals of Concern	Metals, PCBs, PAHs, dioxins/furans, phenols, phthalates, other SVOCs, and petroleum hydrocarbons
Media Affected	Stormwater and storm drain solids

- The water sample was collected from manhole MH-20, which is channelized and receives stormwater from an area that drains a paved parking lot where equipment is stored. Stormwater is conveyed to oil/water separator OWS-D, which drains off site to the Duwamish/Diagonal CSO/SD. Copper, lead, and zinc concentrations exceeded the chronic marine WQC in this sample. Total PCB congeners, benzo(a)pyrene, dibenz(a,h)anthracene, and pentachlorophenol concentrations exceeded the human health WQC.
- Solids samples were collected from the following locations:
 - Catch basin CB-24, located on the north side of a salvage scrap storage yard. Stormwater drains from under the scrapyards barriers and enters CB-24, which has a sediment trap to prevent floating debris from discharging to the storm drain line.
 - Catch basin CB-35, which receives stormwater from CB-36 and CB-37 and paved areas adjacent to the PCB building. Stormwater is conveyed from CB-35 to a storm drain line that eventually enters oil/water separator OWS-D.
 - Location OWS-05, which is chamber 2 of oil/water separator OWS-D. Stormwater is conveyed from OWS-D to the Duwamish/Diagonal CSO/SD.
- Copper, zinc, total PCB Aroclors and congeners, dioxin/furan TEQ, several HPAH compounds, total cPAH TEQ, BEHP, dimethyl phthalate, pentachlorophenol, and petroleum hydrocarbons exceeded the storm drain screening levels (Table 2-6) in all three samples. In addition, cadmium, mercury, butylbenzyl phthalate, dibutyl phthalate, 4-methylphenol, benzyl alcohol, and n-nitrosodiphenylamine exceeded the screening levels

in at least one sample. The highest exceedances were for dioxins/furans, phthalates, PCBs, and pentachlorophenol.

In October 2015, SPU conducted a stormwater compliance inspection of the South Service Center and issued a corrective action letter to address uncovered outside storage of leachable materials, repair of drainage structures, and cleaning and repair of oil/water separators. SPU continued to work with SCL in correcting these issues through periodic meetings and follow-up inspections. Because some of these remedies required extensive work for structural repairs, it was agreed to negotiate an MOA. In June 2016, SPU and SCL signed an MOA to address the following activities:

- Cover salvage wire bins with temporary cover or permanent roofing;
- Cover junk transformers awaiting processing, if there are exterior stains;
- Uncover, inspect, and maintain the stormwater detention structure located in the southeast corner of the site;
- Install catch basin filter with treatment for three areas of the storage yard (near the transformer storage yard awaiting processing, outside warehouse storage yard with galvanized materials, and treated lumber, and salvage yard where scrap copper wire is accumulated);
- Modify the Stormwater Pollution Prevention Plan (SWPPP) for operational changes to BMPs to cover equipment; and
- Repair damaged oil/water separators.

On September 9, 2016, City Light submitted a written notice of completion to SPU. SCL also approved \$1 million in funding to make environmental improvements at its North and South Service Centers in Seattle. Additional work is to be completed in 2019.

Alaska Street Reload and Recycling Center

Ecology conducted a stormwater compliance inspection at the Alaska Street Reload and Recycling Center on January 20, 2015. One water sample and three solids samples were collected from the facility's storm drain system (Leidos 2015c).

- The water sample was collected from catch basin CB-UNK, which is located offsite, north of the fence line, in the northwest area of the facility. The catch basin receives stormwater from a heavy truck traffic area to the west.
 - Copper, lead, mercury, nickel, and zinc exceeded the chronic marine WQC in this sample; total PCB congeners exceeded the human health WQC.

Current Operations	Intermodal truck-to-rail transfer facility for non-hazardous contaminated soils, sludge, and drummed and recyclable materials
Address	70 South Alaska Street
Facility/Site ID	81491835
NPDES Permit	WAR004605 (ISGP)
Chemicals of Concern	Metals, PCBs, dioxins/furans, phthalates, phenols, other SVOCs, and petroleum hydrocarbons
Media Affected	Stormwater and storm drain solids

- Solids samples were collected at the following locations:
 - Catch basin CB-02, located in the northern area of the facility. CB-02 receives stormwater from an area that drains a paved lot with heavy truck traffic adjacent to the truck wash area. Stormwater is conveyed from CB-02 to the on-site treatment system.
 - Catch basin CB-05, located in the southern area of the facility. CB-05 receives stormwater from a paved area with heavy truck traffic. Stormwater is conveyed from CB-05 to CB-06 and then to the on-site treatment system.
 - Offsite catch basin CB-UNK, as described above.
- Zinc, total PCB congeners, BEHP, n-nitrosodiphenylamine, and petroleum hydrocarbons exceeded the storm drain screening levels (Table 2-6) in all three samples. In addition, mercury, total PCB Aroclors, dioxin/furan TEQ, butylbenzyl phthalate, dimethyl phthalate, and 4-methylphenol exceeded the screening levels in at least one sample. The highest exceedances were for phthalates.

Barclay-Dean Building

SPU catch basin solids sampling identified elevated HPAH levels (1,300 to 1,600 mg/kg DW) in two catch basins in the parking area at this county-owned property, located at 4623 7th Avenue S. King County conducted additional site inspection and sampling, and determined that erosion of old asphalt sealant in portions of the paved area were the most likely source of the elevated HPAHs. Subsequent sampling of the sealant in February 2015 confirmed it as a coal-tar based sealant, which is associated with HPAHs. Filter socks were installed in the catch basins, and the asphalt and sealant were removed from the parking lot and new asphalt paving was installed (King County 2016b).

Ralph's Concrete

In 2015, SPU inspected Ralph's Concrete (1511 Rainier Avenue S) and found that they had removed existing pavement and repaved the entire site with concrete, without obtaining the required permits. The work modified the drainage at the site, resulting in the discharge of runoff from the truck wash and fueling areas to an onsite infiltration facility. The extent of work also qualified as a substantial alteration which triggered Seattle Stormwater Code requirements to upgrade the fuel station. The Seattle Department of Construction and Inspection issued two NOVs in 2016 for work without permit (grading and drainage). The NOVs required Ralph's to upgrade fuel/wash pads and direct runoff from this area to the sanitary sewer by January 2017. As of the date of this report, SPU was continuing to work with Ralph's to implement the appropriate source controls.

Sanderson Safety Supply Company

In 2015, SPU issued an NOV and penalty to Sanderson Safety Supply Company (2600 Airport Way S) for an illicit discharge of approximately 5 gallons of putrid liquid from a 50-gallon recycle bin to an onsite catch basin plumbed to the Diagonal Avenue S CSO/SD. The company was also required to clean out the catch basin where the material was discharged.

Plymouth Poultry

In 2014, SPU issued an NOV and penalty to Plymouth Poultry (4500 7th Avenue S) for an illicit discharge of soapy wash water to an onsite catch basin that is plumbed to the Diagonal Avenue S CSO/SD. Employees had been washing oyster totes in the loading bay rather than inside the building where there is a floor drain connected to the sanitary sewer. SPU required Plymouth Poultry to clean the affected catch basin and train employees to prevent discharges of wastewater to the storm drain in the future.

Asian Pacific Properties

In 2016, SPU issued an NOV and penalty to Asian Pacific Properties (1207 S Jackson Street) for an illicit discharge of sewage to the street where it entered a catch basin that is plumbed to the Diagonal Avenue S CSO/SD. The discharge occurred as a result of a blocked side sewer at the site. Sewage had leaked into the onsite parking garage and was pumped out to the street. SPU crews cleaned the affected sidewalk, street, and catch basin. The owner hired a plumber to fix the blocked side sewer.

Uli's Sausage

In 2014, SPU issued an NOV and penalty to Uli's sausage (601 S Nevada Street) for an illicit connection to the drainage system on S Nevada Street found by SPU's IDDE program. Uli's was required to replumb the side sewer and clean the affected storm drain system.

Eastlake Management

In 2015, SPU issued an NOV and penalty to Eastlake Management at 4400 4th Avenue S for an illicit discharge of soapy water from roof washing activities to an onsite catch basin that is connected to the Diagonal Avenue S CSO/SD drainage system. The owner was required to clean out the affected catch basin and develop written procedures for washing, pressure washing, and steam cleaning of vehicles, equipment, and buildings to ensure that future work complies with the Seattle Stormwater Code requirements.

Pacific Millennial Realty

In 2016, SPU issued an NOV and penalty to Pacific Millennial Realty at 3623 6th Avenue S for an illicit discharge of sewage into the Diagonal Avenue S CSO/SD drainage system due to overflows from a privately-owned sanitary lift station. The property owner repaired the lift station and SPU hired a contractor to clean the street and the affected catch basin.

Diagonal Avenue S CSO/SD outfall modifications

In 2014, SPU installed brackets and stainless-steel cable on the outer face of the outfall structure to facilitate installation and operation of sorbent booms to capture spills that occur in this 2,600-acre drainage basin, which collects runoff from an approximately 3.7-mile stretch of I-5 in Seattle. Vehicle accidents on the highway often result in fuel and other automotive fluids being discharged to the drainage system. SPU spill responders had struggled to maintain sorbent booms here because the booms often became entangled on the outfall structure during higher tides and then they no longer functioned when the tide receded. The outfall modification allows the boom to easily rise and fall with the tide. SPU also prepared a written General Response Plan

consistent with the National Oil and Hazardous Substances Pollution Contingency Plan that describes SPU's protocols for installing a spill containment boom at this outfall.

3.3 RM 0.9-1.0 East (Slip 1)

The RM 0.9-1.0 East (Slip 1) source control area includes three properties adjacent to Slip 1: a portion of Federal Center South, the former Snopac Products property, and the northern part of Manson Construction (Figure 3-4).

- Chemicals of concern for this source control area include metals, PAHs, BEHP, PCBs, and dioxins/furans.
- There are six outfalls associated with the Federal Center South property within this source control area. No public storm drain outfalls are located within RM 0.9-1.0 East.
- Of the 19 action items identified for this source control area, four have been completed. Six high priority action items were identified; one of these is complete.

3.3.1 Business Inspections

SPU conducted two inspections at Manson Construction during the current reporting period; one initial inspection and one follow-up inspection (Appendix C).

3.3.2 Source Tracing

No source tracing samples have been collected in this source control area.

3.3.3 Facility-Specific Source Control Actions

During a 2015 inspection at Manson Construction, located at 5053 East Marginal Way S, SPU discovered that the interior sanitary lines in the former Snopac Products building were illicitly connected to the roof downspout that discharged directly to the LDW. The plumbing in this building is no longer in use, and Manson permanently plugged the sewer connections with concrete.

3.4 RM 1.0-1.2 East (King County Lease Parcels)

The RM 1.0-1.2 East (King County Lease Parcels) source control area includes three facilities adjacent to the LDW (Cadman Seattle, United Western Supply, and J.A. Jack & Sons) (Figure 3-5). In addition, upland facilities in the Brandon CSO basin are discussed in this section (Figure 3-6). There are five upland facilities of concern in the Brandon CSO basin. Groundwater contamination associated with four of these facilities has migrated off the properties and into the RM 1.2-1.7 East source control area (Section 3.5) and the RM 1.7-2.0 East source control area (Section 4.1).

- Chemicals of concern for the RM 1.0-1.2 East source control area include PCBs, PAHs, mercury, BEHP, dioxins/furans, and organotin compounds.

- There are three outfalls associated with this source control area, including the Brandon CSO (outfall 2223), a county storm drain at the Cadman Seattle facility (outfall 2244), and a private storm drain at the J.A. Jack & Sons property (outfall 2007).
- Of the 38 action items identified for this source control area, 20 have been completed. Eight high priority action items were identified; seven of these are complete.

3.4.1 Business Inspections

SPU inspected three businesses within the Brandon Street CSO basin (Expedited Intermodal, Mckinstry Company, and Mojo Systems) during the current reporting period (Appendix C).

Ecology conducted Urban Waters inspections at 62 facilities within the Brandon CSO basin during the current reporting period (Appendix E).

3.4.2 Source Tracing

King County collected four sediment trap samples from locations in the Brandon CSO basin during 2014 and 2015. These data (as well as sediment trap data from 2013 which were described in the previous Ecology LDW Source Control Status Report) are available in the King County Source Control Annual Report for 2014/2015 (King County 2016b). BEHP, butylbenzyl phthalate, di-n-octyl phthalate, benzo(a)anthracene, and 3,4-methylphenol exceeded the CSL in one or more samples. No other source tracing samples were collected in this source control area during the current reporting period.

3.4.3 Facility-Specific Source Control Actions

Cadman Seattle

During a June 2013 stormwater compliance inspection at Cadman Seattle, Ecology collected two water samples and one solids sample from the storm drain system. Sampling results were published during the current reporting period (Leidos 2015a).

Current Operations	Manufacture of ready-mix concrete
Address	5225 East Marginal Way S Seattle
Facility/Site ID	70313617
NPDES Permit	WAG503337 (Sand & Gravel GP)
Chemicals of Concern	PCBs, phthalates, phenols, other SVOCs, copper, and petroleum hydrocarbons
Media Affected	Stormwater and storm drain solids

- Water samples were collected from the following locations:
 - Sump pump station MH-SPS, located at the southern portion of the facility; it receives stormwater from the entire site. Copper and nickel exceeded the marine chronic WQC in this sample.
 - An effluent port for aboveground detention vault VT-EFF. The detention vault allows reuse of stormwater in the ready-mix concrete operation. PCB congeners exceeded the human health WQC in this sample; total and dissolved copper exceeded the marine chronic WQC.

- The solids sample was collected from sump pump location MH-SPS. The sump pump station is located at the southern portion of the facility near the effluent pumps, and receives stormwater from the entire site. BEHP, 2,4-dimethylphenol, phenol, n-nitrosodiphenylamine, and oil-range hydrocarbons exceeded the storm drain screening levels (Table 2-6).

East of 4th Site (Burlington Environmental / PSC Georgetown / Stericycle Georgetown)

Burlington Environmental operated a hazardous/dangerous waste treatment facility at this location until 2003. Soil and groundwater were contaminated by releases from past operations at the facility. Groundwater contamination has been detected on property to the east and north owned by the UPRR, and downgradient to the west and southwest, toward the LDW. The site is also known as PSC Georgetown (PSC is the parent company) and Stericycle Georgetown (Stericycle Environmental Solutions acquired PSC Holdings in April 2014).

Current Operations	Storage area for corrective actions in progress at the facility
Historical Operations	Hazardous waste treatment and storage
Address	734 S Lucile Street
Facility/Site ID	47779679
Chemicals of Concern	Chlorinated VOCs, 1,4-dioxane, other SVOCs, PCBs, metals
Media Affected	Soil and groundwater

In 2005, this site was administratively divided into two units. The cleanup of the eastern portion of the site, located east of 4th Avenue S, is governed by Agreed Order DE-7347 (May 2010) and its attached Cleanup Action Plan (CAP). The area to the west of 4th Avenue S has been investigated by three additional potentially liable persons (PLPs); Art Brass Plating, Blaser Die Casting, and Capital Industries, under separate 2008 Orders. The updates below relate to the ‘East of 4th’ section of the PSC Georgetown site. Information about the West of 4th Site is provided in the next section.

- A soil vapor extraction (SVE) system was in operation to reduce levels of VOCs on the PSC Georgetown and adjacent UPRR properties until October 2014.
- After a dispute resolution process, which ended in June 2014 (Ecology 2014j), Ecology modified the facility’s Dangerous Waste Permit for Corrective Action (Ecology 2014l).
- In September 2014, PSC Georgetown submitted a draft approach to 1,4-dioxane remediation (AMEC 2014a). They proposed to use a targeted in situ chemical oxidation (ISCO) approach in the plume areas with 1,4-dioxane concentrations over 400 µg/L, followed by targeted in-situ biological (ISB) degradation to address the more diffuse concentrations of 1,4-dioxane in the plume. In January 2015, PSC Georgetown completed a focused feasibility study of 1,4-dioxane remediation approaches in the area outside the barrier wall (AMEC 2015a).
- Ecology subsequently proposed an amendment to the 2010 Agreed Order to include requirements for a new cleanup action targeting 1,4-dioxane in site groundwater, consisting of application of ISCO, performance of a 1,4-dioxane biodegradation study, and enhanced ISB if the biodegradation study concludes that enhanced ISB is likely to be effective

(Ecology 2015i). In June 2015, Ecology issued a Determination of Nonsignificance (DNS) for the actions identified in the revised Agreed Order (Ecology 2015l). The Agreed Order amendment was signed in August 2015.

- PSC Georgetown prepared a *1,4-Dioxane Remedial Design/Remedial Action Work Plan* in October 2015, and a *Revised In-Situ Chemical Oxidation Pilot Study Work Plan* in March 2016, which also reported results of the ISCO Phase I study.
- Results of the Phase I bench scale ISB study showed that bioremediation of 1,4-dioxane is possible, and therefore ISB should proceed to Phase II (in-situ pilot study) (DOF 2016a).
- Results of the Phase II ISCO pilot study were different than anticipated in the Remedial Design/Remedial Action Work Plan. After a meeting with Ecology in September 2016, Ecology agreed to further pilot study for both ISB and ISCO, and to delay the full scale (Phase III) ISCO work until pilot studies for both technologies could be completed. A summary of the Phase I ISB bench scale results, the Phase II ISCO pilot study results, and a work plan for further pilot testing was submitted to Ecology in November 2016 (DOF 2016a).

Five year review assessments of several aspects of cleanup activities at the site were conducted in late 2014 and 2015:

- Effectiveness of institutional and other controls (AMEC 2014b)
- Potability determination (AMEC 2014c)
- Vapor intrusion mitigation system (Pioneer 2015)

Ecology conducted an SHA for this site in August 2015.¹² A ranking of '4' was assigned to the site, and it was added to the state Hazardous Sites List in August 2015 (Ecology 2015m, Ecology 2015n).

West of 4th Site (Burlington Environmental, Art Brass Plating, Blaser Die Casting, Capital Industries)

Groundwater contamination from the PSC Georgetown facility has migrated offsite towards the LDW. Three additional companies have also released chlorinated solvents in this area: Art Brass Plating, Blaser Die Casting, and Capital Industries.

Soils are contaminated at all of these facilities; in addition, groundwater contamination has been detected at each of the properties and downgradient to the

Facilities and Addresses	Art Brass Plating (5516 3 rd Avenue S) Blaser Die Casting (5700 3 rd Avenue S) Capital Industries (5801 3 rd Avenue S) PSC Georgetown (734 S Lucile Street)
Historical Operations	Plating, die casting, metal fabrication
Facility/Site IDs	88531932 (Art Brass Plating), 7118747 (Blaser Die Casting), 11598755 (Capital Industries), 47779679 (Burlington Environmental LLC Georgetown)
Chemicals of Concern	Chlorinated solvents, 1,4-dioxane, arsenic, cadmium, copper, nickel, and zinc
Media Affected	Soil, groundwater, and surface water

¹² Sites are ranked on a scale of 1 to 5, 1 representing the highest level of concern and 5 representing the lowest, relative to other assessed sites in the state.

west and southwest, towards the LDW. Cleanup activities have been underway at these facilities since 2008.

The West of 4th site has been divided into two units – Study Unit 1 is the northern unit; groundwater contamination in this area includes nickel and other plating-related metals. Unit 2 is the southern unit.

- Ecology issued an Agreed Order (DE-10402) to the West of 4th site PLP Group (the four companies noted above) on April 23, 2014. The Order requires the joint performance of an FS and the drafting of a CAP (Ecology 2014f).
- The West of 4th Group submitted an FS for Study Unit 1 in August 2016 (Aspect Consulting 2016). It evaluated nine remedial alternatives for treatment of metals and chlorinated VOC contamination in this area. The recommended alternative includes pH neutralization and monitored natural attenuation in the source area, and monitored natural attenuation for the downgradient trichloroethylene (TCE) plume.
- The West of 4th Group also submitted an FS for Study Unit 2 in August 2016 (PGG 2016). The recommended alternative includes natural attenuation of chemicals of concern in groundwater with target soil remediation by ISCO in selected source area hot spots.
- In an October 2016 letter, Ecology did not concur with the recommended alternatives for either Study Unit 1 or Study Unit 2, and provided the agency’s preferred cleanup alternatives for both study units. Ecology requested that the West of 4th Group prepare a draft CAP within 90 days.

GE Aviation

Several MTCA Agreed Orders are in place at the former GE Aviation facility. A Focused Feasibility Study was approved by Ecology in 2009.

- Ecology issued the final CAP for this site on March 13, 2014. The available data suggest that the off-site TCE plume has not reached the LDW and the site remedy should prevent this from occurring in the future.
- GE Aviation and Ecology entered into Consent Decree No. 14-2-09134-6 on March 31, 2014, requiring GE Aviation to implement the CAP and clean up the GE Aviation site on March 31, 2014 (King County Superior Court 2014, Washington State Attorney General 2014).
- In 2014, GE Aviation conducted bench scale tests for ISCO groundwater injection of permanganate; in 2015, they conducted bench scale ISCO tests using persulfate. Ecology approved the use of persulfate as the ISCO groundwater treatment chemical in March 2016. An engineering and design report was expected to be received for the final site cleanup using persulfate ISCO injections into on-property contaminated groundwater.

Current Operations	Warehouse
Historical Operations	Manufacture and repair of aircraft parts
Address	220 S Dawson Street
Facility/Site ID	2522
Chemicals of Concern	TCE; PCE; 1,1,1-trichloroethane; fuels; and oil
Media Affected	Soil and groundwater

After on-property groundwater ISCO persulfate injections are completed, GE will implement off-property ISCO injections. A vapor intrusion mitigation system remains in place at the 220 S Dawson Street building to prevent unacceptable indoor air TCE concentrations.

Scougal Rubber

Scougal Rubber entered Ecology's Voluntary Cleanup Program (VCP). The VCP Site number is NW 1707) and developed a Remedial Action Plan to address chlorinated solvents in soil and groundwater on this site.

Current Operations	Rubber manufacturing
Historical Operations	Same
Address	6239 Corson Avenue
Facility/Site ID	93637295
Chemicals of Concern	Chlorinated solvents
Media Affected	Soil and groundwater

- Scougal Rubber installed a targeted ozone injection system in 2009 to reduce concentrations of chlorinated solvents in groundwater. Treatment was discontinued in 2016.
- Scougal Rubber collected soil and groundwater samples at the site in 2014, 2015, and 2016, and analyzed them for chlorinated VOCs (PGG 2014, PGG 2017). In samples collected in December 2016, TCE was the only compound detected above the reporting limit in vadose zone soil samples. It was present in 12 of 15 soil samples, at concentrations to 0.97 mg/kg. In groundwater, TCE was detected in four of five wells sampled, at concentrations to 170 µg/L (above the MTCA Method A groundwater cleanup level) (PGG 2017).
- Scougal Rubber submitted a Final Remediation Plan in November 2016, and an addendum to the Plan in December 2016. Additional remedial actions were planned to be conducted in 2017 and 2018.

3.5 RM 1.2-1.7 East (Saint Gobain to Glacier Northwest)

The RM 1.2-1.7 East (Saint Gobain to Glacier Northwest) source control area includes three facilities adjacent to the LDW (Saint Gobain Containers/Ardagh Glass, Longview Fibre, and CertainTeed Gypsum) (Figure 3-7). Upland facilities near this source control area are in the Brandon CSO basin; the Brandon CSO and the upland facilities within the combined sewer basin and are discussed in Section 3.4 (RM 1.0-1.2 East).

- Chemicals of concern for the RM 1.2-1.7 East source control area include mercury, zinc, PAHs, PCBs, BEHP, benzyl alcohol, and phenol.
- There are nine active outfalls in this area of the LDW, including four private outfalls at Saint Gobain Containers and five private outfalls at CertainTeed Gypsum. No public storm drain outfalls are located within RM 1.2-1.7 East.
- Of the 13 action items identified for this source control area, five have been completed. Five high priority action items were identified; three of these are complete. (Action items associated with facilities in the Brandon CSO basin have been moved to RM 1.0-1.2 East, for consistency.)

3.5.1 Business Inspections

SPU inspected three businesses (Strategic Materials, Ardagh Glass, and Certainteed Gypsum), all of which discharge directly to the LDW, during the current reporting period (Appendix C).

3.5.2 Source Tracing

SPU has not collected any source tracing samples because there are no city-owned outfalls in this source control area. Samples collected by King County are discussed in Section 3.5.3 below.

3.5.3 Facility-Specific Source Control Actions

Saint Gobain / Ardagh Glass

In April 2014, EPA announced that Saint Gobain Containers had been fined \$86,000 for violations of the Clean Water Act, including failure to sample; failure to implement operational source control BMPs; and record keeping violations (EPA 2014a). Discharges have historically contained zinc, copper, and turbidity.

Current Operations	Glass manufacturer
Historical Operations	Glass plant
Address	5801 East Marginal Way South
Facility/Site ID	94925241
NPDES Permit	WAR001134 (ISGP)
Chemicals of Concern	Chromium compounds, ethylene glycol, and lead compounds
Media Affected	Stormwater and air emissions

In July 2014, PSCAA conducted an engineering review to determine whether the existing glass-melting furnaces at the Saint Gobain/Ardagh Glass container glass plant need to install air pollution control equipment (PSCAA 2014). The current status of this effort is unknown.

In July 2016, King County’s Facilities Management Division sampled catch basin solids in storm drain lines discharging to outfalls 2008, 2009, and 2010 (the three northern-most outfalls shown in Figure 3-7), on the Saint Gobain/Ardagh Glass property, during the current reporting period (King County 2017). BEHP exceeded the storm drain screening levels (Table 2-6) at all three locations. In addition, zinc exceeded screening levels at locations with flow to outfalls 2008 and 2010; and cadmium, zinc, PCBs, and 3,4-methylphenol exceeded screening levels at location V-1 (with flow to outfall 2010). Location V-1 is upstream of a Vortech treatment vault.

Ardagh Glass conducted a round of catch basin sampling in September 2016, including the three locations sampled by King County. Results were not available at the time this Source Control Status Report was prepared.

Certainteed Gypsum

In 2014, SPU found uncovered gypsum waste piles waiting for off-site recycle and process water discharge to the LDW. CertainTeed Gypsum removed or covered piles of gypsum waste and discontinued the discharge of process water to the LDW. Process water and collected stormwater were routed for use within the plant as a substitute for City water.

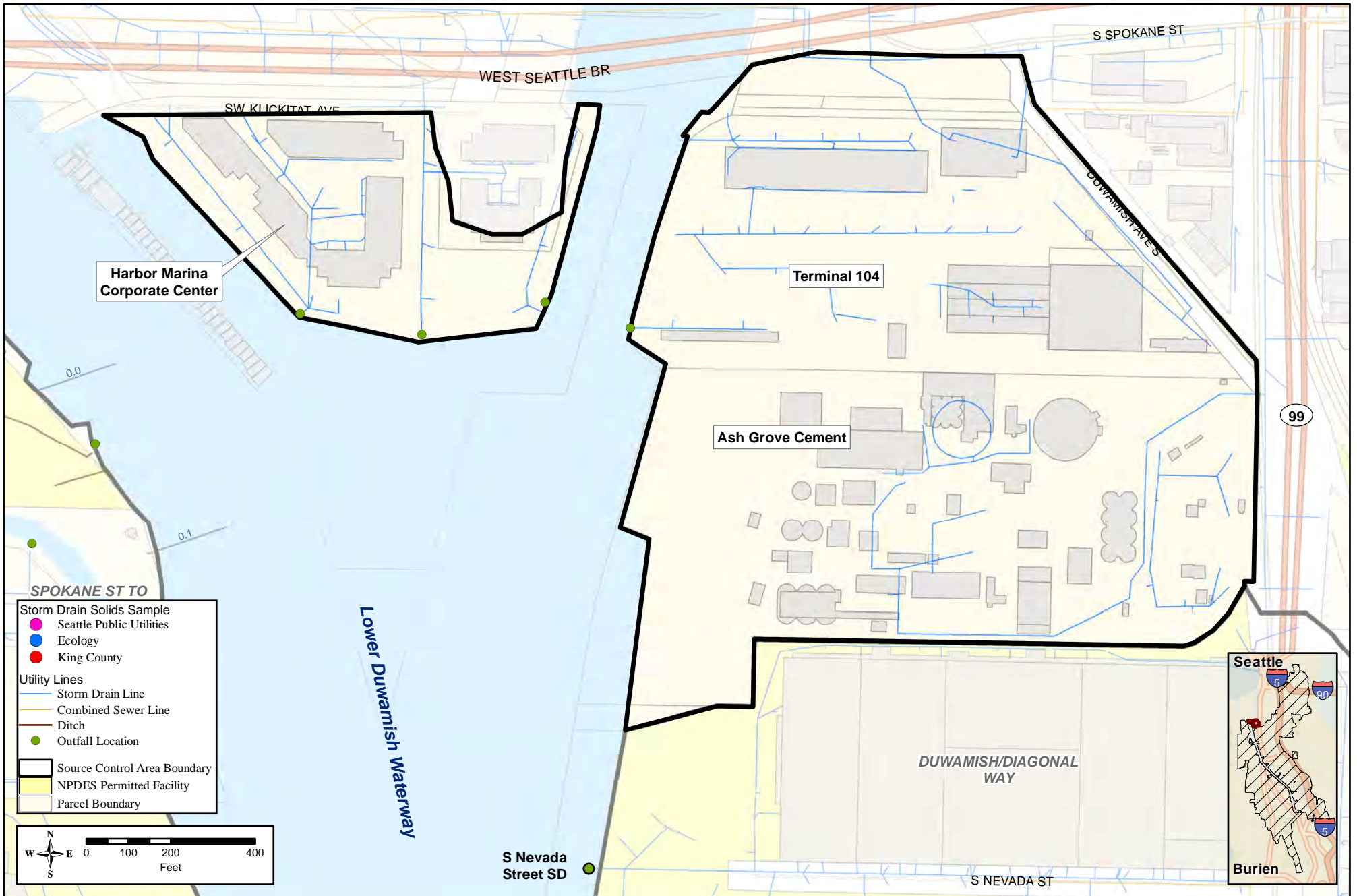


Figure 3-1. RM 0.0-0.1 East
(Spokane Street to Ash Grove Cement)
Source Control Area



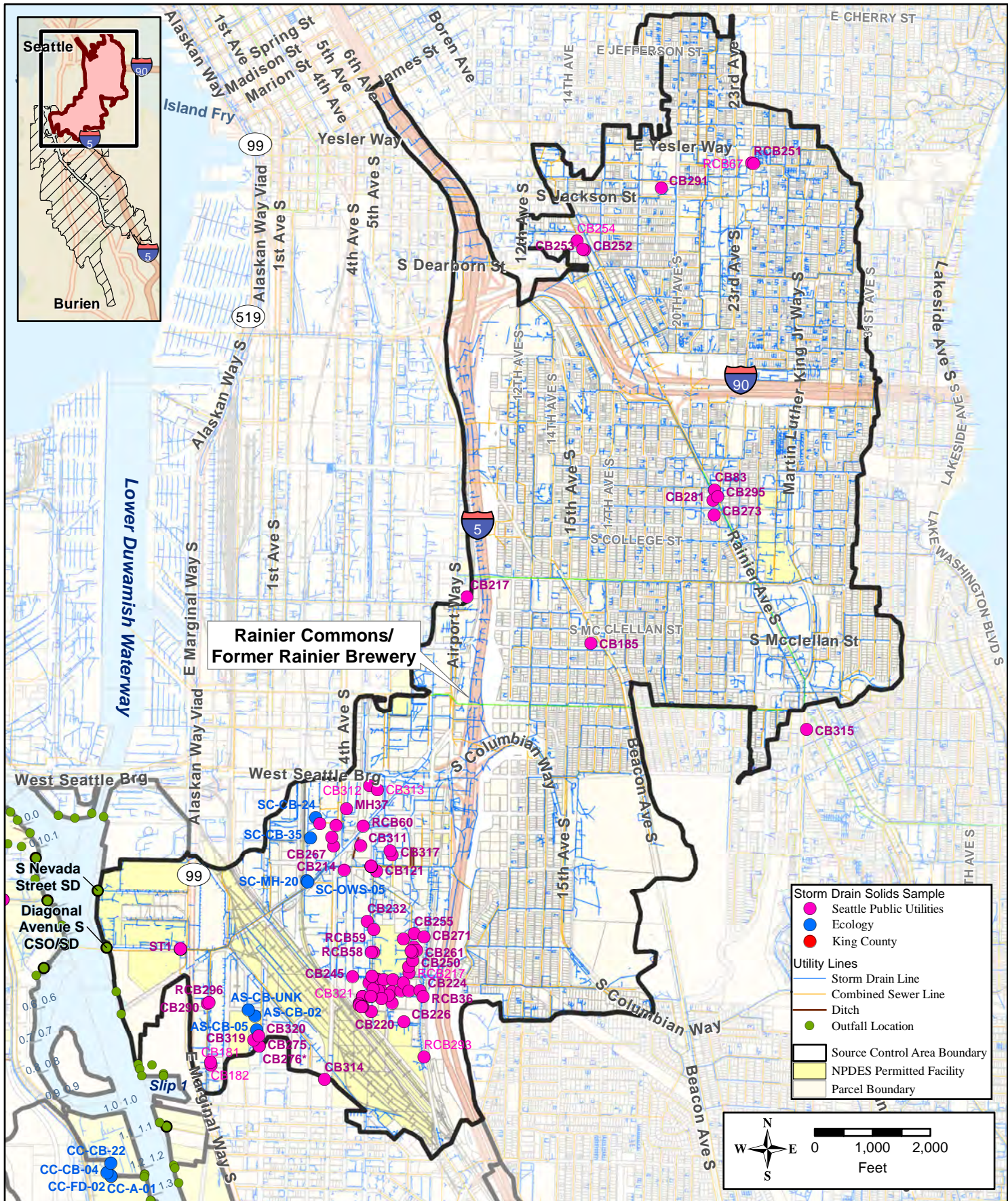
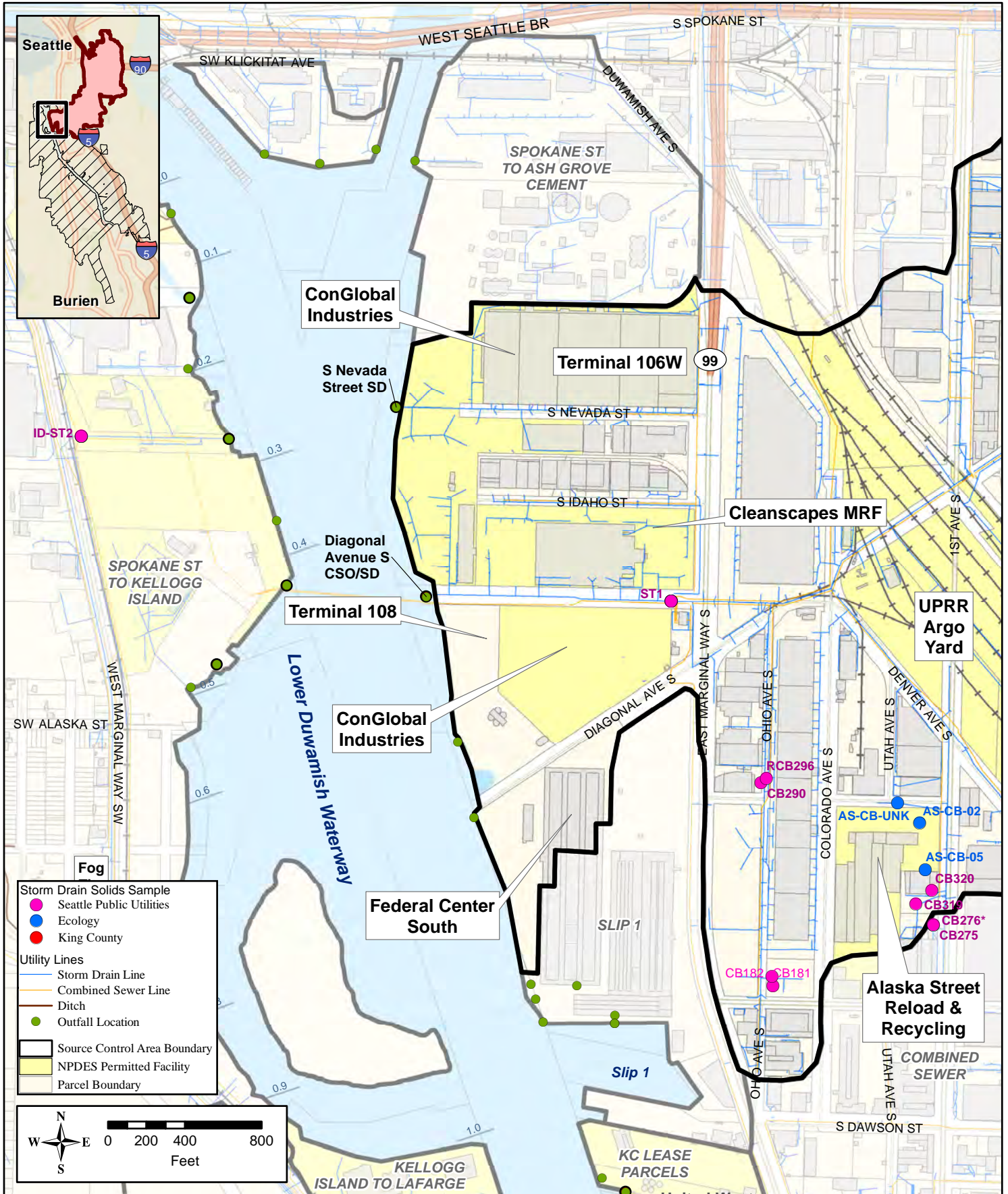


Figure 3-2. RM 0.1-0.9 East
(EAA-1: Duwamish/Diagonal Way)
Diagonal Avenue South Storm Drain Basin



**Figure 3-3. RM 0.1-0.9 East
(EAA-1: Duwamish/Diagonal Way)
Source Control Area**

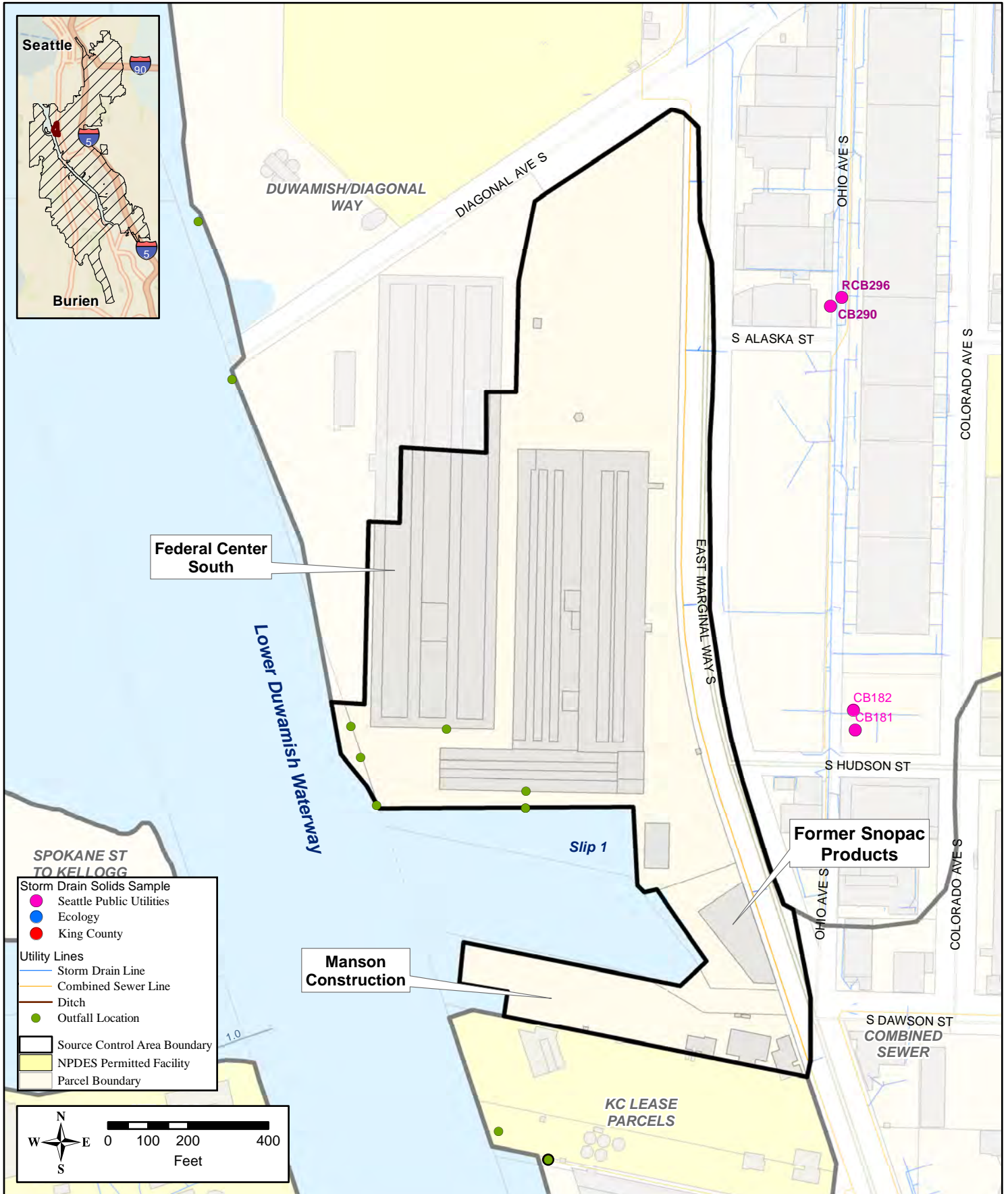
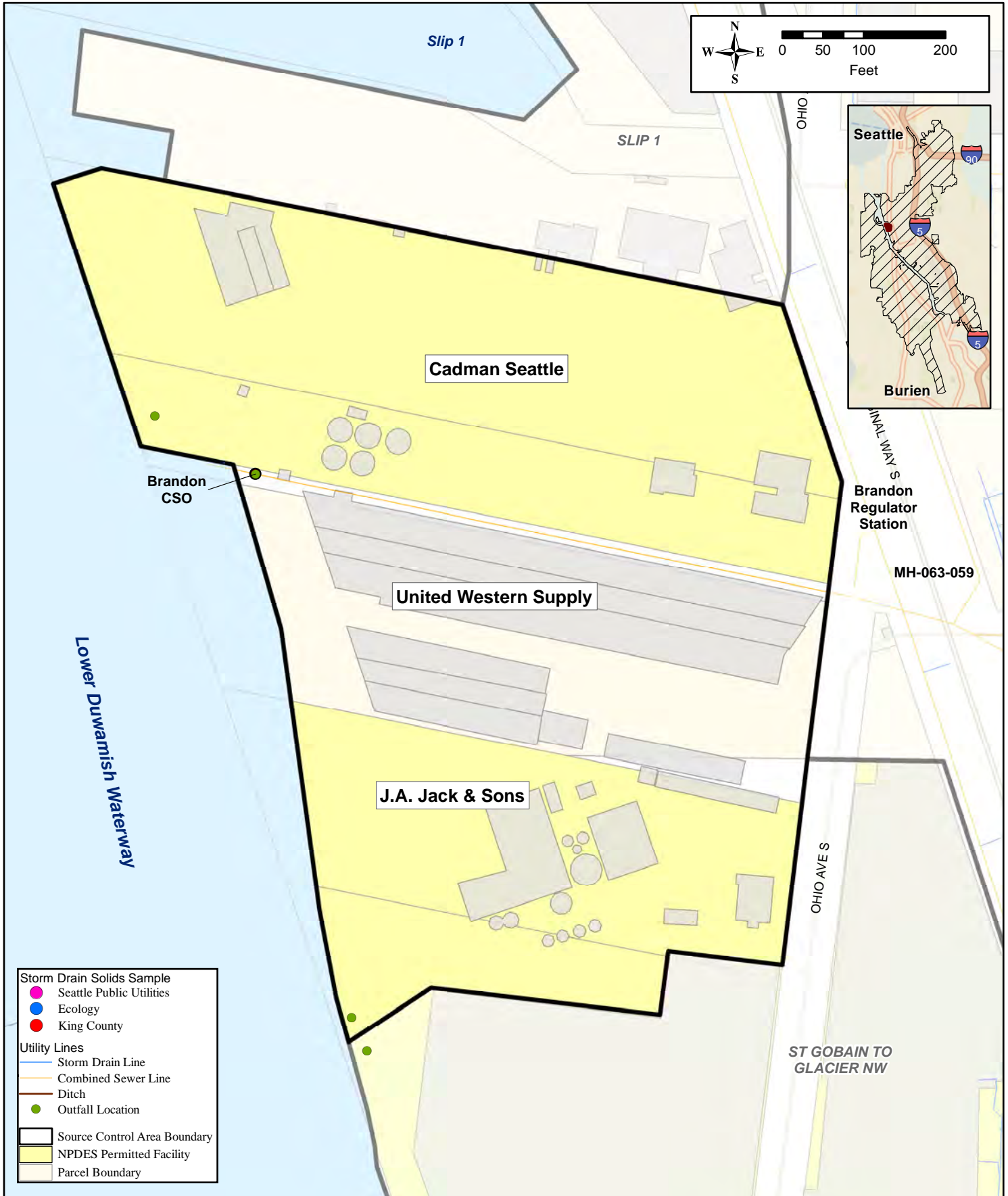


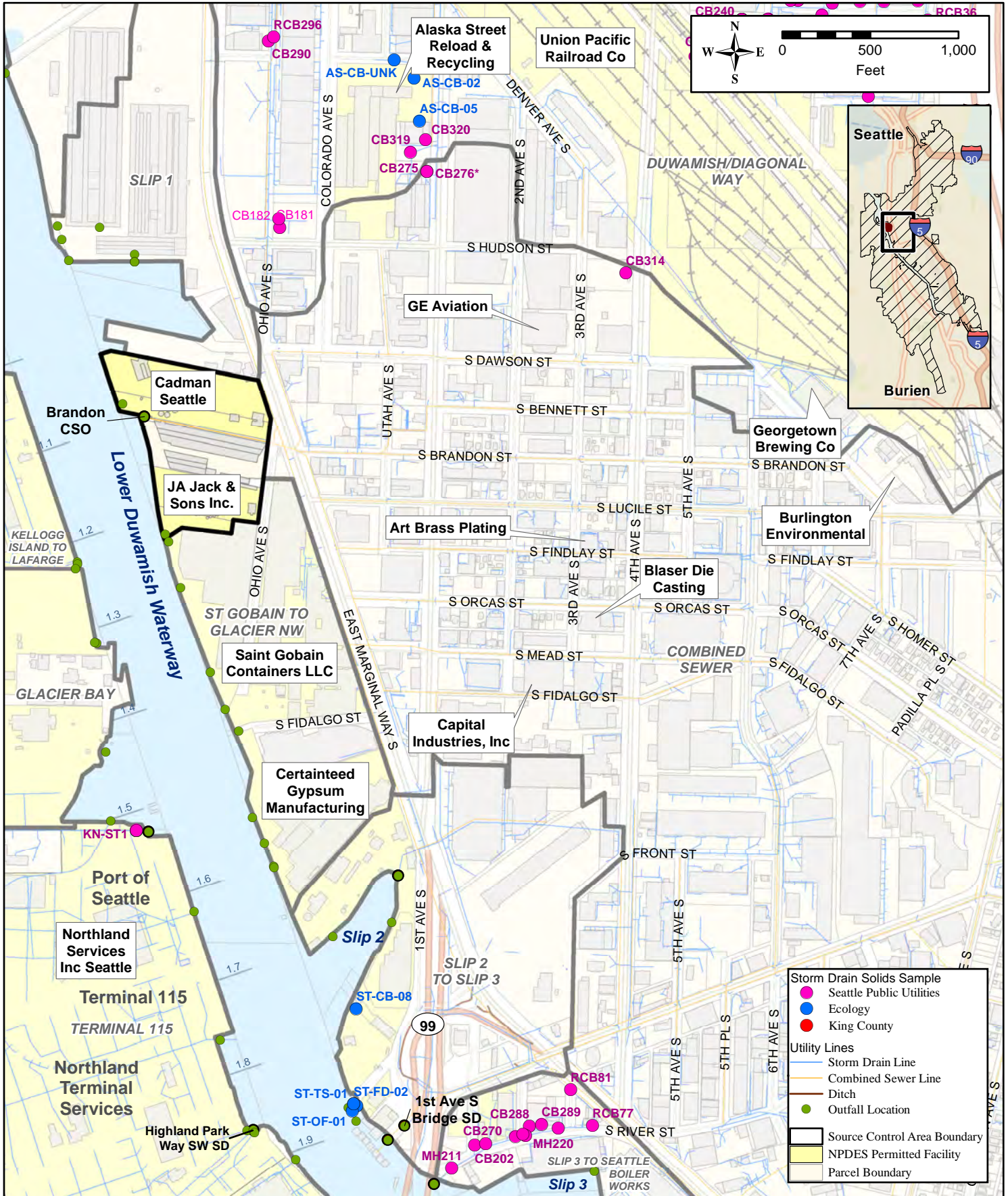
Figure 3-4. RM 0.9-1.0 East (Slip 1) Source Control Area





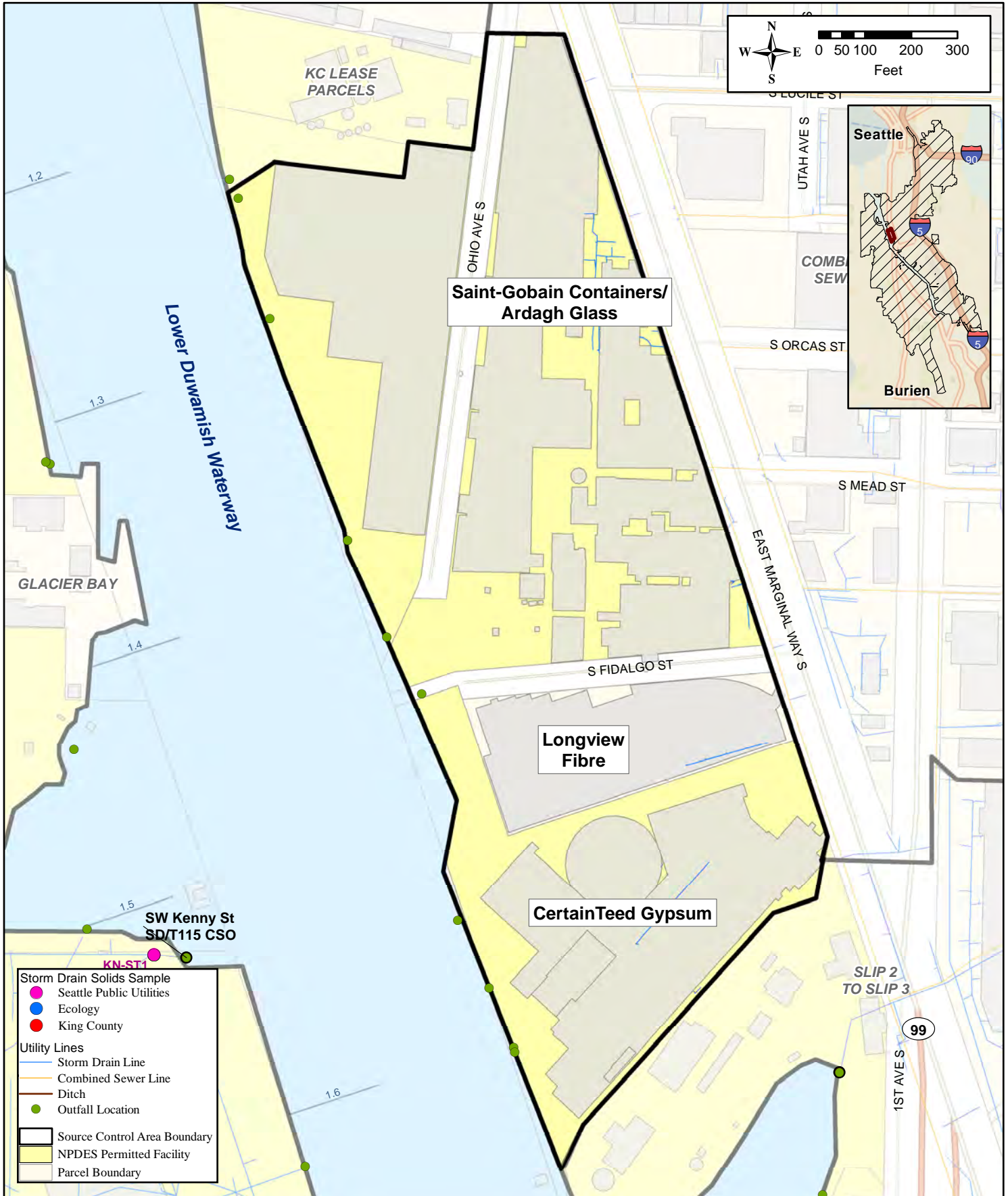
**Figure 3-5. RM 1.0-1.2 East
(King County Lease Parcels)
Source Control Area**





**Figure 3-6. RM 1.0-1.2 East
(King County Lease Parcels)
Brandon CSO Basin**





**Figure 3-7. RM 1.2-1.7 East
(Saint Gobain to Glacier Northwest)
Source Control Area**



4.0 Middle Reach – East Side

This section includes the following source control areas:

- RM 1.7-2.0 East (Slip 2 to Slip 3)
- RM 2.0-2.3 East (Slip 3 to Seattle Boiler Works)
- RM 2.3-2.8 East (Seattle Boiler Works to Slip 4)
- RM 2.8 East (EAA-3: Slip 4)

Several Ecology cleanup sites are located in this area: North Boeing Field-Georgetown Steam Plant (NBF-GTSP), Crowley Marine Services 8th Avenue S, Whitehead Tyee, Fox Avenue Building, and Duwamish Marine Center. In addition, the former Boeing Electronics Manufacturing Facility (EMF), which is under EPA oversight, is located within this source control area.

4.1 RM 1.7-2.0 East (Slip 2 to Slip 3)

The RM 1.7-2.0 East (Slip 2 to Slip 3) source control area includes properties adjacent to the LDW and Slip 2, including Glacier Northwest, Samson Tug & Barge, and Duwamish Marine Center, as well as upland properties in the 1st Avenue S (East) and Head of Slip 2 storm drain basins (Figure 4-1).

- Chemicals of concern for the RM 1.7-2.0 East source control area include metals, PCBs, PAHs, pentachlorophenol, petroleum hydrocarbons, and VOCs.
- A City MS4 outfall (1st Avenue S [East]) and the King County Michigan CSO discharge to this source control area. In addition, several private outfalls associated with the Glacier Northwest, Samson Tug & Barge, and Duwamish Metal Fabrication facilities, as well as the Head of Slip 2 storm drain outfall, are present in this source control area.
- Of the 40 action items identified for this source control area, 21 have been completed. A total of five high priority action items were identified; three of these are complete.

4.1.1 Business Inspections

SPU conducted a total of 20 inspections at seven facilities in this source control area during the current reporting period, including eight initial inspections and 12 follow-up inspections (Appendix C).

Ecology conducted 11 inspections at nine facilities within this source control area during the current reporting period (Appendix E).

4.1.2 Source Tracing

King County collected two sediment trap samples from locations in the Michigan CSO basin in 2015. Data are reported in the King County Source Control Annual Report for 2014/2015 (King County 2016b). BEHP, 1,4-dichlorobenzene, LPAHs, HPAHs, mercury, and PCBs exceeded the CSL in one or more samples.

KCIW began an investigation in 2014 and 2015 to trace the source of PAHs, which are believed to be related to fuel that was intermittently discharged to the combined sewer system. KCIW monitored sites within the combined sewer system upstream and downstream from Corson Avenue S and S Eddy Street. They collected samples and on-site gas meter readings using a photoionization detector. Diesel-range petroleum hydrocarbons were detected at elevated levels. Lead concentrations were higher than background levels and they were primarily used as a chemical marker to identify potential dischargers. KCIW used the data and evaluated dischargers in the area to identify a potential responsible discharger. Subsequent KCIW monitoring at this facility identified items that required correction. KCIW used its permitting authority to issue control documents that require the discharger to upgrade its pretreatment facility, implement other site modifications, and upgrade institutional controls to minimize the potential for incidental releases to the sewer system.

King County also deployed sediment traps in this basin for collection in 2016 to investigate if elevated PAH concentrations continue to be present; sample results were not available at the time this report was prepared.

No source tracing samples were collected by SPU in this source control area during the current reporting period. Two inline grab samples were collected from the 1st Avenue S storm drain (East) in 2013. Copper (401 mg/kg) and BEHP (2.6 mg/kg DW) exceeded screening levels in one of the samples (MH265).

4.1.3 Facility-Specific Source Control Actions

Duwamish Marine Center

Investigations performed at this property in 2000 and 2002 showed petroleum hydrocarbons, metals, PCBs, and PAHs above cleanup levels in soil and groundwater. The groundwater also contained solvents. Sediments adjacent to the site contained PCBs and PAHs.

Ecology and the property owner entered into Agreed Order DE-8072 on September 2, 2011. The Order requires that the property owner/operator conduct an RI/FS to define the nature and extent of contamination in soil, groundwater, surface water, and sediments, and to evaluate cleanup alternatives. In addition, the property owner/operator is required to prepare a draft CAP that identifies the preferred cleanup action and develops a schedule to remediate the contamination (Ecology 2011d).

Current Operations	Tug and barge operations; metal fabrication
Historical Operations	Repair and maintenance of floating vessels; junk dealer; construction services; barge shipping terminal
Address	16 S Michigan Street; 6365 1 st Avenue S
Facility/Site ID	21945598 (Duwamish Marine Center) 71371939 (Duwamish Marine Center, Inc.) 1020256 (Samson Tug & Barge)
NPDES Permit	WAR011484 (ISGP)
Chemicals of Concern	PCBs, PAHs, petroleum hydrocarbons, metals
Media Affected	Soil and groundwater

- Duwamish Marine Center submitted a technical memorandum to incorporate Ecology's comments into the RI/FS work plan in January 2014 (SoundEarth Strategies 2014). Ecology

approved the RI/FS work plan to begin RI activities. G-Logics performed the field investigation during 2015 and 2016 and began preparing the RI report in late 2016.

- As part of the RI activities, one stormwater and five catch basin solids samples were collected in September 2015. Copper exceeded the marine WQC. Zinc, several PAHs and other SVOCs exceeded the SMS criteria in catch basin solids samples (G-Logics 2015).
- For disposal purposes, G-Logics collected samples from several catch basins across the site the fall of 2015. Sediment was allowed to re-accumulate in the catch basins over a period of six months (spring 2016). In June 2016, G-Logics attempted to resample several catch basins located across the site to assess possible source areas of surface contaminants. Accumulated sediment and stagnant stormwater were removed from the catch basin/stormwater system by LineScape, LLC in the winter of 2016 (G-Logics 2016a).
- G-Logics advanced 14 soil borings in March 2016 and collected groundwater samples from 15 wells in April 2015 (G-Logics 2016b, G-Logics 2016c).

Ecology conducted a stormwater compliance inspection at Samson Tug & Barge on February 10, 2015. Three water samples (including one field duplicate) and two solids samples were collected from the storm drain system (Leidos 2015c). Stormwater from 4 acres of the facility is conveyed to a treatment system and discharges to the LDW via OF-1.

- Water samples were collected at the following locations:
 - Outfall OF-01, located on the southwest bank.
 - Sample port of the treatment system (TS-01), including a field duplicate.
- Copper, lead, mercury, nickel and zinc exceeded the chronic marine WQC in water samples at both locations. Total PCB congeners and several PAHs exceeded the human health WQC at both locations. In addition, pentachlorophenol exceeded the human health WQC at TS-01. The highest exceedances were for PCBs and copper.
- Solids samples were collected at the following locations:
 - Catch basin CB-04A, which is located directly upstream of the stormwater treatment system.
 - Catch basin CB-08, located at the northern portion of the facility; stormwater is reportedly pumped from this area to the sanitary sewer.
- Total PCB congeners, several PAHs, cPAH TEQ, BEHP, n-nitrosodiphenylamine, and petroleum hydrocarbons exceeded the storm drain screening levels (Table 2-6) in both solids samples. Zinc exceeded the storm drain screening level in one sample.

Fittings, Inc.

In November 2015, SPU found an illicit connection to the Head of Slip 2 SD system at Fittings, Inc. (located at 5979 4th Avenue S). Cooling water from a welding machine was discharged to a floor drain connected to the exterior drainage system. SPU required Fittings, Inc. to disconnect the floor drain from the exterior drainage system and clean the drainage system. This work was completed in early 2016.

4.2 RM 2.0-2.3 East (Slip 3 to Seattle Boiler Works)

The RM 2.0-2.3 East (Slip 3 to Seattle Boiler Works) source control area includes properties adjacent to the LDW and Slip 3 (SCS Refrigerated Services, Seattle Distribution Center, and Seatac Marine Services), as well as upland properties in the S River Street and S Brighton Street storm drain basins (Figure 4-2).

- Chemicals of concern for the RM 2.0-2.3 East source control area include metals, PAHs, PCBs, chlorobenzene, and benzyl alcohol.
- Two City MS4 outfalls (S River Street SD and S Brighton Street SD) discharge to this source control area. In addition, there are several unknown or unidentified private outfalls near the SCS Refrigerated Services and Seattle Distribution Center properties.
- Of the 32 action items identified for this source control area, 22 have been completed. A total of 12 high priority action items were identified; 10 of these are complete.

The S Brighton Street CSO formerly discharged at this location; SPU blocked this CSO in 2012 and it is no longer in use.

4.2.1 Business Inspections

SPU conducted a total of 43 inspections at 20 facilities in the S Brighton Street and S River Street storm drain basins during the current reporting period, including 20 initial inspections and 25 follow-up inspections (Appendix C).

Ecology conducted inspections at four facilities within this source control area during the current reporting period (Appendix E).

4.2.2 Source Tracing

SPU cleaned the S River Street and S Brighton Street storm drain systems in 2010. Prior to cleaning, the S River Street system contained elevated levels (exceeding the CSL) of arsenic, copper, zinc, diesel-range and oil-range hydrocarbons, cPAH, butylbenzyl phthalate, and BEHP. The S Brighton Street system contained elevated levels of arsenic, copper, lead, mercury, zinc, diesel-range and oil-range hydrocarbons, LPAH, HPAH, cPAH, BEHP, butylbenzyl phthalate, dimethyl phthalate, PCBs, benzyl alcohol, and benzoic acid.

During this reporting period, SPU collected 13 solids samples from the S River Street storm drain and three samples from the S Brighton Street system (all collected in 2016). Samples collected from the S River Street system exceeded the CSLs for oil-range hydrocarbons (multiple locations), HPAH (one onsite catch basin), and BEHP (multiple locations). SPU is currently investigating a potential source of PAHs in this area.

SPU collected one right-of-way catch basin sample and two ODS samples (methanol rinse from a plastic crate and adjacent soil) in the S Brighton Street storm drain during the current reporting period. These samples were collected as part of the detection dog pilot study and were only analyzed for PCBs. The samples from the plastic crate contained 74.5 mg/kg PCBs. SPU disposed of the crate. Adjacent soil and right-of-way catch basin samples contained 0.36 mg/kg DW and 0.56 mg/kg DW PCBs, respectively.

Complete sample results for the current reporting period are presented in Appendix F; sample locations are shown in Figure 4-2. Screening level exceedances are summarized in Table 4-1 below.

Table 4-1. RM 2.0-2.3 East: Screening Level Exceedances in SPU Source Tracing Samples

Chemical Class	Chemical	In-line Solids	On-site CB Solids	Right-of-Way CB Solids
Metals	Mercury		☒	
	Zinc	×	☒	×
PCBs	PCBs, total	×	×	×
PAHs	LPAH		☒	☒
	HPAH		☒	☒
	Total cPAHs		☒	☒
Phthalates	BEHP	☒	☒	☒
	Butylbenzyl phthalate	×	×	×
	Dimethyl phthalate		☒	☒
Other SVOCs	4-Methylphenol	☒	☒	☒
	Benzoic acid			☒
	Benzyl alcohol	☒		
	Phenol	×		×
TPH	Oil-range hydrocarbons	☒	☒	☒

Storm drain screening levels are listed in Table 2-6.

× = Exceedance of SCO (lower screening level) was observed during the current reporting period (2014 through 2016).
 ☒ = Exceedance of CSL (upper screening level) was observed during the current reporting period (2014 through 2016).

The S River Street and S Brighton Street storm drains were cleaned in 2010. Ten samples were collected from these two systems prior to this reporting period and after cleaning. Chemicals that exceeded the CSL in previous samples included mercury (1 sample), zinc (4 samples), HPAH (1 sample), cPAH (1 sample), BEHP (5 samples), dimethyl phthalate (1 sample), and oil-range hydrocarbons (4 samples).

4.2.3 Facility-Specific Source Control Actions

Shultz Distributing

During a stormwater compliance inspection in March 2013, Ecology collected one water sample and two solids samples from the storm drain system. Results were published during the current reporting period (Leidos 2015a).

- A water sample was collected from sump SP-01, which receives stormwater from the western portion of the facility

and is representative of stormwater discharge to the public storm drain system. BEHP and total PCB congeners exceeded the human health WQC in this sample.

Current Operations	Bulk oil storage and distributing facility
Historical Operations	Industrial manufacturing
Address	6851 East Marginal Way S Seattle
Facility/Site ID	95498891
NPDES Permit	WAR002346 (ISGP)
Chemicals of Concern	PCE, TCE, PCBs, zinc, phenols, phthalates, PAHs, hydrocarbons, and dioxins/furans
Media Affected	Groundwater, stormwater, and storm drain solids

- Solids samples were collected at the following locations:
 - Sump SP-01 (described above).
 - Catch basin CB-01, in the southeast corner of the facility.
- Zinc, total PCBs, BEHP, butylbenzyl phthalate, dimethyl phthalate, 4-methylphenol, n-nitrosodiphenylamine, and petroleum hydrocarbons exceeded the storm drain screening levels in both solids samples. In addition, dioxins/furan TEQ exceeded the LDW RAL in sample SP-01, and several PAH compounds, total HPAHs and LPAHs, various phenols, and benzoic acid exceeded the screening levels in sample CB-01. The highest exceedances were for PAHs and phthalates.

South Seattle Community College Georgetown

Ecology’s contractor reviewed existing information related to the South Seattle Community College Georgetown property on Corson Avenue S, which was identified as a “facility of concern” in the June 2008 Data Gaps Report for the Slip 3 to Seattle Boiler Works source control area (Leidos 2014f). Current and historical operations at the property, regulatory history, and environmental investigations and cleanups were summarized. The potential for sediment contamination associated with this facility was assessed as “low.” No data gaps were identified.

Emerson Enterprises

SPU discovered an old oil-water separator buried on the south side of the property at 525 S Brighton Street during a November 2014 inspection (Emerson took over this site when Shultz moved out in 2014). Dye testing confirmed that the separator was connected to the sanitary sewer. It had been installed when the property was a manufacturing facility. One of the floor drains inside the building where wash solid waste carts were washed out is connected to the separator. The separator was completely full of oil and had not been serviced in many years. An estimated 1,000 gallons of oil was removed for recycling.

V Van Dyke

In June 2014, SPU discovered an illicit connection at V Van Dyke (located at 150 S River Street) as part of the City’s IDDE program. A sink in the repair garage had been plumbed to the storm drain in the outside yard. The company immediately disconnected the sink drain and eliminated the discharge.

4.3 RM 2.3-2.8 East (Seattle Boiler Works to Slip 4)

The RM 2.3-2.8 East (Seattle Boiler Works to Slip 4) source control area (Figure 4-3) includes several properties adjacent to the LDW (Dawn Foods, Seattle Boiler Works, Seattle Iron & Metals, Pioneer Distribution, and Recology CleanScapes). In addition, it includes the S Myrtle Street and S Garden Street storm drain basins. Upland cleanup sites in this source control area include the Fox Avenue Building and Whitehead Tye sites.

- Chemicals of concern for the RM 2.3-2.8 East source control area include mercury, PCBs, PAHs, dioxins/furans, and organotin compounds.

- There is one City MS4 outfall at S Myrtle Street and four private storm drains from the Dawn Foods, Seattle Boiler Works, and Recology CleanScapes properties in this source control area. In addition, the S Garden Street storm drain (which is currently owned by Seattle Iron and Metals and collects runoff from S Garden Street and Seattle Iron and Metals property) discharges to the LDW in this source control area.
- Of the 43 action items identified for this source control area, 29 have been completed. A total of 19 high priority action items were identified; 14 of these are complete.

4.3.1 Business Inspections

SPU conducted a total of 11 inspections at four facilities in this source control area during the current reporting period (Appendix C).

Ecology conducted eight inspections at four facilities within this source control area during the current reporting period (Appendix E).

4.3.2 Source Tracing

SPU collected one right-of-way catch basin sample in the S Myrtle Street storm drain basin during the current reporting period (sample collected in 2015). The S Myrtle Street storm drain was cleaned in 2009. Prior to cleaning, samples from this system exceeded the CSLs for copper, mercury, lead, zinc, diesel-range and oil-range hydrocarbons, LPAH, HPAH, PCBs, and phthalates. The 2015 sample exceeded the CSLs for mercury, zinc, oil-range hydrocarbons, BEHP, butylbenzyl phthalate, dimethyl phthalate, and PCBs.

SPU cleaned the S Garden Street storm drain system in 2009. No source tracing samples were collected during the current reporting period. Prior to cleaning, samples, from this system exceeded the CSLs for copper, mercury, lead, zinc, diesel-range and oil-range hydrocarbons, total PCBs, and phthalates.

Complete sample results for the current reporting period are presented in Appendix F; sample locations are shown in Figure 4-3. Screening level exceedances are summarized in Table 4-2 below.

Table 4-2. RM 2.3-2.8 East: Screening Level Exceedances in SPU Source Tracing Samples

Chemical Class	Chemical	In-line Solids	On-site CB Solids	Right-of-Way CB Solids
Metals	Mercury	ns	ns	☒
	Zinc	ns	ns	☒
PCBs	PCBs, total	ns	ns	☒
Phthalates	BEHP	ns	ns	☒
	Butylbenzyl phthalate	ns	ns	☒
	Dimethyl phthalate	ns	ns	☒
Other SVOCs	4-Methylphenol	ns	ns	☒
	Phenol	ns	ns	×
TPH	Diesel-range hydrocarbons	ns	ns	☒
	Oil-range hydrocarbons	ns	ns	☒

Storm drain screening levels are listed in Table 2-6.

× = Exceedance of SCO (lower screening level) was observed during the current reporting period (2014 through 2016).
 ☒ = Exceedance of CSL (upper screening level) was observed during the current reporting period (2014 through 2016).
 ns = not sampled

The S Myrtle Street storm drain was cleaned in 2010. Five samples were collected from this system prior to this reporting period and after cleaning. Chemicals that exceeded the CSLs in previous samples included copper (3 samples), lead (2 samples), mercury (2 samples), zinc (4 samples), PCBs (3 samples), cPAH (1 samples), BEHP (5 samples), butylbenzyl phthalate (3 samples), dimethyl phthalate (3 samples), oil-range hydrocarbons (5 samples).

4.3.3 Facility-Specific Source Control Actions

Recology CleanScapes

Ecology conducted a stormwater compliance inspection at Recology CleanScapes on September 3, 2014. Two water samples and one solids sample were collected from the storm drain system during the inspection (Leidos 2015c).

- Water samples were collected at the following locations:
 - Sump D (SP-01), located in the northwest corner of the facility. This sump receives stormwater from sump A and drainage from the recycle bin container area.
 - Sampling port of the stormwater treatment system (TS-01). The sample represents treated effluent from the facility's north yard.
- Copper, mercury, and zinc exceeded the marine WQC in both samples. In addition, total PCB congeners exceeded the human health WQC in both samples.

Current Operations	Waste transportation facility
Address	7303 8 th Avenue S
Facility/Site ID	41684823
NPDES Permit	WAR000949
Chemicals of Concern	Zinc, PCBs, phthalates, and petroleum hydrocarbons
Media Affected	Stormwater and storm drain solids

- A solids sample was collected from catch basin CB-01, which is located in the north yard and receives stormwater from the truck parking area. A filter sock was removed prior to sampling. Zinc, total PCB congeners, BEHP, butylbenzyl phthalate, and petroleum hydrocarbons exceeded the storm drain solids screening levels (Table 2-6).

Recology CleanScapes proactively implemented a Level 3 Corrective Action in 2015 to improve the quality of stormwater discharged from their facility. Recology CleanScapes submitted an engineering report to Ecology in September 2015 that describes the planned Level 3 Corrective Action (Aspect Consulting 2015). Ecology reviewed and approved the stormwater treatment system design engineering report in November 2015 (Ecology 2015p).

Seattle Iron & Metals

Ecology issued an industrial NPDES individual permit for Seattle Iron & Metals (SIM) in September 2013. It was modified and reissued in 2014.

The permit was modified again in March 2015 to add water quality based effluent limits for ammonia and to correct the analytical testing protocol for PCBs (Ecology 2015d).

Current Operations	Metals recycling
Historical Operations	Dangerous waste transport, construction, and machine shop
Address	601 S Myrtle Street
Facility/Site ID	94727791 (SIM)
NPDES Permit	WA0031968 (Individual)
Chemicals of Concern	Metals (copper, lead, mercury, and zinc), petroleum hydrocarbons, and PCBs
Media Affected	Stormwater

- Puget Soundkeeper Alliance appealed the 2013 NPDES permit issued to the Pollution Control Hearings Board (PCHB). The PCHB concluded in July 2015 that portions of the NPDES permit were invalid, and that revisions to the mixing zone analysis for all parameters (except for PCBs) and modification of Conditions S1.A and S1.B are required (PCHB 2015).
- Ecology issued a Notice of Penalty on September 23, 2014 and fined SIM \$18,000 for allowing stormwater with excessive levels of PCBs and other pollutants to discharge to the LDW in violation of their NPDES permit. The penalty covers 22 violations, from October 2013 through August 2014. In addition, Ecology expects SIM to complete a series of upgrades to improve their stormwater treatment system (Ecology 2014r). The penalty was subsequently reduced to \$16,000 (WA Attorney General 2015).

Fox Avenue Building

On June 18, 2012, Ecology and Fox Avenue Building LLC signed Agreed Order DE-8985 to conduct cleanup actions at the site (Ecology 2012a).

Cleanup actions at the site include thermal treatment of the chlorinated VOC compounds, followed by bio-polishing, until remediation levels are met. The Main Source Area and the

Current Operations	Chemical distribution
Historical Operations	Chain manufacturing; chemical and petroleum repackaging and distribution
Address	6900 Fox Avenue
Facility/Site ID	2282
Chemicals of Concern	VOCs, dioxins/furans, petroleum hydrocarbons
Media Affected	Soil, groundwater, and stormwater

Loading Dock Source Area were thermally treated in 2013. The Northwest Corner Area underwent soil vapor extraction rather than thermal treatment.

- Remediation activities conducted in 2014 included installation of injection and monitoring wells in the Loading Dock Source Area and Main Source Area to facilitate injection of substrate and to monitor performance; performance monitoring; and substrate injection in the Northwest Corner, Loading Dock Source Area, and Main Source Area (Floyd|Snider 2015).
- During 2015, activities included injection of soluble sugar substrate in selected wells; bio-augmentation in selected wells; and performance monitoring in areas that were injected with soluble sugar or edible oil in 2014 (Floyd|Snider 2016a).
- During 2016, activities included additional injections of soluble sugar substrate in selected wells, and performance monitoring of groundwater in areas that had previously been injected with soluble sugar or edible oil (Floyd|Snider 2017).
- As of the end of 2016, concentrations of chlorinated VOCs in most wells were less than the reporting limit of 250 µg/L; the primary constituents are the daughter products of reductive dechlorination. For 2017, additional substrate injections and a site-wide groundwater monitoring event were planned (Floyd|Snider 2017).

Whitehead Tye

The Whitehead Tye site is the location of the former Tye Lumber facility. SIM and 730 Myrtle LLC have been identified as PLPs for this site. Ecology and SIM entered into Agreed Order DE-13458 in August 2016. The Order requires that the property owner/operator complete a data summary report and interim action, conduct an RI/FS, and prepare a preliminary draft CAP (Ecology 2016f).

Current Operations	Metal recycling
Historical Operations	Lumber finishing, refuse burning, wood treating
Address	730 S Myrtle Street
Facility/Site ID	9809
NPDES Permit	WAR125002
Chemicals of Concern	PCBs, PAHs, VOCs, pentachlorophenol, petroleum hydrocarbons, metals
Media Affected	Soil and groundwater

- SIM submitted a draft Current Situation Report and Subsurface Investigation Work Plan to Ecology in November 2015. The work plan documents historical information at the Whitehead Tye site and proposes characterization activities to fill data gaps related to potential subsurface impacts prior to the execution of the stormwater improvement project. The characterization activities proposed in the work plan were carried out as an independent investigation (Freier-Coppinger 2015).
- Surface and subsurface soil samples at the property and downgradient of the property were collected from 12 boring locations, and a total of 33 soil samples were collected. A total of 13 samples were analyzed for pentachlorophenol; 15 samples were analyzed for petroleum hydrocarbons; five samples were analyzed for dioxins/furans; and five samples were analyzed for PCBs, SVOCs, and metals.

- Three new monitoring wells were installed. Groundwater samples were collected from the newly installed wells, six existing monitoring wells at the Whitehead Tyee site, three wells at the Fox Avenue site, and two off-property wells associated with the Fox Avenue site. Samples were analyzed for pentachlorophenol and petroleum hydrocarbons. In addition, three of the samples were analyzed for dioxins/furans.
- Soil and groundwater samples within the approximate area of a former pentachlorophenol underground storage tank (UST)/dip tank contained contaminants above MTCA cleanup levels. Exceedances generally occurred between 7.5 and 14 feet below ground surface (bgs). Soil samples from the general vicinity of the former automobile repair facility indicated petroleum hydrocarbon contamination at concentrations above MTCA cleanup levels in shallow soils. The investigation results were summarized in a March 2016 memorandum (Floyd|Snider 2016b).
- In March 2016, eight additional borings were advanced to further delineate oil-range hydrocarbons in the vicinity of the former auto repair shop.
- In August 2016, SIM submitted a Data Summary Report to Ecology, as required by the Agreed Order. The report describes the historical operations, surrounding area, and available soil and groundwater data for the Whitehead Tyee site (Floyd|Snider 2016c).
- A draft Interim Action Work Plan was submitted to Ecology in October 2016. Proposed actions include construction of a stormwater conveyance system; excavation of contaminated soil adjacent to the proposed detention area; and focused oil-range hydrocarbons excavation. The facility is also required to install a stormwater treatment system under a Water Quality administrative order.

Ecology conducted an SHA for this site in 2016. Sites are ranked on a scale of 1 to 5, with 1 representing the highest level of concern and 5 representing the lowest, relative to other assessed sites in the state. This site was ranked 1, and it was added to the Hazardous Sites List in August 2016 (Ecology 2016e).

Seattle Bulk Shipping

In 2014, SPU responded to a complaint from Ecology regarding transloading operations being performed on S Garden Street. Material from a mine in Nevada was being transferred from rail car to intermodal shipping containers using a front-end loader to move material from the rail car to a conveyor system. Material containing arsenic (1,270 mg/kg), cadmium (6,110 mg/kg), copper (159,000 mg/kg), lead (31,900 mg/kg) and zinc (65,200 mg/kg) was spilled on S Garden Street during transloading operations. The operation was performed in the right-of-way without a street use permit. Seattle Department of Transportation (SDOT) issued a stop work order and Seattle Bulk Shipping swept and pressure washed the area to clean up the spilled material.

4.4 RM 2.8 East (EAA-3: Slip 4)

The RM 2.8 East (EAA-3: Slip 4) source control area includes several properties adjacent to the LDW (Crowley Marine Services 8th Avenue S, Emerald Services, and the northern portion of Boeing Plant 2), the NBF-GTSP site, the northern portion of KCIA, and areas with stormwater drainage to the Georgetown and Interstate 5 (I-5) Slip 4 storm drains (Figure 4-4).

- Chemicals of concern for the RM 2.8 East source control area include PCBs, phthalates, PAHs, and metals.
- Several outfalls discharge to the LDW within this source control area. The KCIA SD#3/PS44 EOF, Georgetown, and I-5 at Slip 4 storm drains discharge at the head of Slip 4. In addition, six private outfalls associated with the Crowley Marine property, one private outfall associated with Emerald Services, and one private outfall (two parallel pipes) associated with Boeing Plant 2 discharge to the LDW within this source control area.
- Of the 56 action items identified for this source control area, 49 have been completed. A total of 25 high priority action items were identified; 21 of these are complete.

The City of Seattle completed a non-time critical removal action to address contaminated sediment at the Slip 4 EAA during 2011-2012. This included the removal of approximately 10,256 cubic yards of contaminated bottom sediment and bank soil; 130 tons of creosote-treated timbers and piles; and a concrete pier structure. In addition, the action included construction of stable slopes; sediment and slope caps over 3.43 acres; and engineered soil covers with habitat enhancements over 0.15 acre in the former upland areas (Integral 2014a). During the current reporting period, annual long-term monitoring reports were submitted for Year 1 (Integral 2014a), Year 2 (Integral 2014b), and Year 3 (Integral 2015). The monitoring report for Year 4 was submitted in January 2017 (Windward 2017).

The sediment cap and backfill remain structurally stable, and new sediment has accumulated. During Year 1, chemical concentrations within the Slip 4 EAA and boundary area were higher compared to the 2012 post-remedy baseline concentrations, with some exceedances of the benthic SCO (BEHP, PCBs) and/or CSL (benzoic acid, benzyl alcohol). Sediment concentrations measured during Year 3 were somewhat higher, with exceedances of the benthic SCO for zinc, PCBs, BEHP, and butylbenzyl phthalate, and CSL exceedances for benzyl alcohol. The City of Seattle will continue to monitor conditions in Slip 4, per the approved monitoring plan.

4.4.1 Business Inspections

SPU conducted a total of 13 business inspections at seven facilities in the I-5 storm drain at Slip 4, KCIA SD #3/PS44 EOF, and Georgetown storm drain basins during the current reporting period (Appendix C).

Ecology conducted 12 inspections at seven facilities in the Slip 4 source control area during the current reporting period (Appendix E).

- In June 2014, Ecology granted Emerald Services coverage under the ISGP (Ecology 2014k).

4.4.2 Source Tracing

Boeing, SPU, and KCIA have been sampling sediment traps in the storm drains discharging to Slip 4 storm since 2005. During the current reporting period, Boeing and KCIA collected sediment trap samples once per year (April/May) in storm drain lines that discharge to KCIA SD#3. SPU collected one sediment trap sample each in April/May 2014, 2015, and 2016 in the I-5 storm drain at Slip 4.

While generally decreasing over time, PCB concentrations in all sediment traps except T3A remain at concentrations above the SCO (0.13 mg/kg DW). The concentrations of PCBs at T1 in 2014, T4 in 2014-2015, and T5 in 2014-2016 samples were above the CSL (1.0 mg/kg DW) during the current reporting period (Table 4-3).

Table 4-3. RM 2.8 East: PCB Concentrations in Slip 4 Sediment Traps

Sediment Trap Location	Range of All PCB Conc'ns, 2005-2016 (mg/kg DW)	2014 Samples (mg/kg DW)	2015 Samples (mg/kg DW)	2016 Samples (mg/kg DW)
T1 (Downstream end of north and north-central lateral SD)	0.62 – 420	1.3	0.64	0.95
T2 (Downstream end of south lateral SD)	0.010 – 1.5	0.62	0.62	0.76
T2A (Upstream of NBF on the south lateral SD)	<0.02 – 1.0	0.26	1.0	0.95
T3 (Downstream end of south-central lateral SD)	0.026 – 1.8	0.57	0.37	0.28
T3A (Upstream of NBF on the south-central lateral SD)	<0.02 – 0.73	0.044	<0.024	0.0080
T4 (Downstream end of north-central lateral SD)	0.24 – 2.8	1.5	1.2	0.66
T4A (Upstream of NBF on the north-central lateral SD)	<0.011 – 5.6	0.24	0.34	0.17
T5 (Downstream end of north lateral SD)	2.1 – 800	4.3	4.9	3.6
T5A, T5A(2) (Upstream of NBF on the north lateral SD, now shifted to King County bypass line*)	0.086 – 0.67*	0.33	0.35	0.22
T6 (I-5 SD at Slip 4)	<0.019 – 7.8	0.76	0.17	0.080

* During 2012, off-site drainage to the north lateral storm drain line was rerouted around the NBF site. The sediment trap at T5A was removed, and solids samples are being collected at the wet well (location T5A[2]) in this new King County storm drain bypass line in lieu of the T5A sediment trap sample.

SPU has collected on-site catch basin samples in areas of the RM 2.8 East source control area that discharge to Slip 4 via private storm drains. SPU has also collected catch basin samples from structures plumbed to the combined sewer system in this area. In addition, prior to removal of the flume, SPU collected in-line solids samples, on-site catch basin samples, and right-of-way catch basin samples in the Georgetown Flume. The flume was removed and replaced with a new storm drain system in 2010 (referred to as the Georgetown storm drain) that collects roof runoff from the GTSP, as well as runoff from S Myrtle Street and other areas west of the flume corridor, outside of KCIA boundaries.

During the current reporting period, SPU collected a sample from MH23, located east of the Aero Motel, within the Georgetown storm drain. This sample contained PCBs (540 mg/kg DW), LPAHs (5.8 mg/kg DW), HPAHs (74 mg/kg DW), BEHP (18 mg/kg DW), butylbenzyl phthalate (1.3 mg/kg DW), benzoic acid (5.1 J mg/kg), zinc (880 mg/kg), and oil-range hydrocarbons (7,900 mg/kg).

Complete SPU source tracing sample results for the current reporting period are presented in Appendix F; sample locations are shown in Figure 4-4. Screening level exceedances are summarized in Table 4-3 below.

**Table 4-4. RM 2.8 East: Screening Level Exceedances
in Source Tracing Samples**

Chemical Class	Chemical	Sediment Traps (SPU/KCIA and Boeing)	In-line Solids (SPU)	On-site CB Solids (SPU)	Right-of-Way CB Solids (SPU)
Metals	Copper	☒		ns	ns
	Mercury	☒		ns	ns
	Zinc	☒	×	ns	ns
PCBs	PCBs, total	☒	×	ns	ns
PAHs	LPAH	☒	☒	ns	ns
	HPAH	☒	☒	ns	ns
	Total cPAHs	☒	☒	ns	ns
Phthalates	BEHP	☒	☒	ns	ns
	Butylbenzyl phthalate	☒	☒	ns	ns
	Dimethyl phthalate	×		ns	ns
	Di-n-butyl phthalate	×		ns	ns
	Di-n-octyl phthalate	×		ns	ns
Other SVOCs	4-Methylphenol	☒		ns	ns
	Benzoic acid	☒	☒	ns	ns
	Benzyl alcohol	☒		ns	ns
	Phenol	×	×	ns	ns
TPH	TPH-oil	☒	☒	ns	ns

Table includes only SPU samples and SPU/KCIA/Boeing sediment trap samples; it does not include other storm drain solids samples collected as part of ongoing investigations at the NBF-GTSP site.

Storm drain screening levels are listed in Table 2-6.

× = Exceedance of SCO (lower screening level) was observed during the current reporting period (2014 through 2016).

☒ = Exceedance of CSL (upper screening level) was observed during the current reporting period (2014 through 2016).

ns = not sampled

SPU collected 25 samples from the Georgetown and I-5 storm drain at Slip 4 drainage systems prior to this reporting period. Chemicals that exceeded the CSLs in previous samples included copper (2 samples), lead (2 samples), zinc (1 sample), LPAH (3 samples), HPAH (5 samples), cPAH (5 samples), PCBs (1 sample), BEHP (20 samples), butylbenzyl phthalate (4 samples), dimethyl phthalate (3 samples), oil-range hydrocarbons (5 samples).

4.4.3 Facility-Specific Source Control Actions

Crowley Marine Services 8th Avenue S

DeNovo Seattle LLC (DeNovo) purchased this property in April 2014; the property is currently leased to Waste Management, which operates the Duwamish Reload Facility. This facility is being used as a transfer facility for sediment offloading in support of sediment cleanup in the LDW and other regional sediment remediation projects. Contaminated uplands soils, predominantly petroleum-contaminated soils, are also transloaded at the facility.

Current Operations	Transloading
Historical Operations	Manufacture of pipe, chain, hydraulic equipment, and concrete; machinery and scrap iron storage; sawmill, lumber distribution; creosote treatment
Address	7400 8 th Avenue S, Seattle 98108
Facility/Site ID	1940187 (Crowley Marine Services, Inc. 8 th Avenue S) 63123962 (Alaska Logistics LLC)
NPDES Permit	WAR302034 (ISGP)
Chemicals of Concern	Metals, PAHs
Media Affected	Sediment, soil, groundwater, and stormwater storm drain solids

Ecology and 8th Avenue Terminals negotiated Agreed Order DE-6721 in 2009 to conduct an RI/FS, implement interim actions if needed, and prepare a draft CAP (Ecology 2009d).

- Phase 1 of the RI was conducted from May 2013 through February 2014 by SLR International Corporation, Inc. (SLR), and consisted of collecting data necessary to assess potential contaminant source areas to better understand contaminant fate and transport and associated potential receptors, and to further review the applicable or relevant and appropriate requirements for the Site. Soil, groundwater, seep, stormwater, storm drain solids, and intertidal and surface sediment samples were collected during Phase 1 field work. A Data Gaps Report was prepared by SLR in October 2014. (Anchor QEA 2016).
- The Phase 1 field work included a geophysical survey of the property to identify former USTs and structures from the former stormwater drainage system. The results indicated that USTs and former stormwater structures are not present at the property (SLR 2014).
- In July 2014, Ecology issued a DNS to DeNovo, the current property owner of the Crowley Marine Services 8th Avenue S cleanup site, to conduct an interim action to remove contaminated soil from the site for construction of a new rail line and concrete foundation (Ecology 2014m).
- In July 2014, SLR and Anchor QEA performed sampling as part of the interim action to support implementation of proposed construction of a new rail line and concrete foundation (Interim Action Area). Soil samples were collected throughout the site, and groundwater samples were collected from three existing site monitoring wells, which were subsequently decommissioned (Anchor QEA 2016).
- Ecology withdrew the DNS issued on July 18, 2014, for the interim action project due to information submitted to Ecology during the public comment period. Ecology received a letter from the Washington Department of Archaeology and Historical Preservation identifying the project area as having a very high potential for archaeological resources. The department recommended that an archaeological survey be conducted prior to

ground-disturbing activities. In addition, the department recommended consultation with the Tribes' cultural committees and concerned parties regarding cultural resources located in the project area. Ecology withdrew their DNS so that additional information on the archaeological resources could be submitted and evaluated prior to holding a new comment period (Ecology 2014p).

- SPU sent comments to Ecology regarding Waste Management's plans for transloading operations at Slip 4 on June 9, 2014. In those comments, SPU requested that mechanical plugs with steel plates be installed in the catch basins. In November 2014, SPU visited the site and noticed that the catch basins in the bunker storage area were plugged with a layer of plastic and filter fabric installed beneath the grate (SPU 2015b).
- In November 2014, a draft SAP Addendum addressing Phase 2 of the RI was submitted to Ecology, which identified potential remaining RI data gaps for the site and proposed additional data collection activities required to complete the RI data set.
- Phase 2 RI sampling activities began (concurrent with Ecology review/comment to the SAP Addendum) in November 2014 and were completed in January 2015, with the exception of one additional round of groundwater monitoring. The Phase 2 sampling included additional soil investigation, monitoring well installation, one groundwater monitoring event, a tidal study, and surface and subsurface sediment sampling in the LDW area adjacent to the site. Following Ecology's review of the draft SAP Addendum, some archived soil samples were analyzed in order to supplement the RI data. The draft RI report, documenting Phases 1 and 2 of the RI field work and the Interim Action, was submitted to Ecology in August 2016 (Anchor QEA 2016).
- Waste Management installed an above-grade rail line on a gravel foundation at the site in 2015 (Anchor QEA 2016).
- Waste Management has planned improvements to the facility; these include perimeter fence installation, stormwater catch basin rehabilitation, electrical conduit trenches, and installation of an advanced stormwater treatment system. The details of those planned improvements, including planned soil excavation and sampling, are provided in the Work Plan Summary: Soil Sampling and Analysis Plan for the Waste Management Duwamish Reload Facility. At the time this Source Control Status Report was prepared, the status of these improvements was unknown.

Ecology conducted a stormwater compliance inspection at the Waste Management Duwamish Reload Facility on February 3, 2015. During the inspection, one water sample and three solids samples were collected from the storm drain system (Leidos 2015c).

- A water sample was collected from catch basin CB-11, which is connected to the drainage line that discharges to the LDW via Outfall No. 1. The sample was collected from above the catch basin filter sock and had high turbidity. Copper (140 µg/L), lead (53 µg/L), nickel (27 µg/L), and zinc (640 µg/L) exceeded the chronic marine WQC in this sample. In addition, total PCB congeners (0.034 µg/L) and BEHP (6.3 µg/L) exceeded the human health WQC.
- Solids samples were collected from the following locations:

- Catch basin CB-21, which is located at the southern area of the facility. The catch basin is connected to the drainage line that discharges to the LDW via Outfall No. 2.
- A filter sock located in catch basin CB-52, in the eastern portion of the facility. The catch basin is offset from the drainage line that discharges to Slip 4 via Outfall No. 5.
- Manhole MH-61, which is located in the northeastern portion of the facility. This manhole receives stormwater from drainage lines in the north central portion of the facility and discharges to Slip 4 via Outfall No. 6.
- Zinc, total PCB congeners, PAHs, BEHP, butylbenzyl phthalate, and petroleum hydrocarbons exceeded the storm drain screening levels (Table 2-6) in all three samples. In addition, dioxin/furan TEQ, diethyl phthalate, dimethyl phthalate, and benzyl alcohol exceeded the screening levels in two of the three samples. The highest exceedances were for phthalates; BEHP concentrations ranged from 31 to 61 mg/kg DW.

In April 2015, SPU noticed a large pile of construction waste in the bunker area of the facility. Photographs show that this material was placed on this site before February 11, 2015. It was unclear whether Waste Management brought additional material onto the site, or whether the pile was material remaining from February. This material came from the Seattle Seawall project. The Seawall subcontractor delivered material to Waste Management without the required prior approval from the SDOT. SDOT directed the Seattle Seawall subcontractor to discontinue using this site and directed Waste Management to remove this material. Waste Management did not obtain a solid waste permit from King County Public Health to use the site for upland soil transloading. The City planned to investigate Waste Management’s use of the site relative to city land use code (SPU 2015b).

On October 9, 2015, Ecology filed a lien against DeNovo for failure to pay \$246,375.96 in remedial action costs for the site (Ecology 2015o).

Emerald Services

During an April 2013 inspection at Emerald Services, Ecology collected one water sample and one solids sample from the storm drain system. Sampling results were published during the current reporting period (Leidos 2015a).

Current Operations	Transporter and transfer facility for non-regulated waste and dangerous/hazardous wastes
Address	7343 East Marginal Way S
Facility/Site ID	89553582
NPDES Permit	WAR002641
Chemicals of Concern	Phthalates, PCBs, phenols, other SVOCs, copper, zinc, and petroleum hydrocarbons
Media Affected	Stormwater and storm drain solids

- The water sample was collected from manhole MH-1, which is located in the northern portion of the facility, directly downstream of the facility’s stormwater treatment system. The sample location is representative of stormwater discharge from Emerald Services to the LDW at Slip 4. Copper exceeded the chronic marine WQC in this sample.
- A solids sample (TS-INF) was collected from the top of the filter cartridges located in the facility’s stormwater treatment vault. The treatment vault is located at the northwestern corner of the facility and receives discharge from the majority of the property, with the

exception of the facility's roof drains. Stormwater is discharged to the LDW following treatment. The sample is representative of storm drain solids at Emerald Services. Zinc, multiple PAHs, BEHP, butylbenzyl phthalate, dimethyl phthalate, 4-methylphenol, phenol, benzyl alcohol, n-nitrosodiphenylamine, total PCB Aroclors, dioxin/furan TEQ, and petroleum hydrocarbons exceeded the storm drain screening levels (Table 2-6). The highest exceedances were for phthalates, 4-methylphenol, and n-nitrosodiphenylamine.

The facility was re-inspected in March 2016 (Ecology 2016b). Emerald Services was directed to update the SWPPP and site map, discontinue the discharge of wash water to the storm drain system, develop and implement a plant to prevent material from overtopping bunkers along the riverbank, and improve various housekeeping procedures.

North Boeing Field / Georgetown Steam Plant Site

Agreed Order DE-5685 for the NBF-GTSP site was signed by the PLPs (Boeing, City of Seattle, and King County) and Ecology, effective August 14, 2008 (Ecology 2008b). On February 6, 2015, the PLPs and Ecology signed an Amendment to this Agreed Order (Ecology 2015a). Under the terms of the Amended Agreed Order, the PLPs will complete an RI/FS and conduct one or more interim actions, as appropriate.

Current Operations	Aircraft finishing and testing; aircraft research and development
Historical Operations	Electrical power generation; aircraft manufacturing, maintenance, and research
Address	GTSP: 6700 13 th Avenue S, Seattle 98108 NBF: 7500 East Marginal Way S, Seattle 98108
Facility/Site ID	2050 (NBF-GTSP)
Chemicals of Concern	PCBs, PAHs, petroleum hydrocarbons, VOCs, SVOCs, metals
Media Affected	Soil, groundwater, stormwater, and soil vapor

Source control activities conducted at the NBF-GTSP site during the current reporting period are summarized below.

Table 4-5. Source Control Activities at the NBF-GTSP Site (2014-2016)

Dates	Activity	Description
March 2014	Fenceline Area and 3-333 Interim Action 2013 Groundwater Compliance Monitoring Reports	Boeing completed groundwater monitoring compliance reports for the Fenceline and 3-333 Building Interim Action areas at NBF. PCBs and VOCs were detected in groundwater in the 3-333 Building area, and PCBs were detected in groundwater in the Fenceline area (Landau 2014c).
March 2014	Annual Performance Evaluation Report for Long-Term Stormwater Treatment	Boeing completed the Annual Performance Evaluation Report for the Long-Term Stormwater Treatment System (LTST) at NBF. All composite whole water sample results at the point of compliance were below the marine chronic WQC of 0.030 µg/L for PCBs during the 2012-2013 reporting period. PCBs were detected twice during very large or intense precipitation events at concentrations of 0.015 µg/L (Landau 2014b).
April 2014	NBF-GTSP RI/FS Final SAP and QAPP	Ecology's contractor, Leidos, completed the final RI/FS SAP and QAPP after review and comment by the PLPs (Leidos 2014d).

Dates	Activity	Description
April 2014	2013 Compliance Monitoring Report at GTSP	The City of Seattle completed the 2013 Compliance Monitoring Report for the GTSP Interim Action Area. PCBs were detected in groundwater at concentrations above the Interim Action Level (0.01 µg/L) during the last two rounds of sampling (SCL 2014).
August 2014	2014 Groundwater Monitoring at NBF	Boeing performed RI groundwater monitoring during the first two quarters of 2014. Types of analyses were wide-ranging, depending on the chemicals of concern in each area (Landau 2014e).
September 2014	SAP for Supplemental Stormwater Solids Assessment at KCIA	King County completed a SAP for supplemental sampling and testing of stormwater solids at KCIA. The purpose of the investigation was to evaluate inputs from the airport property into the drainage system for NBF. A total of 12 stations were sampled and tested for PCBs, metals, SVOCs, petroleum hydrocarbons, and grain size. Selected stations were also sampled for dioxins/furans (Cardno 2014).
October 2014	Fenceline Area and 3-333 Interim Action 2014 Groundwater Compliance Monitoring	Boeing completed groundwater monitoring compliance reports for the Fenceline and 3-333 Building Interim Action areas at NBF. PCBs and VOCs were detected in groundwater in the 3-333 Building area, and PCBs were detected in groundwater in the Fenceline area (Landau 2014c, Landau 2014d).
January 2015	TSCA Cleanup Substation V-94 Removal and Disposal	Boeing completed a report on the Self-Implementing TSCA Cleanup of Substation V-94. The cleanup involved removal and disposal of PCB-contaminated substation structures, adjacent asphalt, and subsurface soils. PCB concentrations in confirmation samples did not exceed 1 mg/kg PCBs (Landau 2015a).
February 2015	Annual Performance Evaluation Report for Long-Term Stormwater Treatment	Boeing completed the Annual Performance Evaluation Report for the LTST system at NBF. All composite whole water sample results at the point of compliance were below the marine chronic WQC of 0.030 µg/L for PCBs during the 2013-2014 reporting period. PCBs were detected four times during very large or intense precipitation events at concentrations ranging from 0.010 to 0.022 µg/L (Landau 2015b).
February 2015	SPU Site Visit re: Storm Drains	SPU conducted a site visit and confirmed that catch basins on NBF have been replumbed to the KCIA SD#3/PS 44 EOF. SPU also video inspected the North Boeing Field storm drain system and confirmed that all connections from North Boeing Field have been plugged.
February 2015	NBF-GTSP Addendum No. 1 to RI/FS SAP/QAPP	Addendum No. 1 to the RI/FS SAP/QAPP summarizes the many planned changes to the SAP/QAPP based on the contents of the Agreed Order Amendment No. 1 (Landau 2015c).
June 2015	Substation 87 Transformer Mineral Oil Cleanup	Boeing spilled mineral oil from a transformer (Ecology 2015c). Boeing completed a cleanup report on the Substation 87 transformer mineral oil release at NBF. A leaky transformer valve caused a release of approximately 20 gallons of non-PCB mineral oil from the transformer. Contaminated areas were excavated, and approximately 1.5 cubic yards of sand and gravel were removed. All confirmation samples were below the cleanup criteria following excavation (Landau 2015d).
August 2015	GTSP Second Semiannual Groundwater Monitoring Report	SCL completed the second semiannual PCB monitoring event at well GTSP-7 on February 11, 2015. This sampling represents conditions during the wet season. PCB Aroclors were detected at 0.016 µg/L. PCB concentrations in groundwater from GTSP-7 have declined from the values observed in 2013 (0.20 µg/L; SCL 2015a).

Dates	Activity	Description
August 2015	NBF-GTSP Addendum No. 2 RI/FS SAP/QAPP	Addendum No. 2 of the RI/FS SAP/QAPP includes revisions to the approved SAP/QAPP and summarizes revisions to the Phase 1 groundwater monitoring analytes approved by Ecology (Landau 2015e).
April 2014 – September 2015	NBF-GTSP RI	The first phase of RI work included installation of approximately 90 soil borings. Groundwater monitoring wells were installed in 25 of the borings, and vapor points were installed in 10 of the borings. Work also included sampling of solids in 53 storm drain structures and surface debris at 91 locations. Phase 1 RI work began in spring 2014 and was completed in September 2015. Phase 2 sampling was completed in March 2016. A preliminary draft RI report was submitted to Ecology in June 2016.
October 2015	NBF-GTSP Addendum No. 3 RI/FS SAP/QAPP	Soil gas samples were collected from the NBF-GTSP site as part of the Phase I investigation activities. Based on those results, Boeing plans to evaluate occupant exposure and other factors at the buildings adjacent to vapor points. Addendum No. 3 of the RI/FS SAP/QAPP includes procedures for collection and analysis of sub-slab soil gas samples, indoor air samples, and ambient air samples (Landau 2015g).
October 2015	NBF-GTSP Addendum No. 4 to RI/FS SAP/QAPP	Addendum No. 4 to the RI/FS SAP/QAPP summarizes the planned Phase 2 soil and groundwater sample locations discussed and approved by Ecology during a meeting in 2015 (Landau 2015f).
December 2015	GTSP Third Semiannual Groundwater Monitoring Report	SCL completed the third semiannual PCB monitoring event at well GTSP-7 on August 18, 2015. This sampling represents conditions during the dry season. PCB Aroclors were detected at 0.047 µg/L (SCL 2015b).
January 2016	Fenceline Area Interim Action 2015 Groundwater Compliance Report	Boeing completed a groundwater monitoring compliance report for the Fenceline Interim Action areas at NBF. PCBs were detected at up to 0.88 µg/L in groundwater in the Fenceline area (Landau 2016c).
February 2016	Annual Performance Evaluation Report for LTST System	Boeing completed the Annual Performance Evaluation report for the LTST at NBF for 2014-2015. All composite whole water sample results at the point of compliance were below the marine chronic WQC of 0.030 µg/L for PCBs during the 2013-2014 reporting period. Concentrations of total PCBs at the influent to the chitosan-enhanced sand filtration system ranged from 0.047 to 0.22 µg/L at MH130A and from non-detect to 0.020 µg/L at the lift station inlet vault. At the lift station inlet vault, PCBs were detected in three of four flow-weighted composite lift station inlet vault samples of bypass during very large or intense precipitation events at concentrations ranging from 0.012 to 0.020 µg/L. PCBs were not detected in any of the four grab samples of lift station inlet vault water during non-bypass conditions (Landau 2016a).
March 2016	Summary of Substrate Injection at the NBF Facility	In October 2015, Boeing performed injections of sucrose/fructose into wells in areas of VOC groundwater contamination at the Building 3-360 and 3-800 areas at NBF. Injections were performed to produce dechlorination of TCE, and groundwater was then sampled for VOCs. Results show decreasing concentrations of TCE and increasing daughter products downgradient (Calibre 2016).

Dates	Activity	Description
March 2016	Vapor Intrusion Model Results	Based on results of RI vapor sampling, Boeing evaluated data at three vapor point locations at NBF. Johnson & Ettinger modeling showed no human health risks related to indoor air within three buildings (Landau 2016d).
June 2016	GTSP Fourth Semiannual Groundwater Monitoring Report	SCL completed the fourth semiannual PCB monitoring event at well GTSP-7 on January 28, 2016. This sampling represents conditions during the wet season. PCB Aroclors were not detected in this round (SCL 2016).
June 2016	Data Summary Report of Stormwater Solids Assessment at KCIA	King County completed a revised report summarizing results of sampling and testing of storm drain solids at 12 locations at KCIA, in addition to incorporation of data from four sediment trap locations. Chemical concentrations were compared to the RI screening levels applied at the downstream NBF-GTSP site. Results showed exceedances of the CSLs for PAHs, PCBs, metals, and several SVOCs (Cardno 2016).
August 2016	TSCA Material Characterization and Removal Plan	This memorandum presents the plan for characterization and removal of material regulated under EPA's TSCA at NBF during NBF-GTSP RI activities in February and March 2016 (Landau 2016b).

King County International Airport - North

Portions of KCIA are located within four separate source control areas. KCIA-North is included in the RM 2.8 East source control area and is discussed here.

In accordance with the facility's ISGP, KCIA cleaned storm drain lines and catch basins on the east side of the airport in November 2015. Approximately 90 storm drain lines were cleaned, legacy sediments were removed, and videos and written reports of storm drain pipe conditions were prepared (King County 2016b). Storm drain line cleaning was completed in the central area of KCIA (runways and taxiways) for 2016, and the west side of KCIA (taxiways, parking lots, maintenance shop, airparks, and outfalls) for 2017.

Current Operations	General aviation airport and related activities
Historical Operations	Military airport operations; general aviation
Address	7277 Perimeter Road S (main terminal); various tenant addresses
Facility/Site Identifier	2051 (KCIA Maintenance Shop)
NPDES Permit	WAR000343
Chemicals of Concern	PAHs, phthalates, copper, zinc, petroleum hydrocarbons, and PCBs
Media Affected	Stormwater and groundwater

In fall 2014, KCIA sampled storm drain structures upgradient of the NBF-GTSP site to fill previously-identified data gaps (Cardno 2016). Data showed elevated concentrations compared to storm drain screening levels; additional focused source tracing is planned for 2018 to determine potential sources of contamination.

The following remediation activities were conducted at KCIA-North during the current reporting period:

- In 2014, an RI/FS was prepared by the tenant at the Shultz Fuel Farm Site (King County 2017). The tenant has entered the site into Ecology's VCP. Groundwater was monitored

quarterly from March 2014 through December 2015. Additional shallow wells were installed at Ecology's request; these continue to be monitored by the tenant.

- Landmark Aviation, another KCIA tenant, is working with Ecology's VCP and UST Program to achieve compliance with regulatory requirements. Landmark Aviation has been monitoring wells at the site to assess the levels of contamination and to plan for cleanup activities.

Former Boeing Electronics Manufacturing Facility

Groundwater beneath the Boeing EMF site was contaminated with TCE, which breaks down to vinyl chloride and other chlorinated VOCs. A plume of contaminated groundwater extends west for one-half mile, under the Boeing Plant 2 site and into the LDW. Groundwater treatment has been ongoing since 1997. In February 2007, EPA and Boeing signed a Settlement Agreement, which requires Boeing to study the extent of contamination and develop cleanup options.

Current Operations	Property leased to United Parcel Service
Historical Operations	Prototype aircraft testing from 1940 to 1960s. Electronic circuit board manufacturing conducted during 1960s to 1982
Address	7355 Airport Way S or 7355 Perimeter Road S
Facility/Site ID	73142589
Chemicals of Concern	Chlorinated VOCs
Media Affected	Soil and groundwater

Boeing completed a draft final Engineering Evaluation/Cost Analysis (EE/CA) in December 2015 (Calibre 2015). It evaluated the following removal action alternatives: no action, monitored natural attenuation, in-situ air sparging with SVE, in-well stripping, and enhanced reductive dechlorination (ERD). The EE/CA provides the details of the comparative analysis of each removal alternative based on the established criteria. The recommended cleanup alternative presented in the EE/CA is treatment with ERD. The public review period for the EE/CA ended in August 2016. EPA is currently deciding on a final cleanup plan, which will be published in an Action Memorandum (EPA 2016).

In August 2016, Boeing conducted groundwater sampling to monitor performance and provide remedial optimization data for the ERD activities at the site. As of December 2016, Boeing had not prepared a report summarizing the sampling results (King County 2017).

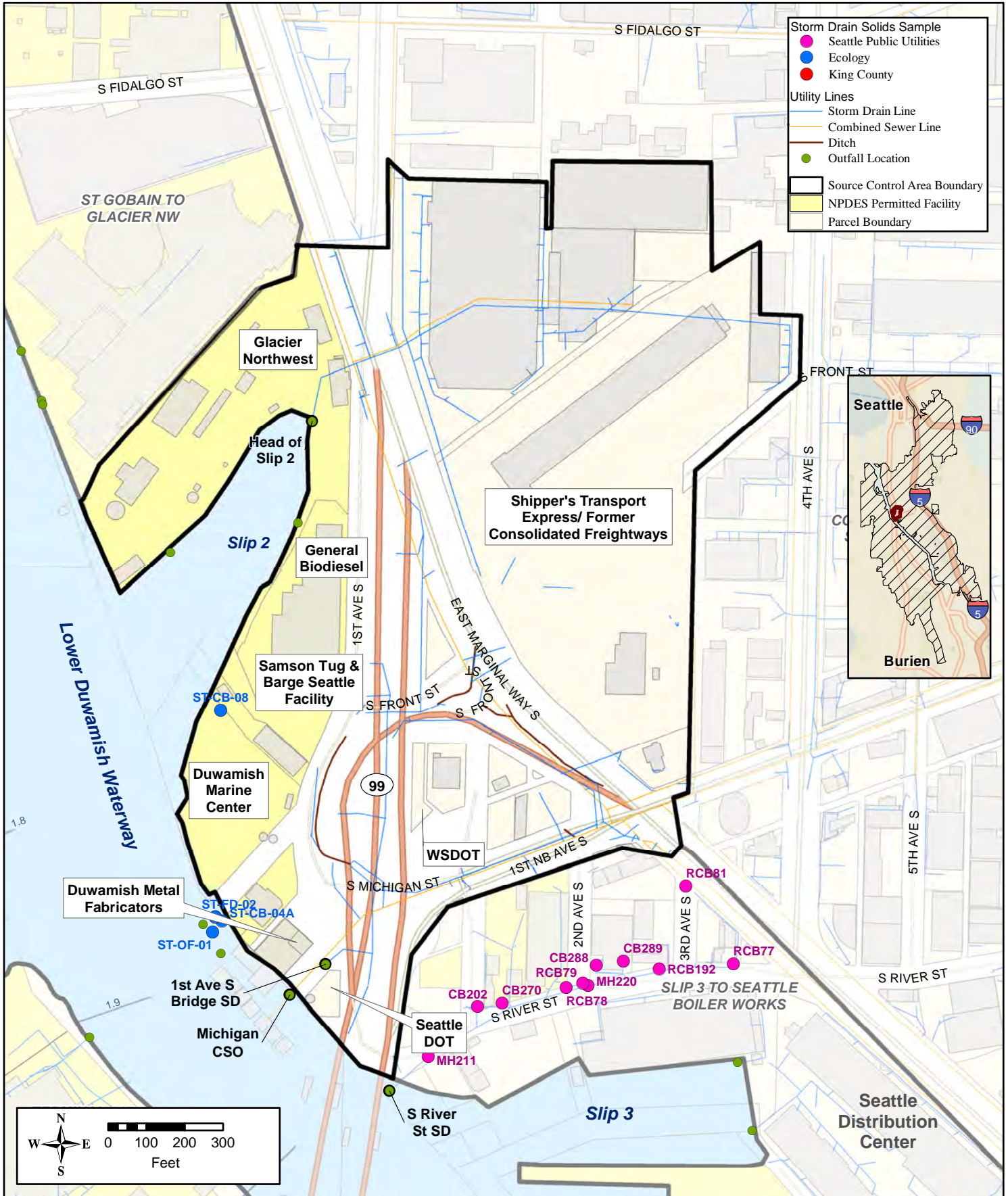


Figure 4-1. RM 1.7-2.0 East
(Slip 2 to Slip 3)
Source Control Area

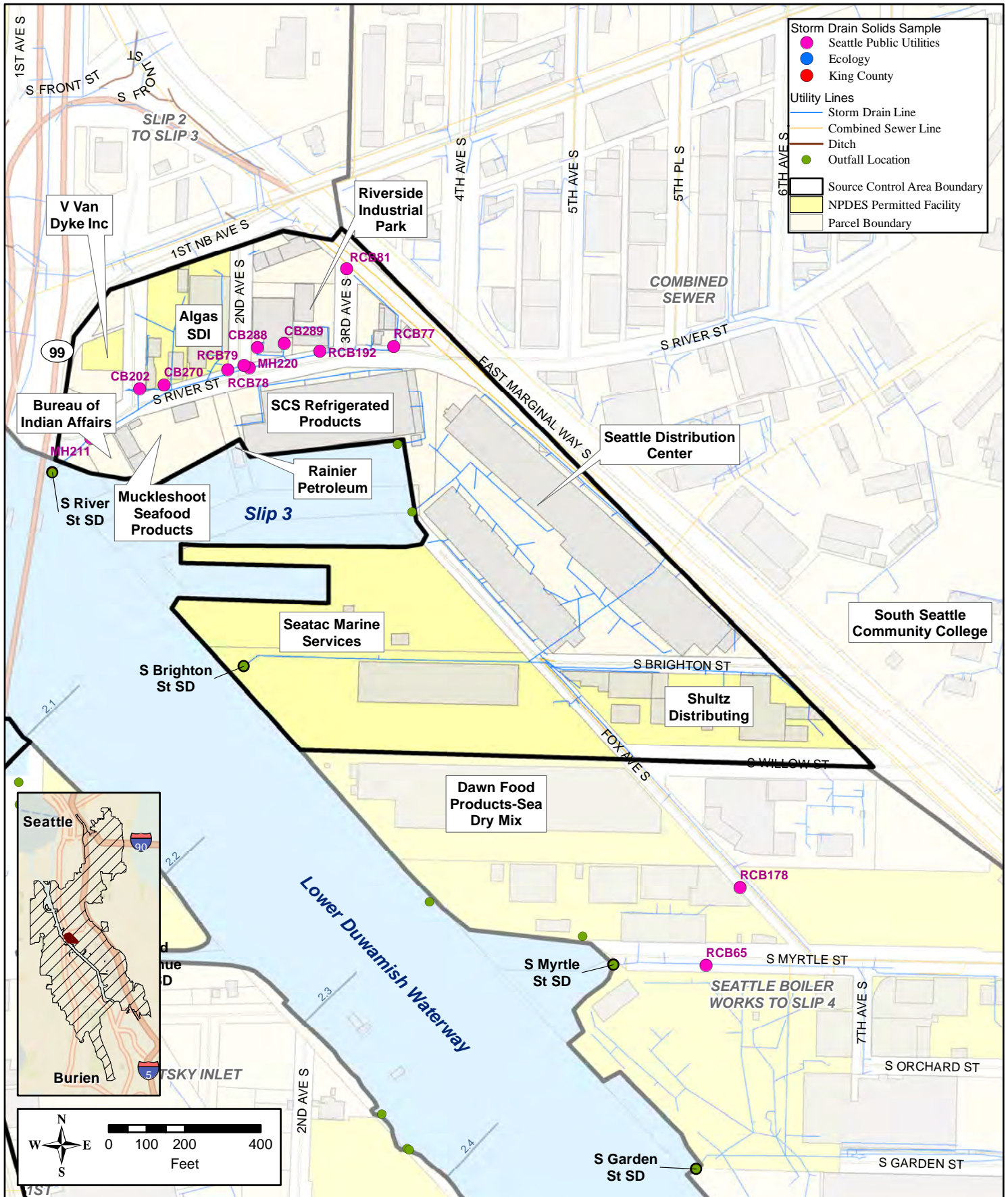
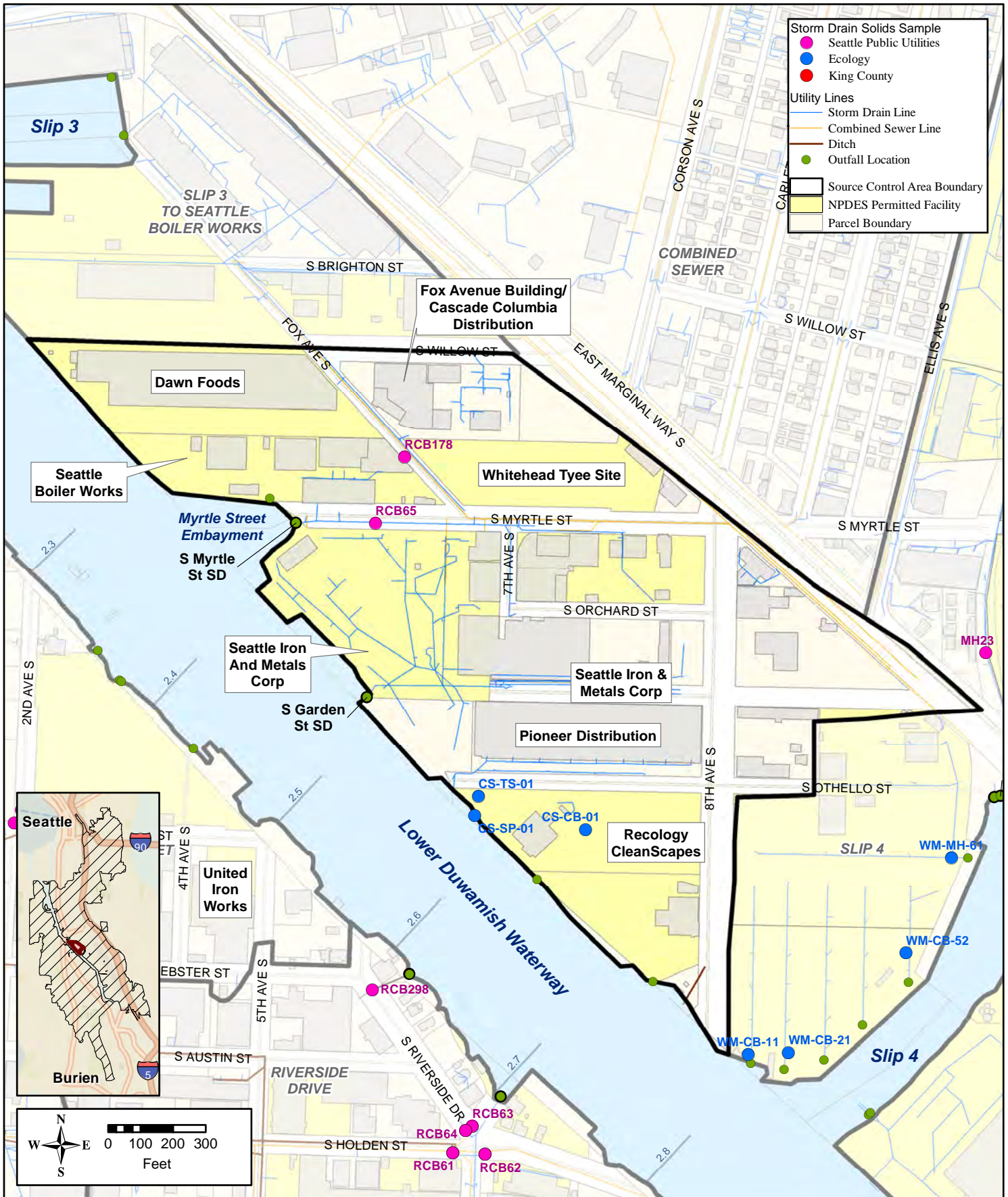


Figure 4-2. RM 2.0-2.3 East
(Slip 3 to Seattle Boiler Works)
Source Control Area





**Figure 4-3. RM 2.3-2.8 East
(Seattle Boiler Works to Slip 4)
Source Control Area**



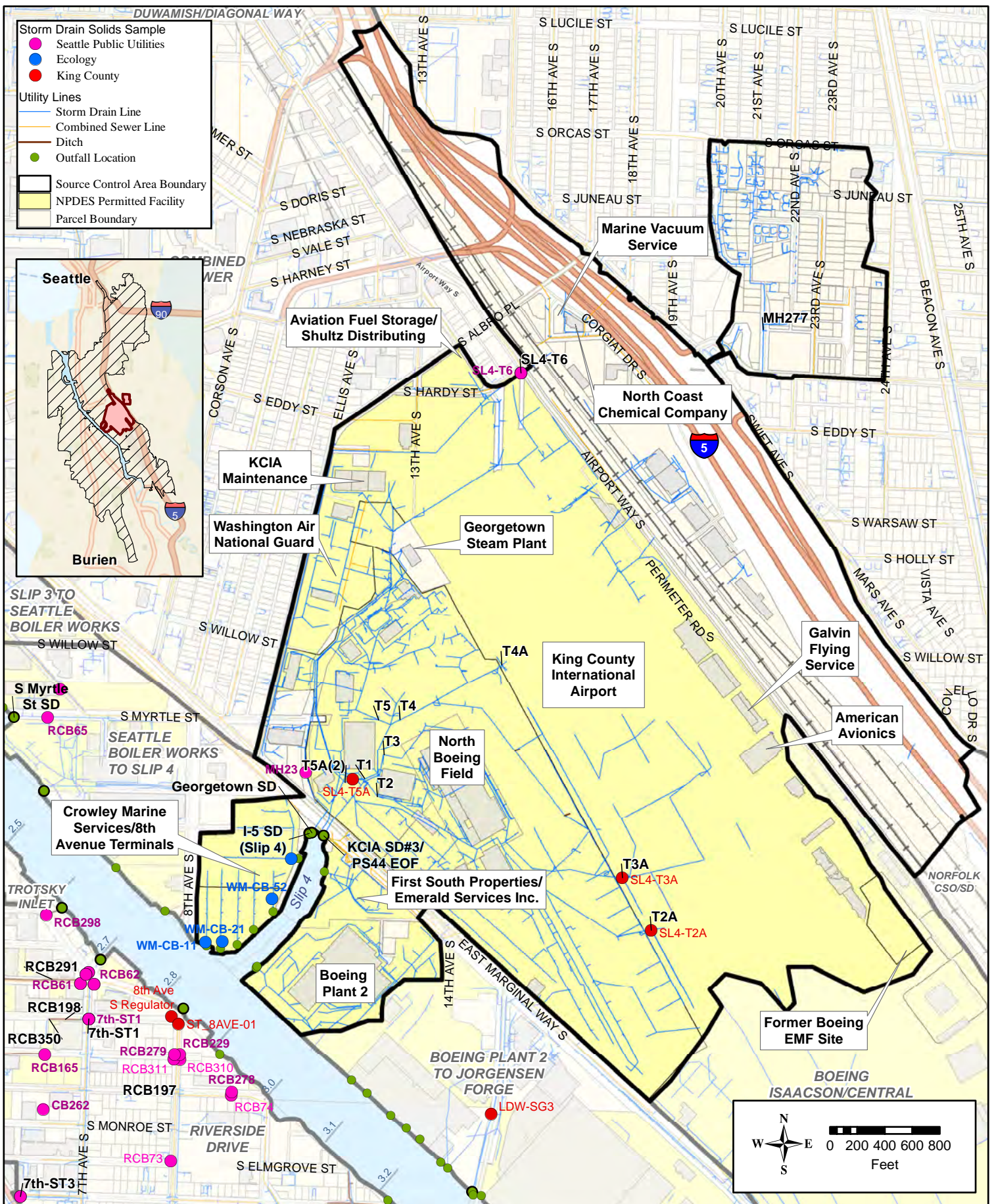


Figure 4-4. RM 2.8 East (EAA-3: Slip 4) Source Control Area



5.0 Upper Reach – East Side

This section includes information about source control activities in the following source control areas:

- RM 2.8-3.7 East (EAA-4: Boeing Plant 2 to Jorgensen Forge)
- RM 3.7-3.9 East (EAA-6: Boeing Isaacson/Central KCIA)
- RM 3.9-4.3 East (Slip 6)
- RM 4.3-4.9 East (Boeing Developmental Center)
- RM 4.9 East (EAA-7: Norfolk CSO/SD)

There are six cleanup sites in this area of the LDW. Two of these are under EPA oversight: Boeing Plant 2 and the former Rhone-Poulenc site. Four cleanup sites are under Ecology's oversight: Jorgensen Forge uplands, Boeing Isaacson/Thompson, the 8801 East Marginal Way site, and Boeing Field Chevron.

5.1 RM 2.8-3.7 East (EAA-4: Boeing Plant 2 to Jorgensen Forge)

The RM 2.8-3.7 East (EAA-4: Boeing Plant 2 to Jorgensen Forge) source control area consists of two facilities, Boeing Plant 2¹³ and Jorgensen Forge, as shown in Figure 5-1.

- Chemicals of concern for the RM 2.8-3.7 East source control area are PCBs, phthalates, PAHs, and metals.
- Active stormwater outfalls in this source control area include 10 private outfalls associated with Boeing Plant 2 (outfalls B through G, north basin, central basin, south basin, and Z); the City of Tukwila's 16th Avenue S storm drain; and three private outfalls associated with the Jorgensen Forge property.
- Of the 36 action items identified for this source control area, 24 have been completed. A total of 24 high priority action items were identified; 18 of these are complete.

5.1.1 Business Inspections

Ecology conducted inspections at the two facilities, Boeing Plant 2 and Jorgensen Forge, within this source control area during the current reporting period (Appendix E).

5.1.2 Source Tracing

SPU collected sediment trap samples and in-line solids samples in the King County-Jorgensen storm drain line before it was rerouted in 2009. The sediment trap was moved at that time to an upstream manhole location in the KCIA SD#2 basin (Section 5.2). King County took over operation of the sediment traps in this system in 2013.

¹³ The northern portion of Boeing Plant 2, where stormwater discharges to Slip 4, is in the RM 2.8 East (EAA-3: Slip 4) source control area (Section 4.4).

SPU collected five in-line solids samples and one right-of-way catch basin sample in the 16th Avenue S storm drain basin in 2013. Chemicals that exceeded the CSLs in these samples included mercury (1 sample), zinc (2 samples), oil-range hydrocarbons (2 samples), BEHP (6 samples), butylbenzyl phthalate (1 samples), benzyl alcohol (2 samples), benzoic acid (2 samples),¹⁴ and phenol (1 sample). SPU cleaned the 16th Avenue S storm drain in 2013.

No source tracing samples were collected by SPU during the current reporting period.

5.1.3 Facility-Specific Source Control Actions

Boeing Plant 2

Boeing is conducting RCRA corrective actions at Boeing Plant 2 under an Administrative Order on Consent, issued by EPA to Boeing in 1994. This includes corrective actions for both the upland area and the sediment/bank areas. Cleanup elements associated with PCBs are concurrently subject to various written approvals under TSCA. In August 2011, EPA issued its Final Decision and Response to Comments for Plant 2 Sediments, containing the final remedy for the Duwamish Sediment Other Area (DSOA), Southwest Bank and other Plant 2 sediment areas.

Current Operations	Airplane parts manufacturing
Historical Operations	Same
Address	7755 East Marginal Way S
Facility/Site ID	2100 (Boeing Plant 2)
Chemicals of Concern	VOCs, PCBs, PAHs, metals, and petroleum hydrocarbons
Media Affected	Groundwater, stormwater, soil, air, and sediment

In-water Work

Boeing submitted a Corrective Measure Implementation Report for the DSOA and Southwest Bank corrective measure to EPA in June 2016 (AMEC 2016). The report describes work conducted during the third and final dredging construction season (between August 2014 and March 2015). Over the course of three construction seasons, Boeing:

- Dredged approximately 163,000 cubic yards of sediment within the DSOA and Slip 4.
- Excavated approximately 160,000 cubic yards of material along the south Plant 2 shoreline.
- Placed approximately 31,300 cubic yards of backfill material along the south Plant 2 shoreline.
- Disposed of approximately 383,000 tons of sediment and soil.
- Discharged approximately 44,200,000 gallons of water through the dredge return water treatment system.

Boeing was awarded the 2016 Western Dredging Association Environmental Excellence Award for their sediment remediation and urban waterway restoration work at Boeing Plant 2. Boeing won the award due to the integration of shoreline habitat restoration with environmental cleanup, which allowed the project to be completed more quickly (Boeing 2016a).

¹⁴ Benzoic acid (13 mg/kg) and benzyl alcohol (31 mg/kg) were well above the CSLs in one in-line sample.

The in-water work is now complete. Boeing continues to monitor the quality of sediment at the site.

Upland Cleanup

Boeing has completed the majority of interim soil cleanups and installed stormwater treatment systems to control contaminants from entering the LDW. A proposed final cleanup plan (or Statement of Basis) for the upland area of the site will be published by EPA in 2018.¹⁵

Jorgensen Forge

The Jorgensen Forge site is divided into an upland portion and a sediment portion. Ecology is the lead for the upland cleanup and EPA is the lead for the sediment cleanup.

Upland Cleanup

Agreed Order DE-4127 between Ecology and Jorgensen Forge Corporation required Jorgensen Forge to evaluate existing data, identify potential ongoing sources of contaminants to sediment, and conduct additional investigations to fill identified data gaps. In June 2013, Ecology and Jorgensen Forge amended the existing Agreed Order to include interim cleanup actions. Jorgensen removed contaminated soil from an access road area to prevent the spread of contamination during EPA's nearby cleanup.¹⁶

In March 2015, Ecology issued Enforcement Order DE-11167 requiring Jorgensen Forge to complete an RI/FS and to prepare a draft and final CAP for the upland portion of the site (Ecology 2015e). Jorgensen Forge declared bankruptcy in 2016. As of the end of 2016, Ecology was negotiating an Agreed Order with the site's former owner and operator, the Earle M. Jorgensen Company.

Sediment Cleanup

An underground 24-inch pipe adjacent to the Boeing Plant 2 facility released PCBs to the LDW. The pipe and contaminated soil are being excavated in phases; Phase 1 was completed in 2015 and Phase 2 is scheduled for 2017. Land use restrictions will address remaining contamination left in place.

PCB-contaminated sediment and bank soils at the property were removed in 2014. Samples collected after the excavation indicated that some sediments were still contaminated. EPA is requiring the Earl M. Jorgensen Company to evaluate additional cleanup work to address the

Current Operations	Fabrication of specialized large-scale metal parts
Historical Operations	Fabrication of structural steel, tractor and road equipment; manufacture of Navy vessels; steel distribution
Address	8531 East Marginal Way S
Facility/Site ID	2382 (Jorgensen Forge Corp) 36575469 (Jorgensen Forge Area 3 Gasoline)
Chemicals of Concern	PCBs, VOCs, petroleum hydrocarbons, metals
Media Affected	Soil and groundwater

¹⁵ <https://cumulis.epa.gov/supercpad/SiteProfiles/index.cfm?fuseaction=second.cleanup&id=1002020>

¹⁶ <https://fortress.wa.gov/ecy/gsp/Sitepage.aspx?csid=3689>

remaining sediment contamination. This evaluation will be described in a Supplemental EE/CA, which will evaluate ways to clean up the remaining PCB contamination.¹⁷

5.2 RM 3.7-3.9 East (EAA-6: Boeing Isaacson / Central KCIA)

The RM 3.7-3.9 East (EAA-6: Boeing Isaacson/Central KCIA) source control area includes the Boeing Thompson and Isaacson properties adjacent to the LDW (shown in Figure 5-2) and the north-central portion of KCIA which is within the drainage basin for KCIA SD#2/PS45 EOF (Figure 5-3).

- Chemicals of concern for the RM 3.7-3.9 East source control area are arsenic and other metals, PCBs, PAHs, phthalates, benzoic acid, and benzyl alcohol.
- Three active outfalls are located within this source control area. In addition to the County's KCIA SD#2 outfall, two private outfalls are associated with stormwater discharges from the Boeing Thompson facility.
- Of the 28 action items identified for this source control area, 19 have been completed. Eight high-priority action items were identified; seven of these have been completed.

5.2.1 Business Inspections

Ecology conducted inspections at two facilities, Boeing Thompson and Charles Air Hangar, within this source control area during the current reporting period (Appendix E). KCIA performs annual tenant inspections in accordance with its ISGP and municipal permit requirements.

5.2.2 Source Tracing

During earlier reporting periods (prior to 2014), SPU collected five in-line solids, three on-site catch basin, four sediment trap, and one right-of-way catch basin samples in the KCIA SD#2/PS45 EOF basin. The following chemicals exceeded the CSLs: mercury (1 sample), zinc (1 sample), PCBs (2 samples), LPAHs (2 samples), HPAHs (3 samples), total cPAH (3 samples), BEHP (3 samples), butylbenzyl phthalate (1 sample), dibenzofuran (2 samples), and oil-range hydrocarbons (2 samples).

KCIA took over sampling of the KCIA2 sediment trap from SPU in 2013. Storm drain solids (sediment trap and in-line grab samples) were collected in May 2014, May 2015, and May 2016. In addition, grab solids samples were collected in 2015 and 2016 from the South Pump Station. Samples were analyzed for metals, PCBs, PAHs, phthalates, and petroleum hydrocarbons. Arsenic, zinc and butylbenzyl phthalate exceeded the SCO (Table 2-6) in one or more of these samples. Results of the KCIA source tracing samples are presented in the King County Source Control Annual Reports (King County 2016b and 2017) and are summarized below.

¹⁷ <https://cumulis.epa.gov/supercpad/SiteProfiles/index.cfm?fuseaction=second.cleanup&id=1002020>

Table 5-1. RM 3.7-3.9 East: Screening Level Exceedances in Source Tracing Samples

Chemical Class	Chemical	Sediment Traps (KCIA)	In-line Solids (KCIA)	On-site CB Solids	Right-of-Way CB Solids
Metals	Arsenic		×	ns	ns
	Zinc		×	ns	ns
Phthalates	Butylbenzyl phthalate	×		ns	ns

Storm drain screening levels are listed in Table 2-6.

× = Exceedance of SCO (lower screening level) was observed during the current reporting period (2014 through 2016).

☒ = Exceedance of CSL (upper screening level) was observed during the current reporting period (2014 through 2016).

ns = not sampled

During earlier reporting periods (prior to 2014), SPU collected five in-line solids, three on-site catch basin, four sediment trap, and one right-of-way catch basin samples in the KCIA SD#2/PS45 EOF basin. The following chemicals exceeded the CSLs: mercury (1 sample), zinc (1 sample), PCBs (2 samples), LPAHs (2 samples), HPAHs (3 samples), total cPAH (3 samples), BEHP (3 samples), butylbenzyl phthalate (1 sample), dibenzofuran (2 samples), and oil-range hydrocarbons (2 samples).

5.2.3 Facility-Specific Source Control Actions

Boeing Isaacson / Thompson

In April 2010, Boeing and Ecology entered into Agreed Order DE-7088 to conduct an RI/FS and prepare a draft CAP (Ecology 2010a).

Boeing submitted an RI Report to Ecology on April 21, 2014 (Landau 2014f). Ecology delayed the final approval of this report pending decisions on responsibility for Port of Seattle property located between Boeing property and the LDW (the sliver property).

- Grette Associates prepared an analysis (for Ecology) of restoration concepts for the sliver property in March 2015 (Grette 2015). Ecology's decisions for restoration alternatives are pending a determination as to whether the sliver property will be excavated and removed or if a new bulkhead will be installed between the sliver property and the LDW.
- Ecology completed a subsurface soil investigation of the sliver property located west of the Boeing Isaacson property in May 2015 (Kennedy Jenks 2015). This investigation was performed for Ecology in support of design activities for installation of a sheet pile bulkhead, and to provide information to support waste characterization needed for soil removal activities that are planned for the site. Ten soil borings were

Current Operations	Aircraft manufacturing
Historical Operations	Steel forging and fabrication, sawmill, wood preserving, and aircraft manufacturing/assembly
Address	8541 to 8811 East Marginal Way S
Facility/Site ID	2218 (Boeing Isaacson Thompson) 1138721 (Boeing Isaacson Property) 83767996 (Boeing Thompson) 4274402 (Boeing Thompson Site)
NPDES Permit	WAR000148 (Boeing Thompson Site)
Chemicals of Concern	PCBs, PAHs, VOCs, furans, phthalates, petroleum hydrocarbons, metals
Media Affected	Soil, groundwater, stormwater, and sediment

advanced to a maximum depth of 25 feet below ground surface. Forty-one soil samples were collected where physical changes in the soil were observed. Twenty soil samples, identified as vertically and spatially representative of site soil, were analyzed for target analytes. Soil samples collected from near the ground surface to depths of 25 feet below ground surface contained concentrations of arsenic, cadmium, copper, lead, zinc, cPAHs, petroleum hydrocarbons, and PCBs above MTCA cleanup levels.

King County International Airport – North Central

This area of KCIA includes Drainage Basin #2, which discharges to the LDW via the County’s KCIA SD#2 outfall (Figure 5-3). The City of Tukwila’s East Marginal Way stormwater drainage also discharges to this outfall. Stormwater discharges at KCIA are covered under the ISGP. Several tenants within KCIA are also covered by an ISGP and comply separately with Ecology requirements. KCIA inspects all tenant and airport common areas monthly to ensure that BMPs are properly maintained, and to ensure that there are no illicit discharges or connections.

Current Operations	General aviation airport and related activities
Historical Operations	Military airport operations; general aviation
Address	7277 Perimeter Road S (main terminal); various tenant addresses
Facility/Site ID	None
NPDES Permit	WAR000343 (ISGP)
Chemicals of Concern	PAHs, phthalates, copper, zinc, petroleum hydrocarbons, and PCBs
Media Affected	Stormwater and groundwater

During a stormwater compliance inspection at KCIA in May 2013, Ecology collected one solids sample from the influent vault to the KCIA south pump station. Sampling results were published during the current reporting period (Leidos 2015a). No screening level exceedances were identified in this sample.

KCIA cleaned lines and catch basins at the east side of the airport in November 2015. Approximately 90 storm drain lines were cleaned. Legacy sediments were removed, and storm drain line conditions were documented in videos and written reports. Stormwater line cleaning was planned for 2016 at the KCIA central area (runways and taxiways) and for 2017 at KCIA west areas (taxiways, parking lots, maintenance shop, airparks, and outfalls) (King County 2016b).

The following remediation activities were performed at KCIA-North Central during the current reporting period:

- KCIA performed an independent cleanup at a former Standard Oil site (7200 Perimeter Road) in January 2014. Activities included excavation and disposal of petroleum-contaminated soil; post-excavation sampling; dewatering; oxygen release compound placement; backfilling; well decommissioning; and well reinstallation. Post-construction monitoring was completed in February 2015; no detectable concentrations of gasoline-range hydrocarbons or lead were present in groundwater after four quarters of sampling (King County 2016b).
- KCIA performed an independent cleanup at a former Standard Oil site (7400 Perimeter Road) in November and December 2014; activities included excavation and disposal of

petroleum-contaminated soil; post-excavation sampling; dewatering; backfilling; oxygen release compound advanced injections; and well installation. Post-construction groundwater data indicate concentrations were below MTCA cleanup levels (King County 2017).

- KCIA performed an independent cleanup of the Former Hangar 5 site in February 2015. Activities included soil excavation and disposal; post-excavation sampling; dewatering; backfilling; oxygen release compound placement; and well reinstallation. Data indicate concentrations are below MTCA cleanup levels (King County 2017).

As of 2012, Western Metal Products no longer operates at KCIA. This location is now part of UPS operations. UPS presently is covered under the ISGP and is complying separately with Ecology requirements.

5.3 RM 3.9-4.3 East (Slip 6)

The RM 3.9-4.3 East (Slip 6) source control area includes several properties adjacent to the LDW: the 8801 Site (also known as the former PACCAR Site, currently occupied by Insurance Auto Auctions), the former Rhone-Poulenc Site (also occupied by Insurance Auto Auctions), parcels owned by the Museum of Flight, and the northern portion of the Boeing Developmental Center (BDC). In addition, it includes stormwater drainage from the south-central portion of KCIA, which discharges to the LDW through KCIA SD#1. The RM 3.9-4.3 East source control area is shown in Figure 5-4.

- Chemicals of concern for RM 3.9-4.3 East are metals, PCBs, PAHs, phthalates, other SVOCs, and petroleum hydrocarbons.
- There are five active outfalls in this area of the LDW; these include the County's KCIA SD#1, two private outfalls associated with the Insurance Auto Auctions facility, and two private outfalls associated with BDC-North. Several private and public stormwater systems continue to discharge into the KCIA SD#1; these include the City of Tukwila East Marginal Way, the Museum of Flight (Aviation High School) property, Aviation Business Center, and International Auto Auction stormwater systems.
- Of the 24 source control action items identified for this source control area, 11 have been completed. A total of 16 high priority action items were identified; 8 of these have been completed.

5.3.1 Business Inspections

Ecology conducted one inspection (Insurance Auto Auctions) within this source control area during the current reporting period.

5.3.2 Source Tracing

King County took over sampling of sediment trap KCIA1A from SPU in 2013. Storm drain solids (sediment trap and in-line grab samples) were collected in May 2014, May 2015, and May 2016. In addition, KCIA conducted a source tracing investigation in April 2016 to assess three major storm drain laterals (east, central, and west) to the Slip 6 basin. The investigation was intended to help focus future source control investigations and mitigation (King County 2017).

Screening level exceedances are summarized in Table 5-2 below.

Table 5-2. RM 3.9-4.3 East: Screening Level Exceedances in Source Tracing Samples

Chemical Class	Chemical	Sediment Trap (KCIA)	In-line Solids (KCIA)	On-Site CB Solids (KCIA)
Metals	Arsenic	×		
	Cadmium			×
	Zinc	×	☒	×
PAHs	LPAH			☒
	HPAH		☒	☒
Phthalates	BEHP	☒		☒
	Butylbenzyl phthalate			×
	Dibutyl phthalate	☒	×	×
TPH	TPH-oil			☒

Storm drain screening levels are listed in Table 2-6.

× = Exceedance of SCO (lower screening level) was observed during the current reporting period (2014 through 2016).

☒ = Exceedance of CSL (upper screening level) was observed during the current reporting period (2014 through 2016).

SPU collected 9 samples from the KCIA SD #1 drainage system prior to this reporting period. Chemicals that exceeded the CSLs in previous samples included LPAH (1 sample), HPAH (4 samples), BEHP (4 samples), butylbenzyl phthalate (1 sample), TPH-diesel (1 samples), and oil-range hydrocarbons (1 sample).

5.3.3 Facility-Specific Source Control Actions

8801 Site (Former Kenworth Truck / PACCAR)

In July 2006, PACCAR and Ecology signed Agreed Order No. DE-3599 to evaluate shoreline and nearshore sediments, seeps, and stormwater at the site. In November 2008, Ecology, PACCAR, and Merrill Creek Holdings (the property owner at that time) signed Agreed Order DE-6069 for upland cleanup, which includes completion of an RI/FS and Interim Action Work Plan (Ecology 2008c). Centerpoint Properties purchased the property in 2015. Ecology plans to amend the Agreed Order to add the new property owner. The site is currently used by Insurance Auto Auctions to store damaged vehicles.

- PACCAR submitted an Ecology Review Final Interim Action Work Plan to Ecology on April 8, 2014. Ecology provided comments to PACCAR. Revisions to the work plan were submitted to Ecology in January 2015. A recent change in property ownership and potential future land use may require additional modifications to the Interim Action Work Plan. Ecology continues to review the draft FS and Interim Action Work Plan.

Current Operations	Damaged vehicle storage
Historical Operations	Truck manufacturing
Address	8801 East Marginal Way S
Facility/Site ID	2072 (Kenworth Truck Co)
NPDES Permit	WAR008681 (Insurance Auto Auctions)
Chemicals of Concern	PCBs, PAHs, VOCs, phenols, phthalates, petroleum hydrocarbons, metals
Media Affected	Soil, groundwater, stormwater, and sediment

Ecology conducted a stormwater compliance inspection at Insurance Auto Auctions on October 20, 2014. Three water samples were collected from the facility’s storm drain system (Leidos 2015c). Samples were collected at the following locations:

- Manhole MH-S5, located at the southeast portion of the facility where damaged vehicles waiting for auction are stored. MH-S5 is located upstream of the stormwater treatment system. After treatment (or during bypass), stormwater is conveyed to the King County drainage system prior to discharge to the LDW at Slip 6.
- Catch basin CBN-60, which is located at the northwest portion of the facility and receives stormwater from roof drains on the vehicle storage warehouse, employee parking area, and the vehicle storage yard.
- Vault CV-01, located along the western and central portions of the facility. CV-01 is on the upstream side of a Vortechs vault that receives stormwater from the southern portion of the north parcel at the facility. The area is used to store cars awaiting auction.

Copper exceeded the marine chronic WQC in all three samples; total PCBs, and BEHP exceeded the human health WQC in all samples. Lead and several PAHs exceeded WQC in two of the samples. In addition, zinc exceeded the WQC in one sample.

Former Rhone-Poulenc Site (Container Properties)

The eastern half of this site is now owned by the Museum of Flight. Cleanup activities on the eastern half are complete.

Toluene, metals, and high pH affect groundwater, soil, and sediments throughout the western half of the site, known as the West Parcel.

- A groundwater pump-and-treat system with a barrier wall currently contains much of the soil and groundwater contamination at the West Parcel.
- EPA is also working with the responsible parties to begin an onsite study to inject carbon dioxide into the groundwater to see if it will lower pH at the site, and to conduct additional groundwater sampling to better understand the groundwater contamination. Information from this study and sampling, along with prior investigations, will be used to help determine appropriate corrective measures for cleaning up the West Parcel.¹⁸

Current Operations	Leased to Industrial Auto Auctions for wrecked vehicle storage
Historical Operations	Glue, paint, resin, and wood preservative manufacturing; vanillin manufacturing
Address	9229 East Marginal Way S
Facility/Site ID	2150 (Container Properties LLC)
NPDES Permit	WAR008681 (Insurance Auto Auctions)
Chemicals of Concern	PAHs, metals (copper), VOCs, PAHs, petroleum hydrocarbons
Media Affected	Soil, groundwater, sediment

¹⁸ <https://cumulis.epa.gov/supercpad/SiteProfiles/index.cfm?fuseaction=second.cleanup&id=1002020>

King County International Airport – South Central

Portions of KCIA are located in several separate source control areas. The south-central area of KCIA is discussed below. The north-central portion of KCIA is discussed in Section 5.2. The north area is discussed in Section 4.4.

During stormwater compliance inspections at KCIA on May 30 and 31, 2013, Ecology collected one water sample and one solids sample from the storm drain system in this area.

Results were published during the current reporting period (Leidos 2015a).

Current Operations	General aviation airport and related activities
Historical Operations	Military airport operations; general aviation
Address	7277 Perimeter Road S (main terminal); various tenant addresses
Facility/Site ID	None
NPDES Permit	WAR000343 (ISGP)
Chemicals of Concern	PAHs, phthalates, copper, zinc, petroleum hydrocarbons, and PCBs
Media Affected	Stormwater and, groundwater

- A water sample and a solids sample were collected from vault VT-1593 in the south-central portion of KCIA. PAHs exceeded the storm drain screening levels in the solids sample; copper exceeded the chronic marine WQC in the water sample.
- A solids sample was collected from catch basin CB-01; this catch basin may receive sheet flow from the adjacent Boeing Military Flight Center property. The sample contained BEHP and PCBs (6.4 mg/kg DW) at concentrations above the storm drain screening level.
- A solids sample (KC-DD-200) was collected from a drainage ditch upstream of OWS-2009. This location is at the southwest corner of KCIA, adjacent to the Boeing Military Flight Center; it has the potential to receive sheet flow from Boeing facility to the west. The sample contained cadmium, mercury, benzo(g,h,i)perylene, indeno(1,2,3-cd)pyrene, BEHP, benzoic acid, and PCBs (150 mg/kg DW) above the storm drain screening levels. The highest exceedance factors were for PCBs.

KCIA cleaned lines and catch basins at the east side of the airport in November 2015. Approximately 90 storm drain lines and catch basins were cleaned. Legacy sediments were removed, and storm drain line conditions were documented in videos and written reports. Stormwater line and catch basin cleaning was completed in 2016 at the KCIA central area (runways and taxiways) and for 2017 at KCIA west areas (taxiways, parking lots, maintenance shop, airparks, and outfalls) (King County 2016b).

A Slip 6 source tracing investigation was conducted by KCIA in April 2016, to assess three major storm drain laterals (east, central, and west) to KCIA's Slip 6 basin. Results of this effort will allow KCIA to focus source control investigations and mitigation. In the west lateral, zinc, PAHs, BEHP, and butylbenzyl phthalate exceeded storm drain screening levels. In the central lateral, zinc exceeded the screening levels. In the east lateral, zinc and PAHs exceeded the screening levels (King County 2017).

Boeing Developmental Center - North

Ecology conducted stormwater compliance inspections at BDC in December 2014. One water sample and one solids sample were collected from the facility's storm drain system in this area (Leidos 2015c).

- A water sample was collected from the influent chamber of oil/water separator OWS-14, which is located at the northwest area of the BDC and receives stormwater from the northwest parking lots and Building 9-08. Stormwater is conveyed from OWS-14 to the LDW via outfall DC14. Total PCB congeners and several PAHs exceeded the human health WQC in this sample.
- A solids sample was collected from oil/water separator OWS-15, which is located in the northern area of the facility and receives stormwater from the northeast parking lots, Buildings 9-07 and 9-77, and the Museum of Flight. Stormwater is conveyed from OWS-15 and discharges to the LDW via outfall DC15. Concentrations of zinc, total PCB congeners, several PAHs, cPAH TEQ, and dioxin/furan TEQ exceeded the storm drain screening levels.

Current Operations	Research and development
Historical Operations	Aircraft manufacturing
Address	9725 East Marginal Way S
Facility/Site ID	4581384 (BDC Norfolk) 2101 (Boeing A&M Developmental Center)
NPDES Permit	WAR000146 (ISGP)
Chemicals of Concern	PCBs, metals, solvents, petroleum hydrocarbons, and SVOCs
Media Affected	Soil, groundwater, stormwater, and sediment

5.4 RM 4.3-4.9 East (Boeing Developmental Center)

The RM 4.3-4.9 East (Boeing Developmental Center) source control area is shown in Figure 5-5. This source control area consists of a single facility, the central portion of the BDC, referred to as BDC-Central. The BDC-South is discussed in Section 5.5 (RM 4.9 East); BDC-North is discussed in Section 5.3 (RM 3.9-4.3 East).

- Chemicals of concern in the RM 4.3-4.9 East source control area are lead, PCBs, and PAHs.
- This source control area includes stormwater drainage from 10 active private outfalls located in the central portion of the BDC. There are no public storm drain outfalls located within RM 4.3-4.9 East.
- A total of nine action items were identified for this source control area; three of these have been completed. Two high-priority action items were identified; one of these has been completed as of December 2016.

5.4.1 Business Inspections

Ecology conducted two inspections (June and December 2014) at BDC during the current reporting period (Appendix E).

5.4.2 Source Tracing

Source tracing activities at BDC are discussed with facility-specific source control actions below (Section 5.4.3).

5.4.3 Facility-Specific Source Control Actions

BDC-Central

Boeing reported that a sub-grade water main ruptured at BDC in June 2014. The water main is owned by the City of Tukwila. Due to the rupture, three buildings were flooded. Water flowing out of the buildings entered the storm drain system. Boeing estimates that 40,000 to 80,000 gallons of potable water with some solids entered the storm drain system, though some water may have reached sanitary sewer drains. The leak may have caused an exceedance of Boeing's stormwater discharge permit (Ecology 2014i).

Current Operations	Research and development
Historical Operations	Aircraft manufacturing
Address	9725 East Marginal Way S
Facility/Site ID	4581384 (BDC Norfolk) 2101 (Boeing A&M Developmental Center)
NPDES Permit	WAR000146 (ISGP)
Chemicals of Concern	PCBs, metals, solvents, petroleum hydrocarbons, and SVOCs
Media Affected	Soil, groundwater, stormwater, and sediment

Ecology conducted stormwater compliance inspections at BDC in December 2014. Three water samples and three solids samples were collected from the facility's storm drain system in the BDC-Central area (Leidos 2015c).

- Water samples were collected at the following locations:
 - Manhole MH-5.16, located near the southwest bank of BDC-Central. MH-5.16 receives stormwater from an area that drains paved driveways and roofs of Buildings 9-80, 9-85, and 9-102. Stormwater conveyed from MH-5.16 discharges to the LDW via outfall DC5.
 - Manhole MH-11.31, located in the west-northwestern area of BDC-Central. MH-11.31 receives stormwater from the west and northwest parking lots and Building 9-99. Stormwater is conveyed from MH-11.31 to oil/water separator OWS-11 and then discharges to the LDW via outfall DC11.
 - Manhole MH-12.56, which receives stormwater from a grassy area between parking lots in the west-northwestern area of BDC-Central. Stormwater conveyed from MH-12.56 discharges to the LDW via outfall DC12.
- Total PCB congeners exceeded the human health WQC in all three water samples; in addition, several PAHs exceeded the human health WQC at MH-12.56.
- Solids samples were collected at the following locations:
 - A solids sample was collected from manhole MH-9.66, which is located in the western area of the central portion of the BDC. MH-9.66 receives stormwater from a parking lot

and Building 9-96. Stormwater is conveyed from MH-9.66 to oil/water separator OWS-9 and then discharges to the LDW via outfall DC9.

- A solids sample was collected from manhole MH-10.9, which is located in the western area of BDC-Central. MH-10.9 receives stormwater from the west parking lots and Building 9-99 and 9-98. Stormwater is conveyed from MH-10.9 to oil/water separator OWS-10 and then discharges to the LDW via outfall DC 10.
- A solids sample was collected from manhole MH-13.43, which is located in the west-northwestern area of BDC-Central. MH-13.43 receives stormwater from the northwest and west parking lots and Building 9-12. Stormwater is conveyed from MH-13.43 to oil/water separator OWS-13 and then discharges to the LDW via outfall DC-13.
- Zinc, total PCBs, several PAHs, and cPAH TEQ in solids exceeded the storm drain screening levels (Table 2-6) at all three locations. Dioxin/furan TEQ exceeded screening levels at MH-10.9 and MH-13.43; cadmium, mercury, and silver exceeded the screening levels at MH-10.9.

The ISGP requires the removal of accumulated solids from storm drain lines (including inlets, catch basins, sumps, conveyance lines, and oil/water separators) prior to October 1, 2016. Site-wide storm drain cleaning was scheduled to be performed at BDC during the 3rd quarter of 2015 (Bet 2015). The status of the line cleaning was not available at the time this Status Report was prepared.

5.5 RM 4.9 East (EAA-7: Norfolk CSO/SD)

The RM 4.9 East (EAA-7: Norfolk CSO/SD) source control area includes Boeing parcels adjacent to the LDW, the southern portion of KCIA, and upland properties in the Norfolk storm drain basin (Figures 5-6 and 5-7).

- Chemicals of concern for the RM 4.9 East source control area are metals, PCBs, PAHs, phthalates, phenols, and other SVOCs.
- There are 12 active outfalls in this source control area; these include five private outfalls associated with the southern portion of the BDC (BDC-South), the Norfolk CSO/SD/EOF, five unknown outfalls upstream of RM 4.9 East, and the I-5 storm drain at S Ryan Way. The Norfolk CSO is controlled to allow no more than one untreated discharge event on average per year.
- Of the 42 action items identified for this source control area, 19 have been completed. Three of the action items are considered high priority; one of these has been completed.

5.5.1 Business Inspections

SPU conducted a total of 66 inspections at 29 facilities in the Norfolk CSO/SD basin during the current reporting period, including one screening visit, 30 initial inspections, and 35 follow-up inspections (Appendix C).

Ecology conducted 15 inspections at 12 facilities within this source control area during the current reporting period (Appendix E).

5.5.2 Source Tracing

SPU reported that it would conduct source tracing in the S Norfolk drainage system along Martin Luther King Way S to investigate elevated levels of HPAHs, as part of Seattle's SCIP. SPU planned to re-inspect all businesses in this drainage system and sample where possible (SPU 2015b) during the 5-year SCIP period which ends in 2020.

During the current reporting period, SPU collected 61 storm drain solids samples in this drainage basin, including 15 sediment trap samples, 14 in-line solids samples, 23 on-site catch basin samples, seven right-of-way catch basin samples, and two samples of street dirt/soil.

King County has discontinued source tracing sampling in the southern portion of KCIA, with Ecology approval, since no industrial activity is performed in that area.

Complete sample results for the current reporting period are presented in Appendix F; sample locations are shown in Figures 5-6 and 5-7. Screening level exceedances are summarized in Table 5-2 below.

**Table 5-3. RM 4.9 East: Screening Level Exceedances
in SPU Source Tracing Samples**

Chemical Class	Chemical	Sediment Traps	In-line Solids	On-site CB Solids	Right-of-Way CB Solids
Metals	Chromium			☒	
	Copper			☒	
	Lead	☒			
	Zinc	☒	☒	☒	☒
PCBs	PCBs, total	×	×	☒	
PAHs	LPAHs	☒		☒	
	HPAHs	☒		☒	
	Total cPAHs	☒		☒	
Phthalates	BEHP	☒	☒	☒	☒
	Butylbenzyl phthalate	×	×	☒	×
	Dibutyl phthalate		☒		
	Dimethyl phthalate	☒	☒	×	☒
	Di-n-octyl phthalate	☒		×	☒
Phenols	2-Methylphenol			☒	
	4-Methylphenol	☒		☒	☒
	Pentachlorophenol			☒	
	Phenol	×		×	
Other SVOCs	Benzoic acid	☒	☒	☒	
	Benzyl alcohol	☒	☒	☒	☒
	Dibenzofuran	☒			
	N-Nitrosodiphenylamine			☒	
TPH	Diesel-range hydrocarbons		☒	☒	☒
	Oil-range hydrocarbons	☒	☒	☒	☒

Storm drain screening levels are listed in Table 2-6.

× = Exceedance of SCO (lower screening level) was observed during the current reporting period (2014 through 2016).

☒ = Exceedance of CSL (upper screening level) was observed during the current reporting period (2014 through 2016).

SPU collected 65 samples from the S Norfolk CSO/EOF/SD drainage system prior to this reporting period. Chemicals that exceeded the CSLs in previous samples included arsenic (1 sample), cooper (1 sample), lead (1 sample), zinc (11 samples), LPAH (5 samples), HPAH (7 samples), cPAH (23 samples), 2-methylnaphthalene (7 samples), BEHP (35 samples), butylbenzyl phthalate (5 samples), dimethyl phthalate (18 samples), diesel-range hydrocarbons (7 samples), oil-range hydrocarbons (31 samples), 4-methylphenol (2 samples), benzoic acid (5 samples), benzyl alcohol (12 samples), and dibenzofuran (2 samples).

5.5.3 Facility-Specific Source Control Actions

Boeing Developmental Center - South

The BDC property straddles three source control areas. BDC-South is located in the RM 4.9 East source control area and it is discussed below. BDC-Central is discussed in Section 5.4; BDC-North is discussed in Section 5.3.

Boeing performed a removal action in the LDW immediately offshore of the BDC south storm drain outfall under Ecology’s VCP in 2003.

Boeing performs annual monitoring for PCBs in the backfill material

installed during the 2003 sediment removal action. The monitoring data is used to evaluate the effectiveness of source control measures that have been implemented in the south storm drain system.

As part of the 2003 removal action, Boeing installed a Vortechincs 9000 swirl concentrator upstream of the outfall. Boeing has performed annual cleanouts of the Vortechincs 9000 every fall since 2004. The accumulated solids in the Vortechincs unit are sampled for PCBs prior to the annual cleanout (Bet 2015). Available data are summarized below.

Data for the 2016 annual sampling round were not available at the time this Status Report was prepared.

Current Operations	Research and development
Historical Operations	Aircraft manufacturing
Address	9725 East Marginal Way S
Facility/Site ID	4581384 (Boeing Development Center Norfolk) 2101 (Boeing A&M Developmental Center)
NPDES Permit	WAR000146 (ISGP)
Chemicals of Concern	PCBs, metals, solvents, petroleum hydrocarbons, and SVOCs
Media Affected	Soil, groundwater, stormwater, and sediment

Table 5-4. BDC South Storm Drain Line Monitoring

Sampling Date	Total PCBs in Backfill Surface Sediment (mg/kg DW)	Total PCBs in Storm Drain Solids (Vortechinics 9000 and upstream) (mg/kg DW)
Oct 2010	<0.03 – 0.56	0.16 - 22
Nov 2011	<0.03 – 0.67	1.2 - 17
Aug 2012	<0.02 – 0.24	0.24 - 15
Sep 2013	0.05 – 0.17	6.6 – 9.4
Sep 2014	<0.02 – 1.8	1.1 – 2.7
Sep 2015	<0.03 – 0.53	5.0 - 13

Ecology conducted stormwater compliance inspections at BDC in December 2014. Two water samples were collected from the storm drain system within the BDC-South area during the inspection (Leidos 2015c). Samples were collected from the following locations:

- Manhole MH-1.32, which is located in the southern area of BDC-South. MH-1.32 receives stormwater from an area that drains the southern parking lot. PCBs (0.00025 µg/L) and several PAHs exceeded the human health WQC in this sample.
- Effluent chamber of oil/water separator OWS-02, which receives stormwater from an area that drains the southeast side of Building 9-101. Zinc (130 µg/L) exceeded the marine chronic WQC in this sample; total PCBs (0.054 µg/L) exceeded both the marine chronic WQC and the human health WQC.

Boeing Military Flight Center

Boeing is conducting source control and cleanup work at the Military Flight Center to address PCBs present in stormwater flowing offsite from the facility, in certain building materials, and in offsite soils.

Boeing submitted a report to EPA and Ecology in January 2014 that documented storm drain, surface, and soil cleanup activities performed by Boeing during 2013 (Landau 2014a).

Stormwater discharges at the Military Flight Center are covered under an ISGP. The following actions are related to the ISGP:

- On January 8, 2014, Ecology issued a Notice of Violation to the Military Flight Center for violations of its ISGP by discharging PCBs to waters of the state (Ecology 2014a).
- Boeing requested that Ecology withdraw the Notice of Violation in February 2014 due to a lack of information or data establishing that a violation of WQ standards had occurred.

Current Operations	Flight line support, including aircraft storage, preparation for flight, general servicing, maintenance, and repair
Historical Operations	Aircraft operations since 1958. Prior to 1958, the site was used for machinery salvage and farm uses and as a department store.
Address	10002 East Marginal Way S
Facility/Site ID	7711519
NPDES Permit	WAR000150
Chemicals of Concern	VOCs, PCBs, PAHs, metals, and petroleum hydrocarbons
Media Affected	Stormwater, storm drain solids, soil

Boeing agreed that continued source control actions were needed to ensure protection of sediment in the LDW (Bet 2015).

- Ecology issued an Administrative Order in April 2014 that required Boeing to revise their Stormwater Monitoring Plan to identify four representative discharge locations and to include PCBs with a method detection limit of at least 0.03 µg/L (Bet 2015).
- Boeing conducted stormwater monitoring for PCBs in July 2014, November 2014, and January 2015 at these four locations (Bet 2015). Detection limits ranged from 0.010 to 0.019 µg/L. Concentrations ranged as follows:
 - MFC-1: 0.35 µg/L in July 2014; non-detect in November 2014 and January 2015
 - MFC-2: non-detect in November 2014; 0.037 µg/L in January 2015
 - MFC-3: non-detect in July and November 2014; 0.070 µg/L in January 2015
 - MFC-4: non-detect in July and November 2014; 0.014 µg/L in January 2015
- Boeing sampled catch basin filters at 13 locations during May 2014 and April 2015, prior to filter replacement. PCB concentrations in captured filter solids ranged from 0.31 to 6.7 mg/kg DW during 2014, decreasing at all 13 locations and ranging from non-detect to 2.7 mg/kg DW during 2015. Catch basin filters were replaced after each sampling event (Bet 2015).
- EPA approved Boeing's proposal to construct a filtration swale to control PCBs in surface water leaving the Military Flight Center via the KCIA property, pending resolution of access and other issues between Boeing and King County. The goal of these efforts is to ensure PCBs unauthorized for use under TSCA are removed, and that residual PCBs are cleaned up to the degree necessary to ensure that surface water at and from the facility meets TSCA and state water quality requirements.

Boeing continued soil cleanup activities during the current reporting period. The following activities related to soil cleanup were conducted:

- Boeing submitted a draft work plan to EPA and Ecology in April 2014 for the removal of soil containing PCBs on the eastern side of the Military Flight Center site (delineated in 2013), and to add stormwater drainage system improvements to increase the quality of stormwater leaving the eastern flight line areas. After responding to Ecology and EPA comments on the work plan, it was finalized and EPA provided a Risk-Based Approval in July 2014 (Bet 2015).
- The work plan was implemented and soil cleanup activities on the eastern side of the site were completed during fourth quarter of 2015 (Boeing 2016b). A final cleanup report was due to EPA and Ecology in 2016; the report was not available at the time this Status Report was prepared.

Various building materials and concrete joint compounds were evaluated during 2014 as a continuation of ongoing source control investigations and source control work.

- During this reporting period, Boeing completed three rounds of removal of PCB-containing concrete joint material (CJM) from the tarmac areas of the facility and is currently

conducting rehabilitation of certain buildings at the site that contain PCBs in paint and caulk.

- Boeing collected and analyzed 84 CJM samples from flight line areas between March and May 2014. The highest concentrations of PCBs were found in one aircraft stall at the northeast corner of the flight line. PCBs were detected at one sample location (CJM15) at 2,600 mg/kg. In September 2014, 24 additional samples were collected from this aircraft stall to further delineate areas where CJM removal would be performed. PCB Aroclor concentrations ranged from non-detect to 1,800 mg/kg in these samples (Bet 2015).
- Boeing completed removal of approximately 2,700 linear feet of PCB-containing CJM from the northeast flight line stall during October and November 2014. A technical memorandum describing the removal was submitted to EPA and Ecology on November 26, 2014 (Bet 2015).
- In April 2014, Boeing collected three roof samples from the 13-01 building. PCB Aroclors were not detected in these samples (Bet 2015).

After data obtained during a 2013 source control investigation identified paint and caulk containing PCB Aroclors above 50 mg/kg on the 13-01 and 13-02 buildings, Boeing notified EPA in December 2014 that it planned to perform abatement of the PCBs in building materials and to encapsulate residual PCBs that could not be removed from concrete. In March 2015, Boeing met with Ecology and EPA to discuss preliminary design plans for PCB caulk removal and installation of new siding. Ecology and EPA agreed that Boeing could implement the design without further agency approvals (Bet 2015).

- Boeing submitted a work plan to address the PCBs in paint and caulk in April 2015; plans included removal of material containing more than 50 mg/kg PCBs from the buildings; application of a polymeric coating; and installation of new exterior metal siding to the remaining material. The coating and siding would encapsulate the materials that contain less than 50 mg/kg PCBs to prevent future releases from the buildings. Abatement of PCB-containing materials was expected to occur during late summer and fall of 2015; the current status was not available at the time this Source Control Status Report was prepared.

Unified Grocers

Ecology conducted a stormwater compliance inspection at Unified Grocers on September 11, 2014. One water sample and three solids samples (including one field duplicate) were collected from the facility's storm drain system (Leidos 2015c).

- The water sample was collected from manhole MH-60, which appeared to receive stormwater from the north and central portions of the facility, and from roof drains from the Dry Grocery Building along the

Current Operations	Wholesale distribution of food products and related non-food items to retail markets and stores
Historical Operations	Truck shop, gasoline service station
Address	2201 S Norfolk Street
Facility/Site ID	73338176
NPDES Permit	WAR002040 (ISGP)
Chemicals of Concern	Copper, mercury, zinc, PCBs, PAHs, cPAHs, phthalates, dioxins/furans, and petroleum hydrocarbons
Media Affected	Stormwater and storm drain solids

eastern portion of the property. Stormwater is conveyed from MH-60 offsite to a city storm drain line along S Norfolk Street. Copper, mercury, and zinc concentrations exceeded the chronic marine WQC in this sample. Total PCBs (0.0015 µg/L) and PAHs exceeded the human health WQC in this sample.

- Solids samples MH-60 and duplicate FD-01 were also collected from manhole MH-60. Mercury, zinc, PCBs, dioxins/furans, PAHs, phthalates, n-nitrosodiphenylamine, and petroleum hydrocarbons exceeded the storm drain screening levels (Table 2-6).
- One solids sample was collected from manhole MH-76, which is located in the central portion of the facility. According to the facility map, piping from MH-76 connects with the WSDOT mainline that runs through the property. Phthalates and petroleum hydrocarbons exceeded the storm drain screening levels in this sample.

Boeing Field Chevron

The Boeing Field Chevron site is located south of the RM 4.9 East source control area, but is discussed here because Ecology identifies it as an LDW cleanup site. In July 2015, Ecology, Chevron, the RPNP Corporation, and Rajbir and Pradeep Sandhu signed Agreed Order DE-10947 for upland cleanup at this site. This includes completion of an RI/FS and draft CAP (Ecology 2015j).

Current Operations	Service station with underground storage of gasoline
Historical Operations	Same as current (since 1940)
Address	10805 Tukwila International Boulevard, Tukwila
Facility/Site ID	2551
Chemicals of Concern	Petroleum hydrocarbons, VOCs
Media Affected	Soil and groundwater

Ecology authorized G-Logics to begin RI field work on behalf of the PLPs in September 2016. RI field activities included installation of 10 groundwater monitoring wells and collection of groundwater samples from 23 monitoring wells. Groundwater from sample ME-16 contained gasoline-range hydrocarbons, benzene, toluene, and xylenes at concentrations exceeding MTCA Method A or B cleanup levels. In December 2016, G-Logics decommissioned 18 wells, performed an initial vapor intrusion assessment for the site, and submitted a progress update to Ecology documenting the RI activities conducted to date (G-Logics 2016).

Steeler

In 2016, SPU issued an NOV to Steeler (10023 Martin Luther King Way S) due to storage of leachable galvanized metal rolls and product outside without cover, lack of maintenance on forklift equipment which allowed fuel leaks to continue, storage of liquid containers in uncovered containment area, and inadequate preparation for spill response. Steeler implemented all of the necessary improvements by the end of 2016.

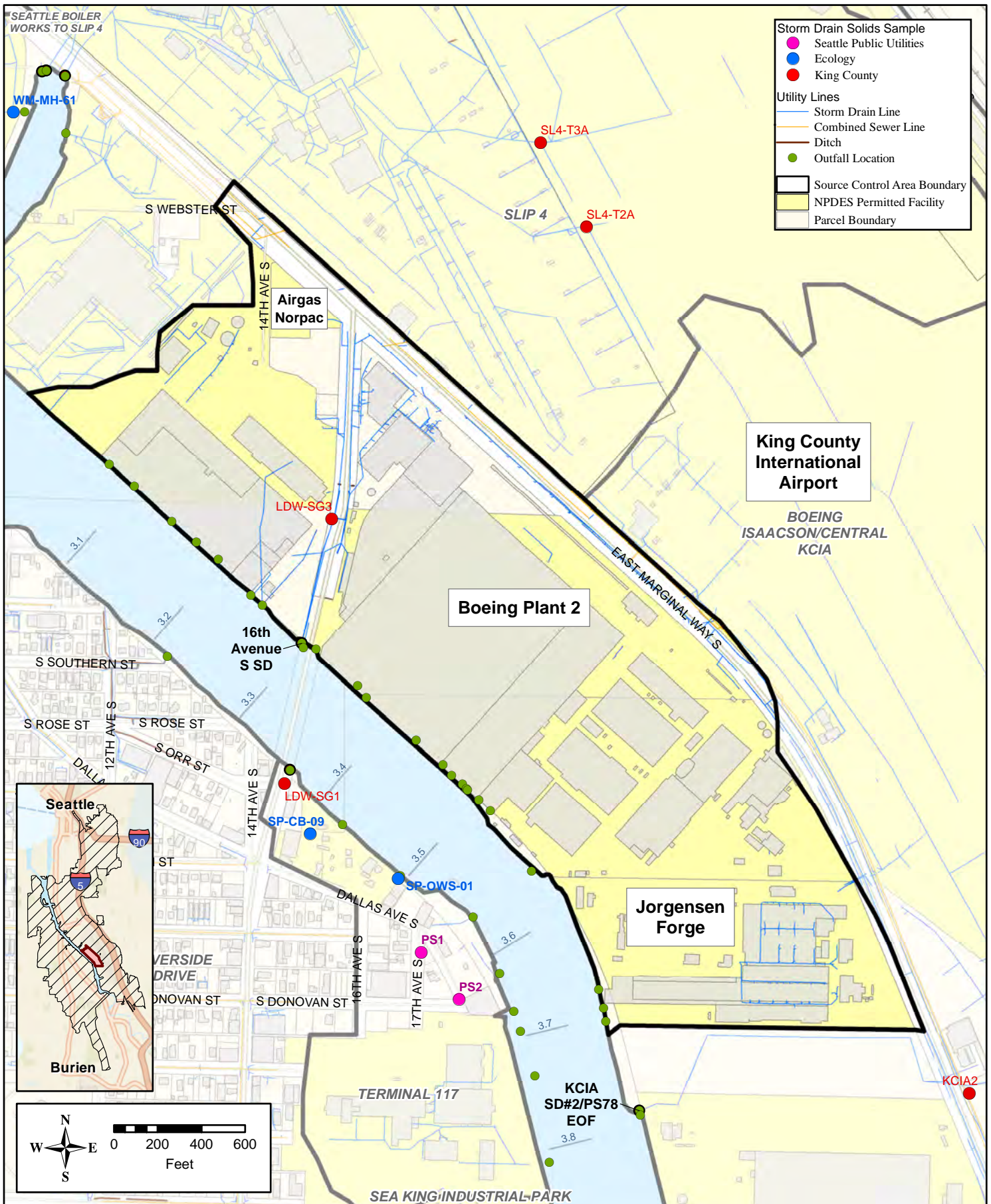
MacDonald Miller

In 2016, SPU inspected MacDonald Miller (3701 S Norfolk Street) and found that a stormwater treatment system installed as a Level 3 corrective action response under the ISGP had not obtained the appropriate City permits. In addition, they had removed an orifice plate on the flow

control structure for the onsite detention system. SPU required MacDonald Miller to obtain the necessary City permits and re-install the orifice plate.

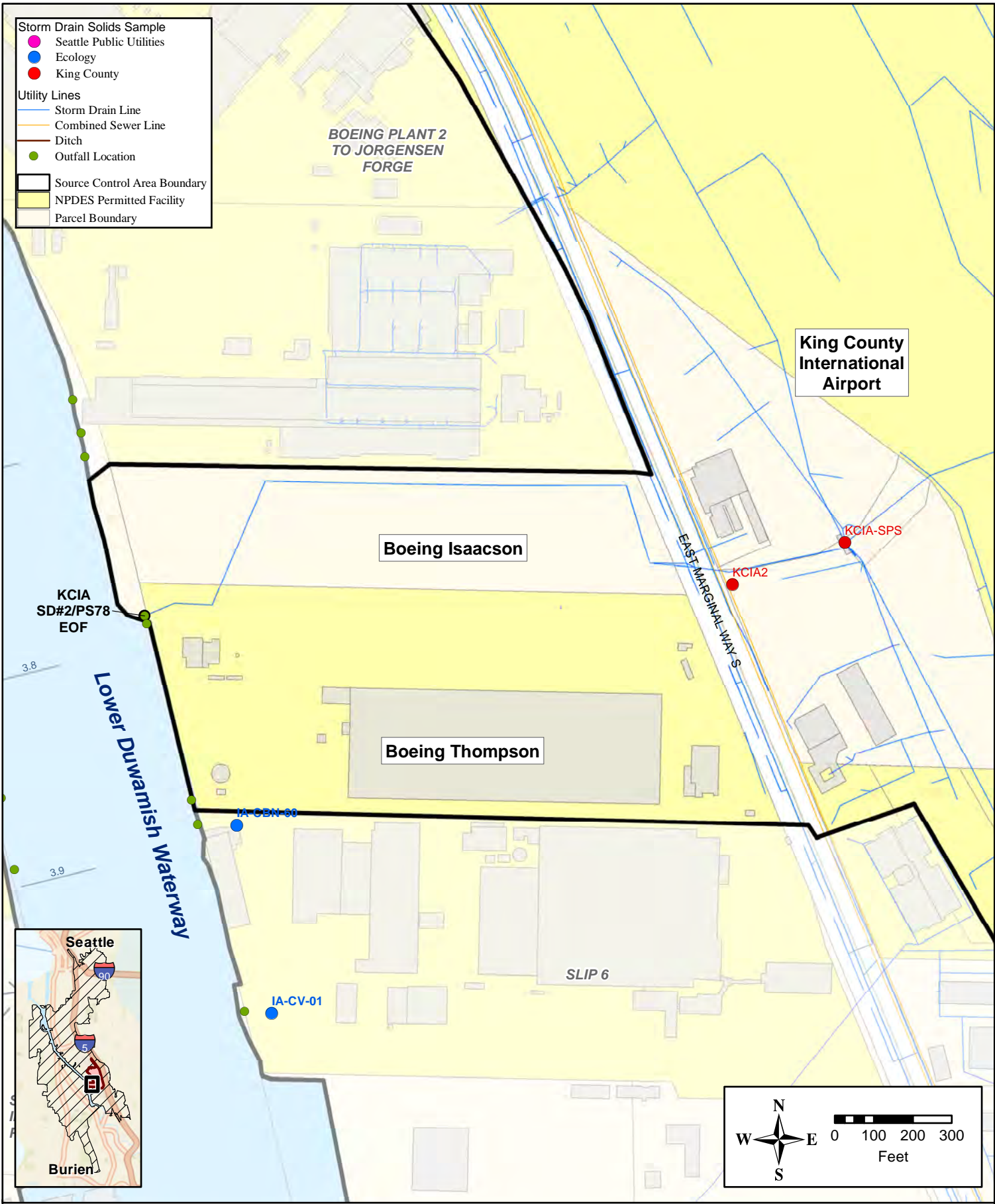
BNSF diesel spill

In 2016, SPU responded to a spill of approximately 2,500 gallons of diesel on the east side of the BNSF tracks north of Military Road S. Fuel soaked into the ballast and flowed to an adjacent ditch that flows south and eventually enters the KCIA SD#1 system. SPU provided the initial response, supported the investigation of drainage pathways, and worked jointly with Ecology and the U.S. Coast Guard to oversee cleanup. BNSF's contractor constructed trenches to intercept the oil and installed sorbent booms in downstream structures to recover the product and prevent material from reaching the downstream drainage system tributary to Slip 6.



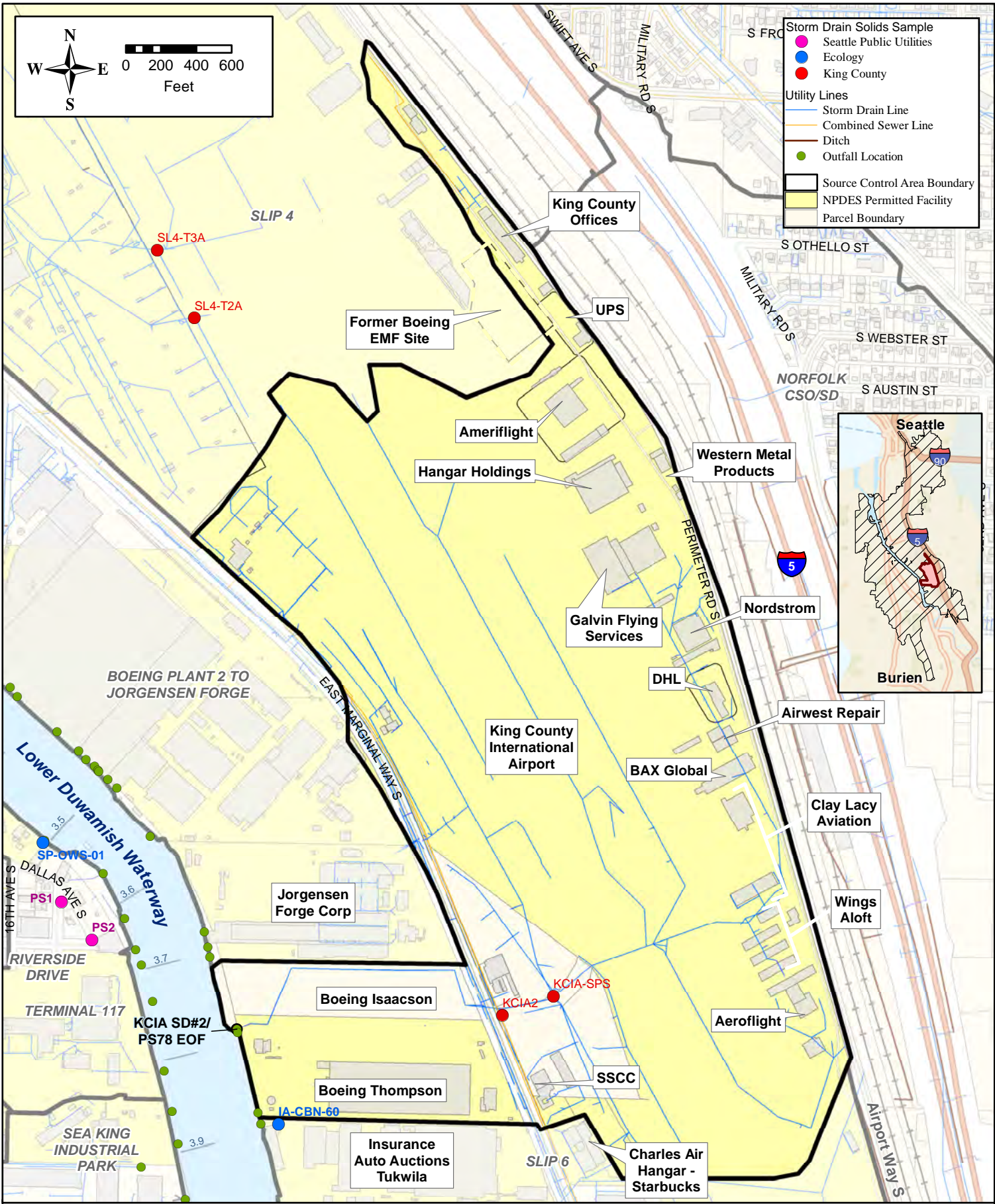
**Figure 5-1. RM 2.8-3.7 East
(EAA-4: Boeing Plant 2 to Jorgensen Forge)
Source Control Area**





**Figure 5-2. RM 3.7-3.9 East
(EAA-6: Boeing Isaacson/Central KCIA)
Boeing Thompson and Isaacson Properties**





**Figure 5-3. RM 3.7-3.9 East
(EAA-6: Boeing Isaacson/Central KCIA)
Central KCIA**



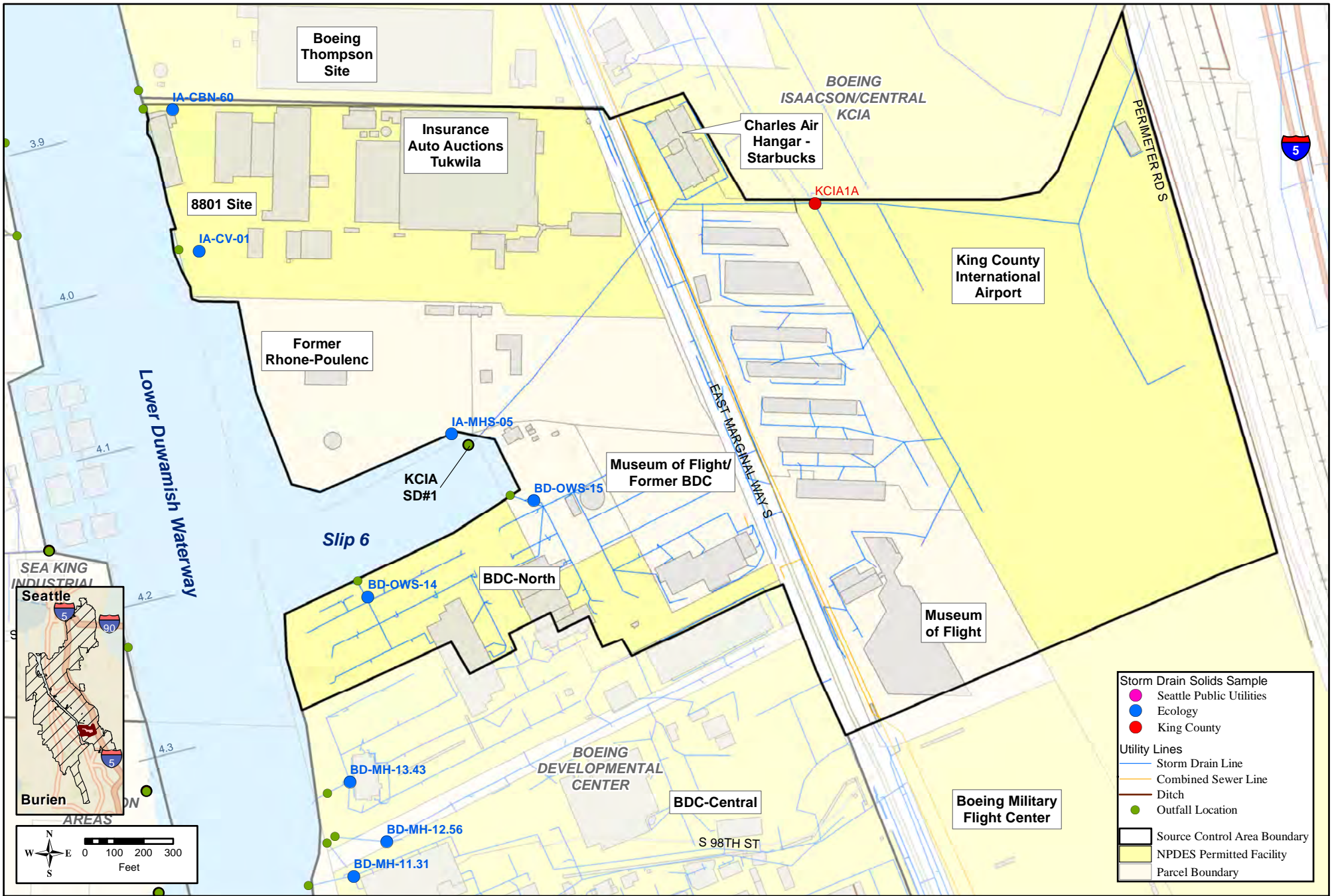
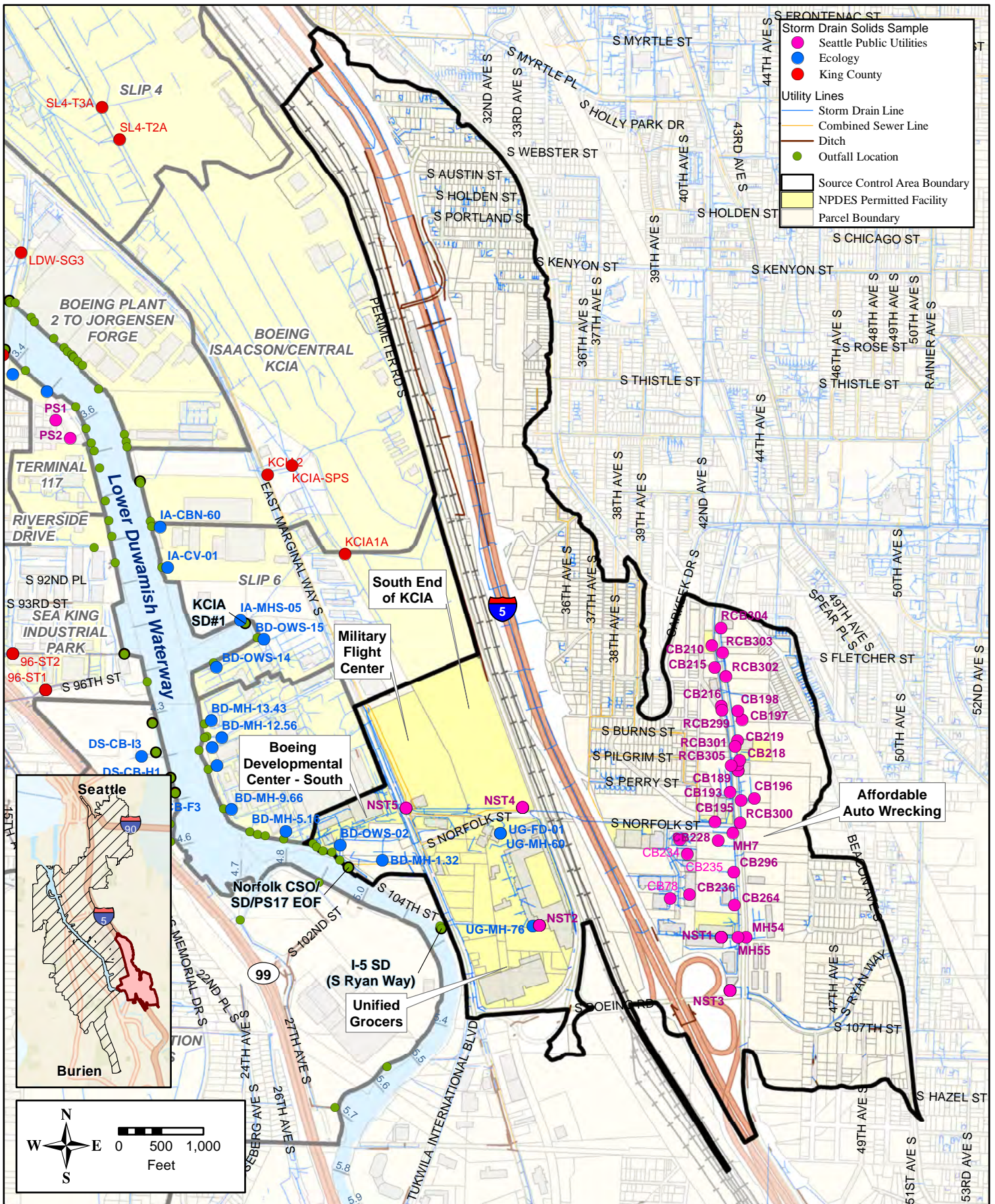


Figure 5-4. RM 3.9-4.3 East (Slip 6) Source Control Area



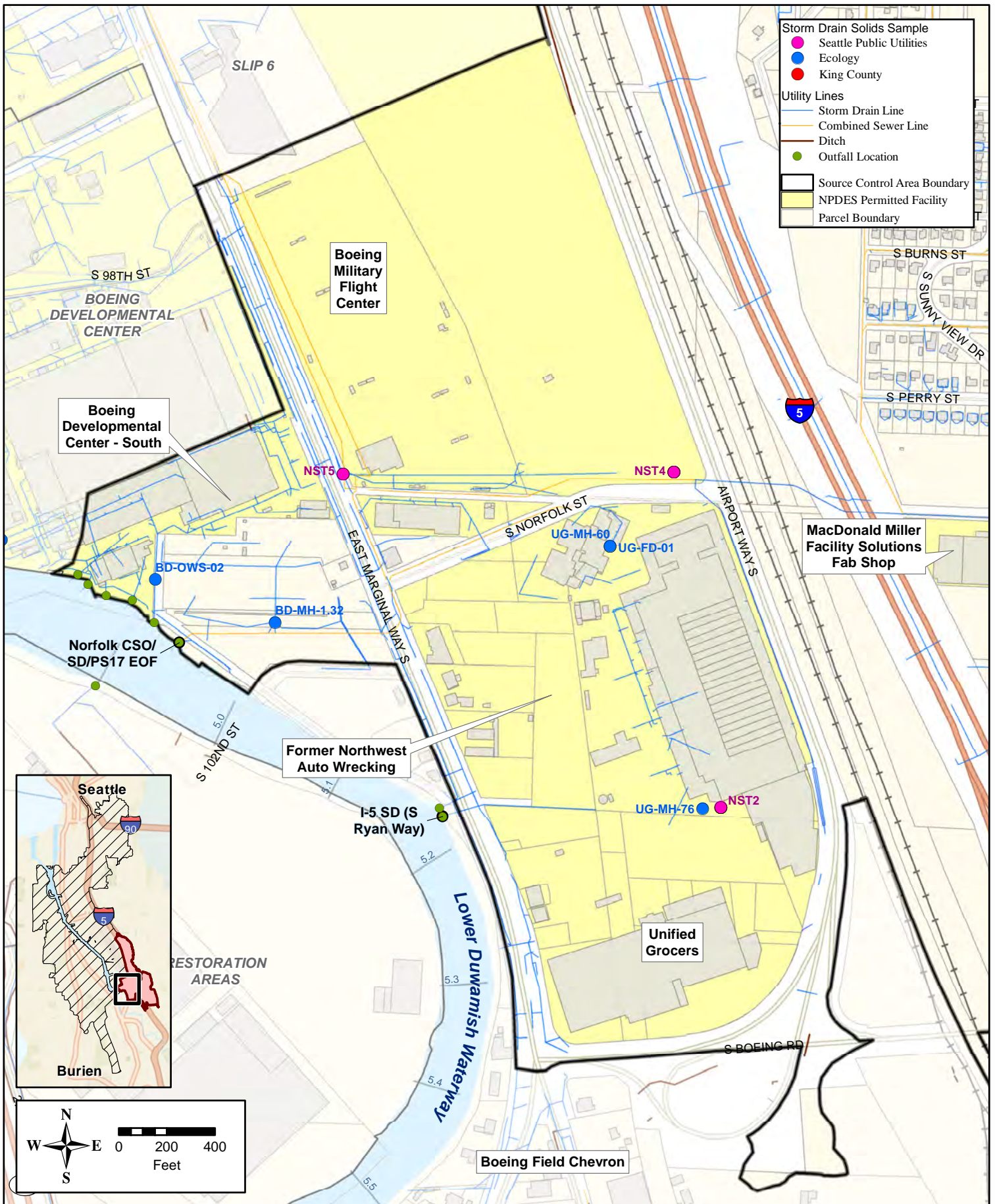
**Figure 5-5. RM 4.3-4.9 East
(Boeing Developmental Center)
Source Control Area**





**Figure 5-6. RM 4.9 East
(EAA-7: Norfolk CSO/Storm Drain)
Norfolk Basin**





**Figure 5-7. RM 4.9 East
(EAA-7: Norfolk CSO/Storm Drain)
Source Control Area**



6.0 Lower Reach – West Side

This section includes the following source control areas:

- RM 0.0-1.0 West (Spokane Street to Kellogg Island)
- RM 1.0-1.3 West (Kellogg Island to Lafarge Cement)
- RM 1.3-1.6 West (Glacier Bay)

This area includes two Ecology cleanup sites: Glacier Northwest/Reichhold Chemical and Duwamish Shipyard.

6.1 RM 0.0-1.0 West (Spokane Street to Kellogg Island)

The RM 0.0-1.0 West (Spokane Street to Kellogg Island) source control area includes Port of Seattle Terminals 103,105 and 107; General Recycling of Washington; and Herring's House Park. In addition, it includes properties in the SW Dakota Street and SW Idaho Street storm drain basins (Figure 6-1).

- Chemicals of concern for this source control area include metals (lead, mercury, and zinc), PAHs, phthalates, phenols, VOCs, and PCBs.
- There are 14 active outfalls to the LDW within this source control area. These include six Port of Seattle outfalls, a ditch at Glacier Northwest Aggregates, City of Seattle storm drains at SW Dakota Street and SW Idaho Street, the County's Duwamish West CSO/EOF, a creek at Herring's House Park, and an outfall associated with the Evergreen Trails property.
- Of the 36 action items identified for this source control area, 10 have been completed. No high priority action items were identified.

6.1.1 Business Inspections

SPU conducted a total of 35 inspections at 22 facilities in the SW Dakota Street and SW Idaho Street storm drain basins during the current reporting period, including 12 inspections at 8 facilities in the SW Dakota Street storm drain basin and 23 inspections at 14 facilities in the SW Idaho Street storm drain basin (Appendix C).

Ecology conducted inspections at seven facilities in the RM 0.0-1.0 West source control area during the current reporting period (Appendix E). Two of these facilities (Fog Tite and General Recycling of Washington) are covered under the ISGP.

6.1.2 Source Tracing

SPU collected nine sediment trap samples in the SW Idaho Street storm drain basin during the current reporting period (Appendix F).

- Sediment trap samples ID-ST1 and ID-ST3 collected on in May 2014 contained benzyl alcohol at 4.4 mg/kg DW and 6.4 mg/kg DW, respectively, well above the CSL value of 0.073 mg/kg DW. ID-ST1 is located in a pipe that serves a residential area and the South

Seattle Community College. ID-ST3 is located in a channel that serves a residential area and forested area along Puget Ridge Creek (Figure 6-1).

No samples were collected in the SW Dakota Street storm drain basin during the current reporting period.

Complete sample results for the current reporting period are presented in Appendix F; sample locations are shown in Figure 6-1. Screening level exceedances are summarized in Table 6-1 below.

Table 6-1. RM 0.0-1.0 West: Screening Level Exceedances in SPU Source Tracing Samples

Chemical Class	Chemical	Sediment Traps	In-line Solids	On-site CB Solids	Right-of-Way CB Solids
Metals	Zinc	☒	ns	ns	ns
PCBs	PCBs, total	×	ns	ns	ns
PAHs	Total cPAHs	☒	ns	ns	ns
Phthalates	BEHP	☒	ns	ns	ns
	Butylbenzyl phthalate	×	ns	ns	ns
Other SVOCs	2-Methylphenol	☒	ns	ns	ns
	4-Methylphenol	☒	ns	ns	ns
	Benzoic acid	☒	ns	ns	ns
	Benzyl alcohol	☒	ns	ns	ns
	Phenol	×	ns	ns	ns
TPH	Diesel-range hydrocarbons	☒	ns	ns	ns
	Oil-range hydrocarbons	☒	ns	ns	ns

Storm drain screening levels are listed in Table 2-6.

× = Exceedance of SCO (lower screening level) was observed during the current reporting period (2014 through 2016).

☒ = Exceedance of CSL (upper screening level) was observed during the current reporting period (2014 through 2016).

ns = not sampled

SPU collected 11 samples from the SW Dakota Street and SW Idaho Street drainage systems between 2005 and 2014. Chemicals that exceeded the CSLs in previous samples included BEHP (3 samples), butylbenzyl phthalate (2 samples), di-n-butyl phthalate (1 sample), benzoic acid (2 samples), and benzyl alcohol (3 samples).

6.1.3 Facility-Specific Source Control Actions

Terminal 103

The Port of Seattle's Terminal 103 property is leased to General Construction Company and CalPortland Seattle Aggregate Yard (also known as Northwest Aggregates).

- The Port of Seattle cleaned 17 structures and 1,337 feet of storm drain lines in November 2014. A total of 2.09 tons of solids were removed (Port of Seattle 2015). Sediment traps were installed at locations CB8118 and CB8126 in December 2014; they were retrieved in April 2015 and solids were analyzed for metals, PCBs, SVOCs, and grain size, and total solids. One sample was also analyzed for dioxins/furans.
 - Detection limits were above the storm drain screening levels for many of the SVOCs.

- Fluoranthene slightly exceeded the SCO value in one sample; zinc (1,600-1,800 mg/kg) and BEHP (37-60 mg/kg DW) exceeded both the SCO and CSL values in both samples. The dioxin/furan TEQ (52.9 ng/kg) exceeded the LDW RAL of 25 ng/kg TEQ.

General Recycling of Washington

During an April 2013 stormwater compliance inspection at General Recycling, Ecology collected one stormwater sample and three storm drain solids samples. Sampling results were published during the current reporting period (Leidos 2015a).

- The water sample was collected from a port on the effluent line of the facility’s stormwater treatment system at MH-01. The treatment system processes the majority of stormwater at the facility.
 - Total PCB congeners (0.0113 µg/L) exceeded the human health WQC in this sample.
- Solids samples were collected from the following locations:
 - Manhole MH-03, which is located upstream of the facility’s treatment system and receives stormwater from an oil/water separator to the north and a stockpile yard to the west.
 - Catch basin CB-07, which is located on the southwest portion of the facility, and receives stormwater in contact with material stockpiles to the north and west.
 - Oil/water separator WS-05, which is located on the south side of the crushed aluminum can and tire piles. The location is also south of a railway used to transport incoming material.
- Metals (cadmium, copper, lead, mercury, zinc), BEHP, butylbenzyl phthalate, n-nitrosodiphenylamine, and total PCBs exceeded the storm drain screening levels (Table 2-6) in all three solids samples. PAHs, phenols, and dioxin/furan TEQ also exceeded the screening levels in one or more samples. The highest screening level exceedances were for mercury, zinc, phthalates, and PCBs.

Current Operations	Receives, stores, and ships pre-processed ferrous scrap materials
Historical Operations	Fertilizer plant
Address	4260 West Marginal Way SW, Seattle
Facility/Site ID	18553
NPDES Permit	WAR002341 (ISGP)
Chemicals of Concern	Cadmium, copper, lead, mercury, zinc, PAHs, phthalates, phenols, PCBs, and hydrocarbons
Media Affected	Groundwater, stormwater, and stormwater solids

On February 11, 2015, Ecology issued an Administrative Order (Docket No. 10984) requiring General Recycling to conduct additional monitoring and to seek coverage under an individual NPDES permit (Ecology 2015b). A draft individual NPDES permit and fact sheet were published by Ecology on November 7, 2016.

6.2 RM 1.0-1.3 West (Kellogg Island to Lafarge Cement)

The RM 1.0-1.3 West (Kellogg Island to Lafarge Cement) source control area consists of a single property, Lafarge Cement (Figure 6-2).

- Chemicals of concern for this source control area include metals (arsenic, mercury, and zinc), PAHs, PCBs, BEHP, and dioxins/furans.
- There are two active private outfalls in this area; one is the current stormwater discharge point for the Lafarge Cement facility, and the other discharges stormwater from the Chemithon property (included in the RM 1.3-1.6 West source control area). There are no public storm drains that discharge to the LDW within this source control area.
- Of the nine action items identified for this source control area, three have been completed. No high priority action items were identified.

6.2.1 Business Inspections

No business inspections were conducted in this source control area during the current reporting period.

6.2.2 Source Tracing

No source tracing samples were collected during this reporting period. SPU collected four on-site catch basin samples at the Lafarge Cement property in 2007. The following chemicals exceeded screening levels: copper (4 samples), zinc (1 sample), BEHP (3 samples), benzyl alcohol (4 samples), and oil-range hydrocarbons (1 sample).

6.2.3 Facility-Specific Source Control Actions

Lafarge Cement

During a June 2013 stormwater compliance inspection at Lafarge Cement, Ecology collected one water sample and two solids from the storm drain system. Sampling results were published during the current reporting period (Leidos 2015a).

- The water sample was collected from a transfer pump vault on the eastern side of the facility. Stormwater is held in the transfer vault prior to treatment and discharge to the LDW.
 - Copper slightly exceeded the marine chronic WQC in this sample.
- Solids samples were collected from the following locations:
 - Transfer pump vault on the eastern side of the facility; stormwater is held in the transfer vault for settling prior to treatment.
 - Lift station LS-004, located at the northeast portion of the facility. The lift station receives stormwater from the coal/coke storage building, scale house, loading bins, and

Current Operations	Cement manufacturing, blending and shipping of cementitious products, and transloading of non-hazardous materials
Historical Operations	Cement clinker production (wet kiln)
Address	5400 West Marginal Way SW
Facility/Site ID	2132
NPDES Permit	WA0002232 (Industrial NPDES IP)
Chemicals of Concern	Total PCBs, copper, phenol, phthalate, and petroleum hydrocarbons
Media Affected	Stormwater

additives building; stormwater is pumped from this location to the transfer pump vault (above).

- Zinc, 2,4-dimethylphenol, and oil-range hydrocarbons slightly exceeded the storm drain screening levels (Table 2-6) in one or more samples.

In March 2014, Ecology issued an NOV to Lafarge Cement for a release of particulate material on January 23, 2014, which was deposited on surrounding area roofs, vehicles, yards, pavement, and other structures, including the adjacent Chemithon property (Ecology 2014e). Ecology determined that the release posed a potential to pollute surface water through stormwater runoff. After submittal of a response by Lafarge in April 2014 (Lafarge 2014), Ecology issued an NFA letter indicating that Lafarge had taken necessary steps to correct the incident and prevent future similar accidents, and that effects on the LDW were minimal (Ecology 2014g).

6.3 RM 1.3-1.6 West (Glacier Bay)

The RM 1.3-1.6 West (Glacier Bay) source control area includes properties adjacent to the LDW (Alaska Marine Lines, Duwamish Shipyard, Glacier Northwest), and portions of the SW Kenny Street storm drain basin (Figure 6-3). Information related to the SW Kenny Street storm drain basin is provided with the RM 1.6-2.1 West (Terminal 115) source control area in Section 7.1.

- Chemicals of concern for this source control area include metals (arsenic, mercury, zinc, copper, lead, antimony, and tin), dioxins/furans, PCBs, phthalates, PAHs, pentachlorophenol, other SVOCs, and tributyltin.
- There are five active outfalls in this area of the LDW; four are associated with the Alaska Marine Lines property, and one discharges stormwater from the Glacier Northwest facility on West Marginal Way.
- Of the 30 action items identified for this source control area, 30 have been completed. Ten high priority action items were identified; six of these are complete.

6.3.1 Business Inspections

SPU conducted a total of 10 inspections at five facilities in this source control area during the current reporting period, including five initial inspections and five follow-up inspections (Appendix C).

Ecology conducted inspections at four facilities within this source control area during the current reporting period (Appendix E).

6.3.2 Source Tracing

No source tracing samples were collected in this source control area during the current reporting period. In 2006-2007, SPU collected 10 on-site catch basin samples at the Chemithon site property (5430 East Marginal Way SW). Samples were collected to identify the source of PCBs

(1.0 – 7.0 mg/kg DW) found in the onsite drainage system.¹⁹ The source was traced to a deposit of old paint/debris in one catch basin (7.0 mg/kg DW). Chemithon jetted and cleaned the onsite drainage system twice to remove the paint residue from the system. Runoff from this site was originally discharged to the combined sewer system, but King County required the storm drains to be disconnected from the sewer system. After final cleaning in 2007, stormwater from the site was discharged to the LDW via an existing outfall. Other chemicals that exceeded the CSLs in the onsite catch basins included: arsenic (1 sample), copper (8 samples), lead (1 sample), mercury (1 sample), zinc (6 samples), LPAHs (1 sample), HPAHs (1 sample), total cPAHs (7 samples), BEHP (9 samples), butylbenzyl phthalate (4 samples), dimethyl phthalate (5 samples), 2,4-dimethylphenol (1 sample), 4-methylphenol (4 samples), benzoic acid (1 sample), benzyl alcohol (3 samples), phenol (2 samples), diesel-range hydrocarbons (3 samples), and oil-range hydrocarbons (6 samples). In 2009, SPU re-sampled the catch basin where the paint/debris deposit was found; PCBs were measured at 1.55 mg/kg DW.

6.3.3 Facility-Specific Source Control Actions

Duwamish Shipyard

Duwamish Shipyard entered into Agreed Order DE-6735 with Ecology on September 13, 2010, to conduct an RI/FS at the site (Ecology 2010c). Stormwater from this property is currently treated and discharged at the Alaska Marine Lines outfall under NPDES Permit WAR001365.

- Supplemental RI groundwater sampling was conducted at the site from January 2014 to January 2015. Four sets of quarterly groundwater samples were collected from all existing site monitoring wells and piezometers, and from 14 new monitoring wells, to evaluate potential seasonal variations in groundwater quality.
- Supplemental RI stormwater and catch basin solids sampling was conducted during four qualifying storm events in December 2013 and March-April 2014.
- Ecology modified the Agreed Order Attachment C Schedule on March 16, 2015, to provide additional time for Duwamish Shipyard to complete the RI.
- Duwamish Shipyard submitted a draft RI report to Ecology in August 2015. This report is currently being reviewed by Ecology.

Current Operations	Equipment and container storage; truck access
Historical Operations	Repair and maintenance of floating vessels and equipment
Address	5658 West Marginal Way SW
Facility/Site ID	2071 (DSI)
NPDES Permit	WAR001365 (ISGP, Alaska Marine Lines)
Chemicals of Concern	PCBs, PAHs, SVOCs, tributyltin, dioxins/furans, petroleum hydrocarbons, metals
Media Affected	Soil, groundwater, stormwater, and sediment

¹⁹During the first cleaning, the contractor discharged the decant water back into the drainage system. A second cleaning was required.

Alaska Marine Lines

During a June 2013 stormwater compliance inspection at Alaska Marine Lines, Ecology collected two solids samples from the storm drain system. Sampling results were published during the current reporting period (Leidos 2015a).

- Solids samples were collected from the following locations:
 - One sample (and a field duplicate) was collected from an access port at the downstream end of the sedimentation chamber of sand filter SF4-EFF, which is located at the northern property boundary.
 - Sample VT-INF was collected from the influent stormwater vault to the facility's stormwater treatment system. The influent vault receives stormwater from the central portion of the facility, which is used for container and equipment storage.
- Zinc, various PAHs, phenols, BEHP, butylbenzyl phthalate, benzyl alcohol, and n-nitrosodiphenylamine exceeded the storm drain screening levels (Table 2-6) in samples from both locations. In addition, cadmium, mercury, various PAHs, total cPAH TEQ, and petroleum hydrocarbons exceeded screening levels at SF4-EFF; 2,4-dimethylphenol, 2-methylphenol, and phenol exceeded the screening levels in sample VT-INF.
- Based on these results, Ecology issued an Administrative Order (Docket No. 11366) to Alaska Marine Lines in May 2015 requiring them to conduct additional stormwater sampling and monitoring for both site outfalls (Ecology 2015g).

Current Operations	Maritime common carrier providing freight transportation services between Seattle, Alaska, and Canada
Historical Operations	Graving dock
Address	5600 West Marginal Way SW
Facility/Site ID	17126
NPDES Permit	WAR001365 (ISGP)
Chemicals of Concern	Metals, PAHs, phthalates, phenols, other SVOCs, and petroleum hydrocarbons
Media Affected	Storm drain solids

Ecology issued an Administrative Order (Docket No. 12780) to Alaska Marine Lines in July 2015 (Ecology 2015k), which required submittal of an engineering report and installation of a stormwater treatment system by September 30, 2015. An updated SWPPP was submitted to Ecology in December 2015 (Anchor QEA 2015).

A shipping container at Alaska Marine Lines caught on fire in September 2016. The incident was increased to a "hazardous materials incident with fire" because several of the nearby containers contained bulk propane and diesel fuel. Seattle Fire Department worked with the Seattle Police Department Harbor Patrol, the U.S. Coast Guard, SPU, and Ecology to evaluate the runoff from the fire into the LDW. The damage was estimated to be \$100,000 (Seattle Fire Department 2016).

Glacier Northwest

Glacier-Reichhold entered into Agreed Order DE-6000 with Ecology on July 28, 2009 to conduct an RI/FS at the site (Ecology 2009b).

RI field investigations were completed between March 2009 and August 2014. The investigation included upland soil sampling; riverbank soil sampling; a ground penetrating radar survey; monitoring well installation and groundwater sampling; stormwater system sampling including water and solids samples; abandonment of a historical stormwater pipe; surface and subsurface sediment sampling; and a subsurface image evaluation.

Current Operations	Cement storage and distribution
Historical Operations	Manufacture of activated charcoal, resins, glues, pentachlorophenol
Address	5900-5902 West Marginal Way SW
Facility/Site ID	23881883 (Glacier Northwest Seattle Terminal) 67234947 (Glacier Northwest Marginal Way Truck Shop) 89139472 (Glacier Northwest, Inc. and Reichhold MTCA)
NPDES Permit	WAG503378 (Sand & Gravel GP)
Chemicals of Concern	Pentachlorophenol, dioxins/furans, metals
Media Affected	Soil, groundwater, surface water, and sediment

- Glacier Northwest submitted a draft RI report to Ecology in May 2015. Ecology is currently reviewing the report.

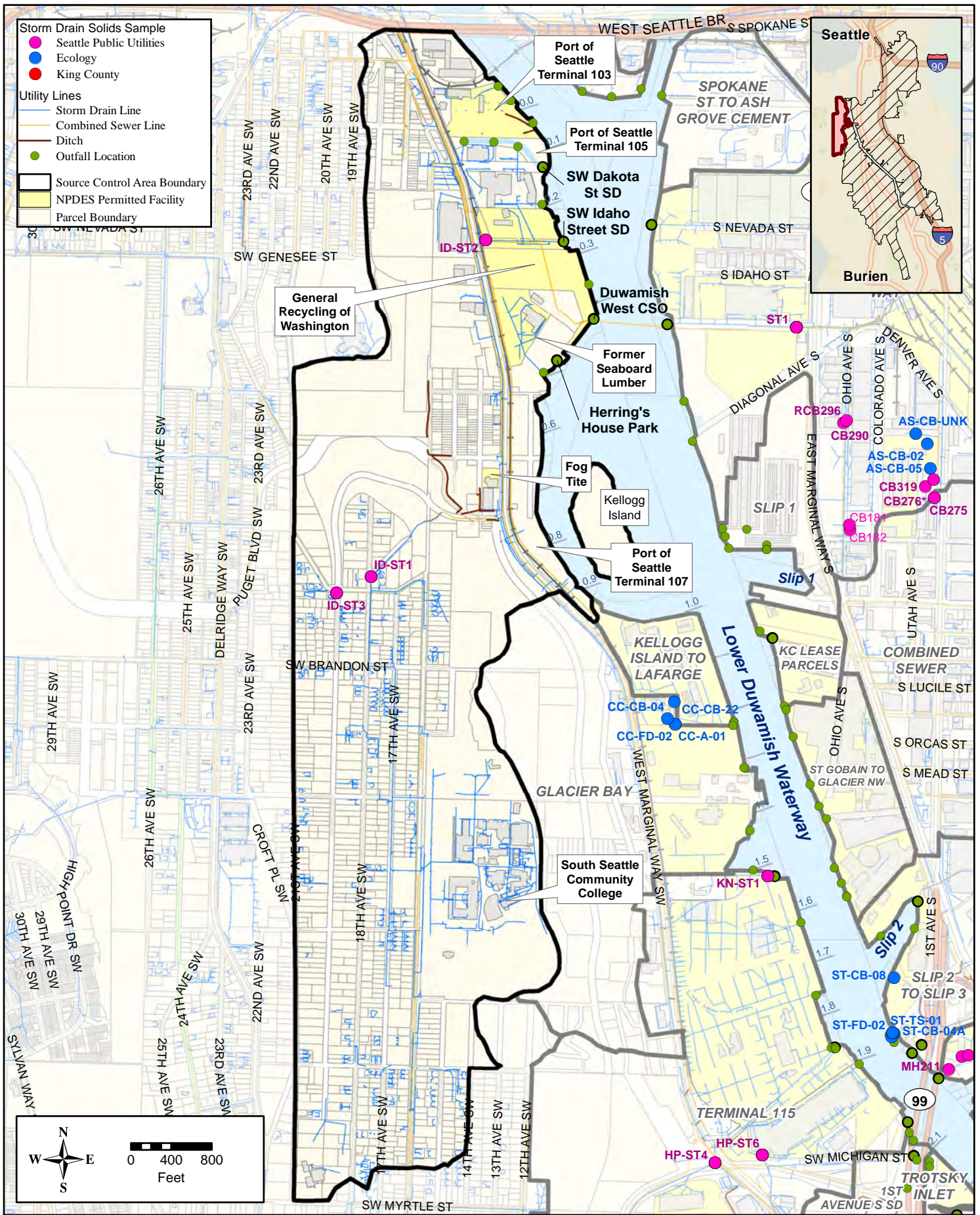
Chemithon

Ecology conducted a stormwater compliance inspection at Chemithon on October 13, 2014. Two water samples (including a field duplicate) and three solids samples were collected from the storm drain system during the inspection (Leidos 2015c).

Current Operations	Industrial gas supplier
Address	5430 West Marginal Way SW
Facility/Site ID	41953656
NPDES Permit	WAR000033 (ISGP)
Chemicals of Concern	Metals, PCBs, phthalates, other SVOCs, and petroleum hydrocarbons
Media Affected	Stormwater and storm drain solids

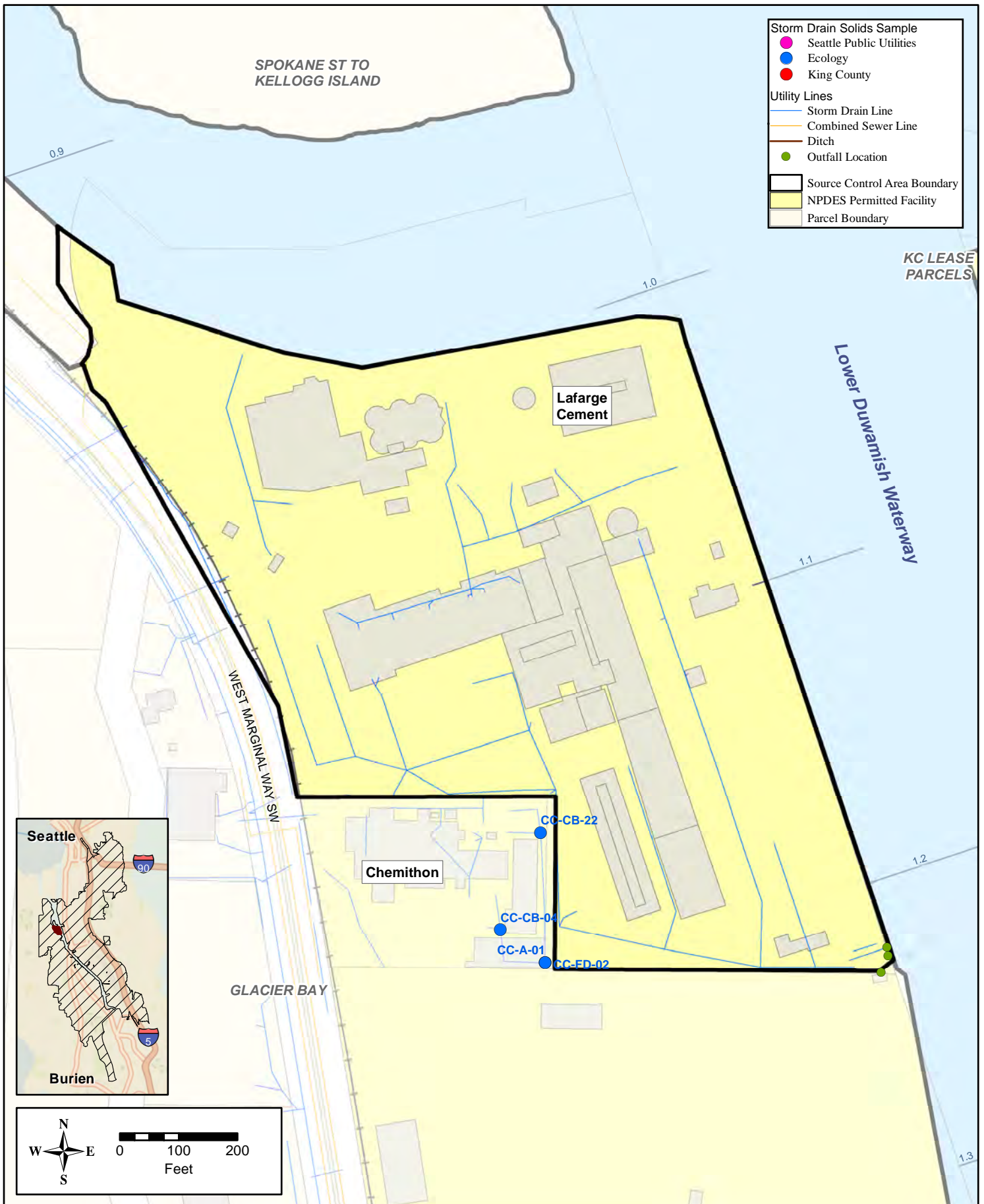
- Water sample A-01 and field duplicate FD-02 were collected from sump/vault A-01, which is located in the southeast corner of the property. The vault receives stormwater from all areas that drain the eastern portion of the facility. Stormwater is conveyed from the vault to two large storage vaults located under the Lafarge Cement property to the east, to prevent tidally-influenced water from the LDW from entering the sump at Chemithon, and discharges to the LDW via a 30-inch outfall.
 - Total PCB congeners exceeded the human health WQC, and copper exceeded the chronic marine WQC in these samples.
- Solids samples were collected from the following locations:
 - One solids sample was collected from sump/vault A-01.
 - One solids sample was collected from catch basin CB-04, which is located upstream of vault A-01. Stormwater from the eastern and central portions of the facility is conveyed to CB-04.

- Solids sample CB-22 was collected as a composite sample from four catch basins located in the northeast portion of the facility. The four catch basins drain to the same drainage line that conveys stormwater south to sump/vault A-01.
- Chromium, copper, zinc, total PCB Aroclors and congeners, BEHP, butylbenzyl phthalate, and dimethyl phthalate exceeded the storm drain screening levels (Table 2-6) in all three solids samples. In addition, arsenic, benzyl alcohol, and petroleum hydrocarbons exceeded screening levels in one or more samples. The highest exceedances were for PCBs, chromium, and phthalates.

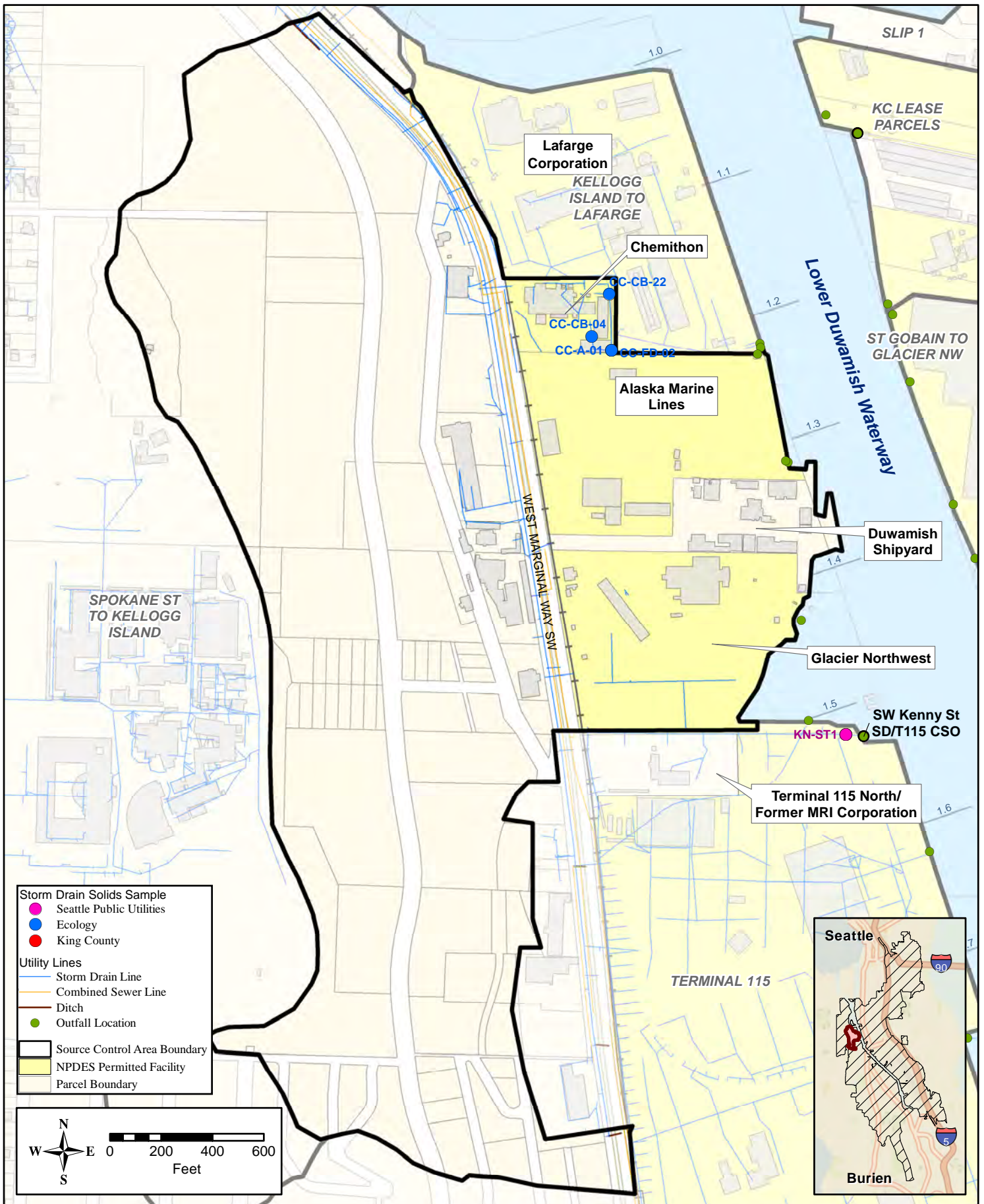


**Figure 6-1. RM 0.0-1.0 West
(Spokane Street to Kellogg Island)
Source Control Area**





**Figure 6-2. RM 1.0-1.3 West
(Kellogg Island to Lafarge Cement)
Source Control Area**



**Figure 6-3. RM 1.3-1.6 West
(Glacier Bay) Source Control Area**

7.0 Middle Reach – West Side

This section includes the following source control areas:

- RM 1.6-2.1 West (Terminal 115)
- RM 2.1 West (1st Avenue S Storm Drain)
- RM 2.1-2.2 West (EAA-2: Trotsky Inlet)
- RM 2.2-3.4 West (Riverside Drive)

Four cleanup sites under Ecology oversight are included in this area: South Park Landfill, North Terminal 115, Industrial Container Services, and Douglas Management Dock.

7.1 RM 1.6-2.1 West (Terminal 115)

The RM 1.6-2.1 West (Terminal 115) source control area includes facilities associated with the Port of Seattle's Terminal 115 such as Northland Services and Lineage Seafreeze (Figure 7-1). In addition, it includes properties located within the Highland Park Way SW storm drain basin, the Terminal 115 CSO basin, and portions of the SW Kenny Street storm drain basin (Figure 7-2).

- Chemicals of concern for the RM 1.6-2.1 West source control area include PCBs, PAHs, phthalates, other SVOCs, and tributyltin.
- There are nine active outfalls to the LDW within this source control area, including six Port of Seattle outfalls, the City's Highland Park Way SW storm drain outfall, and King County's West Michigan CSO. In addition, the SW Kenny Street storm drain and the Terminal 115 CSO share an outfall within the RM 1.6-2.1 West source control area; consequently, this outfall is referred to as the SW Kenny Street storm drain/T115 CSO.
- Of the 26 action items identified for this source control area, seven have been completed. Seven high priority action items were identified; one of these has been completed.

7.1.1 Business Inspections

SPU conducted a total of 12 inspections at eight facilities in the Duwamish West Direct, SW Kenny storm drain, and Highland Park Way SW storm drain basin during the current reporting period (Appendix C).

Ecology conducted five inspections at three facilities within this source control area during the current reporting period (Appendix E).

7.1.2 Source Tracing

SPU collected six sediment trap samples and two in-line solids samples in the Highland Park Way SW basin during the current reporting period. This system was cleaned in 2015. Two trap samples (HP-ST4 and SP-ST6) were collected in 2016 after the line was cleaned. The HP-ST4 sample exceeded the CSL for 4-methylphenol (0.9 mg/kg DW) and the HP-ST6 sample exceeded the CSL for oil-range hydrocarbons (2,800 mg/kg), BEHP (4.6 mg/kg DW), benzoic acid (2.1 mg/kg DW), and benzyl alcohol (0.86 mg/kg DW).

SPU collected three sediment trap samples in the SW Kenny Street storm drain basin during the current reporting period. Samples exceeded the CSL for oil-range hydrocarbons (1 sample), BEHP (2 samples), benzoic acid (1 sample), and benzyl alcohol (2 samples).

Complete sample results for the current reporting period are presented in Appendix F; sample locations are shown in Figures 7-1 and 7-2. Screening level exceedances are summarized in Table 7-1 below.

Table 7-1. RM 1.6-2.1 West: Screening Level Exceedances in SPU Source Tracing Samples

Chemical Class	Chemical	Sediment Traps	In-line Solids	On-site CB Solids	Right-of-Way CB Solids
Metals	Zinc	×	×	ns	ns
PCBs	PCBs, total	×	×	ns	ns
Phthalates	BEHP	☒	☒	ns	ns
	Butylbenzyl phthalate	×	×	ns	ns
	Dimethyl phthalate	☒	☒	ns	ns
Other SVOCs	4-Methylphenol	☒		ns	ns
	Benzoic acid	☒		ns	ns
	Benzyl alcohol	☒	☒	ns	ns
	Phenol	×		ns	ns
TPH	Oil-range hydrocarbons	☒		ns	ns

Storm drain screening levels are listed in Table 2-6.

× = Exceedance of SCO (lower screening level) was observed during the current reporting period (2014 through 2016).
 ☒ = Exceedance of CSL (upper screening level) was observed during the current reporting period (2014 through 2016).
 ns = not sampled

SPU collected 35 samples from the SW Kenny Street and Highland Park Way SW drainage systems between 2006 and 2014. Chemicals that exceeded the CSLs in previous samples included copper (1 sample), LPAH (1 sample), HPAH (2 samples), BEHP (22 samples), butylbenzyl phthalate (1 sample), dimethyl phthalate (1 sample), 4-methylphenol (1 sample), benzoic acid (1 sample), and benzyl alcohol (13 samples).

7.1.3 Facility-Specific Source Control Actions

Terminal 115

Ecology is currently preparing a draft Agreed Order with the Port of Seattle for Terminal 115. Tenants at Terminal 115 include Northland Services (see separate section below) and Lineage Seafreeze.

The Port of Seattle cleaned 249 structures and 27,000 feet of storm drain lines at Terminal 115 between July and November 2014. A total of 37.24 tons of solids were removed (Port of Seattle 2015). Sediment traps were installed at six locations in November 2014: CB632, CB608, MH422, MH540, MH682, and MH637. The sediment traps were retrieved in April 2015 and solids were analyzed for metals, PCBs, SVOCs, grain size, and total solids. One sample was also analyzed for dioxins/furans. Detection limits exceeded the screening levels for most SVOCs.

- Zinc (1,400-3,200 mg/kg) and BEHP (11-37 mg/kg DW) exceeded the CSL at all locations. Chromium (520 mg/kg), copper (440 mg/kg), mercury (0.63 mg/kg), phenol (9.9 mg/kg)

DW), 4-methylphenol (35 mg/kg DW), butylbenzyl phthalate (1.5 mg/kg DW), and fluoranthene (2.9 mg/kg DW) exceeded the CSL in one or more samples. Total PCBs and fluoranthene exceeded the SCO (but not the CSL) in at least one sample each. The dioxin/furan TEQ (91.3 ng/kg) exceeded the LDW-wide RAL of 25 ng/kg TEQ.

North Terminal 115 (Former MRI Corporation)

Ecology and the Port of Seattle entered into an Agreed Order on March 2, 2011. Under Agreed Order DE-8099, the Port of Seattle will conduct an RI/FS and prepare a draft CAP at the site (Ecology 2011a).

During the current reporting period, the Port of Seattle installed test pit direct-push borings between January 6 and January 12, 2014, and collected catch basin samples on January 16 and 17, 2014. A groundwater tidal study was completed in May 2014. Groundwater sampling was conducted by the Port of Seattle during June and September 2014, May 2015, and April 2015.

Current Operations	Lumber distribution, vehicle storage
Historical Operations	Tin reclamation
Address	6000 West Marginal Way SW
Facility/Site ID	2177
Chemicals of Concern	PAHs, SVOCs, petroleum hydrocarbons, metals
Media Affected	Soil and groundwater

Northland Services

During an April 2013 stormwater compliance inspection at Northland Services, Ecology collected four water samples and four solids samples from the storm drain system. Sampling results were published during the current reporting period (Leidos 2015a). Note that storm drain system cleaning was conducted by the Port of Seattle at Terminal 115 in 2014, after these samples were collected (see above).

Current Operations	Receipt and shipment of bulk cargo; barge cargo operations; repair and maintenance of cargo shipping containers
Address	6700 West Marginal Way SW (Terminal 115)
Facility/Site ID	15163955
NPDES Permit	WAR000471 (ISGP)
Chemicals of Concern	PAHs, phthalates, SVOCs, PCBs, and dioxins/furans
Media Affected	Stormwater and groundwater

- Water samples were collected at the following locations:
 - Manhole MH-682, located in the south-central portion of the facility on a tributary to the mainline NSI-DA1.
 - Outfall OF-002, on the southeast boundary of the facility; this outfall is a 12-inch corrugated steel pipe that discharges stormwater from NSI-DA2. Stormwater discharge was collected directly from the discharge pipe during low tide.
 - Outfall OF-006, located along the southeast boundary of the facility; this outfall is an 18-inch concrete pipe that discharges stormwater from NSI-DA6. Stormwater discharge was collected directly from the discharge pipe during low tide.

- Oil/water separator WS-316, in the northeast portion of the facility and within drainage area NSI-DA5. The sample was collected from oil/water separator influent.
- Copper and zinc exceeded the marine chronic WQC in all four samples; lead, mercury, and nickel exceeded the marine chronic WQC in one or more samples. HPAHs and PCB congeners exceeded the human health WQC in all four samples; in addition, BEHP exceeded the human health WQC in one sample. The highest exceedances were for PCB congeners and HPAHs.
- Solids samples were collected at the following locations:
 - Catch basin CB-421, located in the north-central portion of the facility near the marine maintenance yard, on the mainline of NSI-DA4.
 - Catch basin CB-423, located in the container storage yard in the north-central portion of the facility.
 - Catch basin CB-547, in the container storage yard in the central portion of the facility.
 - Manhole MH-356, on a tributary to the mainline of NSI-DA3.
- Zinc, BEHP, and butylbenzyl phthalate exceeded the storm drain screening levels (Table 2-6) in all solids samples. In addition, PCB Aroclors, dibutyl phthalate, LPAHs, phenols, n-nitrosodiphenylamine, and petroleum hydrocarbons exceeded the screening levels in one or more samples. The highest exceedances were observed for phthalates.

Emswiler Construction

In 2016, SPU issued an NOV to Emswiler Construction (6045 West Marginal Way SW) due to improper storage of leachable materials (concrete rubble, scrap metal, building material, and land clear debris), unacceptable housekeeping practices (leaking construction equipment and oil staining on pavement), lack of adequate spill response supplies, and for lack of maintenance of onsite drainage structures (soil and oil in catch basins). The necessary improvements were completed in February 2016.

7.2 RM 2.1 West (1st Avenue S Storm Drain)

The RM 2.1 West (1st Avenue S Storm Drain) source control area (Figure 7-3) includes upland facilities within the 1st Avenue S drainage basin. There are no properties adjacent to the LDW in this source control area.

- Chemicals of concern for the RM 2.1 West source control area include mercury, PCBs, PAHs, phthalates, and other SVOCs.
- Four WSDOT bridge drains and the 1st Avenue S storm drain (west) outfall, which discharges to the LDW under the 1st Avenue S bridge via a series of WSDOT-engineered wetlands, are located within this source control area.
- Of the 16 action items identified for this source control area, eight have been completed. One high priority action item was identified; this is not yet complete.

7.2.1 Business Inspections

SPU conducted a total of 42 inspections at 25 facilities in the 1st Avenue S storm drain basin during the current reporting period (Appendix C).

Ecology conducted at seven facilities within this source control area during the current reporting period (Appendix E).

7.2.2 Source Tracing

During the current reporting period, SPU collected 12 sediment trap samples and three in-line solids samples in the 1st Avenue S storm drain basin.

- The sediment trap sample collected in May 2015 at location 1st-ST2, which serves the industrial area between SR509 and SR99 (see Figure 7-3), contained benzyl alcohol at 3.8 mg/kg DW, more than 50 times the CSL of 0.73 mg/kg DW. In addition, this sample contained BEHP, benzoic acid, and motor oil-range hydrocarbons above the CSLs. Benzyl alcohol was not detected at 0.099 mg/kg DW in the 2016 sample at this location.
- Other samples collected from this drainage system exceeded the CSLs for zinc (2 samples), diesel-range hydrocarbons (2 samples), oil-range hydrocarbons (6 samples), BEHP (7 samples), and PCBs (3 samples).

Complete sample results for the current reporting period are presented in Appendix F; sample locations are shown in Figure 7-3. Screening level exceedances are summarized in Table 7-2 below.

**Table 7-2. RM 2.1 West: Screening Level Exceedances
in SPU Source Tracing Samples**

Chemical Class	Chemical	Sediment Traps	In-line Solids	On-site CB Solids
Metals	Zinc	☒		ns
PCBs	PCBs, total	☒		ns
PAHs	HPAH	☒		ns
	Total cPAHs	☒		ns
Phthalates	BEHP	☒		ns
	Butylbenzyl phthalate	×	×	ns
	Dimethyl phthalate	×		ns
Other SVOCs	2-Methylphenol	☒		ns
	4-Methylphenol	☒		ns
	Benzoic acid	☒		ns
	Benzyl alcohol	☒		ns
	Phenol	×	×	ns
TPH	Diesel-range hydrocarbons	☒		ns
	Oil-range hydrocarbons	☒		ns

Storm drain screening levels are listed in Table 2-6.

× = Exceedance of SCO (lower screening level) was observed during the current reporting period (2014 through 2016).

☒ = Exceedance of CSL (upper screening level) was observed during the current reporting period (2014 through 2016).

ns = not sampled

SPU collected 46 samples from the 1st Avenue S (west) drainage systems between 2008 and 2013. Chemicals that exceeded the CSLs in previous samples included mercury (1 sample), zinc (5 samples), PCBs (4 samples), HPAH (3 samples), oil-range hydrocarbons (22 samples), di-n-butyl phthalate (1 sample), 4-methylphenol (7 samples), benzoic acid (9 samples), and benzyl alcohol (12 samples).

7.2.3 Facility-Specific Source Control Actions

Former South Park Landfill

Ecology, the City of Seattle, and South Park Property Development entered into Agreed Order DE-6706 in May 2009 to conduct an RI/FS at the former South Park Landfill property and to prepare a draft CAP (Ecology 2009a).

The City of Seattle submitted an Interim Action Work Plan for the South Transfer Station Phase II to Ecology in July 2015 (Herrera & Aspect 2015). The preferred alternative for the interim action involved capping, landfill gas and surface water controls, and monitoring. A Washington State Environmental Policy Act (SEPA) DNS was issued for this interim action in November 2015 (SPU 2015e, SPU 2015f).

On February 1, 2016, Ecology and the City of Seattle signed an amendment to the Agreed Order to conduct an interim action at this site (Ecology 2016a).

The City of Seattle and South Park Property Development submitted a draft final RI/FS report to Ecology in June 2016.

Current Operations	Solid waste transfer station, school bus parking
Historical Operations	Landfill, auto wrecking yard
Address	8200 2 nd Avenue S
Facility/Site ID	2180
Chemicals of Concern	VOCs, landfill gas, petroleum hydrocarbons, metals
Media Affected	Soil and groundwater

Waste Management Eastmont Transfer Station

Ecology conducted a stormwater compliance inspection at the Waste Management Eastmont Transfer Station on January 22, 2015. One water sample and one solids sample (plus a field duplicate) were collected from the facility's storm drain system (Leidos 2015c).

Current Operations	Solid waste transfer station that collects and transfers refuse and recyclables
Address	7201 West Marginal Way SW
Facility/Site ID	2425
NPDES Permit	WAR000581 (ISGP)
Chemicals of Concern	Metals, PCBs, PAHs, phthalates, other SVOCs, and petroleum hydrocarbons
Media Affected	Stormwater and storm drain solids

- The water sample was collected from tank FT-1B, a 21,000-gallon stormwater storage/settling tank that receives stormwater from catch basin CB-05, including an area that drains a paved lot with heavy truck traffic. Stormwater is conveyed from FT-1B to the public storm drain system.
 - Copper, mercury, and zinc concentrations exceeded the chronic marine WQC in this sample. In addition, total PCB congeners, benzo(a)anthracene, and chrysene exceeded the human health WQC in this sample.

- The solids samples were collected from catch basin CB-03, which receives stormwater from CB-02 and an area that drains a paved lot with heavy truck traffic. The outlet from CB-03 to CB-04 is plugged, and stormwater is conveyed from CB-03 to tank FT-1A, a 21,000-gallon stormwater storage/settling tank.
 - Mercury, zinc, total PCB congeners, dioxin/furan TEQ, several PAH compounds, BEHP, butylbenzyl phthalate, dimethyl phthalate, benzyl alcohol, n-nitrosodiphenylamine, and petroleum hydrocarbons exceeded the storm drain screening levels at this location. The highest exceedances were for phthalates and other SVOCs.

In 2014, SPU inspected the Eastmont Transfer Station and noticed that stormwater that was stored in Tank FT-1A was being used to wash the pavement. Wash water was recollected in the tank and Waste Management reported that the tank did not discharge to the drainage system. However, SPU inspectors observed the tank overflowing to an adjacent drainage ditch during a subsequent storm event. Because wash water is considered wastewater, it cannot be discharged to the drainage system. SPU referred this site to EPA for further investigation.

Seaport Petroleum

In January 2014, an SPU inspector observed Seaport Petroleum (7800 Detroit Avenue SW) filling drums and totes in the yard area using portable pumps with no containment, as well as a large amount of staining on the pavement and visible sheen in the drainage ditch downstream of this property. SPU issued a corrective action/NOV and directed Seaport Petroleum to implement a number of operational and structural controls:

- Develop and implement a spill prevention and control plan and train employees what to do in the event of a spill,
- Properly manage the storage of portable containers (e.g., drums) and provide a covered bermed area for drums stored outside, and
- Provide covered secondary containment for the loading dock area and install a dead-end sump to contain spills and leaks.

Seaport Petroleum was also directed to comply with City permits for five bulk petroleum tanks that had recently been installed on the west side of the property. Work was completed (drums were moved to an inside contained area, containment was installed for the loading dock, and the bulk storage tanks were emptied until secondary containment could be provided).

In 2016, SPU issued another NOV with penalty for using the five bulk petroleum tanks and Seaport Petroleum entered into a voluntary compliance agreement to complete the containment for the bulk storage tanks. At the time this report was prepared, Seaport had not installed the required secondary containment.

In 2014, Seaport Petroleum submitted a plan to Ecology to install a stormwater treatment system, including an oil/water separator, vault, and filters, due to Level 3 benchmark exceedances of its NPDES ISGP permit for zinc.

Tank Wise

In 2014, SPU responded to a complaint that a tank removal company (Tank Wise), at 5405 West Marginal Way SW, was improperly disposing oil and sludge down a pipe located on the property

which was connected to the sanitary sewer. SPU issued an NOV to the owner of the company. The Washington State Attorney General criminally prosecuted and convicted the owner of defrauding a public utility, unlawful dumping of solid waste without a permit, and making a false or misleading statement to a public servant. The owner estimated that nearly 20,000 gallons of wastewater was discharged to the sanitary sewer between 2012 and 2013.

7.3 RM 2.1-2.2 West (EAA-2: Trotsky Inlet)

The RM 2.1-2.2 West (EAA-2: Trotsky Inlet) source control area (Figure 7-4) includes facilities adjacent to the Trotsky Inlet (Douglas Management Company and Industrial Container Services [ICS]), and numerous parcels owned by Boyer Towing along the LDW shoreline. In addition, it includes facilities within the 2nd Avenue S storm drain basin.

- Chemicals of concern for the RM 2.1-2.2 West source control area include PCBs, phthalates, mercury, lead, zinc, DDT, and dieldrin.
- There are 11 active outfalls in this area of the LDW, including private outfalls associated with Douglas Management Company and Boyer Logistics properties, the 2nd Avenue S storm drain outfall located on the Industrial Container Services property, and a WSDOT bridge drain.
- Of the 33 action items identified for this source control area, 22 have been completed. A total of eight high priority action items were identified; seven of these are complete.

7.3.1 Business Inspections

SPU conducted a total of 29 inspections at 19 facilities in this source control area (Appendix C). Ecology conducted inspections at five facilities within this source control area during the current reporting period (Appendix E).

7.3.2 Source Tracing

SPU collected two on-site catch basin samples and three right-of-way samples in the 2nd Avenue S storm drain basin during the current reporting period. Two right-of-way samples were collected as part of the detection dog pilot study and were only analyzed for PCBs.

Complete sample results for the current reporting period are presented in Appendix F; sample locations are shown in Figure 7-4. Screening level exceedances are summarized in Table 7-3 below.

Table 7-3. RM 2.1-2.2 West: Screening Level Exceedances in SPU Source Tracing Samples

Chemical Class	Chemical	In-line Solids	On-site CB Solids	Right-of-Way CB Solids
PCBs	PCBs, total	ns		×
PAHs	LPAH	ns	☒	ns
	HPAH	ns	×	ns
Phthalates	BEHP	ns	☒	ns
	Butylbenzyl phthalate	ns	×	ns
Other SVOCs	Benzoic acid	ns	☒	ns
TPH	Oil-range hydrocarbons	ns	☒	ns

Storm drain screening levels are listed in Table 2-6.

× = Exceedance of SCO (lower screening level) was observed during the current reporting period (2014 through 2016).

☒ = Exceedance of CSL (upper screening level) was observed during the current reporting period (2014 through 2016).

ns = not sampled

SPU cleaned the City-owned portions of the 2nd Avenue S SD in 2010 and collected 5 samples from the 2nd Avenue S drainage system between 2011 and 2013. Chemicals that exceeded the CSLs included zinc (1 sample), diesel-range hydrocarbons (1 sample), oil-range hydrocarbons (4 samples), BEHP (4 samples), dimethyl phthalate (1 sample), 4-methylphenol (1 sample), and benzyl alcohol (3 samples).

7.3.3 Facility-Specific Source Control Actions

Industrial Container Services / Trotsky Property / Former Northwest Cooperaage

Ecology entered into Agreed Order DE-6720 with Herman and Jacqueline Trotsky (owners) and Industrial Container Services (ICS; operator) on May 18, 2010 (Ecology 2010b). The Agreed Order requires that the property owners conduct an RI/FS to define the nature and extent of

Current Operations	Drum reconditioning
Historical Operations	Same as current operations
Address	7152 1 st Avenue S
Facility/Site ID	2154 (Industrial Container Services – WA, LLC)
Chemicals of Concern	PCBs, PAHs, VOCs, pesticides, petroleum hydrocarbons, metals
Media Affected	Soil, groundwater, and sediment

contamination in soil, groundwater, surface water, and sediments, and to evaluate cleanup alternatives. In addition, the property owners are required to prepare a draft CAP that identifies the preferred cleanup action and develops a schedule to remediate the contamination.

- Archived sediment samples that were collected in 2012 were analyzed in September 2013. The additional data were used to refine characterization of sediment conditions; a technical memorandum documenting the analytical results was submitted to Ecology in March 2014. In the technical memorandum (DOF 2014b), ICS stated that the "...the presence of PCBs and other constituents above SLs [screening levels] in deeper soil beneath the Douglas Property upland raise a concern about constituent migration in groundwater that discharges to the Embayment."

- In November 2014, ICS prepared a memorandum to identify remaining data gaps for the RI. The work needed to fill the remaining data gaps was divided into two phases, Phase 2A and 2B (DOF 2014a).
 - The Phase 2A field activities focused on filling remaining upland data gaps necessary to complete an FS. Direct-push borings were advanced to collect soil and groundwater samples. Data collected during Phase 2A were used for two purposes: 1) to determine new monitoring well locations and screening intervals, 2) to refine groundwater flow directions, soil hydraulic conductivity and the extent of light non-aqueous phase liquids. ICS also collected and analyzed embayment sediment samples as part of Phase 2A. ICS submitted an agency review draft of the Phase 2A Data Report for the upland sampling to Ecology in April 2015 (DOF 2016b).
 - The Phase 2B field activities included installation of new monitoring wells and two rounds of quarterly monitoring. The data from this phase were used to refine groundwater flow directions and further assess hydraulic conductivity. According to the draft RI report, a third round of quarterly monitoring was planned for September 2016 (DOF 2016b). The status of the third monitoring event was not available at the time this Source Control Status Report was prepared.

Douglas Management Dock / Alaska Marine Lines

Ecology entered into Agreed Order DE-8258 with 7100 1st Avenue S, Seattle, LLC (owner) on May 6, 2011. The Agreed Order requires that the owner conduct an RI/FS to define the nature and extent of contamination in soil, groundwater, surface water, and sediments, and to evaluate cleanup alternatives. In addition, the operator is required to prepare a draft CAP that identifies the preferred cleanup action and develops a schedule to remediate the contamination (Ecology 2011b).

Current Operations	Shipping container and equipment storage
Historical Operations	Sand and gravel batch plant; school bus parking and maintenance
Address	7100 1 st Avenue S
Facility/Site ID	97573251 (Douglas Management Dock)
NPDES Permit	WAR127039 (Alaska Marine Lines)
Chemicals of Concern	PCBs, petroleum hydrocarbons, metals
Media Affected	Soil and groundwater

GeoEngineers performed an RI field investigation in 2013 and 2014. The RI field activities included: a geophysical survey to determine the status of a former waste oil UST; advancing 18 soil borings and collecting samples; four rounds of groundwater monitoring; aquifer testing; stormwater sampling from the facility’s stormwater system; and collecting a surface sediment from Slip 2 near the facility outfall (GeoEngineers 2016). The PLPs submitted the draft RI report to Ecology on December 30, 2016.

Bill’s Mobile

In 2015, SPU inspected Bill’s Mobile Service (7265 2nd Avenue S) and observed problems with outdoor storage of oily truck parts, open buckets of antifreeze and oil, and an oily sheen on the property, as well as in runoff flowing off the property. Many of these problems were repeat violations from previous inspections conducting in 2009 and 2012. SPU issued an NOV and penalty and required the owner to improved housekeeping practices, store liquid wastes in

accordance with the Seattle Stormwater Code, and immediately cleanup spills. The necessary improvements were completed in November 2015.

7.4 RM 2.2-3.4 West (Riverside Drive)

The RM 2.2-3.4 West (Riverside Drive) source control area includes the 7th Avenue S storm drain basin and most of the 8th Avenue combined sewer basin (Figure 7-5). Facilities adjacent to the LDW include Pacific Pile & Marine and Independent Metals Plant 2 (now closed).

- Chemicals of concern for the RM 2.2-3.4 West source control area include mercury, PCBs, PAHs, phthalates, phenols, benzoic acid, benzyl alcohol, 1,4-dichlorobenzene, and hexachlorobenzene.
- There are eight active outfalls in this area of the LDW, including the City of Seattle outfalls at S Webster Street²⁰ and 7th Avenue S; the County's 8th Avenue S CSO; private outfalls associated with the Independent Metals Plant 2 facility; and several unidentified outfalls on Port of Seattle property, near the end of S Portland Street and S Southern Street.
- Of the 17 action items identified for this source control area, six have been completed. Three high priority action items were identified; one of these is complete.

The 8th Avenue CSO is controlled to no more than one untreated discharge event per year, on average.

7.4.1 Business Inspections

SPU conducted a total of 121 inspections at 82 facilities with direct discharge to the LDW in the 7th Avenue S storm drain basin and in the 8th Avenue CSO basin during the current reporting period (Appendix C).

King County conducted 11 inspections at five facilities in this source control area during the current reporting period (Appendix D).

Ecology conducted 25 inspections at 23 facilities within this source control area during the current reporting period (Appendix E).

7.4.2 Source Tracing

SPU collected seven sediment trap samples, three in-line solids samples, two on-site catch basin samples, and 11 right-of-way catch basin, and nine street dirt or other debris²¹ samples in the 7th Avenue S storm drain basin during the current reporting period.

No source tracing samples were collected in the 8th Avenue CSO basin during the current reporting period.

Complete sample results for the current reporting period are presented in Appendix F; sample locations are shown in Figure 7-5. Screening level exceedances are summarized in Table 7-4 below.

²⁰ A single catch basin on S Riverside Drive is connected to the S Webster Street outfall.

²¹ These samples were collected as part of the detection dog pilot test and were only analyzed for PCBs.

**Table 7-4. RM 2.2-3.4 West: Screening Level Exceedances
in SPU Source Tracing Samples**

Chemical Class	Chemical	Sediment Traps	In-line Solids	On-site CB Solids	Right-of-Way CB Solids
Metals	Zinc	x		x	☒
PCBs	PCBs, total	x		x	☒
PAHs	LPAH				☒
	HPAH				☒
	Total cPAHs	☒			☒
Phthalates	BEHP	☒		☒	☒
	Butylbenzyl phthalate	x		☒	x
	Dimethyl phthalate			☒	☒
Other SVOCs	4-Methylphenol				☒
	Benzoic acid	☒			☒
	Benzyl alcohol	☒	☒		☒
	N-Nitrosodiphenylamine			x	
	Phenol	☒			x
TPH	Diesel-range hydrocarbons				☒
	Oil-range hydrocarbons	☒		☒	☒

Storm drain screening levels are listed in Table 2-6.

x = Exceedance of SCO (lower screening level) was observed during the current reporting period (2014 through 2016).

☒ = Exceedance of CSL (upper screening level) was observed during the current reporting period (2014 through 2016).

SPU cleaned the 7th Avenue S SD in 2013.

7.4.3 Facility-Specific Source Control Actions

Independent Metals Plants 1 and 2

Independent Metals filed for bankruptcy and ceased operations in late February 2014. The following information is presented for completeness only, since Independent Metals is no longer present on these properties.

During an Ecology stormwater compliance inspection at Independent Metals Plant 2 and the 7th Avenue storage lot in April 2013, Ecology collected two water samples and two solids samples from the storm drain system (Leidos 2015a).

- Water samples were collected from the following locations:
 - Manhole MH-01, located on the east side of Plant 2, along the LDW bank. The sample was collected from a sampling port on the treatment system effluent discharge line. Total PCBs and total PCB congeners exceeded the human health WQC in this sample. In addition, copper, lead, mercury, nickel, zinc, and dissolved nickel exceeded the chronic marine WQC.
 - SW-01, a pool of stagnant water at the Storage Lot. This area was used to store empty shipping containers; stormwater is conveyed to the public storm drain on 7th Avenue S. Several PAH compounds, BEHP, total PCBs, and total PCB congeners exceeded the human health WQC in this sample. In addition, arsenic, copper, lead, mercury, nickel, zinc, and dissolved chromium exceeded the chronic marine WQC.
- Solids samples were collected at the following locations:
 - Catch basin CB-01, which is located in the central portion of the processing yard at Plant 2. Stormwater from CB-01 is conveyed to the treatment system. Metals, PCBs, dioxins/furan TEQ, PAHs, phthalates, phenols, and petroleum hydrocarbons exceeded the storm drain screening levels (Table 2-6).
 - Catch basin CB-02, adjacent to 7th Avenue S. Butylbenzyl phthalate and benzyl alcohol exceeded the storm drain screening levels.

Historical Operations	Scrap metals sorting, recycling, and processing; boat manufacturing and logging transport
Address	Plant 1: 747 S Monroe Street Plant 2: 816 S Kenyon Street, Storage Lot: 703 S Monroe Street
Facility/Site ID	9309618 (Independent Metals Plant 1) 16139 (Independent Metals Plant 2) 21489 (Independent Metals Storage Lot) 861945 (Silver Bay Logging) 95749157 (Former Workboats Northwest)
NPDES Permit	WAR009725 (ISGP) - canceled
Chemicals of Concern	PCBs, metals, PAHs, phthalates, other SVOCs, phenols, dioxins/furans, and petroleum hydrocarbons
Media Affected	Stormwater, soil, and groundwater

After conducting initial investigations at the three Independent Metals facilities, Ecology sent Early Notice Letters to the Independent Metals Plant 1, Independent Metals Plant 2, and Independent Metals Storage Lot facilities on February 24, 2014. The Early Notice Letters explain that Ecology added these facilities to the Washington State Hazardous Sites list and that further investigations or cleanup action will need to be done to clean up known contamination at

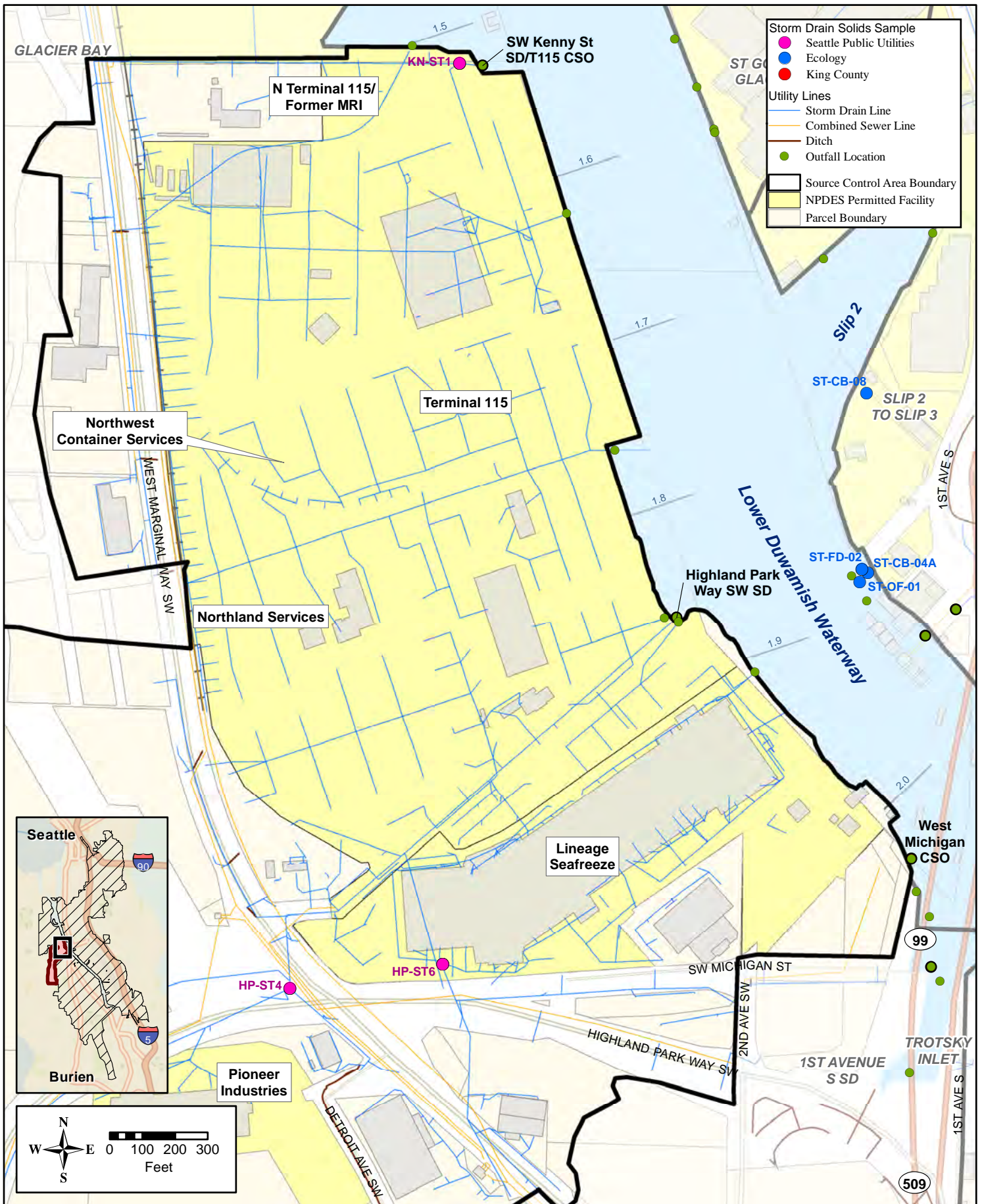
those facilities (Ecology 2014b, 2014c, 2014d). As indicated above, Independent Metals filed for bankruptcy shortly afterwards.

In 2016, KCIW responded to possible contaminated stormwater runoff from the Plant 1 site, and transferred the discharge authorization to the new owner (King County 2016b).

Marine Lumber Service

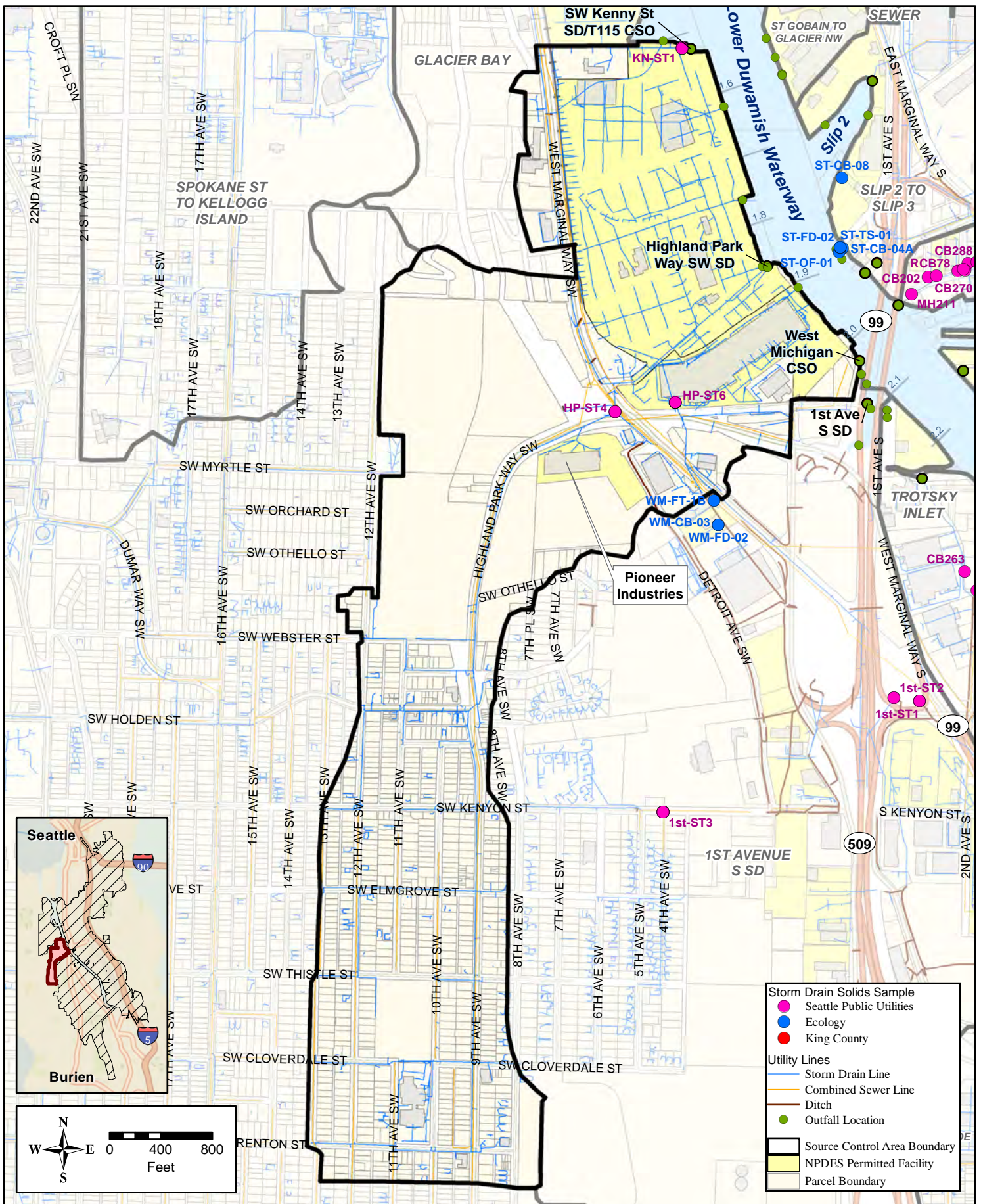
Marine Lumber Service illegally connected an on-site catch basin to the sanitary sewer on S Chicago Street. SPU ordered the company to disconnect this line. The site has been used to store treated lumber. This is the same product that caused elevated levels of arsenic in the street right-of-way (up to 950 mg/kg) at their site on 5th Avenue and S Monroe Street. Marine Lumber decided to move pressure-treated lumber to the main yard at 525 S Chicago Street and construct a covered storage area (SPU 2015b).

Current Operations	Lumber products supply
Historical Operations	Lumber yard for 65 years
Address	7915 5 th Avenue S, 558 S Kenyon Street, 546 S Kenyon Street, 525 S Chicago Street
Facility/Site ID	38921541 73969348
NPDES Permit	WAR011741 (ISGP)
Chemicals of Concern	PCBs, metals, and TPH
Media Affected	Storm drain solids



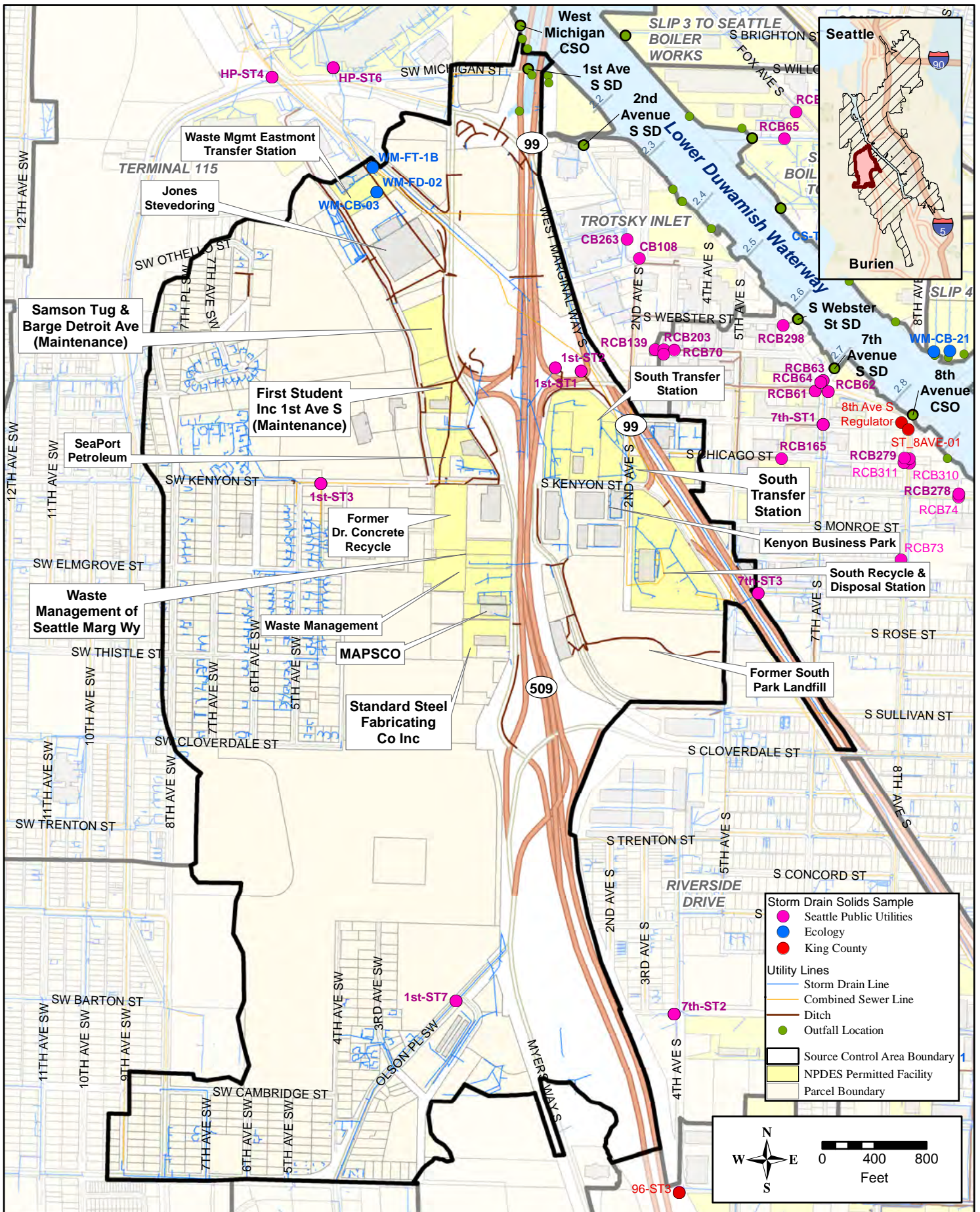
**Figure 7-1. RM 1.6-2.1 West
(Terminal 115) Source Control Area**





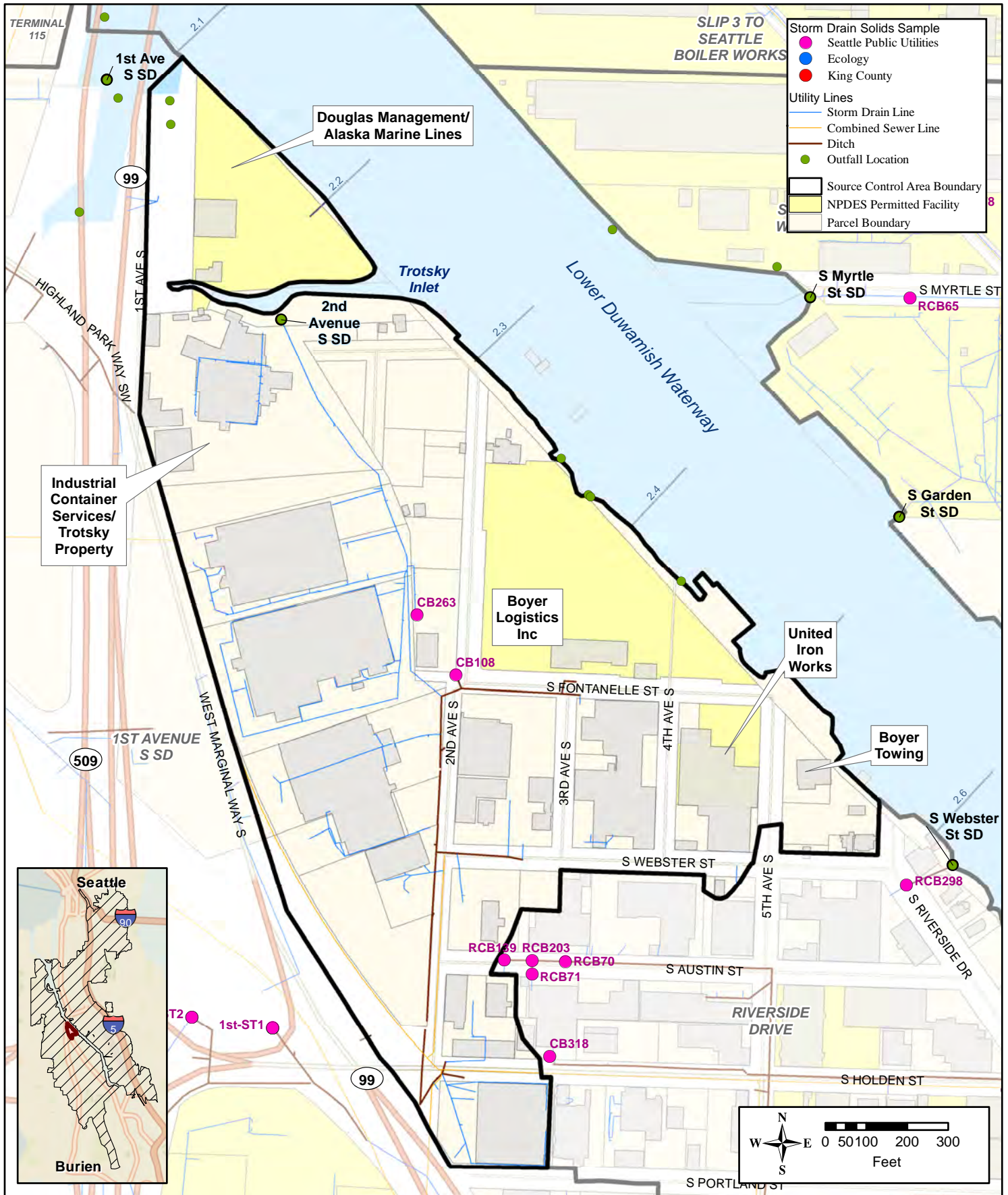
**Figure 7-2. RM 1.6-2.1 West
(Terminal 115) Source Control Area,
Highland Park Way SW Storm Drain Basin**





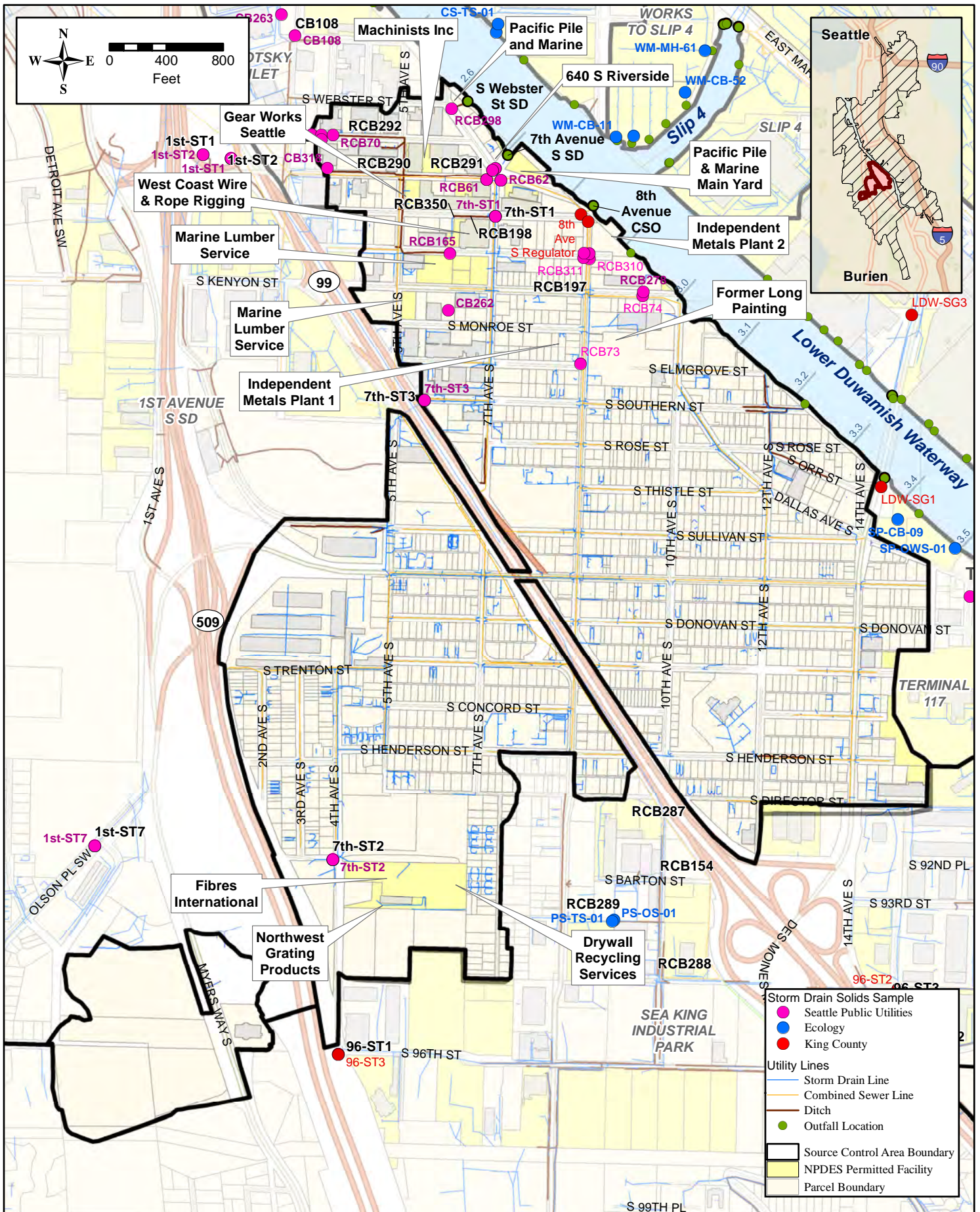
**Figure 7-3. RM 2.1 West
(1st Avenue South Storm Drain)
Source Control Area**





**Figure 7-4. RM 2.1-2.2 West
(EAA-2: Trotsky Inlet)
Source Control Area**





**Figure 7-5. RM 2.2-3.4 West
(Riverside Drive)
Source Control Area**



8.0 Upper Reach – West Side

This section includes the following source control areas:

- RM 3.4-3.8 West (EAA-5: Terminal 117)
- RM 3.8-4.2 West (Sea King Industrial Park)
- RM 4.2-5.8 West (Restoration Areas)

This area includes one EPA-lead cleanup site (Terminal 117), and one cleanup site under Ecology oversight (South Park Marina).

8.1 RM 3.4-3.8 West (EAA-5: Terminal 117)

The RM 3.4-3.8 West (EAA-5: Terminal 117) source control area includes Port of Seattle Terminal 117, South Park Marina, and most of Boeing's South Park facility (Figure 8-1).

- Chemicals of concern for the RM 3.4-3.8 West source control area include PCBs, PAHs, phenol, and phthalates.
- There are 10 active outfalls in this area of the LDW, including the WSDOT 16th Avenue S Bridge outfall; an SPU outfall serving adjacent streets; private outfalls associated with South Park Marina and Boeing South Park properties; and an overflow to drain the upland area at Terminal 117.
- Of the 32 action items identified for this source control area, 30 have been completed. Nine high priority action items were identified; eight of these are complete.

8.1.1 Business Inspections

King County conducted stormwater inspections at four facilities (Boeing South Park, Rick's Master Marine, South Park Marina, and South Park Tire Factory) during the current reporting period (Appendix D).

Ecology conducted inspections at three facilities, Rick's Master Marine, South Park Marina, and Tire Factory during the current reporting period (Appendix E).

8.1.2 Source Tracing

In 2014, SPU collected two in-line solids samples from the pump stations on the temporary drainage system serving the streets adjacent to Terminal 117 in this source control area (Appendix F). Drainage from the adjacent streets was discharged to the combined sewer until August 2016 when the Terminal 117 Adjacent Streets cleanup was completed and a new outfall serving this area went online (17th Avenue S storm drain). The Adjacent Streets cleanup is described below. Chemicals that exceeded the CSL in these two samples included zinc (PS1), diesel-range hydrocarbons (PS1), oil-range hydrocarbons (both samples), cPAH (PS1), PCBs (both samples), 4-methylphenol (both samples), benzyl alcohol (both samples), and phenol (PS1).

King County collected three right-of-way catch basin solids samples in April 2016 at three locations from small drainage basins adjacent to the South Park bridge. Samples were analyzed for metals, PCBs, and SVOCs (King County 2017).

Screening level exceedances are summarized in Table 8-1 below.

Table 8-1. RM 3.4-3.8 West: Screening Level Exceedances in SPU and King County Source Tracing Samples

Chemical Class	Chemical	In-Line Solids (SPU)	Right-of-Way CB Solids (King County)
Metals	Chromium		☒
	Zinc	☒	×
PCBs	PCBs, total	☒	
PAHs	HPAH	☒	
	Total cPAHs	☒	
Phthalates	BEHP	☒	☒
	Butylbenzyl phthalate		×
	Dimethyl phthalate	☒	
Other SVOCs	4-Methylphenol	☒	
	Benzyl alcohol	☒	
	Phenol	☒	
TPH	Diesel-range hydrocarbons	☒	
	Oil-range hydrocarbons	☒	

Storm drain screening levels are listed in Table 2-6.

× = Exceedance of SCO (lower screening level) was observed during the current reporting period (2014 through 2016).

☒ = Exceedance of CSL (upper screening level) was observed during the current reporting period (2014 through 2016).

SPU collected six samples from drainage structures in the Terminal 117 area prior to cleanup (2004-2010). Chemicals that exceeded the CSLs included diesel-range hydrocarbons (5 samples), oil-range hydrocarbons (5 samples), LPAH (2 samples), HPAH (1 sample), cPAH (3 samples), BEHP (5 samples), butylbenzyl phthalate (1 sample), PCBs (1 sample), 2-methylnaphthalene (1 sample), and benzyl alcohol (1 sample).²²

²² Five of these drainage structures were plumbed to the combined sewer and one was plumbed to a storm drain on Terminal 117.

8.1.3 Facility-Specific Source Control Actions

South Park Marina

Ecology began negotiating an Agreed Order for the South Park Marina site in April 2016.

Ecology conducted a stormwater compliance inspection at South Park Marina on October 8, 2014. One water sample and two solids samples were collected from the storm drain system (Leidos 2015c).

Current Operations	Marina with boat storage and repair
Historical Operations	Resort and marina; drum reconditioning
Address	8604 Dallas Avenue S
Facility/Site ID	44653368
NPDES Permit	WAG030045 (Boatyard General Permit)
Chemicals of Concern	PCBs, PAHs, VOCs, dioxins/furans, phthalates, pesticides, petroleum hydrocarbons, metals
Media Affected	Stormwater and storm drain solids

- The water sample was collected from oil/water separator OWS-01, which receives stormwater from an area that drains the parking lot in the southern portion of the site. Copper and zinc exceeded the chronic marine WQC in this sample; total PCB congeners, benzo(b)fluoranthene, and chrysene exceeded the human health WQC in this sample.
- Solids samples were collected at the following locations:
 - Oil/water separator OWS-01. Various metals, total PCB Aroclors and congeners, dioxin/furan TEQ, various HPAHs and LPAHs, total cPAH TEQ, phthalates, phenols, benzoic acid, benzyl alcohol and petroleum hydrocarbons exceeded the storm drain screening levels in this sample. The highest exceedances were for benzyl alcohol, dimethyl phthalate, BEHP, and copper.
 - Catch basin CB-9, which receives stormwater from the boat storage area. Cadmium, copper, zinc, PCBs, dioxin/furan TEQ, 2-methylnaphthalene, various phthalates, benzyl alcohol, and petroleum hydrocarbons exceeded the storm drain screening levels. The highest exceedances in this sample were for phthalates.

South Park Marina collected soil, catch basin, and sediment samples in February 2016. Preliminary results indicate total PCBs at concentrations up to 22 mg/kg DW in soil, 1.5 mg/kg DW in catch basin solids, and 0.27 mg/kg DW in sediment.

Terminal 117 and Adjacent Streets

EPA signed an Administrative Settlement Agreement and Order on Consent with the Port of Seattle and the City of Seattle to implement cleanup actions at Terminal 117 in June 2011 (EPA 2011). The Order required the Port of Seattle and the City to implement EPA's cleanup decision for the Terminal 117 EAA. The cleanup includes the marine

Current Operations	Port of Seattle operations (International Inspection, Construction Services)
Historical Operations	Asphalt manufacturing; untreated lumber storage
Address	8700 Dallas Avenue S
Facility/Site ID	37657495 (Malarkey Asphalt Company)
Chemicals of Concern	PCBs
Media Affected	Soil, groundwater, and sediment

sediments adjacent to Terminal 117, the former industrial facility on terminal property, and 10 acres of soil in the nearby streets and residential area (EPA 2011). The cleanup was conducted in two coordinated phases: the sediment and upland cleanup (Phase 1), performed by the Port of Seattle, and the adjacent streets and residential yards cleanup (Phase 2), performed by the City of Seattle. Cleanup was completed in 2016.

The Port of Seattle and the City of Seattle are developing a long-term monitoring and maintenance plan for the site. The plan will address inspections of the upland area (bank and cap), monitoring of the offshore sediment and storm drain solids, and maintenance of the City's drainage/stormwater treatment system in the Adjacent streets post cleanup. The plan is expected to be completed in 2018.

Sediment and Upland Cleanup

Upland and in-water construction was completed in December 2014. Contaminated soil and sediment were removed from the Terminal 117 property; the site will remain fenced off until the restoration project is complete. Steel sheet piling was used to isolate contaminated soil and water from the river during construction. The sheet pile wall remains in place.

The cleanup included removal of 27,800 tons of PCB-contaminated soil and over 32,000 tons of sediment. In-water work was conducted in December 2014 to finish backfilling, place riprap materials, and replace marine pilings.

Adjacent Streets

The City of Seattle finished cleanup of residential yards in 2013 (removed PCB-contaminated soil from 9 yards and the alley between S Cloverdale Street and S Donovan Street) and in 2016, conducted a non-time critical removal action to remove PCB-contaminated soil in the adjacent streets near the Terminal 117 site. In conjunction with the removal action, the City constructed new permanent stormwater infrastructure to manage runoff from the streets adjacent to the upland area. The adjacent streets and stormwater project includes portions of the rights-of-way of 16th Avenue S, 17th Avenue S, Dallas Avenue S, and S Donovan Street, and the construction of new stormwater infrastructure.

The final phase of the Adjacent Streets cleanup included the following activities:²³

- Removed 28,300 tons of soil to remove PCB contamination;
- Planted 138 trees supplemented with shrubs and other plantings;
- Installed 9 bioretention cells and 4 Filterra® tree boxes to improve stormwater quality;
- Installed an 18-inch outfall to LDW (17th Avenue S storm drain);
- Placed 11 new art installations within the neighborhood;
- Installed 2,200 feet of new sidewalks;
- Installed 1,500 feet of new storm drain pipes under the streets.

²³ <http://t117.com/update1.aspx>

8.2 RM 3.8-4.2 West (Sea King Industrial Park)

The RM 3.8-4.2 West (Sea King Industrial Park) source control area includes the S 96th Street storm drain basin and portions of the 8th Avenue CSO basin (Figure 8-2).

- Chemicals of concern for the RM 3.8-4.2 West source control area include arsenic, mercury, zinc, butylbenzyl phthalate, benzyl alcohol, PCBs, pesticides, and dioxins/furans.
- There are six active outfalls in this area of the LDW, including two outfalls associated with the Boeing South Park facility, a creek at S Director Street, private outfalls associated with the Sea King Industrial Park and Delta Marine properties, and the S 96th Street storm drain, which discharges to the LDW on the Duwamish Yacht Club property.
- A total of 41 action items were identified for this source control area; 15 of these have been completed. Three high priority action items were identified; one of these has been completed and two of these have been canceled.

8.2.1 Business Inspections

- SPU conducted a total of 17 inspections at 9 facilities in the S 96th Street storm drain basin during the current reporting period, including nine initial inspections and eight follow-up inspections (Appendix C).
- King County conducted 48 inspections at 38 facilities in this source control area during the current reporting period (Appendix D).
- Ecology conducted 23 inspections at 16 facilities within this source control area during the current reporting period (Appendix E).

8.2.2 Source Tracing

SPU collected three sediment trap samples and three in-line solids samples in 2014 in the S 96th Street storm drain basin during the current reporting period (Appendix F).

King County sampled these three sediment traps in April 2016 (King County 2017).

In June 2015, Ecology collected four solids samples and three water sample in the S 96th Street storm drain basin (Leidos 2015d).

- Water samples were collected as follows:
 - One water sample was collected from a storm drain structure at location 96-ST2; total PCB congeners and BEHP exceeded the WQC in this sample.
 - Two water samples, representing base flow and storm flow conditions, were collected in the north fork of Hamm Creek at location HC-NF-10 exceeded the marine chronic WQC in the storm flow sample, but not the base flow sample. BEHP exceeded the human health WQC in the base flow sample only. Total PCB congeners exceeded the human health WQC in both samples.
- Solids samples were collected from the following locations:

- Sediment trap locations 96-ST1, 96-ST2, and 96-ST3. Zinc, BEHP, and dimethyl phthalate exceeded the storm drain screening levels at 96-ST1 and 96-ST2; dioxin/furan TEQ exceeded the screening level in all three samples.
- A sediment sample was collected in the north fork of Hamm Creek, at location HC-NF-10. No screening level exceedances were observed in this sample.

Sample locations are shown in Figure 8-2. Screening level exceedances are summarized in Table 8-2 below.

Table 8-2. RM 3.8-4.2 West: Screening Level Exceedances in SPU, King County, and Ecology Source Tracing Samples

Chemical Class	Chemical	Sediment Traps	In-line Solids
Metals	Zinc	☒	
Dioxins/furans	Dioxin/furan TEQ	☒	
PAHs	LPAHs	☒	
	HPAHs	☒	
	Total HPAHs	×	
Phthalates	BEHP	☒	
	Butylbenzyl phthalate	×	×
	Dimethyl phthalate	☒	
Other SVOCs	Benzoic acid	☒	
	Benzyl alcohol	☒	
TPH	Oil-range hydrocarbons	☒	

Storm drain screening levels are listed in Table 2-6.

× = Exceedance of SCO (lower screening level) was observed during the current reporting period (2014 through 2016).
☒ = Exceedance of CSL (upper screening level) was observed during the current reporting period (2014 through 2016).
ns = not sampled

SPU cleaned the City-owned portions of the S 96th Street SD in 2016. Samples have not yet been collected post-cleaning. Prior to cleaning, SPU collected 9 samples in the S 96th Street drainage system. Chemicals that exceeded the CSLs included zinc (3 samples), diesel-range hydrocarbons (1 sample), oil-range hydrocarbons (2 samples), BEHP (3 samples), butylbenzyl phthalate (3 samples), benzoic acid (1 sample), and benzyl alcohol (1 sample).

8.2.3 Facility-Specific Source Control Actions

Precision Engineering, Inc.

Soil at the Precision Engineering, Inc. site is contaminated with metals and halogenated organic compounds, and groundwater is contaminated with metals, halogenated organic compounds, and petroleum products. The site is participating in the VCP and cleanup has started.

- An RI/FS work plan was completed on March 25, 2014, and RI field investigations began in April 2014.

Puget Sound Coatings

Ecology conducted a stormwater compliance inspection at Puget Sound Coatings on September 9, 2014. Two water samples and one solids sample were collected from the storm drain system (Leidos 2015c).

- Water samples were collected from the following locations:
 - Treatment system influent sump TS-01, which receives stormwater from all drainage areas at the Puget Sound Coatings facility. Stormwater is pumped from the sump to an ion exchange stormwater treatment system. After treatment, stormwater is conveyed to the S 96th Street public storm drain system.
 - Manhole OS-01, located on the 48-inch bypass drainage line that conveys upgradient groundwater through the Puget Sound Coatings facility. Water from the treatment system and bypass line is combined and conveyed to the public storm drain line on 10th Avenue S.
- Copper and zinc exceeded the marine chronic WQC at both locations. In addition, total PCBs exceeded the human health WQC at both locations.
- Solids sample TS-01 was collected from the treatment system influent sump. Zinc, BEHP, butylbenzyl phthalate, phenol, benzyl alcohol, and petroleum hydrocarbons exceeded the storm drain screening levels (Table 2-6) in this sample.

Current Operations	Provides blasting, coating, wheelabrating, metallization and flame spraying, tape wrapping, and pressure washing services
Address	9220 8 th Avenue S
Facility/Site ID	927263627
NPDES Permit	WAR002142 (ISGP)
Chemicals of Concern	Copper, zinc, PCBs, phthalates, phenol, benzyl alcohol, and petroleum hydrocarbons
Media Affected	Stormwater and stormwater solids

SPU inspected Puget Sound Coatings in 2015 and found that an internal floor drain in the wheelabrator building was connected to the drainage system (illicit connection) and observed yellow primer dust containing chromium adjacent to the blast booth, near open doors. In addition, SPU found that Puget Sound Coatings had removed the orifice on the flow control structure at the onsite detention system when they installed a new stormwater treatment system. Work was done without the required City permits. The City required Puget Sound Coatings to plug the floor drain, improve housekeeping practices to prevent primer dust from entering the drainage system, and to restore the flow control structure.

In 2016, Ecology issued a fine to Puget Sound Coatings for \$80,000 for significant dangerous waste violations identified during inspections in July and August 2015. Ecology cited the facility for six violations, five of which were repeat violations from previous inspections (Ecology 2016d).

Samson Tug and Barge

SPU inspected Samson Tug and Barge (9228 10th Avenue S) in 2015 and found issues with offsite track out of sediment from unpaved portions of the site, lack of secondary containment for an aboveground diesel storage tank, and noted visible sheens and apparent petroleum contamination in runoff from the site. Samson Tug and Barge increased the cleaning frequency

for onsite catch basins, installed sorbent booms in the onsite flow control structure and catch basins to trap oil, removed the diesel tank, installed additional onsite detention to provide additional settling for site runoff, placed quarry spall to reduce trackout from unpaved surfaces, and increased street sweeping frequency to four times a week to remove material that continues to be tracked out onto the street.

8.3 RM 4.2-5.8 West (Restoration Areas)

The RM 4.2-5.8 West (Restoration Areas) source control area includes the Hamm Creek storm drain basin and a mixture of restored habitats and industrial properties along the LDW shoreline (Figure 8-3). Restored areas include the Hamm Creek Restoration Area, the Muckleshoot Tribe/Kenco Marine Restoration Area, the Turning Basin 3 Restoration Area, North Wind's Weir, and the Point Rediscovery Wetland. Five industrial properties adjacent to the LDW and five upland properties in the Hamm Creek storm drain basin were identified as potential sources of contaminants to sediments in the Restoration Areas source control area.

- Chemicals of concern for the RM 4.2-5.8 West source control area include arsenic, cadmium, silver, PAHs, butylbenzyl phthalate, phenols, chlorobenzenes, PCBs, pesticides, and dioxins/furans.
- There are 11 active outfalls in this source control area, including Hamm Creek, three outfalls associated with the City of Seattle's Duwamish substation, two Washington State Department of Transportation (WSDOT) storm drains that carry drainage from SR-99, two ditches, and three city of Tukwila storm drains.
- Of the nine action items identified for this source control area, one has been completed. No high priority action items were identified.

8.3.1 Business Inspections

Ecology and King County each conducted one inspection within this source control area, at the Seattle City Light Duwamish Substation, during the current reporting period (Appendix D and E).

8.3.2 Source Tracing

SPU collected one sediment trap solids sample in the Hamm Creek drainage basin (at location HC-ST1) in May 2014 (Appendix F). King County collected a sediment trap sample at this location in April 2016 (King County 2017). No chemicals were detected at concentrations above the storm drain screening levels.

In June 2015, Leidos (for Ecology) collected two solids samples and one stormwater sample in the south fork Hamm Creek drainage basin (Leidos 2015d). One sediment trap sample (HC-ST1) and one creek sediment sample (HC-SF) were collected; HC-SF is downstream of HC-ST1. No exceedances of the storm drain screening levels were observed in the solids samples collected from the south fork Hamm Creek drainage basin. A storm flow water sample was collected from location HC-SF. Copper exceeded the marine chronic WQC in this sample; total PCB congeners exceeded the human health WQC.

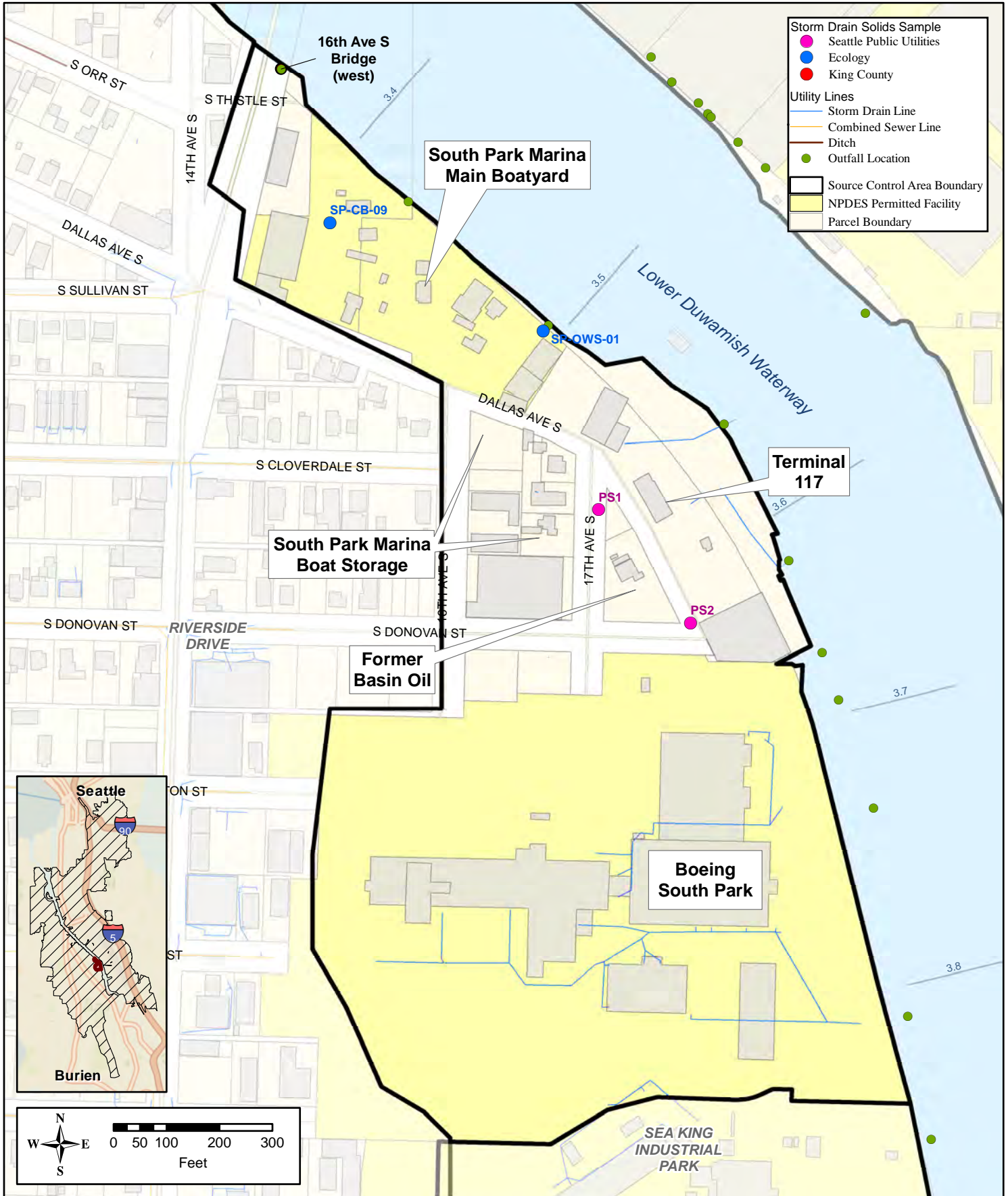
8.3.3 Facility-Specific Source Control Actions

Duwamish Substation (Seattle City Light)

Ecology conducted a stormwater compliance inspection at the SCL Duwamish Substation on December 16, 2014. One water sample and three solids samples were collected from the storm drain system (Leidos 2015c).

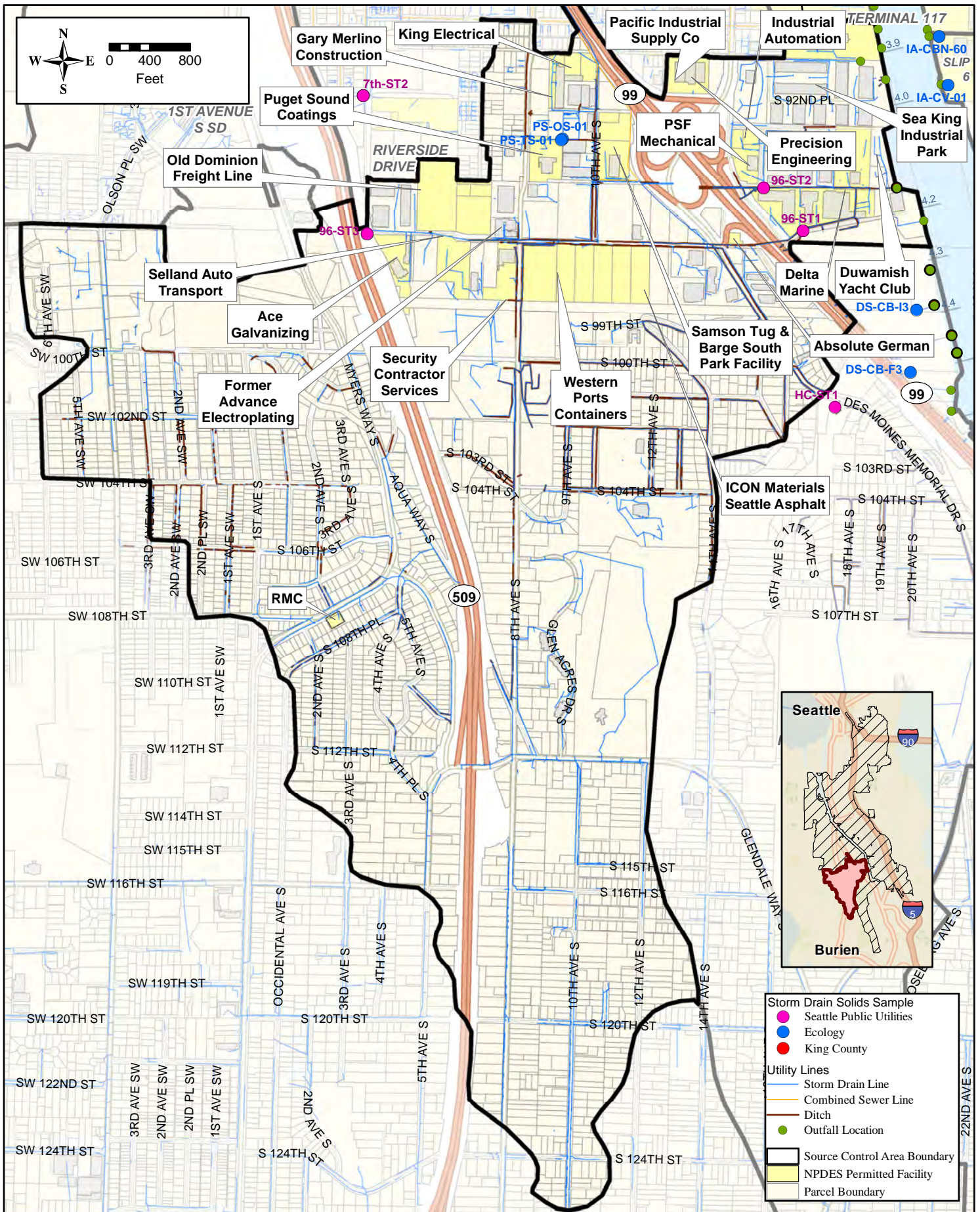
- One water sample was collected from structure CB-F3, which is in the southwest area of the facility. This manhole was labeled as a catch basin on the map provided by facility staff.
 - Copper concentrations exceeded the chronic marine WQC in this sample; total PCB congeners exceeded the human health WQC.
- Solids samples were collected at the following locations:
 - Catch basin CB-H1, in the central area of the Duwamish Substation. Various LPAH and HPAH compounds and dimethyl phthalate exceeded the CSL at this location. In addition, zinc, total PCB congeners, total cPAH TEQ, dioxin/furan TEQ, and petroleum hydrocarbons exceeded the SCO.
 - Catch basin CB-I3, located in the north area of the Duwamish Substation. CB-I3 receives stormwater drainage from driving areas and bus capacitors at the facility. The stormwater discharge from CB-I3 to the LDW is plugged. Dimethyl phthalate concentrations exceeded the CSL in this sample. No other screening level exceedances were observed.
 - Trench drains at banks 77, 78, and 79, which provide secondary containment for transmission substations. An equal amount of solids was collected from each trench drain and composited. Cadmium, silver, zinc, and various phthalates exceeded the CSL in this sample. In addition, lead, cPAH TEQ, and dioxin/furan TEQ exceeded the SCLs.

Current Operations	Power transmission and distribution facility
Address	1000 West Marginal Way SW
Facility/Site ID	17593
NPDES Permit	WAR044503 (Phase I Municipal Stormwater Permit)
Chemicals of Concern	Metals, PCBs, PAHs, dioxins/furans, PAHs, phthalates, and petroleum hydrocarbons
Media Affected	Stormwater and storm drain solids



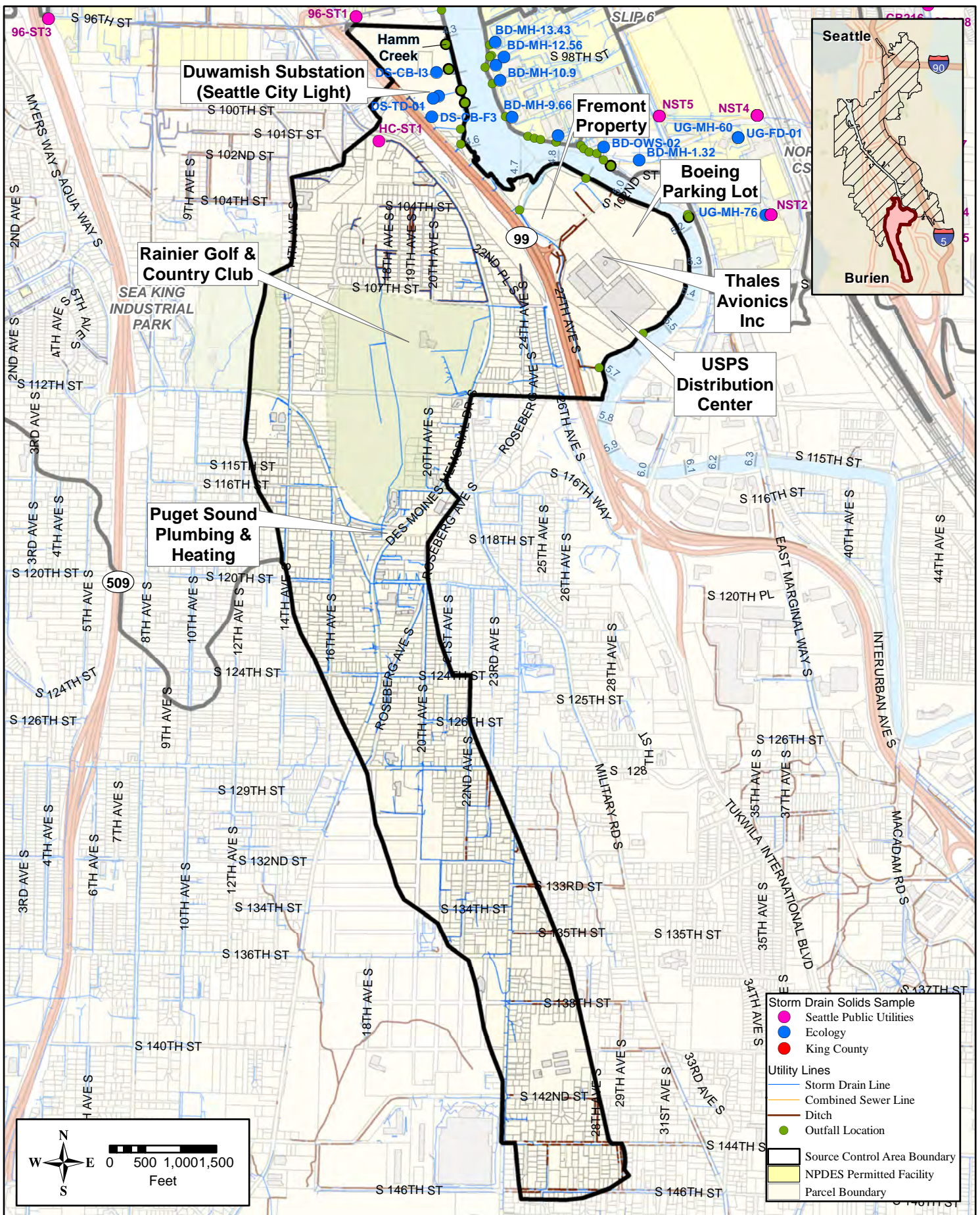
**Figure 8-1. RM 3.4-3.8 West
(EAA-5: Terminal 117)
Source Control Area**





**Figure 8-2. RM 3.8-4.2 West
(Sea King Industrial Park)
Source Control Area**





**Figure 8-3. RM 4.2-5.8 West
(Restoration Areas)
Source Control Area**



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**Appendix A:
Preliminary Source Control
Sufficiency Worksheets
(In Progress)**

Property Name	8801 Site (Former PACCAR)
GENERAL INFORMATION	
Address	8801 East Marginal Way S, Tukwila, WA 98108
Property No.	12001
Tax Parcel No.	542260-0060
Property Owner	Centerpoint 8801 Marginal LLC
Current Operator	Insurance Auto Auctions, Inc.
Property Size	24.3 acres
Facility/Site ID	2072 (8801 E Marginal Way S)
Alternate Names	8801 E Marginal Way S; Insurance Auto Auctions Tukwila; Kenworth Truck Co; Kenworth Truck Co Tuk; Paccar Inc
NPDES Permit No.	WAR008681 (Insurance Auto Auctions)
UST/LUST ID No.	8218 / 552588
SITE HISTORY AND ACTIVITIES	
Description	The 8801 Site is located along the east bank of the Lower Duwamish Waterway (LDW), at approximately river mile (RM) 3.9 to RM 4.0 (Figure 1). The site includes an upland portion and the adjoining LDW sediments. The upland portion of the site is bordered to the north by the Boeing Isaacson-Thompson facility, to the south by property owned by Container Properties, LLC (formerly Rhone-Poulenc and Monsanto Chemical) and the Museum of Flight Foundation, to the east by East Marginal Way S, and to the west by the LDW.
Historical Activities	In 1929, Fisher Body Corporation built the main manufacturing building. During World War II, the property was used to make trucks and airplane assemblies. In 1946, Kenworth Motor Truck Corporation, a PACCAR Inc. subsidiary, bought the northern two-thirds of the property. In 1966, PACCAR purchased what is now the southern third of the property from the Monsanto Company. PACCAR built trucks on the site from 1946 until 2002, when it decommissioned the facility. Merrill Creek Holdings, LLC, bought the entire property in 2004 (Ecology 2008 [0080]).
Current Activities	Currently, the property is leased to Insurance Auto Auctions, Inc. (IAAI), which auctions damaged vehicles. The property is used for storage of damaged automobiles.
Chemicals of Concern	The U.S. Environmental Protection Agency (EPA) has not designated chemicals of concern (COCs) for this section of the LDW. Based on available information, the following chemicals of concern were selected for Slip 6: lead, mercury, zinc, polychlorinated biphenyls (PCBs), high molecular weight polycyclic aromatic hydrocarbons (HPAHs), carcinogenic polycyclic aromatic hydrocarbons (cPAHs), and phthalates (Ecology 2018).
CONTAMINATED MEDIA	
Surface Sediment	Between August 2004 and February 2008 (AECOM 2012 [0999]), 27 surface sediment samples were collected between RM 3.9 and 4.0 East. PCBs, dioxins/furans, metals, butyltins, PAHs,

Property Name	8801 Site (Former PACCAR)
	<p>phthalates, other semivolatile organic compounds (SVOCs), and pesticides exceeded the Washington Statement Sediment Management Standards (SMS) Sediment Cleanup Objective (SCO)/lowest Apparent Effects Threshold (LAET) in at least one of 27 samples.</p> <p>The highest exceedance factors (EFs) were observed for 4,4'-DDT (EF = 82), the total cPAH toxic equivalency (TEQ) (EF = 68), butylbenzyl phthalate (EF = 35), mercury (EF = 34), lead (EF = 27), and total PCB Aroclors (EF = 22). See Table A-1 for additional details.</p>
Storm Drain Solids	<p>Between October 2009 and March 2011, six storm drain solids samples were collected from the site's stormwater system, which began operating in February 2008 (Windward 2011 [07738]). PCBs, dioxins/furans, metals, butyltins, PAHs, phthalates, and other SVOCs exceeded the SMS Cleanup Screening Level (CSL)/second lowest Apparent Effects Threshold (2LAET) in one or more of six storm drain solids samples collected at the 8801 site.</p> <p>The highest exceedance factors observed were for the total cPAH TEQ (EF = 944), tributyltin (EF = 76), the total dioxin/furan TEQ (EF = 42), zinc (EF = 36), dimethyl phthalate (EF = 29), and 4-methylphenol (EF = 21). Total PCB Aroclors exceeded the SCO/LAET. The highest exceedance factor observed was 7.0. See Table A-2 for additional details.</p>
Groundwater	<p>According to the Interim Action Work Plan (IAWP) (AMEC 2014), the following Slip 6 chemicals of concern are present in groundwater at concentrations above screening levels: cPAHs in the northwest corner of the property.</p> <p>Data for groundwater samples collected in 2011 indicate that bis(2-ethylhexyl) phthalate (BEHP) and copper concentrations exceed the LDW preliminary cleanup level (PCUL) for the protection of sediment via groundwater discharge.</p>
Soil	<p>According to IAWP (AMEC 2014), the following Slip 6 chemicals of concern are present in soil at concentrations above screening levels: lead, zinc, PCBs, and cPAHs.</p> <p>Soil samples were collected at the site in 2007 and 2011. Concentrations of several chemicals exceeded the LDW PCUL for the protection of sediment for soil via bank erosion. Exceedances were observed for the following chemicals: PCB Aroclors, dioxin/furan TEQ, arsenic, copper, lead, mercury, 1-methylnaphthalene, 2-methylnaphthalene, acenaphthene, acenaphthylene, fluoranthene, fluorene, naphthalene, phenanthrene, cPAH TEQ, BEHP, butylbenzyl phthalate, 2,4-dimethylphenol, 2-methylphenol, dibenzofuran, n-nitrosodi-n-propylamine, and n-nitrosodiphenylamine.</p>
TRANSPORT PATHWAYS	
Outfalls	<p>A new stormwater treatment system was constructed and began operation in February 2008 (Figure 2). There are two active stormwater outfalls at the property (Outfalls 2073 and 2075). A Stormwater Pollution Prevention Plan (SWPPP) prepared for this facility in 2012 describes the storm drain system, include stormwater treatment systems and best management practices (BMPs) in place at the facility (Windward 2012 [10365]). Additional information about each outfall is provided in Table B-1.</p>
Relevant Pathways	<p>Based on information provided in the Source Control Action Plan (SCAP) (Ecology 2008 [0080]), the IAWP (AMEC 2014), and the information on contaminated media above, the following pathways may contribute to sediment recontamination:</p> <ul style="list-style-type: none"> • Direct stormwater discharges: concentrations of COCs in storm drain solids exceed screening levels. • Contaminated groundwater discharge: concentrations of COCs in groundwater exceed screening levels. • Contaminated soil erosion/leaching: seeps have been observed near the SWS area, and COCs

Property Name	8801 Site (Former PACCAR)
	<p>in soil exceed screening levels in this area; soil in the northwest corner also exceeds screening levels and leaching to groundwater may be occurring.</p> <p>Surface runoff is not considered a significant pathway; the site is paved and runoff is directed to the onsite storm drain system. Leaks and spills may occur, but are likely to be captured in the onsite storm drain system. Waterway operations and atmospheric deposition have not been identified as relevant pathways at this property.</p>
SOURCE CONTROL ACTIONS	
Action Item Status	<p>Six high priority action items were identified for the site. A description of each action item and its status is provided in Table C-1. The following high priority action items are in progress or planned according to the most recent Source Control Status Report (Ecology 2018):</p> <ul style="list-style-type: none"> • Re-evaluate existing soil and groundwater data and compare to site-specific screening levels (to be developed) for metals, PAHs, petroleum hydrocarbons, PCBs, SVOCs, and VOCs as COCs in the LDW, and test for dioxins/furans. (In progress) • Negotiate expanding the stormwater and storm drain solids monitoring to add COCs at the site. Review future monitoring results to determine if further actions are necessary. (In progress) • Complete Phase 2 of the Sediment Evaluation Work, which includes sediment core sampling in selected locations of the LDW adjacent to the site. (Planned) <p>The planned medium priority action item is:</p> <ul style="list-style-type: none"> • Review the current SWPPP and Operations and Maintenance Plan. Make necessary changes and additions to prevent contaminants from potential upland sources (such as fuel leaks from damaged vehicles) from migrating to Slip 6 source control area sediments via the stormwater system.
INSPECTION, PERMIT, AND CLEANUP STATUS	
Inspections	A stormwater compliance inspection was conducted on October 20, 2014 (Leidos 2015 [10939, 10945]). The inspection report was not available for review.
Permit Compliance Status	Several benchmark exceedances for copper and zinc were noted in 2015 and 2016 (Ecology PARIS website).
Upland Cleanups	<p>Two Agreed Orders are in effect for the site:</p> <ul style="list-style-type: none"> • Agreed Order No. 3599, dated October 2006, to investigate the lateral and vertical extent of contamination in sediments adjacent to the 8801 Site (Ecology 2006 [02450]); and • Agreed Order No. 6069, dated September 2008, which includes completion of a Remedial Investigation/Feasibility Study (RI/FS) and IAWP for the upland area (Ecology 2008 [06418]). <p>Issues at the upland area include:</p> <ul style="list-style-type: none"> • a trichloroethylene (TCE) and vinyl chloride plume across the western portion of the upland area; • petroleum and metals contamination in the northwest corner of the upland area that appears to extend into LDW sediment; • PCBs and other chemicals of concern at the middle outfall; and • PAHs, metals, and other COCs at the former hazardous materials storage area. <p>In February 2012, PACCAR submitted the Final Remedial Investigation Report (AMEC 2011 [06872]) and a draft focused feasibility study (FFS) (AMEC 2012 [9900]) to Ecology for the upland area. A review draft of the final FFS was submitted to Ecology in May 2013 (AMEC 2013</p>

Property Name	8801 Site (Former PACCAR)
	<p>[11098]). Ecology has been working with PACCAR to develop final cleanup levels and alternatives.</p> <p>In July 2013, PACCAR submitted a draft IAWP to Ecology. A revised draft final IAWP was submitted in April 2014 (AMEC 2014), with additional revisions submitted in January 2015 (AMEC 2015). A recent change in property ownership and potential future land use may require additional modifications to the IAWP. Ecology is currently reviewing the IAWP.</p>
Other Relevant Studies	<p>Storm drain water samples were collected in October 2014 at two locations (Leidos 2015 [10939, 10945]), catch basin 60, located near the North Outfall (#1; Outfall 2075), and Vault 1, located near the Middle Outfall (#3; Outfall 2073).</p> <p>Copper, lead, and zinc were detected at concentrations that exceeded the Washington State Water Quality Standards (WQS) marine chronic water quality criteria. Copper and zinc also exceeded the WQS marine acute water quality criteria. PCBs and PAHs were detected at concentrations above the National Toxics Rule Water Quality Criteria for Human Health (consumption of organisms only). BEHP concentrations exceeded the National Recommended Water Quality Criteria for Human Health (consumption of organisms only).</p> <p>The highest exceedance factors were observed in catch basin 60.</p>
RECOMMENDATION	
Source Control Summary	<p>Three high priority actions are incomplete, and upland cleanup has not been completed.</p> <p><u>Surface sediment</u>: Analytical results for samples collected in between 2004 and 2009 indicate that PCBs, dioxins/furans, metals, butyltins, PAHs, phthalates, other SVOCs, and pesticides exceeded the SMS SCO/LAET.</p> <p><u>Storm Drain Solids</u>: Analytical results for samples collected between 2009 and 2011 indicate that PCBs, dioxins/furans, metals, butyltins, PAHs, phthalates, and other SVOCs exceed the SMS CSL/2LAET.</p> <p><u>Groundwater</u>: Analytical results for samples collected in 2011 indicate that copper and BEHP concentrations exceed the LDW PCUL for the groundwater to sediment pathway. In addition, the IAWP (AMEC 2014) indicates that cPAHs in groundwater exceed screening levels in the northwest corner of the property.</p> <p><u>Soil</u>: Analytical results for samples collected in 2007 and 2011 indicate that PCB Aroclors, dioxins/furans, metals, PAHs, phthalates, and other SVOCs exceed the LDW PCULs for the bank erosion to sediment pathway. According to IAWP (AMEC 2014), the following Slip 6 chemicals of concern are present in soil at concentrations above screening levels: lead, zinc, PCBs, and cPAHs.</p> <p><u>Stormwater</u>: Analytical results for samples collected in 2014 indicate that PCBs, metals, PAHs, and phthalates exceed state and/or federal water quality criteria.</p>
Preliminary Recommendation	Sources are not sufficiently controlled.

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Figures

Figure 1. RM 3.9-4.3 East (Slip 6) Source Control Area

Figure 2. 8801 Site (Former PACCAR)

Attachments

Attachment A. Summary of Screening Level Exceedances in Surface Sediment and Storm Drain Solids

Attachment B. Outfall Information

Attachment C. Source Control Action Item Status

Preliminary

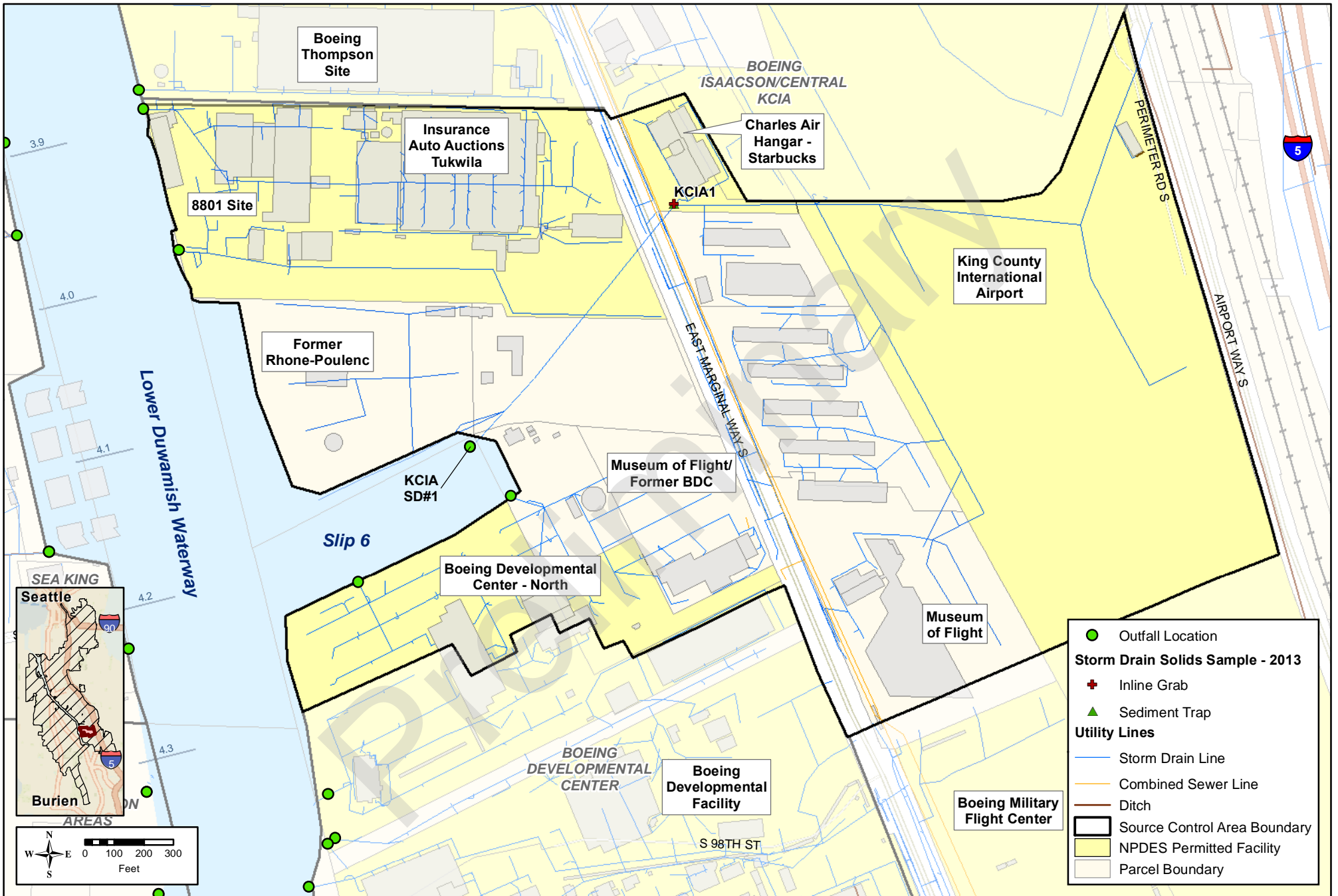
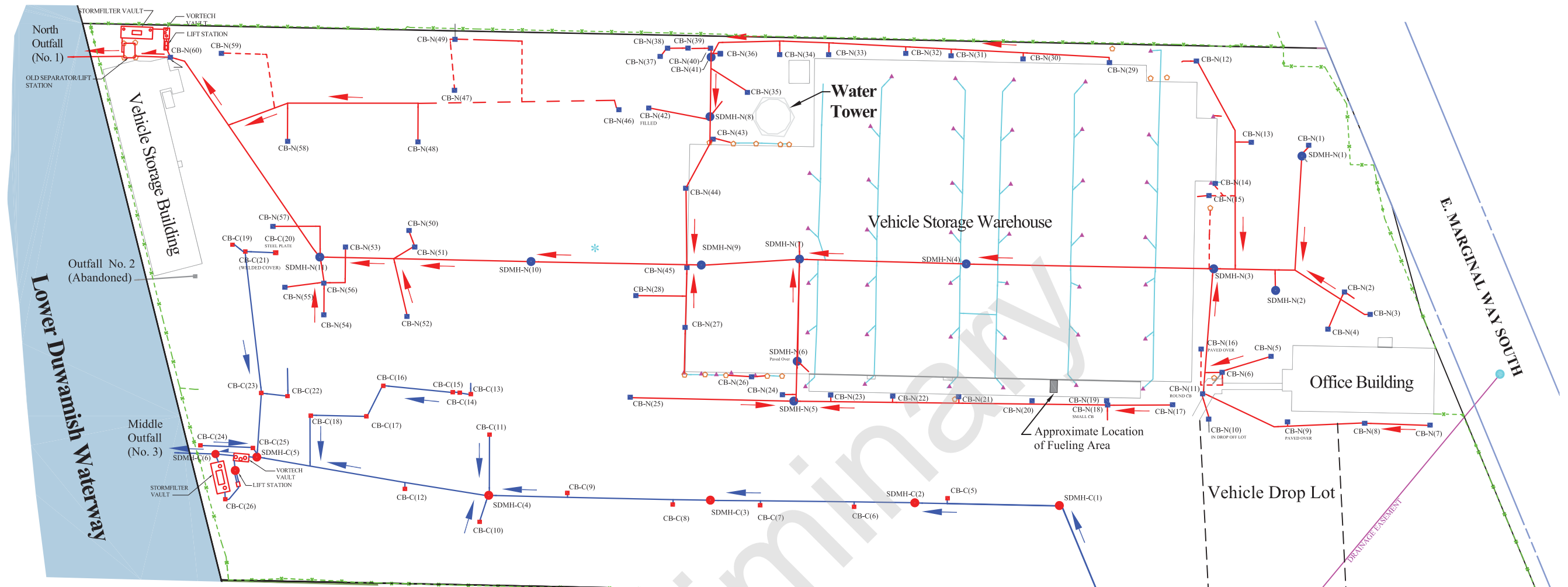


Figure 1. RM 3.9-4.3 East
(Slip 6)
Source Control Area



LEGEND:

	OUTFALL NO. 1 STORM DRAIN PIPES		OUTFALL NO. 1 BASIN CONVEYANCE /ROUTE
	OUTFALL NO. 1 CATCH BASINS		OVERFLOW ROUTE ^a
	OUTFALL NO. 1 STORM DRAIN MANHOLES		OUTFALL NO. 3 BASIN CONVEYANCE ROUTE
	OUTFALL NO. 3 STORM DRAIN PIPES		DOWNSPOUTS
	OUTFALL NO. 3 CATCH BASINS		ROOF DRAIN INLET
	OUTFALL NO. 3 STORM DRAIN MANHOLES		ROOF DRAIN PIPES
	EASEMENT STORM DRAIN PIPES		EAST MARGINAL WAY RIGHT OF WAY
	EASEMENT STORM DRAIN MANHOLES		FENCE LINE
	ABANDONED STORM DRAIN PIPES		PROPERTY LINE
	PRESUMED ALIGNMENT OF STORM DRAIN PIPES ^b		APPROXIMATE LOCATION OF A WELL - NON STORM WATER RELATED STRUCTURE

^a DURING SEVERE STORM EVENTS, THIS ROUTE MAY BE USED IN CONJUNCTION WITH THE NORMAL FLOW ROUTE
^b BASED ON HISTORICAL INFORMATION OR FIELD OBSERVATIONS OF PIPES WITHIN DRAINAGE STRUCTURES, DYE/SMOKE TESTING, AND VIDEO SURVEILLANCE. WORK IS ONGOING TO CONFIRM THESE CONNECTIONS.

Note:
 Base map, utilities, and all survey related information has been obtained from Barghausen Consulting Engineers, Incorporated As-built storm drainage and water quality improvements plans, dated 7/19/08. The base map has been updated based on field observations by Insurance Auto Auctions and Windward Environmental staff. The storm drain system on north parcel is owned by Merrill Creek Holdings LLC. The storm drain system on the south parcel is owned by Container Properties LLC.

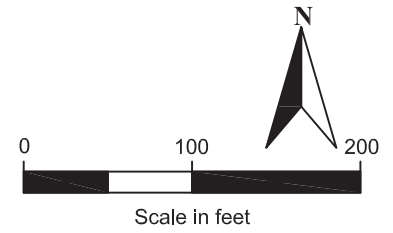


Figure 4. North parcel storm drainage detail
 Storm Water Pollution Prevention Plan (SWPPP)
 Insurance Auto Auctions, Inc.
 8801 East Marginal Way South
 Seattle, Washington

Figure 2. 8801 Site (Former PACCAR)

Table A-1. Summary of Screening Level Exceedances in Surface Sediment near the 8801 Site (Former PACCAR)

Parameter	Frequency of Detection	Range of Detected Conc'ns (mg/kg DW)	Range of Nondetected Conc'ns (mg/kg DW)	Average Detected Conc'n (mg/kg DW)	Lower Screening Level (mg/kg DW)	Maximum Exceedance Factor	Frequency of Detects Above Lower SL	Upper Screening Level (mg/kg DW)	Maximum Exceedance Factor	Frequency of Detects Above Upper SL
PCBs										
Total PCB Aroclors	25 / 25	0.046 - 2.9	NA	0.36	0.13	22	20 / 25	1	2.9	1 / 25
Total PCB TEQ	1 / 1	2.94E-06 - 2.94E-06	NA	0.00000294	0.0000007	4.2	1 / 1	7.00E-07	4.2	1 / 1
Dioxins/Furans										
Total dioxin/furan TEQ	12 / 12	4.38E-06 - 2.06E-05	NA	9.2518E-06	0.000005	4.1	11 / 12	0.000005	4.1	11 / 12
Metals										
Arsenic	26 / 26	6 - 33.1	NA	10	7	4.7	24 / 26	7	4.7	24 / 26
Lead	26 / 26	13 - 12,300	NA	530	450	27	1 / 26	530	23	1 / 26
Mercury	24 / 26	0.06 - 6.8	0.05 - 0.06	0.4	0.2	34	3 / 24	0.2	34	3 / 24
Zinc	26 / 26	67 - 1,000	NA	100	93	11	17 / 26	93	11	17 / 26
Metals - Butyltins										
Tributyltin as ion	1 / 1	0.0067 - 0.0067	NA	0.0067	0.0021	3.2	1 / 1	0.0021	3.2	1 / 1
SVOCs - PAHs										
Total cPAH TEQ	25 / 25	0.025 - 0.61	NA	0.19	0.009	68	25 / 25	0.009	68	25 / 25
SVOCs - Phthalates										
Butylbenzyl phthalate	23 / 25	0.018 - 2.2	0.02 - 0.02	0.2	0.063	35	12 / 23	0.9	2.4	1 / 23
Dimethyl phthalate	18 / 25	0.011 - 0.31	0.02 - 0.02	0.05	0.071	4.4	3 / 18	0.16	1.9	1 / 18
Other SVOCs										
Benzoic acid	2 / 25	0.12 - 0.79	0.2 - 0.2	0.455	0.7	1.2	1 / 2	0.65	1.2	1 / 2
Pesticides										
4,4'-DDT	1 / 5	0.0082 - 0.0082	0.016 - 0.086	0.0082	0.0001	82	1 / 1	0.0001	82	1 / 1

Summary of analytical data for sediment samples collected between August 2006 and February 2008.

Chemical concentrations are compared to the Sediment Management Standards, Sediment Cleanup Objective (lower screening level) and the Cleanup Screening Level (upper screening level).

DW - dry weight

mg/kg - milligrams per kilogram

NA - not applicable

PCBs - polychlorinated biphenyl

SL - screening level

AECOM. 2012. Final Feasibility Study, Lower Duwamish Waterway, Seattle, Washington. Prepared for Lower Duwamish Waterway Group. October 31, 2012. [00099]

Table A-2. Summary of Screening Level Exceedances in Storm Drain Solids at the 8801 Site (Former PACCAR)

Parameter	Frequency of Detection	Range of Detected Conc'ns (mg/kg DW)	Range of Nondetected Conc'ns (mg/kg DW)	Average Detected Conc'n (mg/kg DW)	Lower Screening Level (mg/kg DW)	Maximum Exceedance Factor	Frequency of Detects Above Lower SL	Upper Screening Level (mg/kg DW)	Maximum Exceedance Factor	Frequency of Detects Above Upper SL
PCBs										
Total PCB Aroclors	6 / 6	0.045 - 0.91	NA	0.46	0.13	7.0	5 / 6	NA	NA	NA
Dioxins/Furans										
Total dioxin/furan TEQ	3 / 3	9.22E-05 - 2.09E-04	NA	1.61E-04	5.00E-06	42	3 / 3	5.00E-06	42	3 / 3
Metals										
Arsenic	3 / 6	10 - 12	7 - 20	10	7	1.7	3 / 3	7	1.7	3 / 3
Cadmium	6 / 6	0.9 - 26.3	NA	10	5.1	5.2	5 / 6	6.7	3.9	5 / 6
Copper	6 / 6	76.3 - 1,210	NA	452	390	3.1	2 / 6	390	3.1	2 / 6
Lead	6 / 6	91 - 1,080	NA	710	450	2.4	5 / 6	530	2.0	5 / 6
Mercury	6 / 6	0.06 - 1.76	NA	0.4	0.2	8.8	3 / 6	0.2	8.8	3 / 6
Zinc	6 / 6	214 - 3,360	NA	1,910	93	36	6 / 6	93	36	6 / 6
Metals - Butyltins										
Tributyltin	2 / 3	0.021 - 0.16	0.0038 - 0.0038	0.091	0.0021	76	2 / 2	0.0021	76	2 / 2
SVOCs - PAHs										
Acenaphthene	5 / 6	0.036 - 0.78	1.1 - 1.1	0.33	0.5	1.6	1 / 5	0.5	1.6	1 / 5
Anthracene	6 / 6	0.15 - 1.5	NA	0.73	0.96	1.6	2 / 6	0.96	1.6	2 / 6
Benzo(a)anthracene	6 / 6	0.43 - 2.4	NA	1.5	1.3	1.8	3 / 6	1.6	1.5	3 / 6
Total benzofluoranthenes	6 / 6	1.92 - 15.6	NA	5.6	3.2	4.9	4 / 6	3.6	4.3	3 / 6
Benzo(g,h,i)perylene	6 / 6	0.31 - 2.3	NA	1.3	0.67	3.4	5 / 6	0.72	3.2	5 / 6
Benzo(a)pyrene	6 / 6	0.83 - 6.1	NA	2.7	0.85	7.1	5 / 6	1.6	3.8	4 / 6
Chrysene	6 / 6	1.2 - 11	NA	4.3	1.4	7.9	5 / 6	2.8	3.9	4 / 6
Dibenzo(a,h)anthracene	6 / 6	0.12 - 0.7	NA	0.3	0.23	3.0	4 / 6	0.23	3.0	4 / 6
Dibenzofuran	5 / 6	0.035 - 0.68	1.1 - 1.1	0.32	0.54	1.3	1 / 5	0.54	1.3	1 / 5
Fluoranthene	6 / 6	2.1 - 14	NA	6.5	1.7	8.2	6 / 6	2.5	5.6	5 / 6
Fluorene	5 / 6	0.04 - 0.71	1.1 - 1.1	0.4	0.54	1.3	1 / 5	0.54	1.3	1 / 5
Indeno(1,2,3-cd)pyrene	6 / 6	0.33 - 2.3	NA	1.1	0.6	3.8	5 / 6	0.69	3.3	4 / 6
2-Methylnaphthalene	4 / 6	0.24 - 0.83	0.039 - 1.1	0.59	0.67	1.2	2 / 4	0.67	1.2	2 / 4
Phenanthrene	6 / 6	0.76 - 7.7	NA	4.3	1.5	5.1	5 / 6	1.5	5.1	5 / 6
Pyrene	6 / 6	1.4 - 9.5	NA	4.8	2.6	3.7	4 / 6	3.3	2.9	4 / 6
Total LPAHs	6 / 6	1.01 - 11.6	NA	6.10	5.2	2.2	4 / 6	5.2	2.2	4 / 6
Total HPAHs	6 / 6	8.6 - 64	NA	28	12	5.3	4 / 6	17	3.8	4 / 6
Total cPAH TEQ	6 / 6	1.2 - 8.5	NA	3.7	0.009	944	6 / 6	0.009	944	6 / 6

Table A-2. Summary of Screening Level Exceedances in Storm Drain Solids at the 8801 Site (Former PACCAR)

Parameter	Frequency of Detection	Range of Detected Conc'ns (mg/kg DW)	Range of Nondetected Conc'ns (mg/kg DW)	Average Detected Conc'n (mg/kg DW)	Lower Screening Level (mg/kg DW)	Maximum Exceedance Factor	Frequency of Detects Above Lower SL	Upper Screening Level (mg/kg DW)	Maximum Exceedance Factor	Frequency of Detects Above Upper SL
SVOCs - Phthalates										
Bis(2-ethylhexyl)phthalate	6 / 6	1.2 - 37	NA	17	1.3	28	5 / 6	1.9	19	5 / 6
Butylbenzyl phthalate	6 / 6	0.097 - 5.2	NA	2.1	0.063	83	6 / 6	0.9	5.8	4 / 6
Dimethyl phthalate	6 / 6	0.021 - 4.7	NA	1.3	0.071	66	5 / 6	0.16	29	5 / 6
Other SVOCs										
Benzoic acid	1 / 6	0.88 - 0.88	0.39 - 11	0.88	0.65	1.4	1 / 1	0.65	1.4	1 / 1
Benzyl alcohol	3 / 6	0.15 - 0.78	0.03 - 0.56	0.38	0.057	14	3 / 3	0.073	11	3 / 3
2,4-Dimethylphenol	2 / 6	0.0085 - 0.04	0.0059 - 0.11	0.024	0.029	1.4	1 / 2	0.029	1.4	1 / 2
4-Methylphenol	6 / 6	0.064 - 14	NA	5.1	0.67	21	4 / 6	0.67	21	4 / 6
N-Nitrosodiphenylamine	1 / 6	0.13 - 0.13	0.0059 - 0.16	0.13	0.028	4.6	1 / 1	0.04	3.3	1 / 1
Phenol	1 / 6	0.56 - 0.56	0.039 - 1.1	0.56	0.42	1.3	1 / 1	NA	NA	NA

Summary of analytical data for storm drain solids samples collected between October 2009 and March 2011.

Chemical concentrations are compared to the Sediment Management Standards, Sediment Cleanup Objective (lower screening level) and the Cleanup Screening Level (upper screening level).

cPAHs - carcinogenic polycyclic aromatic hydrocarbons

DW - dry weight

HPAHs - high molecular weight polycyclic aromatic hydrocarbons

mg/kg - milligrams per kilogram

NA - not applicable

PAHs - polycyclic aromatic hydrocarbons

PCBs - polychlorinated biphenyl

SL - screening level

Windward Environmental LLC. 2011. Stormwater System Investigation – Final Report, Insurance Auto Auctions, 8801 E Marginal Way S, Tukwila, Washington. May 20, 2011. [07738]

Table B-1. Outfalls at the 8801 Site (Former PACCAR)

Outfall ID	Alternate Outfall ID	Outfall Status	Outfall Type	Outfall Diameter	Outfall Material	WQ Permit	Outfall Notes
2073	233E	Active	Private SD	18-inch	Concrete	WAR008681 (IAA)	Referred to as Central Outfall (No. 3) in the IAA SWPPP (Windward 2012 [10365]). The Slip 6 Data Gaps Report identified this as "Storm South" (E&E 2008 [02998]). The outfall drains an area of about 9 acres, including 25 catch basins and 6 manholes. Sampling indicated exceedances of COCs in water and solids. In 2008, a Vortechs and Stormfilter pretreatment system was installed at this outfall. During high flow events, stormwater bypasses the Vortechs unit and passes through an old separator/lift station prior to discharge to the LDW.
2075	231E	Active	Private SD	32-inch	Unknown	WAR008681 (IAA)	Referred to as North Outfall (No. 1) in the IAA SWPPP (Windward 2012 [10365]). The Slip 6 Data Gaps Report identified this as "Storm North" (E&E 2008 [02998]). The outfall drains a 15-acre area on the north end of the property, including 58 catch basins, 11 manholes, plus roof drains. The outfall was formerly under PACCAR-Seattle stormwater permit SO3001784 (2000 to 2003). Sampling indicated exceedances of COCs in water and solids. The pipe from CB74 to lift station was lined in 2006. In 2008, a Vortechs and Stormfilter pretreatment system and was installed at this outfall. During high flow events, stormwater bypasses the Vortechs unit and passes through an old separator/lift station prior to discharge to the LDW.

COCs - chemicals of concern

IAA - Insurance Auto Auctions

LDW - Lower Duwamish Waterway

SD - storm drain

SWPPP - Stormwater Pollution Prevention Plan

E&E (Ecology & Environment, Inc.). 2008. Lower Duwamish Waterway, RM 3.9-4.4 East (Slip 6), Summary of Existing Information and Identification of Data Gaps, Final Report.

Prepared for the Washington State Department of Ecology, Toxics Cleanup Program. February 2008. [02998]

Windward (Windward Environmental, LLC). 2012. Stormwater Prevention Pollution Plan, Insurance Auto Auctions, 8801 East Marginal Way South, Tukwila, Washington.

Prepared for Insurance Auto Auctions, Inc. May 2012. [10365]

Table C-1. Source Control Action Item Status for the 8801 Site (Former PACCAR)

Action Item	Priority	Type	Responsible Party	Status	Estimated Completion Date	Date Completed	Comments/Follow-On Actions
Negotiate an Agreed Order to address upland cleanup and source control of soil and groundwater contamination at the site.	High	SCAP	Ecology, Property owner/operator	Complete	--	September 2008	Agreed Order No. 6069, PACCAR, Inc. and Merrill Creek Holdings (Ecology 2008 [06418]).
Re-evaluate existing soil and groundwater data and compare to site-specific screening levels (to be developed) for metals, PAHs, petroleum hydrocarbons, PCBs, SVOCs, and VOCs as COCs in the LDW, and test for dioxin/furans.	High	SCAP	Ecology, Property owner/operator	In Progress	TBD		Ecology is reviewing the Final Draft Interim Action Work Plan (AMEC 2014). Work is continuing as required by Agreed Order No. 6069.
Expand investigation of the southwest storage area and northwest corner of the site to determine the extent of soil and groundwater contamination.	High	SCAP	Ecology, Property owner/operator	Complete		2014	The Final Remedial Investigation Report was submitted to Ecology in February 2012 (AMEC 2011 [06872]). The Final Focused Feasibility Study was completed in May 2013 (AMEC 2013 [11098]).
Complete Phase 2 of the Sediment Evaluation Work, which includes sediment core sampling in selected locations in the LDW adjacent to the site.	High	SCAP	Ecology, Property owner/operator	Planned	TBD		
Negotiate expanding the stormwater and storm drain solids monitoring to add COCs at the site. Review future monitoring results to determine if further actions are necessary.	High	SCAP	Ecology, Property owner/operator	In Progress	TBD		
Prepare Interim Action Work Plan to address upland contamination at the site.	High	New	Ecology, Property owner/operator	Complete		January 2015	Final Draft Interim Action Work Plan submitted to Ecology on April 8, 2014 (AMEC 2014), and revised in January 2015 (AMEC 2015).
Review the current SWPPP and Operations and Maintenance Plan. Make necessary changes and additions to prevent contaminants from potential upland sources (such as fuel leaks from damaged vehicles) from migrating to Slip 6 source control area sediments via the stormwater system.	Medium	SCAP	Ecology, Property owner/operator	Planned	TBD		

Table C-1. Source Control Action Item Status for the 8801 Site (Former PACCAR)

COCs - chemicals of concern

LDW - Lower Duwamish Waterway

PAHs - polycyclic aromatic hydrocarbons

PCBs - polychlorinated biphenyls

SCAP - Source Control Action Plan

SVOCs - semivolatile organic compounds

SWPPP - Stormwater Pollution Prevention Plan

TBD - to be determined

VOCs - volatile organic compounds

AMEC (AMEC Environment & Infrastructure, Inc.). 2011. Final Remedial Investigation Report, 8801 East Marginal Way South, Tukwila, Washington, Agreed Order Number 6069. March 18, 2011. [06972]

AMEC. 2013. Ecology Review, Final Focused Feasibility Study, 8801 East Marginal Way South, Tukwila, Washington, Agreed Order No. 6069. May 30, 2013. [11098]

AMEC. 2014. Ecology Review Final, Interim Action Work Plan, 8801 East Marginal Way South, Tukwila, Washington, Agreed Order No. 6069. April 8, 2014.

AMEC. 2015. Interim Action Work Plan, Revised Section 3.3.1, 8801 East Marginal Way South, Tukwila, Washington, Agreed Order No. 6069. January 5, 2015.

Ecology. 2008. Agreed Order No. 6069, POutfaACCAR, Inc. and Merrill Creek Holdings, LLC. September 15, 2008. [06418]

Property Name	Boeing Developmental Center
GENERAL INFORMATION	
Address	9725 East Marginal Way S, Tukwila 98108
Property No.	12002
Tax Parcel No.	562420-1032, 562420-1038, 562420-1036, 573000-0020, part of 573000-0010
Property Owner	562420 parcels: The Boeing Company; 573000 parcels: Museum of Flight Foundation
Current Operator	562420 parcels: Boeing Developmental Center; 573000 parcels: Museum of Flight (Space Shuttle Gallery and parking)
Property Size	562420 parcels: 32.8 acres; 573000 parcels: 5.9 acres (approx.); total 38.7 acres.
Facility/Site ID	2101 (Boeing A&M Developmental Center)
Alternate Names	Boeing A&M Developmental Center, Boeing BAS Development Ctr, Boeing Developmental Center, Boeing Developmental Center Paving, Developmental Center
NPDES Permit No.	WAR000146 (ISGP)
UST/LUST ID No.	10408 / 324
SITE HISTORY AND ACTIVITIES	
Description	<p>Boeing Developmental Center (BDC) is bordered by Slip 6 to the north, East Marginal Way S to the east, the Lower Duwamish Waterway (LDW) to the west and southwest, and by Strick Lease Yard to the south. It includes parcels on the eastern side of the property that were sold to the Museum of Flight Foundation for the Space Shuttle gallery and associated parking (Figures 1 through 3).</p> <p>The site consists of 174 acres, approximately 54 percent of which is owned by Boeing. The entire site is covered under the National Pollutant Discharge Elimination System (NPDES) stormwater permit. Over 40 designated buildings are located on the site; with the largest being the 9-101 manufacturing building. The majority of the site consists of developed parking, storage areas, and transportation lanes (E&E 2007 [2999]).</p> <p>The BDC property spans three LDW source control areas, based on stormwater drainage patterns at the site and the areas to which runoff discharges.</p> <p>BDC-North is the portion of the BDC property from which stormwater discharges through two outfalls to Slip 6, located along the LDW from approximately river mile (RM) 4.2 to RM 4.3. Outfalls DC14 and DC15, and the associated drainage areas, are included in this portion of the BDC property (Figure 1).</p> <p>BDC-Central is the portion of the BDC property from which stormwater discharges to the LDW through 11 outfalls between approximately RM 4.3 to 4.9. Outfalls DC5, DC6, DC7, DC8, DC9, DC10, DC11, DC12, DC13, DC18, DC19, and the associated drainage areas, are included in this portion of the BDC property (Figure 2).</p> <p>BDC-South is the portion of the BDC property from which stormwater discharges to the LDW through six outfalls northwest of the Norfolk combined sewer overflow (CSO)/storm drain (SD) at</p>

Property Name	Boeing Developmental Center
	RM 4.9. Outfalls DC1, DC2, DC3, DC4, DC16, DC17, and the associated drainage areas, are included in this portion of the BDC property (Figure 3).
Historical Activities	<p>The Monsanto Fund purchased the northern 38 acres of the BDC property at an unknown time and leased portions of the property. The area included warehouse and office buildings, winery buildings, a granary, and a trucking company. The Port of Seattle purchased the property and took over the leases in 1976; the northeastern five acres (two separate parcels) were leased by the Port to Kenworth Truck Company and Transport Pool Granary for storage (Ecology 2008 [0080]).</p> <p>The Port sold the property to The Boeing Company in 1985. Boeing has operated on portions of this property since 1956. Historical activities include manufacturing of airplanes and missiles, including metal machining, electroplating, chemical milling, conversion coating, painting, parts cleaning, and assembly activities (Ecology 2008 [0080]).</p>
Current Activities	The BDC is currently an aircraft and aerospace research and development complex. Activities at the site include manufacturing, fabrication, composite material assembly, painting and other plant activities. The eastern portion of the property is owned by the Museum of Flight Foundation and is the location of the Space Shuttle gallery and associated parking. Boeing has operated continuously on the property since 1956 and has been known as the BDC since 1959 (SAIC 2010 [6802]).
Chemicals of Concern	<p>The U.S. Environmental Protection Agency (EPA) has not designated chemicals of concern (COCs) for this section of the LDW. Based on available information, the following chemicals of concern were selected:</p> <ul style="list-style-type: none"> • RM 3.9-4.3 East (Slip 6) – lead, mercury, zinc, polychlorinated biphenyls (PCBs), high molecular weight polycyclic aromatic hydrocarbons (HPAHs), carcinogenic polycyclic aromatic hydrocarbons (cPAHs), and phthalates. • RM 4.3-4.9 East (Boeing Developmental Center) - PCBs, lead, acenaphthene, benzo(g,h,i)perylene, dibenz(a,h)anthracene, fluoranthene, and indeno(1,2,3-cd)pyrene). • RM 4.9 East (EAA-7: Norfolk CSO/SD) - metals, PCBs, semivolatile organic compounds (SVOCs), polycyclic aromatic hydrocarbons (PAHs), phthalates, and hexachlorobenzene. <p>Chemicals of concern for the site are: PCBs, metals, solvents, petroleum hydrocarbons, and SVOCs (Ecology 2018b).</p>
CONTAMINATED MEDIA	
Surface Sediment	<p>Between 2000 and 2012, 116 surface sediment samples were collected near the BDC site (AECOM 2012 [0099]; E&E 2009 [7450]; SAIC 2011 [6118]; Calibre 2012 [9832], 2013 [10517]). The following chemicals exceeded the lower of the Washington State Sediment Management Standards (SMS) Sediment Cleanup Objective (SCO)/lowest Apparent Effects Threshold (LAET) and the minimum cleanup level in the LDW Record of Decision (ROD) (EPA 2014[12119]) in at least one sample (Table A-1).</p> <ul style="list-style-type: none"> • Total PCB Aroclors and total PCB toxic equivalency (TEQ). • Metals: arsenic, mercury, and zinc. • PAHs: fluoranthene and total cPAHs TEQ. • Phthalates: bis(2-ethylhexyl) phthalate (BEHP) and butylbenzyl phthalate. • Other SVOCs: benzyl alcohol. • Pesticides: 4,4'- dichlorodiphenyltrichloroethane (DDT) and total DDT. <p>The highest SCO/LAET exceedance factors (EF) were for total cPAHs TEQ (EF = 122), total DDT (EF = 101), and total PCB Aroclors (EF = 65).</p>

Property Name	Boeing Developmental Center
Storm Drain Solids	<p>Between 2010 and 2014, 15 storm drain solids samples were been collected from storm drain structures at the site (SAIC and Newfields [7189]; Leidos 2015 [10939, 10946], Calibre 2012 [9832], 2013 [10517]). The following chemicals exceeded the SMS Cleanup Screening Level (CSL)/second lowest Apparent Effects Threshold (2LAET) and the minimum cleanup level in the LDWROD) (EPA 2014[12119]) in at least one sample (Table A-2).</p> <ul style="list-style-type: none"> • PCBs: total PCB Aroclors and congeners, and total PCB TEQ. • Total dioxins/furans TEQ. • Metals: arsenic, cadmium, mercury, silver, and zinc. • PAHs: acenaphthene, anthracene, benzo(a)anthracene, total benzofluoranthenes, benzo(g,h,i)perylene, benzo(a)pyrene, chrysene, dibenz(a,h)anthracene, dibenzofuran, fluoranthene, fluorene, indeno(1,2,3-cd)pyrene, ,2-methylnaphthalene, naphthalene, phenanthrene, pyrene, total LPAHs, and total cPAH TEQ. • Other SVOCs: benzoic acid, benzyl alcohol, BEHP, butylbenzyl phthalate, dimethyl phthalate, di-n-octyl phthalate, and phenol. <p>The following chemicals had CSL/2LAET exceedance factors over 1,000: total cPAH TEQ (EF = 35,333) and total PCB congeners (EF = 1,670). Several PAHs had CSL/2LAET exceedance factors over 100. See Table A-2 for additional details.</p>
Groundwater	<p>Petroleum hydrocarbons, VOCs, SVOCs, total PCB Aroclors, and metals have been detected in groundwater beneath the BDC property. Boeing has conducted excavations and ongoing bioremediation in areas with known groundwater contamination (AOC-05, SWMU-17, SWMU-20). Boeing has characterized the lateral extent of groundwater contamination (Ecology 2010 [6115]).</p> <p>The BDC has had several environmental cleanup activities at the site, including Resource Conservation and Recovery Action (RCRA) corrective actions for groundwater contamination, and soil remediation at the south storm drain (Outfall DC2) (Ecology 2007 [2995]).</p>
Soil	<p>Petroleum hydrocarbons, VOCs, SVOCs, total PCB Aroclors, and metals have been detected in soil. Boeing has conducted excavations and ongoing bioremediation in areas with known groundwater contamination (AOC-05, SWMU-17, SWMU-20) (Ecology 2010 [6115]).</p> <p>The BDC has had several environmental cleanup activities at the site, including Resource Conservation and Recovery Action (RCRA) corrective actions for soil contamination, and soil remediation at the south storm drain (Outfall DC2) (Ecology 2007 [2995]).</p>
TRANSPORT PATHWAYS	
Outfalls	<p>Per the Agreed Order No. 15600 (Ecology 2018a), the BDC property has 19 drainage areas, each with an associated outfall (DC1 through DC19). In addition to these 19 outfalls, KCIA SD#1 (Outfall 2080) which discharges to Slip 6, is present on the BDC property. The BDC 2011 Stormwater Pollution Prevention Plan (SWPPP) describes drainage areas DC1 through DC18 (Boeing 2011 [10364]). DC19 was established after the 2011 SWPPP was prepared. The Agreed Order requires Boeing to prepare an updated SWPPP. Additional details regarding each outfall are provided in Table B-1.</p> <p>Boeing Outfall DC1 is an alternate name for the Norfolk CSO (2095). Discharge from the outfall is covered by three municipal permits and 11 upland permits. Permit numbers and permittees are listed in Table B-1.</p> <p>Boeing Outfall DC2 (2093) collects runoff from 12.5 acres, including the roof of Building 9-110, a portion of the roof of Building 9-101, and from parking areas and roadways adjacent to these</p>

Property Name	Boeing Developmental Center
	<p>buildings. The discharge volume is identified in the BDC SWPPP as "large."</p> <p>Boeing Outfall DC3 (2096) drains 0.8 acre, including a portion of the roofs of Buildings 9-140 and 9-130, plus the pavement and planted areas around the buildings and a small landscaped area. The discharge volume is identified in the BDC SWPPP as "small."</p> <p>Boeing Outfall DC4 (2097) drains 1.4 acres, including a small roof portion of the southwest corner of Building 9-101, half the roof of Buildings 9-140 and 9-130, and parking/driving areas around these buildings. The discharge volume is identified in the BDC SWPPP as "very small."</p> <p>Boeing Outfall DC5 (2091) drains 3.08 acres, including the southwest corner of the roof of Building 9-101, all of Buildings 9-80, 9-85, and 9-102, plus paved areas around buildings. The discharge volume is identified in the BDC SWPPP as "small."</p> <p>Boeing Outfall DC6 (BDC-4) drains 0.87 acre, including part of the paved area west of Building 9-120 from one catch basin. The discharge volume is identified in the BDC SWPPP as "very small."</p> <p>Boeing Outfall DC7 (BDC-3) drains 0.26 acre, including part of the paved area west of Building 9-120 from one catch basin. The discharge volume is identified in the BDC SWPPP as "very small."</p> <p>Boeing Outfall DC8 (BDC-2) drains 0.74 acre, including half of the paved area west of Building 9-120 from a series of catch basins. The discharge volume is identified in the BDC SWPPP as "small."</p> <p>Boeing Outfall DC9 (2090) drains 26.35 acres, approximately one-fourth of the site, including a wide range of eaves from the east to west boundaries of the facility, half of the roof areas of Building 9-101 and 9-120, and roof areas of office buildings, cafeteria, boilers, shipping/receiving, clinic, hazardous material/waste, and data destroy buildings. The outfall drains paved areas around these buildings and small planted areas. The discharge volume is identified in the BDC SWPPP as "very large." This outfall was selected as "site representative" for NDPES sampling.</p> <p>Boeing Outfall DC10 (2085) drains 4.01 acres, including half of the roof areas of Buildings 9-98 and 9-99 (Research and Development [R&D], paint area), plus paved areas around these buildings. Runoff flows through an oil-water separator prior to discharge. The discharge volume is identified in the BDC SWPPP as "medium."</p> <p>Boeing Outfall DC11 (2087) drains 10.63 acres, including a narrow, long portion running across the middle of the site from east to west boundaries. It drains half the roof areas of Buildings 9-99 and 9-53 (R&D, office) and small Buildings 9-42 and 9-55, plus extensive parking and driving areas and the main driving entry to the site. The discharge volume is identified in the BDC SWPPP as "very large."</p> <p>Boeing Outfall DC12 (2088) drains 13.86 acres, including a large narrow portion of the site, north of the area drained by DC11, running from east to west boundaries of the facility. It drains some or all of the roof areas of Buildings 9-53, 9-55, 9-52 (paint booth, hazardous materials), 9-51 (facilities maintenance), 9-43, 9-48, 9-49, and 9-54. It also drains paved areas around these buildings, plus a pedestrian corridor. The discharge volume is identified in the BDC SWPPP as "large."</p> <p>Boeing Outfall DC13 (2089) drains 8.19 acres including the roof of Building 9-12, half of 9-08, and a small portion of the south end of Building 9-77, plus paved areas around these buildings. It also drains planted areas in a greenbelt corridor next to the LDW. The discharge volume is identified in the BDC SWPPP as "medium."</p> <p>Boeing Outfall DC14 (Outfall 2082) drains 6.10 acres, including the north half of the roof of Building 9-08, large paved parking and roadway areas around the building, planted areas, and a</p>

Property Name	Boeing Developmental Center
	<p>greenbelt corridor on the western property boundary adjacent to the LDW. The discharge volume is identified by the BDC SWPPP as "medium."</p> <p>Boeing Outfall DC15 (Outfall 2081) drains 6.86 acres of the BDC property and 5.96 acres of the Museum of Flight (formerly Boeing) parcel. It drains most of the roof areas of Buildings 9-77, 9-05, and 9-07; a large water storage tank; and extensive parking and paved storage areas. The discharge volume is identified in the BDC SWPPP as "medium."</p> <p>Boeing Outfall DC16 (BDC-5) drains 0.055 acre, including a small roof portion of the southwest corner of Building 9-14 and pavement/planted areas around the building. The discharge volume is identified in the BDC SWPPP as "very small."</p> <p>Boeing Outfall DC17 (2092) drains 0.28 acre, including the southwest corner of the Building 9-101 roof, and approximately half of the roof areas of Buildings 9-140 and 9-130, plus the parking and roadway areas around portions of these buildings. The discharge volume is identified in the BDC SWPPP as "small."</p> <p>Boeing Outfall DC18 (BDC-1) drains 0.20 acre, including one catch basin from the parking lot northwest of Building 9-99. The discharge volume is identified in the BDC SWPPP as "very small."</p> <p>Information regarding Boeing Outfall DC19 is not available for review.</p>
<p>Relevant Pathways</p>	<p>Based on information provided in the Source Control Action Plan (SCAP) for each of the three source control areas that include BDC (Ecology 2007 [02995], 2008 [00080], 2010 [06115]), and the information on contaminated media above, the following pathways may contribute to sediment recontamination:</p> <ul style="list-style-type: none"> • Stormwater Discharge: PCBs, dioxins/furans, metals, PAHs, phthalates, and other SVOCs are present at concentrations above screening levels in storm drain solids on the BDC property and in surface sediment adjacent to the property. Therefore, stormwater discharge is a relevant pathway for sediment recontamination. • Groundwater Discharge: The potential for sediment recontamination associated with groundwater contamination is believed to be low. Underground storage tanks (USTs) are present at the BDC property, including one leaking UST (LUST). Seep sampling, which is a medium priority action item, has not been completed. Collection and analysis of seep samples are needed to evaluate the potential for sediment recontamination via this pathway. • The shoreline consists of sheet pile bulkheads, riprap, fill material, and natural vegetation. Erosion is unlikely to contribute significantly to sediment contamination. The LDW Seep Sampling Data Report (Windward 2004 [00002]) identified the area from approximately RM 4.5 to 4.9 has generally high seepage indicated by numerous rivulets flowing along the shoreline. Five seeps are identified in the report; however, these seeps were not sampled. <p>Surface runoff is not considered a significant pathway; the site is paved and runoff is directed to the onsite storm drain system. Leaks and spills may occur, but are likely to be captured in the onsite storm drain system. Waterway operations and atmospheric deposition have not been identified as relevant pathways at this property.</p>
<p>SOURCE CONTROL ACTIONS</p>	
<p>Action Item Status</p>	<p>Six high priority action items have been identified for the site; three of these action items have been completed. The following action items are in progress or planned.</p>

Property Name	Boeing Developmental Center
	<ul style="list-style-type: none"> • BDC-Central: Continue sediment monitoring in the vicinity of the south storm drain sediment removal activities. (In progress) • BDC-South: Continue monitoring storm drain solids. (In progress) • BDC-Outfalls: If COCs are detected in the SD system at concentrations above the SQS, request Boeing to conduct source tracing and control as needed to reduce the potential for sediment recontamination. (Planned) <p>A description of each action item and its status is provided in Table C-1.</p>
INSPECTION, PERMIT, AND CLEANUP STATUS	
Inspections	A site visit was performed by Ecology on July 19, 2017. Inspection report information was unavailable in the PARIS database.
Permit Compliance Status	<p>The entire facility (spanning three source control areas) had multiple exceedances for copper and zinc during 2015 and 2016, which triggered Level 3 corrective actions. Boeing prepared and Engineering Report and supplement describing the expected performance of catch basin inserts that will be installed in drainage areas DC1, DC2, DC3, DC4, DC5, DC9, DC10, DC11, DC12, DC13, DC15, and DC19 (Ecology 2018a).</p> <p>Per Agreed Order No. 15600 between the Ecology Water Quality Program and Boeing, Boeing continued monitoring four drainage areas (DC2, DC5, DC9, and DC12) and began monitoring of drainage areas DC1, DC3, DC4, DC10, DC11, DC13, DC15, and DC19 in January 2018. Monitoring will occur at least once in all months when a discharge occurs during regular business hours. In addition to sampling for the standard Industrial Stormwater General Permit (ISGP) parameters and total suspended solids (TSS), Boeing agreed to monitoring for petroleum hydrocarbons and PCBs in drainage areas DC4, DC10, DC11, DC13, and DC19 (Ecology 2018a).</p>
Upland Cleanups	The BDC has had several environmental cleanup activities at the site, including RCRA corrective actions for groundwater and soil contamination, and soil remediation at the south storm drain (Outfall DC2) (Ecology 2007 [2995]).
Other Relevant Studies	In addition to the storm drain solids sample described above, five storm drain water samples were collected in 2011 (SAIC and Newfields [7189]) and six samples were collected in 2014 (Leidos 2015 [10939 & 10946]). Copper, lead, zinc, total PCB Aroclors and congeners, PAHs, BEHP, hexachlorobutadiene, pentachlorophenol, were detected at concentrations above state or federal water quality criteria (WQC).
RECOMMENDATION	
Source Control Summary	<p>Three high priority action items are not complete.</p> <p>Analytical results for surface sediment samples collected between 2000 and 2012 indicate that PCBs, dioxins/furans, metals, PAHs, phthalates, other SVOCs, and pesticides exceed the SCO/LAET criteria and/or the LDW ROD minimum cleanup level.</p> <p>Analytical results for storm drain solids samples collected between 2010 and 2014 indicate that PCBs, dioxins/furans, metals, PAHs, phthalates, and other SVOCs exceed the CSL/2LAET criteria and/or the LDW ROD minimum cleanup level.</p> <p>Seep sampling, which is a medium priority action item, has not been completed. Collection and analysis of seep samples are needed to evaluate the potential for sediment recontamination via this pathway.</p>

Property Name	Boeing Developmental Center
	The BDC has had several environmental cleanup activities at the site, including RCRA corrective actions for groundwater and soil contamination, and soil remediation at the south storm drain (Outfall DC2) (Ecology 2007 [2995]). It is not clear if cleanup activities are complete, based on the information that is available for review.
Preliminary Recommendation	Sources are not sufficiently controlled. Additional storm drain system source tracing, seep sampling, and information regarding the potential nature and extent of contamination in soil and groundwater is needed. Information regarding outfall DC19 and the associated drainage area is needed.

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RM 3.9-4.3 East (Slip 6)
RM 4.3-4.9 East (Boeing Developmental Center)
RM 4.9 East (EAA-7: Norfolk CSO/SD)

Source Control Sufficiency Worksheet

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Figures

Figure 1. RM 3.9-4.3 East (Slip 6) Source Control Area

Figure 2. RM 4.3-4.9 East (Boeing Developmental Center) Source Control Area

Figure 3. RM 4.9 East (EAA-7: Norfolk CSO/SD)

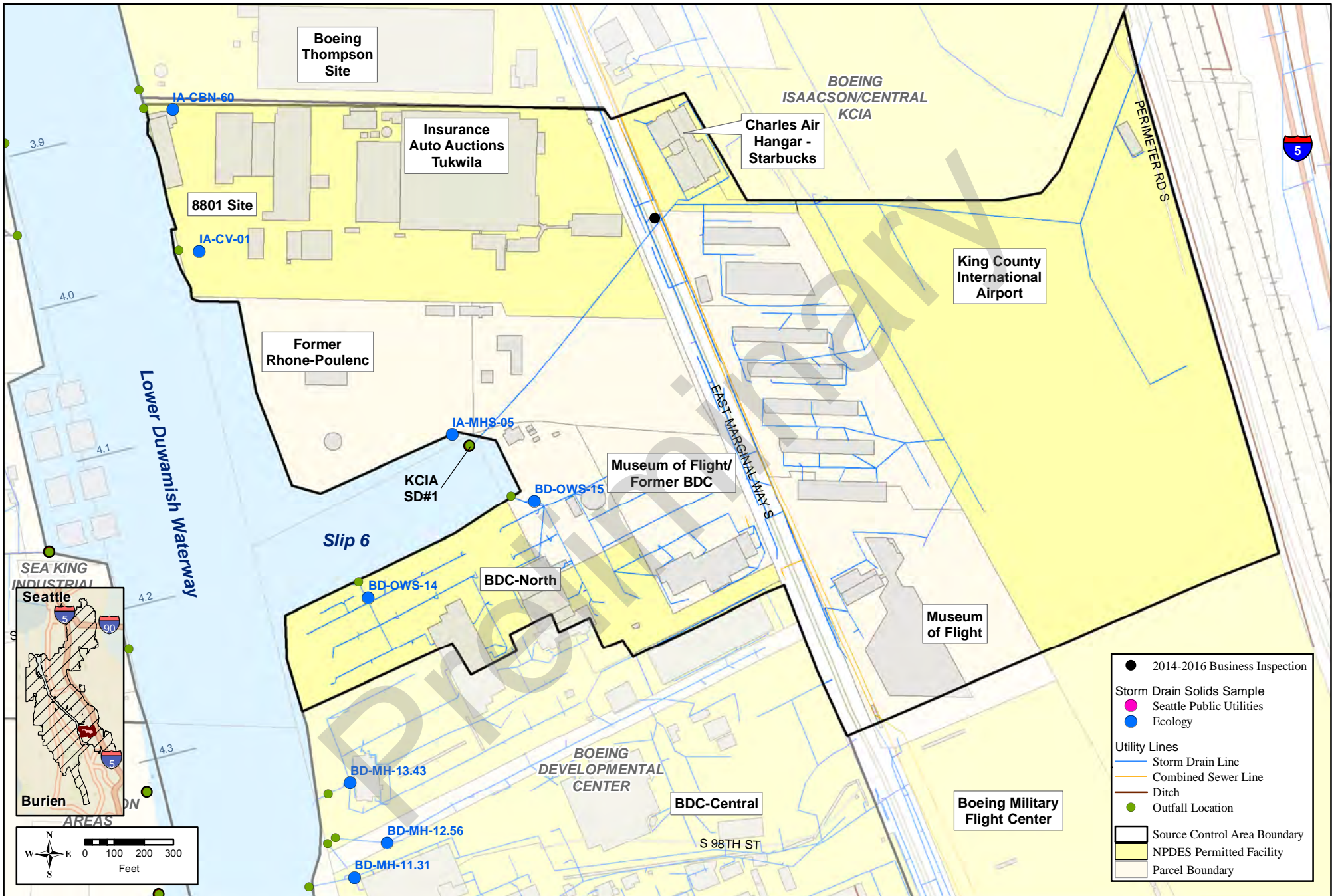
Figure 4. Boeing Developmental Center

Attachments

Attachment A. Summary of Screening Level Exceedances in Surface Sediment and Storm Drain Solids

Attachment B. Outfall Information

Attachment C. Source Control Action Item Status

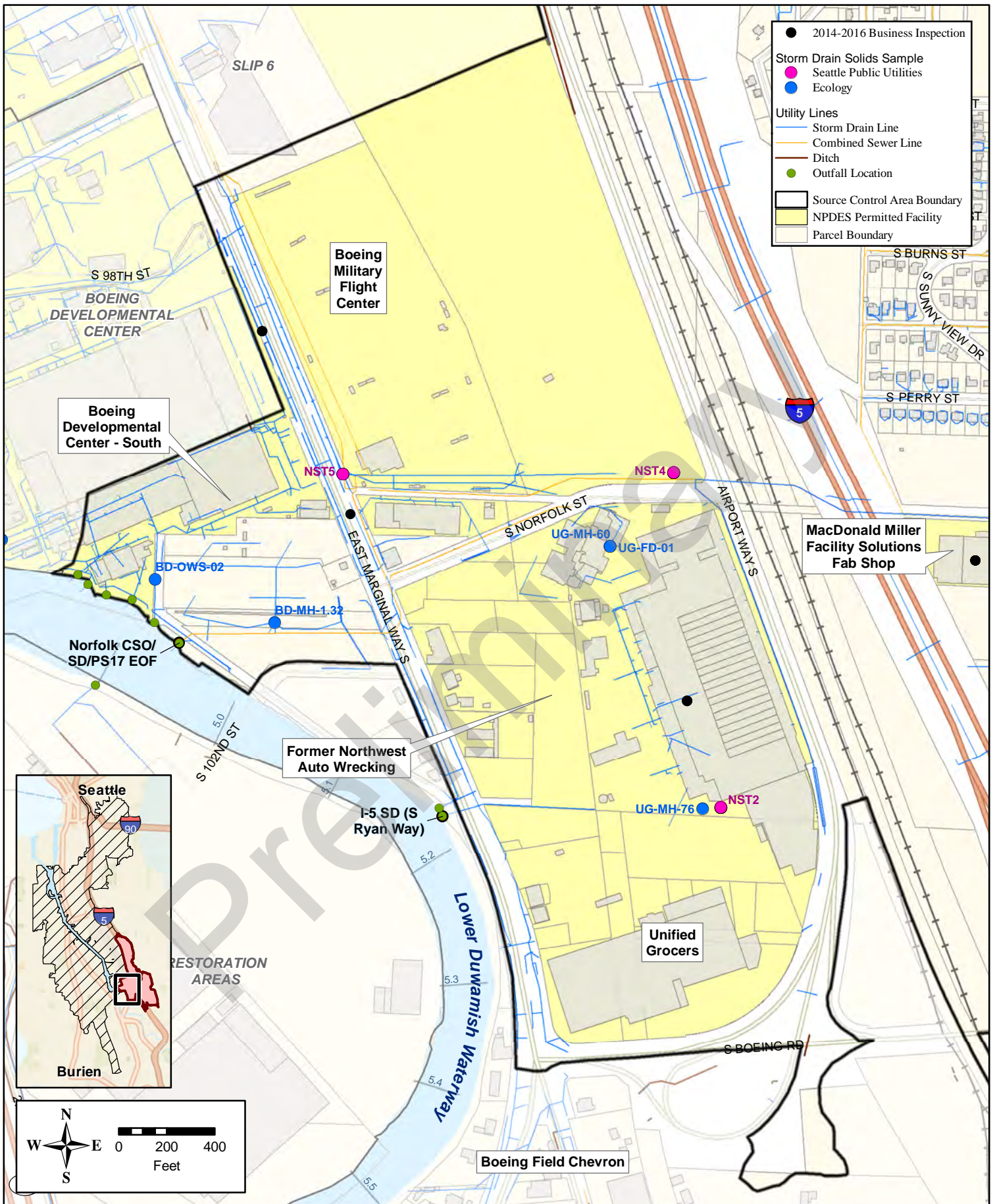


**Figure 1. RM 3.9-4.3 East
(Slip 6)
Source Control Area**



**Figure 2. RM 4.3-4.9 East
(Boeing Developmental Center)
Source Control Area**





**Figure 3. RM 4.9 East
(EEA-7: Norfolk CSO/SD)
Source Control Area**



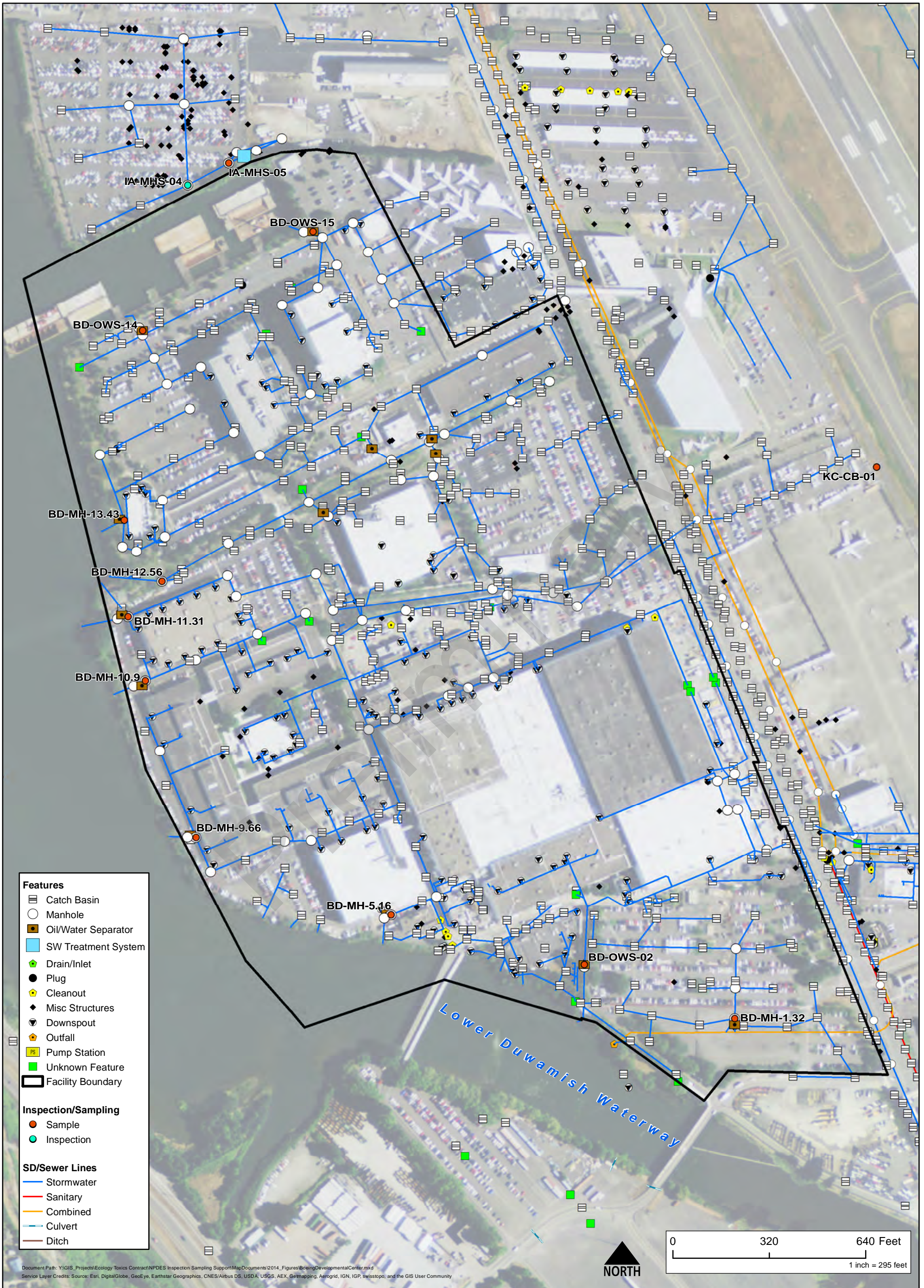


Figure 4. Boeing Developmental Center

Table A-1. Summary of Screening Level Exceedances in Surface Sediment near the Boeing Developmental Center

Parameter	Frequency of Detection	Range of Detected Conc'ns (mg/kg DW)	Range of Nondetected Conc'ns (mg/kg DW)	Average Detected Conc'n (mg/kg DW)	Lower Screening Level (mg/kg DW) ¹	Maximum Exceedance Factor	Frequency of Detects Above Lower SL	Upper Screening Level (mg/kg DW) ²	Maximum Exceedance Factor	Frequency of Detects Above Upper SL
PCBs										
Total PCB Aroclors	63 / 80	0.0022 - 8.4 9.65E-07 - 3.09E-05	0.0039 - 0.033	0.61	0.13	65	23 / 63	1	8.4	7 / 63
Total PCB TEQ	3 / 3		NA	1.18E-05	7.0E-07	44	3 / 3	7.0E-07	44	3 / 3
Dioxins/Furans										
Dioxins/furans TEQ	8 / 8	3.40E-07 - 6.76E-06	NA	2.99E-06	5.0E-06	1.4	1 / 8	5.0E-06	1.4	1 / 8
Metals										
Arsenic	44 / 45	3.4 - 20	3.8 - 3.8	10	7	2.9	36 / 44	7	2.9	36 / 44
Mercury	37 / 44	0.04 - 0.302	0.03 - 0.1	0.1	0.2	1.5	1 / 37	0.2	1.5	1 / 37
Zinc	42 / 42	42.6 - 130	NA	79	93	1.4	10 / 42	93	1.4	10 / 42
Metals - Butyltins										
Tributyltin as ion	3 / 3	0.0016 - 0.0067	NA - NA	0.0033	0.0021	3.2	1 / 3	0.0021	3.2	1 / 3
SVOCs - PAHs										
Fluoranthene	43 / 44	0.022 - 1.84	0.17 - 0.17	0.30	1.7	1.1	1 / 43	NA	NA	NA
Total cPAHs TEQ	41 / 43	0.013 - 1.1	0.027 - 0.040	0.156	0.009	122	41 / 41	0.009	122	41 / 41
SVOCs - Phthalates										
Bis(2-ethylhexyl)phthalate	33 / 43	0.028 - 2	0.022 - 0.32	0.2	1.3	1.5	1 / 33	1.9	1.1	1 / 33
Butylbenzyl phthalate	31 / 43	0.0028 - 0.115	0.0046 - 0.086	0.018	0.063	1.8	2 / 31	NA	NA	NA
Other SVOCs										
Benzyl alcohol	25 / 43	0.0065 - 0.36	0.0047 - 0.045	0.15	0.057	6.3	18 / 25	0.073	4.9	16 / 25
Hexachlorobenzene	1 / 43	0.0014 - 0.0014	0.00049 - 0.02	0.0014	0.001	1.4	1 / 1	0.001	1.4	1 / 1
Pesticides										
4,4'-DDT	1 / 3	0.0054 - 0.0054	0.002 - 0.018	0.0054	0.0001	54	1 / 1	0.0001	54	1 / 1
Total DDT	1 / 3	0.0101 - 0.0101	0.002 - 0.018	0.0101	0.0001	101	1 / 1	0.0001	101	1 / 1

Summary of analytical data for surface sediment samples collected between 2000 and 2012.

¹ Lower screening level is the lower of SMS SCO and minimum cleanup level in LDW ROD.

² Upper screening level is the higher of SMS CSL and minimum cleanup level in LDW ROD.

CSL - Cleanup Screening Level

cPAHs - carcinogenic polycyclic aromatic hydrocarbons

DDT - dichlorodiphenyltrichloroethane

DW - dry weight

LDW - Lower Duwamish Waterway

mg/kg - milligrams per kilogram

Table A-1. Summary of Screening Level Exceedances in Surface Sediment near the Boeing Developmental Center

NA - not applicable

PAHs - polycyclic aromatic hydrocarbons

PCBs - polychlorinated biphenyl

ROD - Record of Decision

SCO - Sediment Cleanup Objective

SL - screening level

SMS - Sediment Management Standards

SVOCs - semivolatile organic compounds

TEQ - toxic equivalency

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Table A-2. Summary of Screening Level Exceedances in Storm Drain Solids at the Boeing Developmental Center

Parameter	Frequency of Detection	Range of Detected Conc'ns (mg/kg DW)	Range of Nondetected Conc'ns (mg/kg DW)	Average Detected Conc'n (mg/kg DW)	Lower Screening Level (mg/kg DW) ¹	Maximum Exceedance Factor	Frequency of Detects Above Lower SL	Upper Screening Level (mg/kg DW) ²	Maximum Exceedance Factor	Frequency of Detects Above Upper SL
PCBs										
Total PCB Aroclors	14 / 15	0.157 - 17.4	0.041 - 0.041	5.6	0.13	134	14 / 14	1	17	8 / 14
Total PCB congeners	4 / 4	0.116 - 3.34	NA	1.04	0.002	1,670	4 / 4	0.002	1,670	4 / 4
Total PCB TEQ	4 / 4	4.00E-05 - 1.39E-04	NA	7.08E-05	7.00E-07	199	4 / 4	7.00E-07	199	4 / 4
Dioxins/Furans										
Total dioxin/furan TEQ	5 / 5	1.32E-05 - 1.30E-04	NA	7.18E-05	5.00E-06	26	5 / 5	5.00E-06	26	5 / 5
Metals										
Arsenic	4 / 5	8.6 - 22	20 - 20	15	7	3.1	4 / 4	7	3.1	4 / 4
Cadmium	5 / 5	2.6 - 7.3	NA	4.7	5.1	1.4	2 / 5	6.7	1.1	2 / 5
Mercury	5 / 5	0.16 - 0.6	NA	0.3	0.2	3.0	3 / 5	0.2	3.0	3 / 5
Silver	5 / 5	0.72 - 97	NA	21	6.1	16	1 / 5	6.1	16	1 / 5
Zinc	5 / 5	850 - 1,600	NA	1,100	93	17	5 / 5	93	17	5 / 5
SVOCs - PAHs										
Acenaphthene	7 / 8	0.045 - 11	0.14 - 0.14	2.8	0.5	22	4 / 7	0.5	22	4 / 7
Anthracene	8 / 8	0.2 - 39	NA	7	0.96	41	5 / 8	0.96	41	5 / 8
Benzo(a)anthracene	8 / 8	0.96 - 230	NA	39	1.3	177	7 / 8	1.6	144	7 / 8
Total benzofluoranthenes	8 / 8	2.4 - 570	NA	100	3.2	178	7 / 8	3.6	158	7 / 8
Benzo(g,h,i)perylene	8 / 8	0.32 - 85	NA	18	0.67	127	7 / 8	0.72	118	7 / 8
Benzo(a)pyrene	8 / 8	1.1 - 220	NA	40	0.85	258	8 / 8	1.6	138	7 / 8
Chrysene	8 / 8	1.3 - 300	NA	50	1.4	214	7 / 8	2.8	107	7 / 8
Dibenz(a,h)anthracene	6 / 8	0.079 - 27	0.14 - 0.87	6.1	0.23	117	5 / 6	0.23	117	5 / 6
Dibenzofuran	8 / 8	0.032 - 7.7	NA	2.0	0.54	14	5 / 8	0.54	14	5 / 8
Fluoranthene	8 / 8	2.2 - 640	NA	110	1.7	376	8 / 8	2.5	256	7 / 8
Fluorene	8 / 8	0.07 - 14	NA	3.0	0.54	26	5 / 8	0.54	26	5 / 8
Indeno(1,2,3-cd)pyrene	8 / 8	0.45 - 120	NA	23	0.6	200	7 / 8	0.69	174	7 / 8
2-Methylnaphthalene	6 / 8	0.018 - 1.4	0.23 - 0.58	0.43	0.67	2.1	1 / 6	0.67	2.1	1 / 6
Naphthalene	10 / 12	0.0011 - 2.6	0.0033 - 0.58	0.44	2.1	1.2	1 / 10	2.1	1.2	1 / 10
Phenanthrene	8 / 8	1.2 - 310	NA	60	1.5	207	7 / 8	1.5	207	7 / 8
Pyrene	8 / 8	1.9 - 500	NA	90	2.6	192	7 / 8	3.3	152	7 / 8
Total LPAHs	4 / 4	1.6 - 380	NA	130	5.2	73	3 / 4	5.2	73	3 / 4
Total cPAHs TEQ	5 / 5	1.5 - 318	NA	83	0.009	35,333	5 / 5	0.009	35,333	5 / 5
SVOCs - Phthalates										
Bis(2-ethylhexyl)phthalate	5 / 5	1.9 - 15	NA	7.2	1.3	12	5 / 5	1.9	7.9	5 / 5
Butylbenzyl phthalate	2 / 5	0.18 - 0.38	4.5 - 7.6	0.28	0.063	6.0	2 / 2	NA	NA	NA
Dimethyl phthalate	3 / 5	0.01 - 0.47	0.23 - 2.9	0.2	0.071	6.6	2 / 3	0.16	2.9	2 / 3
Di-n-octyl phthalate	5 / 5	0.27 - 7.3	NA	3.0	6.2	1.2	1 / 5	6.2	1.2	1 / 5

Table A-2. Summary of Screening Level Exceedances in Storm Drain Solids at the Boeing Developmental Center

Parameter	Frequency of Detection	Range of Detected Conc'ns (mg/kg DW)	Range of Nondetected Conc'ns (mg/kg DW)	Average Detected Conc'n (mg/kg DW)	Lower Screening Level (mg/kg DW) ¹	Maximum Exceedance Factor	Frequency of Detects Above Lower SL	Upper Screening Level (mg/kg DW) ²	Maximum Exceedance Factor	Frequency of Detects Above Upper SL
Other SVOCs										
Benzoic acid	1 / 5	1.2 - 1.2	3.2 - 96	1.2	0.65	1.8	1 / 1	0.65	1.8	1 / 1
Benzyl alcohol	1 / 5	0.31 - 0.31	0.13 - 3.8	0.31	0.057	5.4	1 / 1	0.073	4.2	1 / 1
Phenol	1 / 5	0.49 - 0.49	0.13 - 3.8	0.49	0.42	1.2	1 / 1	NA	NA	NA

Summary of analytical data for storm drain solids samples collected between 2010 and 2014.

¹ Lower screening level is the lower of SMS SCO and minimum cleanup level in LDW ROD.

² Upper screening level is the higher of SMS CSL and minimum cleanup level in LDW ROD.

CSL - Cleanup Screening Level

cPAHs - carcinogenic polycyclic aromatic hydrocarbons

DW - dry weight

LDW - Lower Duwamish Waterway

LPAHs - low molecular weight polycyclic aromatic hydrocarbons

mg/kg - milligrams per kilogram

NA - not applicable

PAHs - polycyclic aromatic hydrocarbons

PCBs - polychlorinated biphenyl

ROD - Record of Decision

SCO - Sediment Cleanup Objective

SL - screening level

SMS - Sediment Management Standards

SVOCs - semivolatiles organic compounds

TEQ - toxic equivalency

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Table B-1. Outfalls at the Boeing Developmental Center

Outfall ID	Alternate Outfall ID	Outfall Status	Outfall Type	Outfall Diameter	Outfall Material	WQ Permit	Outfall Notes
2095	253E; DC1; KC Norfolk CSO (044); PS17 EOF	Active	County CSO/City SD	84-inch	Steel	WAR045544, WAR044501, WA0031682, WAR000343, WAR000146, WAR000150, WAR125005, WAR125421, WAR125428, WAR125646, WAR125358, WAR002040, WAR002153, WAR002835	<p>According to SPU, this outfall is owned by the city of Tukwila, and functions as a city SD. The outfall is also King County's Norfolk CSO (044). Seattle Public Utilities also operates an EOF that discharges through this outfall. Finally, during low flow, treated stormwater from the WSDOT I-5 drainage system merges with runoff from the S Norfolk CSO/EOF/SD and discharges through this outfall. Boeing Outfall DC1 (WAR000146) carries stormwater from 11.76 acres of parking areas, roadways, truck inspection area, and South Yard storage area in the southernmost portion of the BDC property; it connects to the Norfolk CSO/SD at a point just upstream of the outfall after passing through an oil-water separator. Discharge identified in BDC SWPPP as "very large." According to SPU, the CSO basin is 1,060 acres, and the separated SD basin is 769 acres (Boeing 2011 [10364]; LDWG 2011; SAIC 2010 [06802]; SPU 2013).</p> <p><u>Permittees</u> Municipal: WAR045544 (Tukwila City - Municipal SW Phase II Western WA GP), WAR044501 (King County - Municipal SW Phase I GP), WA0031682 (Seattle CSO); Upland: WAR000343 (King County Int Airport); WAR000146 (Boeing Developmental Center); WAR000150 (Boeing Military Flight Center); WAR125005 (MacDonald Miller Facility Solutions Fab Shop); WAR125421 (Nelson Trucking Co 9777); WAR125428 (Northwest Gourmet Foods); WAR125646 (Special Asphalt Products Inc); WAR125358 (Steeler Inc); WAR002040 (Unified Grocers 3301 Norfolk), WAR002153 (Contractors Concrete Recycle/Monster Auto); WAR002835 (UPS Tukwila Freight)</p>
2093	251E; E&E-A; DC2	Active	Private SD	24-inch	Concrete	WAR000146 (BDC)	Boeing South SD. Bank is riprap with moderate slope. No flow observed during 2008 E&E survey. Boeing Outfall DC2. collects runoff from 12.5 acres, including the roof of Building 9-110, a portion of the roof of Building 9-101, and from parking areas and roadways adjacent to these buildings. Stormwater is collected into a primary storm line, which runs through part of the south end of the BDC property before it discharges via a 24-inch concrete pipe to the LDW. PCBs were detected in 2001 up to 16,700 mg/kg DW; the pipe was cleaned in 2002. A sediment trap/oil-water separator was installed in this drain upstream of manhole MH2 in 2003. The discharge volume is identified in the BDC SWPPP as "large" (Boeing 2011 [10364]; SAIC 2010 [06802]).
2096	250E; DC3	Active	Private SD	6-inch	Iron	WAR000146 (BDC)	Boeing Outfall DC3 drains 0.8 acre, including a portion of the roofs of Buildings 9-140 and 9-130, plus the pavement and planted areas around the buildings and a small landscaped area. The discharge volume is identified in the BDC SWPPP as "small" (Boeing 2011 [10364]; SAIC 2010 [06802]).
2097	249E; DC4	Active	Private SD	8-inch	Steel	WAR000146 (BDC)	Boeing Outfall DC4 drains 1.4 acres, including a small roof portion of the southwest corner of Building 9-101, half the roof of Buildings 9-140 and 9-130, and parking/driving areas around these buildings. The discharge volume is identified in the BDC SWPPP as "very small" (Boeing 2011 [10364]; SAIC 2010 [06802]).
2091	247E; DC5	Active	Private SD	36-inch	CMP	WAR000146 (BDC)	Boeing Outfall DC5 drains 3.08 acres, including the southwest corner of the roof of Building 9-101, all of Buildings 9-80, 9-85, and 9-102, plus paved areas around buildings. Runoff discharges to LDW via an oil-water separator. The discharge volume is identified in the BDC SWPPP as "small" (Boeing 2011 [10364]; SAIC 2010 [06802]).
BDC-4	Boeing 9; DC6	Active	Private SD	Unknown	Unknown	WAR000146 (BDC)	Boeing Outfall DC6 drains 0.87 acre, including part of the paved area west of Building 9 120 from one catch basin. The discharge volume identified in the BDC SWPPP as "very small" (Boeing 2011 [10364]; SAIC 2010 [06802]).
BDC-3	Boeing 8; DC7	Active	Private SD	Unknown	Unknown	WAR000146 (BDC)	Boeing Outfall DC7 drains 0.26 acre, including part of the paved area west of Building 9 120 from one catch basin. The discharge volume identified in the BDC SWPPP as "very small" (Boeing 2011 [10364]; SAIC 2010 [06802]).

Table B-1. Outfalls at the Boeing Developmental Center

Outfall ID	Alternate Outfall ID	Outfall Status	Outfall Type	Outfall Diameter	Outfall Material	WQ Permit	Outfall Notes
BDC-2	Boeing 7; DC8	Active	Private SD	Unknown	Unknown	WAR000146 (BDC)	Boeing Outfall DC8 drains 0.74 acre, including half of the paved area west of Building 9 120 from a series of catch basins. The discharge volume is identified in the BDC SWPPP as "small" (Boeing 2011 [10364]; SAIC 2010 [06802]).
2090	246E; DC9	Active	Private SD	36-inch	Concrete	WAR000146 (BDC)	Boeing Outfall DC9 drains 26.35 acres, approximately one-fourth of the site, including a wide range of eaves from the east to west boundaries of the facility, half of the roof areas of Building 9-101 and 9-120; and roof areas of office buildings, cafeteria, boilers, shipping/receiving, clinic, hazardous material/waste, and data destroy buildings. The outfall drains paved areas around these buildings and small planted areas. Runoff is collected into an extensive storm drain system with passes through an oil-water separator prior to discharge. The discharge volume is identified in the BDC SWPPP as "very large." This outfall was selected as "site representative" for NDPEs sampling (Boeing 2011 [10364]; SAIC 2010 [06802]).
2085	245E; DC10	Active	Private SD	36-inch	Concrete	WAR000146 (BDC)	Boeing Outfall DC10 drains 4.01 acres, including half of the roof areas of Buildings 9-98 and 9-99 (R&D, paint area), plus paved areas around these buildings. Runoff flows through an oil-water separator prior to discharge. The discharge volume is identified in the BDC SWPPP as "medium" (Boeing 2011 [10364]; SAIC 2010 [06802]).
2087	243E; DC11	Active	Private SD	36-inch	Concrete	WAR000146 (BDC)	Boeing Outfall DC11 drains 10.63 acres, including a narrow, long portion running across the middle of the site from east to west boundaries. It drains half the roof areas of Buildings 9-99 and 9-53 (R&D, office) and small Buildings 9-42 and 9-55, plus extensive parking and driving areas and the main driving entry to the site. Runoff discharges to the LDW via an oil-water separator. The discharge volume is identified in the BDC SWPPP as "very large" (Boeing 2011 [10364]; SAIC 2010 [06802]).
2088	242E; DC12	Active	Private SD	36-inch	Concrete	WAR000146 (BDC)	Boeing Outfall DC12 drains 13.86 acres, including a large narrow portion of the site, north of the area drained by DC11, running from east to west boundaries of the facility. It drains some or all of the roof areas of Buildings 9-53, 9-55, 9-52 (paint booth, hazardous materials), 9-51 (facilities maintenance), 9-43, 9-48, 9-49, and 9-54. It also drains paved areas around these buildings, plus a pedestrian corridor. Runoff is collected into a centralized storm drain system that discharges to the LDW via four oil-water separators. The discharge volume is identified in the BDC SWPPP as "large" (Boeing 2011 [10364]; SAIC 2010 [06802]).
2089	241E; DC13	Active	Private SD	24-inch	Concrete	WAR000146 (BDC)	Boeing Outfall DC13 drains 8.19 acres including the roof of Building 9-12, half of 9-08, and a small portion of the south end of Building 9-77, plus paved areas around these buildings. It also drains planted areas in a greenbelt corridor next to the LDW. Runoff discharges to the LDW via an oil-water separator. The discharge volume is identified in the BDC SWPPP as "medium" (Boeing 2011 [10364]; SAIC 2010 [06802]).
2082	238E; DC14	Active	Private SD	24-inch	Steel	WAR000146 (BDC)	Boeing Outfall DC14 drains 6.10 acres, including the north half of the roof of Building 9-08, large paved parking and roadway areas around the building, planted areas, and a greenbelt corridor on the western property boundary adjacent to the LDW. The discharge volume is identified in the BDC SWPPP as "medium" (Boeing 2011 [10364]; SAIC 2010 [06802]).
2081	237E; DC15	Active	Private SD	36-inch	Concrete	WAR000146 (BDC)	Boeing Outfall DC15 drains 6.86 acres of the BDC property and 5.96 acres of the Museum of Flight (formerly Boeing) parcel. It drains most of the roof areas of Buildings 9-77, 9 05, and 9-07; a large water storage tank; and extensive parking and paved storage areas. Runoff passes through an oil-water separator prior to discharge. The discharge volume is identified in the BDC SWPPP as "medium" (Boeing 2011 [10364]; SAIC 2010 [06802]).
BDC-5	BDC-5, Boeing 10; DC16	Active	Private SD	12-inch	Concrete	WAR000146 (BDC)	Boeing Outfall DC16 drains 0.055 acre, including a small roof portion of the southwest corner of Building 9-14 and pavement/planted areas around the building. The discharge volume is identified in the BDC SWPPP as "very small" (Boeing 2011 [10364]; SAIC 2010 [06802]).
2092	248E; DC17	Active	Private SD	18-inch	Iron	WAR000146 (BDC)	Boeing Outfall DC17 drains 0.28 acre, including the southwest corner of the Building 9-101 roof, and approximately half of the roof areas of Buildings 9-140 and 9-130, plus the parking and roadway areas around portions of these buildings. The discharge volume is identified in the BDC SWPPP as "small" (Boeing 2011 [10364]; SAIC 2010 [06802]).

Table B-1. Outfalls at the Boeing Developmental Center

Outfall ID	Alternate Outfall ID	Outfall Status	Outfall Type	Outfall Diameter	Outfall Material	WQ Permit	Outfall Notes
BDC-1	Boeing 6; DC18	Active	Private SD	Unknown	Unknown	WAR000146 (BDC)	Boeing Outfall DC18 drains 0.20 acre, including one catch basin from the parking lot northwest of Building 9-99. The discharge volume is identified in the BDC SWPPP as "very small" (Boeing 2011 [10364]).
2080	KCIA SD#1; 234E; Slip 6 SD	Active	County SD	36-inch	Riveted steel	WAR044501, WAR000343, WAR008681, WAR127177	<p>Outfall appears to be located on Boeing parcel, which includes most of Slip 6. Drainage is from south-central portion of KCIA, plus IAA Outfall No. 4 (South Outfall), which discharges to this pipe at SDMH-S(7), just upstream of the outfall to the LDW. The KCIA subbasin includes a portion of the flightline, SW Hangars & Tiedowns area, Southeast Tie-Downs, and one tenant (King County Sheriff Guardion One). Includes 3 oil-water separators and one wet vault. About 9 acres of IAA vehicle storage area, including 9 catch basins and 7 manholes, drains to this outfall via a Stormfilter unit. IAA SWPPP and Slip 6 SCAP describe this as 36-inch diameter pipe (Boeing 2011 [10364]; KCIA 2012 [10458]; SAIC 2010 [06802], Windward 2012 [10365]).</p> <p><u>Permittees</u> Municipal: WAR044501 (King County - Municipal SW Phase I GP) Upland: WAR000343 (KCIA), WAR008681 (IAA), WAR127177 (Charles Air Hanger-Starbucks)</p>

Agreed Order No. 15600 (Ecology 2018) identifies an additional outfall, DC19. Information regarding this outfall is not available for review.

BDC - Boeing Developmental Center

CSO - combined sewer overflow

DW - dry weight

EOF - emergency overflow

GP - general permit

IAA - Insurance Auto Auctions

KCIA - King County International Airport

LDW - Lower Duwamish Waterway

mg/kg - milligrams per kilogram

NPDES - National Pollutant Discharge Elimination System

PCBs - polychlorinated biphenyls

R&D - research and development

SCAP - Source Control Action Plan

SD - storm drain

SPU - Seattle Public Utilities

SW - stormwater

SWPPP - Stormwater Pollution Prevention Plan

WQ - water quality

WSDOT - Washington State Department of Transportation

Boeing (The Boeing Company). 2011. Storm Water Pollution Prevention Plan, Boeing Developmental Center, Washington Department of Ecology (WDOE), Permit # WAR-000146.

January 12, 2011. [10364]

Ecology. 2018. Agreed Order Docket # 15600, In the Matter of An Administrative Order Against: The Boeing Company. January 9, 2018.

KCIA. 2012. Stormwater Pollution Prevention Plan, King County International Airport. May 12, 2012. [10458]

LDWG. 2011. BDC Data Gaps Report; LDWG Comments on Ecology Upriver Source Control FAQ. May 16, 2011. [Did not find document]

SAIC (Science Applications International Corporation). 2010. Lower Duwamish Waterway, RM 4.3 to 4.9 East (Boeing Development Center), Summary of Existing Information and Identification

Table B-1. Outfalls at the Boeing Developmental Center

Outfall ID	Alternate Outfall ID	Outfall Status	Outfall Type	Outfall Diameter	Outfall Material	WQ Permit	Outfall Notes
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of Data Gaps. Prepared for the Washington State Department of Ecology, Toxics Cleanup Program, Northwest Regional Office. September 2010. [06802]

SPU. 2013. Draft Duwamish Source Control Action Plan. November 2013. [Did not find document]

Windward (Windward Environmental, LLC). 2012. Stormwater Prevention Pollution Plan, Insurance Auto Auctions, 8801 East Marginal Way South, Tukwila, Washington. Prepared for Insurance Auto Auctions, Inc. May 2012. [10365]

Preliminary

Table C-1. Source Control Action Item Status for the Boeing Developmental Center

Action Item	Priority	Type	Responsible Party	Status	Estimated Completion Date	Date Completed	Comments/Follow-On Actions
Conduct stormwater and/or storm drain solids monitoring for outfalls DC14 and DC15.	High	SCAP	Ecology, Boeing	Complete	--	December 2014	Ecology/Leidos collected a water sample from an oil/water separator on the DC14 drainage line, and a solids sample from the DC15 drainage line in December 2014 (Leidos 2015 [10939 & 10946]). PCBs and PAHs exceeded screening levels in both samples; dioxins/furans and phthalates also exceeded screening levels in the DC15 sample.
Investigate UST locations to determine whether any USTs are located within the Slip 6 drainage basin and whether any USTs present a source of contaminants to soil and/or groundwater.	Low	SCAP	Boeing	In Progress	TBD		The drainage basin to the two outfalls flowing into Slip 6 (DC14 and DC15) includes Buildings 9-05, 9-07, 9-04, 9-77, 9-08. The Environmental Compliance Group at the BDC was contacted regarding the presence of USTs near these buildings. The status of this inquiry is unknown.
Review the current SWPPP and make changes and additions necessary to prevent contaminants from entering the BDC stormwater system.	Medium	SCAP	Ecology, Boeing	Complete	--	October 2011	The SWPPP for the BDC was updated in January 2011 (Boeing 2011 [10362]), and the SPCC in October 2011.
Review response to EPA's Request for Information 104(e) letters sent to Boeing.	Medium	SCAP	Ecology	Canceled			EPA is no longer providing 104(e) responses; no additional 104(e) reviews are planned.
Continue to monitor RCRA cleanup activities to ensure contaminants present in groundwater as a result of historical releases are not entering the LDW.	Low	SCAP	Ecology	Planned	TBD		
Conduct a stormwater compliance inspection to ensure that current and planned operations are consistent with stormwater regulations and best management practices. Review changes to industrial activities at BDC to assess potential for sediment recontamination associated with new operations.	Medium	SCAP	Ecology	Complete	--	November 2014	Ecology conducted a NPDES inspection on 6/24/2014 and a technical assistance visit on 11/20/2014 (Ecology 2018b).
Request additional information about the nature of BDC's emissions and air permit as they relate to deposition on impervious surfaces and the stormwater pathway to the LDW.	Low	SCAP	Ecology	Planned	TBD		

Table C-1. Source Control Action Item Status for the Boeing Developmental Center

Action Item	Priority	Type	Responsible Party	Status	Estimated Completion Date	Date Completed	Comments/Follow-On Actions
Request Boeing to collect at least one round of seep samples from the four known seepage locations to confirm that no contaminants are being discharged to the LDW via this transport pathway.	Medium	SCAP	Ecology/Boeing	Planned	TBD		
Continue sediment monitoring in the vicinity of the south storm drain sediment removal activities.	High	SCAP	Boeing	In Progress	TBD		Sediment samples are collected as part of annual monitoring (Bet 2015 [12166]).
Determine the source of PCBs in storm drain solids and conduct source control activities to remove PCBs from the system.	High	SCAP	Boeing	Complete	--	October 2009	Completed further pressure washing of storm drain line from Vortechincs unit upstream toward and beneath Building 9-101. Boeing conducts annual cleanout of the sediment trap and other oil-water separators (Calibre 2009 [06826]).
Continue monitoring storm drain solids.	High	SCAP	Boeing	In Progress	TBD		Solids samples are collected from Vortechincs sediment trap unit annually (Bet 2015 [12166]). Ecology sampled water and storm drain solids in other drain lines from the BDC in December 2014 (Leidos 2015 [10939 & 10946]).
Determine need for cleanup of PCB-containing caulk and other building materials	Medium	SCAP	Ecology, Boeing	In Progress	TBD		Boeing has focused upland sampling on drainage areas where impacts to the sediments were detected. In the areas investigated through December 2011 there was no need identified to cleanup caulk or other building materials. Other areas (other buildings/areas) may be investigated as necessary.
Re-evaluate SWPPP to determine whether process/operational changes have been made at the BDC, and modify as necessary to address new conditions.	Low	SCAP	Ecology, Boeing	Complete	--	October 2011	A revised SWPPP was developed and implemented to ensure that the stormwater system components serve their intended function (Bet 2015 [12166]).
Re-evaluate the Industrial Stormwater General Permit to assure that the appropriate parameters are measured to assess ongoing sources.	Low	SCAP	Ecology, Boeing	Planned	TBD		
Determine whether groundwater and soil sampling are needed at Parcel 0423049016 to assess possible historical contamination.	Medium	SCAP	Ecology, Boeing	In Progress	TBD		The initial data gap identified in this area was a barge visible in a historical aerial photo (E&E 2007 [02999]). The barge is still present (now rotten and abandoned) and it is in the LDW on Department of Natural Resources land outside of the noted parcel (Parcel 0423049016). Boeing has identified a historical Phase 1 assessment for the 0423049016 Parcel and is attempting to obtain a copy of that report.

Table C-1. Source Control Action Item Status for the Boeing Developmental Center

Action Item	Priority	Type	Responsible Party	Status	Estimated Completion Date	Date Completed	Comments/Follow-On Actions
Request Boeing to investigate the status of Outfall 2086, which appears to be abandoned.	Medium	SCAP	Ecology/Boeing	Planned	TBD		
Request Boeing to prepare a work plan for collection of subsurface sediment samples in the area of the LDW adjacent to the BDC outfalls.	Medium	SCAP	Ecology/Boeing	Planned	TBD		
Request Boeing to collect grab solids samples from the BDC SD system. Priority should be given to SD lines with medium to high flows and SD lines serving areas with significant industrial activities. Samples should be analyzed for PCBs, PAHs, and metals.	High	SCAP	Ecology/Boeing	Complete	--	December 2014	Ecology sampled storm drain lines at BDC in December 2014 as part of a NPDES inspection (Leidos 2015 [10939 & 10946]). Six water and four solids samples were collected; metals, PCBs, PAHs, dioxins/furans, phthalates, and petroleum hydrocarbons exceeded screening levels.
If COCs are detected in the SD system at concentrations above the SCO, request Boeing to conduct source tracing and control as needed to reduce the potential for sediment recontamination.	High	SCAP	Ecology/Boeing	Planned	TBD		

BDC - Boeing Developmental Center

COCs - chemicals of concern

EPA - U.S. Environmental Protection Agency

LDW - Lower Duwamish Waterway

NPDES - National Pollutant Discharge Elimination System

PAHs - polycyclic aromatic hydrocarbons

PCBs - polychlorinated biphenyls

RCRA - Resource Conservation and Recovery Act

SCAP - Source Control Action Plan

SCO - Sediment Cleanup Objective

SPCC - Spill Prevention, Control, and Countermeasure

SVOCs - semivolatle organic compounds

SWPPP - Stormwater Pollution Prevention Plan

TBD - to be determined

UST - underground storage tank

VOCs - volatile organic compounds

Bet. 2015. Email from James Bet (Boeing) to Mark Edens (Ecology), Re: Lower Duwamish Waterway – Source Control Status Report – Boeing Updates. August 14, 2015. [12166]

Boeing (The Boeing Company). 2011. Storm Water Pollution Prevention Plan, Boeing Developmental Center, Washington Department of Ecology (WDOE), Permit # WAR-000146.

January 12, 2011. [10364]

Calibre (CALIBRE Systems). 2009. 2009 Annual Sampling Report, South Storm Drain System, Boeing Developmental Center. Prepared by Systems for the Boeing Company.

Table C-1. Source Control Action Item Status for the Boeing Developmental Center

Action Item	Priority	Type	Responsible Party	Status	Estimated Completion Date	Date Completed	Comments/Follow-On Actions
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December 2009. [06826]

Ecology. 2018. Lower Duwamish Waterway Source Control Status Report, January 2014 through December 2016, Draft. Prepared by the Washington State Department of Ecology, Toxics Cleanup Program, Northwest Regional Office. Publication No. 17-09-2666. In progress.

E&E (Ecology and Environment, Inc.). 2007. Lower Duwamish Waterway, Early Action Area 7, Final Summary of Existing Information and Identification of Data Gaps Report. Prepared for the Washington State Department of Ecology, Toxics Cleanup Program, Northwest Regional Office. September 2007. [02999]

Leidos. 2015. Lower Duwamish Waterway, NPDES Inspection Sampling Support 2014/2015, Appendix R: Boeing Developmental Center. Prepared for the Washington State Department of Ecology, Toxics Cleanup Program, Northwest Regional Office. June 2015. [10939 & 10946]

Preliminary

RM 3.7-3.9 East (EAA-6: Boeing/Isaacson/Central KCIA) Source Control Sufficiency Worksheet

Property Name	Boeing Isaacson/Thompson Site
GENERAL INFORMATION	
Address	8701 East Marginal Way S, Tukwila 98108
Property No.	11001
Tax Parcel No.	000160-0014 (Boeing Isaacson Site), 000740-0033 (Boeing Thompson Site)
Property Owner	The Boeing Company
Current Operator	The Boeing Company
Property Size	9.84 acres (Boeing Isaacson Site), 19.35 acres (Boeing Thompson Site), 29.2 acres total
Facility/Site ID	2218 Cleanup Site ID: 1944
Alternate Names	Boeing Thompson Site, Isaacson Steel, Thompson Site
NPDES Permit No.	WAR000148 (Boeing Thompson Site)
UST/LUST ID No.	10410 / 1211
SITE HISTORY AND ACTIVITIES	
Description	<p>This site is located at 8625-8811 East Marginal Way S. in Tukwila, on the east side of the Lower Duwamish Waterway (LDW). The site is bordered by Jorgensen Forge to the north, East Marginal Way S to the east, the 8801 Site (former PACCAR) to the south, and the LDW to the west. The site includes two adjacent properties owned by The Boeing Company (Boeing), the Isaacson (Boeing Isaacson) property on the north and the Thompson (Boeing Thompson) property on the south.</p> <p>Boeing purchased the Boeing Isaacson property from the Isaacson Steel Company in March 1984. The parcel was originally 12.29 acres in size; however, a property boundary adjustment was recorded on November 8, 2001, which moved the southern Isaacson property line north to its current location, reducing this parcel by 2.45 acres to its present size of 9.8 acres (SAIC 2008 [3198]). The western property boundary does not extend all the way to the LDW; a strip of land consisting of the shoreline bulkhead and approximately 20 to 30 feet inshore of the bulkhead is identified in King County parcel ownership records as part of the waterway and therefore is under Port of Seattle control (Ecology 2009 [0077]).</p> <p>Boeing purchased the Boeing Thompson property from the Parr Seattle Company in January 1957. The property is approximately 19.35 acres in size (Ecology 2009 [0077]).</p> <p>The Boeing Isaacson and Boeing Thompson properties are located in an area of extensive fill placed as part of the re-channelization of the Duwamish River. Slip 5 was filled to create these properties (SAIC 2008 [3198]).</p>
Historical Activities	<p>The following historical activities were performed at the Boeing Isaacson Site (Landau 2014 [11045]).</p> <ul style="list-style-type: none"> • Sawmill and lumber storage; planing mill, dry kilns, and shavings bin (Duwamish Lumber Company; Tyee Lumber Company) • Steel melting, forging, and fabricating, scrap metal storage, galvanizing plant (Isaacson Iron Works/U.S. Navy)

Property Name	Boeing Isaacson/Thompson Site
	<ul style="list-style-type: none"> • Wood preservation using a solution of arsenic and sulfate salts of copper and zinc (Mineralized-Cell Preserving Company) • Structural steel fabrication and supply, zinc galvanizing (Isaacson Steel Company). <p>The following historical activities were performed at the Boeing Thompson Site (Landau 2014 [11045]):</p> <ul style="list-style-type: none"> • Sawmill, blacksmithing (Bissell Lumber Company) • Airplane assembly, washing, and painting; jet engine build-up; and testing (Boeing).
Current Activities	<p>The Boeing Isaacson property is currently vacant. The building on the Boeing Thompson property is used for office space and storage. One underground storage tank (UST) and two above ground storage tanks are present on the Boeing Thompson property (Landau 2014 [11045]).</p>
Chemicals of Concern	<p>The U.S. Environmental Protection Agency (EPA) has not designated chemicals of concern for this section of the LDW. Based on information in the most recent Source Control Status Report (Ecology 2018), the following chemicals of concern were selected: lead, mercury, zinc, polychlorinated biphenyls (PCBs), high molecular weight polycyclic aromatic hydrocarbons (HPAHs), carcinogenic polycyclic aromatic hydrocarbons (cPAHs), and phthalates.</p> <p>Chemicals of concern for the site are: arsenic, lead, silver, zinc, and PCBs (Ecology 2018).</p>
CONTAMINATED MEDIA	
Surface Sediment	<p>A total of 36 surface sediment samples were collected in 2000, 2004, 2005, and 2012 near the Boeing Isaacson/Thompson site (AECOM 2012 [00099] and Landau 2012 [10203]). The following chemicals exceeded the lower of the Washington State Sediment Management Standards (SMS) Sediment Cleanup Objective (SCO)/lowest Apparent Effects Threshold (LAET) and the minimum cleanup level in the LDW Record of Decision (ROD) (EPA 2014 [12119]) in at least one sample (Table A-1).</p> <ul style="list-style-type: none"> • PCBs: total PCB Aroclors and total PCB toxic equivalency (TEQ) • Metals: arsenic, lead, mercury, and zinc • PAHs: benzo(a)anthracene, total benzofluoranthenes, benzo(g,h,i)perylene, benzo(a)pyrene, chrysene, dibenz(a,h)anthracene, fluoranthene, indeno(1,2,3-cd)pyrene, phenanthrene, pyrene, total HPAHs, and total cPAHs TEQ • Phthalates: butylbenzyl phthalate and diethyl phthalate • Other semivolatile organic compounds (SVOCs): benzoic acid and benzyl alcohol <p>The highest SCO exceedance factors (EF) were for total cPAHs TEQ (EF = 258), arsenic (EF = 157), and total PCB TEQ (EF = 26).</p>
Storm Drain Solids	<p>In 2011 and 2012, a total of 48 storm drain solids samples were collected from storm drain structures at the site (Landau 2012 [10203]). The following chemicals exceeded the lower of the SMS Cleanup Screening Level (CSL)/second lowest Apparent Effects Threshold (2LAET) and the minimum cleanup level in the LDW ROD (EPA 2014 [12119]) in at least one sample (Table A-2).</p> <ul style="list-style-type: none"> • Dioxins/furans TEQ • Metals: arsenic, cadmium, chromium, copper, lead, mercury, and zinc • PAHs: acenaphthene, anthracene, benzo(a)anthracene, total benzofluoranthenes, benzo(g,h,i)perylene, benzo(a)pyrene, chrysene, dibenz(a,h)anthracene, dibenzofuran, fluoranthene, fluorene, indeno(1,2,3-cd)pyrene, 2-methylnaphthalene, naphthalene, phenanthrene, pyrene, total low molecular weight polycyclic aromatic hydrocarbons (LPAHs), total HPAHs, and total cPAHs TEQ • Phthalates: bis(2-ethylhexyl) phthalate (BEHP), butylbenzyl phthalate, dibutyl phthalate,

Property Name	Boeing Isaacson/Thompson Site
	<p>and dimethyl phthalate</p> <ul style="list-style-type: none"> Other SVOCs: benzoic acid, benzyl alcohol, 2,6-dinitrotoluene, 2-methylphenol, 4-methylphenol, and pentachlorophenol <p>The highest CSL EFs were for total cPAHs TEQ (EF = 1,877), benzyl alcohol (EF = 370), 2-methylphenol (EF = 146), and BEHP (EF = 39).</p>
Groundwater	<p>Groundwater monitoring was first performed at the site in 1983. Throughout the 1980s, 1990s, and 2000s, several monitoring events were performed. During the 2011/2012 remedial investigation (RI) activities, 25 new monitoring wells were installed at the site (Landau 2014 [11045]). Data for groundwater samples during the 2011/2012 remedial investigation activities (Study ID AODE7088) are available from Ecology’s Environmental Information Management system (EIM). PCB Aroclors, metals, polycyclic aromatic hydrocarbons (PAHs), phthalates, and other SVOCs are present in groundwater at concentrations exceeding the groundwater LDW preliminary cleanup levels (PCULs) for protection of sediment (Ecology 2017).</p> <p>Concentrations of the following chemicals were over 100 times greater than the groundwater LDW PCULs: arsenic (EF = 1,295); mercury (EF = 875); chromium (EF = 670); and copper (EF = 146).</p> <p>The following chemicals also exceeded groundwater LDW PCULs (listed from greatest EF to lowest EF): total cPAHs TEQ; BEHP; benzoic acid; lead; phenol; indeno(1,2,3-cd)pyrene; acenaphthene; cadmium; dibenz(a,h)anthracene; total PCB Aroclors; and benzo(a)anthracene.</p>
Soil	<p>Soil investigations and remedial actions have been performed at the site since 1983. Most of the investigations were performed on the Isaacson property, though some were also conducted on the Thompson property. Data for 248 soil samples collected during the 2011/2012 RI activities (Study ID AODE7088) (Landau 2014 [11045]) are available for review in EIM. PCB Aroclors, metals, PAHs, phthalates, and other SVOCs are present at concentrations exceeding the soil LDW PCULs for protection of sediment via bank erosion (Ecology 2017).</p> <p>Concentrations of the following chemicals were over 10 times greater than the soil LDW PCULs: arsenic (EF = 234); total cPAHs TEQ (EF = 93); total PCB Aroclors (EF = 92); zinc (EF = 22); anthracene (EF = 17); and chromium (EF = 13).</p> <p>The following chemicals also exceeded soil LDW PCULs (listed from greatest EF to lowest EF): phenanthrene; mercury; fluoranthene; cadmium; benzo(g,h,i)perylene; indeno(1,2,3-cd)pyrene; lead; dibenz(a,h)anthracene; n-nitrosodiphenylamine; chrysene; total HPAHs; pyrene; benzo(a)pyrene; benzo(a)anthracene; total LPAHs; fluorene; acenaphthene; butylbenzyl phthalate; copper; benzyl alcohol; total benzofluoranthenes; 2,4-dimethylphenol; dibutyl phthalate; dibenzofuran; 2-methylnaphthalene; 4-methylphenol; nickel; and naphthalene.</p> <p>In 2015, 11 soil samples were collected on the Port of Seattle sliver situated between the Boeing Isaacson/Thompson site and the LDW (Kennedy/Jenks 2015 [11077]). Analytical data for these samples are available in EIM under Study ID AODE7088-POS_Sliver. Concentrations of the following chemicals exceeded the soil LDW PCULs: arsenic (EF = 11); zinc (EF = 6.4); lead (EF = 4.7); total PCB Aroclors (EF = 3.6); total cPAH TEQ (EF = 3.4); chromium (EF = 3.0); and cadmium (EF = 1.2).</p>
TRANSPORT PATHWAYS	
Outfalls	<p>Two outfalls are covered by the facility’s Industrial Stormwater General Permit (ISGP).</p> <p>Outfall 2061 (TS2) is identified as TS2 in Boeing Thompson Stormwater Pollution Prevention Plan (SWPPP). Drainage to this outfall includes all of the Boeing Isaacson site, the northern half of Building 14-01, the paved parking areas north of Building 14-01, and the site access point on</p>

Property Name	Boeing Isaacson/Thompson Site
	<p>the east side of the property (Boeing 2012 [10368]).</p> <p>Outfall 2077 (TS1) is identified as TS1 in Boeing Thompson SWPPP. Drainage to this outfall includes the southern half of Building 14-01, the paved access road on the south side of Building 14-01, the wooden fire suppression water tank and the main loading/unloading area west of Building 14-01. In addition, drainage from five catch basins along the paved shoulder on the west side of East Marginal Way S flow into this storm drain system near the main gate (Boeing 2012 [10368]).</p> <p>Additional information regarding these outfalls is provided in Table B-1.</p>
Relevant Pathways	<p>Based on information provided in the Data Gaps report (SAIC 2008 [3198]) and SCAP (Ecology 2009 [00077]), and the information on contaminated media above, the following pathways may contribute to sediment recontamination:</p> <ul style="list-style-type: none"> • Stormwater Discharges: PCB Aroclors, dioxins/furans, metals, PAHs, phthalates, and other SVOCs are present at concentrations above screening levels in storm drain solids at the site and in surface sediment adjacent to the property. Therefore, stormwater discharges is a relevant pathway for sediment recontamination. • Groundwater Discharges: PCB Aroclors, metals, PAHs, phthalates, and other SVOCs are present at concentrations exceeding the groundwater LDW PCULs for protection of sediment. Therefore, groundwater discharges is a relevant pathway for sediment recontamination. • Bank Erosion/Leaching: A wooden bulkhead is located along the boundary between the Boeing Isaacson property and the LDW. Rock and rubble fill material have been placed behind the bulkhead. Very little erodible soil material is present in this area. Bank erosion is believed to represent a less significant pathway for contaminants to the LDW than groundwater discharge. PCB Aroclors, metals, PAHs, phthalates, and other SVOCs are present in soil at concentrations exceeding the soil LDW PCUL for protection of sediment via bank erosion. Given the documented soil contamination at this property, bank erosion cannot be ruled out as a potential source of sediment recontamination. <p>Surface runoff is not considered a significant pathway; the site is paved and runoff is directed to the onsite storm drain system. Leaks and spills may occur, but are likely to be captured in the onsite storm drain system. Waterway operations and atmospheric deposition have not been identified as relevant pathways at this property.</p>
SOURCE CONTROL ACTIONS	
Action Item Status	<p>In 2010, Ecology and Boeing entered into a legal agreement (Agreed Order) to conduct a Remedial Investigation/Feasibility Study (RI/FS) and prepare a draft cleanup action plan (Ecology 2010 [2450]). The FS is in development; following its completion, Ecology will prepare a draft Cleanup Action Plan.</p> <p>Four high priority action items have been identified for the site; three of these are complete. The following high priority action item is planned:</p> <ul style="list-style-type: none"> • If COCs in soil and groundwater are present at concentrations that pose a risk of sediment recontamination, then develop a plan for controlling these contaminant sources. <p>A description of each action item and its status is provided in Table C-1.</p>

Property Name Boeing Isaacson/Thompson Site	
INSPECTION, PERMIT, AND CLEANUP STATUS	
Inspections	An Urban Waters inspection was performed at Boeing Thompson on April 9, 2015 (Ecology 2018). Additional information about the inspection was not available for review. Ecology’s PARIS database does not list inspections for this facility.
Permit Compliance Status	Zinc and copper concentrations at outfall TS2 exceeded the permit benchmarks in the third quarter of 2016. Based on information in the PARIS database, the permit benchmarks were exceeded for two parameters in the third quarter of 2017. The parameters were not listed. The 2017 ISGP Annual Report was not available for review.
Upland Cleanups	<p>Environmental investigations at the site began in 1983. The following cleanup actions have been performed at the site (Landau 2014 [11045]).</p> <ul style="list-style-type: none"> • 1984 – Excavation and removal of arsenic and zinc contaminated soils in the north portion of the Boeing Isaacson property. • 1988 – Excavation and removal of arsenic contaminated soil in the bays and courtyard of the former Isaacson building; prior to the removal of the building. • 1991 – Excavation and removal of arsenic contaminated soil discovered during the installation of storm drain line along the northern property boundary, followed by chemical treatment and stabilization of the soil. • 2000 – Removal of a 20,000-gallon heating oil UST from the Boeing Thompson property. • 2006 – Removal of a sump from the northeastern corner of the Boeing Isaacson property and excavation of soil contaminated with petroleum hydrocarbons, VOCs, SVOCs, PCBs, and metals (Landau 2007 [00859]). • 2008 – Removal of a stabilized soil mound on the northern portion of the Boeing Isaacson property. <p>The FS is in development. Using the results of the 2011/2012 RI, the FS will evaluate and recommend measures to cleanup contamination and prevent recontamination of the sediment. Following completion of the FS, Ecology will identify a preferred cleanup action and prepare a draft Cleanup Action Plan.</p>
Other Relevant Studies	<p>Four grab stormwater samples were collected from the storm drain system at the site in March 2012. The sample locations were representative of discharges from the two outfalls at the site. BEHP concentrations in two samples exceeded the National Toxics Rule (NTR) and National Recommended (NR) human health criteria for consumption of organisms only. The zinc concentration in one sample was equal to the Washington State Water Quality Standards marine chronic water quality criteria.</p> <p>Additional stormwater samples were collected in April 2012 (Landau 2014 [11045]); analytical data for these samples were not available in EIM.</p> <p>A total of three seep samples were collected in March, June, and September 2012 (Landau 2014 [11045]). Concentrations of benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, dibenz(a,h)anthracene, and indeno(1,2,3-cd)pyrene exceeded the NTR human health criteria for consumption of organisms only. Concentrations of these chemicals, with the exception of benzo(k)fluoranthene, also exceeded the NR human health criteria for consumption of organisms only.</p> <p>Five soil vapor samples were collected beneath the Building 14-01 floor slab during the 2011/2012 RI activities (Landau 2014 [11045]). Ethylene dibromide and hexachlorobutadiene concentrations exceeded the LDW PCULs for soil vapor.</p>

Property Name Boeing Isaacson/Thompson Site	
RECOMMENDATION	
Source Control Summary	<p>One high priority action item is not complete. An FS evaluating cleanup actions for the site is in development. Upland cleanup of the site is not complete.</p> <p>Surface sediment: Analytical results for samples collected in 2000, 2004, 2005, and 2012 indicated that concentrations of PCBs, dioxins/furans, metals, PAHs, phthalates, and other SVOCs exceed the SCO/LAET or the LDW ROD minimum cleanup levels.</p> <p>Storm drain solids: Analytical results for samples collected in 2011 and 2012 indicated that concentrations of PCBs, dioxins/furans, metals, PAHs, phthalates, and other SVOCs exceed the CSL/2LAET or the LDW ROD minimum cleanup levels.</p> <p>Groundwater: Analytical results for samples collected in 2011 and 2012 indicated that concentrations of PCB Aroclors, metals, PAHs, phthalates, and other SVOCs exceed the groundwater LDW PCULs for protection of sediment.</p> <p>Soil: Analytical results for samples collected in 2011, 2012, and 2015 indicated that concentrations of PCB Aroclors, metals, PAHs, phthalates, and other SVOCs p exceed the soil LDW PCULs for protection of sediment via bank erosion</p> <p>Soil Gas: Analytical results for samples collected in 2011 indicated that concentrations of ethylene dibromide and hexachlorobutadiene exceed the LDW PCULs for soil vapor.</p>
Preliminary Recommendation	Sources are not sufficiently controlled.

References

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SAIC (Science Applications International Corporation). 2008. Lower Duwamish Waterway, RM 3.7-3.9 East, Early Action Area 6, Summary of Existing Information and Identification of Data Gaps. Prepared for the Washington State Department of Ecology, Toxics Cleanup Program. May 2008. [3198]

Figures

Figure 1. RM 3.7-3.9 East (EAA-6: Boeing/Isaacson/Central KCIA)

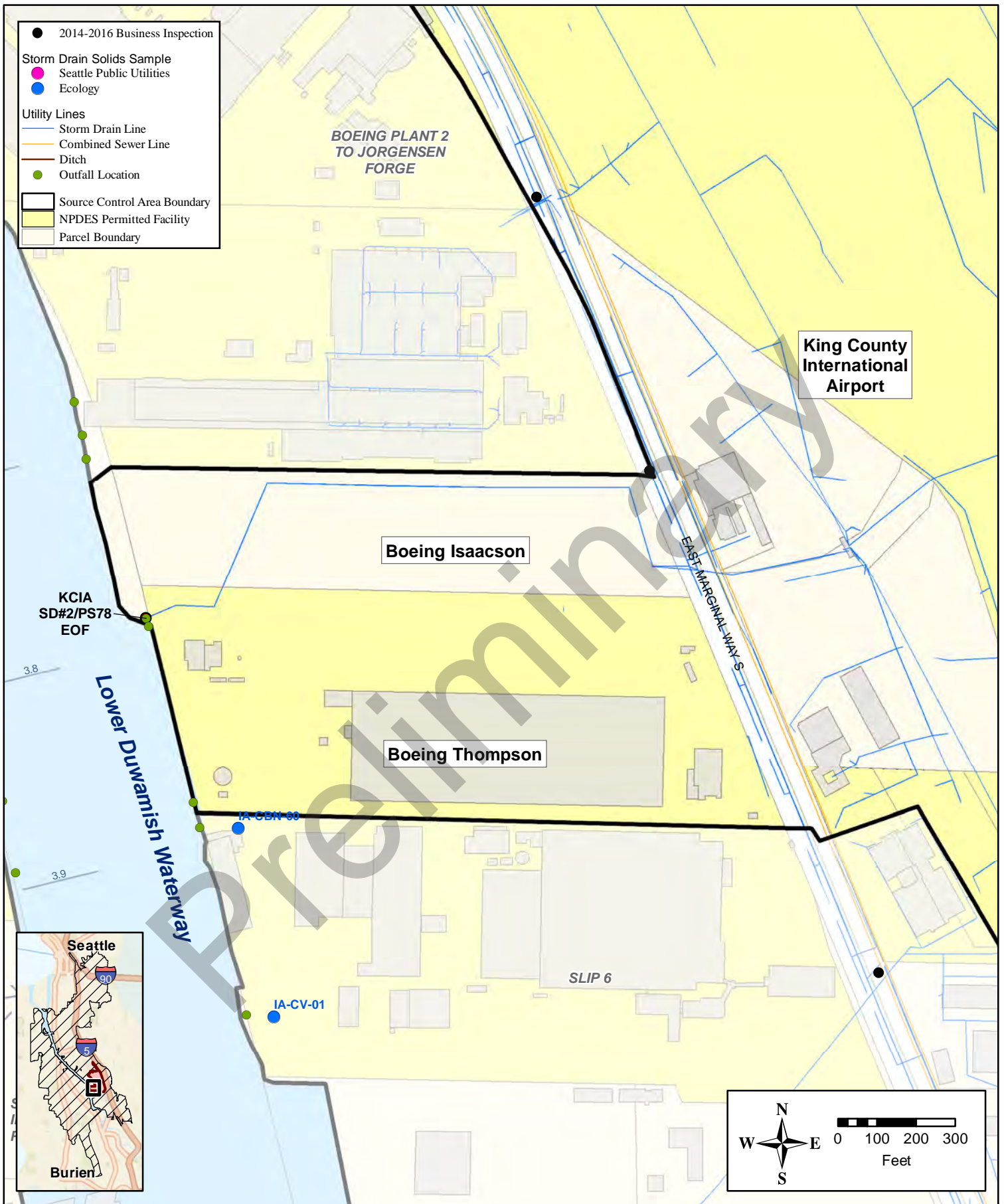
Figure 2. Boeing Isaacson/Thompson Site

Attachments

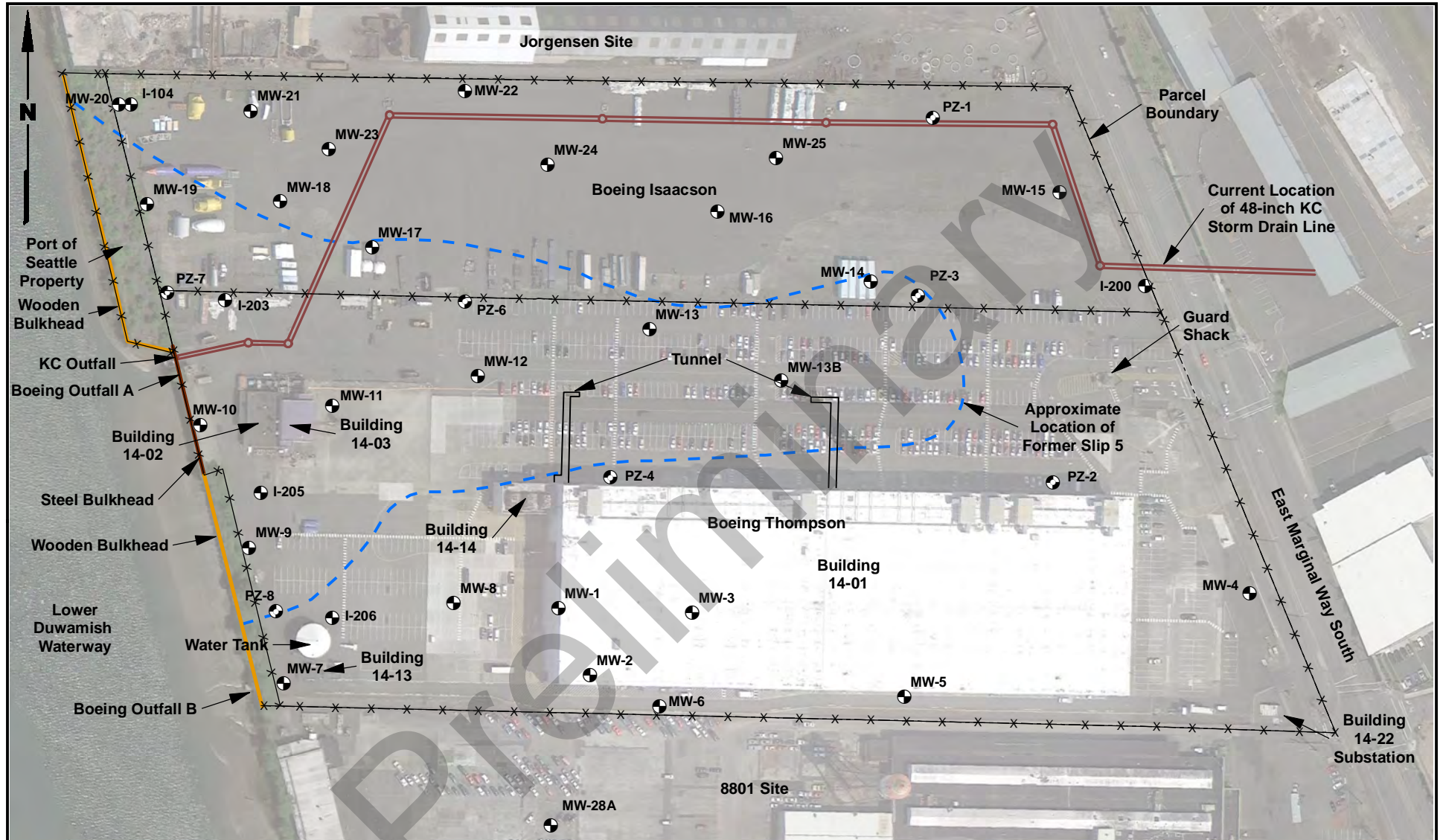
Attachment A. Summary of Screening Level Exceedances in Surface Sediment and Storm Drain Solids

Attachment B. Outfall Information



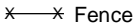
Attachment C. Source Control Action Item Status



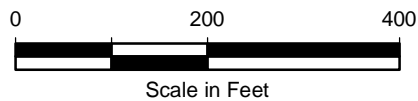
**Figure 1. RM 3.7-3.9 East
(EAA-6: Boeing Isaacson/Central KCIA)
Boeing Thompson and Isaacson Properties**



Legend

-  Monitoring Well
-  Piezometer
-  Fence

Data Sources: Google Earth Pro 2012; King County Parcel Data.



Boeing Isaacson-Thompson Site Tukwila, Washington	Current Site Features	Figure 2
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Figure 2. Boeing Isaacson/Thompson Site

Table A-1. Summary of Screening Level Exceedances in Surface Sediment near the Boeing Isaacson/Thompson Site

Parameter	Frequency of Detection	Range of Detected Conc'ns (mg/kg DW)	Range of Nondetected Conc'ns (mg/kg DW)	Average Detected Conc'n (mg/kg DW)	Lower Screening Level (mg/kg DW) ¹	Maximum Exceedance Factor	Frequency of Detects Above Lower SL	Upper Screening Level (mg/kg DW) ²	Maximum Exceedance Factor	Frequency of Detects Above Upper SL
PCBs										
Total PCB Aroclors	35 / 36	0.024 - 1.29	0.02 - 0.02	0.35	0.13	9.9	23 / 35	1	1.3	2 / 35
Total PCB TEQ	1 / 1	1.81E-05 - 1.81E-05	NA	1.81E-05	7.00E-07	26	1 / 1	7.00E-07	26	1 / 1
Dioxins/Furans										
Total dioxin/furan TEQ	5 / 5	4.15E-06 - 3.37E-05	NA	1.10E-05	5.00E-06	6.7	3 / 5	5.00E-06	6.7	3 / 5
Metals										
Arsenic	30 / 30	9.1 - 1,100	NA	100	7	157	30 / 30	7	157	30 / 30
Lead	30 / 30	14 - 533	NA	77	450	1.2	1 / 30	530	1.0	1 / 30
Mercury	28 / 29	0.06 - 0.27	0.08 - 0.08	0.1	0.2	1.4	4 / 28	0.2	1.4	4 / 28
Zinc	30 / 30	76 - 343	NA	150	93	4	20 / 30	93	3.7	20 / 30
SVOCs - PAHs										
Benzo(a)anthracene	29 / 30	0.035 - 1.5	0.2 - 0.2	0.3	1.3	1.2	1 / 29	NA	NA	NA
Total benzofluoranthenes	30 / 30	0.068 - 3.6	NA	0.86	3.2	1.1	2 / 30	3.6	1.0	1 / 30
Benzo(g,h,i)perylene	28 / 30	0.021 - 0.68	0.096 - 0.2	0.2	0.67	1.0	1 / 28	NA	NA	NA
Benzo(a)pyrene	30 / 30	0.033 - 1.7	NA	0.38	0.85	2.0	5 / 30	1.6	1.1	1 / 30
Chrysene	30 / 30	0.052 - 2.5	NA	0.56	1.4	1.8	5 / 30	NA	NA	NA
Dibenz(a,h)anthracene	39 / 47	0.0087 - 0.28	0.019 - 0.2	0.06	0.23	1.2	3 / 39	0.23	1.2	3 / 39
Fluoranthene	30 / 30	0.096 - 5.2	NA	1.1	1.7	3.1	7 / 30	2.5	2.1	5 / 30
Indeno(1,2,3-cd)pyrene	29 / 30	0.018 - 0.67	0.2 - 0.2	0.2	0.6	1.1	3 / 29	NA	NA	NA
Phenanthrene	29 / 30	0.04 - 2.4	0.2 - 0.2	0.5	1.5	1.6	2 / 29	1.5	1.6	2 / 29
Pyrene	30 / 30	0.087 - 3.2	NA	0.81	2.6	1.2	1 / 30	NA	NA	NA
Total HPAHs	30 / 30	0.41 - 19	NA	4.4	12	1.6	5 / 30	17	1.1	1 / 30
Total cPAHs TEQ	30 / 30	0.048 - 2.3	NA	0.53	0.009	258	30 / 30	0.009	258	30 / 30
Other SVOCs - Phthalates										
Butylbenzyl phthalate	44 / 47	0.007 - 0.32	0.057 - 0.2	0.06	0.063	5.1	10 / 44	NA	NA	NA
Diethyl phthalate	5 / 30	0.0086 - 1.5	0.002 - 0.2	0.4	0.2	7.5	1 / 5	1.2	1.3	1 / 5
Other SVOCs										
Benzoic Acid	8 / 30	0.084 - 0.77	0.064 - 2	0.2	0.65	1.2	1 / 8	0.65	1.2	1 / 8
Benzyl Alcohol	17 / 47	0.017 - 0.13	0.02 - 0.2	0.600	0.057	2.3	9 / 17	0.073	1.8	5 / 17

Table A-1. Summary of Screening Level Exceedances in Surface Sediment near the Boeing Isaacson/Thompson Site

Summary of analytical data for storm drain solids samples collected in 2000, 2004, 2005, and 2012.

¹ Lower screening level is the lower of SMS SCO and minimum cleanup level in LDW ROD.

² Upper screening level is the higher of SMS CSL and minimum cleanup level in LDW ROD.

CSL - Cleanup Screening Level

cPAHs - carcinogenic polycyclic aromatic hydrocarbons

DW - dry weight

HPAHs - high molecular weight polycyclic aromatic hydrocarbons

LDW - Lower Duwamish Waterway

mg/kg - milligrams per kilogram

NA - not applicable

PAHs - polycyclic aromatic hydrocarbons

PCBs - polychlorinated biphenyl

ROD - Record of Decision

SCO - Sediment Cleanup Objective

SL - screening level

SVOCs - semivolatile organic compounds

TEQ - toxic equivalency

AECOM. 2012. Final Feasibility Study, Lower Duwamish Waterway, Seattle, Washington. Prepared for Lower Duwamish Waterway Group. October 31, 2012. [00099]

EPA. 2014. Record of Decision: Lower Duwamish Waterway Superfund Site. Prepared by the United States Environmental Protection Agency Region 10. November 2014. [12119]

Landau Associates. 2012. April 2012 Progress Report, Boeing Isaacson-Thompson Site, Agreed Order No. DE 7088. Prepared for the Washington State Department of Ecology.

May 15, 2012. [10203]

Table A-2. Summary of Screening Level Exceedances in Storm Drain Solids near the Boeing Isaacson/Thompson Site

Parameter	Frequency of Detection	Range of Detected Conc'ns (mg/kg DW)	Range of Nondetected Conc'ns (mg/kg DW)	Average Detected Conc'n (mg/kg DW)	Lower Screening Level (mg/kg DW) ¹	Maximum Exceedance Factor	Frequency of Detects Above Lower SL	Upper Screening Level (mg/kg DW) ²	Maximum Exceedance Factor	Frequency of Detects Above Upper SL
PCBs										
Total PCB Aroclors	42 / 43	0.026 - 0.93	0.02 - 0.02	0.3	0.13	7.2	34 / 42	NA	NA	NA
Dioxins/Furans										
Total dioxin/furan TEQ	2 / 2	5.96E-05	NA	4.87E-05	5.00E-06	12	2 / 2	12	12	2 / 2
Metals										
Arsenic	41 / 41	4.6 - 58	NA	15	7	8.3	36 / 41	7	8.3	36 / 41
Cadmium	41 / 41	0.8 - 154	NA	20	5.1	30	27 / 41	6.7	23	25 / 41
Chromium	41 / 41	37.7 - 492	NA	152	260	1.9	5 / 41	270	1.8	5 / 41
Copper	41 / 41	30.5 - 606	NA	168	390	1.6	1 / 41	390	1.6	1 / 41
Lead	41 / 41	13.2 - 568	NA	194	450	1.3	1 / 41	530	1.1	1 / 41
Mercury	40 / 41	0.02 - 1.57	0.03 - 0.03	0.2	0.2	7.9	12 / 40	0.2	7.9	12 / 40
Zinc	41 / 41	132 - 6,640	NA	1,500	93	71	41 / 41	93	71	41 / 41
SVOCs - PAHs										
Acenaphthene	36 / 42	0.009 - 4	0.046 - 0.23	0.3	0.5	8.0	4 / 36	0.5	8.0	4 / 36
Anthracene	34 / 42	0.019 - 7.2	0.046 - 0.23	0.48	0.96	7.5	4 / 34	0.96	7.5	4 / 34
Benzo(a)anthracene	41 / 42	0.04 - 12	0.046 - 0.046	1	1.3	9.2	6 / 41	1.6	7.5	6 / 41
Total benzofluoranthenes	41 / 42	0.15 - 30.5	0.046 - 0.046	2.6	3.2	9.5	7 / 41	3.6	8.5	7 / 41
Benzo(g,h,i)perylene	42 / 42	0.056 - 3.5	NA	0.56	0.67	5.2	7 / 42	0.72	4.9	7 / 42
Benzo(a)pyrene	40 / 42	0.075 - 12	0.046 - 0.12	1.1	0.85	14	8 / 40	1.6	7.5	6 / 40
Chrysene	42 / 42	0.1 - 15	NA	2	1.4	11	9 / 42	2.8	5.4	7 / 42
Dibenz(a,h)anthracene	34 / 42	0.02 - 1.1	0.046 - 0.27	0.2	0.23	4.8	6 / 34	0.23	4.8	6 / 34
Dibenzofuran	34 / 42	0.012 - 2.9	0.046 - 0.23	0.22	0.54	5.4	1 / 34	0.54	5.4	1 / 34
Fluoranthene	42 / 42	0.029 - 38	NA	3.1	1.7	22	14 / 42	2.5	15	9 / 42
Fluorene	36 / 42	0.013 - 4.6	0.046 - 0.23	0.31	0.54	8.5	4 / 36	0.54	8.5	4 / 36
Indeno(1,2,3-cd)pyrene	40 / 42	0.056 - 3.8	0.046 - 0.098	0.51	0.6	6.3	7 / 40	0.69	5.5	7 / 40
2-Methylnaphthalene	35 / 42	0.012 - 1.6	0.046 - 0.27	0.14	0.67	2.4	1 / 35	0.67	2.4	1 / 35
Naphthalene	33 / 66	0.019 - 5.1	0.0062 - 0.5	0.5	2.1	2.4	2 / 33	2.1	2.4	2 / 33
Phenanthrene	41 / 42	0.14 - 33	0.046 - 0.046	2.4	1.5	22	10 / 41	1.5	22	10 / 41
Pyrene	42 / 42	0.026 - 30	NA	3	2.6	12	8 / 42	3.3	9.1	6 / 42
Total LPAHs	41 / 42	0.14 - 53	0.046 - 0.046	3.6	5.2	10	6 / 41	5.2	10	6 / 41
Total HPAHs	42 / 42	0.21 - 150	NA	13	12	12	8 / 42	17	8.6	7 / 42

Table A-2. Summary of Screening Level Exceedances in Storm Drain Solids near the Boeing Isaacson/Thompson Site

Parameter	Frequency of Detection	Range of Detected Conc'ns (mg/kg DW)	Range of Nondetected Conc'ns (mg/kg DW)	Average Detected Conc'n (mg/kg DW)	Lower Screening Level (mg/kg DW) ¹	Maximum Exceedance Factor	Frequency of Detects Above Lower SL	Upper Screening Level (mg/kg DW) ²	Maximum Exceedance Factor	Frequency of Detects Above Upper SL
Total cPAHs TEQ	42 / 42	0.033 - 17	NA	1.4	0.009	1,877	42 / 42	0.009	1,877	42 / 42
Other SVOCs - Phthalates										
Bis(2-ethylhexyl) phthalate	37 / 40	0.21 - 75	1.7 - 41	11	1.3	58	33 / 37	1.9	39	32 / 37
Butylbenzyl phthalate	31 / 40	0.16 - 7.9	0.094 - 41	1.2	0.063	125	31 / 31	0.9	8.8	15 / 31
Dibutyl phthalate	26 / 40	0.11 - 15	0.094 - 41	1.1	1.4	11	1 / 26	1.4	11	1 / 26
Dimethyl phthalate	19 / 40	0.039 - 1.5	0.094 - 84	0.34	0.071	21	18 / 19	0.16	9.4	15 / 19
Other SVOCs										
Benzoic acid	7 / 40	0.33 - 1.6	1.2 - 100	0.95	0.65	2.5	4 / 7	0.65	2.5	4 / 7
Benzyl alcohol	27 / 40	0.056 - 27	0.078 - 20	3.0	0.057	474	26 / 27	0.073	370	26 / 27
2,6-Dinitrotoluene	1 / 40	41 - 41	0.28 - 10	41	0.57	72	1 / 1	5.7	7.2	1 / 1
2-Methylphenol	1 / 40	9.2 - 9.2	0.056 - 6.1	9.2	0.063	146	1 / 1	0.063	146	1 / 1
4-Methylphenol	31 / 40	0.067 - 18	0.18 - 10	1.8	0.67	27	7 / 31	0.67	27	7 / 31
N-Nitrosodiphenylamine	1 / 40	0.037 - 0.037	0.056 - 34	0.037	0.028	1.3	1 / 1	NA	NA	NA
Pentachlorophenol	1 / 40	1.6 - 1.6	0.56 - 20	1.6	0.355	4.5	1 / 1	0.36	4.5	1 / 1
Phenol	25 / 40	0.062 - 0.5	0.09 - 10	0.2	0.42	1.2	4 / 25	NA	NA	NA

Summary of analytical data for storm drain solids samples collected in 2011 and 2012.

¹ Lower screening level is the lower of SMS SCO and minimum cleanup level in LDW ROD.

² Upper screening level is the higher of SMS CSL and minimum cleanup level in LDW ROD.

CSL - Cleanup Screening Level

cPAHs - carcinogenic polycyclic aromatic hydrocarbons

DW - dry weight

HPAHs - high molecular weight polycyclic aromatic hydrocarbons

LDW - Lower Duwamish Waterway

LPAHs - low molecular weight polycyclic aromatic hydrocarbons

mg/kg - milligrams per kilogram

NA - not applicable

PAHs - polycyclic aromatic hydrocarbons

PCBs - polychlorinated biphenyl

ROD - Record of Decision

SCO - Sediment Cleanup Objective

SL - screening level

SMS - Sediment Management Standards

SVOCs - semivolatile organic compounds

Table A-2. Summary of Screening Level Exceedances in Storm Drain Solids near the Boeing Isaacson/Thompson Site

Parameter	Frequency of Detection	Range of Detected Conc'ns (mg/kg DW)	Range of Nondetected Conc'ns (mg/kg DW)	Average Detected Conc'n (mg/kg DW)	Lower Screening Level (mg/kg DW) ¹	Maximum Exceedance Factor	Frequency of Detects Above Lower SL	Upper Screening Level (mg/kg DW) ²	Maximum Exceedance Factor	Frequency of Detects Above Upper SL
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TEQ - toxic equivalency

EPA. 2014. Record of Decision: Lower Duwamish Waterway Superfund Site. Prepared by the United States Environmental Protection Agency Region 10. November 2014. [12119]

Landau Associates. 2012. April 2012 Progress Report, Boeing Isaacson-Thompson Site, Agreed Order No. DE 7088. Prepared for the Washington State Department of Ecology.

May 15, 2012. [10203]

Preliminary

Table B-1. Outfalls at the Boeing Isaacson/Thompson Site

Outfall ID	Alternate Outfall ID	Outfall Status	Outfall Type	Outfall Diameter	Outfall Material	WQ Permit	Outfall Notes
140	227E; KCIA SD#2/PS78 EOF	Active	County SD/City EOF	48-inch	CMP	WAR044501, WA0031682, WAR000343, WAR004602	<p>KCIA #2 drains approximately 237 acres of the central portion of KCIA, including portions of the flightline, airport and tenant deicing operations, and tenant fueling operations. Tenants - West Side: KCIA Midfield Hangars & Tiedowns, Parking Lot 13, King County Elections, GDH-1 Hangar, FAA Control Tower, and the southern tip of NBF. Tenants - East Side: BFI Holdings/Aeroflight, Wings Aloft, Clay Lacy, BAX Global, Airwest Sales, ABX Air/DHL, Nordstrom, Galvin Flying, Hangar Holdings, Ameriflight, United Parcel Service, former Aerocoverters Site, former Fedex/Western Metals (KCIA 2012 [10458]). This outfall also serves as an EOF for Seattle Pump Station 78. It is identified in the EAA-6 SCAP as PS45 (Ecology 2009 [00077]).</p> <p><u>Permittees</u> Municipal: WAR044501 (King County - Municipal SW Phase I GP); WA0031682 (Seattle CSO) Upland: WAR000343 (KCIA); WAR004602 (ABX Air Inc. Seattle) Inactive: WAR002830 (Ameriflight Inc Hangar 5); WAR000434 (United Parcel Service WABOE); WAR000607 (Galvin Flying Services Inc)</p>
141	228E; TS2	Active	Private SD	24-inch	Steel	WAR000148 (Boeing Thompson Site)	Identified as TS2 in Boeing Thompson SWPPP. Drainage to this outfall includes all of the Boeing Isaacson site, the northern half of Building 14-01, the paved parking areas north of Building 14-01, and the site access point on the east side of the property (Boeing 2012 [10368]).
142	229E; TS1	Active	Private SD	21-inch	Steel	WAR000148 (Boeing Thompson Site)	Identified as TS1 in Boeing Thompson SWPPP. Drainage to this outfall includes the southern half of Building 14-01, the paved access road on the south side of Building 14-01, the wooden fire suppression water tank and the main loading/unloading area west of Building 14-01. In addition, drainage from five catch basins along the paved shoulder on the west side of East Marginal Way S flow into this storm drain system near the main gate (Boeing 2012 [10368]).

CMP - corrugated metal pipe
 CSO - combined sewer overflow
 EAA - Early Action Area
 EOF - emergency overflow
 FAA - Federal Aviation Administration
 GP - General Permit
 KCIA - King County International Airport
 NBF - North Boeing Field
 SCAP - Source Control Action Plan
 SD - storm drain
 SPU - Seattle Public Utilities
 SW - stormwater
 SWPPP - Stormwater Pollution Prevention Plan

Boeing. 2012. Storm Water Pollution Prevention Plan, Boeing Thompson Site, Washington Department of Ecology (WDOE) Permit # WAR-000148. January 10, 2012. [10368]
 Ecology. 2009. Lower Duwamish Waterway, RM 3.7-3.9 East (Early Action Area 6), Source Control Action Plan. Prepared by Washington State Department of Ecology, Toxics Cleanup Program, Northwest Regional Office. Publication No. 09-09-082. May 2009. [00077]
 KCIA. 2012. Stormwater Pollution Prevention Plan, King County International Airport. May 12, 2012. [10458]

Table C-1. Source Control Action Item Status for the Boeing Isaacson/Thompson Site

Action Item	Priority	Type	Responsible Party	Status	Estimated Completion Date	Date Completed	Comments/Follow-On Actions
Negotiate an Agreed Order to conduct a MTCA RI/FS at the Boeing Isaacson/Thompson site.	High	SCAP	Ecology, Boeing	Complete	--	April 2010	Agreed Order No. DE-7088 (Ecology 2010 [06812]).
Characterize contaminant concentrations in subsurface soil near the former location of the Slip 5 outfall, to the north of the 48-inch storm drain line, and at other locations on the property as needed.	High	SCAP	Boeing	Complete	--	April 2014	Completed with submittal of Final RI Report on April 21, 2014 (Landau Associates 2014 [11045]).
Conduct a comprehensive soil and groundwater investigation at this property, including groundwater monitoring at selected wells and evaluation of potential arsenic sources; include wet and dry season samples.	High	SCAP	Boeing	Complete	--	April 2014	Completed with submittal of Final RI Report on April 21, 2014 (Landau Associates 2014 [11045]).
If COCs in soil and groundwater are present at concentrations that pose a risk of sediment recontamination, then develop a plan for controlling these contaminant sources.	High	SCAP	Ecology, Boeing	Planned	TBD		To be addressed as part of Agreed Order No. DE-7088 (Ecology 2010 [06812]).
If needed, conduct additional tidal studies to address the tidal efficiency anomaly identified in well I-205 during a tidal study conducted in 2000, and to collect additional information on tidal influences.	Low	SCAP	Boeing	Complete	--	April 2014	Completed with submittal of Final RI Report on April 21, 2014 (Landau Associates 2014 [11045]).
Collect bank samples and analyze them for COCs to evaluate potential for sediment recontamination from bank erosion.	Medium	SCAP	Boeing, Ecology, and/or Port of Seattle (TBD)	Complete	--	November 2015	Investigation conducted by Ecology's contractor in May 2015. Final report published in November 2015. Results indicate the presence of metals, cPAHs, PCB, and TPH above screening criteria (Kennedy/Jenks 2015 [11077]).
Investigate the condition of the 48-inch KC Airport SD#2/PS45 EOF that passes through the Boeing Isaacson property.	Medium	SCAP	King County	Planned	TBD		
Clarify the purpose, function, and configuration of the edge drains along the Boeing Isaacson shoreline.	Low	SCAP	Boeing, Port of Seattle	In Progress	TBD		To be addressed as part of Agreed Order No. DE-7088 (Ecology 2010 [06812]).

Table C-1. Source Control Action Item Status for the Boeing Isaacson/Thompson Site

Action Item	Priority	Type	Responsible Party	Status	Estimated Completion Date	Date Completed	Comments/Follow-On Actions
Collect stormwater solids samples from the catch basins on the Boeing Isaacson property that drain to the Boeing Thompson stormwater system.	Medium	SCAP	Boeing	Complete		April 2014	Completed with submittal of Final RI Report on April 21, 2014 (Landau Associates 2014 [11045]).
Investigate the status and source of the unidentified outfall pipe located near the Boeing Isaacson/Jorgensen Forge property boundary (Outfall 2063).	Low	SCAP	Boeing	Planned	TBD		To be addressed as part of Agreed Order No. DE-7088 (Ecology 2010 [06812]).
Review Boeing memorandum regarding findings associated with the two drainage pipes that may be discharging to the 8801 Site, and assess the potential that these discharges may contribute to recontamination of LDW sediments.	Medium	SCAP	Ecology	In Progress	TBD		To be addressed as part of Agreed Order No. DE-7088 (Ecology 2010 [06812]).
Collect storm drain solids samples from the Boeing Thompson stormwater system to assess concentrations of contaminants.	Medium	SCAP	Boeing	Complete		April 2014	Completed with submittal of Final RI Report on April 21, 2014 (Landau Associates 2014 [11045]).
Conduct a source control inspection to clarify the nature of current activities at this property and to assess the current potential for sediment recontamination.	Low	SCAP	Ecology	Planned	TBD		

COCs - chemicals of concern

cPAHs - carcinogenic polycyclic aromatic hydrocarbons

KC - King County

LDW - Lower Duwamish Waterway

MTCA - Model Toxics Control Act

PCBs - polychlorinated biphenyls

RI/FS - Remedial Investigation/Feasibility Study

SCAP - Source Control Action Plan

TBD - to be determined

TPH - total petroleum hydrocarbons

Ecology. 2010. Agreed Order No. DE7088, In the Matter of Remedial Action by: The Boeing Company. April 23, 2010. [02450]

Ecology. 2018. Lower Duwamish Waterway Source Control Status Report, January 2014 through December 2016, Draft. Prepared by the Washington State Department of Ecology, Toxics Cleanup Program, Northwest Regional Office. Publication No. 17-09-2666. In progress.

Kennedy/Jenks (Kennedy/Jenks Consultants). 2015. Boeing Isaacson-Thompson Site, Port of Seattle Sliver Data Summary Report. Prepared for Washington State Department of Ecology. November 12, 2015. [11077]

Landau (Landau Associates) and AMEC Environment & Infrastructure, Inc. 2014. Final Remedial Investigation Report, Boeing Isaacson-Thompson Site, Tukwila, Washington. Prepared for The Boeing Company. April 21, 2014. [11045]

Property Name	Boeing Plant 2
GENERAL INFORMATION	
Address	7755 East Marginal Way S, Seattle, WA 98108
Property No.	10002
Tax Parcel No.	000160-0020, 002200-0005, 002200-0165, 002200-0195, 218500-0005, 282404-9009, 292404-9056, 292404-9098, 292404-9112, 332404-9002
Property Owner	The Boeing Company
Current Operator	The Boeing Company
Property Size	Total acres: 112 (Habitat restoration was completed on 5 acres of the property.) 000160-0020: 29.99 acres 002200-0005: 37.45 acres 002200-0165: 0.25 acre 002200-0195: 0.50 acre 218500-0005: 5.70 acres 282404-9009: 8.02 acres 292404-9056: 0.23 acre 292404-9098: 0.09 acre 292404-9112: 1.61 acres 332404-9002: 28.65 acres
Facility/Site ID	2100: Boeing Plant 2 9007: Boeing Plant 2 4981: Boeing Plant 2 Shoreline Restoration 17429: Boeing Plant 2 North Shoreline [sic] Soil Excavation
Alternate Names	Boeing Plant 2 A, Boeing Plant II, Plant II
NPDES Permit No.	WAR000482 (tied to Facility/Site ID 2100) WAR012502 Construction SWGP, expired December 10, 2012 (tied to Facility/Site ID 9007) WAR126089 Construction SWGP, expired January 10, 2014 (tied to Facility/Site ID 17429) WAR127234 Construction SWGP, expired January 16, 2014 (tied to Facility/Site ID 4981)
UST/LUST ID No.	UST ID: 10412 (tied to Facility/Site ID 2100) LUST ID/Cleanup Site ID: 503/7368 LUST ID/Cleanup Site ID: 1310/7369 LUST ID/Cleanup Site ID: 2460/7370
SITE HISTORY AND ACTIVITIES	
Description	Boeing Plant 2 is located on the east bank of the Lower Duwamish Waterway (LDW). It is bordered on the north by Slip 4, to the east by East Marginal Way S, to the south by Jorgensen Forge and to the west by the LDW. The site is located with the cities of Seattle and Tukwila. All areas of the site are developed and almost entirely covered with impervious surfaces (pavement and roofs) (Boeing 2012 [10451]). There are three stormwater systems at the property, identified as North, Central, and South systems. The North and Central systems each have two bioswales which convey flow to a central Contech filter vault before discharging to the LDW. In the South system, stormwater flows to a bioswale, which conveys flow to a Contech filter vault before discharging to the LDW. (Ecology 2017).

Property Name	Boeing Plant 2
	Parcels 002200-0165, 002200-0195, 218500-0005, 292404-9056, 292404-9098, and 292404-9112 are used for parking at Boeing Plant 2.
Historical Activities	The site was developed in the 1930s and quickly expanded to meet the demand for airplanes during World War II. By the 1940s, Plant 2 operated on approximately 390 acres of land. The plant supported production and assembly of a variety of aircraft through the 1970s. ¹ In the 1980s, the plant began operating as a machine shop. From 1990 to the 2000s, the plant was used to restore aircraft for the National Air and Space Museum and the Museum of Flight. ² Demolition of the plant began in 2010 and site redevelopment activities were completed in 2012.
Current Activities	Offices, research and development facilities, and parking are present at Plant 2.
Chemicals of Concern	Based on information in the most recent Source Control Status Report (Ecology 2018), the following chemicals of concern (COCs) were selected for Early Action Area 4 (EAA-4): polychlorinated biphenyls (PCBs), metals, polycyclic aromatic hydrocarbons (PAHs), and phthalates. COCs for the site are: PCBs, metals, PAHs, volatile organic compounds (VOCs), and petroleum hydrocarbons (Ecology 2018).
CONTAMINATED MEDIA	
Surface Sediment	Remediation and cleanup of the surface sediment and the Plant 2 shoreline was completed in March 2015. Over the course of three construction seasons, Boeing: <ul style="list-style-type: none"> • Dredged approximately 163,000 cubic yards of sediment within the Duwamish Sediment Other Area (DSOA) and Slip 4. • Excavated approximately 160,000 cubic yards of material along the south Plant 2 shoreline. • Placed approximately 31,300 cubic yards of backfill material along the south Plant 2 shoreline. • Disposed of approximately 383,000 tons of sediment and soil. • Discharged approximately 44,200,000 gallons of water through the dredge return water treatment system. <p>Following the third construction season, 36 post-construction surface and subsurface sediment samples were analyzed for the Washington State Sediment Management Standards (SMS) list of COCs and dioxins/furans. Concentrations of metals, PCBs, phthalates, and chlorobenzenes were either non-detect or below the SMS Sediment Cleanup Objective (SCO) for all samples. Concentrations of benzoic acid (2 samples), benzyl alcohol (1 sample), and phenol (1 sample) exceeded the SCO (AMEC et al. 2016 [12264]). Additional sediment sampling will be performed to evaluate the effectiveness of the cleanup effort.</p>
Storm Drain Solids	Analytical data for storm drain solids samples collected after the completion of the new storm drain systems, if any, are not available for review. In August 2016, Ecology issued an Administrative Order for modification to Boeing, waiving the Industrial Stormwater General Permit (ISGP) additional requirements for storm drain line cleaning and storm drains solids sampling and analysis (Ecology 2016).

¹ http://www.boeing.com/news/frontiers/archive/2010/august/i_history.pdf

² <http://www.museumofflight.org/News/2081/museum-of-flight-to-move-airplanes-from-boeing039s-historic-plant-2>

Property Name	Boeing Plant 2
Groundwater	<p>The 2017 Documentation of Environment Indicator Determination for Groundwater (EPA 2017) states that concentrations of the following chemicals exceed the December 2017 proposed Final Medial Cleanup Levels: arsenic, copper, zinc, nickel, cadmium, various VOCs, benzene, toluene, ethylbenzene, xylenes (BTEX), PCBs, and bis(2-ethylhexyl) phthalate (BEHP). However, the total contaminant mass has been significantly reduced due to the implementation of interim measures to reduce COCs in soil and groundwater. Groundwater beneath the site is expected to return to more normal geochemical conditions as the contaminant reduction continues.</p> <p>A proposed final cleanup plan (or Statement of Basis) for the upland area of the site will be published by EPA in 2018 (EPA 2018).</p>
Soil	<p>Soil at the site has been remediated to reduce the total contaminant mass and minimize the potential for contaminants in soil to leach to groundwater. Recent soil data were not available for review; however, given the upland soil remediation and cleanup activities, as well as the extensive remediation of the shoreline, soil is unlikely to be a significant source of COCs to LDW sediment. In addition, the U.S. Environmental Protection Agency’s (EPA) determination that groundwater is likely to be an insignificant source of COCs to sediment (EPA 2017), indicates that the determination is in part due to the soil remediation and cleanup and the shoreline remediation.</p> <p>A proposed final cleanup plan (or Statement of Basis) for the upland area of the site will be published by EPA in 2018 (EPA 2018).</p>
TRANSPORT PATHWAYS	
Outfalls	<p>Numerous changes have been made to the stormwater systems at Plant 2 during the redevelopment, interim actions, sediment remediation and habitat restoration activities at the site. Active outfalls at the site include three outfalls associated with each of the stormwater systems, Outfall ZZ, and one or more outfalls discharging to Slip 4.</p>
Relevant Pathways	<p>The following pathways may contribute to sediment recontamination:</p> <ul style="list-style-type: none"> • Stormwater Discharges: COCs in stormwater at the site is conveyed through bioswales and filter vaults prior to discharge to the LDW. With exception of zinc, contaminants in discharges to the LDW are below the ISGP benchmarks. • Groundwater Discharges: The EPA indicates that discharge of contaminated groundwater is likely to be an insignificant source of COCs to sediments. Boeing is required to continue monitoring of the shoreline groundwater monitoring wells to evaluate the potential for COCs to be conveyed to the LDW via this pathway. • Bank Erosion/Leaching: Some areas of the shoreline has been restored to its natural habitat. Where the habitat has not been restored, the shoreline is armored with sheet pile walls or riprap. Soil remediation and cleanup has minimized the potential for COCs to leach to groundwater. <p>Surface runoff is not considered a significant pathway; the site is paved and runoff is directed to the onsite storm drain system. Leaks and spills may occur, but are likely to be captured in the onsite storm drain system. Waterway operations and atmospheric deposition have not been identified as relevant pathways at this property.</p>
SOURCE CONTROL ACTIONS	
Action Item Status	<p>Boeing completed Resource Conservation and Recovery Act (RCRA) corrective actions at Plant 2 under an Administrative Order on Consent, issued by EPA to Boeing in 1994 (Ecology 2018).</p>

Property Name	Boeing Plant 2
	<p>Nine high priority action items have been identified for Plant 2. A description of each action item and its status is provided in Table C-1. The following high priority action items are in progress, ongoing, or planned according to the most recent Source Control Status Report (Ecology 2018):</p> <ul style="list-style-type: none"> • Continue shoreline groundwater monitoring.(In progress) • Collect in-line sediment samples in the City of Tukwila systems immediately prior to discharge to Plant 2's storm drain system. (Ongoing) • Conduct a joint hydrologic investigation with Jorgensen Forge to provide additional hydrogeologic data at the boundary of the two facilities. (Planned)
<p>INSPECTION, PERMIT, AND CLEANUP STATUS</p>	
<p>Inspections</p>	<p>Ecology performed a water quality inspection at Plant 2 on April 27, 2017. Ecology identified four corrective actions related housekeeping issues to come into compliance with the facility's ISGP.</p> <p>The inspector noted that the site drainage maps in the Stormwater Pollution Prevention Plan (SWPPP) were difficult to review due to the very small scale of the maps and advised Boeing to keep the drainage maps up to date with all drainage work and construction activities. The inspector required Boeing to include an Operation and Maintenance manual for the Contech filter systems, including proper maintenance (Ecology 2017).</p>
<p>Permit Compliance Status</p>	<p>The facility's ISGP includes requirements for Dischargers to Impaired Waters. In August 2016, Ecology issued an Administrative Order to Boeing, waiving the ISGP additional requirements for storm drain line cleaning and storm drains solids sampling and analysis (Ecology 2016).</p> <p>Elevated zinc concentrations are associated with building 2-122. Runoff from a galvanized roof, downspout pipes, and headers flow to a treatment system, but the concentrations exceed the permit benchmark for zinc.</p> <p>The April 2017 inspection identified four corrective actions related to housekeeping issues (Ecology 2017). Information regarding the status of completing these corrective actions was not available for review.</p>
<p>Upland Cleanups</p>	<p>Several interim cleanup actions have been performed at the site (Arrigoni 2014, EPA 2015). Examples of these interim measures include:</p> <ul style="list-style-type: none"> • PCB-contaminated soil was removed from the substation area at the southwest corner of Plant 2. • Removal of joint caulk material in concrete that contained PCB concentrations greater than 25 parts per million (ppm) in multiple areas. • UST removals. <p>Boeing has completed the majority of interim soil cleanups and installed stormwater treatment systems to control contaminants from entering the LDW. A proposed final cleanup plan (or Statement of Basis) for the upland area of the site will be published by EPA in 2018 (EPA 2018).</p>
<p>Other Relevant Studies</p>	<p>Boeing continues to delineate the contaminated groundwater plume that originates from the Boeing Electronics Manufacturing Facility (EMF) and flows under Plant 2.</p> <p>Boeing and Jorgensen Forge plan to conduct a joint hydrologic investigation at the boundary of the two facilities (Arrigoni 2014).</p>

Property Name	Boeing Plant 2
RECOMMENDATION	
Source Control Summary	<p>Remediation and cleanup of the surface sediment and the Boeing Plant 2 shoreline was completed in March 2015. Habitat restoration on five acres of the site was completed in 2016. Boeing has completed interim cleanup actions that have reduced the total contaminant mass in soil and groundwater at the site. A proposed final cleanup plan (or Statement of Basis) for the upland area of the site will be published by EPA in 2018 (EPA 2018).</p> <p>Three new stormwater systems have been installed at the site. Each system includes bioswales and filter faults to minimize the potential for COCs in stormwater to be conveyed to LDW sediments.</p>
Preliminary Recommendation	Sources are sufficiently controlled.

References

AMEC et al. (AMEC Foster Wheeler Environment & Infrastructure, Inc.; Dalton, Olmsted & Fuglevand, Inc.; and Floyd|Snider, Inc). 2016. Corrective Measure Implementation Report, Duwamish Sediment Other Area and Southwest Bank Corrective Measure, Boeing Plant 2, Seattle/Tukwila, Washington. Prepared for The Boeing Company. June 2016. [12264]

Arrigoni. 2014. E-mail for Holly Arrigoni (U.S. Environmental Protection Agency). February 3, 2014.

Boeing. 2012. Boeing Plant 2 Stormwater Pollution Prevention Plan, The Boeing Company North Boeing Field Facility, WDOE ISWGP Permit # WAR000482. May 2010, revised April 2012. [10451]

Ecology (Washington State Department of Ecology). 2016. In the Matter of an Administrative Order Against The Boeing Company, Administrative Order Docket #13734. August 22, 2016.

Ecology. 2017. Stormwater Compliance Inspection Report for April 27, 2017 inspection at Boeing Plant 2, 7755 E. Marginal Way South, Seattle, WA 98108. June 28, 2017.

Ecology. 2018. Lower Duwamish Waterway Source Control Status Report, January 2014 through December 2016, Draft. Prepared by the Washington State Department of Ecology, Toxics Cleanup Program, Northwest Regional Office. Publication No. 17-09-2666. In progress.

EPA. 2015 (U.S. Environmental Protection Agency). Report or email dated October 30, 2015.

EPA. 2017. Documentation of Environmental Indicator Determination, Boeing Plant 2, 7755 East Marginal Way, Seattle, WA, Facility EPA ID #: WAD009256819. December 12, 2017.

EPA. 2018. Superfund Site: Lower Duwamish Waterway, Seattle, WA, Cleanup Activities. <https://cumulis.epa.gov/supercpad/SiteProfiles/index.cfm?fuseaction=second.cleanup&id=1002020>. Accessed on May 10, 2018.

Figures

Figure 1. RM 2.8 East (EAA-3: Slip 4)

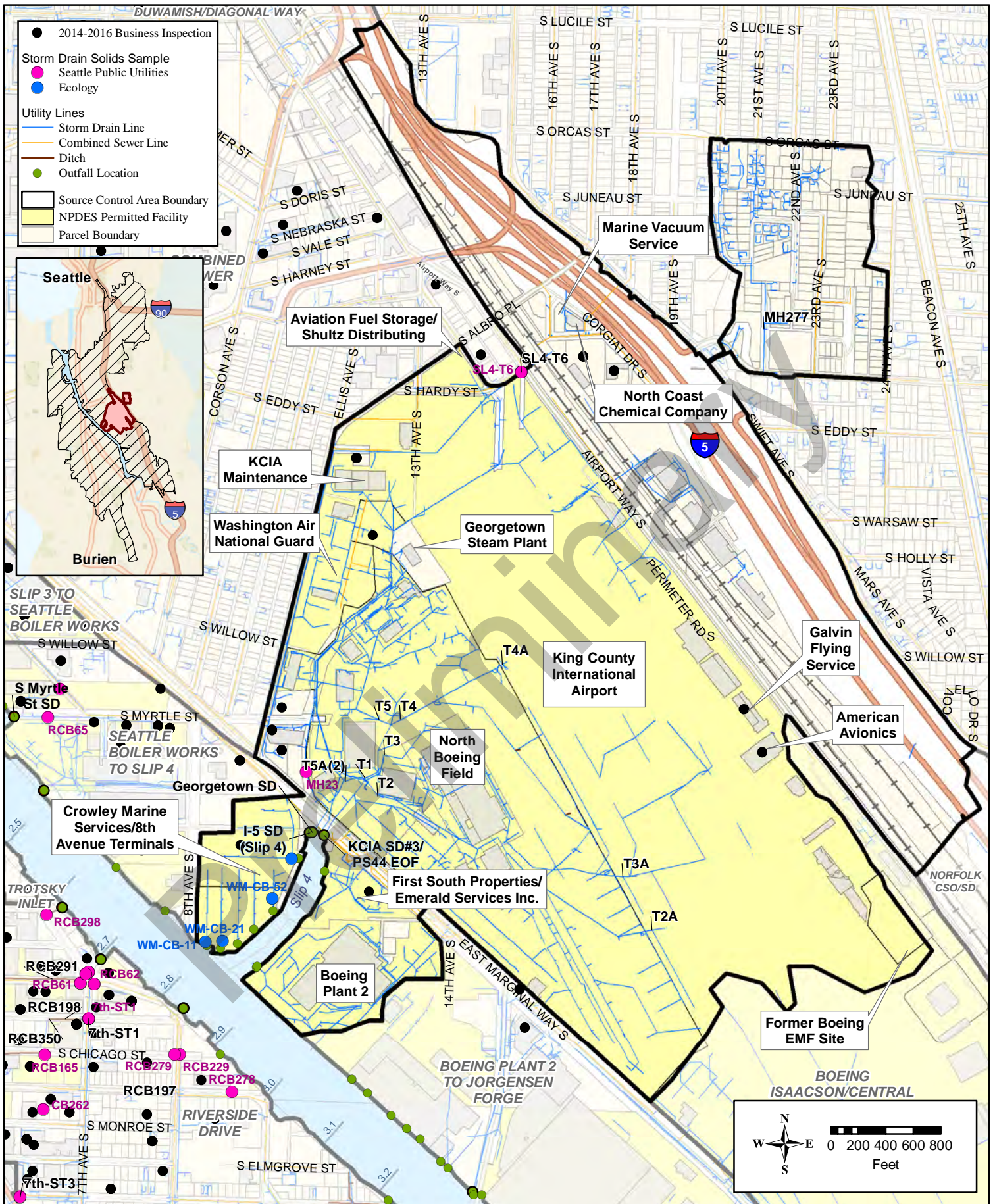
Figure 2. RM 2.8-3.7 East (EAA-4: Boeing Plant 2 to Jorgensen Forge)

Figure 3. Boeing Plant 2

Attachments

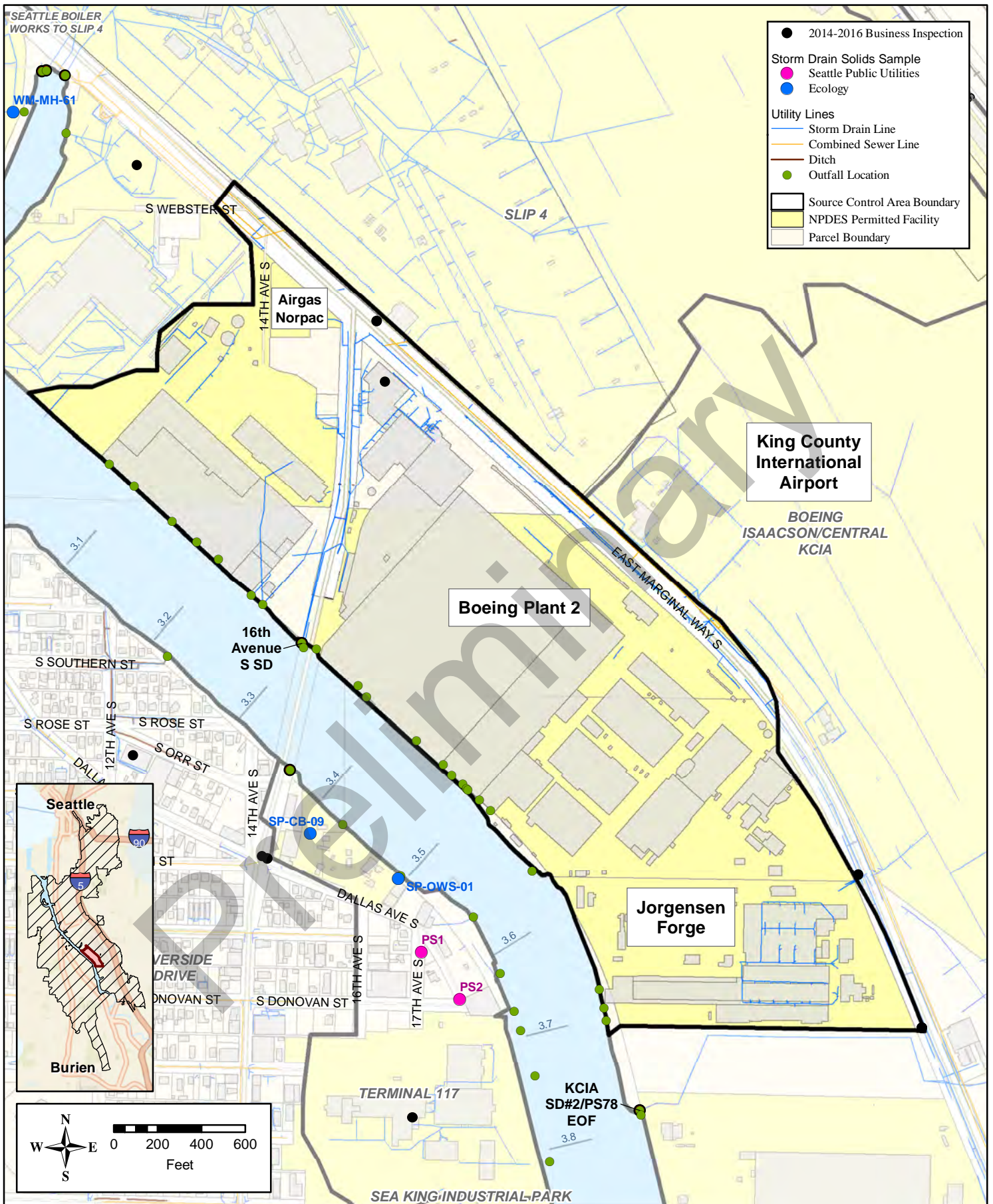
Attachment A. Source Control Action Item Status

Preliminary



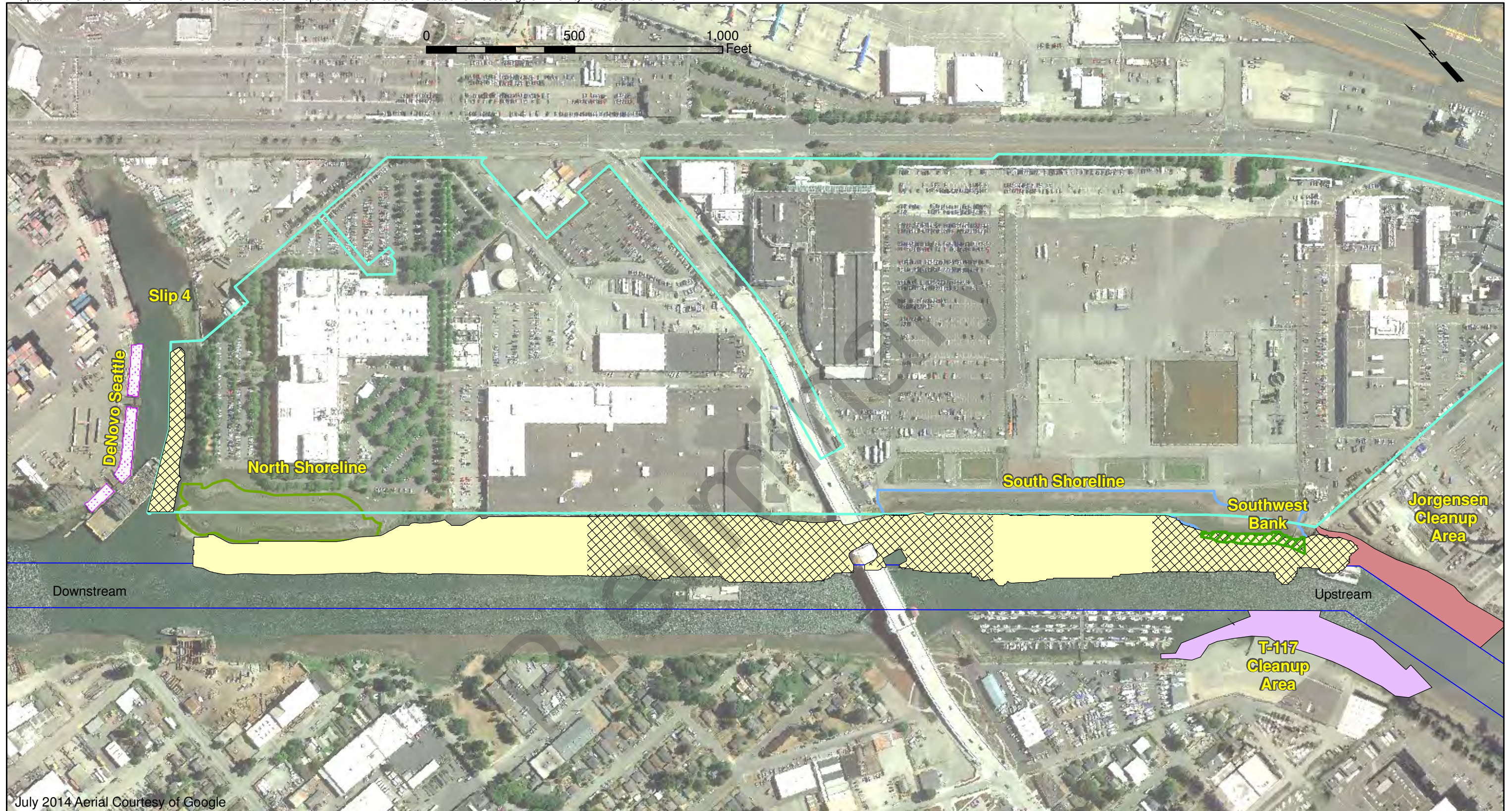
**Figure 1. RM 2.8 East
(EAA-3: Slip 4)
Source Control Area**





**Figure 2. RM 2.8-3.7 East
(EAA-4: Boeing Plant 2 to Jorgensen Forge)
Source Control Area**





July 2014 Aerial Courtesy of Google











Legend		
	North Shoreline Area	 SWB Re-excavation Area (approximate)
	South Shoreline Area	 Area Dredged During CS3
	T-117 Cleanup Area	 Area Backfilled During CS3
	Jorgensen Cleanup Area	 DeNovo Seattle (formerly the Crowley Marine Services dock)
		 Navigation Channel
		 Boeing Plant 2 Parcel

Figure 3. Boeing Plant 2



BOEING PLANT 2 VICINITY
 Corrective Measure Implementation Report
 Duwamish Sediment Other Area and Southwest
 Bank Corrective Measure and Habitat Project,
 Boeing Plant 2, Seattle/Tukwila, Washington

By: RHG Date: 4/5/2016 Project No. 0131320090

Table C-1. Source Control Action Item Status for the Boeing Plant 2

Action Item	Priority	Type	Responsible Party	Status	Estimated Completion Date	Date Completed	Comments/Follow-On Actions
Evaluate the remaining Plant 2 Corrective Measures Study study areas and continue to determine needed source control actions.	Medium	SCAP	EPA, Boeing	In Progress	TBD		Boeing has completed many of the interim soil cleanups and anticipates the Final Cleanup will be completed in 2018.
Continue to delineate and evaluate the EMF plume.	Medium	SCAP	EPA, Boeing	In Progress	TBD		While the plume goes under Plant 2, this activity is being conducted under a CERCLA action.
Complete design and implementation of dredging, capping, and/or backfilling of the Duwamish Sediment Other Area Corrective Measure.	High	SCAP	EPA, Ecology, Boeing	Complete	--	March 2015	The Corrective Measure Implementation Report was published in June 2016.
Remove contaminated bank fill material.	High	SCAP	EPA, Boeing	Complete		May 2014	All contamination from top of bank waterward has been removed and backfilled to the low-water line. Excavation will continue into the channel during 2014 and 2015.
Conduct monthly sampling, including groundwater sampling and vapor sampling of the DDC system wells and multiple points along the vapor treatment system.	Medium	SCAP	EPA, Boeing	Complete			
Continue shoreline groundwater monitoring.	High	SCAP	EPA, Boeing	In Progress	TBD		Shoreline monitoring well network was removed in 2013 to accommodate habitat project. A work plan describing new locations was anticipated in February 2014, and the network was to be reinstalled in time for summer 2014 sampling, however the status of groundwater sampling is unknown.

Table C-1. Source Control Action Item Status for the Boeing Plant 2

Action Item	Priority	Type	Responsible Party	Status	Estimated Completion Date	Date Completed	Comments/Follow-On Actions
Re-evaluate the SWPPP and make necessary changes if process/operational changes are made at Plant 2.	Low	SCAP	Ecology, Boeing	Complete	--	2016	Boeing reviewed and updated its SWPPP in 2016.
Excavate PCB-contaminated soil in the substation area (southwest corner of Plant 2).	High	New	Boeing	Complete	--	2014	This activity is being handled under a CERCLA order. Action pending. Boeing action included in 2014 draft Corrective Measures Study report.
Address removal of materials containing PCBs, including joint caulk material.	High	SCAP	EPA, Boeing	Complete	--	September 2010	Completed removal of joint caulk material containing PCB concentrations greater than 25ppm from concrete in multiple area. Removed 1,545 linear feet of caulk material.
Conduct a joint hydrologic investigation with Jorgensen Forge to provide additional hydrogeologic data at the boundary of the two facilities.	High	SCAP	Boeing, Jorgensen	Planned	TBD		Pending Ecology Order implementation at Jorgensen Forge; Plant 2 is completed.
Collect in-line sediment samples in the City of Seattle and City of Tukwila systems immediately prior to discharge to Plant 2's storm drain system.	High	SCAP	EPA, Boeing	Ongoing	TBD		Seattle lines are closed. Working with city of Tukwila.
Conduct stormwater source control sampling of suspended solids and/or water along active storm drain lines.	High	New	Boeing	Complete	--	February 2014	EPA (H. Arrigoni) reports that Boeing conducts regular sampling.

Table C-1. Source Control Action Item Status for the Boeing Plant 2

Action Item	Priority	Type	Responsible Party	Status	Estimated Completion Date	Date Completed	Comments/Follow-On Actions
Implement catch basin solids sampling program.	High	New	Boeing	Complete	--	February 2014	A sampling program has been implemented. Boeing conducts regular sampling.
Determine if the city storm drain outfall discharging to EAA-4 at the South Park Bridge is Outfall J or another outfall.	Medium	SCAP	EPA, City of Seattle	Complete	--	August 2008	Completed during reconnaissance for sediment trap installation.
Inspect Building 2-122 area.	Medium	SCAP	Ecology	Complete	--	April 2007	Re-inspect as needed to ensure compliance with permit.
Sample onsite storm drain solids.	Medium	SCAP	Ecology	Complete	--	May 2007	
Assess existing groundwater data in the area.	Low	SCAP	Ecology, EPA	Planned	TBD		EPA lead

CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act

DDC - Density-Driven Convection

EMF - Electronics Manufacturing Facility

EPA - U.S. Environmental Protection Agency

PCB - polychlorinated biphenyl

SCAP - Source Control Action Plan

SWPPP - Stormwater Pollution Prevention Plan

TBD - to be determined

Ecology. 2018. Lower Duwamish Waterway Source Control Status Report, January 2014 through December 2016, Draft. Prepared by the Washington State Department of Ecology, Toxics Cleanup Program, Northwest Regional Office. Publication No. 17-09-2666. In progress.

Arrigoni. 2014. E-mail for Holly Arrigoni (U.S. Environmental Protection Agency). February 3, 2014.

Property Name	Crowley Marine/8 th Avenue Terminals
GENERAL INFORMATION	
Address	7400 8th Avenue S, Seattle 98108
Property No.	09002
Tax Parcel No.	2136200641
Property Owner	DeNovo Seattle, LLC
Current Operator	Waste Management
Property Size	15.9 acres
Facility/Site ID	1940187: Crowley Marine Services 8th Ave S Cleanup Site ID 2520 63123962 (Alaska Logistics LLC)
Alternate Names	Duwamish Reload Facility, 8 th Avenue General Storage Area
NPDES Permit No.	WAR302034
UST/LUST ID No.	Not applicable
SITE HISTORY AND ACTIVITIES	
Description	<p>The site is located on the east side of the LDW and adjacent to Slip 4. It is bordered by 8th Avenue S to the west, South Garden Street to the north, the LDW to the south and Slip 4 to the east. Approximately 1.5 acres of the site are submerged by the LDW. The majority of the site is paved except for a vegetated area near East Marginal Way S.</p> <p>Infrastructure at the site supporting current operations include aboveground office trailers, a scale house, two metal companies, the Operations Containment Area, which is designated for offloading and materials handling operations, and a railroad spur.</p>
Historical Activities	Hydraulic parts, chain, and pipes manufacturing, lumber mill, pole-dipping, excelsior (wood packing material) manufacturing, manufacturing and storage of concrete products, aluminum window and sash manufacturing, wood-based compost and alternative fuel production, school bus storage/parking lot.
Current Activities	<p>Waste Management performs following activities are performed at the site:</p> <ul style="list-style-type: none"> • Offloading, loading, transloading, and storage of marine cargo and equipment; • Offloading, loading, transfer, and storage of containerized non-hazardous; contaminated materials in closed rigid containers (intermodal operations); • Offloading, loading, transfer, and storage of containerized non-hazardous; contaminated materials in closed non-rigid containers (intermodal operations); • Storage of trucks, vehicles, rail cars, and equipment; • Mooring of marine vessels; • Offloading, loading, transloading, and storage of clean bulk soils, sands, and gravels; and • Offloading, loading, transloading, and storage of non-hazardous bulk liquids.

Property Name	Crowley Marine/8th Avenue Terminals
Chemicals of Concern	Metals, PAHs, PCBs, phthalates, petroleum hydrocarbons, dioxins/furans, other SVOCs, petroleum hydrocarbons
CONTAMINATED MEDIA	
Surface Sediment	<p>Chemicals of concern for the Seattle Boiler Works to Slip 4 and EAA-3 source control areas are: metals, PCBs, PAHs, phthalates, other SVOCs, dioxins/furans, organo-tin compounds, and petroleum hydrocarbons.</p> <p>Benzoic acid (EF = 1.8) and benzyl alcohol (EF = 10) exceeded the SCO/CSL in samples collected during the 2013 and 2014 RI activities.</p> <p>[RI data from EIM and May 2015 Sherlock database. Need to review data from the 2016 Sherlock database.]</p>
Storm Drain Solids	<p>Storm drain solids data for samples collected in 2004, 2008, 2009, and 2012 through 2015. Source tracing sampling was performed on November 23, 2016; data from the sampling is not available for review.</p> <p>Metals; PCBs; dioxins/furans; PAHs, phthalates, and other SVOCs; VOCs; and petroleum hydrocarbons have been detected in storm drain solids samples. Cadmium, copper, lead, mercury, zinc, anthracene, benzo(a)anthracene, chrysene, fluoranthene, phenanthrene, pyrene, total LPAH, total HPAH, BEHP, butyl benzyl phthalate, diethyl phthalate, dimethyl phthalate, benzoic acid, benzyl alcohol, n-nitrosodiphenylamine, phenol, and pentachlorophenol concentrations exceeded the SCO/LAET and CSL/2LAET. The highest exceedance factors were BEHP (EF = 32), benzyl alcohol (EF = 27), and butyl benzyl phthalate (EF = 8.4). See Table 2 for additional details. [RI data from EIM and NPDES Inspection Sampling Support data. Need to review data from the 2016 Sherlock database.]</p>
Groundwater	Data uploaded to the EIM database includes historical data collected between 1988 and 2013, and data collected during the Phase 2 RI activities in 2014. The following chemicals of concern have been detected in groundwater above the LDW PCULs at Crowley Marine Services: antimony, arsenic, barium, cadmium, chromium, copper, lead, mercury, nickel, selenium, thallium, zinc, PAHs, phthalates, other SVOCs, VOCs, and petroleum hydrocarbons.
Soil	Data uploaded to the EIM database includes historical data collected between 1988 and 2013, and data collected during the Phase 2 RI activities in 2014. The following chemicals of concern have been detected in soil above the LDW PCULs at Crowley Marine Services: antimony, arsenic, barium, cadmium, chromium, copper, lead, mercury, nickel, selenium, silver, thallium, zinc, PCBs, PAHs, phthalates, other SVOCs, dioxins/furans, VOCs, petroleum hydrocarbons, and pesticides.
TRANSPORT PATHWAYS	
Outfalls	<p>Five active, private outfalls are present at the site: outfalls 2042 (OF 1), 5006 (OF 2), 5008 (OF 4), 5009 (OF 5), and 5010 (OF 6).</p> <p>According to Waste Management's 2016 ISGP annual report, 5007 (OF 3) was plugged at the end of the pipe. Flow to Outfall 3 was diverted to the storm/process water pre-treatment system.</p>
Relevant Pathways	<p>Based on information provided in the SCAP and draft RI report (Anchor QEA 2016), and the information on contaminated media above, the following pathways may contribute to sediment recontamination:</p> <ul style="list-style-type: none"> • Direct stormwater discharges: concentrations of COCs in storm drain solids exceed screening

Property Name	Crowley Marine/8 th Avenue Terminals
	<p>levels.</p> <ul style="list-style-type: none"> Contaminated groundwater discharge: concentrations of COCs in groundwater exceed the LDW PCULs throughout the site, with the greatest concentrations adjacent to the shoreline at the southeast corner. Contaminated soil erosion/leaching: concentrations of COCs in soil exceed screening levels, throughout the site, with the greatest concentrations adjacent to Slip 4 and the southern portion of the site adjacent to the LDW. Seeps have been identified at the site, sampling results indicate that arsenic is present at concentrations exceeding the preliminary site cleanup levels. <p>Surface runoff is not considered a significant pathway; the site is paved and runoff is directed to the onsite storm drain system. Leaks and spills may occur, but are likely to be captured in the onsite storm drain system. Waterway operations and atmospheric deposition have not been identified as relevant pathways at this property.</p>
SOURCE CONTROL ACTIONS	
Action Item Status	<p>Ecology and the property owners of the site entered Agreed Order No. DE 6721 in October 2009. The current property owner, DeNovo LLC has been included in the Agreed Order.</p> <p>Fifteen action items were identified for Crowley Marine Services in the SCAPs for the RM 2.3-2.8 source control area and EAA-3 (four high priority, nine medium priority, and two low priority). Two of the four high priority are complete and two are in progress, according to the most recent Source Control Status Report. The in progress action items are:</p> <ul style="list-style-type: none"> 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. Collect stormwater and/or solids samples from storm drain system to determine if onsite system is source of COCs found in waterway sediment. <p>Seven of the medium priority action items are complete and one was canceled. One medium priority action item is in progress:</p> <ul style="list-style-type: none"> Conduct investigation and cleanup activities in accordance with the Agreed Order, including collection of groundwater and storm drain system samples as appropriate. <p>The low priority action items are complete. A draft RI report was submitted to Ecology in August 2016. Ecology is currently reviewing the report.</p>
INSPECTION, PERMIT, AND CLEANUP STATUS	
Inspections	<p>An NPDES inspection was performed on February 3, 2015, which resulted in an Administrative Order for Immediate Action, and on August 6, 2015.</p> <p>An NPDES inspection was performed on August 6, 2015. Following this inspection and a follow-up inspection on August 12, an NOV was issued to Waste Management on October 9, 2015 for improper containment of contaminated soil being stored at the site, and repeated performance of activities that were not described in the SWPPP.</p> <p>Compliance follow-up inspections were performed on November 29, 2016 and August 1, September 26, October 4, and November 1, 2017.</p>
Permit Compliance Status	<p>According to the 2016 NPDES annual report, several permit benchmarks were exceeded.</p> <ul style="list-style-type: none"> Turbidity: 1st, 3rd, and 4th quarters pH: 3rd quarter Copper: 1st, 2nd, and 3rd quarters

Property Name	Crowley Marine/8th Avenue Terminals
	<ul style="list-style-type: none"> Zinc: 1st, 2nd, 3rd, and 4th quarters <p>Waste Management requested an extension until September 30, 2018 to complete Level 3 corrective actions.</p>
Upland Cleanups	<p>Two USTs and one AST were removed from the property in the 1980s. A third UST was installed at the property; no records confirming the removal of the UST have been found.</p> <p>Several investigations have been performed at the Site to delineate the nature and extent of contamination in soil and groundwater; however, no cleanup actions have been performed.</p>
Other Relevant Studies	<p>One storm drain system water sample was collected in February 2015 as part of the NPDES Inspection Sampling Support project. The following chemicals exceeded water quality criteria:</p> <ul style="list-style-type: none"> Cadmium (ISGP benchmark), copper and zinc (ISGP benchmark, WQS marine chronic and acute), lead and nickel (WQS marine chronic), PCBs (WQS marine chronic, NTR protection of human health – consumption of organisms, NR human health – consumption of organisms), and BEHP (NTR protection of human health – consumption of organisms, NR human health – consumption of organisms).
RECOMMENDATION	
Source Control Summary	<p>Chemicals of concern (metals; PCBs; dioxins/furans; PAHs, phthalates, and other SVOCs; VOCs; and petroleum hydrocarbons) are present in surface sediment, storm drain solids, groundwater, and soil at concentrations above screening levels. An upland cleanup has not been completed. The current operator at the Site, Waste Management, requested an extension until September 30, 2018 to complete Level 3 corrective actions that are required to maintain compliance with the NPDES permit.</p>
Preliminary Recommendation	<p>Sources are not sufficiently controlled.</p>

Table 1. Summary of Screening Level Exceedances in Surface Sediment near Crowley Marine Services

Parameter	Frequency of Detection	Range of Detected Conc'ns	Range of Nondetected Conc'ns	Average Detected Conc'n (mg/kg DW)	Lower Screening Level (mg/kg DW)	Maximum Exceedance Factor	Frequency of Detects Above Lower SL	Upper Screening Level (mg/kg DW)	Maximum Exceedance Factor	Frequency of Detects Above Upper SL
Metals										
Arsenic	82 / 101	4.2 - 61	5 - 8	20	57	1.1	1 / 82	93	NA	NA
Lead	95 / 101	2 - 471	2 - 2	40	450	1.0	1 / 95	530	NA	NA
Mercury	110 / 130	0.0135 - 0.62	0.02 - 0.07	0.17	0.41	1.5	3 / 110	0.59	1.1	1 / 110
Zinc	101 / 101	27 - 1180	NA	160	410	2.9	3 / 101	960	1.2	1 / 101
Organic Chemicals										
2,4-Dimethylphenol	10 / 123	0.0036 - 0.079	0.0046 - 1.4	0.022	0.029	2.7	2 / 10	0.029	2.7	2 / 10
Benzoic Acid	43 / 101	0.045 - 1.2	0.054 - 2.9	0.44	0.65	1.8	10 / 43	0.65	1.8	10 / 43
Benzyl Alcohol	61 / 119	0.012 - 0.57	0.0048 - 0.29	0.28	0.057	10	53 / 61	0.073	7.8	52 / 61
Phthalates										
Bis(2-Ethylhexyl) phthalate	59 / 101	0.027 - 37	0.021 - 0.72	1.4	1.3	28	14 / 59	1.9	19	11 / 59
Butyl benzyl phthalate	83 / 122	0.0024 - 1.6	0.0048 - 0.29	0.065	0.063	25	15 / 83	0.9	1.8	1 / 83
Dimethyl phthalate	32 / 122	0.0029 - 0.73	0.0047 - 0.29	0.039	0.071	10	2 / 32	0.16	4.6	2 / 32
PCBs										
Total PCB Aroclors	133 / 146	0.0038 - 8.2	0.0037 - 0.004	0.76	0.13	63	94 / 133	1	8.2	22 / 133
PAHs										
Acenaphthene	80 / 122	0.0038 - 0.53	0.007 - 0.097	0.053	0.5	1.1	3 / 80	0.5	1.1	3 / 80
Anthracene	107 / 122	0.0095 - 3.3	0.018 - 0.02	0.1	0.96	3.4	1 / 107	0.96	3.4	1 / 107
Fluorene	90 / 122	0.0027 - 0.67	0.0075 - 0.062	0.048	0.54	1.2	1 / 90	0.54	1.2	1 / 90
Phenanthrene	112 / 122	0.012 - 8	0.018 - 0.02	0.3	1.5	5.3	5 / 112	1.5	5.3	5 / 112
Total HPAH	119 / 122	0.0096 - 95	0.018 - 0.018	4.4	12	7.9	6 / 119	17	5.6	6 / 119
Benz(a)anthracene	112 / 122	0.014 - 11	0.018 - 0.019	0.45	1.3	8.5	6 / 112	1.6	6.9	5 / 112
Benzo(a)pyrene	113 / 122	0.01 - 9.9	0.018 - 0.019	0.4	1.6	6.2	5 / 113	1.6	6.2	5 / 113
Benzo(g,h,i)perylene	104 / 122	0.012 - 4.4	0.018 - 0.02	0.21	0.67	6.6	4 / 104	0.72	6.1	4 / 104

Parameter	Frequency of Detection	Range of Detected Conc'ns	Range of Nondetected Conc'ns	Average Detected Conc'n (mg/kg DW)	Lower Screening Level (mg/kg DW)	Maximum Exceedance Factor	Frequency of Detects Above Lower SL	Upper Screening Level (mg/kg DW)	Maximum Exceedance Factor	Frequency of Detects Above Upper SL
Total benzofluoranthenes	116 / 122	0.0094 - 13	0.018 - 0.019	0.79	3.2	4.1	5 / 116	3.6	3.6	5 / 116
Chrysene	115 / 122	0.0096 - 12	0.018 - 0.019	0.57	1.4	8.6	9 / 115	2.8	4.3	4 / 115
Dibenzo(a,h) anthracene	97 / 122	0.0077 - 1.8	0.0048 - 0.098	0.11	0.23	7.8	8 / 97	0.23	7.8	8 / 97
Fluoranthene	118 / 122	0.011 - 20	0.018 - 0.019	1.0	1.7	12	13 / 118	2.5	8.0	7 / 118
Indeno(1,2,3-c,d) pyrene	107 / 122	0.0096 - 4.3	0.018 - 0.02	0.20	0.6	7.2	4 / 107	0.69	6.2	4 / 107
Pyrene	121 / 126	0.0093 - 25	0.018 - 0.019	1.0	2.6	9.6	7 / 121	3.3	7.6	7 / 121

Preliminary

Table 2. Summary of Screening Level Exceedances in Storm Drain Solids at Crowley Marine/8th Avenue Terminals

Parameter	Frequency of Detection	Range of Detected Conc'n's (mg/kg DW)	Range of Nondetected Conc'n's (mg/kg DW)	Average Detected Conc'n (mg/kg DW)	Lower Screening Level (mg/kg DW)	Maximum Exceedance Factor	Frequency of Detects Above Lower SL	Upper Screening Level (mg/kg DW)	Maximum Exceedance Factor	Frequency of Detects Above Upper SL
Metals										
Cadmium	15 / 22	0.866 - 8.84	2.04 - 2.19	2.54	5.1	1.3	1 / 15	6.7	1.3	1 / 15
Copper	21 / 21	53.1 - 447	N/A	175	390	1.1	1 / 21	390	1.1	1 / 21
Lead	24 / 24	42.4 - 526	N/A	200	450	1.2	1 / 24	530	N/A	N/A
Mercury	23 / 24	0.044 - 0.44	0.07	0.12	0.41	1.1	1 / 23	0.59	N/A	N/A
Zinc	24 / 24	26.1 - 3450	N/A	1,095	410	3.6	12 / 24	960	3.6	12 / 24
Organic Chemicals										
Benzoic Acid	2 / 20	2.3 - 3.1	0.55 - 22	2.7	0.65	4.8	2 / 2	0.65	4.8	2 / 2
Benzyl Alcohol	5 / 19	0.041 - 2	0.1 - 2	0.6	0.057	27	4 / 5	0.073	27	4 / 5
N-Nitrosodi-phenylamine	1 / 19	0.11 - 0.11	0.005 - 0.4	0.1	0.028	2.8	1 / 1	0.04	2.8	1 / 1
Phenol	6 / 20	0.072 - 0.56	0.42 - 2.2	0.25	0.42	1.3	1 / 6	1.2	N/A	N/A
Phthalates										
Bis(2-Ethylhexyl) phthalate	17 / 21	1.6 - 61	2.7 - 5.4	22	1.3	32	15 / 17	1.9	32	15 / 17
Butyl benzyl phthalate	8 / 21	0.78 - 7.6	0.85 - 2.3	2.5	0.063	8.4	7 / 8	0.9	8.4	7 / 8
Diethyl phthalate	6 / 21	0.13 - 9.7	0.005 - 1.6	3.5	0.2	49	5 / 6	1.2	8.1	5 / 6
Dimethyl phthalate	6 / 21	0.045 - 0.35	0.005 - 0.48	0.2	0.071	2.2	2 / 6	0.16	2.2	2 / 6
PAHs										
Total LPAH	21 / 24	0.261 - 14.7	0.029 - 0.4	2.0	5.2	2.8	1 / 21	5.2	2.8	1 / 21
Anthracene	17 / 24	0.021 - 2.8	0.018 - 0.035	0.49	0.96	2.9	2 / 17	0.96	2.9	2 / 17
Phenanthrene	21 / 24	0.24 - 11	0.029 - 0.13	1.3	1.5	7.3	4 / 21	1.5	7.3	4 / 21
Total HPAH	24 / 24	0.284 - 24.8	NA	4.9	12	2.1	1 / 24	17	1.5	1 / 24
Benzo(a)anthracene	22 / 24	0.1 - 1.6	0.029 - 0.045	0.4	1.3	1.0	1 / 22	1.6	1.0	1 / 22
Chrysene	23 / 24	0.098 - 2.8	0.029	0.70	1.4	1.0	1 / 23	2.8	1.0	1 / 23

Parameter	Frequency of Detection	Range of Detected Conc'ns (mg/kg DW)	Range of Nondetected Conc'ns (mg/kg DW)	Average Detected Conc'n (mg/kg DW)	Lower Screening Level (mg/kg DW)	Maximum Exceedance Factor	Frequency of Detects Above Lower SL	Upper Screening Level (mg/kg DW)	Maximum Exceedance Factor	Frequency of Detects Above Upper SL
Fluoranthene	24 / 24	0.084 - 11	NA	1.5	1.7	4.4	4 / 24	2.5	4.4	4 / 24
Pyrene	24 / 24	0.11 - 5.6	NA	1.2	2.6	1.7	1 / 24	3.3	1.7	1 / 24
Chlorinated Organics										
Pentachlorophenol	2 / 20	0.18 – 0.44	0.12 – 2.5	0.31	0.36	1.2	1 / 2	0.69	N/A	N/A

Preliminary

Property Name	Douglas Management Dock / Alaska Marine Lines
GENERAL INFORMATION	
Address	7100 2 nd Avenue S, Seattle, WA 98106
Property No.	20006
Tax Parcel No.	292404-9090, 687120-0035
Property Owner	7100 1 st Avenue S, Seattle, LLC
Current Operator	Alaska Marine Lines
Property Size	292404-9090: 3.09 acres, 687120-0035: 0.04 acres, located on the south shoreline of the Trotsky Inlet
Facility/Site ID	97573251: Douglas Management Dock (Cleanup Site ID 6967)
Alternate Names	Alaska Marine Lines, Alaska Marine Lines Shipyard, Swan Bay Holdings Dock
NPDES Permit No.	WAR127039 (Alaska Marine Lines) WAR002471-D (Douglas Management Dock)
UST/LUST ID No.	100532
SITE HISTORY AND ACTIVITIES	
Description	<p>The Douglas Management Dock site is located on a 3.1 acre triangular-shaped parcel at 7100 1st Avenue South in Seattle, on the west side of the Lower Duwamish Waterway (LDW). The site is bordered on the northeast by the Duwamish River, on the south by Early Action Area 2 (Trotsky) inlet and the Industrial Container Services-WA, LLC cleanup site, and on the west by 1st Avenue S.</p> <p>Land located to the west of the site is owned by WSDOT is leased to 7100 LLC to support current facility operations.</p> <p>The DMD property is completely paved with concrete or asphalt. The southern shoreline along the Trotsky inlet is mostly lined with ecology blocks. Approximately 91 percent of the property is upland area; approximately 3 percent is located within the LDW, and the remaining 6 percent is located within the Trotsky inlet to the south. The property has 702 feet of frontage along the Duwamish Waterway and 480 feet along the inlet. Most of the shoreline is covered with concrete rip-rap. The entire site is paved. Portions of the inlet extend onto the project site by as much as 25 feet.</p>
Historical Activities	Historically, the site operated as a sand and gravel batch plant and school bus parking and maintenance facility. Shipbuilding, metal and salvage, sand and gravel batch plant, marine cargo handling
Current Activities	It is currently used for storage of equipment and shipping containers, and as a general transfer facility. The facility has moorage along the Duwamish Waterway, which is actively used. No maintenance is performed onsite, and forklifts are the only diesel-powered equipment that is occasionally fueled at this location.
Chemicals of Concern	EAA-2 chemicals of concern: PCBs, phthalates, mercury, lead, zinc, dichloro-diphenyl-trichloroethane (DDT), and dieldrin

Property Name	Douglas Management Dock / Alaska Marine Lines
	Douglas Management Dock chemicals of concern: Petroleum hydrocarbons, PCBs, metals (arsenic, chromium, copper, mercury, and zinc), volatile organic compounds (VOCs), SVOCs
CONTAMINATED MEDIA	
Surface Sediment	<p>Chemicals of concern for the EAA-2 source control areas are: PCBs, phthalates, mercury, lead, zinc, dichloro-diphenyl-trichloroethane (DDT), and dieldrin.</p> <p>Total PCB Aroclors (EF = 1.4), 2,4-dimethylphenol (EF = 3.4), and hexachlorobutadiene (EF = 1.8) concentrations exceeded the SCO in surface sediment samples collected in 2013 as part of the RI. Concentrations of 2,4-dimethylphenol also exceeded the CSL. These samples were collected near Outfall-SED-1.</p> <p>[Data from EIM. NEED UPDATED SHERLOCK DATABASE. EIM has data from 2007 and 2012 that are not included in Sherlock.]</p>
Storm Drain Solids	During the RI field activities, GeoEngineers attempted to collect one catch basin solids sample; however, no solids were present in the catch basin. Site-specific storm drain solids samples have not been collected based on review of available documents and data.
Groundwater	<p>Data uploaded to the EIM database includes data collected in 1990, 1991, 1992, 2008, 2013, and 2014. Metals, PAHs, phthalates, VOCs, petroleum hydrocarbons and pesticides have been detected in groundwater above the LDW PCULs at Douglas Management Dock / Alaska Marine Lines.</p> <p>The following chemicals were detected at concentrations greater than 100 times the LDW PCUL: chromium, benzo(a)anthracene, benzene, benzo(a)pyrene, indeno(1,2,3-cd)pyrene, naphthalene total cPAH TEQ, 4,4'-DDD, 4,4'-DDE, 4,4'-DDT, dieldrin, heptachlor, and heptachlor epoxide.</p>
Soil	<p>Data uploaded to the EIM database includes data collected in 1990, 1991, 2008 and 2013. Metals; PCBs, PAHs, phthalates, and other SVOCs; dioxins/furans; VOCs; petroleum hydrocarbons and pesticides have been detected in soil above the LDW PCULs at Douglas Management Dock / Alaska Marine Lines.</p> <p>The following chemicals were detected at concentrations greater than 100 times the LDW PCUL: total PCB Aroclors, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, chrysene, dibenz(a,h)anthracene, indeno(1,2,3-cd)pyrene, naphthalene, total cPAH TEQ, butyl benzyl phthalate, bis(2-ethylhexyl) phthalate, 1,2-dichlorobenzene, 1,4-dichlorobenzene, n-nitrosodiphenylamine, pentachlorophenol, benzene, ethylbenzene, gasoline range hydrocarbons, 4,4'-DDD, 4,4'-DDE, and 4,4'-DDT.</p>
TRANSPORT PATHWAYS	
Outfalls	<p>Stormwater runoff from most of the site is collected in four catch basins and conveyed to a stormwater treatment system before discharging to a drainage swale that drains to the LDW. In the southwest portion of the property, stormwater discharges to the sanitary sewer system.</p> <p>Outfall 2508 is covered under NPDES permit WAR127039. Based on Figure 9 in the draft RI report, the facility name for this is Outfall-SED-1. It is the only outfall identified on Figure 9, which shows the stormwater and sewer system at the site.</p>
Relevant Pathways	<p>Based on information provided in the Supplemental Data Gaps report and draft RI report (GeoEngineers 2016), and the information on contaminated media above, the following pathways may contribute to sediment recontamination:</p> <ul style="list-style-type: none"> Contaminated groundwater discharge: The draft RI report indicates that contaminated groundwater does not reach the LDW shoreline. Contaminated groundwater appears to

Property Name	Douglas Management Dock / Alaska Marine Lines
	<p>discharge to the Trotsky Inlet.</p> <ul style="list-style-type: none"> Stormwater discharge and surface runoff: stormwater and surface runoff are conveyed to a treatment system which discharges to a drainage swale that drains to the LDW. Copper and zinc exceeded ISGP benchmarks and the chronic and acute marine WQC in effluent treatment system samples collected in 2013 and 2014. Lead also exceeded the chronic marine WQC. In addition, arsenic, benzofluoranthenes, and chrysene concentrations exceeded NTR and NR human health criteria for the consumption of organisms. Contaminated soil erosion/leaching: The banks/shoreline of the site are armored, reducing the potential for contaminant transport to the LDW via this pathway. Concentrations of COCs in soil exceed screening levels primarily in the center of the site. PCBs and pesticides concentrations also exceed screening levels along the LDW shoreline. <p>Copper concentrations in surface water samples have exceeded the marine chronic and acute WQC. Arsenic concentrations in surface water samples have exceeded the NTR and NR human health criteria for the consumption of organisms.</p>
SOURCE CONTROL ACTIONS	
Action Item Status	<p>Ecology entered into an Agreed Order (DE-8258) with 7100 1st Avenue S, Seattle, LLC (owner) on May 6, 2011.</p> <p>Nine action items are identified in the most recent Source Control Status Report (two high priority, six medium priority, and one low priority). Six of these action items were identified in the SCAP. Two new action items and one follow-on action are identified in the most recent Source Control Status Report. The two high priority action items are complete. One medium priority action item is complete, two are in progress, and three are planned. The medium priority action items that are in progress or planned are:</p> <ul style="list-style-type: none"> In progress: Conduct cleanup as needed to eliminate sources of contaminants to EAA-2; negotiate Agreed Order. In progress: Verify storm drainage pathway on the southern portion of the property. Planned: Conduct groundwater sampling along the LDW shoreline to assess the potential for sediment recontamination via groundwater transport. Planned: Request property owner to provide a map showing current storm drainage on the entire property, including locations of storm drains, catch basins, oil/water separators, and outfalls. Planned: If stormwater discharge to EAA-2 (including the Trotsky inlet to the south and the LDW shoreline to the north and east) is confirmed, assess the need for stormwater characterization (solids and whole water). Collect stormwater samples as needed. <p>The low priority follow-on action item is complete. A draft RI report was submitted to Ecology in December 2016. Ecology is currently reviewing the report.</p>
INSPECTION, PERMIT, AND CLEANUP STATUS	
Inspections	<p>SPU performed an inspection of Alaska Marine Lines in November 2015, with a follow up inspection in February 2016. The facility was in compliance.</p> <p>No inspections are listed in the PARIS database for Alaska Marine Lines at this site.</p>
Permit Compliance Status	<p>In January 2015, Alaska Marine Lines was in violation of its permit for late submittal of DMRs. No other violations or triggers are listed in the PARIS database.</p>
Upland Cleanups	<p>Several investigations have been performed at the site to delineate the nature and extent of contamination in soil and groundwater. A remedial excavation was performed in 1991 during the removal of a UST. The limits of the excavation were determined by the absence of observable</p>

Property Name	Douglas Management Dock / Alaska Marine Lines
	petroleum staining. A single confirmation sample was collected, the TPH concentration was below the 200 mg/kg MTCA cleanup level from 1991. The excavated soil was used as backfill. The excavation may have been lined with a geotextile fabric prior to backfilling.
Other Relevant Studies	Stormwater samples collected in 2013 and 2014 as part of the RI. Copper and zinc exceeded ISGP benchmarks and the chronic and acute marine WQC in effluent treatment system samples collected in 2013 and 2014. Lead also exceeded the chronic marine WQC. In addition, arsenic, benzofluoranthes, and chrysene concentrations exceeded NTR and NR human health criteria for the consumption of organisms. [No storm drain water results in Sherlock 2016. Data from EIM, which includes samples from 2013 and 2014.]
RECOMMENDATION	
Source Control Summary	Chemicals of concern (metals; PCBs; dioxins/furans; PAHs, phthalates, and other SVOCs; VOCs; petroleum hydrocarbons; and pesticides) are present in surface sediment, storm drain solids, groundwater, and soil at concentrations above screening levels. An upland cleanup has not been completed.
Preliminary Recommendation	Sources are not sufficiently controlled.

Preliminary

Table 1. Summary of Screening Level Exceedances in Surface Sediment near Douglas Management Dock / Alaska Marine Lines

Parameter	Frequency of Detection	Range of Detected Conc'ns	Range of Nondetected Conc'ns	Average Detected Conc'n (mg/kg DW)	Lower Screening Level (mg/kg DW)	Maximum Exceedance Factor	Frequency of Detects Above Lower SL	Upper Screening Level (mg/kg DW)	Maximum Exceedance Factor	Frequency of Detects Above Upper SL
Metals										
Arsenic	72 / 80	1.1 - 61.1	6 - 30	12	57	1.1	1 / 72	93	N/A	N/A
Cadmium	58 / 80	0.1 - 47	0.1 - 0.6	3	5.1	9.2	7 / 58	6.7	7.0	4 / 58
Chromium	80 / 80	8.9 - 2,940	N/A	140	260	11	9 / 80	270	11	8 / 80
Copper	74 / 74	8 - 1,090	N/A	80	390	2.8	2 / 74	390	2.8	Feb-74
Lead	80 / 80	1.9 - 10,400	N/A	650	450	23	16 / 80	530	20	16 / 80
Mercury	76 / 80	0.02 - 247	0.03 - 0.06	6	0.41	602	24 / 76	0.59	419	20 / 76
Silver	20 / 80	0.088 - 19	0.2 - 1	1.7	6.1	3.1	1 / 20	6.1	3.1	1 / 20
Zinc	74 / 74	21 - 4,580	N/A	360	410	11	10 / 74	960	4.8	7 / 74
Organic Chemicals										
1,2-Dichlorobenzene	34 / 116	0.0024 - 12	0.0046 - 2.1	0.81	0.035	343	11 / 34	0.05	240	11 / 34
1,4-Dichlorobenzene	36 / 116	0.0027 - 7.6	0.0046 - 2	0.54	0.11	69	9 / 36	0.12	69	9 / 36
4-Methylphenol	33 / 62	0.011 - 1.9	0.0086 - 3.5	0.10	0.67	2.8	1 / 33	0.67	2.8	1 / 33
Benzoic acid	24 / 62	0.11 - 1.2	0.18 - 42	0.31	0.65	1.8	1 / 24	0.65	1.8	1 / 24
Benzyl alcohol	73 / 116	0.0071 - 20	0.018 - 4.2	0.57	0.057	351	23 / 73	0.073	274	18 / 73
N-Nitrosodi-phenylamine	40 / 116	0.0024 - 4.8	0.0086 - 2.1	0.55	0.028	171	11 / 40	0.04	120	10 / 40
Pentachlorophenol	41 / 116	0.014 - 14	0.046 - 21	1.00	0.36	39	17 / 41	0.69	20	10 / 41
Phenol	39 / 62	0.01 - 5.7	0.018 - 6.2	0.2	0.42	14	3 / 39	1.2	4.8	1 / 39
Phthalates										
Bis(2-ethylhexyl)-phthalate	56 / 62	0.016 - 180	0.024 - 0.072	4.1	1.3	138	9 / 56	1.9	95	6 / 56
Butyl benzyl phthalate	23 / 87	0.0032 - 44	0.0046 - 2.1	2.2	0.063	698	8 / 23	0.9	49	3 / 23
Dibutyl phthalate	20 / 62	0.0072 - 44	0.018 - 2.1	2.4	1.4	31	2 / 20	5.1	31	2 / 20
PCBs										
Total PCB Aroclors	68 / 81	0.0104 - 2930	0.0036 - 0.004	78.6	0.13	22,538	53 / 68	1	2,930	37 / 68

Parameter	Frequency of Detection	Range of Detected Conc'ns	Range of Nondetected Conc'ns	Average Detected Conc'n (mg/kg DW)	Lower Screening Level (mg/kg DW)	Maximum Exceedance Factor	Frequency of Detects Above Lower SL	Upper Screening Level (mg/kg DW)	Maximum Exceedance Factor	Frequency of Detects Above Upper SL
PAHs										
2-Methylnaphthalene	47 / 62	0.011 - 50	0.018 - 0.06	1	0.67	75	3 / 47	1.4	75	3 / 47
Dibenzofuran	41 / 62	0.0058 - 26	0.018 - 2.1	0.76	0.54	48	2 / 41	0.7	48	2 / 41
Total cPAHs (TEQ, NDx0.5)	61 / 62	0.01744 - 100	0.02774 - 0.02774	2	1	100	5 / 61	3	33	3 / 61
Total LPAHs	59 / 62	0.012 - 700	0.019 - 0.02	10	5.2	135	2 / 59	13	54	2 / 59
Acenaphthene	37 / 62	0.0041 - 39	0.018 - 2.1	1.3	0.5	78	4 / 37	0.73	78	4 / 37
Acenaphthylene	29 / 62	0.0046 - 8.7	0.018 - 2.1	0.36	1.3	6.7	1 / 29	1.3	6.7	1 / 29
Anthracene	52 / 62	0.011 - 82	0.018 - 0.06	2.0	0.96	85	2 / 52	4.4	85	2 / 52
Fluorene	45 / 62	0.0065 - 58	0.018 - 2.1	1.5	0.54	107	3 / 45	1	58	3 / 45
Naphthalene	47 / 62	0.01 - 120	0.018 - 2.1	3	2.1	57	2 / 47	2.4	50	2 / 47
Phenanthrene	59 / 62	0.012 - 380	0.019 - 0.02	6.9	1.5	253	3 / 59	5.4	70	2 / 59
Total HPAH	61 / 62	0.023 - 1200	0.019 - 0.019	23	12	100	4 / 61	17	71	4 / 61
Benzo(a)anthracene	57 / 62	0.012 - 140	0.018 - 0.02	2.8	1.3	108	4 / 57	1.6	88	4 / 57
Benzo(a)pyrene	49 / 62	0.0098 - 71	0.018 - 0.11	1.7	1.6	44	4 / 49	3	44	4 / 49
Benzo(g,h,i)perylene	56 / 62	0.01 - 19	0.018 - 0.06	0.5	0.67	28	5 / 56	0.72	26	5 / 56
Benzofluoranthenes, total	60 / 62	0.014 - 120	0.037 - 0.038	2.5	3.2	38	4 / 60	3.6	33	3 / 60
Chrysene	59 / 62	0.014 - 180	0.018 - 0.019	3.5	1.4	129	5 / 59	2.8	64	4 / 59
Dibenzo(a,h)anthracene	34 / 62	0.0062 - 13	0.018 - 0.11	0.47	0.23	57	5 / 34	0.54	57	5 / 34
Fluoranthene	61 / 62	0.011 - 390	0.019 - 0.019	7.1	1.7	229	5 / 61	2.5	156	4 / 61
Indeno(1,2,3-cd)pyrene	52 / 62	0.0092 - 21	0.018 - 0.06	0.56	0.6	35	5 / 52	0.69	30	5 / 52
Pyrene	61 / 62	0.0097 - 290	0.019 - 0.019	5.4	2.6	112	5 / 61	3.3	88	5 / 61

Property Name	Duwamish Shipyard, Inc.
GENERAL INFORMATION	
Address	5658 West Marginal Way SW, Seattle, 98106
Property No.	17003
Tax Parcel No.	192404-9028
Property Owner	Duwamish Shipyard, Inc.
Current Operator	Alaska Marine Lines, Inc.
Property Size	4.93 acres
Facility/Site ID	2071 11423 (Cleanup Site ID)
Alternate Names	Alaska Marine Lines, Seattle Machine Works Inc. Marginal Way
NPDES Permit No.	WAR001365 (Alaska Marine Lines)
UST/LUST ID No.	1429/5573
SITE HISTORY AND ACTIVITIES	
Description	<p>The property is located in a highly industrialized area. The property is bordered to the north by the Alaska Marine Lines container facility and to the south by the Glacier Northwest, Inc. Seattle Cement Facility (Glacier; now CalPortland) and Terminal 115. West Marginal Way is located immediately west of the Site, and the eastern property boundary is adjacent to the LDW. Portions of the shoreline area contain a former timber marine railway structure and over-water timber pier.</p> <p>The entire property was paved with asphalt in 2016.</p>
Historical Activities	<p>Duwamish Shipyard specialized in repairing and maintaining floating vessels and equipment. Services included machine and electrical work, carpentry, steel fabrication, pipe fitting, sandblasting, pressure washing, and painting. The majority of the vessels serviced were wooden fishing boats until the 1950s. From the 1960s to 2007, most vessels repaired and maintained at Duwamish Shipyard had steel hulls. The facility occasionally serviced vessels with aluminum or fiberglass hulls.</p> <p>Site facilities included a paint shop, distillation shed, solvent distribution shed, diesel/pump machine shop, warehouse, hazardous waste storage area, oil storage area, UST, and pump area. Two dry docks, one graving dock and a marine railway were present on the property. In early 2007 Duwamish Shipyard sold the dry docks and ceased active shipyard operations.</p> <p>Five buildings/structures used in shipyard operations were demolished in 2008.</p>
Current Activities	<p>Alaska Marine Lines uses the property for storage of shipping containers and truck access. The berthing areas are currently being used by Alaska Marine Lines for barge moorage and vessel layup to support vessel loading and unloading operations conducted at the Alaska Marine Lines property.</p> <p>Alaska Marine Lines plans to develop a container and equipment storage and handling facility at the Duwamish Shipyard and Alaska Marine Lines property to the north. Plans include construction of retaining walls or new bulkhead to maintain stability of the property during soil removal and</p>

Property Name	Duwamish Shipyard, Inc.
	sediment area cleanup activities, and installation of a stormwater collection and treatment system to meet all NPDES permit discharge requirements.
Chemicals of Concern	<p>RM 1.3-1.6 West (Glacier Bay) chemicals of concern: Metals (arsenic, mercury, zinc, copper, lead, antimony, tin), dioxins/furans, PCBs, phthalates, PAHs, pentachlorophenol, other SVOCs, tributyltin.</p> <p>Duwamish Shipyard chemicals of concern: Metals (arsenic, lead, mercury, tributyltin, cadmium, copper, zinc), PAHs, VOCs, petroleum hydrocarbons, phthalates, PCBs.</p>
CONTAMINATED MEDIA	
Surface Sediment	<p>Chemicals of concern for the Glacier Bay source control areas are: Metals (arsenic, mercury, zinc, copper, lead, antimony, tin), dioxins/furans, PCBs, phthalates, PAHs, pentachlorophenol, other SVOCs, tributyltin.</p> <p>Metals, PCBs, PAHs, phthalates, other SVOCs, and dioxins/furans concentrations exceeded the SCO/CSL in sediment samples collected adjacent to Duwamish Shipyard. The highest CSL exceedance factors observed were arsenic (EF = 59), total PCBs (EF = 1.3), BEHP (EF = 8.4), fluoranthene (EF = 12), benzo(g,h,i)perylene (EF = 9.2), and hexachlorobenzene (EF = 69). The dioxins/furans TEQ exceeded the LDW RAL by an EF of 25.</p> <p>[EIM data from 2006 and 2013. Sherlock data from 2000, 2004, 2005, 2006, 2009, 2011, and 2012.]</p>
Storm Drain Solids	<p>Facility specific storm drain solids results were not identified in May 2016 Sherlock. Results for one sample are available in EIM. The storm drain solids sample collected from CB-01 is mistakenly identified as a combined sewer system catch basin sample in the data uploaded to the EIM database. Based on Figure 5-1 (Upland Sampling Locations) from the 2017 RI (Anchor QEA 2017), catch basin CB-01 is the last catch basin on the DSI stormwater line before stormwater is routed to Alaska Marine Lines. The catch basin is not connected to the municipal sanitary sewer line.</p> <p>N-nitrosodiphenylamine was detected at the screening level. All other analyte concentrations in the sample were below the screening levels.</p>
Groundwater	<p>Data uploaded to the EIM database includes data collected in 2006, 2009, 2014, and 2015. Metals, PCBs, PAHs, phthalates, VOCs, petroleum hydrocarbons, pesticides, and dioxins/furans have been detected in groundwater above the LDW PCULs at Duwamish Shipyard.</p> <p>The following chemicals were detected at concentrations greater than 100 times the LDW PCUL: arsenic, chromium, total PCB Aroclors, benzo(a)pyrene, benz[a]anthracene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenz(a,h)anthracene, indeno(1,2,3-cd)pyrene, total cPAH TEQ, bis(2-ethylhexyl) phthalate, benzene, 2,3,7,8-TCDD, total dioxin/furan TEQ.</p>
Soil	<p>Data uploaded to the EIM database includes data collected in 2006, 2009, and 2013. Metals; PCBs, PAHs, phthalates, and other SVOCs; dioxins/furans; VOCs; petroleum hydrocarbons and pesticides have been detected in soil above the LDW PCULs at Duwamish Shipyard.</p> <p>The following chemicals were detected at concentrations greater than 100 times the LDW PCUL: lead, silver, total PCB Aroclors, acenaphthene, benzo(a)anthracene, benzo(a)pyrene, benzofluoranthenes, chrysene, dibenz(a,h)anthracene, fluoranthene, fluorene, indeno(1,2,3-cd)pyrene, naphthalene, total cPAH TEQ, butyl benzyl phthalate, bis(2-ethylhexyl) phthalate, hexachlorobenzene, n-nitrosodiphenylamine, pentachlorophenol, benzene, methylene chloride, 4,4'-DDD.</p>

Property Name		Duwamish Shipyard, Inc.
TRANSPORT PATHWAYS		
Outfalls	<p>Stormwater runoff from most of the Site is routed through a series of treatment systems and then discharged at an outfall on the Alaska Marine Lines property to the north.</p> <p>Outfall 2129 is present on the property. This outfall was also known as DP-D, and was identified as Outfall 005 in the Duwamish Shipyard RI/FS Work Plan (Anchor 2010 [6817]). The outfall was previously covered under ISGP WAR003093 (Duwamish Shipyard). This outfall is identified as a former outfall in the 2017 RI report.</p>	
Relevant Pathways	<p>Based on information provided in the Supplemental Data Gaps report and RI report (Anchor QEA 2017), and the information on contaminated media above, the following pathways may contribute to sediment recontamination:</p> <ul style="list-style-type: none"> Contaminated groundwater discharge: The RI report indicates that contaminated groundwater is present in a shallow aquifer at the site; both in the upland area and nearshore hotspots. Stormwater discharge and surface runoff: stormwater and surface runoff are conveyed through a series of treatment systems and then discharged at an outfall on the Alaska Marine Lines property to the north. Discharge monitoring includes analyses for PCBs and RCRA 8 metals. The April and July 2017 DMRs indicate that there were no discharges from the facility. Contaminated soil erosion/leaching: Soil contamination is present primarily in the top 6 inches of soil and appears to be within the footprints of the former Duwamish Shipyard buildings. A portion of the shoreline is protected by a timber bulkhead and armored slopes along the northern and southern shorelines, reducing the potential for contaminant transport to the LDW via this pathway. <p>Surface water samples were collected in July 2013. Arsenic, copper, lead, nickel, selenium, and zinc concentrations exceed the WQS Marine Chronic and Acute criteria. Acenaphthene, antimony, arsenic, chrysene copper, fluoranthene, nickel, selenium, vinyl chloride, and zinc concentrations exceeded the National Toxics Rule Human Health for Consumption of Organisms criteria. With the exception of copper, these chemical concentrations also exceeded the NR Human Health for Consumption of Organisms criteria.</p>	
SOURCE CONTROL ACTIONS		
Action Item Status	<p>Ecology entered into an Agreed Order (DE-6735) with Duwamish Shipyard, Inc. (owner) on September 13, 2010 to complete and RI/FS at the site.</p> <p>Six action items are identified in the most recent Source Control Status Report (five high priority and one low priority). Of the six high priority action items; three are complete and two are listed as in progress. No medium priority action items are identified. The high priority action items that are in progress are:</p> <ul style="list-style-type: none"> Conduct site investigations as specified in the Agreed Order Statement of Work. Review site investigation results and assess potential for sediment recontamination and need for remedial actions. <p>The final RI report was submitted to Ecology in May 2017 (Anchor QEA 2017). Ecology is currently reviewing the report.</p>	
INSPECTION, PERMIT, AND CLEANUP STATUS		
Inspections	<p>Ecology performed an unannounced compliance inspection on June 13, 2017. Additional information about this inspection was not available for review; though based on information in PARIS it appears that no violations or triggers were identified during the inspection.</p>	

Property Name	Duwamish Shipyard, Inc.
Permit Compliance Status	A letter from AML to Ecology indicated the facility exceeded its TSS effluent limit on March 23, 2015 and was investigating the suitability of another treatment system to be installed by December 2015 (Alaska Marine Lines 2015 [12100]).
Upland Cleanups	<p>Previous cleanups at the site include removal of leaded gasoline UST in 1986, excavation of approximately 650 cubic yards of petroleum hydrocarbon contaminated soil in 1993, and removal of diesel and gasoline USTs in 2000.</p> <p>The final RI report indicates that an evaluation of cleanup actions for the upland site will be performed.</p>
Other Relevant Studies	<p>Stormwater samples were collected in 2012, 2013, and 2014 as part of the RI. Copper and zinc exceeded the chronic and acute marine WQC. Hexavalent chromium, lead, and nickel also exceeded the chronic marine WQC. In addition, 2,3,7,8-TCDD, benzo(a)pyrene, benzofluoranthene, indeno(1,2,3-cd)pyrene, and BEHP concentrations exceeded NTR human health criteria for the consumption of organisms. With the exception of BEHP, these chemicals also exceeded the NR human health criteria for the consumption of organisms.</p> <p>[Data for STW-01 are available in Sherlock for October and December 2012, January and April, 2013 and in EIM for December 2013 and March and April 2014.]</p>
RECOMMENDATION	
Source Control Summary	Chemicals of concern (metals; PCBs; dioxins/furans; PAHs, phthalates, and other SVOCs; VOCS) are present in surface sediment, storm drain solids, groundwater, and soil at concentrations above screening levels. An upland cleanup has not been completed.
Preliminary Recommendation	Sources are not sufficiently controlled.

No facility specific storm drain solids or stormwater results identified in May 2016 Sherlock. Data available in EIM.

Table 1. Summary of Screening Level Exceedances in Surface Sediment near Duwamish Shipyard

Parameter	Frequency of Detection	Range of Detected Conc'ns	Range of Nondetected Conc'ns	Average Detected Conc'n (mg/kg DW)	Lower Screening Level (mg/kg DW)	Maximum Exceedance Factor	Frequency of Detects Above Lower SL	Upper Screening Level (mg/kg DW)	Maximum Exceedance Factor	Frequency of Detects Above Upper SL
Metals										
Arsenic	100 / 100	1.2 - 5,490	N/A	150	57	96	15 / 100	93	59	13 / 100
Cadmium	93 / 100	0.03 - 10	0.2 - 1	0.7	5.1	2.0	1 / 93	6.7	1.5	1 / 93
Copper	100 / 100	11.5 - 3,640	N/A	273	390	9.3	11 / 100	390	9.3	11 / 100
Lead	100 / 100	10.2 - 3660	N/A	170	450	8.1	11 / 100	530	6.9	9 / 100
Mercury	97 / 97	0.04 - 5.4	N/A	0.4	0.41	13	14 / 97	0.59	9.2	9 / 97
Zinc	100 / 100	19.2 - 13,000	N/A	530	410	32	13 / 100	960	14	11 / 100
Organic Chemicals										
2,4-Dimethylphenol	21 / 100	0.0027 - 0.049	0.0027 - 0.15	0.011	0.029	1.7	3 / 21	0.029	1.7	3 / 21
Benzyl Alcohol	73 / 98	0.0045 - 0.4	0.0066 - 0.24	0.1	0.057	7.0	51 / 73	0.073	5.5	43 / 73
Dibenzofuran	73 / 100	0.001 - 1.3	0.0038 - 0.15	0.08	0.54	2.4	1 / 73	0.54	2.4	1 / 73
Phenol	78 / 100	0.0067 - 0.68	0.008 - 0.15	0.1	0.42	1.6	4 / 78	1.2	N/A	N/A
N-Nitrosodi-phenylamine	4 / 65	0.0065 - 0.067	0.003 - 0.15	0.03	0.028	2.4	1 / 4	0.04	1.7	1 / 4
Phthalates										
Bis(2-ethylhexyl) phthalate	39 / 39	0.15 - 16	N/A	0.82	1.3	12	2 / 39	1.9	8.4	1 / 39
Butyl benzyl phthalate	83 / 100	0.0031 - 0.47	0.0027 - 0.15	0.034	0.063	7.5	7 / 83	0.9	N/A	N/A
PCBs										
Total PCB Aroclors	97 / 101	0.024 - 1.27	0.02 - 0.39	0.3	0.13	9.8	33 / 97	1	1.3	3 / 97
PAHs										
Total LPAHs	65 / 65	0.046 - 20	N/A	1	5.2	3.8	3 / 65	5.2	3.8	3 / 65
Acenaphthene	76 / 100	0.0027 - 1.5	0.0031 - 0.15	0.11	0.5	3.0	5 / 76	0.5	3.0	5 / 76
Fluorene	82 / 100	0.004 - 3	0.0041 - 0.15	0.1	0.54	5.6	4 / 82	0.54	5.6	4 / 82
Phenanthrene	100 / 100	0.02 - 12	N/A	0.6	1.5	8.0	7 / 100	1.5	8.0	7 / 100
Anthracene	98 / 100	0.009 - 4.8	0.14 - 0.15	0.2	0.96	5.0	4 / 98	0.96	5.0	4 / 98
2-	76 / 100	0.001 - 1	0.0029 - 0.15	0.06	0.67	1.5	1 / 76	0.67	1.5	1 / 76

Parameter	Frequency of Detection	Range of Detected Conc'ns	Range of Nondetected Conc'ns	Average Detected Conc'n (mg/kg DW)	Lower Screening Level (mg/kg DW)	Maximum Exceedance Factor	Frequency of Detects Above Lower SL	Upper Screening Level (mg/kg DW)	Maximum Exceedance Factor	Frequency of Detects Above Upper SL
Methylnaphthalene										
Total HPAH	65 / 65	0.228 - 110.1	N/A	6.76	12	9.2	6 / 65	17	6.5	5 / 65
Fluoranthene	100 / 100	0.052 - 29	N/A	1.3	1.7	17	13 / 100	2.5	12	12 / 100
Pyrene	100 / 100	0.042 - 20	N/A	1	2.6	7.7	8 / 100	3.3	6.1	6 / 100
Benzo(a)anthracene	100 / 100	0.02 - 11	N/A	0.5	1.3	8.5	5 / 100	1.6	6.9	4 / 100
Chrysene	100 / 100	0.046 - 12	N/A	0.64	1.4	8.6	8 / 100	2.8	4.3	4 / 100
Benzofluoranthenes, total	100 / 100	0.03 - 13.8	N/A	0.7	3.2	4.3	3 / 100	3.6	3.8	2 / 100
Benzo(a)pyrene	100 / 100	0.01 - 9.7	N/A	0.4	1.6	6.1	3 / 100	1.6	6.1	3 / 100
Indeno(1,2,3-cd)pyrene	97 / 100	0.007 - 6.1	0.0045 - 0.0046	0.2	0.6	10	5 / 97	0.69	8.8	5 / 97
Dibenzo(a,h)-anthracene	89 / 98	0.002 - 1.9	0.019 - 0.15	0.09	0.23	8.3	5 / 89	0.23	8.3	5 / 89
Benzo(g,h,i)perylene	98 / 100	0.008 - 6.6	0.0043 - 0.098	0.2	0.67	9.9	5 / 98	0.72	9.2	5 / 98
Total cPAHs (TEQ, NDx0.5)	100 / 100	0.016 - 13	N/A	0.58	1	13	13 / 100	3	4.4	2 / 100
Chlorinated Organics										
Hexachlorobenzene	14 / 100	0.0021 - 4.8	0.00096 - 0.14	0.35	0.022	218	2 / 14	0.07	69	1 / 14
Hexachlorobutadiene	1 / 100	0.011	0.00088 - 0.14	0.011	0.011	1.0	1 / 1	0.12	N/A	N/A
Pentachlorophenol	41 / 100	0.014 - 20	0.013 - 0.74	0.7	0.36	56	6 / 41	0.69	29	4 / 41
Dioxins/Furans (ng/kg DW)										
Dioxins/furans (TEQ, NDx0.5)	44 / 44	2.48 - 4,330	N/A	477	25	173	31 / 44	N/A	N/A	N/A

Table 2. Summary of Screening Level Exceedances in Storm Drain Solids near Duwamish Shipyard

Parameter	Frequency of Detection	Range of Detected Conc'ns	Range of Nondetected Conc'ns	Average Detected Conc'n (mg/kg DW)	Lower Screening Level (mg/kg DW)	Maximum Exceedance Factor	Frequency of Detects Above Lower SL	Upper Screening Level (mg/kg DW)	Maximum Exceedance Factor	Frequency of Detects Above Upper SL
N-nitroso-diphenylamine	1 / 1	0.029	N/A	0.029	0.028	1.0	1 / 1	0.04	N/A	N/A

Preliminary

Property Name	Duwamish Marine Center
GENERAL INFORMATION	
Address	6361 1st Avenue S and 16 S Michigan Street
Property No.	06003
Tax Parcel No.	536720-4545; 5367204-560; 536720-4565; 536720-3415; 536720-3447; 536720-3635
Property Owner	James D. Gilmur and Ms. Jacqueline H. Revocable Living Trust (JRLT), S&LA Hale Family Limited Partnership, Mr. Kevin Hale, Ms. Kristine Shimmin and Mr. Steven Hale
Current Operator	Samson Tug and Barge, Duwamish Marine Center
Property Size	4545: 0.65 acre (28,525 sq ft) 4560: 0.49 acre (21,439 sq ft) 4565: 2.80 acres (122,080 sq ft), approximately 0.5 acres (23,360 sq ft) submerged 3415: 0.49 acre (21,537 sq ft) 3447: 0.03 acre (1,225 sq ft) 3635: 0.29 acre (12,444 sq ft)
Facility/Site ID	1020256 (Samson Tug and Barge Co Inc Transporter) 21945598 (Duwamish Marine Center) 71371939 (Duwamish Marine Center Inc) 65697348 (Burgess Enterprises)
Alternate Names	Gilmur/Hale Family Trust Property, Duwamish Metal Fab, Duwamish Metal Fabrication, Samson Tug & Barge Seattle Fac
NPDES Permit No.	WAR011484 (Industrial Stormwater GP)
UST/LUST ID No.	101434 (inactive) (Burgess Enterprises)
SITE HISTORY AND ACTIVITIES	
Description	The Duwamish Marine Center occupies six parcels that are adjacent to Slip 2 and a portion of the area between Slip 2 and Slip 3 (Figure 1). The site is defined in the Agreed Order as the geographic extent of contamination caused by the release of hazardous substances at the site, including upland property, groundwater, the riverbank, and adjacent tidal flats within the LDW. The LDW and a small strip of land, less than 80 feet wide, that defines the west-southwest boundaries of the Property, is owned by the Port of Seattle (Port) and leased by the Duwamish Marine Center. The site is bordered to the north by Seattle Biodiesel, to the north and northwest by Slip 2, to the east by two railway franchise strips and 1 st Avenue South, and to the south by a parcel owned by the Seattle Department of Transportation and the Michigan Street CSO outfall. 5
Historical Activities	Portions of the site have been used for industrial purposes since the mid-1940s. Historical industrial activities and facilities include material storage for a pile driving company (1937 to 1970) a marine railway (1940 to mid-1970s); a tool manufacturing and metal works facility (1950s), a junkyard dealer (1960s to 1970s), and construction material loading (1975 to 1978), barge loading terminal (1979 to 1984), aggregate material loading (1985 to 1989), construction assembly yard and barge shipping (1990 to 1994), and construction and marine-related material storage (1994 to present). In 2000, a 200-gallon AST containing diesel fuel, a 500-gallon AST containing waste oil, and eight 55-gallon drums containing fresh 30-weight lubricating oil were observed at the DMC facility (SoundEarth 2016).

Property Name	Duwamish Marine Center
Current Activities	<p>Operations at the site are characterized by three business activities: Duwamish Metal Fab, Inc. performs contract metal fabrication; Duwamish Marine Center, Inc., loads and unloads barges with a variety of cargo; and Samson Tug and Barge, operates a Seattle to Alaska barging operation that involves temporary storage of equipment, containers, construction materials and lubricants. The site has temporary storage of chemical and petroleum products and the presence of noise, odors and truck traffic.</p> <p>A marina located west-southwest end of the Property is owned by the Port. Duwamish Marine operates the marina, maintains the facility, collected rents, and manages utilities. Duwamish Marine also leases Front Street from the City of Seattle.</p> <p>Filter Engineering is a discrete business entity used by James Gilmur to offload bulk materials from barges. Filter Engineering operates in Parcel 536720-4565 of Lot 20 and utilizes the South Dock on the Port lease land for offloading barges (SoundEarth 2016).</p>
Chemicals of Concern	<p>EPA has not designated chemicals of concern for this section of the LDW. Based on available information, the following chemicals of concern are present at the site: metals (cadmium, copper, lead, mercury, silver, and zinc), PCBs, PAHs, pentachlorophenol, benzene, tetrachloroethene, and petroleum hydrocarbons. These chemicals are also identified as chemicals of concern for the Slip 2 to Slip 3 source control area.</p>
CONTAMINATED MEDIA	
Surface Sediment	<p>PCBs, butyl benzyl phthalate, 2,4-dimethylphenol, and benzyl alcohol exceeded the SCO/LAET in one or more surface sediment samples collected between RM 1.7 and 2.0 East. Benzyl alcohol and 2,4-dimethylphenol also exceeded the CSL/2LAET in at least one sample. Highest exceedance factors were observed for total PCBs (EF = 5.2), and benzyl alcohol (EF = 74). [DATA FROM SHERLOCK DATABASE DATED MAY 2015. Need to review 2016 SHERLOCK DATABASE.]</p> <p>Agreed Order DE-8072, signed September 2011, states that PCBs, lead, phthalates, benzoic acid, PAHs, and dibenzofuran are present in LDW sediment adjacent to the site at concentrations greater than the SMS.</p>
Storm Drain Solids	<p>Dioxins/furans, PAHs, phthalates, other SVOCs, PCBs, VOCs, pesticides, and petroleum hydrocarbons have been detected in storm drain solids at Duwamish Marine Center. Zinc, n-nitrosodiphenylamine, BEHP, butyl benzyl phthalate, dimethyl phthalate, benzo(a)anthracene, chrysene, fluoranthene, fluorene, phenanthrene, pyrene, total LPAH and total HPAH concentrations exceeded the SQS/LAET in one or more storm drain solids samples collected at Duwamish Marine Center. All except benzo(a)anthracene and chrysene also exceeded the CSL/2LAET in one or more samples. The highest exceedance factors were observed for BEHP (EF = 19), butyl benzyl phthalate (EF = 39) and total LPAH (EF = 20). See Table 2 for additional details. [RI data from EIM and NPDES Inspection Sampling Support data. NEED UPDATED SHERLOCK DATABASE.]</p>
Groundwater	<p>Data uploaded to the EIM database includes historical data collected between 2000 and 2008 and the data collected during the RI during 2015 and 2016. The following chemicals of concern have been detected in groundwater above the LDW PCULs at Duwamish Marine Center: cadmium, chromium, copper, lead, mercury, silver, zinc, PCBs, PAHs, pentachlorophenol, and other SVOCs.</p>
Soil	<p>Data uploaded to the EIM database includes historical data collected between 2000 and 2008 and the data collected during the RI during 2015 and 2016. The following chemicals of concern have been detected in soil above the LDW PCULs at Duwamish Marine Center: arsenic, cadmium, chromium, copper, lead, mercury, silver, thallium, zinc, PCBs, PAHs, pentachlorophenol, phthalates, and other SVOCs.</p>

Property Name Duwamish Marine Center	
TRANSPORT PATHWAYS	
Outfalls	Three outfalls are present on the property, 2021 (presumed inactive), and two active outfalls, 2022 and DuwMetalFab. Stormwater Pollution Prevention Plans (SWPPP) prepared for Duwamish Metal Fab and Samson Tug and Barge in 2012 describes the storm drain system, include stormwater treatment systems and best management practices (BMPs) in place at the facility (Blue Environmental and Greylcock Consulting LLC 2012).
Relevant Pathways	<p>Based on information provided in the SCAP and RI/FS work plan (SoundEarth 2016), and the information on contaminated media above, the following pathways may contribute to sediment recontamination:</p> <ul style="list-style-type: none"> • Direct stormwater discharges: concentrations of COCs in storm drain solids exceed screening levels. • Contaminated groundwater discharge: concentrations of COCs in groundwater exceed the preliminary site screening levels throughout the site, with the greatest concentrations adjacent to the shoreline at the southeast corner. • Contaminated soil erosion/leaching: concentrations of COCs in soil exceed screening levels, throughout the site, with the greatest concentrations adjacent to the shoreline at the southeast corner. Seeps have been identified at the site, sampling results indicate that arsenic is present at concentrations exceeding the preliminary site cleanup levels. <p>Surface runoff is not considered a significant pathway; the site is paved and runoff is directed to the onsite storm drain system. Leaks and spills may occur, but are likely to be captured in the onsite storm drain system. Waterway operations and atmospheric deposition have not been identified as relevant pathways at this property.</p>
SOURCE CONTROL ACTIONS	
Action Item Status	<p>Ten action items are identified in the most recent Source Control Status Report (five high priority and five medium priority. five high priority action items are identified; three action items are listed as complete and two are listed as planned. The following high priority action items are planned:</p> <ul style="list-style-type: none"> • Require the property owner/operator to collect data on concentrations of chemical contaminants in river bank soils to assess the potential for sediment recontamination by erosion. • Determine the status of Outfalls 2021 and 2022; if they are currently in use, determine the area drained by these outfalls and assess the potential for COCs to reach the LDW via this pathway. <p>Four of the five medium priority action items are complete. The following action item is in progress:</p> <ul style="list-style-type: none"> • Conduct a follow-up business inspection at Samson Tug and Barge to verify compliance with corrective actions requested by SPU in July and October 2008. Also verify that the cleaning solution tank belonging to Burgess Enterprises has been removed.
INSPECTION, PERMIT, AND CLEANUP STATUS	
Inspections	<p>SPU performed inspections at Samson Tug and Barge. As of the end of December 2016, the facility was not in compliance.</p> <ul style="list-style-type: none"> • SPU observed two outfalls on this property. One outfall is from a storm drain that crosses the property. The system upstream of this property has been abandoned, but it is unclear whether Samson Tug & Barge continues to use the lower end that discharges to the LDW. The second outfall is from the onsite wash pad. Samson Tug & Barge installed treatment, but the

Property Name	Duwamish Marine Center
	<p>treatment was not approved by Ecology. A diesel spill took place onsite and migrated through the silt fence to the drain. SPU observed sheen at the outfall.</p> <ul style="list-style-type: none"> • Ecology conducted a stormwater compliance inspection at Samson Tug and Barge on February 10, 2015. Ecology’s contractor, Leidos, assisted Ecology with the inspection and sampling of the facility’s stormwater conveyance system. • Ecology performed NPDES inspections at Samson Tug and Barge on June 15 and October 20, 2016. The facility was in compliance.
Permit Compliance Status	The 2016 ISGP Annual Report for Samson Tug and Barge states that all monitoring data were within benchmarks for 2016.
Upland Cleanups	<p>Agreed Order No. 8072, dated September 2011, requires the Gilmur Trustees to complete an RI/FS for the site.</p> <p>Issues at the upland area included:</p> <ul style="list-style-type: none"> • Releases of metals, VOCs, SVOCs, PCBs, and petroleum hydrocarbons in soil and groundwater above MTCA cleanup levels. • A release or threatened release of hazardous at the site requires remedial actions to protect human health and the environment. • The nature and extent of contamination in soil and groundwater had not been defined. <p>An RI work plan was submitted to Ecology in May 2013. The RI activities were completed during 2015 and 2016. Environmental data from the investigation have been uploaded to the EIM database; however, the draft RI report has not been submitted to Ecology.</p>
Other Relevant Studies	<p>Concentrations of arsenic, chromium, copper, and zinc exceeded the LDW PCULs in a seep sample collected in February 2015.</p> <p>In February 2015, two water samples were collected from Outfall 2022 and the sample port stormwater treatment system at the site. Copper, lead, mercury, nickel, zinc exceeded WQS Marine Chronic criteria; copper and zinc also exceeded the WQS Marine Acute criteria. Copper, lead, and zinc also exceeded ISGP benchmarks. PCBs exceeded the WQS Marine Chronic criteria and human health criteria for the consumption of organisms. PAHs exceeded human health criteria for the consumption of organisms.</p>
RECOMMENDATION	
Source Control Summary	Chemicals of concern (metals; VOCs; PAHs, phthalates, and other SVOCs; PCBs; and petroleum hydrocarbons) are present in surface sediment, storm drain solids, groundwater, and soil at concentrations above screening levels. Two high priority actions are incomplete, and upland cleanup has not been completed.
Preliminary Recommendation	Sources are not sufficiently controlled.

Table 1. Summary of Screening Level Exceedances in Surface Sediment near Duwamish Marine Center

Parameter	Frequency of Detection	Range of Detected Conc'ns (mg/kg DW)	Range of Nondetected Conc'ns (mg/kg DW)	Average Detected Conc'n (mg/kg DW)	Lower Screening Level (mg/kg DW)	Maximum Exceedance Factor	Frequency of Detects Above Lower SL	Upper Screening Level (mg/kg DW)	Maximum Exceedance Factor	Frequency of Detects Above Upper SL
Organic Chemicals										
2,4-Dimethylphenol	2 / 13	0.0048 - 0.049	0.0039 - 0.0066	0.027	0.029	1.7	1 / 2	0.029	1.7	1 / 2
Benzyl Alcohol	8 / 13	0.011 - 0.42	0.019 - 0.033	0.15	0.057	7.4	3 / 8	0.073	5.8	3 / 8
Phthalates										
Butyl benzyl phthalate	11 / 13	0.0065 - 0.072	0.0065 - 0.0066	0.027	0.063	1.1	1 / 11	0.9	<1	0 / 11
PCBs										
Total PCBs	14 / 14	0.0148 - 0.67	NA	0.19	0.13	5.2	7 / 14	1	<1	0 / 14

Preliminary

Table 2. Summary of Screening Level Exceedances in Storm Drain Solids at Duwamish Marine Center

Parameter	Frequency of Detection	Range of Detected Conc'ns (mg/kg DW)	Range of Nondetected Conc'ns (mg/kg DW)	Average Detected Conc'n (mg/kg DW)	Lower Screening Level (mg/kg DW)	Maximum Exceedance Factor	Frequency of Detects Above Lower SL	Upper Screening Level (mg/kg DW)	Maximum Exceedance Factor	Frequency of Detects Above Upper SL
Metals										
Zinc	9 / 9	321 - 1450	NA	750	410	3.5	7 / 9	960	1.5	2 / 9
Organic Chemicals										
N-Nitroso-diphenylamine	2 / 2	0.056 - 0.078	NA	0.067	0.028	2.8	2 / 2	0.04	2.0	2 / 2
Phthalates										
Bis(2-Ethylhexyl) phthalate	8 / 9	0.389 - 24.9	0.0734 - 0.0734	5.1	1.3	19	5 / 8	1.9	13	5 / 8
Butyl benzyl phthalate	4 / 9	0.118 - 2.44	0.0287 - 0.63	0.84	0.063	39	4 / 4	0.9	2.7	1 / 4
Dimethyl phthalate	2 / 9	0.045 - 0.186	0.0686 - 0.19	0.12	0.071	2.6	1 / 2	0.16	1.2	1 / 2
PAHs										
Total LPAH	7 / 7	0.015 - 100	NA	20	5.2	20	3 / 7	5.2	20	3 / 7
Fluorene	7 / 9	0.0153 - 1.2	0.0734 - 0.11	0.27	0.54	2.2	1 / 7	0.54	2.2	1 / 7
Phenanthrene	7 / 10	0.0754 - 5.4	0.0734 - 0.11	1.3	1.5	3.6	2 / 7	1.5	3.6	2 / 7
Total HPAH	9 / 9	0.194 - 19	NA	6.4	12	1.6	2 / 9	17	1.1	1 / 9
Benzo(a)anthracene	5 / 9	0.0272 - 1.5	0.0734 - 0.11	0.73	1.3	1.2	2 / 5	1.6	<1	0 / 5
Chrysene	8 / 9	0.0513 - 2.4	0.11 - 0.11	1.2	1.4	1.7	3 / 8	2.8	<1	0 / 8
Fluoranthene	9 / 9	0.0621 - 6	NA	2	1.7	3.5	4 / 9	2.5	2.4	1 / 9
Pyrene	8 / 9	0.0789 - 5	0.11 - 0.11	2	2.6	1.9	2 / 8	3.3	1.5	2 / 8

Property Name	Glacier Northwest
GENERAL INFORMATION	
Address	5900 West Marginal Way
Property No.	17004
Tax Parcel No.	192404-9029
Property Owner	Glacier Northwest, Inc.
Current Operator	Glacier Northwest, Inc.
Property Size	17.87 acres (13.68 acres of uplands and 4.19 acres of aquatic property)
Facility/Site ID	23881883 (Glacier Northwest Seattle Terminal) 67234947 (Glacier Northwest Marginal Way Truck Shop) 89139472 (Glacier NW Reichhold MTCA)
Alternate Names	5900 W Marginal Way SW, Glacier Northwest Inc. Sea, Marginal Way Truck Stop Glacier NW, Glacier NW Reichhold MTCA, Reichhold Chemical, Lone Star, Marginal Way Truck Stop, West Marginal Way Plant
NPDES Permit No.	WAG503191 (Sand and Gravel GP)
UST/LUST ID No.	No
SITE HISTORY AND ACTIVITIES	
Description	Glacier Northwest is located along the west bank of the LDW, at approximately RM 1.4 to RM 1.5 (Figure 1). The site is defined in the Agreed Order as the geographic extent of contamination caused by the release of hazardous substances at the site, including upland property, groundwater, the riverbank, and adjacent tidal flats within the LDW. The upland portion of the site is bordered to the north by property owned by Duwamish Shipyards, Inc. (DSI) and operated by Alaska Marine Lines, Inc. (AML), to the east by the main channel of the LDW, to the south by property owned and operated by the Port of Seattle as Terminal 115 (T115), and to the west by West Marginal Way.
Historical Activities	Mineralized-Cell operated a wood preserving facility between approximately 1936 and 1939. From 1940 to 1944, the United States Army manufactured charcoal and Whetlerite (activated carbon impregnated with copper, silver, or chromium) for use in gas masks. Reichhold Inc. leased the northern portion of the property from 1946 to 1961. Reichhold's operational facilities included tank farms, plywood animal glue, resin, pentachlorophenol, and sodium pentachlorophenate production areas. Kaiser redeveloped the property into a cement terminal in 1964. Kaiser purchased the property from the Port of Seattle in 1973, and sold the property to Lone Star in 1987.
Current Activities	Glacier Northwest currently operates the Property as a bulk cement storage and wholesale distribution terminal.
Chemicals of Concern	EPA has not designated chemicals of concern for this section of the LDW. Based on available information, the following chemicals of concern were selected for Glacier Bay: metals (arsenic, mercury, zinc, copper, lead, antimony, tin), dioxins/furans, PCBs, phthalates, PAHs, pentachlorophenol, other SVOCs, tributyltin.

Property Name		Glacier Northwest
CONTAMINATED MEDIA		
Surface Sediment	<p>PCBs, arsenic, copper, lead, zinc, benzyl alcohol, dibenzofuran, n-nitrosodiphenylamine, phenol, butyl benzyl phthalate, PAHs, hexachlorobenzene, and pentachlorophenol exceeded the SCO/LAET in one or more surface sediment samples collected between RM 1.3 and 1.6. Arsenic, copper, lead, zinc, benzyl alcohol, dibenzofuran, PAHs, hexachlorobenzene, and pentachlorophenol also exceeded the CSL/2LAET in at least one sample. Highest exceedance factors were observed for pentachlorophenol (EF = 4), arsenic (EF = 6), total PCBs (EF = 8), and benzyl alcohol (EF = 21). The dioxins/furans TEQ exceeded the LDW RAL in 57 of 86 samples analyzed for dioxins/furans; the highest exceedance factor is 173. See Table 1 for additional details.</p> <p>[DATA AVAILABLE IN EIM and RI report. Need to review 2016 Sherlock Database.]</p>	
Storm Drain Solids	<p>Dioxins/furans, antimony, arsenic, lead, mercury, nickel, zinc cPAHs, other PAHs, phthalates, other SVOCs, PCBs, and petroleum hydrocarbons have been detected in storm drain solids at Glacier Northwest. Arsenic, cadmium, copper, zinc, benzoic acid, benzyl alcohol, n-nitrosodiphenylamine, phenol, BEHP, and butyl benzyl phthalate exceeded the SQS/LAET in one or more storm drain solids samples collected at Glacier Northwest. All except zinc also exceeded the CSL/2LAET in one or more samples. The highest exceedance factors were observed for phthalates (EF = 22 to 25), arsenic (EF = 33), benzoic acid (EF = 34), and benzyl alcohol (EF = 930). The dioxins/furans TEQ exceeded the LDW RAL in all eight samples analyzed for dioxins/furans; the highest exceedance factor is 153. See Table 2 for additional details.</p> <p>[USED DATA AVAILABLE IN EIM. Need to review 2016 Sherlock Database.]</p>	
Groundwater	<p>According to the draft RI report (ERM 2015), arsenic and pentachlorophenol (Glacier Bay chemicals of concern) are present in groundwater above the preliminary site screening levels developed for Glacier Northwest by ERM. These screening levels have not been approved by Ecology.</p> <p>Data uploaded to the EIM database includes historical data and the data collected during the RI in March 2009 and August 2014. The following Glacier Bay chemicals of concern have been detected in groundwater at Glacier Northwest: antimony, arsenic, copper, lead, zinc, dioxins/furans, PCBs, phthalates, PAHs, pentachlorophenol, other SVOCs. VOCs and petroleum hydrocarbons are chemicals of concern for the site.</p>	
Soil	<p>According to the draft RI report (ERM 2015), arsenic, copper, dioxins/furans, and pentachlorophenol (Glacier Bay chemicals of concern) are present in soil above the preliminary site screening levels developed for Glacier Northwest by ERM. These screening levels have not been approved by Ecology.</p> <p>Data uploaded to the EIM database includes historical data and the data collected during the RI in March 2009 and August 2014. The following Glacier Bay chemicals of concern have been detected in soil above the LDW PCULs at Glacier Northwest: antimony, arsenic, mercury, PCBs, phthalates, PAHs, pentachlorophenol, and other SVOCs. VOCs and petroleum hydrocarbons are chemicals of concern for the site.</p>	
TRANSPORT PATHWAYS		
Outfalls	<p>There is one active stormwater outfall at the property (Outfall 2130). A Stormwater Pollution Prevention Plan (SWPPP) prepared for this facility in 2012 describes the storm drain system, include stormwater treatment systems and best management practices (BMPs) in place at the facility (CalPortland 2012).</p>	

Property Name	Glacier Northwest
Relevant Pathways	<p>Based on information provided in the SCAP, and the information on contaminated media above, the following pathways may contribute to sediment recontamination:</p> <ul style="list-style-type: none"> • Direct stormwater discharges: concentrations of COCs in storm drain solids exceed screening levels. • Contaminated groundwater discharge: concentrations of COCs in groundwater exceed the preliminary site screening levels throughout the site, with the greatest concentrations adjacent to the shoreline at the southeast corner. • Contaminated soil erosion/leaching: concentrations of COCs in soil exceed screening levels, throughout the site, with the greatest concentrations adjacent to the shoreline at the southeast corner. Seeps have been identified at the site, sampling results indicate that arsenic is present at concentrations exceeding the preliminary site cleanup levels. <p>Surface runoff is not considered a significant pathway; the site is paved and runoff is directed to the onsite storm drain system. Leaks and spills may occur, but are likely to be captured in the onsite storm drain system. Waterway operations and atmospheric deposition have not been identified as relevant pathways at this property.</p>
SOURCE CONTROL ACTIONS	
Action Item Status	<p>Ten action items are identified in the most recent Source Control Status Report (five high priority, three medium priority, and two low priority). Three of the five high priority action items are complete. The following high priority action items in progress:</p> <ul style="list-style-type: none"> • Upon approval of work plans by Ecology, conduct site investigations as specified. • Review site investigation results and assess potential for sediment recontamination and need for remedial actions. <p>The medium and low action items are complete.</p>
INSPECTION, PERMIT, AND CLEANUP STATUS	
Inspections	<p>SPU completed an initial inspection at the facility on January 9, 2014. The facility was in compliance. A stormwater compliance inspection was conducted on May 20, 2009. At that time, the facility was in compliance with the ISGP. [NEED UPDATED INSPECTION INFO.]</p>
Permit Compliance Status	<p>The 2016 ISGP Annual Report for Glacier Northwest states that all monitoring data were within benchmarks for 2016.</p>
Upland Cleanups	<p>Agreed Order No. 6000, dated July 2009, requires Glacier Northwest to complete an RI/FS for the site.</p> <p>Issues at the upland area included:</p> <ul style="list-style-type: none"> • Ongoing soil and groundwater concentrations above MTCA for arsenic and pentachlorophenol, and groundwater concentrations above MCLs for petroleum hydrocarbons, arsenic, and silver. • Potential for sediment recontamination due to the presence of metals, pentachlorophenol, and 2,4-dichlorophenol in soil and groundwater, and dioxins directly offshore of the site. • Concentrations of arsenic, silver, pentachlorophenol, and 2,4,6-trichlorophenol in seeps above MTCA surface water cleanup levels. Arsenic concentrations in seeps exceeded the WQC. • The nature and extent of contamination in soil and groundwater had not been defined, particularly at the property boundaries.

Property Name	Glacier Northwest
	A draft remedial investigation report was submitted to Ecology in May 2015. Ecology has reviewed and commented on the draft report.
Other Relevant Studies	<p>Storm drain water samples were collected in October and December 2012 and January and April 2013 at one location, STW-01, which is the Sand and Gravel Permit point of compliance. The point of compliance is upstream of the discharge point to Glacier Bay.</p> <p>Total and dissolved copper exceeded the WQC in all samples.</p> <p>BEHP exceeded the Human Health Criteria for Consumption of Water & Organisms in three samples. BEHP was not detected in the most recent sample; however, the detection limit exceeded the criterion.</p>
RECOMMENDATION	
Source Control Summary	Chemicals of concern (metals, PCBs, HPAHs, and phthalates) are present in surface sediment, storm drain solids, groundwater, and soil at concentrations above screening levels. Four high priority actions are incomplete, and upland cleanup has not been completed.
Preliminary Recommendation	Sources are not sufficiently controlled.

Preliminary

Table 1. Summary of Screening Level Exceedances in Surface Sediment near Glacier Northwest

Parameter	Frequency of Detection	Range of Detected Conc'n's (mg/kg DW)	Range of Nondetected Conc'n's (mg/kg DW)	Average Detected Conc'n (mg/kg DW)	Lower Screening Level (mg/kg DW)	Maximum Exceedance Factor	Frequency of Detects Above Lower SL	Upper Screening Level (mg/kg DW)	Maximum Exceedance Factor	Frequency of Detects Above Upper SL
Metals										
Arsenic	75 / 75	1.28 - 269	NA	31.4	57	4.7	8 / 75	93	2.9	6 / 75
Copper	75 / 75	9.7 - 405	NA	97	390	1.0	1 / 75	390	1.0	1 / 75
Lead	75 / 75	1.6 - 1,070	NA	83	450	2.4	3 / 75	530	2.0	2 / 75
Mercury	70 / 75	0.03 - 0.5	0.02 - 0.03	0.2	0.41	1.2	3 / 70	0.59	<1	0 / 70
Zinc	75 / 75	19 - 1,680	NA	180	410	4.1	2 / 75	960	1.8	1 / 75
Organic Chemicals										
Benzyl Alcohol	68 / 74	0.0068 - 0.33	0.0065 - 0.007	0.074	0.057	5.8	30 / 68	0.073	4.5	21 / 68
Dibenzofuran	51 / 78	0.0084 - 1.3	0.0014 - 0.0041	0.073	0.54	2.4	2 / 51	0.54	2.4	2 / 51
N-Nitroso-diphenylamine	21 / 74	0.0025 - 0.037	0.0012 - 0.0014	0.0067	0.028	1.3	1 / 21	0.04	<1	1 / 21
Phenol	62 / 74	0.0092 - 0.68	0.008 - 0.0085	0.13	0.42	1.6	5 / 62	1.2	<1	0 / 62
Phthalates										
Butyl benzyl phthalate	65 / 74	0.0028 - 0.16	0.0027 - 0.0028	0.020	0.063	2.5	3 / 65	0.9	<1	0 / 65
PCBs										
Total PCBs	79 / 79	0.003 - 2.24	NA	0.3	0.13	17	49 / 79	1	2.2	8 / 79
PAHs										
Acenaphthene	46 / 79	0.0096 - 2.2	0.0012 - 0.0033	0.13	0.5	4.4	3 / 46	0.5	4.4	3 / 46
Anthracene	71 / 79	0.011 - 9.3	0.0014 - 0.0044	0.23	0.96	9.7	3 / 71	0.96	9.7	3 / 71
Benz[a]anthracene	75 / 79	0.0058 - 4.1	0.0031 - 0.0031	0.24	1.3	3.2	3 / 75	1.6	2.6	2 / 75
Benzo(a)pyrene	74 / 79	0.0056 - 2	0.0051 - 0.0051	0.2	1.6	1.3	2 / 74	1.6	1.3	2 / 74
Benzo(ghi)perylene	71 / 79	0.012 - 0.77	0.0029 - 0.0043	0.12	0.67	1.1	1 / 71	0.72	1.1	1 / 71

Parameter	Frequency of Detection	Range of Detected Conc'ns (mg/kg DW)	Range of Nondetected Conc'ns (mg/kg DW)	Average Detected Conc'n (mg/kg DW)	Lower Screening Level (mg/kg DW)	Maximum Exceedance Factor	Frequency of Detects Above Lower SL	Upper Screening Level (mg/kg DW)	Maximum Exceedance Factor	Frequency of Detects Above Upper SL
Total Benzofluoranthenes	76 / 79	0.007 - 4	0.0026 - 0.0026	0.4	3.2	1.3	1 / 76	3.6	1.1	1 / 76
Chrysene	75 / 79	0.0069 - 5.6	0.0035 - 0.0035	0.35	1.4	4.0	3 / 75	2.8	2.0	2 / 75
Dibenzo(a,h)anthracene	72 / 79	0.0026 - 0.35	0.0019 - 0.0022	0.045	0.23	1.5	2 / 72	0.23	1.5	2 / 72
Fluoranthene	77 / 79	0.0084 - 14	0.0027 - 0.0027	0.59	1.7	8.2	5 / 77	2.5	5.6	3 / 77
Fluorene	57 / 79	0.0095 - 3	0.0012 - 0.0043	0.1	0.54	5.6	2 / 57	0.54	5.6	2 / 57
Indeno(1,2,3-cd)pyrene	68 / 79	0.018 - 0.7	0.0033 - 0.0046	0.1	0.6	1.2	1 / 68	0.69	1.0	1 / 68
Phenanthrene	75 / 79	0.0031 - 7.8	0.0034 - 0.0034	0.35	1.5	5.2	2 / 75	1.5	5.2	2 / 75
Pyrene	77 / 79	0.013 - 13	0.0018 - 0.0018	0.67	2.6	5	4 / 77	3.3	3.9	2 / 77
Chlorinated Organics										
Hexachlorobenzene	13 / 75	0.0026 - 4.8	0.0011 - 0.0013	0.39	0.022	218	3 / 13	0.07	69	2 / 13
Pentachlorophenol	40 / 74	0.016 - 20	0.013 - 0.014	0.7	0.36	56	6 / 40	0.69	29	4 / 40
Dioxins/Furans										
Dioxins/Furans TEQ (ng/kg)	86 / 86	0.013 - 4335	NA	340	2	2,168	81 / 86	2	2,168	81 / 86

Table 2. Summary of Screening Level Exceedances in Storm Drain Solids at Glacier Northwest

Parameter	Frequency of Detection	Range of Detected Conc'ns (mg/kg DW)	Range of Nondetected Conc'ns (mg/kg DW)	Average Detected Conc'n (mg/kg DW)	Lower Screening Level (mg/kg DW)	Maximum Exceedance Factor	Frequency of Detects Above Lower SL	Upper Screening Level (mg/kg DW)	Maximum Exceedance Factor	Frequency of Detects Above Upper SL
Metals										
Arsenic	8 / 8	2.6 - 1900	NA	640	57	33	3 / 8	93	20	3 / 8
Cadmium	5 / 5	0.2 - 29.7	NA	10	5.1	5.8	2 / 5	6.7	4.4	2 / 5
Copper	8 / 8	40.1 - 515	NA	260	390	1.3	2 / 8	390	1.3	2 / 8
Zinc	8 / 8	62 - 955	NA	480	410	2.3	5 / 8	960	<1	0 / 8
Organic Chemicals										
4-Methylphenol	2 / 5	0.15 - 1.1	0.006 -0.0062	0.63	0.67	1.6	1 / 2	0.67	1.6	1 / 2
Benzoic Acid	2 / 5	5.5 - 22	0.092 -0.094	14	0.65	34	2 / 2	0.65	34	2 / 2
Benzyl Alcohol	4 / 5	0.024 - 53	0.0066 - 0.0066	17	0.057	930	2 / 4	0.073	726	2 / 4
Phenol	3 / 8	0.013 - 3.1	0.0079 -0.11	1.5	0.42	7.4	2 / 3	1.2	2.6	2 / 3
N-Nitroso-diphenylamine	3 / 5	0.0026 - 0.054	0.0013 - 0.0039	0.020	0.028	1.9	1 / 3	0.04	1.4	1 / 3
Phthalates										
Bis(2-Ethylhexyl) phthalate	4 / 5	0.28 - 32	0.034 -0.034	8.3	1.3	25	1 / 4	1.9	17	1 / 4
Butyl benzyl phthalate	5 / 5	0.0085 - 1.4	NA	0.30	0.063	22	1 / 5	0.9	1.6	1 / 5
Dioxins/Furans										
Dioxins/Furans TEQ (ng/kg)	8 / 8	16.1 - 305	NA	151	2	153	8 / 8	2	153	8 / 8

Property Name	Industrial Container Services
GENERAL INFORMATION	
Address	7152 1 st Avenue South, Seattle 98108
Property No.	20018
Tax Parcel No.	292404-9030
Property Owner	Herman and Jacqueline Trotsky
Current Operator	Industrial Container Services
Property Size	5.1 acres (Property) 2 acres (Slip 2)
Facility/Site ID	2154: Industrial Container Services WA LLC (Cleanup Site ID 62)
Alternate Names	Container Services Co NW, Inc., IFCO Container Systems, Northwest Cooperage Co, Inc., PALEX Container Systems, Second Street Ditch, Mitzel & Co, and Pacific Drum Co.
NPDES Permit No.	None
UST/LUST ID No.	Not applicable
SITE HISTORY AND ACTIVITIES	
Description	<p>The Industrial Container Services-WA, LLC site is located at 7152 First Avenue South, Seattle, Washington, on the west side of the Lower Duwamish Waterway (LDW). The site is bordered by Boyer Towing to the east, Alaska Marine Lines on the north, First Avenue South on the west and DaVinci Gourmet on the south.</p> <p>The site contains an inlet to the Duwamish River, known as Early Action Area 2 located on the north side of the site. Final site boundaries will be defined by the extent of contamination determined during the remedial investigation.</p>
Historical Activities	<p>Drum reconditioning and manufacturing operations on the property date back to as early as the 1930s. In the early 1940s, Mitzel & Co. reportedly refurbished 1,500 drums per month for the U.S. government during World War II.</p> <p>The Trotsky family purchased the property in 1953 and operated the site as Northwest Cooperage. The property was paved in 1973 and a wastewater pretreatment system was installed. The pretreatment system included a “closed” drainage system that channels all drainage, including stormwater, spills, and process water into a wastewater pretreatment system to the sanitary sewer.</p>
Current Activities	<p>Industrial Container Services-WA, LLC currently leases the property and continues to operate a drum reconditioning facility. Operations at the site include storage, cleaning, and repainting of used drums, some of which may have contained food products, petroleum products, solvents, resins, paints, adhesives and hazardous wastes.</p> <p>Contamination at this site is a result of drum reconditioning operations.</p> <p>Wastewater generated at the facility includes spent wash water and rinse solutions (SAIC 2007). The facility maintains a permitted wastewater pre-treatment system. Sources of wastewater include liquids used for cleaning, manufacturing, or reconditioning of steel drums, plastic drums,</p>

Property Name	Industrial Container Services
	and intermediate bulk containers. Storm water also passes through the wastewater pre-treatment system. The facility discharges an average of up to 1,540 gpd of storm water to the sanitary sewer.
Chemicals of Concern	EAA-2 chemicals of concern: PCBs, phthalates, mercury, lead, zinc, dichloro-diphenyl-trichloroethane (DDT), and dieldrin Industrial Container Services chemicals of concern: PCBs, metals (arsenic, chromium, copper, lead, mercury, zinc), PAHs, phthalates, chlorinated benzenes, phenols, petroleum hydrocarbons, and pesticides
CONTAMINATED MEDIA	
Surface Sediment	Chemicals of concern for the EAA-2 source control areas are: PCBs, phthalates, mercury, lead, zinc, dichloro-diphenyl-trichloroethane (DDT), and dieldrin. Metals, PCBs, PAHs, phthalates, other SVOCs, and petroleum hydrocarbons exceeded the SCO/LAET or LDW RALs. All chemicals exceeded the CSL/2LAET except arsenic. Greatest exceedances of the upper screening limits include: mercury (EF = 419), 1,2-dichlorobenzene (EF = 240), BEHP (EF = 95), fluoranthene (EF = 156), and total PCB Aroclors (EF = 2,930). [Data for samples collected in 2004, 2007, 2012, and 2014. Data from EIM and 2015 Sherlock database. Most recent sample date in 2016 Sherlock is 05/14/2015, need to add data. EIM has data from November 26, 27, 28, 30 and December 10, 2012, and November 19, 2014 that are not included in Sherlock.]
Storm Drain Solids	Storm drain solids samples were collected at the site in 1991 and 2012. Only the data from the single sample collected in 2012 were available for review. Metals; PCBs; PAHs, phthalates, and other SVOCs; dioxins/furans and petroleum hydrocarbons were detected in 2012 storm drain solids sample. With the exception of PCBs and petroleum hydrocarbons, one or more individual chemicals from the above-listed chemical classes exceeded the SCO/LAET and/or the CSL/2LAET. The highest exceedance factors were zinc (EF = 1.1), benzyl alcohol (EF = 2.8), BEHP (EF = 2.6), naphthalene (EF = 2.0), and 1,2,4-trichlorobenzene (EF = 171). See Table 2 for additional details. [Data from EIM, results from 2012 sample only.]
Groundwater	Data uploaded to the EIM database includes data collected in 2007, 2012, and 2014 through 2016. Metals; PCBs, PAHs, phthalates, and other SVOCs; VOCs, petroleum hydrocarbons and pesticides have been detected in groundwater above the LDW PCULs at Industrial Container Services. The following chemicals were detected at concentrations greater than 100 times the LDW PCUL: chromium, total PCB Aroclors, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, dibenz(a,h)anthracene, indeno(1,2,3-cd)pyrene, BEHP, butyl benzyl phthalate, di-n-octyl phthalate, hexachlorobenzene, pentachlorophenol, vinyl chloride, 4,4'-DDD, 4,4'-DDE, 4,4'-DDT, and dieldrin.
Soil	Data uploaded to the EIM database includes data collected in 2007, 2008, 2012, 2014, and 2015. Metals; PCBs, PAHs, phthalates, and other SVOCs; dioxins/furans; VOCs; petroleum hydrocarbons and pesticides have been detected in soil above the LDW PCULs at Industrial Container Services. The following chemicals were detected at concentrations greater than 1,000 times the LDW PCUL: 1,2,4-trichlorobenzene, 2,3,7,8-TCDD, 2,4-dimethylphenol, 4,4'-DDD, 4,4'-DDE, 4,4'-DDT, aldrin, benzo(a)anthracene, benzene, benzo(a)pyrene, benzo(b)fluoranthene, butyl benzyl phthalate, chlordane, chrysene, total cPAH TEQ, bis(2-ethylhexyl) phthalate, dibenz(a,h)anthracene, dibutyl phthalate, dieldrin, ethylbenzene, hexachlorobenzene, indeno(1,2,3-cd)pyrene, naphthalene, n-nitrosodiphenylamine, pentachlorophenol, toluene, total PCB Aroclors,

Property Name	Industrial Container Services
	and TCE.
TRANSPORT PATHWAYS	
Outfalls	Industrial Container Services does not operate/own any outfalls that discharge to the Slip 2 or LDW.
Relevant Pathways	<p>Based on information provided in the SCAP and draft RI report (DOF 2015), and the information on contaminated media above, the following pathways may contribute to sediment recontamination:</p> <ul style="list-style-type: none"> Contaminated groundwater discharge: concentrations of COCs in groundwater exceed the LDW PCULs throughout the site, with the greatest concentrations adjacent to the shoreline at the southeast corner. Contaminated soil erosion/leaching: concentrations of COCs in soil exceed screening levels, throughout the site, with the greatest concentrations adjacent to Slip 2 and the eastern portion of the Site. <p>Surface runoff is not considered a significant pathway; the site is paved and runoff is directed to the onsite treatment system and then discharged to the sanitary sewer. Leaks and spills may occur, but are likely to be captured in the onsite storm drain system. Waterway operations and atmospheric deposition have not been identified as relevant pathways at this property.</p>
SOURCE CONTROL ACTIONS	
Action Item Status	<p>Ecology and the property owners of the site entered Agreed Order No. DE 6720 with Herman and Jacqueline Trotsky (property owners) and Industrial Container Services (operator) on May 18, 2010.</p> <p>Eight action items are identified in the most recent Source Control Status Report (two high priority, five medium priority, and one low priority). Both high priority action items and the low priority action item are complete. Three medium priority action items are complete and two are listed as in progress. The medium priority action items that are in progress are:</p> <ul style="list-style-type: none"> Conduct RI/FS, implement interim actions (as needed), and prepare draft CAP. Evaluate the need for stormwater characterization (solids and whole water) from this facility if overflow occurs during heavy rainfall events. <p>*A draft RI report was submitted to Ecology in April 2015. Ecology is currently reviewing the report.</p>
INSPECTION, PERMIT, AND CLEANUP STATUS	
Inspections	An Urban Waters inspection was performed at Industrial Container Services on September 11, 2014. Based on Appendix D of the most recent Source Control Status Report, no corrective actions were identified.
Permit Compliance Status	Industrial Container Services is not required to obtain an NPDES permit. Facility waste water and stormwater are collected and routed through a pretreatment system and then discharged to the sanitary sewer. Discharge to the sanitary sewer is covered under KCIW Permit No. 7130. (DOF 2015).
Upland Cleanups	Several investigations have been performed at the site to delineate the nature and extent of contamination in soil and groundwater; however, no cleanup actions have been performed.

Property Name	Industrial Container Services
<p>Other Relevant Studies</p>	<p>Storm drain water samples were collected in May 2007, August 2012, and March and September 2015. Samples were collected at low tide.</p> <p>The following chemicals exceeded NPDES permit benchmarks: copper, mercury, and zinc (note that ICS is not required to have an NPDES permit)</p> <p>Copper, lead, mercury, nickel, and zinc exceeded the WQS marine chronic standards; copper, mercury, and zinc also exceed the marine acute standards.</p> <p>Arsenic and chrysene exceeded the NTR and NR protection of human health via consumption of organisms criteria. BEHP exceeded the NR protection of human health via consumption of organisms criteria.</p> <p>[No storm drain water results in Sherlock 2016. Data from EIM, which includes samples from 2012 and 2015 only.]</p>
<p>RECOMMENDATION</p>	
<p>Source Control Summary</p>	<p>Chemicals of concern (metals; PCBs; dioxins/furans; PAHs, phthalates, and other SVOCs; VOCs; petroleum hydrocarbons; and pesticides) are present in surface sediment, storm drain solids, groundwater, and soil at concentrations above screening levels. An upland cleanup has not been completed.</p>
<p>Preliminary Recommendation</p>	<p>Sources are not sufficiently controlled.</p>

Preliminary

Table 1. Summary of Screening Level Exceedances in Surface Sediment near Industrial Container Services

Parameter	Frequency of Detection	Range of Detected Conc'ns	Range of Nondetected Conc'ns	Average Detected Conc'n (mg/kg DW)	Lower Screening Level (mg/kg DW)	Maximum Exceedance Factor	Frequency of Detects Above Lower SL	Upper Screening Level (mg/kg DW)	Maximum Exceedance Factor	Frequency of Detects Above Upper SL
Metals										
Arsenic	72 / 80	1.1 - 61.1	6 - 30	12	57	1.1	1 / 72	93	N/A	N/A
Cadmium	58 / 80	0.1 - 47	0.1 - 0.6	3	5.1	9.2	7 / 58	6.7	7.0	4 / 58
Chromium	80 / 80	8.9 - 2,940	N/A	140	260	11	9 / 80	270	11	8 / 80
Copper	74 / 74	8 - 1,090	N/A	80	390	2.8	2 / 74	390	2.8	Feb-74
Lead	80 / 80	1.9 - 10,400	N/A	650	450	23	16 / 80	530	20	16 / 80
Mercury	76 / 80	0.02 - 247	0.03 - 0.06	6	0.41	602	24 / 76	0.59	419	20 / 76
Silver	20 / 80	0.088 - 19	0.2 - 1	1.7	6.1	3.1	1 / 20	6.1	3.1	1 / 20
Zinc	74 / 74	21 - 4,580	N/A	360	410	11	10 / 74	960	4.8	7 / 74
Organic Chemicals										
1,2-Dichlorobenzene	34 / 116	0.0024 - 12	0.0046 - 2.1	0.81	0.035	343	11 / 34	0.05	240	11 / 34
1,4-Dichlorobenzene	36 / 116	0.0027 - 7.6	0.0046 - 2	0.54	0.11	69	9 / 36	0.12	69	9 / 36
4-Methylphenol	33 / 62	0.011 - 1.9	0.0086 - 3.5	0.10	0.67	2.8	1 / 33	0.67	2.8	1 / 33
Benzoic acid	24 / 62	0.11 - 1.2	0.18 - 42	0.31	0.65	1.8	1 / 24	0.65	1.8	1 / 24
Benzyl alcohol	73 / 116	0.0071 - 20	0.018 - 4.2	0.57	0.057	351	23 / 73	0.073	274	18 / 73
N-Nitrosodi-phenylamine	40 / 116	0.0024 - 4.8	0.0086 - 2.1	0.55	0.028	171	11 / 40	0.04	120	10 / 40
Pentachlorophenol	41 / 116	0.014 - 14	0.046 - 21	1.00	0.36	39	17 / 41	0.69	20	10 / 41
Phenol	39 / 62	0.01 - 5.7	0.018 - 6.2	0.2	0.42	14	3 / 39	1.2	4.8	1 / 39
Phthalates										
Bis(2-ethylhexyl)-phthalate	56 / 62	0.016 - 180	0.024 - 0.072	4.1	1.3	138	9 / 56	1.9	95	6 / 56
Butyl benzyl phthalate	23 / 87	0.0032 - 44	0.0046 - 2.1	2.2	0.063	698	8 / 23	0.9	49	3 / 23
Dibutyl phthalate	20 / 62	0.0072 - 44	0.018 - 2.1	2.4	1.4	31	2 / 20	5.1	31	2 / 20
PCBs										
Total PCB Aroclors	67 / 79	0.0104 - 2930	0.0036 - 0.004	78.6	0.13	22,538	52 / 67	1	2,930	36 / 67

Parameter	Frequency of Detection	Range of Detected Conc'ns	Range of Nondetected Conc'ns	Average Detected Conc'n (mg/kg DW)	Lower Screening Level (mg/kg DW)	Maximum Exceedance Factor	Frequency of Detects Above Lower SL	Upper Screening Level (mg/kg DW)	Maximum Exceedance Factor	Frequency of Detects Above Upper SL
PAHs										
2-Methylnaphthalene	47 / 62	0.011 - 50	0.018 - 0.06	1	0.67	75	3 / 47	1.4	75	3 / 47
Dibenzofuran	41 / 62	0.0058 - 26	0.018 - 2.1	0.76	0.54	48	2 / 41	0.7	48	2 / 41
Total cPAHs (TEQ, NDx0.5)	61 / 62	0.01744 - 100	0.02774 - 0.02774	2	1	100	5 / 61	3	33	3 / 61
Total LPAHs	59 / 62	0.012 - 700	0.019 - 0.02	10	5.2	135	2 / 59	13	54	2 / 59
Acenaphthene	37 / 62	0.0041 - 39	0.018 - 2.1	1.3	0.5	78	4 / 37	0.73	78	4 / 37
Acenaphthylene	29 / 62	0.0046 - 8.7	0.018 - 2.1	0.36	1.3	6.7	1 / 29	1.3	6.7	1 / 29
Anthracene	52 / 62	0.011 - 82	0.018 - 0.06	2.0	0.96	85	2 / 52	4.4	85	2 / 52
Fluorene	45 / 62	0.0065 - 58	0.018 - 2.1	1.5	0.54	107	3 / 45	1	58	3 / 45
Naphthalene	47 / 62	0.01 - 120	0.018 - 2.1	3	2.1	57	2 / 47	2.4	50	2 / 47
Phenanthrene	59 / 62	0.012 - 380	0.019 - 0.02	6.9	1.5	253	3 / 59	5.4	70	2 / 59
Total HPAH	61 / 62	0.023 - 1200	0.019 - 0.019	23	12	100	4 / 61	17	71	4 / 61
Benzo(a)anthracene	57 / 62	0.012 - 140	0.018 - 0.02	2.8	1.3	108	4 / 57	1.6	88	4 / 57
Benzo(a)pyrene	49 / 62	0.0098 - 71	0.018 - 0.11	1.7	1.6	44	4 / 49	3	44	4 / 49
Benzo(g,h,i)perylene	56 / 62	0.01 - 19	0.018 - 0.06	0.5	0.67	28	5 / 56	0.72	26	5 / 56
Benzofluoranthenes, total	60 / 62	0.014 - 120	0.037 - 0.038	2.5	3.2	38	4 / 60	3.6	33	3 / 60
Chrysene	59 / 62	0.014 - 180	0.018 - 0.019	3.5	1.4	129	5 / 59	2.8	64	4 / 59
Dibenzo(a,h)anthracene	34 / 62	0.0062 - 13	0.018 - 0.11	0.47	0.23	57	5 / 34	0.54	57	5 / 34
Fluoranthene	61 / 62	0.011 - 390	0.019 - 0.019	7.1	1.7	229	5 / 61	2.5	156	4 / 61
Indeno(1,2,3-cd)pyrene	52 / 62	0.0092 - 21	0.018 - 0.06	0.56	0.6	35	5 / 52	0.69	30	5 / 52
Pyrene	61 / 62	0.0097 - 290	0.019 - 0.019	5.4	2.6	112	5 / 61	3.3	88	5 / 61

Table 2. Summary of Screening Level Exceedances in Storm Drain Solids at Industrial Container Services

Parameter	Frequency of Detection	Range of Detected Conc'ns (mg/kg DW)	Range of Nondetected Conc'ns (mg/kg DW)	Average Detected Conc'n (mg/kg DW)	Lower Screening Level (mg/kg DW)	Maximum Exceedance Factor	Frequency of Detects Above Lower SL	Upper Screening Level (mg/kg DW)	Maximum Exceedance Factor	Frequency of Detects Above Upper SL
Metals										
Zinc	1 / 1	464	na	464	410	1.1	1 / 1	960	na	na
Organic Chemicals										
Benzoic Acid	1 / 1	0.77	na	0.77	0.65	1.2	1 / 1	0.65	1.2	1 / 1
Benzyl Alcohol	2 / 2	0.14 – 0.16	na	0.15	0.057	2.8	2 / 2	0.073	2.2	2 / 2
Phenol	1 / 1	0.5	na	0.5	0.42	1.2	1 / 1	1.2	na	na
Phthalates										
BEHP	1 / 1	3.4	na	3.4	1.3	2.6	1 / 1	1.9	1.8	1 / 1
Butyl benzyl phthalate	1 / 1	0.082	na	0.082	0.063	1.3	1 / 1	0.9	na	na
PAHs										
Total LPAHs	1 / 1	6.9	na	6.9	5.2	1.3	1 / 1	13	na	na
Naphthalene	1 / 1	4.1	na	4.1	2.1	2.0	1 / 1	2.4	1.7	1 / 1
Phenanthrene	1 / 1	1.7	na	1.7	1.5	1.1	1 / 1	5.4	na	na
Fluoranthene	1 / 1	2.2	na	2.2	1.7	1.3	1 / 1	2.5	na	na
Chlorinated Organics										
1,2,4-Trichlorobenzene	2 / 2	5.3 – 5.3	na	5.3	0.031	171	2 / 2	0.051	104	2 / 2
1,2-Dichlorobenzene	2 / 2	3.4 – 3.4	na	3.4	0.035	97	2 / 2	0.05	68	2 / 2
1,4-Dichlorobenzene	2 / 2	2.9 – 2.9	na	2.9	0.11	26	2 / 2	0.12	24	2 / 2
Hexachlorobenzene	1 / 2	0.23	0.0016	0.23	0.022	10	1 / 2	0.07	3.3	1 / 2

Property Name	Jorgensen Forge
GENERAL INFORMATION	
Address	8531 East Marginal Way S, Seattle, WA 98108
Property No.	10003
Tax Parcel No.	000160-0023
Property Owner	Star Forge LLC
Current Operator	Star Forge LLC
Property Size	21.6 acres
Facility/Site ID	2382 Cleanup Site ID: 3689
Alternate Names	Jorgensen Forge Corp, Mineralized Cell Wood Pres Co
NPDES Permit No.	WAR003231
UST/LUST ID No.	Not applicable
SITE HISTORY AND ACTIVITIES	
Description	<p>The Jorgensen Forge site is located along the east bank of the Lower Duwamish Waterway (LDW) at 8531 East Marginal Way S in Tukwila, Washington. It is bordered to the north by Boeing Plant 2, to the east by East Marginal Way S, and to the south by the Boeing Isaacson property.</p> <p>A 350,000-square-foot building is present at the site. All main production operations are performed in this building. Smaller buildings at the site are used for office space, support services, storage and an aluminum heat-treat facility. The majority of the site with asphalt or concrete. A small gravel area is present along the northwestern portion of the site and a small dirt area is present along the southwestern portion of the site. A rail track is present at the site (PES Environmental, Inc. 2015).</p> <p>Catch basins on the site are designed to minimize introduction of oil and grease to the storm drain system. Stormwater from all areas of the site is conveyed to a vault and then pumped to large black storage tanks and into a polymer/sand filter treatment system, with the exception of an estimated 7.26 acres of the facility is not directly or indirectly captured by the existing storm drain system. The majority of this uncaptured area lies along the perimeters of the facility where surface water infiltrates within pervious materials surrounding the rail spur lines. Approximately 1 acre of impervious area along the east side of the facility is captured by the existing sanitary sewer conveyance system (PES Environmental 2015).</p> <p>One 600-gallon underground storage tank (UST) is present at the site. Due to its size, it is not regulated by Ecology (PES Environmental 2015).</p> <p>The Jorgensen Forge site is divided into an upland portion and a sediment portion for site cleanup. The Washington State Department of Ecology (Ecology) is the lead for the upland cleanup and the U.S. Environmental Protection Agency (EPA) is the lead for the sediment cleanup.</p>
Historical Activities	The site was developed in 1942, and operated from 1942 to 1965 as a fabricator of structural steel, tractor and road equipment. Operations at the site included forging and heat-treating by Isaacson

Property Name	Jorgensen Forge
	<p>Iron Works, which operated as a U.S. naval vessel manufacturer.</p> <p>Bethlehem Steel operated a steel distribution center on the northwestern portion of the site from approximately 1951 to 1963. Bethlehem Steel operations consisted of cutting prefabricated steel rods to customers' specifications. From 1965 to 1992, the property was owned and operated by the Earle M. Jorgensen Company. In July 1992, the site was purchased by the plant management group and became the Jorgensen Forge Corporation (E&E 2007 [03163]).</p>
Current Activities	<p>Star Forge LLC purchased the property in November 2016 and continues to operate as Jorgensen Forge (EPA and DOJ 2016 [12306]). Jorgensen Forge manufactures forged bars and sleeves; forging disks; and specialized open die steel forgings and rolled aluminum rings. In addition to steel and aluminum, Jorgensen also processes nickel, titanium, and carbon/low alloy steels (Jorgensen Forge 2018). No over-water or waterside operations are performed.</p>
Chemicals of Concern	<p>Based on information in the most recent Source Control Status Report (Ecology 2018), the following chemicals of concern were selected for Early Action Area 4: polychlorinated biphenyls (PCBs), phthalates, polycyclic aromatic hydrocarbons (PAHs), and metals.</p> <p>Chemicals of concern for the site are: Metals, PCBs, petroleum hydrocarbons, and non-halogenated solvents.</p>
CONTAMINATED MEDIA	
Surface Sediment	<p>During 2003, 2004, 2005, and 2009, a total of 51 surface sediment samples were collected adjacent to the Jorgensen Forge site (AECOM 2012 [00099]). The following chemicals exceeded the lower of the Washington State Sediment Management Standards (SMS) Sediment Cleanup Objective (SCO)/lowest Apparent Effects Threshold (LAET) and the minimum cleanup level in the LDW Record of Decision (ROD) (EPA 2014 [12119]) in at least one sample (Table A-1).</p> <ul style="list-style-type: none"> • PCBs: total PCB Aroclors and total PCB toxic equivalency (TEQ) • Dioxins/furans TEQ • Metals: arsenic, chromium, copper, lead, mercury, and zinc • Tributyltin • PAHs: anthracene, benzo(a)anthracene, total benzofluoranthenes, benzo(a)pyrene, chrysene, dibenz(a,h)anthracene, fluoranthene, fluorene, phenanthrene, pyrene, total low molecular weight PAHs (LPAHs), total high molecular weight PAHs (HPAHs), and total carcinogenic (cPAHs) TEQ • Phthalates: butylbenzyl • Other semivolatile organic compounds (SVOCs): phenol • Pesticides: 4,4'- dichlorodiphenyltrichloroethane (DDT), total DDT, and toxaphene <p>The highest SCO exceedance factors (EFs) were for total PCB TEQ (EF = 1,971), total PCB Aroclors (SCO EF = 846), total cPAHs TEQ (EF = 367), 4,4'-DDT (EF = 360) and total DDT (EF = 360).</p>
Storm Drain Solids	<p>Six SD solids samples were collected from storm drain structures and pipes at the site prior to cleaning and sealing in February 2011 (Floyd Snider 2011 [10202]). The following chemicals exceeded the lower of the SMS Cleanup Screening Level (CSL)/second lowest Apparent Effects Threshold (2LAET) and the minimum cleanup level in the LDW ROD (EPA 2014 [12119]) in at least one sample (Table A-2).</p> <ul style="list-style-type: none"> • Metals: arsenic, cadmium, copper, lead, and zinc • PAHs: benzo(a)anthracene, total benzofluoranthenes, benzo(g,h,i)perylene, benzo(a)pyrene, chrysene, fluoranthene, fluorene, indeno(1,2,3-cd)pyrene, phenanthrene,

Property Name	Jorgensen Forge
	<p>pyrene, total LPAHs, total HPAHs, and total cPAHs TEQ</p> <ul style="list-style-type: none"> Phthalates: butylbenzyl phthalate, dibutyl phthalate, and dimethyl phthalate <p>The highest CSL EFs were for total cPAHs TEQ (EF = 503), zinc (EF = 59), butylbenzyl phthalate (EF = 11), and arsenic (EF = 10).</p>
Groundwater	<p>Analytical results for groundwater samples collected between 1990 and 2017 (Study ID FS2382) are available for review in Ecology's Environmental Information Management (EIM) system.</p> <p>Analytical results for samples collected in August 2017 indicate that cadmium (EF = 1.1), chromium (EF = 457), acenaphthene (EF = 1.9), and naphthalene (EF = 71) are present in groundwater at concentrations exceeding the groundwater LDW preliminary cleanup levels (PCULs) for protection of sediment (Ecology 2017).</p>
Soil	<p>Soil investigations and remedial actions have been performed at the site since 1990. Analytical results for soil samples collected between 1990 and 2013 are available in EIM (Study ID FS2382). Concentrations of PCBs, metals, and PAHs are present at concentrations exceeding the soil LDW PCULs for protection of sediment via bank erosion (Ecology 2017).</p> <p>The following chemicals also exceeded soil LDW PCULs (listed from greatest EF to lowest EF): total PCB Aroclors, chromium, zinc, arsenic, total cPAHs TEQ, lead, copper, cadmium, and nickel. In the 2013 samples, total PCB Aroclors, total cPAHs TEQ, chromium, and arsenic exceed the soil LDW PCULs.</p>
TRANSPORT PATHWAYS	
Outfalls	<p>The Stormwater Pollution Prevention Plan (SWPPP) for the site (Anchor QEA 2012 [10469]) and Ecology inspection reports (Ecology 2014 [12136] and 2016) indicate that all stormwater discharges to the LDW through outfall 2065 (JOR-003) after passing through a polymer/sand filter treatment system.</p> <p>According to the 2015 draft remedial investigation (RI) work plan (PES Environmental, Inc. 2015), historical outfalls JOR-001 and JOR-002 were abandoned in 2013 as part of the construction of the stormwater treatment system.</p> <p>Additional information regarding these outfalls is provided in Table B-1.</p>
Relevant Pathways	<p>Based on information provided in the Data Gaps report (E&E 2007 [03163]) and SCAP (Ecology 2007 [02996] for Early Action Area 4 (EAA-4), and the information on contaminated media above, the following pathways may contribute to sediment recontamination:</p> <ul style="list-style-type: none"> Stormwater Discharges: Per the 2015 draft RI work plan (PES Environmental, Inc. 2015), this pathway potentially occurred or is occurring from building surfaces and pavement. However, the significance of this pathway may have been reduced when the stormwater treatment system was installed in 2013. Metals, PCBs, PAHs, and phthalates were historically present at concentrations above screening levels in storm drain solids at the site and in surface sediment in EAA-4. These chemicals are also present in surface sediments in EAA-4. Data for storm drain solids samples collected after 2011, if any, were not available for review. Stormwater samples collected in 2013 and 2014 contained PCBs at concentrations exceeding the Washington State Water Quality Standards (WQS). Therefore, stormwater discharges may be relevant pathway for sediment recontamination. Groundwater Discharges: Metals and PAHs are present in groundwater at concentrations exceeding the groundwater LDW PCULs for protection of sediment. Therefore, groundwater discharges is a relevant pathway for sediment recontamination. Bank Erosion/Leaching: The shoreline bank is heavily armored with riprap, woody debris,

Property Name	Jorgensen Forge
	<p>vegetation, and steel sheet pile/concrete bulkhead. However, contamination in the shoreline bank occurs within the intertidal zone, which is flooded twice a day by tides. In addition, there are debris piles in the intertidal zone. For this reason, contamination of the shoreline bank is likely, eroding and leaching into the sediments of the LDW. However, contaminated bank soil was removed from the site in 2014, reducing the significance of this pathway (PES Environmental 2015).</p> <p>Surface runoff is not considered a significant pathway; the site is paved and runoff is directed to the onsite storm drain system. Leaks and spills may occur, but are likely to be captured in the onsite storm drain system. Waterway operations and atmospheric deposition have not been identified as relevant pathways at this property.</p>
SOURCE CONTROL ACTIONS	
Action Item Status	<p>In July 2017, Ecology negotiated Agreed Order No. DE14143 with the Earle M. Jorgensen Company (Ecology 2017). The order requires the company to complete and RI, feasibility study (FS), and draft cleanup action plan (CAP).</p> <p>Twelve high priority action items have been identified for the site. Nine of these action items are complete. The following high priority action items are in progress (Ecology 2018).</p> <ul style="list-style-type: none"> • Contain and remove soils from upland outfall area of the 12-and 24-inch pipes. The 24-inch pipe and contaminated soil below the pipe were removed from the site in two phases, completed in 2015 and 2017 (EPA 2018b) • Develop a hydrogeologic site model as part of the source control investigation to characterize the groundwater system on site, including tidal influence. • Complete an RI/FS of the upland site area. <p>A description of each action item and its status is provided in Table C-1.</p>
INSPECTION, PERMIT, AND CLEANUP STATUS	
Inspections	<p>Ecology performed a stormwater compliance inspection at the site in February 2016 (Ecology 2016). The inspection was performed following a pump failure at the stormwater treatment system, which may have led to a discharge that bypassed the treatment system. Findings from the inspection are listed below.</p> <ul style="list-style-type: none"> • The SWPPP needs detailed and accurate maps and "as-builts" of the main stormwater vault including all associated pipes and structures leading to and from the treatment system. • The sonic high level alarm needs to be set such that flows bypassing treatment are detected. • An open-channel flow measurement device estimates bypass volumes but has not been inspected or calibrated for several years. Jorgensen Forge will need to recalibrate and properly set the bypass flow device to record bypass volumes. • An annual grab sample needs to be collected for analysis.
Permit Compliance Status	<p>The 2016 pump failure violated the facility's Industrial Stormwater General Permit. Based on information in Ecology's PARIS database, it appears that Jorgensen Forge collected annual grab samples in 2016 and 2017. The status of preparing an updated SWPPP is unknown.</p>
Upland Cleanups	<p>Since 1990, several environmental investigations have been performed at the site. Interim actions performed at the site are described below (PES Environmental Inc. 2015).</p> <ul style="list-style-type: none"> • Installation of product recovery wells, groundwater recovery and reinjection system in the

Property Name	Jorgensen Forge
	<p>northeastern portion of the site. Approximately 15,106 gallons of cutting oil were recovered. The system operated from 1993 to 1996.</p> <ul style="list-style-type: none"> • Installation of a hydraulic control system using groundwater extraction wells in the southeastern portion of the site to reduce the thickness of hydraulic oil light non-aqueous phase liquid (LNAPL) and concentrations of dissolved-phase oil-range hydrocarbons in groundwater. The system began operating in 1995. Over 414,000 gallons of water were removed; however, no significant changes to the LNAPL thickness or oil-range hydrocarbons concentrations were observed. Due to no apparent beneficial effect of the system the system ceased operations in 1996. • Removal of three gasoline USTs and approximately 65 cubic yards of contaminated soil, and installation of an air sparge/extraction system near the eastern boundary of the site. Analytical results or groundwater samples collected between 1993 and 1997 indicated that the system was effective. • Removal of bank soil contaminated by PCBs and metals began in September 2013 and was completed in 2014. <p>Earle M. Jorgensen submitted a work plan for sampling to fill data gaps to the EPA in 2015. EPA is currently reviewing the work plan and sampling is expected to be performed during Summer 2018 (EPA 2018a).</p>
Other Relevant Studies	<p>From August 2013 through 2014, Jorgensen Forge monitored and collected stormwater samples from the treatment system. Samples were analyzed for NPDES permit required parameters (total copper, lead, zinc, total petroleum hydrocarbons, pH, turbidity, and visible oil sheen) as well as PCBs, benzene, toluene, ethylbenzene, total xylenes, total and dissolved metals (arsenic, cadmium, chromium, mercury, selenium, and silver), and SVOCs (PES Environmental Inc. 2015). PCBs were detected in three “water quality characterization” samples at concentrations exceeding the Washington State WQS Marine Chronic water quality criteria (WQC). Concentrations of all other analytes were below permit benchmark parameters and Washington State WQS.</p> <p>One seep sample was collected in 2004 and analyzed for metals (Herrera 2014 [00066]). Copper exceeded the both Marine Chronic and Acute WQC.</p>
RECOMMENDATION	
Source Control Summary	<p>Three high priority action items are in progress (Ecology 2018). A draft RI work plan was completed in 2015. Earle M. Jorgensen submitted a work plan for sampling to fill data gaps. EPA is currently reviewing the work plan and sampling is expected to be performed during Summer 2018.</p> <p>Surface Sediment: Analytical results for surface sediment samples collected in 2003, 2004, 2005, and 2009 indicate that concentrations of PCBs, dioxins/furans, metals, tributyltin, PAHs, phthalates, other SVOCs and pesticides exceed the minimum of the SCO and the LDW ROD minimum cleanup level.</p> <p>Storm drain solids: Analytical results for storm drain solids samples collected in 2011 indicate that concentrations of metals, PAHs, and phthalates exceed the minimum of the CSL and the LDW ROD minimum cleanup level. A stormwater treatment system was installed in 2013. PCBs exceeded the Marine Chronic WQC in a single sample after installation of the stormwater treatment system. Data from storm drain solids samples collected after installation of the treatment system, if any, are not available for review.</p> <p>Groundwater: Analytical results for groundwater samples collected in 2017 indicate that concentrations of metals and PAHs exceed the groundwater LDW PCUL for protection of sediment.</p> <p>Soil: Analytical results for soil samples collected between 1990 and 2013 indicate that</p>

Property Name	Jorgensen Forge
	concentrations of PCBs, metals and PAHs exceeded the soil LDW PCULs for protection of sediment via bank erosion. In the 2013 samples, total PCB Aroclors, total cPAHs TEQ, chromium, and arsenic exceeded the soil LDW PCULs.
Preliminary Recommendation	Sources are not sufficiently controlled.

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Figures

Figure 1. RM 3.9-4.3 East (Slip 6) Source Control Area

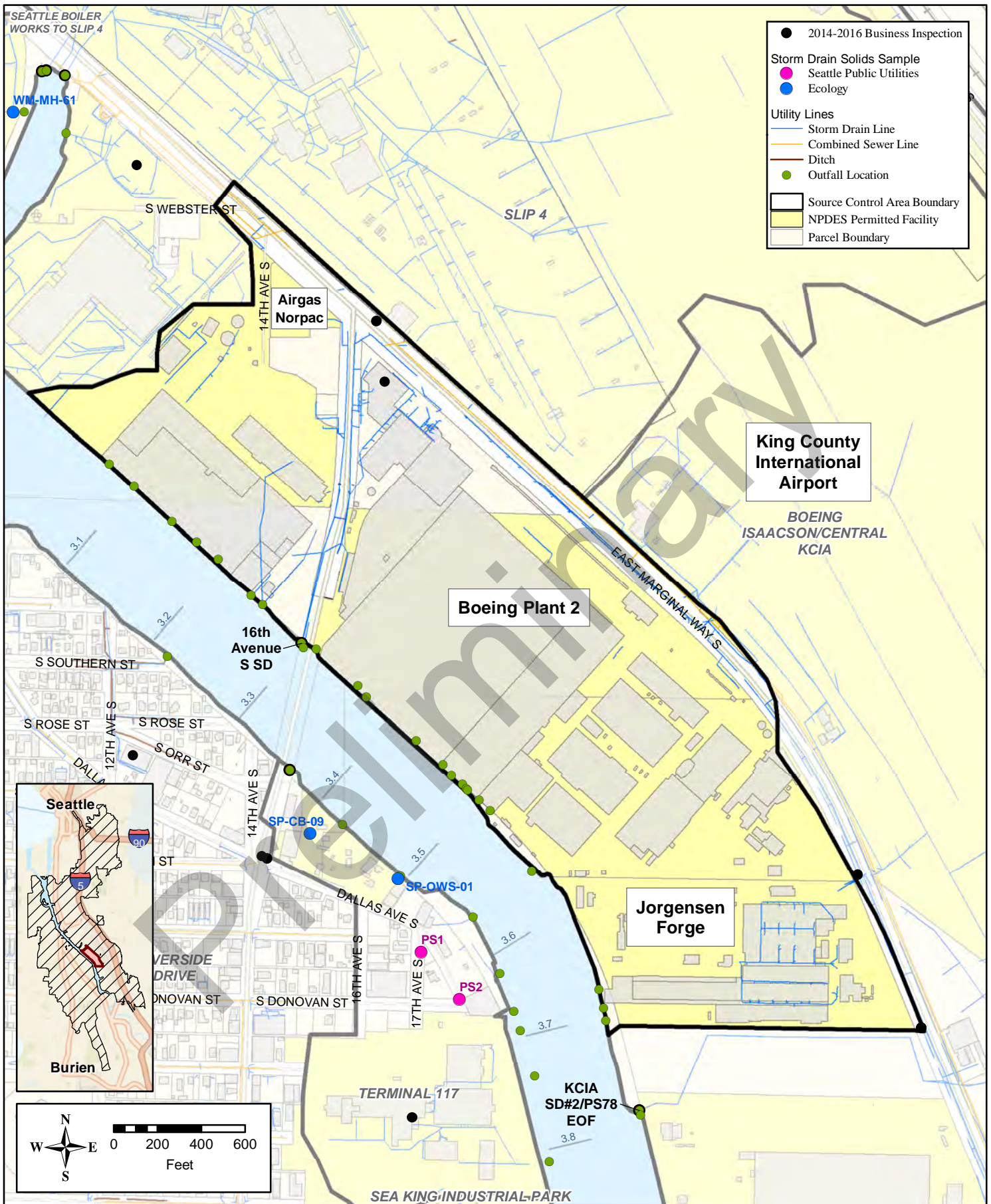
Figure 2. Jorgensen Forge Site

Attachments

Attachment A. Summary of Screening Level Exceedances in Surface Sediment and Storm Drain Solids

Attachment B. Outfall Information

Attachment C. Source Control Action Item Status



**Figure 1. RM 2.8-3.7 East
(EAA-4: Boeing Plant 2 to Jorgensen Forge)
Source Control Area**



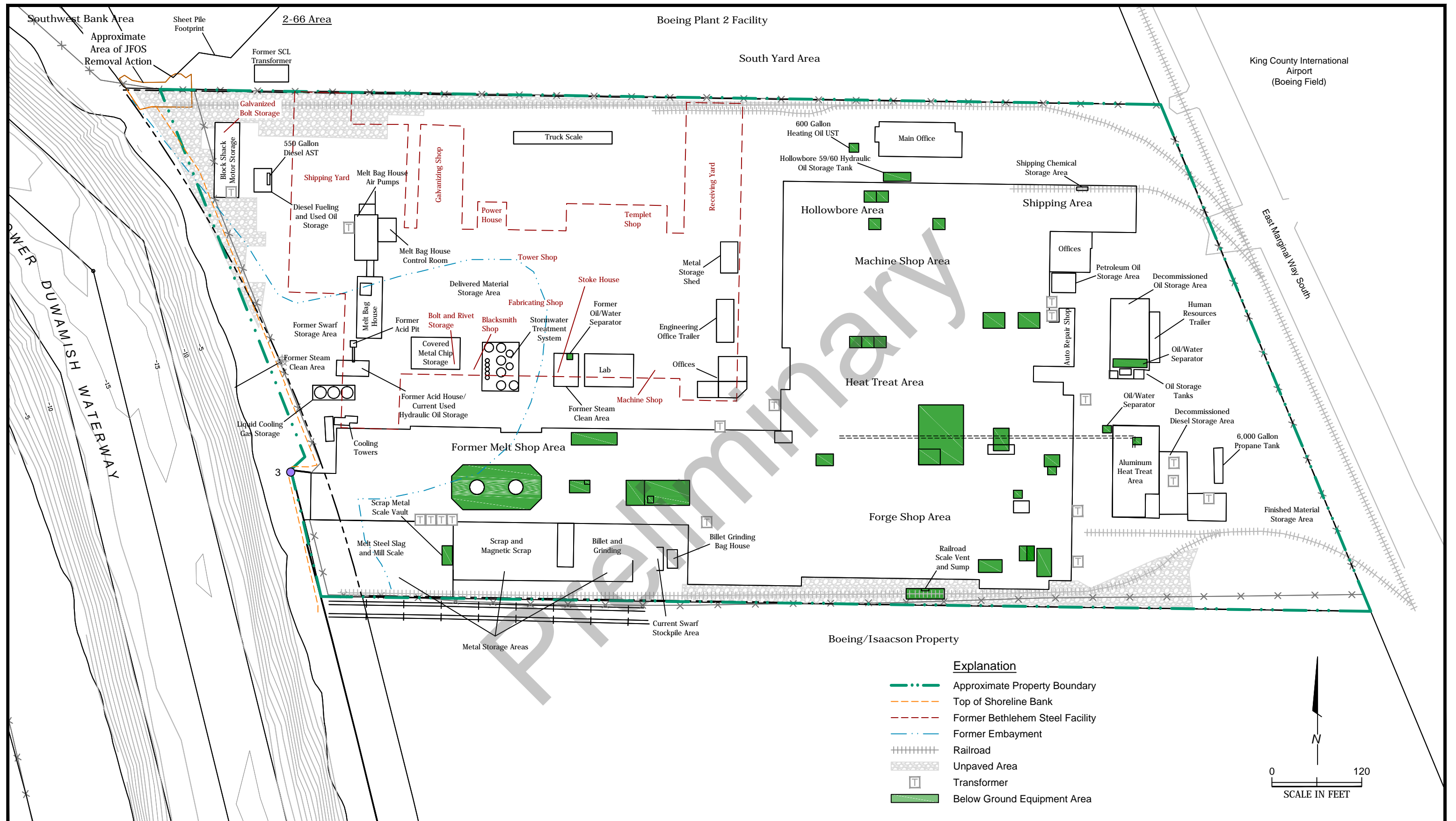


Figure 2. Jorgensen Forge Site Plan

Table A-1. Summary of Screening Level Exceedances in Surface Sediment near the Jorgensen Forge Site

Parameter	Frequency of Detection	Range of Detected Conc'ns (mg/kg DW)	Range of Nondetected Conc'ns (mg/kg DW)	Average Detected Conc'n (mg/kg DW)	Lower Screening Level (mg/kg DW) ¹	Maximum Exceedance Factor	Frequency of Detects Above Lower SL	Upper Screening Level (mg/kg DW) ²	Maximum Exceedance Factor	Frequency of Detects Above Upper SL
PCBs										
Total PCB Aroclors	47 / 47	0.0087 - 110	NA	5.0	0.13	846	43 / 47	1	110	18 / 47
Total PCB TEQ	3 / 3	2.34E-05 - 1.38E-03	NA	5.24E-04	7.00E-07	1,971	3 / 3	7.00E-07	1,971	3 / 3
Dioxins/Furans										
Total dioxin/furan TEQ	2 / 2	1.50E-05 - 1.01E-04	NA	5.81E-05	5.00E-06	20	2 / 2	5.00E-06	20	2 / 2
Metals										
Arsenic	20 / 20	7.89 - 37	NA	19	7	5.3	20 / 20	7	5.3	20 / 20
Chromium	20 / 20	26.9 - 584	NA	122	260	2.2	2 / 20	270	2.2	2 / 20
Copper	20 / 20	45.9 - 454	NA	103	390	1.2	1 / 20	390	1.2	1 / 20
Lead	20 / 20	25.5 - 870	NA	270	450	1.9	4 / 20	530	1.6	4 / 20
Mercury	18 / 18	0.09 - 0.528	NA	0.2	0.2	2.6	7 / 18	0.2	2.6	7 / 18
Zinc	20 / 20	115 - 1,690	NA	366	93	18	20 / 20	93	18	20 / 20
Metals - Butyltins										
Tributyltin	1 / 1	0.0058 - 0.0058	NA	0.0058	0.0021	2.8	1 / 1	0.0021	2.8	1 / 1
SVOCs - PAHs										
Anthracene	15 / 17	0.028 - 4.4	0.02 - 0.2	0.5	0.96	4.6	1 / 15	0.96	4.6	1 / 15
Benzo(a)anthracene	17 / 17	0.06 - 4.7	NA	0.7	1.3	3.6	2 / 17	1.6	2.9	1 / 17
Total benzofluoranthenes	17 / 17	0.17 - 7	NA	1	3.2	2.2	1 / 17	3.6	1.9	1 / 17
Benzo(a)pyrene	17 / 17	0.065 - 2	NA	0.6	0.85	2.3	4 / 17	1.6	1.3	1 / 17
Chrysene	17 / 17	0.075 - 6.6	NA	0.94	1.4	4.7	2 / 17	2.8	2.4	1 / 17
Dibenz(a,h)anthracene	12 / 17	0.012 - 0.23	0.02 - 0.2	0.088	0.23	1.0	1 / 12	0.23	1.0	1 / 12
Fluoranthene	17 / 17	0.12 - 10	NA	2	1.7	5.9	5 / 17	2.5	4.0	4 / 17
Fluorene	13 / 17	0.0069 - 1.5	0.02 - 0.2	0.4	0.54	2.8	4 / 13	0.54	2.8	4 / 13
Phenanthrene	17 / 17	0.053 - 4.9	NA	1.3	1.5	3.3	4 / 17	1.5	3.3	4 / 17
Pyrene	17 / 17	0.12 - 3.9	NA	1.2	2.6	1.5	2 / 17	3.3	1.2	2 / 17
Total LPAHs	17 / 17	0.089 - 11	NA	2.2	5.2	2.1	3 / 17	5.2	2.1	3 / 17
Total HPAHs	17 / 17	0.77 - 35	NA	6.9	12	2.9	2 / 17	17	2.1	1 / 17
Total cPAHs TEQ	17 / 17	0.0971 - 3.30	NA	0.800	0.009	367	17 / 17	0.009	367	17 / 17
Other SVOCs - Phthalates										
Butylbenzyl phthalate	14 / 17	0.007 - 0.1	0.02 - 0.2	0.04	0.063	1.6	2 / 14	NA	NA	NA
Other SVOCs										
Phenol	14 / 17	0.032 - 2.8	0.059 - 0.2	0.68	0.42	6.7	7 / 14	1.2	2.3	2 / 14

Table A-1. Summary of Screening Level Exceedances in Surface Sediment near the Jorgensen Forge Site

Parameter	Frequency of Detection	Range of Detected Conc'ns (mg/kg DW)	Range of Nondetected Conc'ns (mg/kg DW)	Average Detected Conc'n (mg/kg DW)	Lower Screening Level (mg/kg DW) ¹	Maximum Exceedance Factor	Frequency of Detects Above Lower SL	Upper Screening Level (mg/kg DW) ²	Maximum Exceedance Factor	Frequency of Detects Above Upper SL
Pesticides										
4,4'-DDT	1 / 1	0.036 - 0.036	NA	0.036	0.0001	360	1 / 1	0.0001	360	1 / 1
Total DDT	1 / 1	0.036 - 0.036	NA	0.036	0.0001	360	1 / 1	0.0001	360	1 / 1
Toxaphene	1 / 1	6.3 - 6.3	NA	6.3	0.78	8.1	1 / 1	NA	NA	NA

Summary of analytical data for storm drain solids samples collected in 2003, 2004, 2005, and 2009.

¹ Lower screening level is the lower of SMS SCO and minimum cleanup level in LDW ROD.

² Upper screening level is the higher of SMS CSL and minimum cleanup level in LDW ROD.

CSL - Cleanup Screening Level

cPAHs - carcinogenic polycyclic aromatic hydrocarbons

DDT - dichlorodiphenyltrichloroethane

DW - dry weight

HPAHs - high molecular weight polycyclic aromatic hydrocarbons

LDW - Lower Duwamish Waterway

LPAHs - low molecular weight polycyclic aromatic hydrocarbons

mg/kg - milligrams per kilogram

NA - not applicable

PAHs - polycyclic aromatic hydrocarbons

PCBs - polychlorinated biphenyl

ROD - Record of Decision

SCO - Sediment Cleanup Objective

SL - screening level

SVOCs - semivolatile organic compounds

TEQ - toxic equivalency

AECOM. 2012. Final Feasibility Study, Lower Duwamish Waterway, Seattle, Washington. Prepared for Lower Duwamish Waterway Group. October 31, 2012. [00099]

EPA. 2014. Record of Decision: Lower Duwamish Waterway Superfund Site. Prepared by the United States Environmental Protection Agency Region 10. November 2014. [12119]

Table A-2. Summary of Screening Level Exceedances in Storm Drain Solids at the Jorgensen Forge Site

Parameter	Frequency of Detection	Range of Detected Conc'ns (mg/kg DW)	Range of Nondetected Conc'ns (mg/kg DW)	Average Detected Conc'n (mg/kg DW)	Lower Screening Level (mg/kg DW) ¹	Maximum Exceedance Factor	Frequency of Detects Above Lower SL	Upper Screening Level (mg/kg DW) ²	Maximum Exceedance Factor	Frequency of Detects Above Upper SL
Metals										
Arsenic	5 / 6	30 - 70	30 - 30	50	7	10	5 / 5	7	10	5 / 5
Cadmium	4 / 6	0.8 - 21	1 - 1	8	5.1	4.1	2 / 4	6.7	3.1	2 / 4
Copper	6 / 6	190 - 4,060	NA	1,000	390	10	2 / 6	390	10	2 / 6
Lead	6 / 6	80 - 1,410	NA	600	450	3.1	3 / 6	530	2.7	3 / 6
Zinc	6 / 6	367 - 5,490	NA	1,490	93	59	6 / 6	93	59	6 / 6
SVOCs - PAHs										
Benzo(a)anthracene	4 / 6	0.41 - 2.9	0.061 - 0.063	1.7	1.3	2.2	3 / 4	1.6	1.8	3 / 4
Total benzofluoranthenes	4 / 6	0.84 - 6.7	0.061 - 0.063	4.1	3.2	2.1	3 / 4	3.6	1.9	3 / 4
Benzo(g,h,i)perylene	4 / 6	0.22 - 0.96	0.061 - 0.063	0.64	0.67	1.4	2 / 4	0.72	1.3	2 / 4
Benzo(a)pyrene	4 / 6	0.41 - 3.4	0.061 - 0.063	1.8	0.85	4.0	3 / 4	1.6	2.1	3 / 4
Chrysene	4 / 6	0.46 - 3.5	0.061 - 0.063	1.9	1.4	2.5	3 / 4	2.8	1.3	1 / 4
Fluoranthene	4 / 6	0.88 - 5.4	0.061 - 0.063	3.1	1.7	3.2	3 / 4	2.5	2.2	3 / 4
Fluorene	2 / 6	0.21 - 0.57	0.061 - 0.18	0.39	0.54	1.1	1 / 2	0.54	1.1	1 / 2
Indeno(1,2,3-cd)pyrene	4 / 6	0.23 - 1.2	0.061 - 0.063	0.74	0.6	2.0	3 / 4	0.69	1.7	3 / 4
Phenanthrene	4 / 6	0.45 - 3.5	0.061 - 0.063	1.5	1.5	2.3	2 / 4	1.5	2.3	2 / 4
Pyrene	4 / 6	0.77 - 5.6	0.061 - 0.063	3.0	2.6	2.2	2 / 4	3.3	1.7	1 / 4
Total LPAHs	4 / 6	0.58 - 5.2	0.061 - 0.063	2.3	5.2	1.0	1 / 4	5.2	1.0	1 / 4
Total HPAHs	4 / 6	4.2 - 30	0.061 - 0.063	20	12	2.5	3 / 4	17	1.7	2 / 4
Total cPAHs TEQ	4 / 6	0.57 - 4.5	0.043 - 0.044	2.5	0.009	503	4 / 4	0.009	503	4 / 4
Other SVOCs - Phthalates										
Butylbenzyl phthalate	1 / 6	10 - 10	0.061 - 0.32	10	0.063	159	1 / 1	0.9	11	1 / 1
Dibutyl phthalate	3 / 6	0.62 - 9.2	0.061 - 0.064	5.0	1.4	6.6	2 / 3	1.4	6.6	2 / 3
Dimethyl phthalate	2 / 6	0.23 - 0.43	0.061 - 0.32	0.33	0.071	6.1	2 / 2	0.16	2.7	2 / 2

Summary of analytical data for storm drain solids samples collected in 2011.

¹ Lower screening level is the lower of SMS SCO and minimum cleanup level in LDW ROD.

² Upper screening level is the higher of SMS CSL and minimum cleanup level in LDW ROD.

CSL - Cleanup Screening Level

cPAHs - carcinogenic polycyclic aromatic hydrocarbons

DW - dry weight

HPAHs - high molecular weight polycyclic aromatic hydrocarbons

LDW - Lower Duwamish Waterway

Table A-2. Summary of Screening Level Exceedances in Storm Drain Solids at the Jorgensen Forge Site

LPAHs - low molecular weight polycyclic aromatic hydrocarbons

mg/kg - milligrams per kilogram

NA - not applicable

PAHs - polycyclic aromatic hydrocarbons

ROD - Record of Decision

SCO - Sediment Cleanup Objective

SL - screening level

SMS - Sediment Management Standards

SVOCs - semivolatile organic compounds

TEQ - toxic equivalency

EPA. 2014. Record of Decision: Lower Duwamish Waterway Superfund Site. Prepared by the United States Environmental Protection Agency Region 10. November 2014. [12119]

Floyd | Snider. 2011. Jorgesen Forge Outfall Site, Seattle, Washington, Source Control Action Completion Report. Prepared for The Boeing Company and Jorgensen Forge Corporation.

May 27, 2011. [10202]

Preliminary

Table B-1. Outfalls at the Jorgensen Forge Site

Outfall ID	Alternate Outfall ID	Outfall Status	Outfall Type	Outfall Diameter	Outfall Material	WQ Permit	Outfall Notes
2065	223E, JOR-003	Active	Private SD	18-inch	Concrete	WAR003231 (Jorgensen Forge Corp)	All stormwater discharges to the LDW through outfall (JOR-003) after passing through a polymer/sand filter treatment system (Anchor QEA 2012 [10469]).

CMP - corrugated metal pipe

LDW - Lower Duwamish Waterway

SD - storm drain

Anchor QEA (Anchor QEA, LLC). 2012. Stormwater Pollution Prevention Plan, Industrial Stormwater General Permit, Permit No. WAR-003231. Prepared for Jorgensen Forge Corporation. Version 2.0. March 2012. [10469]

Preliminary

Table C-1. Source Control Action Item Status for the Jorgensen Forge Site

Action Item	Priority	Type	Responsible Party	Status	Estimated Completion Date	Date Completed	Comments/Follow-On Actions
Conduct a source control investigation through Ecology Agreed Order No. DE-4127 to determine if the facility is an ongoing source of contamination to LDW sediments.	High	SCAP	Jorgensen, Ecology	Complete	--	March 2011	Completed under Agreed Order No. DE-4127. (Floyd Snider 2011 [10202])
Conduct soil and groundwater sampling in the southeast portion of the site (historically thought to have been occupied by a wood treating facility) to determine if arsenic contamination is present and if so, whether the contamination is leaching into the adjacent sediments.	High	SCAP	Ecology, Jorgensen	Complete	--	March 2011	Completed under Agreed Order No. DE-4127.
Review current groundwater monitoring data to ensure that groundwater is not a pathway for contaminants to the LDW.	High	SCAP	Ecology, Jorgensen	Complete	--	March 2011	Completed under Agreed Order No. DE-4127.
Conduct groundwater sampling in the center of the property (previously occupied by Isaacson Iron Works) to determine if contaminants are present above screening levels.	High	SCAP	Ecology, Jorgensen	Complete	--	March 2011	Completed under Agreed Order No. DE-4127.
Determine ownership of the 12- and 24-inch diameter storm drain lines located in an easement along the Jorgensen/Boeing property line; determine the exact locations of the connections between these lines and the stormwater systems of Jorgensen, Boeing, City of Tukwila, and KCIA.	High	SCAP	Ecology, Jorgensen Forge, Boeing, City of Tukwila, KCIA	Complete	--	November 2008	Boeing agreed to take responsibility for the 12-inch line. Ecology issued Notice of Violation to King County/City of Tukwila for PCBs in 24-inch line.
Remove PCB-contaminated sediments from the 24-inch storm drain line.	High	Follow-On	EPA, Boeing, Jorgensen	Complete	--	February 2011	Cleaning and closure of 15-inch and 24-inch public storm drains completed in response to an EPA Action Memorandum for a Time Critical Removal Action.
Contain and remove soils from upland outfall area of the 12-and 24-inch pipes.	High	Follow-On	EPA, Boeing, Jorgensen	In Progress	TBD		A 24-inch pipe and contaminated soil below the pipe were partially excavated in 2015 and 2017. Land use restrictions will address remaining contamination left in place (EPA 2018).
Develop a hydrogeologic site model as part of the source control investigation to characterize the groundwater system on site, including tidal influence.	High	SCAP	Jorgensen, Boeing	In Progress	TBD		

Table C-1. Source Control Action Item Status for the Jorgensen Forge Site

Action Item	Priority	Type	Responsible Party	Status	Estimated Completion Date	Date Completed	Comments/Follow-On Actions
Complete a Remedial Investigation/Feasibility Study of the upland site area	High	New	Jorgensen, Boeing	In Progress	TBD		Ecology issued an enforcement order for completion of an RI/FS on March 16, 2015. Jorgensen submitted a draft RI work Plan to Ecology in Summer 2015 and declared bankruptcy in 2016. A new Agreed Order was anticipated in 2017.
Continue to address PCB and metals contamination in sediments of the LDW and Shoreline Bank Area through EPA CERCLA Order No. 10-2013-0032.	High	SCAP	EPA, Jorgensen	Complete	--	February 2012	Certificate of Completion approved by EPA in February 2012.
Negotiate an Amended Administrative Order on Consent for preparation of a Work Plan to clean up affected sediments along a portion of the LDW adjacent to this property.	High	New	EPA, Jorgensen	Complete	--	November 2012	EPA issued an Administrative Settlement Agreement, Order on Consent, and Statement Work for the Jorgensen Forge Early Action Area Non-Time Critical Removal Action Implementation in November 2012.
Implement Non-Time Critical Removal Action.	High	Follow-On	EPA, Jorgensen	Complete	--	September 2014	Removal Action construction including shoreline bank excavation and contaminated sediment removal was completed on September 13, 2014.

COCs - chemicals of concern

cPAHs - carcinogenic polycyclic aromatic hydrocarbons

KC - King County

LDW - Lower Duwamish Waterway

MTCA - Model Toxics Control Act

PCBs - polychlorinated biphenyls

RI/FS - Remedial Investigation/Feasibility Study

SCAP - Source Control Action Plan

TBD - to be determined

TPH - total petroleum hydrocarbons

Ecology. 2018. Lower Duwamish Waterway Source Control Status Report, January 2014 through December 2016, Draft. Prepared by the Washington State Department of Ecology, Toxics Cleanup Program, Northwest Regional Office. Publication No. 17-09-2666. In progress.

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<https://cumulis.epa.gov/supercpad/SiteProfiles/index.cfm?fuseaction=second.Cleanup&id=1002020#bkground>. Accessed on April 20, 2018.

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May 27, 2011. [10202]

Property Name	Former Rhône-Poulenc Site
GENERAL INFORMATION	
Address	9229 East Marginal Way S, Tukwila, WA 98108
Property No.	12005
Tax Parcel No.	West Parcel: 542260-0010; East Parcel: formerly 542260-0020 but currently 572980-0010, 572980-0020, and part of 573000-0010.
Property Owner	West Parcel: Container Properties LLC; East Parcel: Museum of Flight Foundation
Current Operator	West Parcel: Insurance Auto Auctions, Inc.; East Parcel: Museum of Flight and Raisbeck Aviation High School
Property Size	West Parcel: 13.15 acres; East Parcel: 6.5 acres.
Facility/Site ID	2150 (Container Properties LLC)
Alternate Names	Container Properties LLC, Monsanto Corp Seattle Plant, Rhodia Inc, Rhône Poulenc, Rhône Poulenc Inc, BASF Corp Rhône Poulenc, Insurance Auto Auctions, Museum of Flight Overflow Parking, Raisbeck Aviation High School
NPDES Permit No.	WAR0008681 (ISGP) [Note – this permit also covers Insurance Auto Auctions Inc. activities at the 8801 Site to the north.]
UST/LUST ID No.	None
SITE HISTORY AND ACTIVITIES	
Description	The former Rhône-Poulenc site is located on the east side of the Lower Duwamish Waterway (LDW) from approximately river mile (RM) 4.0 to 4.2. The site is approximately 21.5 acres, of which 19.5 acres are considered uplands and 2 acres are intertidal mudflats. The site is bordered by the 8801 site to the north, East Marginal Way S to the east, the Boeing Developmental Center (BDC) and Slip 6 to the south, and the LDW to the west.
Historical Activities	Industrial use of the property began in the 1930s when I.F. Laucks built a pilot plant to formulate glue for use in plywood manufacturing. In the mid-1940s, the site was used as prisoner-of-war camp. In 1946, the site was purchased by Monsanto Chemical Company, which manufactured glue, paints, and resins, and handled wood preservatives. In 1952, Monsanto began producing vanillin at the site. Production continued when the property was sold to Rhône-Poulenc in 1986, and ceased in 1991 (Ecology 2008 [00080]).
Current Activities	There have been no manufacturing activities at this site since the facility’s closure in 1991. The process equipment, most tanks, and several buildings were dismantled or removed during closure. The West Parcel is currently owned by Container Properties LLC; the upland portion of the West Parcel is leased by Insurance Auto Auctions (IAA) for use as a vehicle storage yard. The East Parcel was sold to the Museum of Flight Foundation in 2007 (Ecology 2008 [00080]).
Chemicals of Concern	The U.S. Environmental Protection Agency (EPA) has not designated chemicals of concern (COCs) for this section of the LDW. Based on available information, the following chemicals of concern were selected for Slip 6: lead, mercury, zinc, polychlorinated biphenyls (PCBs), high molecular weight polycyclic aromatic hydrocarbons (HPAHs), carcinogenic polycyclic aromatic

Property Name	Former Rhône-Poulenc Site
	hydrocarbons (cPAHs), and phthalates.
CONTAMINATED MEDIA	
Surface Sediment	<p>Between 1994 and 2012 (EIM Study IDs RHONE194, RHONE294, RHONE495, RHONE804, SAIC 2011 [06118], Cardno ENTRIX 2012 [10697]), 137 surface sediment samples collected between RM 4.0 and 4.2. The following chemicals exceeded the Washington State Sediment Management Standards (SMS) Sediment Cleanup Objective (SCO)/lowest Apparent Effects Threshold (LAET) or the minimum cleanup level in the LDW Record of Decision (ROD) (EPA 2014[12119]) in one or more sample.</p> <ul style="list-style-type: none"> • PCBs: total PCB Aroclors and total PCB toxic equivalency (TEQ) • Total dioxin/furan TEQ • Metals: arsenic, lead, mercury, zinc, and tributyltin • PAHs: anthracene, benzo(a)anthracene, total benzofluoranthenes, benzo(a)pyrene, benzo(g,h,i)perylene, chrysene, dibenz(a,h)anthracene, fluoranthene, fluorene, indeno(1,2,3-cd)pyrene, phenanthrene, pyrene, total HPAHs, and total cPAHs TEQ • Phthalates: bis(2-ethylhexyl) phthalate, butylbenzyl phthalate, and dimethyl phthalate • Other SVOCs: benzoic acid, benzyl alcohol, hexachlorobenzene, and phenol • Pesticides: 4,4'-DDT, total DDT, total aldrin/dieldrin, and heptachlor <p>Highest exceedance factors (EF) were observed for 4,4'-DDT (EF = 820), total DDT (EF = 470), total cPAHs TEQ (EF = 236), butylbenzyl phthalate (EF = 35), mercury (EF = 34), lead (EF = 27), total PCB Aroclors (EF = 22) and dimethyl phthalate (EF= 14). See Table A-1 for additional details.</p> <p>These chemicals, with the exceptions of benzo(a)anthracene, benzo(a)pyrene, and chrysene, also exceeded the SMS Cleanup Screening Level (CSL)/second lowest Apparent Effects Threshold (2LAET) or the minimum cleanup level in the LDW ROD in at least one sample. See Table A-1 for additional details.</p>
Storm Drain Solids	Only on storm drain solids sample has been collected at this site; no chemicals exceeded screening levels in that sample, which was collected in 2011. During the October 2014 National Pollutant Discharge Elimination System (NPDES) inspection, insufficient solid material was present in the storm drain structures examined (Leidos 2015[10939 & 10945]).
Groundwater	<p>In 1985, investigations detected release of hazardous constituents to soils and groundwater, including toluene and metals (copper, arsenic, mercury). Most of the contamination was located in the former processing and chemical storage areas on the West Parcel. A hydraulic control interim measure (HCIM) was installed in 2003, consisting of a low permeability barrier wall, groundwater recovery system, and performance monitoring well network. Mercury is the only Slip 6 COC in groundwater noted in the Slip 6 Data Gaps Report, and concentrations appear to be below screening levels as of 2006 (Ecology 2008 [00080]).</p> <p>No Slip 6 COCs have been identified in groundwater at the East Parcel.</p>
Soil	Bank soils may have been contaminated by historical activities (application of wastes vanillin black liquor solids). A Shoreline & Sediment Investigation Work Plan (AMEC Geomatrix Inc. 2011 [07254]) presents describes plan for collecting bank soil samples from Slip 6 and LDW riverbank; however, a report documenting these results has not been identified.
TRANSPORT PATHWAYS	
Outfalls	Stormwater from the Rhône-Poulenc site enters the KCIA SD#1 stormwater conveyance just upstream of the outfall location to Slip 6; this discharge is included in the IAA Industrial

Property Name	Former Rhône-Poulenc Site
	Stormwater General Permit (ISGP) WAR008681. A Stormwater Pollution Prevention Plan (SWPPP) prepared for this facility in 2012 describes the storm drain system, include stormwater treatment systems and best management practices (BMPs) in place at the facility (Windward 2012 [10365]). Additional information about each outfall is provided in Table B-1.
Relevant Pathways	<p>Based on information provided in the Source Control Action Plan (SCAP) (Ecology 2008 [00080]), and the information on contaminated media above, the following pathways may contribute to sediment recontamination:</p> <ul style="list-style-type: none"> • Stormwater is treated prior to discharge. No COCs were identified in the one storm drain solids sample that has been collected. During a 2014 inspection, very little solid material was present (Leidos 2015 [10939 & 10945]). • Contaminated soil and groundwater are being controlled by the HCIM, and therefore do not pose a current risk of recontaminating sediment. • No data is available on COC concentrations in bank soil. Therefore, erosion of bank soil is a potential pathway for transport of COCs to LDW sediments. <p>Surface runoff is not considered a significant pathway; the site is paved and runoff is directed to the onsite storm drain system. Leaks and spills may occur, but are likely to be captured in the onsite storm drain system. Waterway operations and atmospheric deposition have not been identified as relevant pathways at this property.</p>
SOURCE CONTROL ACTIONS	
Action Item Status	<p>Four high priority action items were identified for the site; one of these has been completed. A description of each action item and its status is provided in Table C-1. The following high priority action items are listed as in progress or planned in the most recent Source Control Status Report (Ecology 2018):</p> <ul style="list-style-type: none"> • In progress: Continue to monitor the effectiveness of the hydraulic interim control measure, and investigate the presence of elevated copper concentrations in groundwater outside the barrier wall and the potential leak in the barrier wall. • In progress: Investigate and address shoreline bank contamination from historical site operations and releases (e.g., application of vanillin black liquor solids to the shoreline bank for weed control). • Planned: Review the current SWPPP and Operations and Maintenance Plan. Make necessary changes and additions to prevent contaminants from potential upland sources (such as fuel leaks from damaged vehicles) from migrating to Slip 6 source control area sediments via the stormwater system. <p>Some of these action items are not related to Slip 6 COCs, and therefore are not relevant to the source control sufficiency evaluation, specifically the first bullet above.</p>
INSPECTION, PERMIT, AND CLEANUP STATUS	
Inspections	A stormwater compliance inspection was conducted on October 20, 2014 (Leidos 2015 [10939 & 10945]). The inspection report was not available for review.
Permit Compliance Status	<p>Several benchmark exceedances for copper and zinc were noted in 2015 and 2016 (Ecology PARIS website).</p> <p>Stormwater is treated prior to discharge (Windward 2012 [10365]).</p>
Upland Cleanups	<u>West Parcel:</u> In May 1993, Rhône-Poulenc and EPA entered into an Administrative Order on Consent under the EPA’s Resource Conservation and Recovery Act (RCRA) corrective action authority to address releases of contaminants at the facility. A RCRA Facility Investigation (RFI)

Property Name	Former Rhône-Poulenc Site
	<p>was conducted in 1995. A hydraulic control interim measure (HCIM) was implemented in 2003. Groundwater outside the barrier wall (included in the shoreline area of the site) will be addressed as part of a future site cleanup under RCRA (Ecology 2008 [00080]). A draft Corrective Measures Study work plan was submitted to EPA in September 2014; a carbon dioxide injection pilot study was to address high pH values was expected to begin in early 2016.</p> <p>Several other voluntary interim measures have been conducted at the site, including installation and operation of a soil vapor extraction system to remove toluene from beneath the former tank farm (2000 to 2002) and two separate PCB removal actions (1995, 2006). Soil removal was conducted in conjunction with an extensive redevelopment of the property in 2006 (Ecology 2008 [00080]).</p> <p>In April 2009, EPA requested that Container Properties complete additional investigations in the Slip 6 bank area and in LDW sediments near the site. In June 2011, Container Properties submitted a shoreline and sediment investigation work plan for the West Parcel; EPA approved the plan, with modifications, in August 2011. The work plan included collection of soil and/or groundwater samples along the LDW shoreline, between the barrier wall and top of the bank, and collection of LDW surface and subsurface sediment samples (AMEC Geomatrix Inc. 2011 [07254]).</p> <p>Characterization of intertidal and subtidal sediments was conducted in 2011/2012. Results indicated the presence of PCBs and benzyl alcohol in surface sediments at concentrations above the SCO. In subsurface sediment samples, mercury, PAHs, PCBs, and benzyl alcohol exceeded the SCO. The shoreline bank contamination investigation was completed in September 2012 (Ecology 2012 [10359]).</p> <p>The shoreline area will be addressed as part of a future site cleanup under RCRA. A draft Corrective Measures Study work plan was submitted to EPA in September 2014. A groundwater pump-and-treat system with a barrier wall currently contains much of the soil and groundwater contamination at the West Parcel (Ecology 2018).</p> <p>EPA is also working with the responsible parties to begin an onsite study to inject carbon dioxide into the groundwater to evaluate its potential to lower pH at the site, and to conduct additional groundwater sampling to better understand the groundwater contamination. Information from this study and sampling, along with prior investigations, will be used to help determine appropriate corrective measures for cleaning up the West Parcel (Ecology 2018).</p> <p><u>East Parcel:</u> The 1995 RFI indicated that the East Parcel had not been impacted by facility operations, however some contaminants (PCBs, arsenic, copper, mercury, cPAHs, and toluene) were present in soil in the East Parcel. A voluntary removal action was undertaken by the property owner in late summer 2006, however a small amount of toluene remained in groundwater. EPA issued a Statement of Basis in November 2006 proposing to select source area excavation and removal as the final remedy for the East Parcel, and to require a contingent remedy to address residual toluene in groundwater if source removal is not effective (EPA 2006 [01828]). EPA has issued a partial “Corrective Action Complete Without Controls” determination for the site.</p> <p>EPA approved shutdown of the active operation of the East Parcel CMI biosparge/vent system in July 2015. If the toluene levels continue to be in compliance with the cleanup standard for four consecutive quarters of groundwater monitoring following shutdown, the system may be dismantled and the monitoring discontinued (AMEC Foster Wheeler 2017 [11076]).</p>
<p>Other Relevant Studies</p>	<p>Storm drain water samples were collected in October 2014 at one location:</p> <p>Manhole S5, located near the South Outfall (#4) at the former Rhône-Poulenc site. This manhole is located upstream of the stormwater treatment system. During heavy flows, a portion of the stormwater bypasses the treatment system via a weir in manhole S5. Copper, PCBs, and BEHP were detected at a concentration above one or more state or federal water quality criteria (Leidos 2015 [10939 & 10945]).</p>

Property Name	Former Rhône-Poulenc Site
RECOMMENDATION	
Source Control Summary	<p>Three high priority actions are incomplete. Bank soils may be contaminated by historical activities; characterization data were not available for review.</p> <p>Upland cleanup of the West Parcel is not complete. Soil and groundwater contamination may be present at the West Parcel. Slip 6 sediment COCs do not appear to be present in soil and groundwater; in addition an interim measure is in place to minimize contaminants from reaching the LDW. The East Parcel has been remediated.</p> <p>Surface sediment: Analytical results for samples collected between 1994 and 2012 indicate that PCBs, dioxins/furans, metals, PAHs, phthalates, other SVOCs and pesticides concentrations exceed the SMS CSL/2LAET.</p> <p>Storm drain solids: Slip 6 COCs were not detected in the storm drain sample collected in 2011. During a 2014 inspection, very little solid material was present (Leidos 2015 [10939 & 10945]).</p> <p>Stormwater: Analytical results for samples collected in 2014 indicate that copper, PCBs, and BEHP concentrations exceeded one or more state or federal water quality criteria (Leidos 2015 [10939 & 10945]). Stormwater is treated prior to discharge (Windward 2012 [10365]).</p>
Preliminary Recommendation	<p>Sources are controlled with qualifications. Characterization of the bank soils is needed before sediment cleanup can proceed.</p>

References

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AMEC Foster Wheeler. 2017. East Parcel Corrective Measures Implementation, Operations and Maintenance Report, 2016. Former Rhone-Poulenc Site, Tukwila, Washington. Prepared for: Container Properties, L.L.C., Tukwila, Washington. March 2017. [11076]

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Ecology. 2012. Lower Duwamish Waterway Source Control Status Report, January 2012 through December 2012. Prepared by Washington State Department of Ecology, Toxics Cleanup Program, Northwest Regional Office. Publication No. 13-09-136. June 2013. [10359]

Ecology. 2018. Lower Duwamish Waterway Source Control Status Report, January 2014 through December 2016, Draft. Prepared by the Washington State Department of Ecology, Toxics Cleanup Program, Northwest Regional Office. Publication No. 17-09-2666. In progress.

EPA. 2006. Statement of Basis for Remedy Selection and Corrective Action Complete without Controls Determination at Rhône-Poulenc, Inc., East Parcel, Located at 9229 East Marginal Way South, Tukwila, WA. EPA Identification Number WAD 00928 2302, Administrative Order on Consent 1091-11-20-3008(h). Prepared by the U.S. Environmental Protection Agency, Region 10. November 2006. [01828]

EPA. 2014. Record of Decision: Lower Duwamish Waterway Superfund Site. Prepared by the United States Environmental Protection Agency Region 10. November 2014. [12119]

Leidos. 2015. Lower Duwamish Waterway, NPDES Inspection Sampling Support 2014/2015, Appendix Q: Insurance Auto Auctions. Prepared for the Washington State Department of Ecology, Toxics Cleanup Program, Northwest Regional Office. June 2015. [10939 & 10945]

SAIC (Science Applications International Corporation). 2011. Surface Sediment Sampling at Outfalls in the Lower Duwamish Waterway, Seattle, WA, Data Report. Prepared for the Washington State Department of Ecology, Toxics Cleanup Program, Northwest Regional Office. October 2011. [06118]

Windward (Windward Environmental, LLC). 2012. Stormwater Prevention Pollution Plan, Insurance Auto Auctions, 8801 East Marginal Way South, Tukwila, Washington. Prepared for Insurance Auto Auctions, Inc. May 2012. [10365]

Figures

Figure 1. RM 3.9-4.3 East (Slip 6) Source Control Area

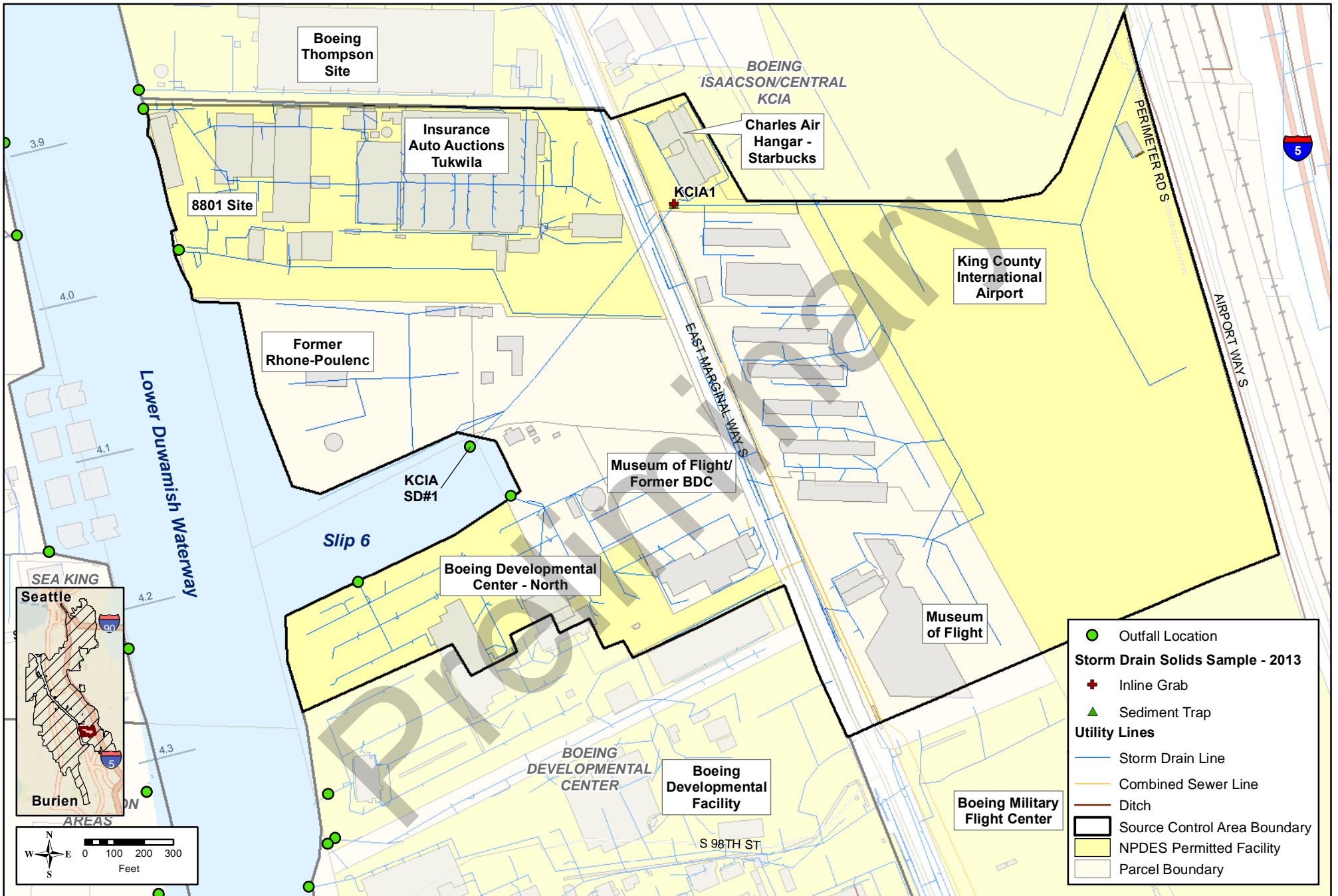
Figure 2. Former Rhône-Poulenc Site

Attachments

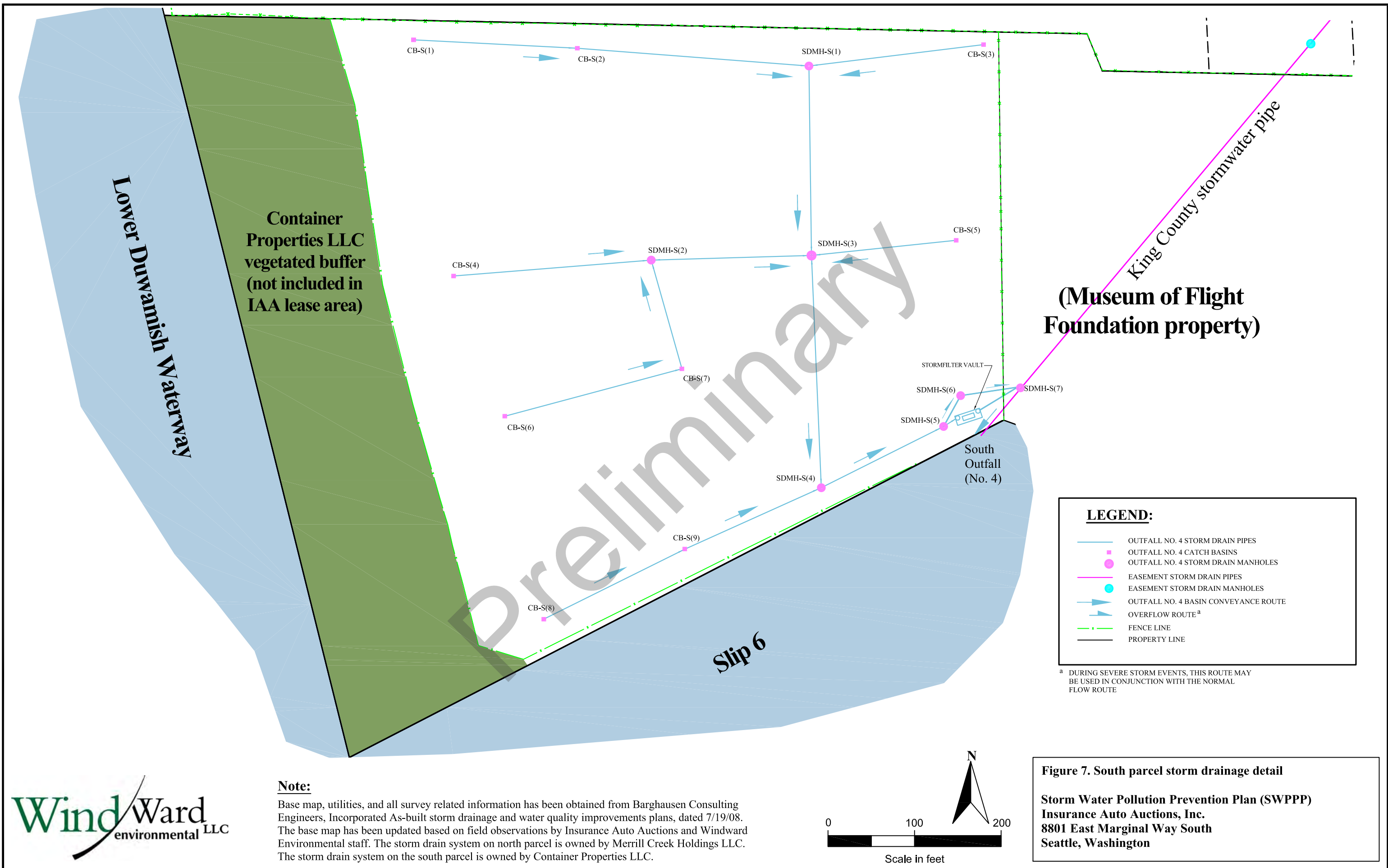
Attachment A. Summary of Screening Level Exceedances in Surface Sediment and Storm Drain Solids

Attachment B. Outfall Information

Attachment C. Source Control Action Item Status



**Figure 1. RM 3.9-4.3 East
(Slip 6)
Source Control Area**



Note:
 Base map, utilities, and all survey related information has been obtained from Barghausen Consulting Engineers, Incorporated As-built storm drainage and water quality improvements plans, dated 7/19/08. The base map has been updated based on field observations by Insurance Auto Auctions and Windward Environmental staff. The storm drain system on north parcel is owned by Merrill Creek Holdings LLC. The storm drain system on the south parcel is owned by Container Properties LLC.

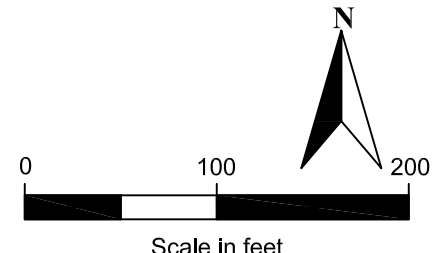


Figure 7. South parcel storm drainage detail
Storm Water Pollution Prevention Plan (SWPPP)
Insurance Auto Auctions, Inc.
8801 East Marginal Way South
Seattle, Washington

Figure 2. Former Rhône-Poulenc Site

Table A-1. Summary of Screening Level Exceedances in Surface Sediment near the Former Rhône-Poulenc Site

Parameter	Frequency of Detection	Range of Detected Conc'ns (mg/kg DW)	Range of Nondetected Conc'ns (mg/kg DW)	Average Detected Conc'n (mg/kg DW)	Lower Screening Level (mg/kg DW) ¹	Maximum Exceedance Factor	Frequency of Detects Above Lower SL	Upper Screening Level (mg/kg DW) ²	Maximum Exceedance Factor	Frequency of Detects Above Upper SL
PCBs										
Total PCB Aroclors	75 / 79	0.012 - 2.9	0.019 - 0.02	0.2	0.13	22	32 / 75	1	2.9	3 / 75
Total PCB TEQ	2 / 2	1.65E-06 - 2.94E-06	NA	2.30E-06	7.00E-07	4.2	2 / 2	7.00E-07	4.2	2 / 2
Dioxins/Furans										
Total dioxin/furan TEQ	14 / 14	4.38E-06 - 2.06E-05	NA	9.38E-06	5.00E-06	4.1	13 / 14	5.00E-06	4.1	13 / 14
Metals										
Arsenic	111 / 111	2.8 - 33.1	NA	11	7	4.7	93 / 111	7	4.7	93 / 111
Lead	111 / 111	5.2 - 12,300	NA	140	450	27	1 / 111	530	23	1 / 111
Mercury	96 / 110	0.03 - 6.8	0.05 - 0.22	0.2	0.2	34	21 / 96	0.2	34	21 / 96
Zinc	111 / 111	32.4 - 1,000	NA	100	93	11	57 / 111	93	11	57 / 111
Metals - Butyltins										
Tributyltin	2 / 2	0.0017 - 0.0067	NA	0.0042	0.0021	3.2	1 / 2	0.0021	3.2	1 / 2
SVOCs - PAHs										
Anthracene	63 / 91	0.011 - 2.3	0.016 - 0.31	0.081	0.96	2.4	1 / 63	0.96	2.4	1 / 63
Benzo(a)anthracene	73 / 77	0.018 - 1.4	0.17 - 0.17	0.19	1.3	1.1	2 / 73	NA	NA	NA
Total benzofluoranthenes	77 / 77	0.047 - 3.7	NA	0.50	3.2	1.2	1 / 77	3.6	1.0	1 / 77
Benzo(a)pyrene	85 / 92	0.016 - 1.4	0.043 - 0.35	0.19	0.85	1.6	2 / 85	NA	NA	NA
Benzo(g,h,i)perylene	70 / 77	0.01 - 1.1	0.02 - 0.35	0.1	0.67	1.6	2 / 70	0.72	1.5	2 / 70
Chrysene	87 / 92	0.018 - 2.1	0.043 - 0.17	0.30	1.4	1.5	4 / 87	NA	NA	NA
Dibenz(a,h)anthracene	66 / 91	0.0062 - 0.7	0.013 - 0.85	0.08	0.23	3.0	7 / 66	0.23	3.0	7 / 66
Fluoranthene	90 / 92	0.036 - 5.3	0.33 - 0.34	0.56	1.7	3.1	3 / 90	2.5	2.1	3 / 90
Fluorene	33 / 90	0.0036 - 0.57	0.013 - 0.31	0.045	0.54	1.1	1 / 33	0.54	1.1	1 / 33
Indeno(1,2,3-cd)pyrene	88 / 92	0.0092 - 1.2	0.02 - 0.043	0.1	0.6	2.0	2 / 88	0.69	1.7	2 / 88
Phenanthrene	85 / 92	0.02 - 1.8	0.043 - 0.17	0.2	1.5	1.2	2 / 85	1.5	1.2	2 / 85
Pyrene	90 / 92	0.019 - 4.1	0.17 - 0.17	0.46	2.6	1.6	3 / 90	3.3	1.2	2 / 90
Total HPAHs	77 / 77	0.231 - 20	NA	3	12	1.7	3 / 77	17	1.2	1 / 77
Total cPAHs TEQ	77 / 77	0.025 - 2.1	NA	0.29	0.009	236	77 / 77	0.009	236	77 / 77
Other SVOCs										
Benzoic acid	23 / 82	0.098 - 1.9	0.013 - 3	0.5	0.65	2.9	6 / 23	0.65	2.9	6 / 23
Benzyl alcohol	21 / 81	0.02 - 0.29	0.0046 - 0.52	0.1	0.057	5.1	15 / 21	0.073	4.0	13 / 21
Bis(2-ethylhexyl) phthalate	77 / 92	0.022 - 2.1	0.033 - 1.5	0.21	1.3	1.6	3 / 77	1.9	1.1	2 / 77
Butylbenzyl phthalate	62 / 79	0.0034 - 2.2	0.0064 - 0.52	0.071	0.063	35	12 / 62	0.9	2.4	1 / 62

Table A-1. Summary of Screening Level Exceedances in Surface Sediment near the Former Rhône-Poulenc Site

Parameter	Frequency of Detection	Range of Detected Conc'ns (mg/kg DW)	Range of Nondetected Conc'ns (mg/kg DW)	Average Detected Conc'n (mg/kg DW)	Lower Screening Level (mg/kg DW) ¹	Maximum Exceedance Factor	Frequency of Detects Above Lower SL	Upper Screening Level (mg/kg DW) ²	Maximum Exceedance Factor	Frequency of Detects Above Upper SL
Dimethyl phthalate	49 / 80	0.0025 - 0.97	0.0048 - 0.52	0.048	0.071	14	5 / 49	0.16	6.1	2 / 49
Hexachlorobenzene	10 / 81	0.00086 - 0.0027	0.00047 - 0.52	0.0016	0.001	2.7	8 / 10	0.001	2.7	8 / 10
Phenol	32 / 90	0.0098 - 1.4	0.0073 - 0.31	0.12	0.42	3.3	2 / 32	1.2	1.2	2 / 32
Pesticides										
4,4'-DDT	9 / 18	0.0025 - 0.082	0.0019 - 0.086	0.031	0.0001	820	9 / 9	0.0001	820	9 / 9
Total DDT	4 / 13	0.0052 - 0.047	0.0019 - 0.086	0.027	0.0001	470	4 / 4	0.0001	470	4 / 4
Total aldrin/dieldrin	1 / 13	0.000113 - 0.000113	0.00081 - 0.019	0.000113	0.0001	1.1	1 / 1	0.0001	1.1	1 / 1
Heptachlor	2 / 14	0.00012 - 0.00012	0.00081 - 0.0097	0.00012	0.0001	1.2	2 / 2	0.0001	1.2	2 / 2

Summary of analytical data for surface sediment samples collected between 1994 and 2012.

¹ Lower screening level is the lower of SMS SCO and minimum cleanup level in LDW ROD.

² Upper screening level is the higher of SMS CSL and minimum cleanup level in LDW ROD.

CSL - Cleanup Screening Level

cPAHs - carcinogenic polycyclic aromatic hydrocarbons

DDT - dichlorodiphenyltrichloroethane

DW - dry weight

HPAHs - high molecular weight polycyclic aromatic hydrocarbons

LDW - Lower Duwamish Waterway

mg/kg - milligrams per kilogram

NA - not applicable

PAHs - polycyclic aromatic hydrocarbons

PCBs - polychlorinated biphenyl

ROD - Record of Decision

SCO - Sediment Cleanup Objective

SL - screening level

SMS - Sediment Management Standards

SVOCs - semivolatile organic compounds

TEQ - toxic equivalency

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SAIC (Science Applications International Corporation). 2011. Surface Sediment Sampling at Outfalls in the Lower Duwamish Waterway, Seattle, WA, Data Report. Prepared for the Washington State Department of Ecology, Toxics Cleanup Program, Northwest Regional Office. October 2011. [06118]

Table B-1. Outfalls at the Former Rhône-Poulenc Site

Outfall ID	Alternate Outfall ID	Outfall Status	Outfall Type	Outfall Diameter	Outfall Material	WQ Permit	Outfall Notes
2080	KCIA SD#1; 234E; Slip 6 SD	Active	County SD	36-inch	Riveted steel	WAR044501, WAR000343, WAR008681, WAR127177	<p>Outfall appears to be located on a BDC parcel, which includes most of Slip 6. Drainage is from south-central portion of KCIA, plus IAA Outfall No. 4 (South Outfall), which discharges to this pipe at SDMH-S(7), just upstream of the outfall to the LDW. The KCIA subbasin includes a portion of the flightline, SW Hangars & Tiedowns area, Southeast Tie-Downs, and one tenant (King County Sheriff Guardian One). Includes 3 oil-water separators and one wet vault. About 9 acres of IAA vehicle storage area, including 9 catch basins and 7 manholes, drains to this outfall via a Stormfilter unit. IAA SWPPP and Slip 6 SCAP describe this as 36-inch diameter pipe (Boeing 2011 [10364]; KCIA 2012 [10458]; SAIC 2010 [06802], Windward 2012 [10365]).</p> <p><u>Permittees</u> Municipal: WAR044501 (King County - Municipal SW Phase I GP) Upland: WAR000343 (KCIA), WAR008681 (IAA), WAR127177 (Charles Air Hanger-Starbucks)</p>

BDC - Boeing Developmental Center
 GP - General Permit
 IAA - Insurance Auto Auctions
 KCIA - King County International Airport
 LDW - Lower Duwamish Waterway
 SCAP - Source Control Action Plan
 SD - storm drain
 SPU - Seattle Public Utilities
 SW - stormwater
 SWPPP - Stormwater Pollution Prevention Plan
 WSDOT - Washington State Department of Transportation

Boeing (The Boeing Company). 2011. Storm Water Pollution Prevention Plan, Boeing Developmental Center, Washington Department of Ecology (WDOE), Permit # WAR-000146. January 12, 2011. [10364]
 KCIA. 2012. Stormwater Pollution Prevention Plan, King County International Airport. May 12, 2012. [10458]
 SAIC (Science Applications International Corporation). 2010. Lower Duwamish Waterway, RM 4.3 to 4.9 East (Boeing Development Center), Summary of Existing Information and Identification of Data Gaps. Prepared for the Washington State Department of Ecology, Toxics Cleanup Program, Northwest Regional Office. September 2010. [06802]
 Windward (Windward Environmental, LLC). 2012. Stormwater Prevention Pollution Plan, Insurance Auto Auctions, 8801 East Marginal Way South, Tukwila, Washington. Prepared for Insurance Auto Auctions, Inc. May 2012. [10365]

Table C-1. Source Control Action Item Status for the former Rhône-Poulenc Site

Action Item	Priority	Type	Responsible Party	Status	Estimated Completion Date	Date Completed	Comments/Follow-On Actions
Address the toluene groundwater contamination in the southwest corner of the East Parcel, in accordance with the Revised East Parcel CMI Work Plan.	High	SCAP	EPA, Property owner/operator	Complete	--	November 2016	EPA approved shut down of the active operation of the East Parcel CMI biosparge/vent system (July 2015). Toluene levels were in compliance with the cleanup standard for four consecutive quarters of groundwater monitoring following shut down and monitoring was discontinued.
Continue to monitor the effectiveness of the hydraulic interim control measure, and investigate the presence of elevated copper concentrations in groundwater outside the barrier wall and the potential leak in the barrier wall.	High	SCAP	EPA, Property owner/operator	In Progress	TBD		The HCIM is still in operation and effective. Groundwater outside the barrier wall (included in Shoreline Area of site) will be addressed as part of the future site cleanup under RCRA. EPA established PRGs in March 2014, and Respondents submitted a draft CMS work plan to EPA in September 2014. A work plan for a Carbon Dioxide Injection Pilot Study to address high pH has been submitted.
Investigate and address shoreline bank contamination from historical site operations and releases (e.g. application of vanillin black liquor solids to the shoreline bank for weed control).	High	SCAP	EPA, Property owner/operator	In Progress	TBD		An investigation of shoreline bank contamination was completed September 2012. The Shoreline Area will be addressed as part of the future site cleanup under RCRA. EPA established PRGs in March 2014, and Respondents submitted a draft CMS work plan to EPA in Sept 2014. A work plan for a Carbon Dioxide Injection Pilot Study to address high pH has been submitted.
Review the current SWPPP and Operations and Maintenance Plan. Make necessary changes and additions to prevent contaminants from potential upland sources (such as fuel leaks from damaged vehicles) from migrating to Slip 6 source control area sediments via the stormwater system.	High	SCAP	Ecology, Property owner/operator	Planned	TBD		
Oversee and inspect discharge to the King County sanitary sewer system from groundwater remediation at this site through the KCIW Program.	Low	SCAP	KCIW	Ongoing	TBD		

CMI - Corrective Measures Implementation
 CMS - Corrective Measures Study
 EPA - U.S. Environmental Protection Agency
 HCIM - hydraulic control interim measure
 KCIW - King County Industrial Waste

PRGs - preliminary remediation goals
 RCRA - Resource Conservation and Recovery Act
 SCAP - Source Control Action Plan
 SWPPP - Stormwater Pollution Prevention Plan
 TBD - to be determined

Property Name	South Park Marina
GENERAL INFORMATION	
Address	8604 Dallas Avenue S, Seattle, WA 98108
Property No.	22003
Tax Parcel No.	000160-0001
Property Owner	South Park Marina LTD Partnership
Current Operator	South Park Marina
Property Size	1.96 acres
Facility/Site ID	44653368 (South Park Marina) Cleanup Site ID 2858
Alternate Names	A&B Barrel Co, South Park Marina LP, Willard S Crow
NPDES Permit No.	WAG030045 (Boatyard General Permit)
UST/LUST ID No.	853
SITE HISTORY AND ACTIVITIES	
Description	<p>South Park Marina is bordered by the Lower Duwamish Waterway (LDW) to the north and east, Terminal 117 to the south and Dallas Avenue S to the west, and South Park Tire Factory to the northwest.</p> <p>The site slopes steeply from Dallas Avenue S to the LDW shoreline. The site is paved with the exception of 1,500 square foot area at the southeast corner of the site. The unpaved area is used for mast storage.</p> <p>Four catch basins are present, CB-1 through CB-4. A closed loop pressure washing area is situated over CB-3. CB-2, which is adjacent to CB3, is plugged when pressure washing is performed (South Park Marina 2012 [10328]).</p> <p>Other features at the site include offices, cleaning facilities, a boat haul-out crane, a boat launch ramp, and moorage slips.</p>
Historical Activities	<p>A&B Barrel Company operated at the site in the 1950s and vacated it in 1961. The company cleaned, painted, and reconditioned barrels. Sodium hydroxide, oil, and grease discharged to a small pond, which reportedly discharged to the LDW until 1961. After 1961, the site was used to park cars and in 1970 it was developed as South Park Marina.</p> <p>A mobile home park (South Park Mobile Homes) occupied the northern half of the present-day marina site from approximately 1985 to 1999. Former occupants of the central portion of the site reportedly include North Star Trading Company (1980 to 1981), Evergreen Boat Transport (1985 to 1999), R.P. Boatbuilding (dates unknown), and Dekker Engineering (1995 to 1999) (SAIC 2007 [02992]).</p>
Current Activities	<p>Activities at South Park Marina include mooring, dry boat storage, boat building and repair, pressure washing, painting, engine maintenance, and welding and grinding. Approximately 110 vessels are hauled out and pressured washed each year. South Park Marina provides restrooms, showers, laundry facilities, secured docks, and parking. Electricity, water, and small garbage</p>

Property Name	South Park Marina
	disposal are provided at each moorage location (South Park Marina 2012 [10328]) ¹ .
Chemicals of Concern	<p>This section of the LDW was designated as an early action area in 2003 due to high concentrations of polychlorinated biphenyls (PCBs) in surface sediment. In addition to PCBs, arsenic, polycyclic aromatic hydrocarbons (PAHs), carcinogenic PAHs (cPAHs), phenol, and dioxins/furans were identified as contaminants of concern in sediment.</p> <p>Chemicals of concern for the site are: PCBs, dioxins/furans, metals, PAHs, phthalates, phenols, and petroleum hydrocarbons (Ecology 2018).</p>
CONTAMINATED MEDIA	
Surface Sediment	<p>Data from 72 surface sediment samples collected near South Park Marina between 2003 and 2009, and 2016 were available for review (AECOM 2012 [00099], The Intelligence Group 2016). The following chemicals exceeded the lower of the Washington State Sediment Management Standards (SMS) Sediment Cleanup Objective (SCO)/lowest Apparent Effects Threshold (LAET) or the minimum cleanup level in the LDW Record of Decision (ROD) (EPA 2014 [12119]) in at least one sample (Table A-1).</p> <ul style="list-style-type: none"> • PCBs: total PCB Aroclors, total PCB congeners, and total PCB congeners toxic equivalency (TEQ); • Dioxins/Furans: total dioxins/furans TEQ; • Metals: arsenic, mercury, and zinc; • Metals – Butyltins: Tributyltin • PAHs: acenaphthene, anthracene, benzo(a)anthracene, total benzofluoranthenes, benzo(g,h,i)perylene, benzo(a)pyrene, chrysene, dibenz(a,h)anthracene, dibenzofuran, fluoranthene, fluorene, indeno(1,2,3-cd)pyrene, 2-methylnaphthalene, phenanthrene, pyrene, total low molecular weight PAHs (LPAHs), total high molecular weight PAHs (HPAHs), and total cPAH TEQ; • Other semivolatile organic compounds (SVOCs): benzyl alcohol. <p>The highest SCO/LAET exceedance factors were for total cPAH TEQ (EF = 1,197), total PCB Aroclors (EF = 262), and total PCB congeners (EF = 99).</p>
Storm Drain Solids	<p>Two storm drain solids samples were collected during the October 2014 inspection (Leidos 2015 [10939 & 10945]) and 10 storm drain solids samples were collected in 2016 (The Intelligence Group 2016). The samples collected in 2016 were analyzed only for PCBs. The following chemicals exceeded the lower of the Washington State SMS Cleanup Screening Level (CSL)/second lowest Apparent Effects Threshold (2LAET) and the minimum cleanup level in the LDW ROD (EPA 2014 [12119]) in at least one sample (Table A-2).</p> <ul style="list-style-type: none"> • PCBs: total PCB Aroclors, total PCB congeners, and total PCB congeners TEQ; • Dioxins/Furans: total dioxins/furans TEQ; • Metals: arsenic, cadmium, chromium, copper, lead, mercury, and zinc; • PAHs: benzo(a)anthracene, total benzofluoranthenes, benzo(g,h,i)perylene, benzo(a)pyrene, chrysene, dibenz(a,h)anthracene, fluoranthene, fluorene, indeno(1,2,3-cd)pyrene, 2-methylnaphthalene, naphthalene, phenanthrene, pyrene, total LPAHs, total HPAHs, and total cPAH TEQ; • Phthalates: bis(2-ethylhexyl) phthalate, butylbenzyl phthalate, dibutyl phthalate, and dimethyl phthalate; • Other SVOCs: benzoic acid, benzyl alcohol, pentachlorophenol, and phenol. <p>The highest CSL/2LAET exceedance factors were for benzyl alcohol (EF = 863), total PCB congeners (EF = 615), total cPAH TEQ (EF = 611), dimethyl phthalate (EF = 438), total PCB</p>

¹ <https://www.southparkmarina.com/>

Property Name	South Park Marina
	congeners TEQ (EF = 343), and total dioxin/furan TEQ (EF = 178).
Groundwater	<p>Groundwater samples were collected at South Park Marina in 2007 and 2008 (SAIC 2008 [03433]). Concentrations of the following chemicals exceeded the LDW preliminary cleanup levels (PCULs) for protection of sediment via groundwater discharge (Ecology 2017).</p> <ul style="list-style-type: none"> • Metals: chromium; • Pesticides: Aldrin and dieldrin.
Soil	<p>Soil samples were collected at South Park Marina in 2007 (SAIC 2008 [03433]). Surface soil samples were collected and analyzed for PCB Aroclors and congeners (The Intelligence Group 2016). Concentrations of the following chemicals exceeded the LDW PCULs for protection of sediment via bank erosion (Ecology 2017).</p> <ul style="list-style-type: none"> • PCBs: total Aroclors, total congeners and total PCB congeners TEQ; • Metals: arsenic, cadmium, chromium, copper, lead, mercury, and zinc; • PAHs: 2-methylnaphthalene, acenaphthene, anthracene, dibenzofuran, fluorene, naphthalene, phenanthrene total LPAHs, and total cPAH TEQ; • Phthalates: bis(2-ethylhexyl) phthalate, butylbenzyl phthalate, and dimethyl phthalate; • Other SVOCs: benzoic acid, benzyl alcohol, 1,2-dichlorobenzene, and pentachlorophenol; • Pesticides: 4,4'-DDT, aldrin, dieldrin, and heptachlor
TRANSPORT PATHWAYS	
Outfalls	<p>Outfall 2214: Stormwater from three catch basins on the South Park Marina property flows through a 3,000-gallon oil/water separator and a StormwaterRx filtration system (new in 2009) prior to discharge. This is the only outfall on the property (South Park Marina 2012 [10328]). Additional information regarding this outfall is available in Table B-1.</p>
Relevant Pathways	<p>Based on information provided in the Summary of Existing Information and Data Gaps report (SAIC 2007 [02992]), and the information on contaminated media above, the following pathways may contribute to sediment recontamination:</p> <ul style="list-style-type: none"> • Stormwater discharge and surface runoff: copper and zinc concentrations exceeded the chronic marine WQC in 2014. Zinc exceeded the permit benchmark in January 2018. • Groundwater discharge: concentrations of metals and pesticides exceed the LDW PCULs for protection of sediment via groundwater discharge. • Soil/bank erosion: concentrations of PCBs, metals, PAHs, phthalates, other SVOCs, and pesticides exceed the LDW PCULs for protection of sediment via bank erosion. Based on August 2016 aerial photos posted on Ecology’s Washington State Coastal Atlas², the shoreline is armored with riprap near Terminal 117 and partially armored to the north of the gangway to the moorage slips. <p>Waterway operations and atmospheric deposition have not been identified as relevant pathways at this property.</p>
SOURCE CONTROL ACTIONS	
Action Item Status	<p>In April 2016, Ecology began negotiating an Agreed Order with South Park Marina LP. Under the Agreed Order, South Park Marina LP will be responsible for an environmental investigation and development of a cleanup action plan (Ecology 2018).</p> <p>Seven action items have been identified for the site (four medium priority and three low priority).</p>

² <https://fortress.wa.gov/ecy/shorephotoviewer/>

Property Name	South Park Marina
	<p>All of the medium priority and two of the low priority action items are complete. The remaining low priority action item is planned:</p> <ul style="list-style-type: none"> Investigate sewer connections and discharge locations of storm drains and catch basins. <p>A description of each action item and its status is provided in Table C-1.</p>
INSPECTION, PERMIT, AND CLEANUP STATUS	
Inspections	<p>A stormwater compliance inspection with sampling was performed at the facility in October 2014. One water and two solids samples were collected during the inspection (Leidos 2015 [10939 & 10943]). Summaries of the analytical results for these samples is provided in the Storm Drain Solids and Other Relevant Studies sections of this worksheet.</p> <p>The complete inspection report was not available for review.</p>
Permit Compliance Status	<p>In January 2018, zinc exceeded the permit benchmark in sample collected at the monitoring point. Additional information regarding permit compliance was not available for review.³</p>
Upland Cleanups	<p>In 1996, a UST, which was installed in 1964, was removed from the site (Ecology 2015 [11057]). Environmental investigations were performed at the site in 2004, 2006, 2007, and 2008 to assess the nature and extent of contamination in soil and groundwater at the site. Data from the 2007 and 2008 investigations were used to model potential contaminant leaching and solute transport from the marina to LDW sediment [SAIC 2007 [02992], 2008 [03433]).</p> <p>Information on upland cleanups, if any, is not available for this site.</p>
Other Relevant Studies	<p>One stormwater sample was collected during the October 2014 inspection. In this sample, copper and zinc concentrations exceeded the Washington State chronic marine water quality criteria. Total PCB congeners, benzo(b)fluoranthene, and chrysene concentrations exceeded National Toxics Rule and the National Recommended water quality criteria for the protection of human health due to consumption of organisms only (Leidos 2015 [10939 & 10943]).</p>
RECOMMENDATION	
Source Control Summary	<p>One low priority action item is not complete.</p> <p>Analytical results for surface sediment samples collected between 2003 and 2009, and 2016 indicate that concentrations of PCBs, dioxins/furans, metals, butyltins, PAHs, and other SVOCs exceed the SCO/LAET criteria and/or the LDW ROD minimum cleanup level (Table A-1).</p> <p>Analytical results for storm drain solids samples collected in 2014 and 2016 indicate that concentrations of PCBs, dioxins/furans, metals, PAHs, phthalates, and other SVOCs exceed the CSL/2LAET criteria and/or the LDW ROD minimum cleanup level (Table A-2).</p> <p>Analytical results for groundwater samples collected in 2007 and 2008 and soil samples collected in 2007 indicate that concentrations of metals and pesticides exceed the LDW PCULs for protection of sediment. In addition, concentrations of PAHs, phthalates, and other SVOCs exceed the LDW PCULs.</p> <p>Ecology is currently negotiating an Agreed Owner with South Park Marina LP to conduct an environmental investigation and prepare a draft cleanup plan.</p>

³ <https://fortress.wa.gov/ecy/paris/FacilitySummary.aspx?FacilityId=44653368>

Property Name	South Park Marina
Preliminary Recommendation	Sources are not sufficiently controlled.

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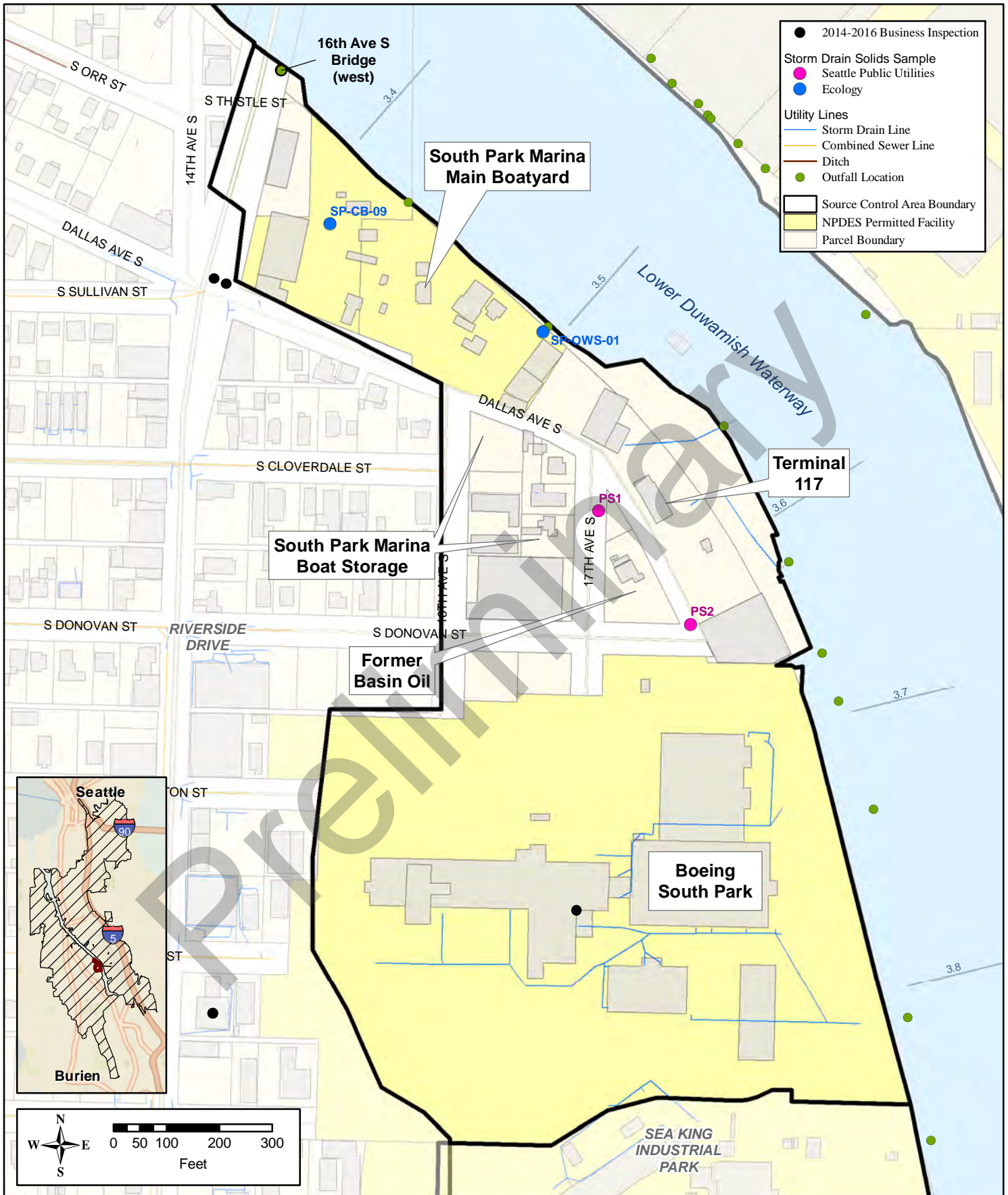
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Figures

- Figure 1. RM 3.4-4.8 West (EAA-5: Terminal 117)
- Figure 2. South Park Marina

Attachments

- Attachment A. Summary of Screening Level Exceedances in Surface Sediment and Storm Drain Solids
- Attachment B. Outfall Information
- Attachment C. Source Control Action Item Status



**Figure 1. RM 3.4-3.8 West
(EAA-5: Terminal 117)
Source Control Area**



Figure 2. South Park Marina

Table A-1. Summary of Screening Level Exceedances in Surface Sediment near South Park Marina

Parameter	Frequency of Detection	Range of Detected Conc'ns (mg/kg DW)	Range of Nondetected Conc'ns (mg/kg DW)	Average Detected Conc'n (mg/kg DW)	Lower Screening Level (mg/kg DW) ¹	Maximum Exceedance Factor	Frequency of Detects Above Lower SL	Upper Screening Level (mg/kg DW) ²	Maximum Exceedance Factor	Frequency of Detects Above Upper SL
PCBs										
Total PCB Aroclors	65 / 72	0.0048 - 34	NA	75	0.13	262	27 / 72	1	34	9 / 72
Total PCB congeners	19 / 19	4.88E-03 - 1.97E-01	NA	6.43E-02	2.00E-03	99	19 / 19	2.00E-03	99	19 / 19
Total PCB TEQ	19 / 19	3.47E-08 - 2.2E-06	NA	3.47E-07	7.00E-07	3.1	1 / 19	7.00E-07	3.1	1 / 19
Dioxins/Furans										
Total dioxin/furan TEQ	3 / 3	4.36E-06 - 9.36E-06	NA	6.75E-06	5.00E-06	1.9	2 / 3	5.00E-06	1.9	2 / 3
Metals										
Arsenic	2 / 3	10 - 11.4	7 - 7	11	7	1.6	2 / 2	7	1.6	2 / 2
Mercury	5 / 5	0.07 - 0.2	NA	0.1	0.2	1.0	1 / 5	0.2	1.0	1 / 5
Zinc	3 / 3	68.8 - 115	NA	98	93	1.2	2 / 3	93	1.2	2 / 3
Metals - Butyltins										
Tributyltin	1 / 2	0.0087 - 0.0087	0.005 - 0.005	0.0087	0.0021	4.1	1 / 1	0.0021	4.1	1 / 1
SVOCs - PAHs										
Acenaphthene	1 / 3	3.9 - 3.9	0.02 - 0.059	3.9	0.5	7.8	1 / 1	0.5	7.8	1 / 1
Anthracene	2 / 3	0.035 - 4.3	0.02 - 0.02	2	0.96	4.5	1 / 2	0.96	4.5	1 / 2
Benzo(a)anthracene	3 / 3	0.038 - 8.4	NA	2.9	1.3	6.5	1 / 3	1.6	5.3	1 / 3
Total benzofluoranthenes	3 / 3	0.137 - 17	NA	5.8	3.2	5.3	1 / 3	3.6	4.7	1 / 3
Benzo(g,h,i)perylene	2 / 3	0.073 - 1.2	0.02 - 0.02	0.6	0.67	1.8	1 / 2	0.72	1.7	1 / 2
Benzo(a)pyrene	3 / 3	0.044 - 7.9	NA	2.7	0.854	9.3	1 / 3	1.6	4.9	1 / 3
Chrysene	3 / 3	0.071 - 7.7	NA	2.7	1.4	5.5	1 / 3	2.8	2.8	1 / 3
Dibenz(a,h)anthracene	2 / 3	0.022 - 0.64	0.059 - 0.059	0.33	0.23	2.8	1 / 2	0.23	2.8	1 / 2
Dibenzofuran	1 / 3	4.2 - 4.2	0.02 - 0.059	4.2	0.54	7.8	1 / 1	0.54	7.8	1 / 1
Fluoranthene	3 / 3	0.092 - 24	NA	8.2	1.7	14	1 / 3	2.5	9.6	1 / 3
Fluorene	2 / 3	0.028 - 5.5	0.059 - 0.059	2.8	0.54	10	1 / 2	0.54	10	1 / 2
Indeno(1,2,3-cd)pyrene	3 / 3	0.066 - 1.9	NA	0.69	0.6	3.2	1 / 3	0.69	2.8	1 / 3
2-Methylnaphthalene	2 / 3	0.09 - 1.4	0.059 - 0.059	0.7	0.67	2.1	1 / 2	0.67	2.1	1 / 2
Phenanthrene	3 / 3	0.07 - 28	NA	9	1.5	19	1 / 3	1.5	19	1 / 3

Table A-1. Summary of Screening Level Exceedances in Surface Sediment near South Park Marina

Parameter	Frequency of Detection	Range of Detected Conc'ns (mg/kg DW)	Range of Nondetected Conc'ns (mg/kg DW)	Average Detected Conc'n (mg/kg DW)	Lower Screening Level (mg/kg DW) ¹	Maximum Exceedance Factor	Frequency of Detects Above Lower SL	Upper Screening Level (mg/kg DW) ²	Maximum Exceedance Factor	Frequency of Detects Above Upper SL
Pyrene	3 / 3	0.087 - 16	NA	5.5	2.6	6.2	1 / 3	3.3	4.8	1 / 3
Total LPAHs	3 / 3	0.135 - 43.0	NA	14.5	5.2	8.3	1 / 3	5.2	8.3	1 / 3
Total HPAHs	3 / 3	0.557 - 84.7	NA	29.0	12	7.1	1 / 3	17	5.0	1 / 3
Total cPAH TEQ	3 / 3	0.0710 - 10.8	NA	3.69	0.009	1,197	3 / 3	0.009	1,197	3 / 3
Other SVOCs										
Benzyl alcohol	1 / 3	0.072 - 0.072	0.033 - 0.039	0.072	0.057	1.3	1 / 1	NA	NA	NA

Summary of analytical data for surface sediment samples collected in 2003, 2004, 2005, 2008, 2009, and 2016.

¹ Lower screening level is the lower of SMS SCO and minimum cleanup level in LDW ROD.

² Upper screening level is the higher of SMS CSL and minimum cleanup level in LDW ROD.

CSL - Cleanup Screening Level

cPAH - carcinogenic polycyclic aromatic hydrocarbon

DW - dry weight

HPAHs - high molecular weight polycyclic aromatic hydrocarbons

LDW - Lower Duwamish Waterway

LPAHs - low molecular weight polycyclic aromatic hydrocarbons

mg/kg - milligrams per kilogram

NA - not applicable

PAHs - polycyclic aromatic hydrocarbons

PCBs - polychlorinated biphenyl

ROD - Record of Decision

SCO - Sediment Cleanup Objective

SL - screening level

SMS - Sediment Management Standards

SVOCs - semivolatile organic compounds

TEQ - toxic equivalency

AECOM. 2012. Final Feasibility Study, Lower Duwamish Waterway, Seattle, Washington. Prepared for Lower Duwamish Waterway Group. October 31, 2012. [00099]

The Intelligence Group. 2016. Karr Tuttle Campbell, South Park Marina, 2016 Sampling Results. Draft figures and tables. [DOCUMENT NUMBER]

Table A-2. Summary of Screening Level Exceedances in Storm Drain Solids at South Park Marina

Parameter	Frequency of Detection	Range of Detected Conc'ns (mg/kg DW)	Range of Nondetected Conc'ns (mg/kg DW)	Average Detected Conc'n (mg/kg DW)	Lower Screening Level (mg/kg DW) ¹	Maximum Exceedance Factor	Frequency of Detects Above Lower SL	Upper Screening Level (mg/kg DW) ²	Maximum Exceedance Factor	Frequency of Detects Above Upper SL
PCBs										
Total PCB Aroclors	8 / 12	0.34 - 4.1	0.80 - 4.0	0.74	0.13	32	8 / 8	1	4.1	2 / 8
Total PCB congeners	12 / 12	0.00158 - 1.23	NA	0.427	0.002	615	11 / 12	0.002	615	11 / 12
Total PCB TEQ	12 / 12	4.19E-06 - 2.4E-04	NA	4.6E-05	7.00E-07	343	12 / 12	7.00E-07	343	12 / 12
Dioxins/Furans										
Total dioxin/furan TEQ	2 / 2	5.9E-05 - 8.9E-04	NA	4.7E-04	5.00E-06	178	2 / 2	5.00E-06	178	2 / 2
Metals										
Arsenic	2 / 2	22 - 69	NA	45	7	9.9	2 / 2	7	9.9	2 / 2
Cadmium	2 / 2	6.5 - 16	NA	11	5.1	3.1	2 / 2	6.7	2.4	1 / 2
Chromium	2 / 2	160 - 330	NA	250	260	1.3	1 / 2	270	1.2	1 / 2
Copper	2 / 2	1,800 - 14,000	NA	7,900	390	36	2 / 2	390	36	2 / 2
Lead	2 / 2	430 - 940	NA	685	450	2.1	1 / 2	530	1.8	1 / 2
Mercury	2 / 2	0.19 - 1.7	NA	0.95	0.2	8.5	1 / 2	0.2	8.5	1 / 2
Zinc	2 / 2	2,900 - 5,600	NA	4,300	93	60	2 / 2	93	60	2 / 2
SVOCs - PAHs										
Benzo(a)anthracene	2 / 2	0.27 - 3.4	NA	1.8	1.3	2.6	1 / 2	1.6	2.1	1 / 2
Total benzofluoranthenes	2 / 2	1 - 11	NA	6	3.2	3.4	1 / 2	3.6	3.1	1 / 2
Benzo(g,h,i)perylene	2 / 2	0.36 - 1.4	NA	0.88	0.67	2.1	1 / 2	0.72	1.9	1 / 2
Benzo(a)pyrene	2 / 2	0.37 - 3.8	NA	2.1	0.85	4.5	1 / 2	1.6	2.4	1 / 2
Chrysene	2 / 2	0.96 - 5.9	NA	3.4	1.4	4.2	1 / 2	2.8	2.1	1 / 2
Dibenz(a,h)anthracene	1 / 2	0.44 - 0.44	0.18 - 0.18	0.44	0.23	1.9	1 / 1	0.23	1.9	1 / 1
Fluoranthene	2 / 2	1.6 - 12	NA	6.8	1.7	7.1	1 / 2	2.5	4.8	1 / 2
Fluorene	2 / 2	0.51 - 0.95	NA	0.73	0.54	1.8	1 / 2	0.54	1.8	1 / 2
Indeno(1,2,3-cd)pyrene	2 / 2	0.25 - 1.8	NA	1.0	0.6	3.0	1 / 2	0.69	2.6	1 / 2
2-Methylnaphthalene	2 / 2	4.6 - 4.7	NA	4.7	0.67	7.0	2 / 2	0.67	7.0	2 / 2
Naphthalene	4 / 4	1.5 - 5	NA	2.8	2.1	2.4	2 / 4	2.1	2.4	2 / 4
Phenanthrene	2 / 2	0.88 - 6.3	NA	3.6	1.5	4.2	1 / 2	1.5	4.2	1 / 2

Table A-2. Summary of Screening Level Exceedances in Storm Drain Solids at South Park Marina

Parameter	Frequency of Detection	Range of Detected Conc'ns (mg/kg DW)	Range of Nondetected Conc'ns (mg/kg DW)	Average Detected Conc'n (mg/kg DW)	Lower Screening Level (mg/kg DW) ¹	Maximum Exceedance Factor	Frequency of Detects Above Lower SL	Upper Screening Level (mg/kg DW) ²	Maximum Exceedance Factor	Frequency of Detects Above Upper SL
Pyrene	2 / 2	2.2 - 11	NA	6.6	2.6	4.2	1 / 2	3.3	3.3	1 / 2
Total LPAHs	2 / 2	4 - 10	NA	7	5.2	1.9	1 / 2	5.2	1.9	1 / 2
Total HPAHs	2 / 2	7 - 50	NA	30	12	4.2	1 / 2	17	2.9	1 / 2
Total cPAH TEQ	2 / 2	0.54 - 5.5	NA	3.0	0.009	611	2 / 2	0.009	611	2 / 2
SVOCs - Phthalates										
Bis(2-ethylhexyl) phthalate	2 / 2	37 - 110	NA	74	1.3	85	2 / 2	1.9	58	2 / 2
Butylbenzyl phthalate	2 / 2	1.8 - 4.3	NA	3.1	0.063	68	2 / 2	0.9	4.8	2 / 2
Dibutyl phthalate	2 / 2	3.7 - 6.6	NA	5.2	1.4	4.7	2 / 2	1.4	4.7	2 / 2
Dimethyl phthalate	2 / 2	3.9 - 70	NA	40	0.071	986	2 / 2	0.16	438	2 / 2
Other SVOCs										
Benzoic acid	1 / 2	9.7 - 9.7	11 - 11	9.7	0.65	15	1 / 1	0.65	15	1 / 1
Benzyl alcohol	2 / 2	3.6 - 63	NA	33	0.057	1,105	2 / 2	0.073	863	2 / 2
Pentachlorophenol	1 / 2	1.5 - 1.5	0.88 - 0.88	1.5	0.355	4.2	1 / 1	0.355	4.2	1 / 1
Phenol	2 / 2	0.37 - 2.2	NA	1.3	0.42	5.2	1 / 2	1.2	1.8	1 / 2

Summary of analytical data for surface sediment samples collected in 2014 and 2016.

¹ Lower screening level is the lower of SMS SCO and minimum cleanup level in LDW ROD.

² Upper screening level is the higher of SMS CSL and minimum cleanup level in LDW ROD.

CSL - Cleanup Screening Level

cPAHs - carcinogenic polycyclic aromatic hydrocarbons

DW - dry weight

HPAHs - high molecular weight polycyclic aromatic hydrocarbons

LDW - Lower Duwamish Waterway

LPAHs - low molecular weight polycyclic aromatic hydrocarbons

mg/kg - milligrams per kilogram

NA - not applicable

PAHs - polycyclic aromatic hydrocarbons

PCBs - polychlorinated biphenyl

SCO - Sediment Cleanup Objective

SL - screening level

SMS - Sediment Management Standards

TEQ - toxic equivalency

Leidos. 2015. Lower Duwamish Waterway, NPDES Inspection Sampling Support 2014/2015, Appendix O: South Park Marina. Prepared for the Washington State Department of Ecology, Toxics Cleanup Program, Northwest Regional Office. June 2015. [10939 & 10943]

Table B-1. Outfalls at South Park Marina

Outfall ID	Alternate Outfall ID	Outfall Status	Outfall Type	Outfall Diameter	Outfall Material	WQ Permit	Outfall Notes
2214	365W	Active	Private SD	12-inch	Corrugated metal	WAG030045 (South Park Marina)	Stormwater from three catch basins on the South Park Marina property flows through a 3,000-gallon oil/water separator and a StormwaterRx filtration system (new in 2009) prior to discharge (South Park Marina 2012 [10328]).

SD - storm drain
WQ - water quality

South Park Marina. 2012. Stormwater Pollution Prevention Plan, South Park Marina, 8604 Dallas Avenue S. May 23, 2012. [10328]

Preliminary

Table C-1. Source Control Action Item Status for South Park Marina

Action Item	Priority	Type	Responsible Party	Status	Estimated Completion Date	Date Completed	Comments/Follow-On Actions
Conduct inspection at South Park Marina, including review of waste management practices and compliance with permit.	Medium	SCAP	Ecology	Complete	--	June 2005	Conduct follow-up inspection
Conduct follow-up inspections until compliance is achieved.	Low	Follow-On	Ecology	Complete	--	October 2014	The last NPDES compliance inspection occurred in October 2014 (Leidos 2015 [10939 & 10943]).
Investigate sewer connections and discharge locations of storm drains and catch basins.	Low	SCAP	Ecology	Planned	TBD		
Investigate location and fate of A&B Barrel waste lagoon.	Medium	SCAP	Ecology	Complete	--	June 2007	Conduct soil, groundwater, and bank sampling.
Conduct soil, groundwater, and bank sampling.	Medium	Follow-On	Ecology, SAIC	Complete	--	July 2008	
Sample soils adjacent to fence between Terminal 117 and South Park Marina due to contamination observed in borings at Terminal 117.	Medium	SCAP	Ecology	Complete	--	July 2010	EE/CA approved by Ecology. The Port of Seattle will remove this material as part of the remedy.
Sample catch basins for metals and phthalates.	Low	SCAP	Ecology	Complete	--	October 2014	Ecology/Leidos completed NPDES sampling in 2014 (Leidos 2015 [10939 & 10943]).

EE/CA - Engineering Evaluation/Cost Analysis

NPDES - National Pollutant Discharge Elimination System

SAIC - Science Applications International Corporation

SCAP - Source Control Action Plan

Ecology. 2018. Lower Duwamish Waterway Source Control Status Report, January 2014 through December 2016, Draft. Prepared by the Washington State Department of Ecology, Toxics Cleanup Program, Northwest Regional Office. Publication No. 17-09-2666. In progress.

Leidos. 2015. Lower Duwamish Waterway, NPDES Inspection Sampling Support 2014/2015, Appendix O: South Park Marina. Prepared for the Washington State Department of Ecology, Toxics Cleanup Program, Northwest Regional Office. June 2015. [10939 & 10943]

Property Name	Terminal 117
GENERAL INFORMATION	
Address	8700 Dallas Avenue S, Seattle, WA 98108
Property No.	22004
Tax Parcel No.	00016-00044
Property Owner	Port of Seattle
Current Operator	Port of Seattle
Property Size	2.39 acres
Facility/Site ID	37657495 (Malarkey Asphalt Company)
Alternate Names	Malarkey Asphalt Company
NPDES Permit No.	Not applicable
UST/LUST ID No.	Not applicable
SITE HISTORY AND ACTIVITIES	
Description	<p>Terminal 117 is bordered by South Park Marina to the northwest, the Lower Duwamish Waterway (LDW) to the north and east, Dallas Avenue S to the west, and by Boeing South Park to the south (Figure 1).</p> <p>The site is currently a vacant flat lot. A sheet pile wall, installed during upland cleanup activities at the site, remains in place.</p>
Historical Activities	<p>Duwamish Manufacturing Company manufactured asphalt roofing materials at the site from 1937 to 1978. Malarkey Asphalt Company continued manufacturing asphalt roofing materials until 1993.</p> <p>From 1989 to approximately 1995, Basin Oil leased a 10,000-gallon tank within the Malarkey plant area. Basin Oil stored and processed used oil in the tank.</p> <p>In 1997, Malarkey Asphalt Company decommissioned tanks and equipment and removed asbestos from the site. Following decommissioning of the asphalt plant, portions of the site were used for untreated lumber storage and loading. Basin Oil leased a portion of the south building for storage and oil processing from 2003 to 2004.</p> <p>The Port of Seattle acquired Terminal 117 in 2000. Portions of the site were leased to Post Construction Services for storage of miscellaneous materials, International Inspection (non-destructive testing services), and Second Use Building Materials for inventory storage.</p> <p>The Upland Study Area was vacant as February 2007 (Windward et al. 2010 [06814]).</p>
Current Activities	Terminal 117 is currently vacant and awaiting habitat restoration on the southern portion of the site and construction to create a public space on the northern portion of the site that will include walkways, public gathering areas, viewpoints, interpretive features, public art, and a hand-carried boat launch ¹

¹ Port of Seattle website: <https://www.portseattle.org/Environmental/Site-Clean-Up/Pages/Terminal-117-Habitat-Restoration.aspx>, accessed on February 27, 2018).

Property Name	Terminal 117
Chemicals of Concern	<p>The U.S. Environmental Protection Agency (EPA) has designated polychlorinated biphenyls (PCBs), polycyclic aromatic hydrocarbons (PAHs), phenol, and phthalates as chemicals of concern (COCs) for this section of the LDW.</p> <p>PCBs are COCs at Terminal 117; however, upland and in-water cleanup is complete.</p>
CONTAMINATED MEDIA	
Surface Sediment	<p>This section of the LDW was designated as Early Action Area 5 (EAA-5) in 2003 due to high concentrations of PCBs in surface sediment. In addition to PCBs, arsenic, PAHs, carcinogenic PAHs (cPAHs), phenol, and dioxins/furans were identified as COCs in sediment. Historical activities at Terminal 117 were identified as a primary source of contaminants to sediment.</p> <p>In-water cleanup activities and sediment dredging to remove PCB-contaminated sediment began in December 2013 and concluded in December 2014. Clean fill materials were used to restore the aquatic portion of the site. The success of the cleanup action will be evaluated through a long-term operation, maintenance, and monitoring plan. The monitoring plan is in development.</p>
Storm Drain Solids	<p>Historically, PCBs, PAHs, dioxins and furans, and some metals were detected in storm drain solids samples collected within and adjacent to catch basins at Terminal 117. Surface soil and atmospheric deposition were identified as potential sources of these contaminants.</p> <p>New drainage systems installed as part of the site cleanup include components to retain solids. Solids accumulating in the new drainage system will be monitored for the COCs.</p>
Groundwater	<p>Arsenic, silver, cPAHs, diesel- and oil-range hydrocarbons, bis(2-ethylhexyl) phthalate (BEHP), and PCBs were identified as COCs in groundwater at Terminal 117. Contaminated soil at the site was the primary source of contaminants to groundwater. Contamination in groundwater was addressed through the soil removal and cleanup actions. Groundwater monitoring will continue at the site to evaluate the effectiveness of the soil removal action.</p>
Soil	<p>Arsenic, silver, cPAHs, diesel- and oil-range hydrocarbons, PCBs and dioxins/furans were identified as COCs in the upland area of Terminal 117. PCBs and dioxins/furans were identified as contaminants of concern in the adjacent streets.</p> <p>Upland soil removal and cleanup activities to remove PCB-contaminated soil began in June 2013 and concluded in March 2014. Clean fill was used to backfill the site and adjacent streets.</p>
TRANSPORT PATHWAYS	
Outfalls	<p>Two outfalls are present at Terminal 117. According to Roy Kuroiwa (Port of Seattle), in an email dated 5/6/2014, there are currently no active outfalls at Terminal 117.</p>
Relevant Pathways	<p>Prior to the cleanup action, relevant pathways for sediment contamination included bank soil erosion, stormwater discharge, soil leaching to groundwater, groundwater discharge, and dust generation and transport.</p> <p>The cleanup action was completed in 2016, rendering these pathways incomplete as the sources of contaminants to sediment have been removed.</p>
SOURCE CONTROL ACTIONS	
Action Item Status	<p>EPA signed an Administrative Settlement Agreement and Order on Consent with the Port of Seattle and the City of Seattle to implement cleanup actions at Terminal 117 in June 2011. The</p>

Property Name	Terminal 117
	Order required the Port of Seattle and the City to implement EPA's cleanup decision for Terminal 117 (EAA-5). The cleanup was completed in 2016. According to the most recent Source Control Status Report (Ecology 2018), all action items have been completed. Descriptions of the actions items are provided in Table C-1.
INSPECTION, PERMIT, AND CLEANUP STATUS	
Inspections	None
Permit Compliance Status	Not applicable
Upland Cleanups	The City of Seattle finished cleanup of residential yards in 2013 and cleanup of adjacent streets in 2016. The Port of Seattle finished cleanup of the uplands and in-water sediment in 2015. The cleanup included removal of 27,800 tons of PCB-contaminated soil and over 32,000 tons of sediment. The Port of Seattle is developing a long-term monitoring and maintenance plan for the site in collaboration with the EPA ² . The plan will address groundwater monitoring, and the operation, monitoring and maintenance requirements for storm drainage systems serving the upland portions of EAA-5. The post-removal monitoring plan will be designed to evaluate the effectiveness of source control measures put in place (Windward et al. 2010 [06814]).
Other Relevant Studies	Bulk sampling of exterior building materials, paints, and asphalt sealant was performed in 2011 to determine if these materials were a source of PCBs. Eleven samples of these materials contained PCBs. Buildings and asphalt are no longer present at Terminal 117.
RECOMMENDATION	
Source Control Summary	Sources of PCB contamination to sediments have been removed from Terminal 117 and the adjacent streets. Monitoring will be performed to evaluate the effectiveness of the cleanup. The site is currently vacant. The northern portion of the property will be developed as a public space and the habitat of the southern portion will be restored. The new storm drain system includes components to retain storm drain solids, which reduces the potential for solids to be transported to LDW sediment.
Ecology Recommendation	Sources are sufficiently controlled.

References

Ecology. 2018. Lower Duwamish Waterway Source Control Status Report, January 2014 through December 2016, Draft. Prepared by the Washington State Department of Ecology, Toxics Cleanup Program, Northwest Regional Office. Publication No. 17-09-2666. In progress.

Windward Environmental, Integral Consulting, Inc., AECOM, Crete Consulting, Inc., and Dalton, Olmsted & Fuglevand, Inc. 2010. Lower Duwamish Waterway Superfund Site, Terminal 117 Early Action Area, Revised Engineering Evaluation/Cost Analysis. Prepared for The Port of Seattle and The City of Seattle. June 3, 2010. [06814]

² Port of Seattle website: www.t117.com, accessed on February 26, 2018

Figures

Figure 1. RM 3.4-3.8 West (EAA-5: Terminal 117) Source Control Area

Figure 2. Terminal 117 Upland Study Area and Adjacent Streets

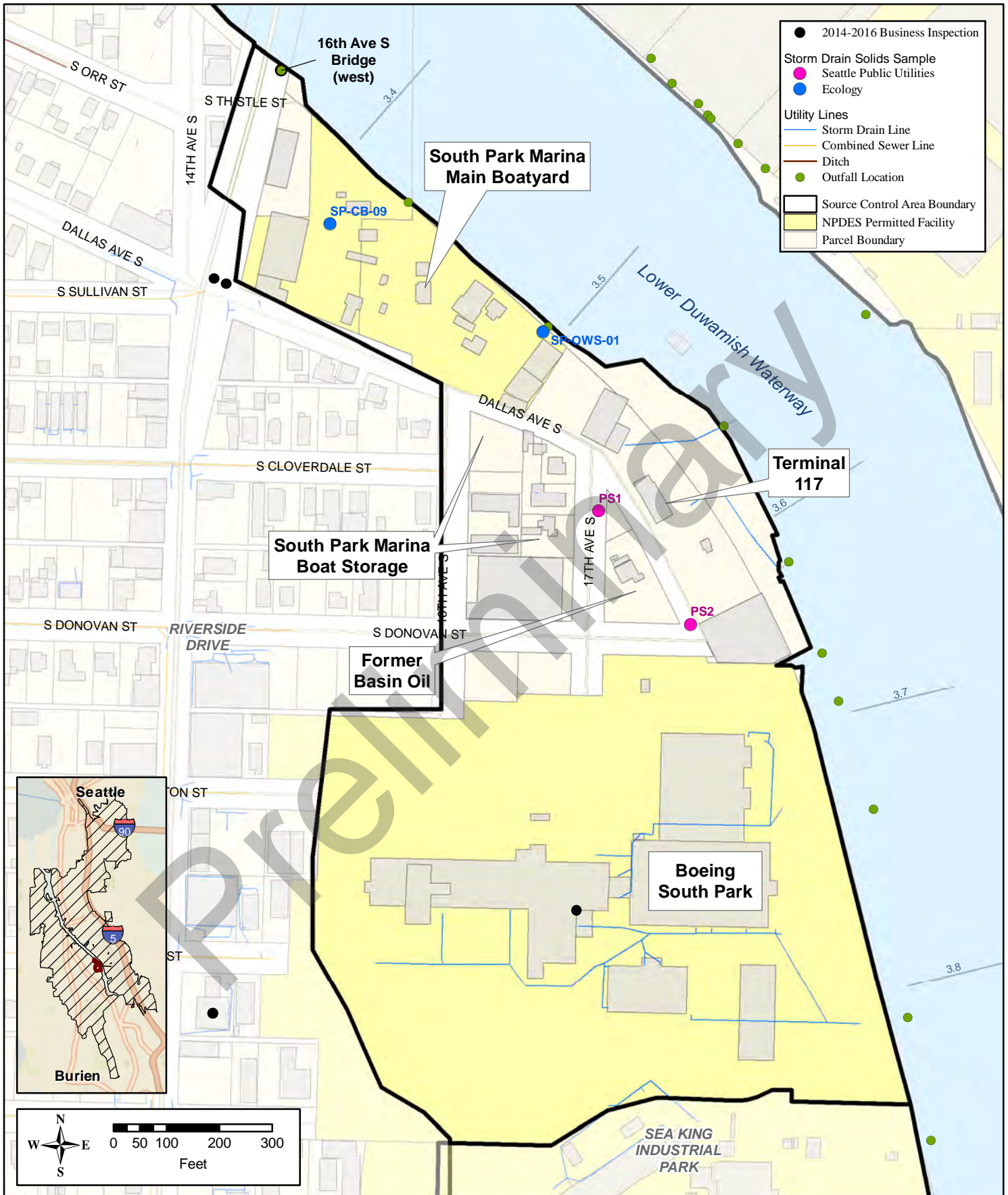
Attachments

Attachment A. Summary of Screening Level Exceedances in Surface Sediment and Storm Drain Solids

Attachment B. Outfall Information

Attachment C. Source Control Action Item Status

Preliminary



**Figure 1. RM 3.4-3.8 West
(EAA-5: Terminal 117)
Source Control Area**



Prepared by: CEH 06/11/07, revised by: MTY 11/23/09, Map #2939, W:\Projects\03-08-12 T-117 (Malarkey)\Data\GIS\2008 EECA



Map 1-1. T-117 EAA site overview

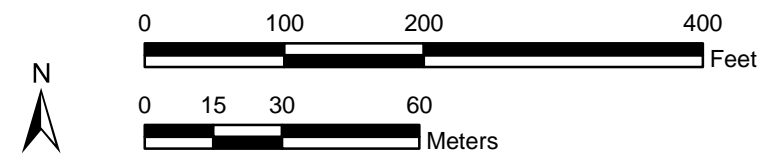


Figure 2. Terminal 117 Upland Study Area and Adjacent Streets

Appendix B: Action Item Status

**Table B-1. Action Items Completed
During the Current Reporting Period**

Table B-2. Actions Items Not Yet Completed

Table B-1. Source Control Action Items Identified as Completed or Canceled During the Current Reporting Period

Facility	Action Item	Priority	Type	Responsible Party	Status	Estimated Completion Date	Date Completed	Comments/Follow-On Actions
RM 0.0-0.1 East (Spokane Street to Ash Grove Cement)								
Harbor Marina Corporate Center / Port of Seattle Terminal 102	Inspect drainage connections to all outfalls. Work with adjacent property owners to clarify origins and ownership of each outfall at the Harbor Marina Corporate Center.	Low	SCAP	Ecology WQ, Port of Seattle	Complete	--	2013	Port of Seattle is Municipal Stormwater Permittee, Phase I Secondary. WAR04-4701. Conveyances to these 3 outfalls were mapped in 2013.
	Demonstrate that the marina is in compliance with all applicable permits.	High	SCAP	Port of Seattle	Complete	--	2016	Ecology's Water Quality Program monitors this property under the Port of Seattle's municipal stormwater permit. No issues have been identified.
Port of Seattle Terminal 104	Ensure that storm drain structures and function are completely delineated and properly permitted. Existing drainage problems have been identified and need to be addressed.	High	SCAP	Ecology, Port of Seattle	Complete	--	2013	Port of Seattle is Municipal Stormwater Permittee, Phase I Secondary. WAR04-4701. Conveyances to these 3 outfalls were mapped in 2013.
Ash Grove Cement	Ensure that storm drain system structures and function are delineated, properly permitted, and existing drainage problems have been identified.	Medium	SCAP	Ecology WQ; Port of Seattle	Complete	--	Oct 2016	New NPDES permit effective 10/2016.
	Conduct additional source control inspections to ensure compliance and implementation of BMPs.	High	SCAP	Ecology	Canceled	--		SPU last inspected Ash Grove Cement in 2009. Ash Grove pumps stormwater from their detention tank to the S. Hinds St. storm drain in the East Waterway. This site does not drain to the LDW. Ash Grove has an NPDES permit.
RM 0.1-0.9 East (EAA-1: Duwamish/Diagonal Way)								
Emerald City Bindery	Verify storm drain and sanitary connections to ensure that the sanitary sewer is not inadvertently connected to the storm drain.	Low	New	SPU	Complete	--	2015	SPU completed an illicit discharge survey of the entire LDW area in summer 2014. No evidence of a sewer cross-connection was found in this area. SPU also checked the storm drain downstream of Emerald City Bindery during dry weather in 2015 and found no evidence of any sanitary flow.
MacMillan-Piper, Inc. - Airport Way Facility	Collect catch basin solids to determine if pollutants from agricultural sources at the property are a source of sediment COCs.	Low	New	SPU/Ecology	Complete	--	Nov 2010	SPU sampled onsite catch basins (CB127, CB128) in 2008. Elevated levels of arsenic and zinc. SPU inspected MacMillan-Piper in 2003, 2007, and 2010. During the last visit MacMillan-Piper was required to do several corrective actions. Re-inspection confirmed that corrective actions were implemented. Catch basins, detention system, and pipes in their onsite drainage system are cleaned quarterly. Catch basins in areas where fertilizers, grains, or pesticides may be stored are isolated from the drainage system and water is hauled offsite for disposal. MacMillan-Piper is an NPDES-permitted facility.
North Star Casteel	Verify that facility is in compliance with the final Voluntary Compliance Agreement, when issued.	Low	New	SPU	Complete	--	2011	North Star completed the roadway paving and other requirements of the Voluntary Compliance Agreement. SDOT inspected site in 2013 to confirm compliance with street use permit.
Recycling Depot, Inc.	Review DMRs from 2007 to present to determine if facility is in compliance with its NPDES permit. Conduct follow-up inspections as needed, if review indicates that facility is not in compliance.	Low	New	Ecology	Complete	--	Mar 2017	Ecology HWTR conducted inspection on 6/4/14, SPU conducted inspection on 5/22/15, Ecology WQ conducted joint inspection with SPU on 3/1/17.

Table B-1. Source Control Action Items Identified as Completed or Canceled During the Current Reporting Period

Facility	Action Item	Priority	Type	Responsible Party	Status	Estimated Completion Date	Date Completed	Comments/Follow-On Actions
Seattle Radiator	Review side sewer cards and/or perform a dye test to determine if the interior floor drain at Seattle Radiator is connected to the storm drain or sanitary sewer.	Low	New	SPU/Ecology	Complete	--	2008	SPU/Ecology dye tested the internal floor drains in 2008 and confirmed that they discharge to the sanitary sewer.
Western Peterbilt, Inc.	Review the February 2009 dye test results and determine if this facility's discharges to the storm drain and/or sanitary sewer require coverage under the Industrial Stormwater General Permit or a KCIW discharge permit or authorization.	Low	New	Ecology/SPU	Complete	--	2015	Dye test conducted by Western Peterbilt in June 2012 confirms that an internal trench drain, oil/water separator, and steam cleaning wash bay are connected to the storm drain which ties into the Diagonal Avenue S CSO/SD and discharges to the LDW. SPU referred this site to EPA. EPA issued penalty in 2015.
Other Upland Properties	Review responses to EPA CERCLA 104(e) Request for Information letters for 18 facilities as identified in Duwamish/Diagonal CSO/SD Data Gaps Report.	Low	New	Ecology	Complete	--	Dec 2013	All 104(e) responses for these facilities received by Ecology from EPA have been reviewed; EPA is no longer providing these responses to Ecology, therefore no additional reviews will be performed.
	Assess whether 18 facilities (as listed in the Duwamish/Diagonal CSO/SD) are required to apply for coverage under the Industrial Stormwater General Permit. Request facilities to submit applications for coverage, as appropriate.	Medium	New	Ecology	Complete	--	2014	The city of Seattle referred a list of business to Ecology for potential ISGP coverage.
RM 0.9-1.0 East (Slip 1)								
Former Snopac Products Property	If EPA sends a 104(e) Request for Information Letter to Snopac Products, review responses for relevant information on potential sources of contaminants to Slip 1.	Medium	SCAP	Ecology	Canceled	--		EPA is no longer providing 104(e) responses to Ecology; therefore, no additional reviews will be performed.
	Perform an inspection at the facility when or if a new business occupies the property to ensure compliance with applicable regulations/codes.	Medium	SCAP	Ecology, SPU, King County	Complete	--	2015	Former Snopac site is currently used by the adjacent tenant (Manson Construction) on King County parcels for employee parking. SPU inspected new tenant in 2015. All bathrooms in building are plumbed to roof downspout. Bathrooms have been inoperable for a number of years. SPU required Manson Construction to plug all plumbing connections.
RM 1.0-1.2 East (KC Lease Parcels)								
Public Outfall Nos. 2007 and 2244	Conduct business inspections at facilities with stormwater drainage to Outfall Nos. 2007 and 2244 including Cadman, Lehigh Northwest, and J.A. Jack.	Medium	SCAP	King County, Ecology	Complete	--	Dec 2016	Ecology conducted NPDES inspection at Cadman and JA Jacks in 2016. LeHigh Northwest is no longer there. WAG503337 covers Cadman. King County is the property owner and provides MS4-related inspections under the KC MS4 permit.
S Brandon Street Combined Sewer Overflow	Provide data to Ecology from solids samples collected in June 2010 in the S Brandon Street CSO basin.	Medium	SCAP	King County	Complete	--	May 2016	Data report submitted to Ecology.
Cadman Seattle, Inc.	Conduct a follow-up business inspection of Cadman to verify compliance with Ecology's 2007 and 2009 recommendations, applicable regulations, and BMPs to prevent the release of contaminants to the LDW.	High	SCAP	Ecology	Complete		Dec 2016	Facility was inspected by Ecology WQ on 1/31/2013, 6/5/2013, and 12/6/2016. King County inspected the facility in 2013, and sent a compliance letter in 2015 for completion of an updated site plan and monitoring plan, and installing a concrete pad at the on-site fueling station.
	Review the updated Stormwater Pollution Prevention Plan (SWPPP), when completed, to ensure compliance with Ecology's requirements.	High	SCAP	Ecology	Complete		Dec 2016	Revised SWPPP reviewed by Ecology WQ during inspections. Any remaining deficiencies are being addressed by WQ.

Table B-1. Source Control Action Items Identified as Completed or Canceled During the Current Reporting Period

Facility	Action Item	Priority	Type	Responsible Party	Status	Estimated Completion Date	Date Completed	Comments/Follow-On Actions
United Western Supply	Perform a source control inspection of United Western Supply and the buildings on the southern portion of the property to verify compliance with applicable regulations and BMPs to prevent the release of contaminants to the LDW.	Medium	SCAP	King County, Ecology	Complete		Aug 2014	King County inspected this facility in 2013; a follow-up inspection was conducted in May 2014. In August 2014, a compliance letter was sent to the facility. Compliance actions included placing spill kits at every loading/unloading area and generating a Spill Response and Cleanup Plan.
	Review responses from Western Utilities and United Western Supply to EPA's CERCLA Section 104(e) Request for Information letters, when available.	Medium	SCAP	Ecology	Complete		Dec 2011	Response from Western Utilities was reviewed in December 2011. EPA is no longer providing these responses to Ecology, and no additional reviews will be performed.
J.A. Jack & Sons	Conduct a follow-up inspection of J.A. Jack to verify compliance with corrective actions identified by Ecology in 2007 and SPU in 2009, applicable regulations, and BMPs to prevent the release of contaminants to the LDW.	High	SCAP	Ecology	Complete		Oct 2016	Facility was inspected on 2/6/2013 and 10/5/2016. Inspector noted that all stormwater from the facility is collected and routed through an oil/water separator to an underground vault and drain field. The facility has no discharge to surface waters.
	Evaluate the onsite stormwater collection system to determine its efficiency since Ecology inspectors observed stormwater flowing to the catch basins on the St. Gobain facility.	High	SCAP	Ecology	Complete		Oct 2016	Per inspections described above, King County and Ecology WQ are addressing the stormwater system at this site.
	Obtain additional information, through facility inspections/ observations or environmental sampling, to determine if discharges from the Pinch Point area are permissible and if these discharges are a potential source of sediment recontamination.	High	SCAP	Ecology	Canceled			Canceled as this is routine. Ecology conducted inspection in 2013 and on 10/5/16.
Art Brass Plating	Negotiate Agreed Order to include an FS and draft Cleanup Action Plan for the area west of 4th Avenue S.	Medium	Follow-on	Property Owner/Operator	Complete	--	Apr 2014	An Agreed Order for a joint (4-PLP) FS and draft Cleanup Action Plan was issued in April 2014 (DE010402).
Blaser Die Casting	Negotiate Agreed Order to include an FS and draft Cleanup Action Plan for the area west of 4th Avenue S.	Medium	Follow-on	Property Owner/Operator	Complete	--	Apr 2014	An Agreed Order for a joint (4-PLP) FS and draft Cleanup Action Plan was issued in April 2014 (DE010402).
Capital Industries Inc.	Negotiate Agreed Order to include an FS and draft Cleanup Action Plan for the area west of 4th Avenue S.	Medium	Follow-on	Property Owner/Operator	Complete	--	Apr 2014	An Agreed Order for a joint (4-PLP) FS and draft Cleanup Action Plan was issued in April 2014 (DE010402).
RM 1.2-1.7 East (Saint Gobain to Glacier Northwest)								
Saint Gobain Containers Inc.	Sample catch basins as needed.	Medium	SCAP	Ecology, SPU	Complete	--	Mar 2011	SPU inspected Saint Gobain with Ecology in 2008 and 2010. Several corrective actions were identified, including installation of missing trap on a catch basin and removing heavy accumulation of paint and paint chips on the pavement surrounding the south side of the building. SPU re-inspected the site and confirmed that corrective actions had been implemented in March 2011. This facility is covered under the ISGP (WAR001134). Ecology's Water Quality program will continue to monitor this facility.

Table B-1. Source Control Action Items Identified as Completed or Canceled During the Current Reporting Period

Facility	Action Item	Priority	Type	Responsible Party	Status	Estimated Completion Date	Date Completed	Comments/Follow-On Actions
Certaineed Gypsum	Sample catch basins as needed.	Medium	SCAP	Ecology, SPU	Complete	--	Jun 2014	SPU inspected Certaineed Gypsum with Ecology in 2010 and inspected again in 2014 in response to a water quality complaint. In 2014, SPU required Certaineed Gypsum to stop discharging process water to the storm drain system. SPU confirmed corrective actions implemented during re-inspection.
RM 1.7-2.0 East (Slip 2 to Slip 3)								
1st Avenue S Bridge Storm Drain (Outfall 2503)	Conduct business inspections at properties with stormwater drainage to the 1st Avenue S Bridge (East) outfall, including Seattle Truck Repair, Evergreen Tractor, and the former Taco Time parcel.	Medium	SCAP	SPU, Ecology	Complete	--	Jan 2013	Most of the area contributing to Outfall 2503 is right-of-way. SPU inspected the one business in this basin (Evergreen Tractor) in 2012. Evergreen Tractor was required to install missing trap in one onsite CB. Corrections were confirmed in January 2013.
Michigan Street CSO	Conduct a stormwater compliance inspection at the King County Airport Staging Yard/Georgetown Yard; this facility is covered under the Industrial Stormwater General Permit but no information on inspections was identified.	Low	SCAP	Ecology	Complete	--	Mar 2016	This facility is covered under the ISGP (WAR010792). Ecology conducted a NPDES inspection on March 24, 2016.
Slip 2 Outfall (Glacier Northwest; Outfall 2019)	Conduct business inspections at properties with stormwater drainage to Outfall 2019, including Bank and Office Interiors, Ener-G Foods, and Shippers Transport Express (formerly Consolidated Freightways).	Medium	SCAP	SPU, Ecology	Complete	--	2013	SPU inspected the 3 businesses in the Head of Slip 2 SD basin between 2008 and 2013. All were identified as medium risk. SPU confirmed sites in compliance with City source control requirements during follow-up inspections.
	Identify the owner of Outfall 2019 and evaluate the adequacy of existing NPDES permits with regard to stormwater discharges from this outfall.	Medium	SCAP	SPU, Ecology	Complete	--	2015	SPU side sewer cards show that this storm drain was installed by the Duwamish Bend Housing Project in 1943. There are no records of this system being turned over to the City.
Glacier Northwest, Inc.	Request additional information from Glacier Northwest regarding the process water treatment and recycling system at the facility, including the capacity of the system and the frequency and volume of discharges to the LDW.	Medium	SCAP	Ecology	Complete		2014	If discharges are frequent, collect catch basin solids samples and/or effluent discharge samples as needed.
	Request additional information from Glacier Northwest regarding (a) the trench drain installed in 1985; (b) the storm drain line shown on SPU maps that appears to discharge to Slip 2 approximately half-way between the head and mouth of the slip; (c) connections to Outfall 2018, if any; and (d) ownership of Outfall 2019.	Medium	SCAP	Ecology	Complete		2014	
	Review information submitted by Glacier Northwest in response to EPA Section 104(e) Request for Information.	Medium	SCAP	Ecology	Canceled			EPA is no longer providing 104(e) responses to Ecology, therefore no additional reviews will be performed.

Table B-1. Source Control Action Items Identified as Completed or Canceled During the Current Reporting Period

Facility	Action Item	Priority	Type	Responsible Party	Status	Estimated Completion Date	Date Completed	Comments/Follow-On Actions
Duwamish Marine Center	Conduct a follow-up source control inspection at Duwamish Marine Center to verify compliance with applicable regulations/code and implementation of appropriate stormwater BMPs.	Medium	SCAP	Ecology, SPU	Complete	--	Oct 2016	Tenants at this property are covered under the ISGP: Samson Tug & Barge under WAR011084, Duwamish Metal Fabrication under WAR125423. NPDES inspections are conducted regularly, most recently in October and September 2016, respectively.
	Conduct a follow-up business inspection at Samson Tug and Barge to verify compliance with corrective actions requested by SPU in July and October 2008. Also verify that the cleaning solution tank belonging to Burgess Enterprises has been removed.	Medium	SCAP	Ecology, SPU	Complete	--	Oct 2008	Samson Tug & Barge is covered under the ISGP (WAR011084). SPU confirmed corrective actions were implemented during October 2008 re-inspection. Following a 2013 inspection, SPU issued a compliance letter in November 2014 but noted that trackout of mud onto the adjacent street at gate 3 is a continuing problem and could result in a future NOV if not adequately controlled.
	Determine the status of Outfalls 2021 and 2022; if they are currently in use, determine the area drained by these outfalls and assess the potential for COCs to reach the LDW via this pathway.	High	SCAP	Ecology	Complete	--	Jun 2016	According to the 2012 SWPPP, Outfall 2021 is normally locked and sealed; it serves as an overflow for drainage from the facility's wash pad, which is pumped to the sanitary sewer. Outfall 2022 drains the southern 4 acres of the facility; Sampson Tug and Barge. In June 2016, Ecology approved an engineering report for installation of a stormwater treatment system due to exceedance of Level 3 benchmarks.
	Verify the status of NPDES permits for Duwamish Metal Fabricators.	Medium	SCAP	Ecology	Complete	--	Dec 2011	Duwamish Metal Fabricators was granted NPDES coverage in December 2011 (WAR 125423).
	Verify the status of NPDES permits for Samson Tug and Barge.	Medium	SCAP	Ecology	Complete	--	Dec 2014	Samson Tug & Barge Seattle Facility is covered under the ISGP (WAR011484). Ecology inspected Samson Tug & Barge 12/8/14 and conducted facility sampling on 2/10/15.
	Review information submitted by James Gilmur and Samson Tug and Barge in response to EPA Section 104(e) Requests for Information.	Medium	SCAP	Ecology	Complete	--	Dec 2011	Response from James Gilmur was reviewed in the December 2011 LDW Review of 104(e) Responses. No additional 104(e) reviews are planned.
Former Frank's Used Cars	Conduct a brief site visit to assess current site conditions and determine whether stormwater from this property is a potential source of sediment recontamination.	Low	SCAP	Ecology	Complete	--	Aug 2015	This property is currently owned by AK Media NW. Site is vacant with a large billboard onsite. Most of the site is covered with blackberries, although gravel/grass in the vicinity of billboard.
Bank and Office Interiors/Other Tenants	Conduct source control inspections at Bank and Office Interiors and other businesses located on this property.	Medium	SCAP	SPU, Ecology	Complete	--	2013	SPU inspected 2 tenants (Mark's Mobile Chassis Repair and Whole Food Markets Select Fish) in 2013 and 2011, respectively. Mark's Mobile Chassis Repair appears to be mobile repair business operating without a license. Whole Foods Markets Select Fish was required to develop/implement spill plan and keep dumpsters closed when not in use. Follow up inspection 6/9/11 confirmed implementation of corrective actions.
Former Consolidated Freightways	Conduct a site inspection to identify whether activities along the western edge of the property (in the area that drains to Slip 2) could be a source of sediment recontamination via stormwater discharge.	Low	SCAP	Ecology, SPU	Canceled	--		This is not an ISGP permitted facility. This has an active CSGP WAR 204806. This site is vacant and based on SPU GIS, drains to the combined sewer system.

Table B-1. Source Control Action Items Identified as Completed or Canceled During the Current Reporting Period

Facility	Action Item	Priority	Type	Responsible Party	Status	Estimated Completion Date	Date Completed	Comments/Follow-On Actions
Facilities Within the Michigan Street CSO Basin	Pioneer Porcelain Enamel Company: Conduct a business inspection to assess current activities at the site and verify that they are in compliance with applicable regulations/code and have implemented appropriate stormwater BMPs.	Low	SCAP	Ecology, King County	Canceled	--		Routine activity; action item canceled.
	Former Unocal Service Station 0907: Conduct a site inspection to verify current activities at the site and that activities are in compliance with applicable regulations/code and that appropriate stormwater BMPs have been implemented.	Low	SCAP	Ecology, King County	Canceled	--		Routine activity; action item canceled.
RM 2.0-2.3 East (Slip 3 to Seattle Boiler Works)								
SCS Refrigerated Services	Review the PRP response to EPA's CERCLA 104(e) letters sent to SCS Holding LLC and SCS Refrigerated Services LLC in March 2008.	Low	SCAP	Ecology	Canceled			EPA is no longer providing 104(e) responses to Ecology, therefore no additional reviews will be performed.
Seattle Distribution Center	Review the response to EPA's CERCLA 104(e) letter sent to CLPF Seattle Distribution in March 2008.	Low	SCAP	Ecology	Canceled	TBD		EPA is no longer providing 104(e) responses to Ecology, therefore no additional reviews will be performed.
	Conduct a source control inspection to determine whether the facility needs a NPDES permit, and confirm the presence of discharge points to the LDW including Outfall 2025 and an additional private storm drain line.	High	SCAP	SPU, Ecology	Complete	--	Jul 2009	SPU inspected site in 2009 and 2013. Dye tested roof drains and interior storm drains between buildings. Storm drains located between buildings discharge to private system that discharges to southeast corner of Slip 3. Outfall 2025 was a survey point at a suspected seep in the vicinity of the private outfall, but surveyors did not find a pipe at this location. Roof drains appeared to be clogged as water backed up through downspouts and on to road. Required SDC to clean onsite drainage system and recommended that they clean roof drains. SPU confirmed onsite CBs cleaned.
Glacier Marine Services	Review responses to EPA's CERCLA 104(e) Request for Information letters sent to Northland Services, Inc., Fox Avenue LLC, Seatac Marine Properties, Evergreen Marine Leasing, and Fox Avenue Warehouse in 2008.	Low	SCAP	Ecology	Complete	--	Dec 2011	Partially complete. Responses from Northland Services-Fox Avenue and Fox Avenue LLC were reviewed in the December 2011 LDW: Review of 104(e) Responses. EPA is no longer providing 104(e) responses to Ecology, therefore no additional reviews will be performed.
	Conduct a source control inspection to clarify issues related to storm drain system configuration and location of outfalls, sanitary sewer connections, and current activities at the facility as identified in the SCAP; conduct storm drain sampling as needed.	High	SCAP	SPU, Ecology	Complete	--	Jul 2012	SPU inspected current owner Seatac Marine Services in 2012 and required SMS to repair the outlet trap on an onsite CB, improve overall housekeeping practices, and to improve portable storage of liquid materials. SPU confirmed that Seatac Marine Services completed the necessary improvements during July 2012 re-inspection.
	Conduct in-line storm drain sampling to evaluate whether COCs are migrating to LDW sediments via the Glacier Marine Services storm drain system.	High	SCAP	SPU, Ecology	Complete	--	Aug 2012	SPU collected inline sample at MH222 near the downstream end of the S Brighton St SD system in 2012. None of the contaminants analyzed exceeded SPU source tracing thresholds.
V. Van Dyke	Review responses to EPA's Request for Information 104(e) Letter sent to V. Van Dyke, Inc. in March 2008	Low	SCAP	Ecology	Canceled			EPA is no longer providing 104(e) responses to Ecology, therefore no additional reviews will be performed.

Table B-1. Source Control Action Items Identified as Completed or Canceled During the Current Reporting Period

Facility	Action Item	Priority	Type	Responsible Party	Status	Estimated Completion Date	Date Completed	Comments/Follow-On Actions
Riverside Industrial Park	Review responses to EPA's Request for Information 104(e) Letter sent to Riverside Industrial Park and Big John's Truck Repair in 2008.	Low	SCAP	Ecology	Canceled			EPA is no longer providing 104(e) responses to Ecology, therefore no additional reviews will be performed.
	Conduct a source control inspection to address the two former shop building floor drains, determine if storm drain lines between the shop building and office building pass through areas where contaminated soil has been excavated, and conduct in-line storm drain sampling as needed.	High	SCAP	SPU	Complete	--	2014	SPU inspected the 2 businesses at this site and did not find any floor drains: Railworks Comstock (2008) -- required to develop a written spill plan and educate employees. Work completed 11/08. Commercial Floor (2014) -- no corrective actions required. According to the SCAP for this area, the floor drains were removed in October 1998 along with the 3 USTs found at the site during P1 and P2 investigations. SPU conducted illicit discharge survey in this area in 2014. Did not find any evidence of cross connections in this system.
Fox Avenue Building	Review responses to EPA's CERCLA 104(e) letter sent to Great Western Chemical Company in July 2008.	Low	SCAP	Ecology	Canceled			EPA is no longer providing 104(e) responses to Ecology, therefore no additional reviews will be performed.
	Coordinate any source control to be implemented at Cascade Columbia Distribution with the work that is to be conducted under the new 2009 Agreed Order.	Medium	SCAP	Ecology	Complete	--	2013	Ecology and Fox negotiated a second Agreed Order in 2012, signed in June 2012. Thermal treatment was completed in 2013 under the Agreed Order.
Bunge Foods/Dawn Food Products/Guimont Parcel	Review responses to EPA's CERCLA 104(e) letter sent to Bunge Foods Processing LLC in July 2008.	Medium	SCAP	Ecology	Canceled			EPA is no longer providing 104(e) responses to Ecology, therefore no additional reviews will be performed.
Muckleshoot Seafood Products	Review responses to EPA's CERCLA 104(e) letter sent to Silver Bay Logging in March 2008.	Medium	SCAP	Ecology	Canceled			EPA is no longer providing 104(e) responses to Ecology, therefore no additional reviews will be performed.
Rainier Petroleum	Review responses to EPA's CERCLA 104(e) letter sent to Rainier Petroleum Corporation in July 2008.	Medium	SCAP	Ecology	Canceled			EPA is no longer providing 104(e) responses to Ecology, therefore no additional reviews will be performed.
Morton Marine Equipment	Review responses to EPA's CERCLA 104(e) letter sent to Morton Marine Equipment in March 2008.	Medium	SCAP	Ecology	Canceled			EPA is no longer providing 104(e) responses to Ecology, therefore no additional reviews will be performed.
RM 2.3-2.8 East (Seattle Boiler Works to Slip 4)								
Guimont Parcel (Dawn Foods/former Bunge Foods)	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	SCAP	Ecology	Complete		Dec 2011	Ecology reviewed Fox Avenue Warehouse Corp 104(e) review; EPA is no longer providing 104(e) responses and therefore no additional reviews will be performed. Ecology verified drainage at Dawn Foods. Dawn Foods originally believed storm flow went out to Fox Avenue. Investigation found it to be the reverse. The whole site and storm flow from Fox Ave discharges on bank north of Seattle Boiler Works. A flapper valve was installed in late 2012 to minimize river flow into storm drainage system.

Table B-1. Source Control Action Items Identified as Completed or Canceled During the Current Reporting Period

Facility	Action Item	Priority	Type	Responsible Party	Status	Estimated Completion Date	Date Completed	Comments/Follow-On Actions
Seattle Boiler Works, Inc.	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	SCAP	Ecology	Canceled			EPA is no longer providing 104(e) responses to Ecology, therefore no additional reviews will be performed.
	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	SCAP	Ecology	Complete	--	June 2014	Ecology WQ conducted NPDES inspections on 3/20/13 and 6/20/14. SPU conducted inspections on 11/13/13 and 6/20/14. Inspections will continue on a routine basis. An Engineering Design Report was submitted to Ecology for review and approval.
	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	SCAP	Ecology/SPU	Complete	--	2014	This is an NPDES-permitted site that discharges to the LDW via private storm drains. SPU inspected Seattle Boiler Works in 2013-2014 due to concerns about track out and interior floor drain at building entry connecting to exterior storm drain system. Two outfalls were identified on the property. SPU agreed to continue to allow connection as long as Seattle Boiler Works implemented appropriate spill control actions.
Seattle Iron & Metals Corporation	Review responses to EPA's Request for Information 104(e) Letter sent to Seattle Iron & Metals, Manson Construction Company, Othello Street Warehouse Corporation, and The Must Corporation in July 2008.	High	SCAP	Ecology	Complete	--	Aug 2012	Manson Construction Company's initial response was reviewed as part of the December 2011 <i>LDW: Review of 104(e) Responses</i> . SAIC reviewed and summarized Seattle Iron & Metals 104(e) response in August 2012 (SAIC 2012 [10615]). EPA is no longer providing 104(e) responses to Ecology, therefore no additional reviews will be performed.
Puget Sound Truck Lines	Review responses to EPA's Request for Information 104(e) letters sent to Puget Sound Truck Lines and R&A Properties LLC.	High	SCAP	Ecology	Canceled			EPA is no longer providing 104(e) responses to Ecology, therefore no additional reviews will be performed.
	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	SCAP	Ecology	Canceled	--		
Seattle City Light Georgetown Pump Station	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	SCAP	Ecology, SPU	Complete	--	2009	The City of Seattle removed the old flume serving the steam plant and replaced it with a new 24" pipe in 2009. Only the roof of the steam plant building, S. Myrtle St. and some of the adjacent parcels currently drain to this storm drain.
Crowley Marine Services	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	SCAP	Ecology	Complete	--	Dec 2011	Responses from Northland Services and Evergreen Marine Leasing were reviewed as part of the 2011 <i>LDW: Review of 104(e) Response</i> . Response from Crowley Marine Services, Inc. has been reviewed (document index only). Response from Samson Tug & Barge has been received by Ecology, but has not been reviewed. No additional reviews are planned at this time.

Table B-1. Source Control Action Items Identified as Completed or Canceled During the Current Reporting Period

Facility	Action Item	Priority	Type	Responsible Party	Status	Estimated Completion Date	Date Completed	Comments/Follow-On Actions
Fox Avenue Building	Monitor the progress of the RI/FS to investigate and remediate soil and groundwater contamination beneath the property.	Medium	SCAP	Ecology	Complete		Jun 2014	Ecology and Fox negotiated a second Agreed Order in 2012, signed in June 2012. Thermal treatment, required under the 2012 AO, was completed in 2013.
	Review responses to EPA's July 2008 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.	Low	SCAP	Ecology	Canceled	--		EPA is no longer providing 104(e) responses to Ecology, therefore no additional reviews will be performed.
Whitehead Company, Inc./Former Tyee Industries	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	SCAP	Ecology	Complete	--	2016	Site is currently used by Seattle Iron and Metals to store trucks, bins, and trailers. SPU and Ecology inspected site in 2012 and found numerous problems. SPU required corrective actions for track out, uncovered and leaking containers, lacking spill plan, and general housekeeping. Site is covered by ISGP. SPU referred site to Ecology in 2013 regarding need for stormwater treatment. SIM installed a stormwater collection and treatment system that discharges to the S. Myrtle St. storm drain. Ecology conducted inspections on 5/19/16, 10/26/16 and 11/08/16. This site is under an active Administrative Order.
Whitehead Company, Inc./Former Perkins Lot	Assist Svendsen Brothers with obtaining coverage under the Industrial Stormwater General Permit and KCIW discharge authorization or permit.	Medium	SCAP	Ecology, KCIW	Canceled			Svendsen Brothers no longer operates at this location.
	Perform a follow-up inspection at Taxi King to ensure that corrective actions identified in July 2008 have been implemented.	Medium	SCAP	EPA, Ecology	Complete	--	Jan 2012	SPU conducted a joint inspection with EPA on 1/24/12. EPA is currently lead on this site.
Former Trim Systems	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	SCAP	Ecology	Canceled	--		Seattle Iron & Metals expanded operations to this parcel in 2013. As part of the expansion, SPU transferred ownership of the portion of the S. Garden St. stormwater on SIM property, including the outfall to SIM (because of difficulty in accessing the outfall and drainage system crossing SIM property) and required SIM to install, operate, and maintain an Filterra unit in the ROW to address track out issues. This parcel is included in the draft Seattle Iron & Metals individual NPDES permit renewal, and will be included in future Seattle Iron & Metals site inspections.
Nitze-Stagen/Frye Parcels	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	SCAP	Ecology, SPU	Complete	--	Aug 2009	SPU inspected the 2 current tenants in 2009, Seattle Transload (no corrective actions required) and EWC Group, Inc (spill plan and employee training required).

Table B-1. Source Control Action Items Identified as Completed or Canceled During the Current Reporting Period

Facility	Action Item	Priority	Type	Responsible Party	Status	Estimated Completion Date	Date Completed	Comments/Follow-On Actions
Former Sternoff Parcel	Inspect facility to confirm that stormwater does not drain to the LDW and ensure that operations are in compliance with applicable codes and regulations.	Medium	SCAP	Ecology, SPU	Complete	--	2015	SPU inspected CDL Recycle in 2009 and 2015. In 2015, SPU again required CDL to reduce track out onto East Marginal Way S and to increase sweeping to control pollutants. CDL is in the process of replacing concrete panels onsite to reduce dust, has purchased a portable misting system, and has hired a full time employee responsible for sweeping and spill response. SPU confirmed improvements during re-inspection, but notified CDL that structural controls may be required if operational BMPs are not adequate. In addition, SPU has linked this property with PCB contamination found in the ROW. Onsite "trash pile" containing 69-120 mg/kg PCBs was removed in 1999. Sidewall and bottom samples showed 977 mg/kg remaining onsite. SPU sampled site in 2009. Elevated levels of PCBs (6.9 mg/kg dw) found in the roadway on 8th Ave S immediately adjacent to driveway. Results provided to Ecology. Majority of site drains to the combined sewer on E Marginal Way S, but track out does occur on 8th Ave S.
RM 2.8 East (EAA-3: Slip 4)								
Crowley Marine / 8th Avenue Terminals	Review CERCLA 104(e) responses submitted by Crowley Marine Services, Inc. and Samson Tug & Barge Company, Inc.	Medium	New	Ecology, EPA	Canceled			Partially complete. Response from Crowley Marine Services, Inc. has been reviewed (document index only). Response from Samson Tug & Barge has been received by Ecology, but has not been reviewed. No additional reviews are planned.
First South Properties / Emerald Services	Reinspect facility and collect in-line solids to assess recontamination potential from any ongoing operations.	Medium	New	Ecology, King County	Complete	--	Aug 2016	Denovo purchased property in 2014. Denovo intends to construct a permanent transload facility at this location and has initiated the SEPA/permitting process. Waste Management plans to begin operating an interim transload facility at this site in August 2015. Will require oversight as transloading operations begin. Ecology will be the lead since this is an NPDES-permitted site that discharges directly to the waterway. King County issued permit to discharge contaminated stormwater and decant water from transloading operations to the sanitary sewer. Ecology conducted Urban Waters/NPDES inspections in March and August 2016.

Table B-1. Source Control Action Items Identified as Completed or Canceled During the Current Reporting Period

Facility	Action Item	Priority	Type	Responsible Party	Status	Estimated Completion Date	Date Completed	Comments/Follow-On Actions
RM 2.8-3.7 East (EAA-4: Boeing Plant 2/Jorgensen Forge)								
Boeing Plant 2	Complete design and implementation of dredging, capping, and/or backfilling of the Duwamish Sediment Other Area Corrective Measure.	High	SCAP	EPA, Ecology, Boeing	Complete	--	Mar 2015	The Corrective Measure Implementation Report was published in June 2016.
	Remove contaminated bank fill material.	High	SCAP	EPA, Boeing	Complete	--	May 2014	All contamination from top of bank waterward has been removed and backfilled to the low-water line. Excavation will continue into the channel during 2014 and 2015.
	Re-evaluate the SWPPP and make necessary changes if process/operational changes are made at Plant 2.	Low	SCAP	Ecology, Boeing	Complete	--	2016	Boeing reviewed and updated its SWPPP in 2016.
	Excavate PCB-contaminated soil in the substation area (southwest corner of Plant 2).	High	New	Boeing	Complete	--	2014	This activity is being handled under a CERCLA order. Action pending. Boeing action included in 2014 draft CMS report.
	Conduct stormwater source control sampling of suspended solids and/or water along active storm drain lines.	High	New	Boeing	Complete	--	Feb 2014	EPA (H. Arrigoni) reports that Boeing conducts regular sampling.
	Implement catch basin solids sampling program.	High	New	Boeing	Complete	--	Feb 2014	A sampling program has been implemented. Boeing conducts regular sampling.
Jorgensen Forge	Implement Non-Time Critical Removal Action.	High	Follow-On	EPA, Jorgensen	Complete	--	Sept 2014	Removal Action construction including shoreline bank excavation and contaminated sediment removal was completed on September 13, 2014.
RM 3.7-3.9 East (EAA-6: Boeing Isaacson/Central KCIA)								
KC Airport SD #2/PS45 EOF (King County Storm Drain / SPU EOF)	If COCs are present in the storm drain line, conduct source tracing to identify potential contaminant sources at KCIA.	High	SCAP	King County, SPU	Complete	--	May 2015	Based on samples collected at the KCIA2 sampling location and the KCIA pump station in 2014 and 2015, COCs are below SQS/LAET in storm drain solids within this basin.
	Collect and analyze a solids sample from near the KC Airport SD #2/PS45 EOF outfall to evaluate whether chemicals are being discharged to EAA-6 via this outfall.	Medium	SCAP	King County, SPU	Complete	--	May 2015	Inline sediment trap samples collected at KCIA discharge point in May 2014 and May 2015 showed no exceedances of SQS for metals, PAHs, PCBs, phthalates, or TPH. South pump station samples collected in May 2015 showed no exceedances of SQS for metals, PAHs, PCBs, phthalates, or TPH. The data collected at KCIA shows that it is not a source of LDW COCs. City of Tukwila East Marginal Way stormwater drainage also discharges to this outfall.

Table B-1. Source Control Action Items Identified as Completed or Canceled During the Current Reporting Period

Facility	Action Item	Priority	Type	Responsible Party	Status	Estimated Completion Date	Date Completed	Comments/Follow-On Actions
Boeing Isaacson/Thompson Site	Characterize contaminant concentrations in subsurface soil near the former location of the Slip 5 outfall, to the north of the 48-inch storm drain line, and at other locations on the property as needed.	High	SCAP	Boeing	Complete	--	Apr 2014	Completed with submittal of Final RI Report on April 21, 2014.
	Conduct a comprehensive soil and groundwater investigation at this property, including groundwater monitoring at selected wells and evaluation of potential arsenic sources; include wet and dry season samples.	High	SCAP	Boeing	Complete	--	Apr 2014	Completed with submittal of Final RI Report on April 21, 2014.
	If needed, conduct additional tidal studies to address the tidal efficiency anomaly identified in well I-205 during a tidal study conducted in 2000, and to collect additional information on tidal influences.	Low	SCAP	Boeing	Complete	--	Apr 2014	Completed with submittal of Final RI Report on April 21, 2014.
	Collect bank samples and analyze them for COCs to evaluate potential for sediment recontamination from bank erosion.	Medium	SCAP	Boeing, Ecology, Port of Seattle	Complete	--	Nov 2015	Investigation conducted by Ecology's contractor in May 2015. Final report published in November 2015. Results indicate the presence of metals, cPAHs, PCB, and TPH above screening criteria.
	Collect stormwater solids samples from the catch basins on the Boeing Isaacson property that drain to the Boeing Thompson stormwater system.	Medium	SCAP	Boeing	Complete		Apr 2014	Completed with submittal of Final RI Report on April 21, 2014.
	Collect storm drain solids samples from the Boeing Thompson stormwater system to assess concentrations of contaminants.	Medium	SCAP	Boeing	Complete		Apr 2014	Completed with submittal of Final RI Report on April 21, 2014.
KCIA	Conduct a follow-up inspection at United Parcel Service (UPS) Boeing Field to verify that corrective actions have been taken with regard to elevated copper and zinc in stormwater.	Low	SCAP	Ecology	Canceled	--		The UPS inspection is routine. Ecology issued North Boeing Field an Administrative Order #13641 on 7/19/16 to give a time extension for the stormwater line cleaning requirement of the ISGP.
	Conduct a follow-up inspection at Ameriflight to identify which drains discharge to the storm drain system and to ensure that no contaminants are entering storm drains.	Low	SCAP	Ecology	Canceled	TBD		The Ameriflight inspection is routine.
	Conduct a follow-up inspection at DHL Express to verify that corrective actions have been completed and that no contaminants are entering the storm drain system.	Low	SCAP	Ecology, King County	Canceled	TBD		Ecology received a Notice of Termination letter in 2016 for this facility that ceased operations at this property 5/15/16.
RM 3.9-4.3 East (Slip 6)								
King County Stormwater Outfall	Collect in-line water and storm drain solids samples to evaluate if COCs are migrating to Slip 6 source control area sediments via the storm drain outfall.	High	SCAP	King County	Complete	--	May 2013	Sediment trap installed in September 2008; first sample collected in March 2009; most recent sample was May 2013.
	Conduct source tracing to identify sources of COCs to the storm drain line, as necessary.	High	SCAP	King County	Complete	--	May 2013	Contaminant concentrations in May 2013 sediment trap sample were below sediment screening levels.
8801 Site (Former PACCAR Site)	Expand investigation of the southwest storage area and northwest corner of the site to determine the extent of soil and groundwater contamination.	High	SCAP	Ecology, Property owner/operator	Complete		2014	Work continuing as required by Agreed Order # 6069.
	Prepare Interim Action Work Plan to address upland contamination at the site.	High	New	Ecology, Property owner/operator	Complete		Jan 2015	Final Draft Interim Action Work Plan submitted to Ecology on April 8, 2014, and revised in January 2015.

Table B-1. Source Control Action Items Identified as Completed or Canceled During the Current Reporting Period

Facility	Action Item	Priority	Type	Responsible Party	Status	Estimated Completion Date	Date Completed	Comments/Follow-On Actions
Former Rhône-Poulenc Site	Address the toluene groundwater contamination in the southwest corner of the East Parcel, in accordance with the Revised East Parcel Corrective Measures Implementation Work Plan.	High	SCAP	EPA, Property owner/operator	Complete	--	Nov 2016	EPA approved shut down of the active operation of the East Parcel CMI biosparge/vent system (July 2015). Toluene levels were in compliance with the cleanup standard for four consecutive quarters of groundwater monitoring following shut down and monitoring was discontinued.
KCIA	Review and modify KCIA stormwater management activities to prevent contaminants from entering the KCIA stormwater system.	Medium	SCAP	Ecology, King County	Complete	--	Sep 2015	KCIA implemented airport-wide BMPs in accordance with its ISGP requirements. KCIA implementation of BMPs are provided in its SWPPP. KCIA performs annual stormwater facility and illicit discharge inspections.
Boeing Developmental Center (BDC) - North	Conduct stormwater and/or storm drain solids monitoring for outfalls DC14 and DC15.	High	SCAP	Ecology, Boeing	Complete	--	Dec 2014	Ecology/Leidos collected a water sample from an oil/water separator on the DC14 drainage line, and a solids sample from the DC15 drainage line in December 2014 (Leidos 2015c). PCBs and PAHs exceeded screening levels in both samples; dioxins/furans and phthalates also exceeded screening levels in the DC15 sample.
RM 4.3-4.9 East (Boeing Developmental Center)								
BDC Outfalls	Request Boeing to collect grab solids samples from the BDC SD system. Priority should be given to SD lines with medium to high flows and SD lines serving areas with significant industrial activities. Samples should be analyzed for PCBs, PAHs, and metals.	High	SCAP	Ecology/Boeing	Complete	--	Dec 2014	Ecology sampled storm drain lines at BDC in December 2014 as part of a NPDES inspection (Leidos 2015c). Six water and four solids samples were collected; metals, PCBs, PAHs, dioxins/furans, phthalates, and petroleum hydrocarbons exceeded screening levels.
BDC - Central	Review response to EPA's Request for Information 104(e) letters sent to Boeing.	Medium	SCAP	Ecology	Canceled	--		EPA is no longer providing 104(e) responses; no additional 104(e) reviews are planned.
	Conduct a stormwater compliance inspection to ensure that current and planned operations are consistent with stormwater regulations and best management practices. Review changes to industrial activities at BDC to assess potential for sediment recontamination associated with new operations.	Medium	SCAP	Ecology	Complete	--	Nov 2014	Ecology conducted a NPDES inspection on 6/24/2014 and a technical assistance visit on 11/20/2014.
RM 4.9 East (EAA-7: Norfolk CSO/SD)								
Norfolk CSO/SD/EOF	Obtain drainage plans for private properties along East Marginal Way S. to better delineate drainage basin boundaries in this area.	Low	SCAP	SPU, City of Tukwila, King County	Complete	--	Aug 2015	Seattle has updated the Norfolk basin boundaries based on information provided by Tukwila/King County.
	Conduct further source tracing and sampling within the Norfolk CSO/SD.	Medium	SCAP	Ecology, property owners	Complete	--	Dec 2016	As of December 2016, SPU has collected 54 sediment trap samples, 57 in-line solids samples, 29 on site catch basin samples, and 19 right-of-way catch basin samples from the Norfolk SD basin.

Table B-1. Source Control Action Items Identified as Completed or Canceled During the Current Reporting Period

Facility	Action Item	Priority	Type	Responsible Party	Status	Estimated Completion Date	Date Completed	Comments/Follow-On Actions
Military Flight Center	Conduct additional testing to assess the effectiveness of removal of PCB-contaminated material; provide caulk removal and testing reports to Ecology.	Medium	SCAP	Boeing	Complete		Nov 2014	A PCB Source Evaluation Report was completed in December 2013 identifying additional areas where source control actions would be required. Additional testing of concrete joint materials (CJM) was completed during 2014 to identify areas for removal of PCB containing CJM. Supplemental CJM removal work was completed in November 2014 (Bet 2015).
	Re-evaluate the SWPPP and NPDES permit and make any necessary changes, including parameters to address potential ongoing sources.	Low	SCAP	Ecology, Boeing	Complete		Jul 2014	The SWPPP was updated by Boeing in July 2014. Sampling locations were updated. Sampling for PCBs in stormwater discharges added in July 2014 (Bet 2015).
	Conduct inspection to ensure that pollution prevention practices are adequate and the facility is in compliance with its stormwater permit.	Low	SCAP	Ecology	Complete	--	2016	Ecology conducted NPDES inspections in 2013, 2014 and 2016. Ecology will routinely conduct inspections. Ecology issued an Administrative Order #13932 on 3/27/17 requiring the installation of stormwater treatment. This facility has also been working with EPA on TSCA. Boeing conducts stormwater inspections monthly (Bet 2015).
Northwest Auto Wrecking	Once a new business is operating at this site, conduct a facility inspection to assess the potential for sediment recontamination associated with this property.	Low	Follow-On	Ecology, City of Tukwila, KCIW	Complete	--	Mar 2016	SPU inspected the site in 2016 and found that vector waste and demolition debris/spoils were being placed on this property. SPU required the current property owner (Sabey Corporation) to remove the vector waste and demolition debris and re-establish site drainage. In March 2016, the owner reported that these activities had been completed and site was regraded to retain all stormwater onsite.
Affordable Auto Wrecking	Determine whether the storm drain system connects to the Norfolk CSO/SD.	Medium	SCAP	Property owner/operator, SPU, King County	Complete	--	Dec 2016	Site is now vacant. North yard, which is used to store trailers, is plumbed to the SD. South yard where car crushing took place is plumbed to the sanitary sewer.
	Inspect facility to ensure that recent drainage system modifications are functioning properly and that contaminated runoff does not flow into the municipal storm drain system on MLK Way.	Medium	SCAP	Ecology, SPU, KCIW	Complete	--	Aug 2015	Affordable Auto Wrecking ceased operations in 2013-2014. All materials have been removed and the pavement has been swept. This property, particularly the underlying groundwater system has likely been impacted by site activities. Site runoff continues to discharge to the sanitary sewer.
	Re-evaluate the SWPPP and make necessary changes to address potential ongoing sources.	Low	SCAP	Ecology, Property owner/operator	Canceled	--		Affordable Auto Wrecking ceased operations in 2013-2014 and the NPDES permit is inactive.
Arco Gas Station (Pacific Truck School)	Determine if a SWPPP is required to address potential ongoing sources.	Low	SCAP	SPU	Complete	--	Jun 2015	This site is now occupied by Pacific Truck School. The lot is unpaved; there is no sanitary, water, or drainage service at this location. SPU inspected Pacific Truck School in 2015. Several patches of oil and sheen were observed on the gravel lot. SPU required Pacific Truck school to implement appropriate spill prevention practices.
	Gain a better understanding of the storm drain system and possible historic or present connections to the Norfolk CSO/SD.	Low	SCAP	SPU	Complete	--	Jun 2015	There is no formal drainage system on this unpaved site. Stormwater infiltrates or sheet flows off the property and is picked up in catch basins along MLK Jr. Way S.

Table B-1. Source Control Action Items Identified as Completed or Canceled During the Current Reporting Period

Facility	Action Item	Priority	Type	Responsible Party	Status	Estimated Completion Date	Date Completed	Comments/Follow-On Actions
RM 0.0-1.0 West (Spokane Street to Kellogg Island)								
Duwamish West CSO/Siphon West CSO	Continue to perform facility inspections within the CSO basin as part of ongoing source control efforts. Document source control actions that are identified as a result of these inspections, if any.	Low	SCAP	KCIW, Ecology	Canceled	--		This is a routine ongoing requirement under King County's and SPU's CSO permits.
Riverside Mill Property	Perform an initial inspection to verify compliance with applicable regulations and source control BMPs.	Medium	SCAP	SPU	Canceled	--		This property is located on the West Waterway, not the LDW.
BNSF Railroad Right-of-Way	Determine whether the drainage ditch discharges to the LDW and identify if stormwater runoff is conveyed to the drainage ditch from Riverside Mill or other nearby facilities/properties.	Medium	SCAP	Ecology	Canceled	--		Not in LDW. Ditch is located on BNSF property and if active, discharges to the West Waterway, not the LDW. Port of Seattle property to the south is served by private drainage system (discharges to LDW). Property to north occupied by A+ Storage Container and Modification, Inc., Bob's Boat Shop, and United Motor Freight, Inc. SPU inspected these sites in 2013. Area drains to the combined sewer.
Global Diving & Salvage	Request that Global Diving & Salvage provide information to determine if catch basins at the facility are plumbed to the storm drain system at Terminal 103 or the SW Dakota Street SD system.	Low	SCAP	Ecology	Complete	--	Feb 2014	SPU inspected in 2014. Onsite catch basins connect to private drainage system that discharges directly to waterway.
	Perform a facility inspection to verify compliance with applicable regulations and source control BMPs.	Low	SCAP	SPU	Complete	--	Mar 2014	SPU inspected in 2014 and required Global Diving and Salvage to implement a number of corrective actions (cleaning onsite drainage system, preventing washwater from entering drainage system). SPU re-inspected to confirm that required improvements were completed.
Encore Oils (former Pacific Rendering)	Perform a follow-up inspection to determine if Encore Oils has implemented the corrective actions identified during the inspections performed in May and July 2012.	Low	SCAP	SPU	Complete	--	Aug 2012	SPU inspected in 2012. The west side of the property drains to the SW Dakota St SD, the remainder drains directly to the wetland swale (Outfall 2233) via outfall 2148. Required corrective actions included repairing/maintaining used oil collection bins that are stored outside, removing open pan of oil/grease stored outside, installing missing trap on one onsite catch basin, preparing spill prevention plan, sweeping or otherwise cleaning the waste storage area to collect loose solids for disposal. SPU confirmed that corrective actions were implemented during August 2012 re-inspection.
	Determine if Encore Oils is required to obtain coverage under the ISGP or is eligible for a CNE certificate.	Low	SCAP	Ecology	Canceled	--		This is obsolete. Ecology inspection at this address on 4/11/13 for Sequential Biodiesel. This company is no longer operating in Seattle. The property is for sale.
Former Seaboard Lumber Property	Perform a follow-up inspection at Evergreen Trails to verify that corrective actions identified during the May 2008 inspection have been implemented and that the facility is maintaining appropriate source control BMPs.	Medium	SCAP	Ecology	Canceled	--		This is obsolete. Evergreen Trails ceased operations 12/31/15.
	Request that Evergreen Trails verify which outfall (2140, 2141, or other) the facility uses to discharge stormwater to the intertidal bay at Herring's House Park.	Medium	SCAP	Ecology	Complete	--	Dec 2016	A 24" SD (L1521) serves the former Evergreen Trails property. This is not outfall 2140 or 2141.

Table B-1. Source Control Action Items Identified as Completed or Canceled During the Current Reporting Period

Facility	Action Item	Priority	Type	Responsible Party	Status	Estimated Completion Date	Date Completed	Comments/Follow-On Actions
Former Fraser Properties	Perform an inspection at Global Diving & Salvage to ensure compliance with applicable regulations and source control BMPs.	Low	SCAP	SPU, Ecology	Complete	--	Feb 2014	SPU inspected GDS facilities at 3801, 3840, and 4025 W Marginal Wy SW in 2014. 3801 site contains a warehouse with fabrication, repair, and maintenance operations. Marine salvage equipment is stored in the outside yard (diving equipment and fuel tanks). Tanks are double walled and stored empty. No problems identified.
	Perform an inspection at Rehabitat Northwest to ensure compliance with applicable regulations and source control BMPs.	Low	SCAP	SPU, Ecology	Canceled	--		Not in LDW. This site drains to the West Waterway via the Longfellow Creek outlet. SPU inspected in 2005 when site was occupied by Tiger Industrial Trading, a used merchandise store.
Fromer Concrete Restoration	Perform business inspections at Gary's Westside Towing to verify compliance with applicable regulations and source control BMPs.	Medium	SCAP	SPU, Ecology	Canceled	--		Gary's Westside Towing is located in Georgetown. Former Concrete Restoration site now occupied by Global Diving and Salvage.
	Perform business inspections at Global Diving & Salvage to verify compliance with applicable regulations and source control BMPs.	Medium	SCAP	SPU, Ecology	Complete	--	Feb 2014	Former Concrete Restoration site is now occupied by Global Diving and Salvage. SPU inspected site in 2014 and found no source control issues. This site is used to store spill response equipment.
RM 1.0-1.3 West (Kellogg Island to Lafarge Cement)								
Lafarge North America Inc. Seattle	Conduct a follow-up business inspection to verify compliance with the corrective actions required by Ecology as a result of the June 2009 inspection, applicable regulations, and BMPs.	Low	SCAP	Ecology	Complete	--	2013	Inspections will continue routinely. Ecology conducted NPDES inspections in 2013 and 2014. SPU conducted inspections in 2013.
	Request Lafarge to provide additional information about the composition of material behind the bulkhead and whether or not bulkhead repairs were completed during 2006.	Low	SCAP	Ecology	Canceled	--		Redundant; combined with action item below.
RM 1.3-1.6 West (Glacier Bay)								
N Terminal 115 (Former MRI Corporation)	Verify the storm drainage pathway at the site; if stormwater flow to the LDW is confirmed, assess the need for stormwater characterization.	Medium	SCAP	SPU, Ecology	Complete		2014	A camera investigation was conducted that confirms the pathway of stormwater from the Port to the LDW, along the 48 inch SPU main line.
RM 1.6-2.1 West (Terminal 115)								
Icicle Seafoods	Review the responses to CERCLA Section 104(e) Request for Information letters from the companies that provide services to or are affiliated with Icicle Seafoods to identify potential sources of sediment recontamination. These companies include: Cypress Island Seafood, LLC, Murphy Overseas, LLC, and Smoki Foods.	Low	SCAP	Ecology	Complete	--	Dec 2011	Ecology reviewed the 104(e) response from Icicle Seafoods. EPA is no longer providing 104(e) responses to Ecology; therefore, no additional reviews will be performed.
Gene Summy Lumber and Commercial Fence (N Terminal 115)	Review the response to the CERCLA Section 104(e) Request for Information letter from Strategic Global Mobility (SGM) to identify potential sources of sediment recontamination that may be associated with historical operations.	Low	SCAP	Ecology	Canceled	--		EPA is no longer providing 104(e) responses to Ecology; therefore, no additional reviews will be performed.
Northwest Container Services	Perform a follow-up stormwater inspection at Northwest Container Services to verify compliance with applicable regulations and BMPs to prevent the release of contaminants to the LDW.	Medium	SCAP	Ecology, SPU	Canceled	--		Northwest Container Services closed and moved out but then returned. Northland Services expanded their permit to include the Northwest Container Services footprint. Ecology conducted an inspection in 2013 and 2015. Inspections will continue routinely.

Table B-1. Source Control Action Items Identified as Completed or Canceled During the Current Reporting Period

Facility	Action Item	Priority	Type	Responsible Party	Status	Estimated Completion Date	Date Completed	Comments/Follow-On Actions
Shultz Distributing (Associated Petroleum)	Determine if stormwater from the Shultz Distributing facility is conveyed to the Highland Park Way SW SD system without treatment.	High	SCAP	Port of Seattle, Ecology	Complete	--	Dec 2016	Site currently occupied by Associated Petroleum Products. Catch basins located at the entrance and apron to the fuel island are plumbed to the Highland Park Way SW SD.
	Perform a facility inspection to verify compliance with applicable regulations and BMPs to prevent the release of contaminants to the LDW.	Medium	SCAP	Ecology, SPU, King County	Complete	--	Dec 2016	SPU inspected the current tenant (Associated Petroleum Products) in 2015. SPU required business to install traps on the two catch basins that are plumbed to the Highland Park Way SW SD, provide required spill containment and response equipment on site, improve signage at the fuel dispensing station. This work was completed in 2015.
Seafreeze Cold Storage	Review the responses from Seafreeze, Custom Seafoods, and Northwest Seafood Processors to the CERCLA Section 104(e) Request for Information letter to identify potential sources of sediment recontamination (if any) that may be associated with current or historical operations.	Low	SCAP	Ecology	Canceled	--		EPA is no longer providing 104(e) responses to Ecology, therefore no additional reviews will be performed.
Former Foss Environmental Services	Review responses from McGraw-Hill Companies, Inc. and Ilahie Holdings, Inc. to the CERCLA Section 104(e) Request for Information letters to identify potential sources of sediment recontamination that may be associated with current or historical operations.	Low	SCAP	Ecology	Canceled	--		EPA is no longer providing 104(e) responses to Ecology, therefore no additional reviews will be performed.
Aluminum & Bronze Fabricators	Determine if Aluminum & Bronze can obtain a CNE certificate or is required to obtain coverage under the Industrial Stormwater General Permit.	Medium	SCAP	Ecology	Complete	--	2016	Drains to SW Kenney St storm drain. In PARIS this is called A&B Fabricators Inc and they have CNE 126297.
RM 2.1 West (1st Avenue S SD)								
Burkheimer Family Property	Perform a follow-up inspection at Samson Tug & Barge to verify compliance with Ecology's recommendations, applicable regulations, and BMPs to prevent release of contaminants to the LDW.	Low	SCAP	Ecology	Complete	--	Aug 2015	This is the Samson Tug & Barge Detroit Ave SW facility (WAR011800). NPDES inspection conducted on 4/26/2014; track-out is a chronic problem. Ecology conducted two follow-up site visits in 2015.
Lion Trucking	Perform a follow-up inspection at Lion Trucking to verify compliance with Ecology's recommendations, applicable regulations, and BMPs to prevent release of contaminants to the LDW.	Low	SCAP	Ecology	Complete	--	2013	SPU conducted initial inspection, 10/11/12. SPU sent 2nd and final letter 1/9/13 requiring spill kits, cleaning onsite, detention vault, and catch basins.
South Recycle & Disposal Station	Perform a follow-up inspection at South Recycle & Disposal Station to verify compliance with Ecology's recommendations, applicable regulations, and BMPs to prevent release of contaminants to the LDW.	Low	SCAP	Ecology	Complete	--	Dec 2016	This facility is covered under the ISGP (WAR000737). Inspections are conducted routinely as needed.
Waste Management Eastmont Transfer Station	Perform a follow-up inspection at Waste Management Eastmont Transfer Station to verify compliance with Ecology's recommendations, applicable regulations, and BMPs to prevent release of contaminants to the LDW.	Low	SCAP	Ecology	Complete	--	2013	Routine; SPU conducted 3 inspections in 2013.

Table B-1. Source Control Action Items Identified as Completed or Canceled During the Current Reporting Period

Facility	Action Item	Priority	Type	Responsible Party	Status	Estimated Completion Date	Date Completed	Comments/Follow-On Actions
North Star Ice Equipment	Review reports from recent inspections to verify compliance with Ecology's recommendations, applicable regulations, and BMPs to prevent the release of contaminants to the LDW.	Low	SCAP	Ecology	Complete	--	2013	SPU inspected the site in 2013 and required North Star to clean onsite catch basins and cover the solid waste roll off container. Work was completed in 2013. Routine activity.
	Perform an evaluation to determine if the facility is required to obtain coverage under the ISGP or is eligible for a CNE certificate.	Low	SCAP	Ecology	Complete	--	2013	SPU conducted inspections on 10/24/13 and 12/5/13; routine activity.
South Transfer Station/Former S Kenyon Street Bus Yard	Request additional information regarding the locations, materials, and conditions of storm drain system pipes and structures from the property owner.	Low	SCAP	Ecology	Complete	--	2013	SPU redeveloped the bus yard at 130 S Kenyon Street into the South Trannsfer Station, which opened in 2013. Contaminated soil was removed and the drainage was completely redesigned. Site plans and drainage information are available from SPU. The old South Transfer station at 8100 2nd Avenue S is now vacant. Drainage information is available from SPU.
Non-Ferrous Metals	Perform an evaluation to determine if the facility is required to obtain coverage under the ISGP or is eligible for a CNE certificate.	Low	SCAP	Ecology	Complete	--	2013	Ecology NPDES inspection 7/25/13; received CNE in 2013; routine.
Seattle Housing Authority	Perform an evaluation to determine if the facility is required to obtain coverage under the ISGP or is eligible for a CNE certificate.	Low	SCAP	Ecology	Complete	--	2016	This is a permitted facility; routine. SPU conducted inspections in June and August 2013, Ecology conducted inspection in March 2016. SHA applied for permit 5/12/15.
Urban Hardwoods	Perform an evaluation to determine if the facility is required to obtain coverage under the ISGP or is eligible for a CNE certificate.	Low	SCAP	Ecology	Complete	--	2013	Routine.
RM 2.1-2.2 West (EAA-2: Trotsky Inlet)								
2nd Avenue S SD	Review responses to CERCLA 104(e) letters by Wells Trucking and Leasing, Inc. and Ferguson Enterprises, Inc.	Low	New	Ecology, EPA	Canceled	--		EPA is no longer providing 104(e) responses, therefore no additional reviews will be performed.
Reservoir Overflow	Repair West Seattle Reservoir to remove source of water to the overflow pipe that discharges to the head of the inlet.	Low	New	City of Seattle	Complete	--	2010	This above ground reservoir was replaced with an underground structure in 2010.
Douglas Management Company	Conduct a re-inspection of the site to confirm that operations are in accordance with all applicable stormwater regulations; evaluate the potential for contaminant transport to the Trotsky Inlet or LDW via surface runoff.	Low	Follow-On	Ecology	Complete	--	Mar 2013	Revised SWPPP was submitted to Ecology in September 2012. In January 2013 SWPPP was updated and resubmitted. Ecology Inspection conducted in March 2013 verified stormwater treatment had been installed.
Boyer Towing	Review responses to EPA CERCLA 104(e) Request for Information letters issued to River View Marina and Mary Catherine Halvorsen, if available.	Medium	New	Ecology	Canceled	--		EPA is no longer providing 104(e) responses, therefore no additional reviews will be performed.
RM 2.2-3.4 West (Riverside Drive)								
Independent Metals Plant 2	Conduct a follow-up stormwater compliance inspection to verify compliance with the corrective actions identified repeatedly by Ecology during inspections performed from 2007 to 2011. Evaluate compliance with corrective actions, and take enforcement action as appropriate.	High	SCAP	Ecology	Complete	--	Apr 2014	Administrative Order Docket #10634 issued to Silver Bay Logging on 4/10/14 requiring operation of the stormwater treatment system and good housekeeping BMPs.
Machinists Inc – Main Facility	Evaluate the stormwater treatment system, when completed, to ensure compliance with applicable regulations and BMPs.	Low	SCAP	Ecology	Complete	--	Nov 2013	Follow-up NPDES inspection was conducted in November 2013 and the facility was found to be in permit compliance.

Table B-1. Source Control Action Items Identified as Completed or Canceled During the Current Reporting Period

Facility	Action Item	Priority	Type	Responsible Party	Status	Estimated Completion Date	Date Completed	Comments/Follow-On Actions
Olympic Steel Door	Conduct a follow-up business inspection to verify compliance with corrective actions identified by SPU in 2009, applicable regulations, and BMPs, to prevent release of contaminants to the LDW.	Medium	SCAP	SPU	Complete	--	Oct 2009	SPU completed follow-up inspection and confirmed that correction actions were implemented. Site has been referred to Ecology to evaluate need for NPDES coverage.
Marine Lumber Service Inc.	Review the September 2011 inspection report to evaluate Marine Lumber Service's progress with regard to implementing source control BMPs and preventing ACZA leachate from entering the storm drain system.	Medium	SCAP	Ecology	Complete	--	Apr 2012	Ecology conducted NPDES inspections on 1/4/12, 1/30/12, and 4/26/12 and an Urban Waters Inspection on 1/15/12.
Rogers Machinery Co Inc.	Request Rogers Machinery to discharge wash water to the sanitary sewer.	Low	SCAP	Ecology	Complete	--	2016	SPU inspected in 2016. Equipment is pressure washed in an outside, covered area that is plumbed to the sanitary sewer.
RM 3.4-3.8 West (EAA-5: Terminal 117)								
Terminal 117	Conduct removal action in accordance with EPA Enforcement Order on Consent.	High	Follow-On	City of Seattle, Port of Seattle	Complete	--	Dec 2014	Upland and in-water construction were completed in December 2014.
Adjacent Streets/Dallas Ave.	Conduct cleanup action to remove PCB-contaminated street soils, install new storm drainage, and restore roads.	Medium	SCAP	City of Seattle	Complete	--	Aug 2016	Streets cleanup was conducted simultaneously with stormwater system upgrade.
	Install permanent stormwater collection/treatment system per Seattle code.	Medium	Follow-On	City of Seattle	Complete	--	Aug 2016	Adjacent Streets & Stormwater construction was completed in August 2016.
South Park Marina	Conduct follow-up inspections until compliance is achieved.	Low	Follow-On	Ecology	Complete	--	2013	The last NPDES compliance inspection occurred in April 2009. Routine.
	Sample catch basins for metals and phthalates	Low	SCAP	Ecology	Complete	--	Oct 2014	Ecology/Leidos completed NPDES sampling in 2014 (Leidos 2015c).
Basin Oil	Conduct Site Hazard Assessment.	Medium	Follow-On	Ecology	Complete	--	Feb 2015	Ecology conducted Site Hazard Assessment in February 2015.
RM 3.8-4.2 West (Sea King Industrial Park)								
S 96th Street SD Basin	Perform further environmental investigations and cleanup activities to address sources of contaminants to the LDW.	High	SCAP	Ecology, King County	Complete	--	Dec 2016	LDW sediment samples collected near this outfall do not indicate that contaminants are being transported to the LDW via this SD outfall. However, sediment trap samples collected by Ecology/SPU/King County during 2014-2016 indicate multiple exceedances of the CSL for a wide variety of chemicals during the current reporting period: zinc, phthalates, PAHs, dioxins/furans, chromium, other SVOCs. Further evaluation will be conducted at this freshwater site separately from the LDW cleanup.
	Request a current map of the S 96th Street SD basin from King County in order to verify conveyance and drainage features.	Medium	SCAP	Ecology	Complete	--	Sep 2012	Ecology requested updated map as part of King County's source control implementation plan. Request made September 2012. King County is still working on the map.
Sea King Industrial Park	Perform a follow-up inspection at Diamond Painting to verify compliance recommendations made during the August 2008 inspection.	Low	SCAP	Ecology	Complete	--	Mar 2016	Ecology and King County conduct routine inspections at Sea King Industrial park, most recently in March 2016.

Table B-1. Source Control Action Items Identified as Completed or Canceled During the Current Reporting Period

Facility	Action Item	Priority	Type	Responsible Party	Status	Estimated Completion Date	Date Completed	Comments/Follow-On Actions
Duwamish Yacht Club	Perform a source control inspection to verify compliance with applicable regulations and BMPs to prevent the release of contaminants to the LDW. During the inspection, determine if fueling operations and/or boat maintenance and repair operations are conducted at the facility.	Medium	SCAP	Ecology	Complete	--	Mar 2016	King County inspected this facility on March 17, 2016. No issues of concern were identified.
	Request that the Desimone Trust (property owner) collect soil and groundwater data in order to determine the potential for sediment recontamination via the groundwater discharge pathway.	Medium	SCAP	Ecology	Canceled	--		LDW sediment samples collected near this property do not indicate that contaminants are being transported via groundwater. Action item is therefore not needed.
Delta Marine Industries	Conduct an inspection during a storm event to determine if Outfall 2100(B) and the Delta Marine Outfall are operational or have been abandoned. If discharge from these outfalls is observed, request that the property owners conduct dye testing to determine if storm drain lines are connected to the unresolved outfalls and delineate the associated drainage areas.	Medium	SCAP	Ecology	Canceled	--		This facility is covered under the NPDES Boatyard General Permit (WAG030091). Water Quality inspections will be performed to ensure permit compliance. Ecology inspected this facility in November 2014.
	Request that the property owner collect soil and groundwater data in order to determine the potential for sediment recontamination via the groundwater discharge pathway.	Medium	SCAP	Ecology	Canceled	--		LDW sediment samples collected near this property do not indicate that contaminants are being transported via groundwater. Action item is therefore not needed.
	Request an updated facility map that includes details of the stormwater drainage systems associated with the treatment system, wash pad near the large boat lift, Outfall 2100(B), Delta Marine Outfall, and parcels 0029 and 0062 in order to assess the stormwater pathway at the facility.	Medium	SCAP	Ecology	Canceled	--		This facility is covered under the NPDES Boatyard General Permit (WAG030091). Water Quality inspections will be performed to ensure permit compliance. Ecology inspected this facility in November 2014.
PSF Mechanical	Perform inspections to monitor compliance with the Administrative Order, which directed the facility to implement all applicable operational and structural source control BMPs and to collect and analyze at least one stormwater discharge sample each quarter from October 1, 2011 through June 30, 2012.	Low	SCAP	Ecology	Complete	--	Jan 2015	Routine; Ecology performed inspections in January 2015. PSF mechanical submitted annual stormwater reports yearly from 2012-2015.
	Request information from PSF Mechanical regarding the status of the proposed stormwater treatment system.	Low	SCAP	Ecology	Complete	--	Jan 2015	This facility is covered under the ISGP (WAR000264). Ecology conducted a NPDES inspection in January 2015. Ecology's Water Quality Program will follow up as needed.
Industrial Automation	Review inspection reports from the January 24 and June 6, 2012 inspections to verify continued compliance with source control BMPs and corrective actions.	Low	SCAP	Ecology	Complete	--	Jun 2015	This facility is covered under the ISGP (WAR001949). Ecology conducted a NPDES inspection in June 2015. Ecology's Water Quality program will follow up as needed.
Absolute German/Former All City Auto Wrecking	Collect a solids sample from the drainage ditch at the southern boundary of the property. The sample will be analyzed for arsenic and cadmium to assess the potential for sediment recontamination via the groundwater discharge pathway.	Medium	SCAP	Ecology	Canceled	--		LDW sediment samples collected near this property do not indicate that contaminants are being transported via groundwater. Action item is therefore not needed.
	Perform a follow-up inspection to verify compliance with corrective actions identified during Ecology's February 2012 stormwater inspection.	Low	SCAP	Ecology	Complete	--	2016	Ecology conducted inspections in 2013 and 2016, and routine inspections will continue.

Table B-1. Source Control Action Items Identified as Completed or Canceled During the Current Reporting Period

Facility	Action Item	Priority	Type	Responsible Party	Status	Estimated Completion Date	Date Completed	Comments/Follow-On Actions
Carey Limousine Service	Request that property owner provide data to define the contaminant plume associated with the property and to verify that contaminants associated with the property are not reaching the LDW.	Medium	SCAP	Ecology	Canceled	--		LDW sediment samples collected near this property do not indicate that contaminants are being transported via groundwater. Action item is therefore not needed.
	Perform a follow-up inspection to verify compliance with corrective actions identified during Ecology's August 2011 inspection.	Low	SCAP	Ecology	Complete	--	Apr 2015	King County inspected this facility in March 2015, and determined that catch basins needed cleaning. Work was completed and verified in April 2015.
Former Precision Engineering/Pacific Industrial Supply	Request that the property owner provide data to define the contaminant plume associated with the property and to verify that contaminants associated with the former Precision Engineering property are not reaching the LDW.	Medium	SCAP	Ecology	Complete		2015	R/I/F/S was completed by Ecology in 2015. Contaminants include diesel and oil range petroleum hydrocarbons, arsenic, chromium, and chlorinated solvents. Oil and diesel range petroleum were identified at >500 ug/L at two downgradient monitoring wells at property boundary. Other contaminants are contained on property. Arsenic assumed background.
Gary Merlino Construction Company	Perform a follow-up inspection to verify that Merlino Construction has complied with the corrective actions and recommendations identified by Ecology during the July 2011 inspection.	Low	SCAP	Ecology	Complete	--	2015	Routine; SPU conducted an inspection 6/19/13. Ecology HQTR conducted an inspection 6/23/16. Ecology conducted an NPDES inspection 11/18/15.
Wooldridge Boats	Assess the need for an environmental investigation to determine if soil and groundwater were contaminated by PCBs and methylene chloride due to the disposal of contaminated oil and water in an underground sump in 1992. An investigation may be needed to determine the potential for sediment recontamination via groundwater discharge.	Medium	SCAP	Ecology	Canceled	--		LDW sediment samples collected near this property do not indicate that contaminants are being transported via groundwater. Action item is therefore not needed.
ICON Materials	Confirm that ICON Materials has complied with corrective actions to control track out and prepare a source control plan. This action includes performing a follow-up inspection to verify that the source control plan has been implemented at the facility.	Low	SCAP	Ecology	Complete	--	Dec 2016	Routine; Ecology conducted WQ inspections in August and December 2016.
Western Ports Transportation	Perform an inspection to verify that current activities performed at the property are in compliance with applicable source control regulations and BMPs.	Low	SCAP	Ecology	Complete	--	Aug 2013	Ecology conducted inspections on 4/23/13 and 8/28/13. SPU inspected this facility on 6/26/13.
Western United Fish Company	Perform a facility inspection to determine compliance with applicable regulations and BMPs for stormwater and hazardous waste management practices.	Low	SCAP	Ecology	Complete	--	Mar 2016	This facility is now known as Sealaska Seafoods. It was inspected by King County on March 23, 2016, and no issues of concern were identified.
Former Advance Electroplating	Provide to Ecology the environmental data and sample location maps from the 1995 remedial actions and related investigations performed at the property. Ecology will review the information to determine if metals are present in soil and groundwater at concentrations exceeding current MTCA cleanup levels and to determine the potential for sediment recontamination via the groundwater discharge pathway.	High	SCAP	EPA, Ecology	Canceled	--		LDW sediment samples collected near this property do not indicate that contaminants are being transported via groundwater. Action item is therefore not needed.
	Perform a facility inspection at Show Quality Metal Finishing to determine compliance with applicable source control regulations and BMPs.	Medium	SCAP	Ecology	Canceled	--		Show Quality Metal Finishing moved to SeaTac in 2014.

Table B-1. Source Control Action Items Identified as Completed or Canceled During the Current Reporting Period

Facility	Action Item	Priority	Type	Responsible Party	Status	Estimated Completion Date	Date Completed	Comments/Follow-On Actions
Former Penberthy Electromelt/ToxGon	Request that the property owner collect additional solids samples from the drainage ditch and groundwater samples in order to determine the potential for sediment recontamination via the groundwater discharge pathway.	Medium	SCAP	Ecology	Canceled	--		LDW sediment samples collected near this property do not indicate that contaminants are being transported via groundwater. Action item is therefore not needed.
Old Dominion Freight Line	Request that the property owner collect additional groundwater samples in order to determine the potential for sediment recontamination via the groundwater discharge pathway.	Medium	SCAP	Ecology	Canceled	--		LDW sediment samples collected near this property do not indicate that contaminants are being transported via groundwater. Action item is therefore not needed.
Selland Auto Transport	Perform a follow-up business inspection to verify compliance with Ecology's recommendations, applicable regulations, and BMPs to prevent the release of contaminants to the LDW.	Low	SCAP	Ecology	Complete	--	Sep 2016	Ecology conducted inspections on 8/28/13, 4/15/14, and 9/26/16.
Ace Galvanizing	Request that the property owner collect additional groundwater samples to assess current concentrations of zinc in groundwater and to evaluate whether additional source control actions are needed to minimize the potential for sediment recontamination via the groundwater discharge pathway.	High	SCAP	Ecology	Canceled	--		LDW sediment samples collected near this property do not indicate that contaminants are being transported via groundwater. Action item is therefore not needed.
	Review DMRs from third and fourth quarters of 2012 and the beginning of 2013 to assess the water quality of stormwater being conveyed to the S 96th Street SD system from Ace Galvanizing.	Medium	SCAP	Ecology	Complete	--	Mar 2016	This facility is covered under the ISGP (WAR000154). Ecology inspected this facility in May 2014. King County conducted a stormwater inspection in February 2016, and corrections were completed in March 2016. Any follow-up needed will be conducted by Ecology's Water Quality Program and/or King County.
	Perform a follow-up inspection to determine if Ace Galvanizing is in compliance with corrective actions identified during the May 2012 inspection.	Low	SCAP	Ecology HWTR	Complete	--	May 2014	This facility is covered under the ISGP (WAR000154). Ecology inspected this facility in May 2014.
RMC	Perform an inspection to determine if RMC has completed corrective actions to reduce copper and zinc concentrations in stormwater discharge.	Low	SCAP	Ecology	Complete	--	Dec 2015	Ecology conducted inspections on 1/3/13 and 8/21/14. Operations ceased 12/18/15. Property vacated 12/31/15.
Emerald City Machine	Perform initial inspection to verify that the facility is in compliance with applicable source control regulations and BMPs.	Low	SCAP	Ecology	Canceled	--		Ecology routinely conducts source control inspections as needed.
Mason Dixon Intermodal	Perform initial inspection to verify that the facility is in compliance with applicable source control regulations and BMPs.	Low	SCAP	Ecology	Canceled	--		Ecology routinely conducts source control inspections as needed.
McKinstry Co S Barton	Perform initial inspection to verify that the facility is in compliance with applicable source control regulations and BMPs.	Low	SCAP	Ecology, SPU	Complete	--	Oct 2016	Site currently occupied by King Electric Manufacturing Company. SPU inspected in February 2015 and October 2016. Site is a storage warehouse. No corrective actions identified.
Sound Delivery Service	Perform initial inspection to verify that the facility is in compliance with applicable source control regulations and BMPs.	Low	SCAP	Ecology, King County	Complete	--	Nov 2015	King County inspected this facility on 11/19/15. No issues were identified.
RM 4.2-5.8 West (Restoration Areas)								
Seattle City Light Power Substation	Request information from SCL and perform a facility inspection to determine if operations represent a potential source of contaminants to LDW sediments.	Medium	SCAP	Ecology	Complete	--	Feb 2014	Inspection report is associated with NPDES permit WAR044502. Ecology conducted sampling.

Table B-1. Source Control Action Items Identified as Completed or Canceled During the Current Reporting Period

Facility	Action Item	Priority	Type	Responsible Party	Status	Estimated Completion Date	Date Completed	Comments/Follow-On Actions
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Priority:

High = High priority action item -- to be completed prior to sediment cleanup

Medium = Medium priority action item -- to be completed prior to or concurrent with sediment cleanup

Low = Low priority action -- ongoing actions, or actions to be completed as resources become available

Type:

SCAP

Action item identified in a SCAP

Follow-On

Action item is a follow-on to an action item identified in a SCAP

New

Action item identified after publication of the SCAP

Responsible Party includes owner/operators as well as government entities responsible for enforcement/follow-up

Table B-2. Incomplete Source Control Action Items (as of December 2016)

Facility	Action Item	Priority	Type	Responsible Party	Status	Estimated Completion Date	Date Completed	Comments/Follow-On Actions
RM 0.0-0.1 East (Spokane Street to Ash Grove Cement)								
Harbor Marina Corporate Center / Port of Seattle Terminal 102	Determine the permitting requirements and responsible parties for each outfall. Work with adjacent property owners to confirm permit requirements for outfall HRE-1 and assign appropriate responsibility.	Medium	SCAP	Ecology WQ, Port of Seattle	Planned	TBD		
Port of Seattle Terminal 104	Determine how to address identified data gaps in the western portion of T-104.	High	SCAP	Ecology, Port of Seattle	Planned	TBD		
	Prepare and submit an annual report to document groundwater monitoring results and provide recommendations for future remedial efforts as stated in the VCP Cleanup Action Plan	Medium	SCAP	Port of Seattle	Planned	TBD		
	Review post remediation reports and annual report as part of the VCP and determine whether further action is needed.	High	SCAP	Ecology	Planned	TBD		
Ash Grove Cement	Negotiate an agreed order for a Remedial Investigation/ Feasibility Study that will focus on potential soil and groundwater contamination at the site.	High	SCAP	Ecology, Property owner/operator	Planned	TBD		
	Demonstrate appropriate separation of wastewater from storm water and install an appropriate treatment system.	Medium	SCAP	Property Owner/Operator	Planned	TBD		
	Inspect condition and operational records of the groundwater well used for cooling water to ensure that it cannot release contaminants into the aquifer.	Medium	SCAP	Ecology WQ	Planned	TBD		
RM 0.1-0.9 East (EAA-1: Duwamish/Diagonal Way)								
ConGlobal (formerly Container Care)	Verify the installation of stormwater treatment and resolution of permit and stormwater quality issues.	Low	Follow-On	Ecology	In Progress	Sep-16		In December 2013, interim treatment was installed at drainage area #3 on T108 portion of ConGlobal. Ecology WQ ordered ConGlobal to install and have final treatment operational for all drainage basins by September 30, 2016 (includes one-year extension). Current status is unknown.
UPRR Argo Yard	Conduct Site Hazard Assessment	Low	Follow-On	King County	Planned	TBD		
Terminal 108	Implement appropriate source control actions.	Medium	Follow-On	Port of Seattle	In Progress	TBD		Sampling was conducted in 2012.
GSA / Federal Center South	Clean and repair storm drain system; correct housekeeping issues	Medium	Follow-On	GSA	Planned	TBD		See also action items identified for the RM 0.9-1.0 East (Slip 1) source control area.
Former JANCO-United, Inc.	Conduct Site Hazard Assessment	Low	Follow-On	Public Health-Seattle & King County	Planned	TBD		Deferred pending review of groundwater data collected under VCP by property owner/agent.
	Review groundwater data collected under VCP; determine if further source control actions are needed.	Low	New	Ecology	Planned	TBD		

Table B-2. Incomplete Source Control Action Items (as of December 2016)

Facility	Action Item	Priority	Type	Responsible Party	Status	Estimated Completion Date	Date Completed	Comments/Follow-On Actions
Rainier Commons / Former Rainier Brewery Property	Sample and remove PCB-contaminated building materials, including interior paint, as needed.	High	New	EPA/Property Owner	In Progress	Dec 2018		EPA approved Rainier's general work plan in December 2013. Removal will take place in phases, with each phase commencing only after EPA approves the individual phase work plan. Current estimates of remediation duration are on the order of 5 years, given the complexities in removing paint from some of the surfaces, the protective measures that must be in place, and the oversight required of both the Work Plans and Completion Reports.
Bloch Steel Industries	Request Bloch Steel to provide updated information regarding groundwater monitoring activities at this facility after 2004.	Low	New	Ecology	Planned	TBD		
North Star Casteel	Review results of environmental investigations to determine if sediment COCs are present in soil and/or groundwater at concentrations that exceed screening levels, and determine if additional actions are needed for source control.	Low	New	Ecology	Planned	TBD		
Seattle Radiator	Review discharge permit/authorization records to determine if Discharge Authorization 366 is valid.	Low	New	King County/Ecology	Planned	TBD		
RM 0.9-1.0 East (Slip 1)								
Federal Center South	Review historical property files for information regarding the status and contents of three 30,000-gallon USTs; determine if sediment COCs may be present in soil and groundwater in this area.	Medium	SCAP	Ecology	Planned	TBD		
	If file review indicates that sediment COCs may be present in soil and/or groundwater, require the property owner/operator to perform an environmental assessment of soil and groundwater around the 30,000-gallon UST area.	Medium	SCAP	EPA	Planned	TBD		
	Conduct a visual bank survey; collect and analyze bank soil samples for sediment COCs to evaluate the potential for sediment recontamination from bank erosion.	Medium	SCAP	Ecology, Property owner/operator	Planned	TBD		
	Perform Site Hazard Assessment	High	SCAP	Ecology	Planned	TBD		
	Determine if Federal Center South must apply for coverage under the Industrial Stormwater General Permit.	Medium	SCAP	EPA, Ecology	Planned	TBD		

Table B-2. Incomplete Source Control Action Items (as of December 2016)

Facility	Action Item	Priority	Type	Responsible Party	Status	Estimated Completion Date	Date Completed	Comments/Follow-On Actions
Former Snopac Products Property	Review responses to EPA's Request for Information 104(e) Letter sent to Unimar in July 2008; assess potential for historical release(s) of arsenic or other sediment COCs to soil and groundwater beneath this property.	Medium	SCAP	Ecology	Planned	TBD		
	If there is potential for historical releases, require the property owner/operator to collect soil and groundwater samples and analyze them for sediment COCs. Prepare and implement a plan to remediate soil and/or groundwater, as needed.	Medium	SCAP	Ecology	Planned	TBD		
	Collect additional samples from Seep 76 to determine if the arsenic concentration reported in 2004 was an anomaly. Analyze sample for all sediment COCs.	High	SCAP	Ecology	Planned	TBD		
	Conduct a visual bank survey during low tide conditions; collect and analyze bank soil samples for sediment COCs to evaluate the potential for sediment recontamination from bank erosion and leaching. Reconnaissance cores should be collected along the top and bottom of the bank to determine "as is" conditions.	Medium	SCAP	Ecology	Planned	TBD		
	Obtain information from Snopac or other historical property owners regarding the construction of the dock adjacent to the property. If no information is available, perform an evaluation of the materials used to construct the dock.	Medium	SCAP	Ecology	Planned	TBD		

Table B-2. Incomplete Source Control Action Items (as of December 2016)

Facility	Action Item	Priority	Type	Responsible Party	Status	Estimated Completion Date	Date Completed	Comments/Follow-On Actions
Manson Construction Company	Obtain laboratory data and site plans from historical site assessment(s) and remediation performed at the property. Confirm that satisfactory completion of soil cleanup activities was achieved. Determine if arsenic or other sediment COCs are present in soil and groundwater beneath the facility at concentrations that may recontaminate sediments.	High	SCAP	Ecology	Planned	TBD		
	If satisfactory soil cleanup was not achieved, require the property owner/operator to conduct a site assessment to determine residual concentrations of sediment COCs in soil and groundwater beneath the property.	High	SCAP	Ecology	Planned	TBD		
	Collect additional samples from Seep 76 to determine if the arsenic concentration reported in 2004 was an anomaly. Analyze sample for all sediment COCs.	High	SCAP	Ecology	Planned	TBD		
	Conduct a visual bank survey during low tide conditions; collect and analyze bank soil samples for COCs. Reconnaissance cores should be collected along the top and bottom of the bank to determine "as is" conditions.	Medium	SCAP	Ecology	Planned	TBD		
RM 1.0-1.2 East (KC Lease Parcels)								
S Brandon Street Combined Sewer Overflow	Evaluate the 2009 effluent discharge and 2010 solids sample data to assess whether the effluent concentrations and/or solids sample concentrations represent a potential source of contaminants to sediments associated with the KC Lease Parcels source control area, and develop source control actions if necessary.	Medium	SCAP	Ecology	Planned	TBD		
	Use source tracing data to identify and evaluate possible point source contributions of LDW COCs to CSO discharges. Determine if contaminant loading analyses are necessary for King County Industrial Waste (KCIW) Program permit holders in this CSO basin.	Medium	SCAP	King County	Planned	TBD		
Manson Construction Company	Obtain and review a copy of <i>Environmental Site Assessment, Duwamish Properties</i> prepared by Boateng for King County in January 1997, to identify additional potential sources of COCs to sediment and develop appropriate source control actions, if necessary.	Medium	SCAP	Ecology	Planned	TBD		

Table B-2. Incomplete Source Control Action Items (as of December 2016)

Facility	Action Item	Priority	Type	Responsible Party	Status	Estimated Completion Date	Date Completed	Comments/Follow-On Actions
Cadman Seattle, Inc.	Require Cadman to report when discharges to Outfall No. 2244 occur to allow Ecology to track overflow events and evaluate potential impacts to the LDW.	High	SCAP	Ecology	Planned	TBD		
	Obtain and review a copy of <i>Environmental Site Assessment, Duwamish Properties</i> , prepared by Boateng for King County in January 1997, to identify additional potential sources of COCs to sediment and develop appropriate source control actions, if necessary.	Medium	SCAP	Ecology	Planned	TBD		
United Western Supply	Obtain and review the March 1997 environmental assessment report, prepared by Boateng, in order to identify potential sources of COCs to sediment and develop appropriate source control actions.	Medium	SCAP	Ecology	Planned	TBD		
J.A. Jack & Sons	Require J.A. Jack to obtain environmental data to assess the groundwater quality in the infiltration gallery in order to determine if sediment COCs are present in groundwater and if these COCs may be transported to the LDW.	Medium	SCAP	Ecology	Planned	TBD		
	Conduct a visual bank survey. If bank erosion is likely, collect bank soil samples and analyze them for sediment COCs to evaluate the potential for contaminants to enter the LDW via bank erosion.	Medium	SCAP	Ecology	Planned	TBD		
Facilities Within the S Brandon Street CSO Basin	Review information regarding two Leaking Underground Storage Tank facilities, Bob's Texaco Service and Chevron 9-0636, to evaluate the potential for sediment recontamination, if any, that may be associated with these facilities.	Low	SCAP	Ecology	Planned	TBD		
	Perform an inspection at Union Pacific Motor (a LUST facility) to verify compliance with applicable regulations and BMPs to prevent the release of contaminants to the LDW.	Low	SCAP	Ecology TCP	Planned	TBD		
	Perform inspections at two facilities holding KCIW discharge authorizations, City of Seattle--SPU Materials Storage Yard and Kamco Seafood, Inc., that have not been assigned Facility/Site ID numbers by Ecology.	Low	SCAP	Ecology	Planned	TBD		

Table B-2. Incomplete Source Control Action Items (as of December 2016)

Facility	Action Item	Priority	Type	Responsible Party	Status	Estimated Completion Date	Date Completed	Comments/Follow-On Actions
Burlington Environmental/PSC Environmental Services	Implement Cleanup Action Plan as specified in Agreed Order and Dangerous Waste Permit.	Medium	Follow-on	Property Owner/Operator	In Progress	TBD		Ecology approved the environmental design report in the summer of 2011. Elements of the cleanup action were initiated in late 2011. Some elements (excavation) were completed in 2013; others (soil/vapor extraction) in 2014. Of the cleanup actions required by the 2010 CAP, three primary actions have yet to be completed: (1) implementation of in-situ bioremediation (groundwater behind the barrier wall), (2) establishment of an environmental covenant for the Burlington property, and (3) establishment of an environmental covenant for the adjoining UPRR property.
	Finalize Agreed Order Amendment for the east part of the site. The Amendment will include requirements for designing and implementing an additional cleanup action, focused on the reduction of 1,4-dioxane in groundwater.	Medium	New	Ecology/Property Owner/Operator	In Progress	TBD		The Agreed Order Amendment will include an enforceable schedule for the design, implementation, and monitoring of the selected cleanup action.
	Complete the West of 4th Site Feasibility Study, finalize FS report and draft Cleanup Action Plan.	Medium	New	Ecology/Property Owner/Operator	In Progress	TBD		The draft West of 4th FS Report was due at the end of 2015. Pre-FS Report technical memoranda, work plans, and reports were submitted in 2014 and 2015.
Art Brass Plating	Complete the West of 4th Site Feasibility Study, finalize FS report and draft Cleanup Action Plan.	Medium	New	Ecology/Property Owner/Operator	In Progress	TBD		The draft West of 4th FS Report was due at the end of 2015. Pre-FS Report technical memoranda, work plans, and reports were submitted in 2014 and 2015.
	Conduct a source control inspection to confirm compliance with regulations/permits and implementation of BMPs.	Medium	SCAP	Ecology, King County	Planned	TBD		
Blaser Die Casting	Complete the West of 4th Site Feasibility Study, finalize FS report and draft Cleanup Action Plan.	Medium	New	Ecology/Property Owner/Operator	In Progress	TBD		The draft West of 4th FS Report was due at the end of 2015. Pre-FS Report technical memoranda, work plans, and reports were submitted in 2014 and 2015.
Capital Industries Inc.	Complete the West of 4th Site Feasibility Study, finalize FS report and draft Cleanup Action Plan.	Medium	New	Ecology/Property Owner/Operator	In Progress	TBD		The draft West of 4th FS Report was due at the end of 2015. Pre-FS Report technical memoranda, work plans, and reports were submitted in 2014 and 2015.
RM 1.2-1.7 East (Saint Gobain to Glacier Northwest)								
Saint Gobain Containers Inc.	Determine appropriate engineering controls for the inaccessible contamination located beneath the soil/water separator described in the 1991 Limited UST Assessment.	High	SCAP	Property Owner/Operator	Planned	TBD		

Table B-2. Incomplete Source Control Action Items (as of December 2016)

Facility	Action Item	Priority	Type	Responsible Party	Status	Estimated Completion Date	Date Completed	Comments/Follow-On Actions
Longview Fibre Paper and Packaging	Review the latest groundwater monitoring report regarding exceedances of diesel-range hydrocarbons.	High	SCAP	Ecology	Planned	TBD		If needed, require the property owner/operator to prepare a remedial action plan.
	Conduct a source control inspection to confirm compliance with regulations/permits and implementation of BMPs.	Medium	SCAP	Ecology	Planned	TBD		This facility was granted a Conditional No Exposure Exemption in January 2014.
	Sample catch basins as needed.	Medium	SCAP	Ecology	Planned	TBD		If needed, conduct source tracing.
Certainfeed Gypsum	Locate and review the 500-gallon UST closure report documented in Ecology's UST database. Evaluate the potential for groundwater contamination.	Low	SCAP	Ecology	Planned	TBD		
RM 1.7-2.0 East (Slip 2 to Slip 3)								
1st Avenue S Bridge Storm Drain (Outfall 2503)	Assess the effectiveness of the vegetated swale in treating stormwater discharged via Outfall 2503.	Medium	SCAP	Ecology	Planned	TBD		
Michigan Street CSO	Provide data regarding contaminant concentrations in Michigan Street CSO discharges.	Medium	SCAP	King County	In Progress	TBD		King County collected two sediment trap samples in the Michigan CSO basin in 2015. PAHs, phthalates, PCBs, mercury, and 1,4-dichlorobenzene exceeded the CSL in one or both samples. Additional sediment traps have been deployed. KCIW conducted an investigation in 2014/2015 to identify sources of PAHs near Corson Avenue S and S Eddy Street; corrective actions were identified.
	Conduct business inspections within the Michigan Street CSO basin to identify undocumented industrial operations, if any, that may represent sediment recontamination sources.	Low	SCAP	King County, Ecology	In Progress	TBD		Ecology/King County conducted a review of the 751 parcels identified in the S Michigan CSO basin in 2015; 141 facilities were identified as candidates for stormwater assessment; 15 facilities were visited and 4 stormwater assessments conducted (Ecology 2015q).
Seattle Biodiesel	Collect information regarding chemical concentrations in bank soils.	Medium	SCAP	Ecology	Planned	TBD		
	Review information submitted by Lonestar Investors LP (the property owner) in response to EPA Section 104(e) Request for Information.	Medium	SCAP	Ecology	Planned	TBD		
Duwamish Marine Center	Require the property owner/operator to collect data on concentrations of chemical contaminants in river bank soils to assess the potential for sediment recontamination by erosion.	High	SCAP	Ecology	In Progress	TBD		To be conducted as part Agreed Order DE-8072. The Remedial Investigation is in progress.
Seattle Department of Transportation Parcel	Complete discussions with the adjacent property owner to prevent parking and vehicle maintenance on the Seattle Department of Transportation property.	Low	SCAP	SDOT	In Progress	TBD		Referred to SDOT by SPU.

Table B-2. Incomplete Source Control Action Items (as of December 2016)

Facility	Action Item	Priority	Type	Responsible Party	Status	Estimated Completion Date	Date Completed	Comments/Follow-On Actions
Former Frank's Used Cars	Review the current status of cleanup activities at this site to determine whether residual soil contamination poses a risk of sediment recontamination.	Medium	SCAP	Ecology	Planned	TBD		
Fittings, Inc.	Determine whether this facility should apply for coverage under the Industrial Stormwater General Permit	Medium	SCAP	Ecology	Planned	TBD		SPU inspected in 2015 and found illicit connection to the storm drain discharging to Slip 2. Facility corrected the problem in 2016.
Former Consolidated Freightways	Locate and review the results of soil and groundwater sampling proposed in 2000 (if the sampling plans were implemented), and assess the potential for sediment recontamination via groundwater transport.	Medium	SCAP	Ecology	Planned	TBD		
	Search for additional information regarding the two dump areas located at this property in 1940, as identified in historical aerial photographs, and evaluate the potential for sediment recontamination associated with these areas.	Medium	SCAP	Ecology	Planned	TBD		
Facilities Within the Michigan Street CSO Basin	Emerald Tool, Inc.: Conduct a business inspection at this facility; request information regarding concentrations of sediment COCs in soil and catch basins at this property.	Low	SCAP	Ecology, King County	Planned	TBD		
	Kelly Moore Paint Company: Assess the current nature and extent of soil and groundwater contamination associated with this facility to determine the potential for contaminated groundwater to infiltrate the combined sewer system.	Low	SCAP	Ecology	Planned	TBD		
	Kelly Moore Paint Company: Determine the current status of cleanup efforts to evaluate whether additional remedial activities are required.	Low	SCAP	Ecology	In Progress	TBD		Sampling and cleanup activities are underway. Ecology continues to track progress.
	Pioneer Porcelain Enamel Company, Scougal Rubber Corporation, former Sonn Property, former Unocal Service Station 0907, Winters Investment LP/Riveretz's Auto Care/Former Georgetown Gasco/Tesoro: Request the property owner to provide information regarding the nature and extent of soil contamination at the site to determine if contaminants in soil may be leaching to groundwater, and if contaminated groundwater may then be infiltrating into the combined sewer system.	Low	SCAP	Ecology	Planned	TBD		Interim Action Work Plan and Final Cleanup Report for Scougal Rubber was submitted to Ecology on June 30, 2010. Scougal Rubber Corp. submitted a technical memorandum in December 2012 summarizing remedial actions conducted September 2011-September 2012. Scougal Rubber Corp. submitted a technical memorandum in November 2013 summarizing remedial actions conducted September 2012-November 2013.

Table B-2. Incomplete Source Control Action Items (as of December 2016)

Facility	Action Item	Priority	Type	Responsible Party	Status	Estimated Completion Date	Date Completed	Comments/Follow-On Actions
RM 2.0-2.3 East (Slip 3 to Seattle Boiler Works)								
S Brighton Street SD	Conduct source tracing in the S Brighton Street CSO/SD basin.	High	Follow-On	SPU, Ecology	In Progress	TBD		SPU jetted and cleaned the entire drainage system in 2010 and has collected 4 samples since cleaning. No chemicals exceeded the CSL in the 3 inline sediment grab samples. TPH-oil (62,000 mg/kg), BEHP (10 mg/kg DW), dimethylphthalate (0.52 mg/kg DW), and 4-methylphenol (1.1 mg/kg DW) exceeded the CSL in the one onsite catch basin sample at Emerald Services. SPU is working with the business to control pollutant discharges from this site and will collect an inline sample near the downstream end of this system.
	Review VCP files pertaining to four former facilities at South Seattle Community College (Arrow Transportation, Inland Transportation Company, Ben's Truck Repair, and Hat n' Boots Gas Station). Investigate the South Seattle Community College property to determine what cleanup actions may have been conducted during development, and whether potential sources of sediment recontamination may remain onsite from the four former facilities.	Medium	SCAP	Ecology	Planned	TBD		
S River Street SD	Conduct source tracing in the S River Street SD basin.	High	Follow-On	SPU, Ecology	In Progress	TBD		SPU jetted and cleaned the entire system in 2010. Three samples were collected in 2012: HPAH concentrations were elevated in inline grab collected near end of pipe. SPU collected 13 samples and inspected 9 businesses in this basin in 2016. Elevated levels of TPH-oil and HPAH were found in multiple samples. SPU is currently investigating a potential source of PAHs in this area. SPU conducted IDDE survey in this area in 2014. Did not find any evidence of cross connections in this system.
V. Van Dyke	Determine whether a UST may have been removed from the property without a proper closure.	Medium	SCAP	Ecology	Planned	TBD		
	Locate and review additional reports related to V. Van Dyke property that are missing from Ecology's files.	Medium	SCAP	Ecology	Planned	TBD		
	Work with V. Van Dyke to complete quarterly groundwater or other monitoring suggested by Adapt, if needed.	Medium	SCAP	Ecology	Planned	TBD		
Riverside Industrial Park	Determine the status of cleanup at the facility and whether to pursue additional investigation and cleanup under an administrative order.	Medium	SCAP	Ecology	Planned	TBD		Railworks Comstock (2008)--required to develop a written spill plan and educate employees. Work completed 11/08.

Table B-2. Incomplete Source Control Action Items (as of December 2016)

Facility	Action Item	Priority	Type	Responsible Party	Status	Estimated Completion Date	Date Completed	Comments/Follow-On Actions
Shultz Distributing	Review AGI's results and conclusions and determine whether additional investigations should be conducted.	Medium	SCAP	Ecology	Planned	TBD		
Fox Avenue Building	Conduct sitewide groundwater monitoring and continue ERD treatment and additional substrate injection in the downgradient area at Seattle Boiler Works property.	Medium	New	Property owner/operator	In Progress	TBD		
R.A. Barnes	Conduct additional investigations as needed to determine facility location and potential for sediment recontamination.	Medium	SCAP	Ecology	Planned	TBD		
RM 2.3-2.8 East (Seattle Boiler Works to Slip 4)								
S Garden Street and S Myrtle Street Storm Drains	Conduct source tracing to identify potential contaminant sources to stormwater discharging to the LDW.	High	SCAP	SPU, Ecology	In Progress	TBD		SPU cleaned the entire system in 2010. <u>S Garden Street SD</u> : 2 samples were collected during the current reporting period; samples contained elevated levels of arsenic, copper, mercury, and zinc due to unpermitted transloading of mine waste in the right-of-way. Seattle Bulk Shipping was required to remove spilled material. SPU required Seattle Iron and Metals to install a Filterra treatment unit on S Garden Street to control pollutant track out. <u>S Myrtle Street SD</u> : One sample collected during the current reporting period. SPU is awaiting action via Seattle Iron and Metals' individual NPDES permit to control discharges from the site. SDOT sweeps S Myrtle Street and S Garden Street every week. SPU also required Seattle Iron and Metals to install Filterra stormwater water treatment units on S. Myrtle Street adjacent to driveway to control track out.
Seattle Boiler Works, Inc.	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	SCAP	Ecology	Planned	TBD		
Seattle Iron & Metals Corporation	Review stormwater improvements, when completed, to assess the potential for transport of ASR to the LDW.	Medium	Follow-On	Ecology	Planned	TBD		
	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	SCAP	Ecology/PSCAA	Planned	TBD		
Puget Sound Truck Lines	Determine whether the five outfalls identified at the property are active, and identify the source of discharge from these outfalls, if any.	High	SCAP	Ecology, Property owner/operator	Planned	TBD		

Table B-2. Incomplete Source Control Action Items (as of December 2016)

Facility	Action Item	Priority	Type	Responsible Party	Status	Estimated Completion Date	Date Completed	Comments/Follow-On Actions
Seattle City Light Georgetown Pump Station	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	SCAP	Ecology	Planned	TBD		
Crowley Marine Services	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	SCAP	Property owner/operator	In Progress	TBD		To be conducted in accordance with Agreed Order No. DE-6721. A draft RI report was submitted to Ecology in August 2016. Ecology is currently reviewing.
	Collect stormwater and/or solids samples from storm drain system to determine if onsite system is source of COCs found in waterway sediment.	High	SCAP	Ecology	In Progress	TBD		To be conducted in accordance with Agreed Order No. DE-6721. A draft RI report was submitted to Ecology in August 2016. Ecology is currently reviewing.
Fox Avenue Building	Review responses to EPA's July 2008 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.	Low	SCAP	Ecology	Planned	TBD		
Whitehead Company, Inc./Former Tyee Industries	Require the property owner/operator to address the pentachlorophenol contamination in groundwater discovered by Cascade Columbia Distributions' consultant.	Medium	SCAP	Ecology	In Progress	TBD		An Agreed Order (DE13548) was signed in August 2016 requiring Seattle Iron and Metals to install a stormwater treatment system on the property. An Interim Action Work Plan was submitted for public comment in December 2016.
Whitehead Company, Inc./Former Perkins Lot	Conduct facility inspection to determine if activities conducted by businesses at this location require an NPDES permit, and to ensure compliance with applicable codes and regulations.	Medium	SCAP	Ecology, KCIW, EPA	In Progress	TBD		In 2013 Taxi King was granted coverage under the NPDES ISGP but does not have a SWPPP or a monitoring plan. EPA pursued enforcement on this facility and is the compliance lead.
	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	SCAP	Ecology, Property owner/operator	Planned	TBD		
Former Sternoff Parcel	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	SCAP	Ecology	Planned	TBD		
	Locate documentation verifying that a PCB-contaminated "trash pile" and approximately 52,187 pounds of contaminated soil have been removed from the property.	Medium	SCAP	Ecology	Planned	TBD		
	Determine the disposition of petroleum-contaminated soil stockpiled at the property by Remedco and provide the documentation to Ecology.	Low	SCAP	Ecology	Planned	TBD		

Table B-2. Incomplete Source Control Action Items (as of December 2016)

Facility	Action Item	Priority	Type	Responsible Party	Status	Estimated Completion Date	Date Completed	Comments/Follow-On Actions
RM 2.8 East (EAA-3: Slip 4)								
North Boeing Field / KCIA / I-5 Storm Drains	Reinstall sediment traps and continue monitoring as needed.	High	SCAP	SPU, Boeing, King County	In Progress	Apr-17		Since 2012, sediment traps have been retrieved once per year instead of every 6 months. King County took over responsibility for sediment traps in 2014. SPU continues to maintain the trap in the I-5 SD at Slip 4. Boeing plans to discontinue sediment trap sampling in 2017.
Crowley Marine / 8th Avenue Terminals	Conduct investigation and cleanup activities in accordance with the Agreed Order, including collection of groundwater and storm drain system samples as appropriate.	Medium	SCAP	8th Avenue Terminals (Crowley)	In Progress	TBD		A draft RI report was submitted to Ecology in August 2016. Ecology is currently reviewing.
Boeing Plant 2	Assess existing groundwater data in the area.	Low	SCAP	Ecology, EPA	Planned	TBD		EPA lead
North Boeing Field	Determine impact of remaining joint sealant material on PCB concentrations in stormwater.	High	Follow-On	Ecology	In Progress	2018		Investigation of joint sealant is continuing as part of the RI/FS.
	Continue source tracing in north drain line to identify and/or eliminate transport of PCBs to Slip 4.	High	Follow-On	Boeing	In Progress	2018		Source tracing is continuing as part of the RI/FS.
KCIA	Investigate soil and groundwater investigation and cleanup under Ecology's VCP.	Low	Follow-On	KCIA, property operator	In Progress	TBD		Shultz and subtenant operators are conducting investigations at the site for eventual cleanup under the VCP. KCIA lessee and subtenant operators are conducting investigations at the site for eventual cleanup under the VCP. In 2013 KCIA conducted investigations and cleanup of the former Standard Gas site in accordance with the substantive MTCA requirements of an Ecology-guided cleanup. The lessee is communicating with Ecology in accordance with its VCP requirements.
NBF-GTSP	Conduct RI/FS and implement interim actions (as needed).	High	New	Ecology, Boeing, City of Seattle, King County	In Progress	2018		Final RI work plans were completed in April 2014. RI work began in March 2015. Plan to characterize and remove TSCA material prepared in 2016.

Table B-2. Incomplete Source Control Action Items (as of December 2016)

Facility	Action Item	Priority	Type	Responsible Party	Status	Estimated Completion Date	Date Completed	Comments/Follow-On Actions
RM 2.8-3.7 East (EAA-4: Boeing Plant 2/Jorgensen Forge)								
Boeing Plant 2	Evaluate the remaining Plant 2 Corrective Measures Study study areas and continue to determine needed source control actions.	Medium	SCAP	EPA, Boeing	In Progress	TBD		Boeing has completed many of the interim soil cleanups and anticipates the Final Cleanup will be completed in 2018.
	Continue to delineate and evaluate the EMF plume.	Medium	SCAP	EPA, Boeing	In Progress	TBD		While the plume goes under Plant 2, this activity is being conducted under a CERCLA action.
	Conduct monthly sampling, including groundwater sampling and vapor sampling of the DDC wells and multiple points along the vapor treatment system.	Medium	SCAP	EPA, Boeing	In Progress	TBD		
	Continue shoreline groundwater monitoring.	High	SCAP	EPA, Boeing	In Progress	TBD		Shoreline monitoring well network was removed in 2013 to accommodate habitat project. A work plan describing new locations was anticipated in February 2014, and the network was to be reinstalled in time for summer 2014 sampling, however the status of groundwater sampling is unknown.
	Conduct a joint hydrologic investigation with Jorgensen Forge to provide additional hydrogeologic data at the boundary of the two facilities.	High	SCAP	Boeing, Jorgensen	Planned	TBD		Pending Ecology Order implementation at Jorgensen Forge; Plant 2 is completed.
	Collect in-line sediment samples in the City of Seattle and City of Tukwila systems immediately prior to discharge to Plant 2's storm drain system.	High	SCAP	EPA, Boeing	Ongoing	TBD		Seattle lines are closed. Working with city of Tukwila.
Jorgensen Forge	Conduct a joint hydrologic investigation with Boeing to provide additional hydrogeologic data at the boundary of the two facilities.	Medium	SCAP	Boeing, Jorgensen	Planned	TBD		Pending Ecology Order implementation at Jorgensen Forge; Plant 2 is completed.
	Contain and remove soils from upland outfall area of the 12-and 24-inch pipes.	High	Follow-On	EPA, Boeing, Jorgensen	In Progress	TBD		A 24-inch pipe and contaminated soil below the pipe were partially excavated in 2015 with the remainder scheduled to be excavated in 2017. Land use restrictions will address remaining contamination left in place.
	Develop a hydrogeologic site model as part of the source control investigation to characterize the groundwater system on site, including tidal influence.	High	SCAP	Jorgensen, Boeing	In Progress	TBD		
	Complete a Remedial Investigation/Feasibility Study of the upland site area	High	New	Jorgensen, Boeing	In Progress	TBD		Ecology issued an enforcement order for completion of an RI/FS on March 16, 2015. Jorgensen submitted a draft RI work Plan to Ecology in Summer 2015 and declared bankruptcy in 2016. A new Agreed Order was anticipated in 2017.

Table B-2. Incomplete Source Control Action Items (as of December 2016)

Facility	Action Item	Priority	Type	Responsible Party	Status	Estimated Completion Date	Date Completed	Comments/Follow-On Actions
KCIA	Monitor remedial activities at the former Boeing EMF to ensure that contaminated soil does not enter the storm drain system.	Medium	SCAP	King County, EPA	In Progress	TBD		KCIA is closely monitoring and coordinating access for Boeing to perform remediation work. In accordance with EPA requirements, Boeing was revising its enhanced reductive dechlorination remedial optimization plan, conducting bio-screen modeling, and preparing bi-annual sampling report, which was expected in Fall 2015. Current status was not available.
East Marginal Way S.	Install stormwater treatment for roadway runoff discharged through the newly dedicated City of Tukwila outfall (the former Plant 2 Z line)	Medium	New	City of Tukwila	In Progress	TBD		This retrofit project is funded in part by an Ecology Stormwater Financial Assistance Program grant. Project has been delayed due to funding issues.
RM 3.7-3.9 East (EAA-6: Boeing Isaacson/Central KCIA)								
KC Airport SD #2/PS45 EOF (King County Storm Drain / SPU EOF)	Review information from KCIA to determine whether additional source control investigations are needed at central KCIA.	Medium	Follow-On	Ecology	In Progress	TBD		
	If COCs are present in the storm drain line downstream of CB-39, collect a solids sample from CB-39 on the Boeing Thompson property.	Medium	SCAP	Boeing	Planned	TBD		
Boeing Isaacson / Thompson Site	If COCs in soil and groundwater are present at concentrations that pose a risk of sediment recontamination, then develop a plan for controlling these contaminant sources.	High	SCAP	Ecology, Boeing	Planned	TBD		To be addressed as part of Agreed Order No. DE-7088.
	Investigate the condition of the 48-inch KC Airport SD#2/PS45 EOF that passes through the Boeing Isaacson property.	Medium	SCAP	King County	Planned	TBD		Investigation is planned to clean and video the pipe in 2017.
	Clarify the purpose, function, and configuration of the edge drains along the Boeing Isaacson shoreline.	Low	SCAP	Boeing, Port of Seattle	In Progress	TBD		To be addressed as part of Agreed Order No. DE-7088.
	Investigate the status and source of the unidentified outfall pipe located near the Boeing Isaacson/Jorgensen Forge property boundary (Outfall 2063).	Low	SCAP	Boeing	Planned	TBD		To be addressed as part of Agreed Order No. DE-7088.
	Review Boeing memorandum regarding findings associated with the two drainage pipes that may be discharging to the 8801 Site, and assess the potential that these discharges may contribute to recontamination of LDW sediments.	Medium	SCAP	Ecology	In Progress	TBD		To be addressed as part of Agreed Order No. DE-7088.
	Conduct a source control inspection to clarify the nature of current activities at this property and to assess the current potential for sediment recontamination.	Low	SCAP	Ecology	Planned	TBD		
	KCIA	Assess/confirm the adequate completion of cleanup activities associated with petroleum Leaking Underground Storage Tanks at Hangar Holdings.	Low	SCAP	Ecology	Planned	TBD	

Table B-2. Incomplete Source Control Action Items (as of December 2016)

Facility	Action Item	Priority	Type	Responsible Party	Status	Estimated Completion Date	Date Completed	Comments/Follow-On Actions
RM 3.9-4.3 East (Slip 6)								
8801 Site (Former PACCAR Site)	Re-evaluate existing soil and groundwater data and compare to site-specific screening levels (to be developed) for metals, PAHs, petroleum hydrocarbons, PCBs, SVOCs, and VOCs as COCs in the LDW, and test for dioxin/furans.	High	SCAP	Ecology, Property owner/operator	In Progress	TBD		Draft Remedial Investigation Report submitted to Ecology on September 30, 2010, as required by Agreed Order # 6069. Final RI Report submitted to Ecology in February 2012. Ecology is working with the PLPs to complete the FS and move forward with a draft Interim Action Work Plan for the uplands.
	Complete Phase 2 of the Sediment Evaluation Work, which includes sediment core sampling in selected locations in the LDW adjacent to the site.	High	SCAP	Ecology, Property owner/operator	Planned	TBD		
	Negotiate expanding the stormwater and storm drain solids monitoring to add COCs at the site. Review future monitoring results to determine if further actions are necessary.	High	SCAP	Ecology, Property owner/operator	In Progress	TBD		
	Review the current SWPPP and Operations and Maintenance Plan. Make necessary changes and additions to prevent contaminants from potential upland sources (such as fuel leaks from damaged vehicles) from migrating to Slip 6 source control area sediments via the stormwater system.	Medium	SCAP	Ecology, Property owner/operator	Planned	TBD		

Table B-2. Incomplete Source Control Action Items (as of December 2016)

Facility	Action Item	Priority	Type	Responsible Party	Status	Estimated Completion Date	Date Completed	Comments/Follow-On Actions
Former Rhône-Poulenc Site	Continue to monitor the effectiveness of the hydraulic interim control measure, and investigate the presence of elevated copper concentrations in groundwater outside the barrier wall and the potential leak in the barrier wall.	High	SCAP	EPA, Property owner/operator	In Progress	TBD		The HICM is still in operation and effective. Groundwater outside the barrier wall (included in Shoreline Area of site) will be addressed as part of the future site cleanup under RCRA. EPA established PRGs in March 2014, and Respondents submitted a draft CMS work plan to EPA in Sept 2014. A work plan for a CO2 Injection Pilot Study to address high pH has been submitted.
	Investigate and address shoreline bank contamination from historical site operations and releases (e.g. application of vanillin black liquor solids to the shoreline bank for weed control).	High	SCAP	EPA, Property owner/operator	In Progress	TBD		An investigation of shoreline bank contamination was completed Sept 2012. The Shoreline Area will be addressed as part of the future site cleanup under RCRA. EPA established PRGs in March 2014, and Respondents submitted a draft CMS work plan to EPA in Sept 2014. A work plan for a CO2 Injection Pilot Study to address high pH has been submitted.
	Review the current SWPPP and Operations and Maintenance Plan. Make necessary changes and additions to prevent contaminants from potential upland sources (such as fuel leaks from damaged vehicles) from migrating to Slip 6 source control area sediments via the stormwater system.	High	SCAP	Ecology, Property owner/operator	Planned	TBD		
	Oversee and inspect discharge to the King County sanitary sewer system from groundwater remediation at this site through the KCIW Program.	Low	SCAP	KCIW	Ongoing	TBD		
KCIA	Assess and modify all tenant and airport pollutant prevention measures within KCIA.	Medium	SCAP	KCIA	Ongoing	TBD		Efforts to comply with KCIA's industrial and municipal NPDES permits are ongoing and include annual tenant assessments for potential pollutant generating sources.
Museum of Flight (MOF)	Monitor stormwater and/or storm drain solids at MOF and former BDC properties in the vicinity of USTs and associated groundwater contamination.	High	SCAP	Ecology, Property owner/operator	Planned	TBD		
	Develop a plan to remove USTs and associated soil and groundwater contamination on the MOF property.	Medium	SCAP	Ecology, Property owner/operator	Planned	TBD		
	Identify the source and extent of groundwater contamination on the former BDC property, and conduct remedial action, as necessary.	High	SCAP	Ecology, Property owner/operator	Planned	TBD		

Table B-2. Incomplete Source Control Action Items (as of December 2016)

Facility	Action Item	Priority	Type	Responsible Party	Status	Estimated Completion Date	Date Completed	Comments/Follow-On Actions
Boeing Developmental Center (BDC) - North	Investigate UST locations to determine whether any USTs are located within the Slip 6 drainage basin and whether any USTs present a source of contaminants to soil and/or groundwater.	Low	SCAP	Boeing	In Progress	TBD		The drainage basin to the two outfalls flowing into Slip 6 (DC 14 and DC 15) includes Buildings 9-05, 9-07, 9-04, 9-77, 9-08 at the BDC. The Environmental Compliance Group at the BDC was contacted regarding the presence of USTs near these buildings. The status of this inquiry is unknown.
RM 4.3-4.9 East (Boeing Developmental Center)								
BDC Outfalls	Request Boeing to investigate the status of Outfall 2086, which appears to be abandoned.	Medium	SCAP	Ecology/Boeing	Planned	TBD		
	Request Boeing to prepare a work plan for collection of subsurface sediment samples in the area of the LDW adjacent to the BDC outfalls.	Medium	SCAP	Ecology/Boeing	Planned	TBD		
	If COCs are detected in the SD system at concentrations above the SQS, request Boeing to conduct source tracing and control as needed to reduce the potential for sediment recontamination.	High	SCAP	Ecology/Boeing	Planned	TBD		
BDC - Central	Continue to monitor RCRA cleanup activities to ensure contaminants present in groundwater as a result of historical releases are not entering the LDW.	Low	SCAP	Ecology	Planned	TBD		
	Request additional information about the nature of BDC's emissions and air permit as they relate to deposition on impervious surfaces and the stormwater pathway to the LDW.	Low	SCAP	Ecology	Planned	TBD		
	Request Boeing to collect at least one round of seep samples from the four known seepage locations (see Figure 2) to confirm that no contaminants are being discharged to the LDW via this transport pathway.	Medium	SCAP	Ecology/Boeing	Planned	TBD		

Table B-2. Incomplete Source Control Action Items (as of December 2016)

Facility	Action Item	Priority	Type	Responsible Party	Status	Estimated Completion Date	Date Completed	Comments/Follow-On Actions
RM 4.9 East (EAA-7: Norfolk CSO/SD)								
Boeing Developmental Center (BDC) - South	Continue sediment monitoring in the vicinity of the south storm drain sediment removal activities.	High	SCAP	Boeing	In Progress	TBD		Sediment samples are collected as part of annual monitoring (Bet 2015).
	Continue monitoring storm drain solids.	High	SCAP	Boeing	In Progress	TBD		Solids samples are collected from Vortechinics sediment trap unit annually. Ecology sampled water and storm drain solids in other drain lines from the BDC in December 2014.
	Determine need for cleanup of PCB-containing caulk and other building materials	Medium	SCAP	Ecology, Boeing	In Progress	TBD		Boeing has focused upland sampling on drainage areas where impacts to the sediments were detected. In the areas investigated through December 2011 there was no need identified to cleanup caulk or other building materials. Other areas (other buildings/areas) may be investigated as necessary.
	Re-evaluate the Industrial Stormwater General Permit to assure that the appropriate parameters are measured to assess ongoing sources.	Low	SCAP	Ecology, Boeing	Planned	TBD		
	Determine whether groundwater and soil sampling are needed at Parcel 0423049016 to assess possible historical contamination.	Medium	SCAP	Ecology, Boeing	In Progress	TBD		The initial data gap identified in this area was from a 2007 E&E report noting a barge visible in a historical aerial photo. The barge is still present (now rotten and abandoned) and it is in the LDW on Department of Natural Resources land outside of the noted parcel (Parcel 0423049016). Boeing has identified a historical Phase 1 assessment for the 0423049016 Parcel and is attempting to obtain a copy of that report.
Military Flight Center	Monitor stormwater for PCBs at discharge points to assess potential ongoing sources.	Medium	SCAP	Boeing	In Progress	TBD		PCB monitoring performed at each designated outfall location (Bet 2015).
	Discuss cleanup options for removal of caulk containing PCBs at less than 50 mg/kg.	Medium	SCAP	Ecology, Boeing	Planned	TBD		
Unified Grocers / Associated Grocers	Sample monitoring wells located near the former truck shop to evaluate current groundwater flow and extent of the contaminant plume; determine if additional monitoring wells are needed.	Medium	SCAP	Property owner	Planned	TBD		
	Re-evaluate the free product removal strategy to determine its source control effectiveness.	Medium	SCAP	Property owner	Planned	TBD		
	Determine whether additional groundwater and soil assessment is needed for the maintenance building where UST removal activities took place in 1995.	Medium	SCAP	Ecology	Planned	TBD		
	Evaluate spill prevention/cleanup plan for the two operational USTs to assure adequate control of potential spills.	Low	SCAP	Ecology, Property owner	Planned	TBD		

Table B-2. Incomplete Source Control Action Items (as of December 2016)

Facility	Action Item	Priority	Type	Responsible Party	Status	Estimated Completion Date	Date Completed	Comments/Follow-On Actions
Northwest Auto Wrecking	Conduct soil, groundwater, surface water, and sediment sampling, as appropriate, to evaluate potential historical sources.	Medium	SCAP	Northwest Auto Wrecking	Planned	TBD		Review sampling results and assess potential for sediment recontamination.
	Review results of soil, groundwater, surface water, and/or sediment sampling to assess potential for sediment recontamination.	Medium	SCAP	Ecology	Planned	TBD		
Affordable Auto Wrecking	Conduct surface water, soil, and groundwater sampling to assess the potential for sediment recontamination.	Medium	SCAP	Property owner/operator	Planned	TBD		
	Determine cleanup options for removal of historically-contaminated media, as appropriate.	Medium	SCAP	Ecology, Property owner/operator	Planned	TBD		
	Oversee and monitor discharges to the combined sewer system.	Medium	SCAP	KCIW	Planned	TBD		
Arco Gas Station (Pacific Truck School)	Conduct soil sampling in the area adjacent to the former tank farm under the Voluntary Cleanup Program, to determine if soils are impacted and if remediation is necessary to control this potential contaminant pathway.	Medium	SCAP	Arco	Planned	TBD		
	Conduct additional groundwater monitoring.	Medium	SCAP	Arco	Planned	TBD		
	Based on results of soil and groundwater sampling, determine whether further actions are needed to address potential historical sources.	Medium	SCAP	Ecology	Planned	TBD		
RM 0.0-1.0 West (Spokane Street to Kellogg Island)								
SW Dakota Street SD Outfalls (Outfalls 2148, 2149, 2150, and 2233)	Continue source tracing to identify potential sources of the sediment COCs reported above screening levels in storm drain structures in the SW Dakota Street SD basin.	Medium	SCAP	SPU, Ecology	In Progress	TBD		Outfall 2149 is the City's SW Dakota Street SD; it was relocated to the habitat swale to accommodate development on land adjacent to waterway. SW Dakota Street end was vacated to Port in 2012 (Ord # 123884). SPU cleaned this system in 2016 and continues to collect samples in this basin. SPU plans to collect samples near the downstream end of the SW Dakota Street SD in 2018 and evaluated whether a sediment trap can be installed in this system. Outfall 2148 serves the Encore Oil property at 4034 West Marginal Way SW. Outfall 2150 serves the Lipsett Co property just east of Encore. SPU GIS indicates that both of these drainage systems are privately owned. Outfall 2233 is the outlet of the salt water habitat swale constructed by the Port in 1993-1994.
SW Idaho Street SD Outfalls (Outfall 2147)	Continue source tracing to identify potential sources of the sediment COCs reported above screening levels in storm drain structures in the SW Idaho Street SD basin.	Medium	SCAP	SPU, Ecology	In Progress	TBD		SPU jetted and cleaned the entire SW Idaho Street SD system in 2013 and continues to operate 3 sediment traps in this drainage system.

Table B-2. Incomplete Source Control Action Items (as of December 2016)

Facility	Action Item	Priority	Type	Responsible Party	Status	Estimated Completion Date	Date Completed	Comments/Follow-On Actions
Outfalls 2140, 2141, 2142, 2153, 2144, 2145, 2146	Conduct an inspection during a storm event to determine if Outfalls 2140 through 2146 are operational or have been abandoned. If discharge from these outfalls is observed, request that the property owners conduct dye testing to determine if storm drain lines are connected to the unresolved outfalls and delineate the associated drainage areas.	Medium	SCAP	SPU, Ecology	Planned	TBD		Outfalls 2140-2143 are located on City property at Herring's House Park. City will investigate these outfalls. Outfalls 2144, 2145, and 2146 are located on General Recycling property at 4260 W Marginal Wy SW. General Recycling is an NPDES-permitted facility.
Port of Seattle Terminal 103	Perform a facility inspection at General Construction to verify compliance with applicable regulations and source control BMPs.	Low	SCAP	Port of Seattle	Planned	TBD		Port tenant. This property discharges directly to the waterway via Port-owned outfalls and/or sheet flow. Inspection of direct discharges is a low priority for SPU. Inspections are scheduled only after City NPDES obligations are met. As this is a low priority for SPU, Port should inspect this property as described in Section 7 of its SWMP.
	Perform a facility inspection at CalPortland to verify compliance with applicable regulations and source control BMPs.	Low	SCAP	Port of Seattle	Planned	TBD		Port tenant. This NPDES-permitted site discharges directly to the waterway via Port-owned outfalls and/or sheet flow. Inspections of NPDES-permitted sites that do not affect the City MS4 are a low priority for SPU. Inspections are scheduled only after City NPDES obligations are met. As this is a low priority for SPU, Port should inspect this property as described in Section 7 of its SWMP.
Port of Seattle Terminal 105	Determine if the Liquid Disposal Corporation USTs have been removed from Terminal 105 park.	Medium	SCAP	Port of Seattle	Planned	TBD		
	Request that the Port of Seattle and Ferguson Enterprises provide information to determine if PCB-bearing dredge spoils were removed from parcel 3530 prior to the construction of the warehouse over the disposal area.	Medium	SCAP	Ecology	Planned	TBD		
	Assess the need for an environmental investigation at the Terminal 105 Park to characterize the nature and extent of soil and groundwater contaminated by PCBs, PAHs, and metals in order to determine the potential for sediment recontamination.	Medium	SCAP	Ecology	Planned	TBD		
Encore Oils (former Pacific Rendering)	Assess the need for additional environmental investigations and/or cleanup of contaminated soil.	Medium	SCAP	Ecology	Planned	TBD		

Table B-2. Incomplete Source Control Action Items (as of December 2016)

Facility	Action Item	Priority	Type	Responsible Party	Status	Estimated Completion Date	Date Completed	Comments/Follow-On Actions
Ferguson Enterprises	Request that the Port of Seattle and Ferguson Enterprises provide information to determine if PCB-bearing dredge spoils were removed from parcel 3530 prior to the construction of the warehouse over the disposal area.	Medium	SCAP	Ecology	Planned	TBD		
	Assess the need for additional environmental investigations and/or cleanup of contaminated soil and groundwater.	Medium	SCAP	Ecology	Planned	TBD		
General Recycling of Washington	Request that General Recycling update the facility SWPPP to include the chemical treatment upgrades to the stormwater treatment system. General Recycling will be required to provide the updated SWPPP to Ecology.	Medium	SCAP	Ecology	Planned	TBD		
	Assess the need for additional environmental investigations and/or cleanup of contaminated soil and groundwater.	Medium	SCAP	Ecology	Planned	TBD		
Former Seaboard Lumber Property	Assess the need for additional environmental investigations at Evergreen Trails and Herring's House Park to define the nature and extent of residual soil and groundwater contamination at the properties to determine if LDW sediment near the properties is or has the potential to become contaminated via the groundwater discharge and bank erosion pathways.	Medium	SCAP	Ecology	Planned	TBD		
Port of Seattle Terminal 107	Determine the potential inputs to a pipe located near the ravine in the northern portion of the Terminal 107 Park.	Medium	SCAP	Port of Seattle	Planned	TBD		
	Perform an environmental investigation to determine if soil and groundwater are contaminated due to historical industrial operations and filling activities.	Medium	SCAP	Port of Seattle	Planned	TBD		
Former Fraser Properties	Assess the need for additional environmental investigations and/or cleanup of suspected soil and groundwater contamination at this property.	Low	SCAP	Ecology	Planned	TBD		
Former Concrete Restoration	Request additional information from Brys Auto Wrecking regarding the previous environmental investigations at the property to determine if LDW sediment COCs are present in soil and groundwater at concentrations indicating a potential for sediment recontamination.	Low	SCAP	Ecology	Planned	TBD		
	Assess the need for additional investigations and/or cleanup of suspected soil and groundwater contamination at this property.	Low	SCAP	Ecology	Planned	TBD		

Table B-2. Incomplete Source Control Action Items (as of December 2016)

Facility	Action Item	Priority	Type	Responsible Party	Status	Estimated Completion Date	Date Completed	Comments/Follow-On Actions
West Seattle Estates	Request information regarding cleanup and groundwater monitoring at West Seattle Estates to evaluate the potential for sediment recontamination via the groundwater discharge pathway.	Low	SCAP	Ecology	Planned	TBD		
	Assess the need for additional investigations and/or cleanup of soil and groundwater contamination at this property.	Low	SCAP	Ecology	Planned	TBD		
Puget Park	Request information from Seattle Parks to determine if the leachate collection trench was installed down gradient of the Puget Park Lobe.	Low	SCAP	Ecology	Planned	TBD		
	Assess the need for additional investigations and/or cleanup of soil and groundwater contamination at this property.	Low	SCAP	Ecology	Planned	TBD		
RM 1.0-1.3 West (Kellogg Island to Lafarge Cement)								
Lafarge North America Inc. Seattle	Request information from Lafarge regarding the status of Outfall 001/2139 and 004.	Medium	SCAP	Ecology	Planned	TBD		
	Review new sediment data from the 2009 Lafarge maintenance dredging and the 2011 surface sediment sampling conducted by Ecology to determine if additional sediment sampling is needed for sediment characterization.	Medium	SCAP	Ecology	Planned	TBD		
	Review the response to the CERCLA Section 104(e) Supplemental Information Request sent to Lafarge by EPA.	Medium	SCAP	Ecology	Planned	TBD		
	Request Lafarge to collect environmental data to determine if soil and groundwater are contaminated due to historical drum recycling and reclamation activities at the Lafarge property.	Medium	SCAP	Ecology	Planned	TBD		
	Request Lafarge to collect additional seep samples to better characterize groundwater being discharged into the LDW. Seep samples will be analyzed for sediment COCs, including PCBs.	Medium	SCAP	Ecology	Planned	TBD		
	Request Lafarge to provide additional information about the composition of material behind the bulkhead and whether or not bulkhead repairs were completed during 2006.	Medium	SCAP	Ecology	Planned	TBD		

Table B-2. Incomplete Source Control Action Items (as of December 2016)

Facility	Action Item	Priority	Type	Responsible Party	Status	Estimated Completion Date	Date Completed	Comments/Follow-On Actions
RM 1.3-1.6 West (Glacier Bay)								
SW Kenny SD (Glacier Bay Outfall)	If COCs are present in the storm drain line, conduct source tracing to identify sources of contaminants.	Medium	SCAP	SPU	In Progress	2017		An in-line solids sample collected in May 2010 contained elevated concentrations of metals, PCBs, PAHs, phthalates, and TPH. SPU continues to maintain the near end of pipe sediment trap in this system. SPU has selected this drain for source tracing as part of the first 5-year Source Control Implementation Plan.
Alaska Marine Lines	Sample groundwater along shoreline to determine whether residual site contaminants are being discharged to Glacier Bay.	Medium	SCAP	Property owner/operator	Planned	TBD		
	Confirm location of former USTs that were removed in 1990.	Low	SCAP	Property owner/operator	Planned	TBD		
	Verify that remediation associated with filling of graving dock was completed and all conditions met.	Low	SCAP	Ecology	Planned	TBD		
Duwamish Shipyard	Conduct site investigations as specified in the Agreed Order Statement of Work.	High	SCAP	Property owner/operator	In Progress	TBD		Supplemental Work Plan submitted in March 2013 and approved by Ecology in May 2013. Stormwater and groundwater sampling and testing was performed during 2014-2016.
	Review site investigation results and assess potential for sediment recontamination and need for remedial actions.	High	SCAP	Ecology	In Progress	TBD		Phase 2 Site investigations were expected to be complete by September 2014. Current status was not available.
Glacier Northwest	Upon approval of work plans by Ecology, conduct site investigations as specified.	High	SCAP	Property owner/operator	In Progress	TBD		Dispute Resolution was invoked and the work plan process was extended another year.
	Review site investigation results and assess potential for sediment recontamination and need for remedial actions.	High	SCAP	Ecology	In Progress	TBD		Draft Remedial Investigation Report submitted to Ecology on May 22, 2015.
N Terminal 115 (Former MRI Corporation)	Conduct Remedial Investigation as specified in Agreed Order No. 8099.	Medium	New	Port of Seattle	In Progress	TBD		Final RI work plan received by Ecology in May 2013. Activities in 2014-2015 included sampling and testing of soil, groundwater, and storm drain solids.
Chemithon	Prepare and/or update the SWPPP and processes to ensure that site activities do not result in transport of contaminants to the LDW.	Low	SCAP	Property owner/operator	Planned	TBD		
RM 1.6-2.1 West (Terminal 115)								
SW Kenny Street SD/POS SD 6132/Terminal 115 CSO (Outfall 2127)	Identify and evaluate potential sources of the sediment COCs reported above screening values in storm drain structures within the SW Kenny Street SD basin.	Medium	SCAP	SPU, Ecology	In Progress	TBD		SPU retrieves the sediment trap in the SW Kenny Street SD/T115 CSO each year and the results are uploaded to Ecology EIM database. The 2013 sediment trap sample contained elevated levels of BEHP and benzyl alcohol. SPU selected this system for source tracing in the 2015 Source Control Implementation Plan.

Table B-2. Incomplete Source Control Action Items (as of December 2016)

Facility	Action Item	Priority	Type	Responsible Party	Status	Estimated Completion Date	Date Completed	Comments/Follow-On Actions
Highland Park Way SW SD/POS 6162 (Outfall 2125)	Identify and evaluate potential sources of the sediment COCs reported above screening values in storm drain structures within the Highland Park Way SW SD basin.	Medium	SCAP	SPU, Ecology	In Progress	TBD		Two sediment trap samples and one in-line solids samples collected in 2013. SPU cleaned 19,848 feet of the Highland Park Way SW SD system in 2015 and will continue to maintain 2 sediment traps in this system (Outfall 2125) following cleaning. About 1,100 feet of the line remains to be cleaned. Samples are collected annually and results are uploaded to Ecology EIM.
	Review data from storm drain solids samples collected up gradient of Outfall 2125 in April and October 2010 and May 2011, and data from sand cover samples collected from the clean sand cover placed on the maintenance dredged area in Berth 1, to evaluate the potential for sediment recontamination.	Medium	SCAP	Ecology, Port of Seattle	Planned	TBD		
West Michigan CSO (Outfall 2506)	Evaluate the 2009 King County effluent discharge data to assess whether the effluent discharges from the West Michigan CSO represent a potential source of contaminants to the sediments near the Terminal 115 source control area.	Medium	SCAP	Ecology	Planned	TBD		
Terminal 115 - Port of Seattle Storm Drain Outfalls (Outfalls 2122, 2123, 2124, 2220, and POS 6146)	Review data from storm drain solids samples collected up gradient of Outfalls 2123, 2124, and 2220 in April and October 2010 and May 2011; storm drain solids samples collected up gradient of Outfall 2128 in September 2011; and data from sand cover samples collected from the clean sand cover placed on the maintenance dredged area in Berth 1 to evaluate the potential for sediment recontamination.	Medium	SCAP	Ecology, Port of Seattle	Planned	TBD		
	Collect base flow samples from the portions of the Terminal 115 SD system that discharge to Outfalls 2128 and 2220 to determine if contaminants in base flow (i.e., groundwater draining into the storm drain system through French drains and groundwater drainage structures) are present at concentrations exceeding Washington State Water Quality Standards (WAC 173-201A) and/or the draft groundwater-to-sediment screening levels.	Medium	SCAP	Port of Seattle	Planned	TBD		

Table B-2. Incomplete Source Control Action Items (as of December 2016)

Facility	Action Item	Priority	Type	Responsible Party	Status	Estimated Completion Date	Date Completed	Comments/Follow-On Actions
	Negotiate an Agreed Order with the Port, to include Terminal-wide investigations to characterize the nature and extent of potential COC sources in fill material, soil, groundwater, and stormwater at Terminal 115, including specific areas identified in the Terminal 115 SCAP.	High	SCAP	Ecology, Port of Seattle	Planned	TBD		
	Collect storm drain solids samples from the storm drain lines discharging to Outfalls 2122, 2123, 2124, 2128, 2220, and POS 6146 and provide the data to Ecology to identify potential contaminant sources. Samples were recently collected from the storm drain lines discharging to Outfalls 2123, 2124, 2128, and 2220.	High	SCAP	Port of Seattle	In Progress	TBD		
	Perform a video inspection of storm drain lines to identify areas where groundwater infiltrates the storm drain system.	High	SCAP	Port of Seattle	Planned	TBD		
	Provide information regarding discharges to the deck drains north of Berth 1 to Ecology. Information to be provided will include, at minimum, a description of BMPs employed to prevent pollution of the stormwater runoff that is conveyed to the deck drains.	High	SCAP	Port of Seattle	Planned	TBD		
	Provide additional information to Ecology regarding stormwater drainage to the LDW from the 150 SW Michigan Street area of the Terminal 115 property. Information to be provided will include, at minimum, a map showing the area draining to the two small outfalls and a description of BMPs employed to prevent stormwater pollution.	High	SCAP	Port of Seattle	Planned	TBD		
Seattle Engineering Department Penn Yard	Perform a property inspection to determine current use of the property and determine if stormwater and/or spills may be conveyed to the LDW via sheet flow or groundwater discharge.	Medium	SCAP	Ecology	Planned	TBD		
	Request information from the City of Seattle Engineering Department regarding historical operations performed by the department to determine if operations may have resulted in releases of contaminants to soil and/or groundwater.	Medium	SCAP	Ecology	Planned	TBD		

Table B-2. Incomplete Source Control Action Items (as of December 2016)

Facility	Action Item	Priority	Type	Responsible Party	Status	Estimated Completion Date	Date Completed	Comments/Follow-On Actions
Former Foss Environmental Services	Request additional information regarding the status of the utility-owned pad-mounted electrical transformer from Haslund MP to determine if it remains at the property, and if so, to determine if it contains PCB-bearing fluid.	Medium	SCAP	Ecology	Planned	TBD		
	Request additional information from Haslund MP to determine the locations of storm drain lines on the former Foss Environmental property.	Medium	SCAP	Ecology	Planned	TBD		
	Request that Haslund MP perform an environmental investigation to characterize the nature and extent of potential sediment COCs in soil and groundwater beneath the property. Soil and groundwater contamination may be present due to historical operations by Boeing.	High	SCAP	Ecology	Planned	TBD		
Catholic Printery	Review the April 2010 local source control inspection report to determine if there is a potential for sediment recontamination via the stormwater pathway.	Medium	SCAP	Ecology	Planned	TBD		
RM 2.1 West (1st Avenue S SD)								
1st Avenue S Bridge Drains (Outfalls 2505, 2507, 2510, 2512)	Request additional information from WSDOT regarding the quantity and quality of stormwater and solids discharged to the LDW through the bridge drains.	High	SCAP	Ecology	Planned	TBD		
1st Avenue S Storm Drain System	Request additional information on the configuration of pipes and drainage ditches in this area from WSDOT to support identification of potential contaminant sources to the 1st Avenue SD.	Low	SCAP	Ecology	Planned	TBD		
1st Avenue S Engineered Wetlands	Request information regarding monitoring and maintenance of the engineered wetlands in the 1st Avenue S SD source control area from WSDOT in order to assess the potential for discharge of sediment COCs from the wetlands to LDW sediment.	Medium	SCAP	Ecology	Planned	TBD		
	Design a study to identify/evaluate sediment and water sampling locations at the confluence of the 1st Avenue S wetlands and the LDW, taking tidal fluctuations and accessibility into consideration. If it is determined that sediment COCs are being released, determine what measures may be necessary to mitigate contaminant release to the LDW and re-evaluate the priority of source control actions for the upland properties within the 1st Avenue S SD basin.	Medium	SCAP	Ecology	Planned	TBD		

Table B-2. Incomplete Source Control Action Items (as of December 2016)

Facility	Action Item	Priority	Type	Responsible Party	Status	Estimated Completion Date	Date Completed	Comments/Follow-On Actions
MAPSCO	Request additional information regarding the locations, materials, and conditions of storm drain system pipes and structures from the property owner.	Low	SCAP	Ecology	Planned	TBD		
Vista Pro Automotiv	Perform an evaluation to determine if the facility is required to obtain coverage under the ISGP or is eligible for a CNE certificate.	Low	SCAP	Ecology	Planned	TBD		
RM 2.1-2.2 West (EAA-2: Trotsky Inlet)								
2nd Avenue S SD	Continue source tracing to identify sources of phthalates and other COCs.	High	SCAP	SPU	In Progress	TBD		In 2010, SPU jetted and cleaned all catch basins culverts, and pipes in the street that connect to this private drainage system. SPU has collected 5 samples in this system since cleaning. Chemicals that exceeded the CSL included zinc (1 sample), TPH-oil (3 samples), BEHP (4 samples), other phthalates, 4-methylphenol (1 sample), and benzyl alcohol (3 samples).
Industrial Container Services	Conduct RI/FS, implement interim actions (as needed), and prepare draft CAP.	Medium	Follow-On	Industrial Container Services	In Progress	TBD		To be conducted in accordance with Agreed Order No. DE-6720. Revised RI/FS Work Plan submitted to Ecology in February 2012. RI Data Gaps Memo and Phase 2 Work Plan submitted in November 2014. Draft RI report submitted to Ecology in April 2015.
	Evaluate the need for stormwater characterization (solids and whole water) from this facility if overflow occurs during heavy rainfall events.	Medium	SCAP	Ecology/ KCIW	In Progress	TBD		To be addressed in accordance with Agreed Order No. DE-6720. All of the production areas at this site are plumbed to the sanitary sewer and are covered by a KCIW permit. Building roof drains discharge to ground. Site is lower than street, so roof runoff remains onsite. Site does not affect City MS4. ICS has reportedly installed an overflow with discharge to waterway. King County and EPA are investigating.

Table B-2. Incomplete Source Control Action Items (as of December 2016)

Facility	Action Item	Priority	Type	Responsible Party	Status	Estimated Completion Date	Date Completed	Comments/Follow-On Actions
Douglas Management Company	Conduct cleanup as needed to eliminate sources of contaminants to EAA-2; negotiate Agreed Order.	Medium	SCAP	Property owner/operator, Ecology	In Progress	TBD		To be conducted in accordance with Agreed Order No. DE-8258 (effective May 6, 2011).
	Conduct groundwater sampling along the LDW shoreline to assess the potential for sediment recontamination via groundwater transport.	Medium	New	Ecology	Planned	TBD		To be addressed in accordance with Agreed Order No. DE-8258.
	Verify storm drainage pathway on the southern portion of the property.	Medium	SCAP	Ecology	In Progress	TBD		Review of 104(e) response could not confirm; request property owner to provide current storm drainage map. To be addressed in accordance with Agreed Order No. DE-8258. This is direct discharge. Does not affect City MS4.
	Request property owner to provide a map showing current storm drainage on the entire property, including locations of storm drains, catch basins, oil/water separators, and outfalls.	Medium	New	Ecology	Planned	TBD		Action item identified in Supplemental Data Gaps Report. To be addressed in accordance with Agreed Order No. DE-8258.
	If stormwater discharge to EAA-2 (including the Trotsky inlet to the south and the LDW shoreline to the north and east) is confirmed, assess the need for stormwater characterization (solids and whole water). Collect stormwater samples as needed.	Medium	SCAP	Ecology/ Property owner/operator	Planned	TBD		To be addressed in accordance with Agreed Order No. DE-8258. This is direct discharge. Does not affect City MS4.
Boyer Towing	Review source tracing data collected by SPU for the 2nd Avenue S storm drain basin to identify whether the Boyer Towing owned or leased parcels are a potential source of contaminants to the Trotsky Inlet and the LDW.	Medium	New	Ecology	In Progress	TBD		Preliminary review indicates phthalates and metals may be present at elevated concentrations.
	Determine if additional storm drain samples are needed.	Medium	New	Ecology	Planned	TBD		If connected, Boyer properties along 2nd Ave S would tie into the privately-owned 2nd Ave S SD system. Site does not affect City MS4.
	Request additional data regarding potential soil contamination at Parcels F and G; evaluate the need for additional characterization.	Medium	New	Ecology	Planned	TBD		Action item identified in Supplemental Data Gaps Report.
RM 2.2-3.4 West (Riverside Drive)								
7 th Avenue S SD Outfall (Outfall 2112)	Continue source tracing to identify potential sources of the sediment COCs reported above screening levels in storm drain structures in the 7 th Avenue S SD basin.	Medium	SCAP	SPU, Ecology	In Progress	TBD		SPU jetted and cleaned the entire 7th Ave S SD system in 2013 and continues to operate 3 sediment traps in this basin. Trap samples are collected each year and results are uploaded to Ecology EIM.
King County Outfall (Outfall 3037)	Conduct source tracing to identify potential sources of sediment COCs reported above screening levels in LDW sediments adjacent to Outfall 3037.	Medium	SCAP	King County	In Progress	TBD		

Table B-2. Incomplete Source Control Action Items (as of December 2016)

Facility	Action Item	Priority	Type	Responsible Party	Status	Estimated Completion Date	Date Completed	Comments/Follow-On Actions
Private Outfalls (Outfalls 2106, 2108, and 2113)	Conduct an inspection during a storm event to determine if the three unresolved outfalls (Outfalls 2106, 2108, and 2113) are operational or have been abandoned.	Medium	SCAP	SPU	Planned	TBD		Outfall 2113 is the City's S Webster Street SD. This outfall serves one catch basin located on S Riverside Dr. Outfalls 2106 and 2107 are located in the commercial waterway.
	If discharge from these outfalls is observed, conduct dye testing to determine if storm drain lines are connected to the unresolved outfalls, and delineate the associated drainage areas.	Medium	SCAP	Property Owners	Planned	TBD		
Independent Metals Plant 2	Review Independent Metals' revised SWPPP, when provided, and verify that the information identified in Ecology's October 21, 2011, corrective action letter is included in the SWPPP.	Low	SCAP	Ecology	Planned	TBD		Independent Metals Plant 2 is no longer in business. Silver Bay Logging is the current operator.
	Request drainage information from Independent Metals for Outfalls 2109 and 2111 to determine if the outfalls are operational and to identify the drainage areas associated with the outfalls, if any.	High	SCAP	Ecology	Planned	TBD		Independent Metals Plant 2 is no longer in business. Silver Bay Logging is the current operator.
Former Long Painting – 10 th Avenue S Facility	Perform a facility inspection at Unity Electric to verify compliance with applicable regulations and BMPs.	Medium	SCAP	King County	Planned	TBD		
American Civil Constructors Barge Removal Ramp	Request American Civil Constructors to provide information about the fill used for a barge removal ramp, to determine if the fill is a potential source of contaminants to adjacent sediments.	High	SCAP	EPA, USACE	Planned	TBD		
Olympic Steel Door	Request Olympic Steel Door, Redox, and All Metal Arts to obtain coverage under the ISGP or apply for a CNE.	Low	SCAP	Ecology	Planned	TBD		
Independent Metals Plant 1	Request Independent Metals to obtain environmental data to determine if soil and groundwater is contaminated by metals recycling operations and if COCs in soil and groundwater may be transported to the LDW.	Medium	SCAP	Ecology	Planned	TBD		
RM 3.4-3.8 West (EAA-5: Terminal 117)								
Adjacent Streets/Dallas Ave.	Continue monitoring of storm drain solids	High	Follow-On	SPU, Port of Seattle	In Progress	TBD		T117 Adjacent Streets cleanup began in July 2015 and was completed in August 2016. City of Seattle and Port of Seattle are preparing long term maintenance and monitoring plan for EPA. Port is responsible for monitoring sediment cleanup. City is responsible for post-construction monitoring associated with the Adjacent Streets cleanup. Long term monitoring at outfall to be conducted as part of Seattle's SCIP.
South Park Marina	Investigate sewer connections and discharge locations of storm drains and catch basins.	Low	SCAP	Ecology	Planned	TBD		

Table B-2. Incomplete Source Control Action Items (as of December 2016)

Facility	Action Item	Priority	Type	Responsible Party	Status	Estimated Completion Date	Date Completed	Comments/Follow-On Actions
RM 3.8-4.2 West (Sea King Industrial Park)								
S 96th Street SD Basin	Provide Ecology with updated information regarding the proposed drainage basin upgrades to divert the north and middle forks of Hamm Creek around the S 96th Street industrial area in order to discharge directly to the LDW via Hamm Creek.	Medium	SCAP	King County	Planned	TBD		
Sea King Industrial Park	Conduct an inspection during a storm event to determine if the S Director Street Outfall and Outfall 2101 are operational or have been abandoned. If discharge from these outfalls is observed, request that the property owners conduct dye testing to determine if storm drain lines are connected to the unresolved outfalls and delineate the associated drainage areas.	Medium	SCAP	Ecology, King County	Planned	TBD		
	Request clarification from King County regarding the owner and operator status for the S Director Street Outfall and Outfall 2101.	Medium	SCAP	Ecology	Planned	TBD		
	Request information from the property owner regarding stormwater drainage features to evaluate the potential for contaminant transport to the LDW via stormwater discharge. Information should include Parcel 0001600058 (Aerospace Machinists Union) if it is connected to the storm drain system at Sea King Industrial Park.	Low	SCAP	Ecology	Planned	TBD		
	Request information from the property owner regarding historical tenant operations to determine the potential for soil and/or groundwater contamination beneath the property.	Low	SCAP	Ecology	Planned	TBD		
KRS Marine	Perform a source control inspection to verify compliance with applicable regulations and BMPs to prevent the release of contaminants to the LDW.	Low	SCAP	Ecology	Planned	TBD		
Sound Delivery Service	Contact representatives of Rasmussen Wire Rope (former operator at Sound Delivery Service) to determine if contaminated soil was removed from the property.	Low	SCAP	Ecology	Planned	TBD		

Table B-2. Incomplete Source Control Action Items (as of December 2016)

Facility	Action Item	Priority	Type	Responsible Party	Status	Estimated Completion Date	Date Completed	Comments/Follow-On Actions
RM 4.2-5.8 West (Restoration Areas)								
Hamm Creek SD Basin	Request additional information from King County and the Cities of Burien and SeaTac to define the boundaries of the Hamm Creek SD basin in order to determine if the area to the east of Des Moines Memorial Drive between S 116th Way and S 124th Street and the area south of S 124th Street should be included in or excluded from the Restoration Areas source control area.	Medium	SCAP	Ecology	In Progress	TBD		King County is updating their map of the municipal stormwater system as part of their Source Control Implementation Plan.
Outfall 3842	Request additional information from the City of Tukwila to determine the drainage area associated with Outfall 3842.	Medium	SCAP	Ecology	Planned	TBD		
Seattle City Light Power Substation	Request that SCL perform an environmental assessment to address the potential arsenic, mercury, benzo(a)pyrene, and BEHP contamination in fill material.	Medium	SCAP	Ecology	Planned	TBD		
Boeing Parking Lot Property	Perform a source control inspection to verify compliance with applicable regulations and BMPs to prevent the release of contaminants to the LDW.	Low	SCAP	Ecology	Planned	TBD		
USPS Seattle Distribution Center	Request a facility map from the Sabey Corporation (property manager) showing the storm drain system on the property.	Medium	SCAP	Ecology	Planned	TBD		
	Request information from the U.S. Postal Service regarding the neutralizing tank and the results from testing of sludge in the tank and waste ink/alcohol.	Low	SCAP	Ecology	Planned	TBD		
	Request that the Sabey Corporation collect groundwater data to assess the current concentrations of metals in groundwater beneath the property.	Low	SCAP	Ecology	Planned	TBD		
	Review the cleanup records associated with Atlas Demolition to assess the potential for sediment recontamination via the groundwater discharge pathway.	Low	SCAP	Ecology	Planned	TBD		

Priority:

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

Type:

Follow-On Action item is a follow-on to an action item identified in a SCAP
 New Action item identified after publication of the SCAP
 SCAP Action item identified in a SCAP

**Appendix C:
SPU Source Control Inspections
(2014-2016)**

Appendix C
SPU Source Control Inspections (2014-2016)

Facility (DBA)	Address	Date Inspected	Inspection Type	Total Corrective Actions*	HW	IW	SP	SW	Rank
RM 0.1-0.9 East (EAA-1: Duwamish/Diagonal Way)									
Diagonal Avenue S CSO/SD									
3-D Systems Corp.	620 S Industrial Way	9/23/2016	Initial	3			1	2	Low
		11/10/2016	Followup						
7 Eleven Store # 2360-24497C	2009 Rainier Avenue S	10/2/2015	Initial				1	2	Low
		10/19/2015	Followup						
A-1 Auto Repair & Towing, Inc.	1821 Rainier Avenue S	5/28/2015	Initial	12	2		7	3	Low
Aamco Transmission	2107 23rd Avenue S	3/31/2014	Initial	8			4	4	Medium
		5/6/2014	Followup						
		5/17/2016	Initial						
Acme Construction Supply	4747 1st Avenue S	7/13/2016	Followup	15			4	11	High
		11/3/2016	Initial						
		12/14/2016	Followup						
ACRS	3639 Martin Luther King Jr Way S	6/17/2014	Initial	6			3	3	Medium
		7/1/2014	Followup						
		7/11/2014	Followup						
		9/25/2014	Followup						
Adhesa Plate	4000 7th Avenue S	9/3/2014	Initial	1		1			Low
Agbar Technologies, Inc.	3820 6th Avenue S	12/7/2015	Initial	4			3	1	Low
Airgas	4401 Airport Way S	6/11/2014	Initial	11			6	5	Medium
		6/21/2016	Initial						
		8/12/2016	Followup						
Alaskan Copper & Brass	3200 6th Avenue S	1/17/2014	Followup	9		1	2	6	High
		5/25/2016	Initial						
		7/29/2016	Followup						
Alaskan Copper & Brass	3223 6th Avenue S	1/17/2014	Followup	7		1	2	4	Medium
		5/25/2016	Initial						
		7/29/2016	Followup						
Alaskan Copper & Brass	3300 6th Avenue S	1/17/2014	Followup	7			3	4	Medium
		5/25/2016	Initial						
		7/29/2016	Followup						
Alaskan Copper & Brass	3317 6th Avenue S	1/17/2014	Followup	4			1	3	Low
		5/25/2016	Initial						
		7/29/2016	Followup						
Alaskan Copper & Brass	3405 6th Avenue S	1/17/2014	Followup	11			3	8	High
		5/25/2016	Initial						
		7/29/2016	Followup						
Alaskan Copper & Brass	4700 Colorado Avenue S	5/25/2016	Initial						
		7/29/2016	Followup						

Appendix C
SPU Source Control Inspections (2014-2016)

Facility (DBA)	Address	Date Inspected	Inspection Type	Total Corrective Actions*	HW	IW	SP	SW	Rank	
All City Fence Co.	36 S Hudson Street	3/4/2014	Followup	10				4	6	Medium
		6/3/2014	Followup							
		6/20/2014	Followup							
		10/6/2016	Initial							
		11/17/2016	Followup							
Allied Furniture Clinic	1716 21st Avenue South	9/15/2016	Initial	5	1		4		Low	
Amazon.com	2646 Rainier Avenue S	11/18/2014	Initial	3			3		blank	
		12/15/2014	Self-Cert							
Amtrak	220 S Holgate Street	5/22/2015	Initial							
Aria Style	4616 Ohio Avenue S	8/6/2015	Initial	3			3		Low	
		8/24/2015	Followup							
Atlantic Veterinary Hospital	2115 23rd Avenue S	11/6/2016	Initial						Low	
Auto-Chlor System	4315 7th Avenue S	4/28/2015	Initial	3		1		2	High	
		6/18/2015	Followup							
AutoZone #4121	306 23rd Avenue S	5/27/2016	Initial	5			4	1	Medium	
AV PRO INC	812 S Adams Street	3/27/2015	Initial	3			3		Low	
		5/22/2015	Followup							
Avalon Artists	5018 Ohio Avenue S and/or 5021 Colorado Avenue S	4/27/2016	Initial	4				4	Low	
		8/5/2016	Followup							
Bailey Gazert Elementary School	1301 E Yesler Way	11/18/2014	Initial	13	2		6	5	Low	
Bamboo Hardwoods Manufacturing Co	4100 4th Avenue S	6/30/2015	Initial	6			3	3	Medium	
		9/1/2015	Followup							
Banzai Sushi	3623 6th Avenue S	8/10/2016	Initial						Low	
Barcodes West LLC	2755 Airport Way S	1/16/2014	Initial	2			1	1	Medium	
		5/8/2014	Followup							
Bartell Drugs #63	2345 Rainier Avenue S	9/17/2014	Initial	4			3	1	Low	
		10/14/2014	Followup							
		10/30/2014	Followup							
		11/4/2014	Followup							
		11/6/2015	Initial							
Bartell Drugs Distribution	4140 East Marginal Way S	4/1/2016	Followup	7	1		4	2	Medium	
		2/2/2014	Initial							
Beacon Market	2500 Beacon Avenue S	4/22/2014	Followup	5			3	2	Low	
		6/3/2014	Followup							
		6/22/2016	Initial							
Big Brothers Big Sisters of Puget Sound	5023 Colorado Avenue S	6/22/2016	Initial							
Big People Scooters	5951 Airport Way S	10/19/2016	Screening						None	
Botanical Designs Inc.	4201 Airport Way S	8/27/2014	Initial	5			3	2	Low	
		10/1/2014	Followup							
Boy Boy's Salon	1400 S Jackson St	3/5/2015	Screening						Low	

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Facility (DBA)	Address	Date Inspected	Inspection Type	Total Corrective Actions*	HW	IW	SP	SW	Rank
Brickhouse Industries	5018 Ohio Avenue S	6/23/2016	Initial	5			3	2	Medium
		9/6/2016	Followup						
Budget Batteries	2006 Rainier Avenue S	4/8/2016	Initial	25			14	11	High
		6/14/2016	Followup						
Burger King - Rainier	2021 Rainier Avenue S	12/15/2015	Initial	6			3	3	Medium
		4/21/2016	Followup						
Cash & Carry #583	1915 21st Avenue S	4/18/2014	Initial	13			6	7	Medium
		5/23/2014	Followup						
		6/2/2014	Followup						
		11/8/2016	Initial						
Charlie's Produce 1st Avenue S	3844 1st Avenue S	12/16/2016	Followup	17	1		9	7	Medium
		2/12/2014	Initial						
		2/20/2014	Followup						
		3/24/2014	Followup						
Charlie's Produce 2nd Avenue S	4103 2nd Avenue S	5/23/2016	Initial	14			6	8	Medium
		7/27/2016	Followup						
Chau's Complete Auto Repair	509 Rainier Avenue S	6/30/2016	Initial	12	2	1	5	4	High
		9/9/2016	Followup						
Cheryl Zahniser Studio	5019 Colorado Avenue S	4/17/2015	Initial	3					None
		5/28/2015	Followup						
Choice Linens	4700 Ohio Avenue S	6/23/2016	Initial	3			3		Low
		9/10/2015	Initial						
City Art Works at Pratt Fine Arts Center	1902 S Main Street	10/27/2015	Followup	12		1	2	9	Medium
		4/15/2016	Initial						
CMARR	1216 S Weller Street	6/3/2016	Followup	4			2	2	Medium
Commercial Warehouse Co., Inc.	3623 6th Avenue S	7/22/2016	Initial	3			3		Medium
Community House Mental Health Agency	2212 S Jackson Street	1/24/2014	Initial	1				1	Low
		10/15/2014	Initial						
ConGlobal Industries	1 S Idaho Street	2/17/2015	Followup	9		1	2	6	Medium
		7/13/2016	Initial						
Copiers Northwest Inc.	615 S Alaska Street	8/3/2016	Followup	1				1	Low
		4/10/2014	Initial						
		5/15/2014	Followup						
COSTCO Wholesale	4401 4th Avenue S	6/6/2014	Followup	8			2	6	Medium
		6/24/2015	Initial						
		8/11/2015	Followup						
		8/19/2015	Followup						
		11/24/2015	Followup						

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Facility (DBA)	Address	Date Inspected	Inspection Type	Total Corrective Actions*	HW	IW	SP	SW	Rank	
D.P. Nicoli	3700 6th Avenue S	5/16/2014	Initial	8				3	5	Medium
		10/9/2014	Followup							
		10/31/2016	Initial							
		12/18/2016	Followup							
Dave's Transmission Warehouse	4750 Airport Way S	12/2/2016	Initial	3			3		Medium	
Davis Door Service	2021 S Grand Street	11/30/2016	Initial	12	1		4	7	Low	
Davis Sign	4025 7th Avenue S	3/4/2015	Initial						Low	
DCG One	4401 East Marginal Way S	11/30/2016	Initial	2			1	1	Low	
		12/9/2016	Followup							
Deeny Construction Co. Inc.	2545 Rainier Avenue S	4/21/2015	Initial	14	2		8	4	High	
		5/28/2015	Followup							
Dere Auto	1818 Rainier Avenue S	4/20/2015	Initial	11	5		4	2	Medium	
		5/27/2015	Followup							
Dirty Hands Co-op	1817 S Jackson Street	4/18/2014	Screening	12	5	1	3	3	None	
Douglass-Truth Branch Library	2300 E Yesler Way	5/9/2016	Initial						Low	
Downtown Cannabis Co.	612 S Alaska Street	9/27/2016	Initial						Low	
El Delicioso	2500 Beacon Avenue S	2/12/2014	Initial	4			3	1	Low	
		4/22/2014	Followup							
El Hot Metal Fabrication	unknown	12/1/2016	Initial	4	1		3		Medium	
Evergreen Herbal	3922 6th Avenue S	9/27/2016	Initial						Low	
Express Cold Storage	4606 4th Avenue S	4/15/2014	Initial	4	1		2	1	Medium	
Fast Rabbits	2822 Martin Luther King Jr Way S	10/13/2015	Initial	6			3	3	Low	
		12/29/2015	Followup							
FedEx	651 S Alaska Street	3/7/2014	Initial	2				2	Medium	
		4/17/2014	Followup							
Fleet and Facilities Department	255 S Spokane Street	9/1/2015	Initial						Low	
Fleetpride	600 S Dakota Street	11/7/2016	Initial	3			3		Low	
Floral Design Morales	650 S Orcas Street	3/5/2015	Screening						Low	
Food Service International	4601 6th Avenue S	4/10/2014	Initial	2				2	Low	
Franks Quality Produce Inc.	612 S Alaska Street	8/27/2014	Initial	6			4	2	Medium	
		9/26/2014	Followup							
Franz Family Bakeries	2006 S Weller Street	6/18/2015	Initial	7			2	5	Medium	
		8/12/2015	Followup							
		9/14/2015	Followup							
Fulcrum Coffee LLC	4660 Ohio Avenue S	9/17/2015	Initial	4			3	1	Low	
		9/25/2015	Followup							
Full Pull Wines	3933 1st Avenue S	10/4/2016	Screening						None	
Garfield High School	400 23rd Avenue	7/1/2015	Initial	5			4	1	Low	
		8/27/2015	Followup							

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Facility (DBA)	Address	Date Inspected	Inspection Type	Total Corrective Actions*	HW	IW	SP	SW	Rank
Gauge Design	3810 4th Avenue S	10/7/016	Initial						Low
Gent Components	4701 Colorado Avenue S	9/25/2015	Initial	3			3		Low
		11/11/2015	Followup						
Georgetown Brewing Co.	5200 Denver Avenue S	1/7/2014	Followup	8	1		4	3	Medium
		3/29/2016	Initial						
Global Fulfillment	4 S Idaho Street	2/24/2015	Initial	3			1	2	Low
		4/29/2015	Followup						
Grand Image Ltd.	4730 Ohio Avenue S	9/10/2015	Initial						Low
Grease Monkey #481	2101 23rd Avenue S	3/31/2014	Initial	5	1	1		3	Medium
		5/6/2014	Followup						
Gretchen's Shoebox Express	3922 6th Avenue S	2/19/2016	Initial	15	2	1	5	7	Medium
		3/23/2016	Followup						
Harborview Medical Center	325 9th Avenue	4/3/2015	Initial	6	2	1	1	2	Medium
		6/11/2015	Followup						
Henry Built	4632 and/or 4746 Ohio Avenue S (unclear)	8/6/2015	Initial	6			3	3	Low
		8/18/2015	Followup						
		9/25/2015	Followup						
Hertz Equipment Rental	5055 4th Avenue S	6/10/2014	Initial	1				1	Medium
		8/6/2014	Followup						
Hollywood Lights	660 S Dakota Street	4/28/2014	Initial	2			1	1	Low
Hudson Bay Insulation	210 S Hudson Street #375	1/31/2014	Initial						Medium
Hui-Intertrading Inc.	2100 22nd Avenue S	7/27/2015	Initial	6			3	3	Medium
		9/18/2015	Followup						
Imagine Visual Service LLC	665 S Dakota Street	8/20/2014	Initial	6	1		3	2	Low
		9/26/2014	Followup						
		11/4/2014	Followup						
International Sign	2914 S McClellan Street	10/14/2014	Initial	8	3		3	2	Low
International Truck Leasing & Rental	3801 7th Avenue S	4/7/2015	Initial	4			1	3	Medium
		7/30/2015	Followup						
JCE Inc.	2021 22nd Avenue S	9/19/2014	Initial	3			3		Low
		10/30/2014	Followup						
		11/24/2014	Followup						
Jefferson Park Family Medicine	2902 Beacon Avenue S	3/26/2014	Initial	2				2	Low
		7/17/2014	Followup						
John Perine Co.	820 S Adams Street	6/1/2016	Initial	6			3	3	Medium
Jon-Don	4111 Airport Way S	5/19/2016	Initial	4			4		Low
K2 Sports	4201 6th Avenue	2/20/2015	Initial	9	1		3	5	Medium
		4/10/2015	Followup						
Kawabe Memorial House	221 18th Avenue S	1/18/2014	Initial	1				1	blank

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Facility (DBA)	Address	Date Inspected	Inspection Type	Total Corrective Actions*	HW	IW	SP	SW	Rank
Kellan's Motor Works	1501 S Dearborn Street	1/28/2014	Initial	7			5	2	Medium
		6/17/2014	Followup						
Kelly Paper Company	4616 Ohio Avenue S	9/17/2015	Initial						Low
Kerloo Cellars	3911 1st Avenue S	10/4/2016	Initial	7		1	3	3	Medium
		11/8/2016	Followup						
King's Oriental Foods Co. Ltd.	1238 S Weller Street	10/11/2016	Initial	4				4	Low
		11/22/2016	Followup						
Kings Hall	2929 27th Avenue S	4/18/2014	Screening						None
KT Building Supply	3614 6th Avenue S	6/20/2014	Followup	13	1		6	6	High
		6/25/2014	Followup						
		7/11/2014	Followup						
Kukuruza Popcorn	1214 S Weller Street	5/9/2014	Initial	3			3		Low
		6/17/2014	Followup						
Kusak Cut Glass Works	1911 22nd Avenue S	11/30/2016	Initial						None
L Room Fabrication	5030 Ohio Avenue S	3/3/2016	Initial	1	1				Low
L.N. Curtis & Sons	629 S Industrial Way	2/18/2015	Initial	3			2	1	Low
		4/13/2015	Followup						
Lamar Advertising of Seattle	3601 6th Avenue S	8/18/2016	Initial	13			4	9	High
		9/12/2016	Followup						
Lantern Press	4773 Colorado Avenue S	9/17/2015	Initial	3			3		Low
		9/24/2015	Followup						
Latta Wines	3933 1st Avenue S	11/8/2016	Initial	5		1	3	1	Medium
Lowes Home Improvement Warehouse	2700 Rainier Avenue S	5/6/2014	Followup	17			8	9	Medium
MacMillan Piper Inc.	655 S Edmunds Street	8/4/2015	Initial	38			12	26	Medium
		9/30/2015	Followup						
Magic Dragon Chinese Eatery	306 23rd Avenue S	8/15/2016	Initial	3			3		Medium
Mallory & Church	676 S Industrial Way	10/28/2014	Initial	6	1		2	3	Low
		12/3/2014	Followup						
McDonalds #435	2336 25th Avenue S	7/12/2016	Initial	11			3	8	Medium
		8/23/2016	Followup						
		9/8/2016	Followup						
McKinstry - in the Diagonal SD	4 locations, unspecified	8/31/2016	Initial	2				2	Low (2), Medium (2)
McKinstry - in the Diagonal CSO	one location, unspecified	8/31/2016	Initial	1				1	Low
McKinstry Co - in the Diagonal CSO	one location, unspecified	8/31/2016	Initial	8			2	6	Low
MDE Engineers, Inc.	700 S Industrial Way	2/18/2015	Initial	7	1		3	3	Low
Megenagna Ethiopian Bar and Restaurant	2814 Martin Luther King Jr Way S	10/20/2015	Initial	3			3		Medium
		11/2/2015	Followup						
Mercer Distribution Services LLC	4050 East Marginal Way S	6/11/2015	Initial						Medium

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Facility (DBA)	Address	Date Inspected	Inspection Type	Total Corrective Actions*	HW	IW	SP	SW	Rank
Merlino Foods	4100 4th Avenue S	7/16/2015	Initial	7			3	4	Medium
		9/14/2015	Followup						
Moonlight Café	1919 S Jackson Street	1/28/2014	Initial	9			8	1	Medium
		6/17/2014	Followup						
		7/8/2014	Followup						
Mutual Fish Co. Inc.	2335 Rainier Avenue S	9/17/2014	Initial	10			3	7	Medium
		11/21/2014	Followup						
No Junk Inc.	4634 East Marginal Way S	7/15/2014	Initial						Low
North Star Casteel	3909 9th Avenue S	4/15/2014	Initial	38	11	3	11	13	Medium
		6/2/2014	Followup						
		8/1/2014	Followup						
Northwest Consolidated Investments	3828 4th Avenue S	6/1/2016	Initial	9			3	6	High
		7/11/2016	Followup						
Northwest Wood Design	5024 Ohio Avenue S	3/3/2016	Initial	4			3	1	Low
O'Reilly Auto Parts	2805 Rainier Avenue S	8/26/2015	Initial	4			1	3	High
		2/2/2016	Followup						
Oma Construction Inc.	2700 6th Place S	11/6/2015	Initial	8				8	High
		2/18/2016	Followup						
Oversea Casing Company	601 S Nevada Street	8/25/2016	Initial	3			2	1	Low
Pacific Tower (UW Pacific Medical Tower)	1200 12th Avenue S	2/3/2014	Initial	8			6	2	Medium
		3/13/2014	Followup						
Parent Trust for Washington Children	2200 Rainier Avenue S	4/23/2015	Initial	1				1	Low
		6/30/2014	Followup						
Pedersen's Rentals & Sales	4500 4th Avenue S	2/18/2015	Initial	8			5	3	Medium
		4/10/2015	Followup						
Phelps Tire	3922 7th Avenue S	9/3/2014	Initial	11	2		3	6	Low
Photon Factory	4810 Airport Way S	12/14/2016	Screening						None
Plantscapes Horticultural Services	1127 Poplar Place S	11/24/2014	Initial	25	5		3	17	Medium
		2/2/2015	Followup						
Plymouth Poultry	4500 7th Avenue S	1/31/2014	Followup	13	1		4	8	Medium
		4/16/2014	Followup						
		5/19/2014	Followup						
		6/19/2014	Followup						
		6/26/2014	Followup						
		8/17/2016	Initial						
9/26/2016	Followup								
Point S Affordable Tire Factory	3300 MLK Jr Way S or	9/29/2016	Initial	8			4	4	High
	3201 4th Avenue S	11/16/2016	Followup						
Pork Chop Screen Printing	3706 Airport Way S	5/16/2014	Initial	4	2		2		Low

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Facility (DBA)	Address	Date Inspected	Inspection Type	Total Corrective Actions*	HW	IW	SP	SW	Rank	
Precision Welder & Engine Repair	4429 Airport Way S	3/12/2014	Initial	11				2	9	Medium
		6/3/2014	Followup							
		8/17/2016	Initial							
		9/26/2016	Followup							
Presbytery of Seattle	1625 S Columbian Way	7/17/2015	Initial	3					3	Low
		9/18/2015	Followup							
Prince Telecom	4323 Airport Way S	3/12/2014	Initial	4				3	1	Low
		5/21/2014	Followup							
		6/18/2014	Followup							
		6/26/2014	Followup							
Promenade 23 Shopping Center	2301 S Jackson Street	2/4/2016	Initial							
		2/26/2016	Followup							
		3/23/2016	Followup							
Promenade Red Apple Market	2301 S Jackson Street	9/25/2015	Initial	9				3	6	Medium
		12/30/2015	Followup							
Rainier Ave Chevron	2802 Rainier Avenue S	10/2/2015	Initial	6				1	5	Medium
		12/8/2015	Followup							
		1/15/2016	Followup							
		2/10/2016	Followup							
		3/1/2016	Followup							
Rainier Commons LLC	3100 Airport Way S	11/10/2015	Initial	4	1				3	Medium
Rainier Cycle	4740 Airport Way S	12/14/2016	Initial	2					2	Medium
Rainier Development Group LLC	2021 22nd Avenue S	9/17/2014	Initial	3				3		Low
		10/28/2014	Followup							
Rainier Plaza #2 LLC	2701 Rainier Avenue S	10/21/2016	Initial	3					3	Low
		11/22/2016	Followup							
		12/28/2016	Followup							
Ralph's Concrete Pumping - Poplar	816 Poplar Place S	6/14/2016	Initial	21				9	12	Medium
		7/21/2016	Followup							
Ralph's Concrete Pumping - Rainier	1511 Rainier Avenue S	6/14/2016	Initial	15				7	8	Medium
		7/21/2016	Followup							
Recology Cleanscapes Inc	4401 East Marginal Way S	5/22/2015	Initial							High
Recycling Depot	851 Rainier Avenue S	6/4/2014	Initial	19	2			8	9	High
		6/5/2014	Followup							
		8/11/2014	Followup							
Red Soul	3433 Airport Way S	10/29/2014	Initial	3				3		Low
		11/21/2014	Followup							
Refrigeration Supplies Distributor Total Control	625 S Industrial Way	2/24/2015	Initial	5				2	3	Medium
		4/10/2015	Followup							

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Facility (DBA)	Address	Date Inspected	Inspection Type	Total Corrective Actions*	HW	IW	SP	SW	Rank		
Remo Borracchini's Bakery	2307 Rainier Avenue S	3/5/2015	Initial	8				4	4	High	
		6/30/2015	Followup								
		8/14/2015	Followup								
		11/17/2015	Followup								
Resolute	4617 Colorado Avenue S	8/6/2015	Initial	3				3		Low	
		9/1/2015	Followup								
Resource 3 NW	4632 Ohio Avenue S	9/10/2015	Initial							Low	
RH Brown	12 S Idaho Street	1/30/2015	Initial	2				2		Low	
		3/6/2015	Followup								
Rodda Paint	3838 4th Avenue S	9/17/2014	Initial							Medium	
Rosichelli Design	4660 Ohio Avenue S	9/10/2015	Initial							Low	
Rotie Cellars	3861 1st Avenue South	10/10/2016	Screening							None	
Safari Exports	3655 East Marginal Way S	1/24/2014	Initial								
Sanderson Safety Supply	2600 Airport Way S	3/31/2015	Initial	9	1			4	4	Medium	
		5/27/2015	Followup								
Schooner Exact Brewing Co	3901 1st Avenue South	10/7/2016	Initial	5	1			3	1	Low	
		11/16/2016	Followup								
Scientific Supply & Equipment Inc.	619 S Snoqualmie Street	2/26/2014	Initial	3				3		Low	
		4/7/2014	Followup								
SD Computer Repair and Wireless	1400 S Jackson Street, #2	9/17/2014	Initial							Low	
Seafood Products Association	1600 S Jackson Street	12/16/2014	Screening							None	
Seapine Brewing Co.	3828 4th Avenue S	8/29/2014	Initial	4	1			3		Low	
		10/8/2014	Followup								
Sears Service Center	4790 1st Avenue S	9/19/2014	Initial	8	2	1			5	Low	
		10/30/2014	Followup								
		12/30/2014	Followup								
Seattle Barrel Company - 4621 Airport Way	4621 Airport Way S	3/7/2014	Initial	1					1	Low	
		4/11/2014	Initial								
Seattle Barrel Company - Main	4716 Airport Way S	8/30/2016	Initial	25		1	11	13		Low	
Seattle Children's Play Garden	1745 24th Avenue S	6/12/2014	Initial	2					2	Low	
		7/16/2014	Self-Cert								
Seattle City Light South Service Center	3613 4th Avenue S	9/9/2015	Initial	9					2	7	High
		10/1/2015	Followup								
		11/6/2015	Followup								
		12/16/2015	Followup								
		3/29/2016	Followup								
		6/24/2016	Followup								
8/26/2016	Followup										
Seattle Collision Center	1752 Rainier Avenue S	7/7/2015	Initial	3					3	Low	

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Seattle Fire Station No. 30	2931 S Mount Baker Blvd	10/6/2015	Initial						Low
Seattle Goodwill	1400 S Lane Street	5/1/2014	Initial	29	10		7	12	Medium
		8/1/2014	Followup						
		10/24/2014	Followup						
Seattle Haunts	5000 East Marginal Way S	4/22/2016	Initial	3			3		Low
		5/11/2016	Followup						
Seattle Lighthouse for the Blind Foundation	2501 S Plum Street	6/18/2014	Initial	23	5	2	8	8	High
		10/9/2014	Followup						
Seattle Parks Dept - Medgar Evers Pool	500 23rd Avenue	4/9/2014	Initial	8	2		6		Low
Seattle Public Library	2821 Beacon Avenue S	6/11/2015	Initial	1					Low
Seattle Radiator Works	5011 Ohio Avenue S	10/22/2015	Initial	6		1		5	Medium
		12/8/2015	Followup						
Seattle Tunnel Partners	44 S Nevada Street	11/9/2015	Initial	2			1	1	Low
		3/22/2016	Followup						
Siemens Water Tech Corp	601 S Snoqualmie Street	2/26/2014	Initial						Low
Skeeter's Auto Rebuild	2104 S Plum Street	7/2/2015	Initial	13			7	6	Low
		10/20/2015	Followup						
Skyline Electric & MFG. Company	3619 7th Avenue S	5/21/2014	Initial	6	1		3	2	Medium
		6/12/2014	Followup						
SME Electrical Contractors	828 Poplar Place S	4/7/2016	Initial	14			5	9	Medium
		5/12/2016	Followup						
Solstice Group	640 S Spokane Street	8/4/2016	Initial	7		1	3	3	Medium
		9/13/2016	Followup						
		10/13/2016	Followup						
South Seattle Business Park	4634 East Marginal Way S	7/15/2014	Audit	7			4	3	blank
		7/23/2014	Audit						
Steel Toe Studios	5020 Ohio Avenue S	8/7/2015	Screening	2			2		None
Stella Color	620 S Dakota Street	10/19/2016	Initial	3			3		Low
Structure Cellars	3849 1st Avenue South #D	11/8/2016	Initial	5		1	3	1	Medium
Stusser Electric Co.	660 S Andover Street	2/24/2015	Initial	15	1		7	7	Medium
		3/10/2015	Followup						
Sun Food Trading Co.	4715 6th Avenue S	4/4/2014	Initial	14			6	8	High
		8/26/2014	Followup						
		7/21/2016	Initial						
Superior Imprints Inc.	4226 6th Avenue S	3/31/2016	Initial	3			3		Low
TEK Machining Inc.	4770 Ohio Avenue S	3/31/2015	Initial	3	1		2		Medium
		5/14/2015	Followup						
Thai Columbia Apartments	unknown	3/5/2015	Initial	2				2	Low
		8/13/2015	Followup						

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Facility (DBA)	Address	Date Inspected	Inspection Type	Total Corrective Actions*	HW	IW	SP	SW	Rank
The Field Roast Grain Meat Co.	3901 7th Avenue S	6/27/2014	Initial	5	1		1	3	High
		7/1/2014	Followup						
		7/21/2014	Followup						
		6/19/2015	Followup						
		8/13/2015	Followup						
The Firm	4701 Colorado Avenue S	10/23/2015	Initial	3			3		Low
		11/11/2015	Followup						
The Oak	3019 Beacon Avenue S	1/3/2014	Initial	3			3		Low
		3/7/2014	Followup						
The Seattle Indian Services Commission	606 12th Avenue S	5/8/2014	Initial	1				1	Low
		7/11/2014	Followup						
		8/1/2014	Followup						
Torah Day School	1625 S Columbian Way	7/17/2015	Initial	1				1	Low
		9/18/2015	Followup						
Tuxedo and Tennis Shoes Catering Inc.	4101 Airport Way S	8/20/2014	Initial	5			3	2	Low
		9/26/2014	Followup						
		10/9/2014	Followup						
Twinline Motorcycles LLC	2106 S Holgate Street	4/24/2014	Initial	9	2		3	4	Low
		6/6/2014	Followup						
Two Beers Brewing Co.	4700 Ohio Avenue S	6/21/2016	Initial	8	1		5	2	Medium
U-Haul Center of Rainier	2515 Rainier Avenue S	2/26/2016	Initial	13			8	5	Medium
		5/17/2016	Followup						
UPS	4455 7th Avenue S	3/21/2014	Initial	11			3	8	High
		11/15/2016	Initial						
		12/9/2016	Self-Cert						
Urban Hardwoods Inc.	4755 Colorado Avenue S	9/17/2015	Initial	4	1		3		Low
Urban League Village	2300 S Massachusetts Street	3/26/2015	Initial						Low
Victor's Granite & Marble LLC	4660 East Marginal Way S	4/1/2016	Initial	6	1		3	2	Low
Vieng Thong	2820 Martin Luther King Jr Way S	10/20/2015	Initial	4			3	1	Medium
		11/2/2015	Followup						
W.W. Grainger, Inc.	4930 3rd Avenue	8/25/2016	Initial	6			5	1	Low
Washington Middle School	2101 S Jackson Street	6/11/2014	Initial	4		1		3	Medium
Washington State DOT - Gas Station	3700 9th Avenue S	2/13/2014	Initial	6			5	1	Medium
		4/28/2014	Followup						
Washington State DOT - Signal Shop	3700 9th Avenue S	2/13/2014	Initial	6	1		1	4	Medium
		4/28/2014	Followup						
Waste Management, Inc. Alaska St.	70 S Alaska Street	12/5/2014	Initial	2			1	1	High
Waters Winery	3861 1st Avenue South	10/7/2016	Screening						None

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Wendy's Old Fashioned Hamburgers #1556	2543 Rainier Avenue S	9/25/2015	Initial	10				6	4	Medium
		12/22/2015	Followup							
		3/29/2016	Followup							
		4/1/2016	Followup							
Western Peterbilt Inc.	3707 Airport Way S	10/13/2015	Initial	12				6	6	Low
		12/1/2015	Followup							
Western Peterbilt Inc.	3801 Airport Way S	12/1/2015	Followup							
Western Waterproofing Co., Inc.	4429 Airport Way S	4/16/2014	Initial	6	1			3	2	Medium
		5/14/2014	Followup							
		8/1/2014	Followup							
		9/18/2014	Followup							
WGM Jeweler Company	301 23rd Avenue S	4/15/2016	Initial	1				1		None
Xtracted Laboratories 502 Inc.	2021 22nd Avenue S	9/17/2014	Initial	3				3		Low
		10/28/2014	Followup							
S Nevada St SD										
B & G Machine Inc.	11 S Nevada Street	4/28/2014	Initial	1					1	Medium
		6/11/2014	Followup							
RM 1.0-1.2-1.7 East (KC Lease Parcels)										
Brandon CSO										
Mojo Systems	128 S Lucille Street	4/28/2014	Initial							
Duwamish East Direct										
Manson Construction Co.	5053 East Marginal Way S	8/6/2015	Initial	1					1	Medium
		9/1/2015	Followup							
RM 1.2-1.7 East (St. Gobain to Glacier Northwest)										
Duwamish East Direct										
Ardagh Glass Inc	5801 East Marginal Way S	1/21/2016	Initial	2					2	High
		3/8/2016	Followup							
RM 1.7-2.0 East (Slip 2 to Slip 3)										
Duwamish East Direct										
Certainteed Gypsum	5931 East Marginal Way S	1/7/2014	Initial	14	1			2	11	High
		2/28/2014	Followup							
		5/23/2014	Followup							
		6/4/2014	Followup							
General Biodiesel Seattle	6333 1st Avenue S	10/2/2014	Initial	8				3	5	High
		11/18/2014	Followup							
		6/27/2016	Initial							
		9/20/2016	Followup							
		9/21/2016	Followup							

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Facility (DBA)	Address	Date Inspected	Inspection Type	Total Corrective Actions*					Rank
					HW	IW	SP	SW	
Glacier Northwest - Seattle Redi-Mix Plant (CalPortland)	5975 East Marginal Way S	1/9/2014	Initial	2			1	1	Low
		7/20/2015	Initial						
Great Sun Corp	5930 1st Avenue S	1/30/2015	Initial	4			3	1	Low
		5/4/2015	Followup						
		6/18/2015	Followup						
Samson Tug and Barge	6361 1st Avenue S	1/16/2014	Followup	8	2	1	3	2	High
Strategic Materials	5801 East Marginal Way S	1/19/2015	Initial	4			3	1	Medium
		3/8/2016	Followup						
		3/23/2016	Followup						
Head of Slip 2 SD									
Fittings Inc	5979 4th Avenue S	10/15/2015	Initial	5			3	2	Medium
		3/1/2016	Followup						
RM 2.0-2.3 East (Slip 3 to Seattle Boiler Works)									
S Brighton St SD									
Area Distributors Northwest	6719 East Marginal Way S	1/28/2015	Initial	1			1		Low
		3/6/2015	Followup						
Cascade Columbia Distribution	6900 Fox Avenue S	8/30/2016	Initial	4			4		Medium
		10/7/2016	Followup						
Dawn Food Products, Inc	6901 Fox Avenue S	4/10/2015	Initial	5	1		2	2	Medium
		5/29/2015	Followup						
Delta North	6701 Fox Avenue S	4/21/2016	Initial	5			3	2	Medium
		5/17/2016	Followup						
		6/17/2016	Followup						
Emerald Services	6851 East Marginal Way S	8/20/2014	Initial	2				2	High
		10/13/2014	Followup						
Emerson Enterprises LLC	525 S Brighton Street	11/7/2014	Initial	1				1	Low
		12/15/2014	Followup						
		1/30/2015	Followup						
		3/6/2015	Followup						
Marchest LLC	6767 East Marginal Way S	12/2/2015	Initial	1			1		Medium
		1/19/2016	Followup						
Pike Brewing Co.	6725 East Marginal Way S	1/24/2014	Followup	4			3	1	Medium
		2/19/2014	Followup						
Seatac Marine Services LLC	6701 Fox Avenue S	10/28/2015	Initial	9			3	6	High
		1/14/2016	Followup						
		3/11/2016	Followup						
		6/16/2016	Followup						
Seattle Schools-Science Materials Center	5975 East Marginal Way S	4/30/2014	Initial	3			3		Low

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YMS	525 S Brighton Street	10/28/2014 2/5/2015	Initial Followup	5	1		3	1	Medium
S River Street SD									
Algas-SDI International LLC	151 S Michigan Street	4/23/2014 6/6/2014 4/1/2016	Initial Followup Initial	15	1		7	7	Low
Commercial Floor Distributors Inc.	210 S River Street	3/28/2014	Initial	5			3	2	Medium
Cores West	6501 East Marginal Way S	3/16/2015 5/14/2015	Initial Followup	4	1		3		Low
Matts Famous Chilli Dogs	6615 East Marginal Way S	9/27/2015 11/9/2015	Initial Followup	4			3	1	Low
Pivot Custom Metal Fabrication	6501 East Marginal Way S, #C	3/9/2015 5/14/2015 7/17/2015	Initial Followup Followup	3			3		Medium
Seattle Cabinet & Design LLC	6533 3rd Avenue S	2/23/2016	Initial	3			3		Low
Toth Construction Inc.	6506 2nd Avenue S	3/7/2015 4/29/2015 5/28/2015	Initial Followup Followup	8	3		4	1	Medium
US Printing	6501 East Marginal Way S	3/16/2015	Initial	5	2		3		Low
V. Van Dyke, Inc.	150 S River Street	6/17/2014 2/23/2016 3/29/2016	Followup Initial Followup	7			3	4	High
RM 2.3-2.8 East (Seattle Boiler Works to Slip 4)									
Duwamish East Direct									
Seattle Boiler Works Inc.	500 S Myrtle Street	1/24/2014	Followup	2			1	1	Medium
S Garden St SD									
United Rentals	7135 8th Avenue S	7/7/2015 8/18/2015 9/25/2015 12/10/2015	Initial Followup Followup Followup	15	1		3	11	Medium
S Myrtle St SD									
Commercial Welding & Fabrication, Inc.	711 S Myrtle Street	7/12/2015 9/1/2015	Initial Followup	2			2		Low
Sea Native USA Inc.	745 S Myrtle Street	7/12/2016 8/19/2016 10/28/2016	Initial Followup Followup	9		1	3	5	High
Taxi King	720 S Orchard Street	8/26/2014	Screening	18	6		9	3	None

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Facility (DBA)	Address	Date Inspected	Inspection Type	Total Corrective Actions*	HW	IW	SP	SW	Rank
Michigan CSO									
CDL Recycle	7201 East Marginal Way S	2/13/2015 3/27/2015	Initial Followup	3				3	High
RM 2.8 East (EAA-3: Slip 4)									
I-5 SD									
Seattle Fire Station No. 27	1000 S Myrtle Street	10/6/2015	Initial	1				1	Low
KCIA SD #3/PS 44 EOF									
Troll Motors	1115 S Elizabeth Street	10/13/2015 11/2/2015	Initial Followup	1			1		Low
Slip 4									
Boiling Point Restaurant Seattle	1001 S Myrtle Street	2/27/2015 4/29/2015	Initial Followup	5			3	2	Low
Marginal Way ARCO	7200 East Marginal Way S	3/27/2015 5/7/2015	Initial Followup	8	1		3	4	Medium
Tire Distribution Systems	6311 Corgiat Drive S	3/26/2014 7/17/2014	Initial Followup	9	1	1	6	1	Medium
Ultrablock Inc.	1615 S Graham Street	1/6/2015 3/1/2016	Initial Followup	8			4	4	High
RM 4.9 East (EAA-7: Norfolk CSO/SD)									
Norfolk CSO/SD									
Affordable Auto Wrecking	9750 Martin Luther King Jr Way S	7/31/2014 10/29/2014	Initial Followup	8	1		3	4	Low
Alegis	3701 S Norfolk Street	6/17/2015	Screening						None
Becker Transfer Co	9777 Martin Luther King Jr Way S	6/26/2015 7/9/2015 7/29/2015	Initial Followup Followup	5			3	2	Medium
Classic Foundry LLC	9688 Martin Luther King Jr. Way S	3/31/2015 4/23/2015	Initial Followup	4	1		3		Medium
Engineered Products A Pape Company	9883 40th Avenue S	6/25/2015 11/17/2015 12/31/2015 1/30/2016	Initial Followup Initial Followup	3			3		Medium
Evergreen Truck Driving School	8500 Perimeter Road	6/15/2015 9/3/2015	Initial Followup	3			3		Low
Frank Coluccio Construction Co - Main	9600 Martin Luther King Jr Way S	6/29/2015 9/2/2015	Initial Followup	12	1	1	4	6	High
Frank Coluccio Construction Co - Yard	9850 Martin Luther King Jr Way S	9/1/2015 12/8/2015	Initial Followup	7			4	3	Medium

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Facility (DBA)	Address	Date Inspected	Inspection Type	Total Corrective Actions*	HW	IW	SP	SW	Rank
Fujimoto Landscaping	9639 Martin Luther King Jr Way S	7/27/2015 9/28/2015	Initial Followup	3			3		High
Jacks Payless Auto Parts	9423 Martin Luther King Jr Way S	3/30/2015 5/21/2015	Initial Followup	3			2	1	High
JCM U-Link, Joint Venture	9645 Martin Luther King Jr Way S	6/22/2015 12/8/2015	Initial Followup	6			1	5	Medium
Kroger	3701 S Norfolk Street	6/17/2015 12/3/2015 12/8/2015	Initial Followup Followup	3			2	1	Medium
MacDonald Miller Fab Shop	3701 S Norfolk Street	6/5/2014 10/6/2016 11/10/2016 11/30/2016	Initial Initial Followup Followup	6				6	High
Nelson Trucking	9747 Martin Luther King Jr Way S	1/2/2014 5/27/2015	Followup Initial	18	3		6	9	High
Noble Wines	9860 40th Avenue S	8/5/2015	Initial	3			1	2	Medium
NRC Environmental Services, Inc.	9650 Martin Luther King Jr Way S	7/7/2015 7/7/2015	Initial Followup	1				1	Low
NW Kidney Center	9700 Martin Luther King Jr Way S	6/15/2015 8/12/2015	Initial Followup	9			4	5	Medium
Ohno Construction Company	9416 Martin Luther King Jr Way S	6/29/2015 9/10/2015 12/8/2015 3/9/2016	Initial Followup Followup Followup	17			7	10	Medium
Pacific Pavement Protection Inc	9243 Martin Luther King Jr Way S	6/8/2015	Initial						Medium
Pacific Truck School	9842 Martin Luther King Jr Way S	5/14/2015 6/25/2015	Initial Followup	3			3		Medium
Pape	9800 40th Avenue S	6/25/2015 11/17/2015 12/31/2015 1/29/2016	Initial Followup Followup Followup	1				1	Medium
Pape Material Handling	9892 40th Avenue S	11/17/2016 1/30/2016	Initial Followup	7			3	4	High
Public Storage - MLK WY S	10020 Martin Luther King Jr Way S	1/22/2014	Followup	3				3	Low
Special Asphalt Products Inc	9243 Martin Luther King Jr Way S	5/26/2015 7/7/2015	Initial Followup	13	1		4	8	High
Speedeelube	9637 Martin Luther King Jr Way S	6/15/2015	Initial	2	2				Medium
Starline Inc	9801 Martin Luther King Jr Way S	7/21/2014 9/11/2014	Initial Followup	5			2	3	Medium

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Facility (DBA)	Address	Date Inspected	Inspection Type	Total Corrective Actions*	Total				Rank
					HW	IW	SP	SW	
Steeler Inc	10023 Martin Luther King Jr Way S	10/9/2014 12/9/2014 8/4/2016 12/1/2016	Initial Followup Initial Followup	28	1		11	16	High
Unified Grocers	3301 S Norfolk Street	4/16/2015	Initial	14	3		5	6	Medium
Wall & Ceiling	9830 40th Avenue S	3/13/2015 4/28/2015 6/19/2015 6/25/2015	Initial Followup Followup Followup	18	2		4	12	High
RM 0.0-1.0 West (Spokane Street to Kellogg Island)									
SW Dakota St SD									
4101 W Marginal Way SW Business Park	4101 West Marginal Way S	8/10/2016	Initial	1				1	Low
		8/25/2016	Followup						
Active Environmental Inc	4001 16th Avenue SW	6/19/2014	Initial	6	1		2	3	Medium
		9/25/2014	Followup						
		10/29/2014	Followup						
Aquatic Enterprises, Inc.	4101 West Marginal Way S	4/15/2016	Initial	2	1			1	Low
Cohesive Garage	4101 West Marginal Way S	3/28/2014	Initial						Low
Creoworks	4101 West Marginal Way S	4/8/2016	Initial	6	1	1	3	1	Medium
Ferguson Enterprises Inc.	4100 West Marginal Way S	8/27/2014	Initial	7	1		2	4	Medium
Global Diving and Salvage Inc.	4025 West Marginal Way S	2/7/2014	Initial						Medium
Heathco International	4025 16th Avenue SW	9/23/2016	Initial	3			3		Low
Sea Pac Transport Services LLC	3544 West Marginal Way SW	6/17/2014	Initial						
		7/7/2014	Followup						
Sequential Biodiesel	4034 West Marginal Way S	9/23/2016	Initial	8			6	2	Medium
		11/4/2016	Followup						
SW Idaho St SD									
Airclean Technologies Inc	4725 W Marginal Way SW	4/28/2016	Initial	6			3	3	Low
Chaldea LLC	4845 West Marginal Way S	4/28/2016	Initial						None
Continental Van Lines	4501 West Marginal Way SW	10/28/2014	Initial	4			1	3	Low
		12/8/2014	Followup						
David and Eugenie Jack	unknown	4/26/2016	Initial	2				2	None
		7/1/2016	Followup						
Evergreen Building Products LLC	4835 West Marginal Way S	4/28/2016	Initial	3			2	1	Low
Expert Marble & Granite Inc.	4749 West Marginal Way S	5/9/2014	Initial	5		2	3		Low
Heath Landscape Services Inc	4849 West Marginal Way S	5/19/2015	Initial	7	1		4	2	Medium
		6/25/2014	Followup						
John Plantish	unknown	4/28/2014	Initial	1				1	Low

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Facility (DBA)	Address	Date Inspected	Inspection Type	Total Corrective Actions*	HW	IW	SP	SW	Rank
Krueger Sheet Metal Co.	6515 West Marginal Way S	3/28/2014	Initial	12	2		6	4	Medium
		7/18/2014	Followup						
		9/18/2014	Followup						
New Finishes, Inc.	4235 West Marginal Way S	4/28/2014	Initial	8	3	1	3	1	Medium
Pacifica Marine Inc.	4233 West Marginal Way S	4/23/2014	Initial	9	4		3	2	Medium
		10/9/2014	Followup						
		10/25/2014	Followup						
Salmon Bay Barge Line Inc.	4749 West Marginal Way S	4/28/2016	Initial	3			1	2	Medium
		6/1/2016	Followup						
South Seattle Community College	6000 16th Avenue SW	4/24/2014	Initial	13	1		3	9	Medium
		6/20/2014	Followup						
RM 1.3-1.6 West (Glacier Bay)									
Duwamish West Direct									
Alaska Marine Lines - 5600	5600 West Marginal Way SW	11/5/2015	Initial	16			5	11	High
		3/28/2016	Followup						
SW Kenny Street SD									
Alaska Marine Lines - 5615/5423	5615 West Marginal Way SW	11/6/2015	Initial	9	1		1	7	High
		4/12/2016	Followup						
Glacier Northwest - Seattle Terminal	5900 West Marginal Way SW	1/9/2014	Initial	3	1		1	1	Low
Glacier Northwest - Truck Parking and Storage Lot	5902 West Marginal Way SW	1/9/2014	Initial	4			3	1	Low
Tank Wise LLC	5405 West Marginal Way SW	3/27/2014	Initial						High
		3/27/2014	Followup						
		4/1/2014	Followup						
		5/15/2014	Followup						
RM 1.6-2.1 West (Terminal 115)									
Duwamish West Direct									
CFN Seattle #470	6760 West Marginal Way SW	10/15/2015	Initial	2			1	1	Medium
		12/3/2015	Followup						
Northland Services Marine Transportation	6700 West Marginal Way SW	10/20/2015	Initial	5			1	4	High
		12/11/2015	Followup						
SW Kenny Street SD									
Catholic Printery Inc.	6327 West Marginal Way SW	4/28/2014	Initial	7			3	4	Medium
Emswiler Construction	6045 West Marginal Way SW	3/4/2014	Followup	16			7	9	High
		12/29/2015	Initial						
		2/16/2016	Followup						
Gene Summy Lumber	6000 West Marginal Way SW	6/10/2014	Initial	6	1		4	1	Low
		6/13/2014	Followup						

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Pacific Rim Equipment Rental	6515 West Marginal Way SW	8/30/2016	Initial	14		1	3	10	Low
		10/11/2016	Followup						
Highland Park Way SD									
A & E Auto Repair Inc.	7902 9th Avenue SW	3/28/2014	Initial	6	1		3	2	Medium
Pacific Plumbing Supply Co. LLC	7115 West Marginal Way SW	4/18/2014	Initial	9	1		3	5	Medium
		7/21/2014	Followup						
RM 2.1 West (1st Avenue S SD)									
1st Avenue S SD									
American Northwest Import and Distribution	7910 Occidental Avenue S	2/6/2014	Initial	3			3		Low
		3/12/2014	Followup						
		4/7/2014	Followup						
Demolition Man Inc.	8129 Occidental Avenue S	3/27/2014	Initial	12	3	4		5	Medium
Demolition Man Inc.	8151 Occidental Avenue S	5/8/2014	Followup	10	1		4	5	Medium
		3/27/2014	Initial						
First Student Inc.	7739 1st Avenue S	10/29/2015	Initial	8	1		3	4	High
		12/2/2015	Followup						
		1/7/2016	Followup						
International Construction Equipment	8101 Occidental Avenue S	8/27/2014	Initial	8	1	1	5	1	Medium
		9/30/2014	Followup						
Jones Stevedoring	7245 West Marginal Way SW	10/17/2004	Initial	8	4		3	1	Low
MacDonald Miller Co., Inc.	7707 Detroit Avenue SW	3/28/2014	Initial	10	3		6	1	High
		8/26/2014	Followup						
MAPSCO	unspecified/unclear	9/29/2016	Initial	2				2	Medium
MAPSCO	unspecified/unclear	9/29/2016	Initial	2				2	Low
Non Ferrous Metal	230 S Chicago Street	4/29/2016	Initial	1			1		Medium
Personal shop	8001 5th Avenue S	2/20/2015	Screening						unranked
SDOT Glassyard Property	8100 2nd Avenue S	4/21/2015	Initial						Low
Seaport Food Mart	7801 Detroit Avenue SW	9/12/2014	Initial	11		1	6	4	High
		9/26/2014	Followup						
		12/4/2014	Followup						
		12/11/2014	Followup						
Seaport Petroleum	7800 Detroit Avenue SW	1/29/2014	Followup	26	1		10	15	High
		10/5/2016	Initial						
		11/22/2016	Followup						
Sound Marine and Industrial Services Inc	300 S Sullivan Street	1/24/2014	Initial	4			1	3	Medium
		3/14/2014	Followup						
		6/9/2014	Followup						
Standard Steel Fabricating Co. Inc.	8155 1st Avenue S	10/28/2015	Initial						

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Facility (DBA)	Address	Date Inspected	Inspection Type	Total Corrective Actions*	HW	IW	SP	SW	Rank
Thermal Solutions	7921 2nd Avenue S	6/25/2014	Initial	2	1		1		Medium
Versatile Drilling	7201 Detroit Avenue SW	10/25/2016 11/25/2016	Initial Followup	4			2	2	Low
W & O Supply Inc.	7745 1st Avenue S	11/16/2016	Initial	5			3	2	Low
Waste Management Eastmont Transfer Station	7155 West Marginal Way SW	10/7/2014	Initial	3		1	1	1	High
Waste Management of Seattle	8101 1st Avenue S	3/19/2014 7/12/2016	Initial Initial	1			1		High
Waste Management 1st Avenue S	8111 1st Avenue S	7/12/2016	Initial	1			1		High
Western Stud Welding	127 S Kenyon Street	5/30/2014	Initial	1				1	Medium
WM Healthcare Solutions	149 S Kenyon Street	11/4/2016 12/2/2016	Initial Followup	3			2	1	Medium
RM 2.1-2.2 West (EAA-2: Trotsky Inlet)									
Duwamish West Direct									
Alaska Marine Lines	7100 1st Avenue S	11/10/2015 2/5/2016	Initial Followup	2				2	Medium
Western Marine Construction	7245 2nd Avenue S	8/12/2016	Initial	1				1	Low
Trotsky Inlet									
Bill's Mobile Service	7265 2nd Avenue S	5/14/2015 7/16/2015	Initial Followup	23			7	16	High
Kelly-Ryan Inc.	7235 2nd Avenue S	1/24/2014	Screening	8	4	1	1	2	None
Oppenheimer Cine Rental LLC	7400 3rd Avenue S	8/6/2015	Initial	3			3		Low
Seattle Forging & Tool Inc.	218 S Holden Street	4/28/2014	Initial	1			1		Low
2nd Avenue S SD									
Bessemer Trading Inc.	424 Cloverdale Street	4/29/2016	Initial	3			3		Low
Da Vinci Gourmet	7224 1st Avenue S	10/15/2015 12/29/2015	Initial Followup	20	1		12	7	High
Elliott Bay Industries	7500 W Marginal Way S	9/27/2016 11/15/2016	Initial Followup	9	1		3	5	Low
Flying Fish Express	7937 2nd Avenue S	5/15/2014	Initial	2				2	Medium
Fox Plumbing & Heating	7501 2nd Avenue S	10/6/2016	Initial	7			3	4	Low
Full Circle	424 Cloverdale Street	6/16/2016 7/21/2016	Initial Followup	4			3	1	High
Molly's Salads	432 Cloverdale Street	6/16/2016	Initial	4			3	1	Medium
North Star Ice Equipment Corporation	8151 Occidental Avenue S	1/2/2014	Followup	2				2	Medium
Northwest Building Tech	215 S Austin Street	9/15/2016	Initial	4			3	1	Medium
Northwest Center	7272 W Marginal Way S	4/26/2016 6/6/2016	Initial Self-Cert	11			4	7	Low
Pacific Western Agencies	7700 2nd Avenue S	4/22/2015	Initial	3			3		Low

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Facility (DBA)	Address	Date Inspected	Inspection Type	Total Corrective Actions*	Total				Rank
					HW	IW	SP	SW	
PACO - Yard 1	7400 2nd Avenue S	4/15/2015 6/3/2015	Initial Followup	16			5	8	Medium
PACO - Yard 2	7560 2nd Avenue S	4/15/2015 6/3/2015	Initial Followup	11			6	5	Medium
PACO - Yard 3	7601 2nd Avenue S	4/15/2015 6/3/2015	Initial Followup	6			5	1	Medium
T H Seafood	7901 2nd Avenue S	3/28/2014	Initial	5		1	3	1	Medium
RM 2.2-3.4 West (Riverside Drive)									
Duwamish West Direct									
Pacific Pile and Marine	523 S Riverside Drive	4/7/2015	Initial						High
Pacific Pile and Marine	700 S Riverside Drive	4/7/2015 5/28/2015	Initial Followup	3		1	1	1	High
7th Avenue S SD									
Adventure Ready	309 S Cloverdale Street	8/1/2016	Screening						None
Ahab Shipping	309 S Cloverdale Street	10/27/2016	Initial	3			3		Low
Alaska Logistics, LLC	327 S Kenyon Street	7/7/2015 9/4/2015	Initial Followup	3	1		1	1	Medium
All Services Moving	521 S Monroe Street	4/8/2016	Initial						
Applewhite Aero	309 S Cloverdale Street	10/27/2016	Initial	4			3	1	Low
Braicks Construction Inc	309 S Cloverdale Street	6/25/2014	Initial	3	1		2		Low
Builtgreen Building Supply (New Standard Building Materials)	521 S Monroe Street	6/5/2015 8/19/2015 9/24/2015	Initial Followup Followup	3			3		Medium
Coast Crane Company	8250 5th Avenue S	5/12/2015 6/25/2015 8/22/2016	Initial Followup Initial	11			3	8	High
Consistent Coatings Inc	719 S Riverside Drive	12/7/2015 1/27/2016	Initial Followup	6			6		Low
Custom Crating Company Inc.	233 S Holden Street	3/20/2015	Initial	1				1	Low
Dama	460 S Kenyon Street	6/16/2015 7/17/2015	Initial Followup	4			3	1	Medium
Dead Center Cycles LTD	233 S Holden Street	3/25/2016	Initial						Low
Demetri's Gourmet Mixes	8230 5th Avenue S	5/3/2016 7/27/2016	Initial Followup	5			3	2	Medium
DMH Industrial Electric, Inc.	7800 7th Avenue S	2/6/2014 3/12/2014	Initial Followup	4			3	1	Medium
Eden Labs	309 S Cloverdale Street	10/11/2016	Initial	5		1	3	1	Low
Encompass Print Solutions	309 S Cloverdale Street	6/20/2016	Screening						None
Espresso Technologies	309 S Cloverdale Street	10/27/2016	Screening						None

Appendix C
SPU Source Control Inspections (2014-2016)

Facility (DBA)	Address	Date Inspected	Inspection Type	Total Corrective Actions*	HW	IW	SP	SW	Rank
Federal Marine & Defense Services, LLC	8000 5th Avenue S	3/14/2014	Initial	4			3	1	Low
Gil's Aluminum & Shell Core Shop	533 S Holden Street	9/23/2014	Initial						Low
Got Soup	309 S Cloverdale Street	6/20/2016	Audit						Low
Gourmondo	309 S Cloverdale Street	12/21/2015	Initial	3			3		Low
Graham Trucking	743 S Chicago Street	8/4/2016	Initial						Low
Graycloud	309 S Cloverdale Street	8/4/2016	Initial	4			3	1	Low
Green Day Trading and Recycling Co.	747 S Monroe Street	7/8/2014 10/30/2014	Initial Followup	2			1	1	Medium
Harsch Investment Properties	309 S Cloverdale Street	6/20/2014 6/24/2014	Initial Followup	4	1		1	2	Medium
HGH Metalworks	8009 7th Avenue S	6/3/2016 9/9/2016	Initial Followup	4	1		2	1	Medium
Industrial Tire of Wa Inc.	540 S Holden Street	5/21/2015 7/16/2015	Initial Followup	10			4	6	High
Innovative Repairs LLC	8110 7th Avenue S	7/28/2014 9/23/2014	Initial Followup	4			3	1	Medium
Knife Technology Inc	309 S Cloverdale Street	8/12/2016	Initial						Low
Little Rae's Bakery Inc.	309 S Cloverdale Street	4/23/2015 5/4/2015 6/3/2015	Initial Followup Followup	5			3	2	Low
Live Oak Audio Visual	309 S Cloverdale Street	8/1/2016	Screening						None
Loki Fish Company	309 S Cloverdale Street	3/20/2016	Audit						Low
Marine Lumber Service	525 S Chicago Street	8/12/2015	Initial	1				1	Medium
Mark's Sharps	309 S Cloverdale Street	10/5/2016	Initial						Low
Mavam Espresso	309 S Cloverdale Street	10/27/2016	Initial	2		1		1	Low
Mechanical Agents Inc.	550 S Monroe Street	6/3/2015	Initial						Low
Mercury Commercial Cleaning	309 S Cloverdale Street	6/26/2014 7/23/2014	Initial Followup	4			2	2	Low
MH Textile Northwest	309 S Cloverdale Street	6/20/2016	Screening						None
Modern Coach/Modern Pattern	255 S Austin Street	5/18/2016	Initial	3				3	Low
MTI	7709 5th Avenue S	11/6/2015 2/11/2016	Initial Followup	1				1	Medium
Neilsen Florist	309 S Cloverdale Street	8/15/2016	Initial	1				1	Low
Northwest Laboratories	241 S Holden Street	10/21/2014 12/3/2014	Initial Followup	6	2		3	1	Low
Ochsner Auto Body	309 S Cloverdale Street	6/20/2016	Initial						Low
Olsson Manufacturing Inc.	525 S Elmgrove Street	3/31/2016 4/1/2016	Initial Followup	4			3	1	Medium

Appendix C
SPU Source Control Inspections (2014-2016)

Facility (DBA)	Address	Date Inspected	Inspection Type	Total Corrective Actions*	HW	IW	SP	SW	Rank
Pacific Logistics Inc.	424 S Cloverdale Street	6/16/2016 7/29/2016	Initial Followup	2			1	1	Low
Phil's Custom Bindery	309 S Cloverdale Street	2/4/2016	Initial	4		1	3		Low
Piroshky Baking Company	309 S Cloverdale Street	12/15/2016	Initial	4		1	3		Low
Prism Graphics Inc.	7609 5th Avenue S	5/19/2016	Initial	3			3		Low
Pro Fab Inc	640 S Riverside Drive	9/12/2016	Initial	1			1		Low
Prohibition Gold LLC	7510 5th Avenue S	5/27/2016	Initial	3			3		Low
Rachel's Ginger Beer	309 S Cloverdale Street	12/16/2016	Initial	5		1	3	1	Medium
Rasmussen Equipment Co. (location inspected not specified)	415 S Cloverdale Street and/or 8727 5th Avenue S	11/30/2016	Initial	6		1	2	3	Low
Redpoint	309 S Cloverdale Street	8/4/2016	Screening						None
Renewal by Anderson of Seattle	7433 5th Avenue S	3/29/2016	Initial						Medium
Resound Energy	309 S Cloverdale Street	10/5/2016	Initial	3			3		Low
Rogers Machinery Co.	7800 5th Avenue S	4/29/2016 6/9/2016	Initial Followup	6			4	2	Medium
S&S Communications Equipment Inc	309 S Cloverdale Street	8/12/2016	Screening						None
Schubert Floorcovering Co.	8305 7th Avenue S	2/27/2016 6/21/2016	Initial Followup	9			4	5	Medium
Schuchart Corp.	530 S Holden Street	2/26/2016	Initial	3			1	2	Low
Seamar Community Health Center File Storage	7801 5th Avenue S	8/19/2015 9/16/2015 10/1/2015	Initial Followup Followup	4			3	1	Low
Seattle Heat Treaters	521 S Holden Street	3/16/2015	Initial						Low
Sister Sage	unspecified/uncler	10/7/2016	Initial	5		1	3	1	Low
South Park Branch Library	8604 8th Avenue S	6/11/2015	Initial						Low
South Paw Screen Printing	309 S Cloverdale Street	6/25/2014 9/10/2014	Initial Followup	4	1		3		Low
The Design Garage	7601 5th Avenue S	1/2/2014 5/18/2016	Followup Initial	3	1		2		Low
The Gear Works Seattle Inc	500 S Portland Street	8/21/2015 10/29/2015	Initial Followup						
The Gear Works Seattle Inc	516 S Chicago Street	8/21/2015 10/29/2015	Initial Followup						
The Gear Works Seattle Inc	707 S Riverside Drive	8/21/2015 10/29/2015	Initial Followup						
The Natural Pet Pantry	309 S Cloverdale Street	10/5/2016	Initial	4			3	1	Low
The Shop	740 S Monroe Street	4/30/15 6/16/2015	Initial Followup	8			4	4	Medium
Tierney Eletric Mfg Co	7901 7th Avenue S	10/19/2016	Initial	1				1	Low

Appendix C
SPU Source Control Inspections (2014-2016)

Facility (DBA)	Address	Date Inspected	Inspection Type	Total Corrective Actions*	HW	IW	SP	SW	Rank
Tin Dog Brewing	309 S Cloverdale Street	7/7/2016	Initial	5		1	3	1	Medium
Washington Liftruck	700 S Chicago Street	7/18/2016 9/8/2016	Initial Followup	5			2	3	Medium
West Coast Wire Rope & Rigging Inc	7777 7th Avenue S	4/22/2014 5/6/2014 5/22/2014 6/6/2014 9/18/2014 9/23/2014	Initial Followup Followup Followup Followup Followup	9	3		2	4	Medium
8th Avenue S CSO									
Centro America Body Shop	8902 14th Avenue S	4/23/2014 6/17/2014	Initial Followup						
Lower Case Brewing	8103 8th Avenue S	3/20/15	Initial						
RM 3.8-4.2 West (Sea King Industrial Park)									
S 96th St SD									
Atacs Products	850 S Cambridge Street	10/11/2016	Initial	3			3		Low
Gary Merlino Construction	9125 10th Avenue S	10/22/2015 12/30/2015 1/26/2016	Initial Followup Followup	2				2	High
Keithly Electric Co.	827 S Director Street	10/19/2016	Screening						None
King Electric	855 S Barton Street	2/12/2015	Initial						Low
King Electrical Mfg. Company	9131 10th Avenue S	3/4/2014 5/7/2014 6/24/2014	Initial Followup Followup	18	6	3	4	5	Medium
Old Dominion Freight Line	60 S 96th Street	10/11/2016	Initial						Low
Progressive Fastening Inc	837 S Director Street	11/26/2014	Initial						Low
Puget Sound Coatings	9220 8th Avenue S	5/22/2015 7/28/2015	Initial Followup	12			2	10	High
Queen Anne Upholstery	1414 S Director Street	4/14/2016 5/26/2016	Initial Followup	7			3	4	High
Samson Tug and Barge	9228 10TH Avenue S	1/27/2015 4/23/2015 6/3/2015	Initial Followup Followup	7			1	6	High

NOTE: The information presented in this table was compiled from data provided by SPU. Information may not be complete. In some cases, facility addresses were not available; these facilities are not included in the table above.

HW = hazardous waste
IW = industrial waste
SP = spill prevention
SW = stormwater

**Appendix D:
King County Source Control Inspections
(2014-2016)**

Appendix D. King County Stormwater Services Inspections, 2014-2016

Facility Name	Address	Type of Inspection	Inspection Date	Notes
RM 2.2-3.4 West (Riverside Drive)				
CDL Recycling	9208 4th Avenue S	Stormwater	4/24/2014 2/3/2014 3/2/2016	Drywall recycler. Joint inspection with Ecology. Open dumpsters, waste oil drums, debris. Company moved to another location in September, leaving the site clean.
Cloverdale Industrial Park	9320 4th Avenue S	Stormwater	5/13/2015	Shipping/warehousing. No issues.
Northwest Grating Products	9230 4th Avenue S	Stormwater	3/26/2014 3/7/2016 6/6/2016	Catch basins need cleaning and labeling. Issues corrected by return visit.
Security Contractor Services	9226 4th Avenue S	Stormwater	3/19/2014 5/11/2016	No issues.
SP Plus Transportation	9301 4th Avenue S	Stormwater	3/16/2016 3/17/2016	No issues.
RM 3.4-3.8 West (EAA-5: Terminal 117)				
Boeing Company	1420 S Trenton Street	Stormwater	8/21/2014	Inspected vegetated portion of property adjacent to parking lot. No issues.
Rick's Master Marine	1411 S Thistle Street	Stormwater	4/6/2016	No issues.
South Park Marina	8604 Dallas Avenue S	Stormwater	3/24/2016	No issues.
South Park Tire Factory	8510 Dallas Avenue S	Stormwater	3/17/2016	No issues.
RM 3.8-4.2 West (Sea King Industrial Park)				
615 S 96th St	615 S 96th Street	Stormwater	2/17/2016	No issues.
AAAA Mini Storage	9640 Des Moines Memorial Drive S	Stormwater	2/1/2016	No issues.
Absolute German	9510 14th Avenue S	Stormwater	4/20/2016	Small spills and drips with sorbent material needed sweeping. Used oil and antifreeze not labeled.
Ace Galvanizing	429 S 96th Street	Stormwater	2/1/2016 3/30/2016	Zinc solids outside window in production shed. Not all CBs stenciled. Berm to collect contaminated water at entry was broken. Corrected by return visit.
Aero-Lac	420 S 96th Street	Stormwater	1/25/2016	No issues.
Allied Body Works	625 S 96th Street	Stormwater	2/3/2016	No issues.
Anmarco Yard	1110 S 96th Street	Stormwater	2/16/2016 3/16/2016	No issues.
Bakersfield Pipe & Supply	1050 S 96th Street	Stormwater	2/3/2016	No issues.
Beckwith & Kuffel	1313 S 96th Street	Stormwater	2/16/2016	No issues.
Bidadoo Auctions	1541 S 96th Street	Stormwater	3/3/2016	No longer in business.

Appendix D. King County Stormwater Services Inspections, 2014-2016

Facility Name	Address	Type of Inspection	Inspection Date	Notes
Carey Chauffeur	1237 S Director Street	Stormwater	3/3/2015	Catch basins need cleaning. Work verified by 4/6/15.
Concrete Restoration, Inc.	910 S 96th Street	Stormwater	2/24/2014	Open dumpster. Corrected by 4/10/14.
Concrete Restoration, Inc.	9587 8th Avenue S	Stormwater	2/24/2014	Catch basin socks needed; dust and debris; open empty containers. Corrected by 4/10/14.
Dominic's Red Apple Market	9627 Des Moines Memorial Drive S	Stormwater	3/16/2016 8/22/2016	Two catch basins require cleaning and stenciling, waste oil receptacles need to be replaced. All issues corrected.
Duwamish Yacht Club	1801 S 93rd Street	Stormwater	3/17/2016	No issues.
Harrasch Industrial Park	1605 S 93rd Street	Stormwater	3/17/2016	No issues.
Industrial Automation	9300 14th Avenue S	Stormwater	3/24/2016	No issues in areas in which inspector was allowed access.
McDonalds at South Park	9610 Des Moines Memorial Drive S	Stormwater	9/14/2015	Conveyance system needed cleaning. Completed by 10/23/15.
Old Dominion Freight	600 S 96th Street	Stormwater	6/7/2016	No issues.
Pacific Industrial	1251 S Director Street	Stormwater	3/5/2015	Needed catch basin sock. Installed by 5/8/15.
Pacific Northwest Motor Freight	515 S 96th Street	Stormwater	5/13/2015	No issues.
Pro Weld	9587 8th Avenue S	Stormwater	2/24/2015	No issues.
PSF Industries	9322 14th Avenue S	Stormwater	3/23/2016	No issues.
Puget Sound Coatings	9400 8th Avenue S	Stormwater	6/16/2014 10/23/2015 11/17/2016	Joint inspection with Ecology. Concerns about discharge from wash area. Determined that discharge goes to the sanitary sewer. Items from 2013 inspection were corrected.
Pyrometric Service Inc.	1312 S 96th Street	Stormwater	2/16/2016	No longer in business.
Riverton Distribution Center	9600 8th Avenue S	Stormwater	12/2/2016	New development, food bank distribution center. All waste is recycled.
Sea King Industrial Park	1521 S 92nd Place	Stormwater	2/17/2016	No issues.
Sea King Industrial Park	1621 S 92nd Place	Stormwater	3/24/2016	No issues.
Sealaska Seafoods	9411 8th Avenue S	Stormwater	3/23/2016	No issues.
Security Contractor Services	9617 8th Avenue S	Stormwater	6/14/2014 9/30/2014 5/11/2016	Fencing material manufacturer. Stenciling of catch basins and dumpster lids needed. Corrected by 9/30/14. Plans under way for stormwater treatment system.
Shell Gas Station	9525 14th Avenue S	Stormwater	8/28/2014 12/4/2015 2/18/2016	Illicit connection from espresso stand. Connection eliminated.

Appendix D. King County Stormwater Services Inspections, 2014-2016

Facility Name	Address	Type of Inspection	Inspection Date	Notes
Simplex Grinnell	1000 S 96th Street	Stormwater	10/27/2015	No issues.
Sound Delivery Services	999 8th Avenue S	Stormwater	11/9/2015	No issues.
Terex Utilities	9426 8th Avenue S	Stormwater	2/17/2016	No issues.
The Revere Group	515 S 96th Street	Stormwater	3/27/2015 5/18/2015	Stenciling needed. Completed by 5/8/15.
Universal Intermodal Services	910 S 96th Street	Stormwater	2/24/2014	Debris and tires; site cleaning needed. Corrected by 4/10/14.
Warp Corporation	631 S 96th Street	Stormwater	8/28/2014	No issues.
Woolridge Boats	1303 S 96th Street	Stormwater	2/17/2016	Need to replace dumpster with cracked lid, apply drain markers/stencil to catch basins. No further issues.
RM 4.2-5.8 West (Restoration Areas)				
Seattle City Light	10000 West Marginal Place S	Stormwater	3/29/2016	No issues.

**Appendix E:
Ecology Source Control Inspections
(2014-2016)**

Appendix E. Ecology Source Control Inspections (2014-2016)

NPDES Permit No.	Facility Name	Address	Date Inspected	Type of Inspection	Ecology Findings
RM 0.0-0.1 East (Spokane Street to Ash Grove Cement)					
	Puget Sound Institute of Pathology	1001 SW Klickitat Way 205	1/16/2014	Urban Waters	
RM 0.1-0.9 East (EAA-1: Duwamish/Diagonal Way)					
	A Better Roofing Company	4126 Airport Way S	6/11/2014	Urban Waters	
	Accutint	2218 Airport Way S	2/13/2014	Urban Waters	
	Adhesa Plate	4000 7th Avenue S	2/5/2015	Urban Waters	
	Airgas West	4412 7th Avenue S	2/18/2014	Urban Waters	
WAR004605	Alaska Street Reload	70 S Alaska Street	1/20/2015	NPDES	Sampling inspection; Ecology collected one water sample and three solids samples (Leidos 2015c).
	Atlas Supply Co	611 S Charlestown Street	2/17/2015	Urban Waters	
	Blanchard Electric	640 S Spokane Street	10/28/2014	Urban Waters	
	CCI Automated Technologies	5300 Denver Avenue S	10/30/2014	Urban Waters	
	CHOKe Print Shop	920 S Holgate Street, 109	11/6/2014	Urban Waters	
	Clean Republic	920 S Holgate Street, 106	11/6/2014	Urban Waters	
WAR003679 (inactive)	ColorGraphics Seattle	1421 S Dean Street	2/10/2016	NPDES	ColorGraphics filed a Notice of Termination with Ecology on 6/17/2016 (ColorGraphics 2016). The facility ceased operations 5/31/16.
WAR010569	ConGlobal Industries	1 S Idaho Street	4/22/2015	NPDES	The facility was in the process of installing two treatment systems, one for the northern portion (T-106), and one for the southern half (T-108). Both systems are to be electro-coagulation units, preceded by a settling tank, and followed by a sand filter. TSS issues at outfall OF001 are due to unpaved areas of the southern portion of the facility, and should be resolved subsequent to completion of treatment system installation. SWPPP needs to be updated (Ecology 2015x).
			10/20/2016	NPDES	
	Emerald City Bindery	4809 Airport Way S	3/11/2015	Urban Waters	
	Emerald Services Inc Airport Way	1500 Airport Way S	5/15/2014	Urban Waters	
	Fabriform Plastics Inc	3300 Airport Way S	2/20/2014	Urban Waters	
	Franz Bakery	2006 South Weller Street	6/18/2015	Urban Waters	
WAR125420	Georgetown Brewing	5200 Denver Avenue S	3/23/2016	NPDES	
	Goodwill Industries Seattle	1400 S Lane Street	5/1/2014	Urban Waters	
	Honolulu Freight Service	2326 Airport Way S	4/21/2015	Urban Waters	

Appendix E. Ecology Source Control Inspections (2014-2016)

NPDES Permit No.	Facility Name	Address	Date Inspected	Type of Inspection	Ecology Findings
	Interior Environments	3450 4th Avenue S	2/6/2014	Urban Waters	
	International Truck Leasing & Rental	3801 7th Avenue S	2/18/2015	Urban Waters	
	Jon-Don	4111 Airport Way S	2/24/2015	Urban Waters	
	Kansai Collision Center	3810 Airport Way S	6/11/2014	Urban Waters	
			1/21/2015	Urban Waters	
	L. N. Curtis & Sons	629 S Industrial Way	4/29/2015	Urban Waters	
	LC Jergens Painting Co	417 18th Avenue S	2/14/2014	Urban Waters	
WAR004614	Lee & Eastes Tank Lines	2418 Airport Way S	3/24/2016	NPDES	
WAR009970	Lighthouse For The Blind	2501 S Plum Street	1/8/2014	Urban Waters	
			3/23/2016	NPDES	
WAR011326	MacMillan-Piper Airport Way	655 S Edmunds Street	3/19/2015	NPDES	Most of the yard shows areas of accumulation indicating inadequate coverage by sweeping. Not all liquid chemical and petroleum products and wastes stored outside are provided with adequate cover and containment (Ecology 2015o).
			11/18/2015	NPDES	
	Metro Auto Rebuild	2218 Airport Way S, #2	2/13/2014	Urban Waters	
	Model Werks	655 S Andover Street	6/24/2014	Urban Waters	
	MRJ Constructors	1400 Airport Way S	11/20/2014	Urban Waters	
			3/25/2014	Urban Waters	
WAR301360	Northwest Container Services	635 S Edmunds Street	1/7/2015	NPDES	SWPPP needs to be updated. NW Container added Zeolite to catch basin inserts to reduce copper and zinc levels in stormwater discharges (Ecology 2015b).
	Olympic Foundry Inc	5200 Airport Way S	3/10/2014	Urban Waters	
	Pepsi Beverage Company	2300 26th Avenue S	9/10/2014	Urban Waters	
	Phelps Tire	3922 7th Avenue S	10/28/2014	Urban Waters	
	Plymouth Poultry	4500 7th Avenue S	8/17/2016	NPDES	
WAR301608	Recology CleanScapes Material Recovery Facility	4401 East Marginal Way S	7/2/2014	NPDES/Urban Waters	Facility opened May 2014. The scrap metal dumpster was located outside without a cover. Potential track-out problem on northern ramp/west side of the building. The facility must include a 'track-out' management plan in their SWPPP (Ecology 2014ii).

Appendix E. Ecology Source Control Inspections (2014-2016)

NPDES Permit No.	Facility Name	Address	Date Inspected	Type of Inspection	Ecology Findings
WAR000015	Recycling Depot Inc	851 Rainier Avenue S	6/4/2014	NPDES/Urban Waters	SWPPP/site map needs to be updated. Dye testing indicated the treatment discharge may connect to the combined sewer system in Rainier Avenue, and needs to be confirmed (Ecology 2014z, Ecology 2014cc).
	Rodda Paint	3838 4th Avenue S	2/5/2015	Urban Waters	
	RSD	625 S Industrial Way	2/5/2015	Urban Waters	
	Sanderson Safety and Supply Company	2600 Airport Way S	3/31/2015	Urban Waters	
	Sears 8109/8224/9512	4798 1ST Avenue S	4/29/2014	Urban Waters	
	Seattle Barrel Co	4716 Airport Way S	3/24/2014	Urban Waters	
	Seattle City Light MRWF	3613 4th Avenue S	12/16/2014	Urban Waters	
	Seattle City SDOT Sunny Jim	4200 Airport Way S	3/25/2015	Urban Waters	
	Seattle Injector	1410 Airport Way S	11/20/2014	Urban Waters	
	Seattle Radiator	5011 Ohio Avenue S	6/26/2014	Urban Waters	
	Seattle Transmission Repair	4750 Airport Way S	3/31/2015	Urban Waters	
	Snorkel Hot Tubs, Inc./Snorkel Stove Co.	4216 6th Avenue S	4/29/2015	Urban Waters	
WAR044503	South Service Center	400 S Spokane Street	12/11/2014	NPDES	Sampling inspection; Ecology collected one water sample and three solids samples (Leidos 2015c). SWPPP needs to be updated. Facility needs to implement BMPs and conduct periodic visual observations.
	Stanley Black and Decker	2100 Airport Way S	11/6/2014	Urban Waters	
	Stellar Industrial Supply	915 S Walker Street	9/11/2014	Urban Waters	
	Superior Imprints, Inc.	4226 6th Avenue S	4/29/2015	Urban Waters	
	Touratech	4021 Airport Way S	4/23/2015	Urban Waters	
WAR000444	UPS Seattle Hub	4455 7th Avenue S	8/11/2015	NPDES	
WAR004605	Waste Management Alaska Street Reload & Recycling	70 S Alaska Street	1/20/2015	NPDES	
	Western Peterbilt Inc Seattle	3707 Airport Way S	9/11/2014	Urban Waters	
	Wilcor Grounding Systems	4045 7th Avenue S	2/5/2015	Urban Waters	
	WW Grainger Inc Seattle	4930 3rd Avenue S	9/11/2014	Urban Waters	
RM 1.0-1.2 East (KC Lease Parcels)					
	ABS Building Supply	5315 4th Avenue S	2/26/2015	Urban Waters	
	All West Components and Fasteners	5516 4th Avenue S	2/26/2015	Urban Waters	

Appendix E. Ecology Source Control Inspections (2014-2016)

NPDES Permit No.	Facility Name	Address	Date Inspected	Type of Inspection	Ecology Findings
	Architectural Landscape Supply	404 S Brandon Street	9/17/2014	Urban Waters	
	Aussie Performance Center	300 S Bennett Street	10/9/2014	Urban Waters	
	Auto Quest, Inc.	5910 Corson Avenue S	1/14/2014	Urban Waters	
	Balancing Service Co	5512 6th Avenue S	10/2/2014	Urban Waters	
	Baxter-Rutherford, Inc aka Louisville Ladder Inc.	920 S Doris Street	7/18/2014	Urban Waters	
	Bellan Construction	5319 1st Avenue S	2/26/2015	Urban Waters	
	Best Window Coverings	215 S Findlay Street	3/27/2015	Urban Waters	
	Boyce Construction	628 South Brandon Street	4/30/2015	Urban Waters	
WAG503337	Cadman	5225 East Marginal Way S	12/6/2016	NPDES	
	CCI Surfacing	417 S Fidalgo Street	1/8/2015	Urban Waters	
	City Lights Electric Supply	118 S Mead Street	1/8/2015	Urban Waters	
	Contech Services Inc	5304 3rd Avenue S	1/29/2015	Urban Waters	
	Cool Earth Software	226 S Orcas Street	9/25/2014	Urban Waters	
	DORSE Air Products	5000 1st Avenue S	4/14/2015	Urban Waters	
	DSHS Region 4	305 S Dawson	10/9/2014	Urban Waters	
	EDLEN	5931 4th Avenue S	1/16/2015	Urban Waters	
	Electro Mechanical	5200 4th Avenue S	11/19/2014	Urban Waters	
	Fix Auto South Seattle	5958 Corson Avenue S	1/21/2014	Urban Waters	
	Florida Tile	665 S Orcas Street	12/3/2014	Urban Waters	
	Foamfanatics LLC	663 S Lucile Street	10/2/2014	Urban Waters	
	Gary's Westside Towing	5939 4th Avenue S	1/16/2015	Urban Waters	
	Granum, Inc. (dba Choice Organic Teas)	600 S Brandon Street	4/30/2015	Urban Waters	
	Hip Hop Robot Tattoo	118 S Lucile Street	9/24/2014	Urban Waters	
	Impression Printing	222 S Lucile	10/9/2014	Urban Waters	
WAG503082	JA Jack and Sons	5427 Ohio Avenue S	10/5/2016	NPDES	Site map needs to be updated. Scrap metal bin must be provided with a lid. Drums stored outdoors must be completely emptied. The area between JA Jack & Sons and the neighboring facility to the south, Ardagh Glass, was dirty and in need of improved source control measures.
	Magnum Print Solutions	5300 4th Avenue S	9/17/2014	Urban Waters	
	Martin Signs & Fabrication, Inc.	122 S Mead Street	1/8/2015	Urban Waters	
	Master Source	5964 6th Avenue S	11/7/2014	Urban Waters	
	McGuire Bearing Co	780 S Michigan Street	1/14/2014	Urban Waters	
	Mercantile 12	5506 6th Avenue S	10/2/2014	Urban Waters	
	Metal Solutions	5212 6th Avenue S	1/14/2015	Urban Waters	

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NPDES Permit No.	Facility Name	Address	Date Inspected	Type of Inspection	Ecology Findings
	Miller Paint Airport Way	6101 Airport Way S	11/20/2014	Urban Waters	
	Miller Paint Company Corson Ave	5959 Corson Avenue S	11/20/2014	Urban Waters	
	Misty Mountain Manufacturing	6264 Stanley Avenue S	2/3/2015	Urban Waters	
	MOHAI	5933 6th Avenue S	11/7/2014	Urban Waters	
	Morel Industries	637 S Lucile Street	7/29/2014	Urban Waters	
	MS International	5930 4th Avenue S	1/14/2015	Urban Waters	
	Network Support Group	5606 6th Avenue S	10/2/2014	Urban Waters	
	Northwest Sales Group	5718 1st Avenue S	1/8/2015	Urban Waters	
	Northwest Wholesale Florists	525 S Front Street	11/19/2014	Urban Waters	
	O S Winery	5319 4th Avenue S	2/26/2015	Urban Waters	
	Oregon Tile & Marble	5930 6th Avenue S	11/7/2014	Urban Waters	
	Pacific Lighting Systems	6363 7th Avenue S	7/18/2014	Urban Waters	
	Pacific Ocean Design	808 S Fidalgo Street	1/21/2015	Urban Waters	
	Package It	308 S Orcas Street	12/3/2014	Urban Waters	
	Pental	713 S Fidalgo Street	1/21/2015	Urban Waters	
	Print Services Northwest	5616 4th Avenue S	10/30/2014	Urban Waters	
	Quality Press	222 S Orcas Street	9/25/2014	Urban Waters	
	Sharehouse	5706 2nd Avenue S	1/21/2015	Urban Waters	
	Stone World	6166 4th Avenue S	3/27/2015	Urban Waters	
	Stonecraft (Custom Slab Fabrication)	112 S Mead Street	1/8/2015	Urban Waters	
	Terris Draheim (2 addresses)	5600 6th Avenue S	9/17/2014	Urban Waters	
	Terris Draheim (2 addresses)	5616 6th Avenue S	9/17/2014	Urban Waters	
	The Little Showroom	6564 5th Place S	7/30/2014	Urban Waters	
	The Safety Team	670 S Lucile Street	5/21/2014	Urban Waters	
	US STARCRAFT CORP	5210 Utah Avenue S	3/25/2015	Urban Waters	
	VECA Electric & Technologies	5614 7th Avenue S	1/29/2014	Urban Waters	
	Western Trailer Repair, Inc.	707 S Lucile Street	3/11/2015	Urban Waters	
	Woodcraft	5963 Corson Avenue S	1/14/2014	Urban Waters	
	WSDOT Ferries Division	6000 6th Avenue S	11/7/2014	Urban Waters	

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NPDES Permit No.	Facility Name	Address	Date Inspected	Type of Inspection	Ecology Findings
RM 1.7-2.0 East (Slip 2 to Slip 3)					
WAR125423	Duwamish Metal Fabrication	16 S Michigan Street	9/8/2016	NPDES	Dumpsters without lid or not under cover. Materials stored outside in the boneyard should be evaluated for oily residues, peeling paint and electronics to determine if cover is necessary. Trailer used to store miscellaneous scrap metal must be provided with cover or be stored under a roof.
	Ducky's Office Furniture	300 S Michigan Street	3/17/2015	Urban Waters	
	Ener-G-Foods	5960 1st Avenue S	3/17/2015	Urban Waters	
WAR010447	General Biodiesel	6333 1st Avenue S	6/27/2016	NPDES	
WAG503191	Glacier Northwest - Seattle Ready Mix Plant	5975 East Marginal Way S	5/26/2015	NPDES	Site Management Plan out of date. The adjacent facility (CertainTeed Gypsum) has an exit gate onto Glacier Property via an easement agreement. CertainTeed has chronically tracked wall board dust and debris onto Glacier property, and on out the Glacier exit gate to East Marginal Way S. CertainTeed stores totes of liquid chemical and petroleum products and wastes along the northern boundary of Glacier property. Glacier must work with Certain Teed to provide proper and adequate cover and containment for these totes (Ecology 2015u).
	Olympic Medical	5000 1st Avenue S	1/14/2015	Urban Waters	
	Open Square	6000 East Marginal Way S	3/17/2015	Urban Waters	
WAR011484	Samson Tug and Barge Seattle	6361 1st Avenue S	2/10/2015	NPDES	Sampling inspection; Ecology collected three water samples and two solids samples (Leidos 2015c).
			6/15/2016 & 10/20/2016	NPDES	
	Tayags Auto Repair	6185 4th Avenue S	3/5/2015	Urban Waters	
RM 2.0-2.3 East (Slip 3 to Seattle Boiler Works)					
WAR011723	Algas SDI	151 S Michigan Street	2/11/2016	NPDES	SWPPP needs to be updated. Repeated remedial actions noted on provided monthly inspection reports indicate that follow-up actions, such as replacing catch basin inserts, may not be adequately attended to. Illicit discharge of process water directly to Catch Basin 'B' via a hose from inside the testing shipping container inside the facility. A great deal of dirt, sediment, and debris was found accumulated around materials stored in the yard. Mechanical sweeping is likely ineffective due to the storage of materials in the yard, and any

Appendix E. Ecology Source Control Inspections (2014-2016)

NPDES Permit No.	Facility Name	Address	Date Inspected	Type of Inspection	Ecology Findings
					hand sweeping conducted at the facility appears inadequate. Accumulation of sediment, paint, and metal waste, such as filings, dust, turnings, chips, at the base of the scrap metal dumpster.
WAR011560	Dawn Food Products	6901 Fox Ave S	11/28/2014	NPDES	Facility map needs to be updated (Ecology 2014bbb).
WAR000962	Seatac Marine Services LLC	6701 Fox Avenue S	4/30/2014	NPDES Urban Waters	SWPPP needs to be updated. The facility must establish a separate sampling location for both storm lines and update their site map and sampling plan accordingly. Liquid and chemical products and wastes not properly stored; dumpsters not covered (Ecology 2014u).
			9/8/2016	NPDES	Sampling plan needs to be updated. CB # 22 is not representative of stormwater discharging from the southern portion of the facility. A manhole or sample port must be installed upgradient from the 30" City Storm Drain Line. Metal grindings and welding debris were on the ground. Source control measure must be improved at the welding grinding table and the shackle shack. Site map needs to be updated. Ecology sent warning letter October 11, 2016 (Ecology 2016j).
	Scougal Rubber Corp	6239 Corson Avenue S	1/28/2014	Urban Waters	
RM 2.3-2.8 East (Seattle Boiler Works to Slip 4)					
WAR000949	Recology CleanScapes Inc	7303 8th Avenue S	9/3/2014	NPDES/Urban Waters	SWPPP needs to be updated. Many of the garbage bins stored on site contained waste materials. The facility must implement measures to ensure that all dumpsters/bins have lids that are closed. Drums or containers of liquid products or wastes were stored near doorways that would allow a leak or spill to flow outside the building. The amount of oil drips and leaks was very noticeable (Ecology 2014uu).
WAR002208	Seattle Boiler Works	500 S Myrtle Street	6/20/2014	NPDES	

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NPDES Permit No.	Facility Name	Address	Date Inspected	Type of Inspection	Ecology Findings
WA0031968	Seattle Iron & Metals	601 S Myrtle Street	7/30/2015	NPDES	Drivers observed deliberately driving around the rumble pads when exiting the facility. Mister not installed in design location where most dusts are generated (north wall); facility needs to evaluate installing a second mister and installing a taller fence along the north wall and east of the maintenance. Facility to re-evaluate reevaluate installing a "curtain" type fence along the north wall and along the 701 yard wall where ASR/MSW is stockpiled, and install a high visibility fence type material at the top of the fence to remind operators to not stockpile above that level.
			8/24/2016	NPDES	Scrap metal and pipes on the dock. Visible dust generated from the operation near the north wall; dust suppression required. Rumble pads need to be extended to provide additional removal and prevent track out (Ecology 2016h).
WAR125002	Seattle Iron & Metals Annex	730 S Myrtle Street	11/20/2014	NPDES	Engineering Report was approved by Ecology in November 2013. Not all milestones have been met; Ecology is reviewing the need to issue an Administrative Order for new BMP completion timeframes. The facility installed rock-lined ditches, a plastic-lined pond, 2 sedimentation tanks and discharge spreader. SWPPP needs to be updated (Ecology 2014fff).
			5/19, 10/26, & 11/08/2016	NPDES	
RM 2.8 East (EAA-3: Slip 4)					
	American Avionics	7023 Perimeter Road S	2/3/2015	Urban Waters	
WAR002641 (Cedar Grove became holder of this permit in July 2016)	Emerald Services Inc. - Corporate	7343 East Marginal Way S	3/16/2016	NPDES	SWPPP needs to be updated. Pavement was stained with grease and grime. Poor source control measures at the Cedar Grover portion of the site was allowing dirt and soil to be tracked out onto the Emerald Services storm drainage area. Materials stored in bins along the river bank were overtopped and spilling to the bank. Vendor washing trucks on site was discharging to the storm drains. Contaminated parts stored outside without cover or containment.
			8/24/2016	NPDES	
WAR010792	Georgetown Yard	6640 Ellis Avenue S	3/24/2016	NPDES	

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NPDES Permit No.	Facility Name	Address	Date Inspected	Type of Inspection	Ecology Findings
	Hertz Local Edition	7001 Perimeter Road S, Ste 101	2/3/2015	Urban Waters	
WAR000226	North Boeing Field	7700 E. Marginal Way South	7/15/2014	NPDES	The temporary sweeper decant facility had a broken asphalt perimeter berm and was leaking. Boeing representatives began to immediately address the situation and the broken berm was fixed before the end of the day. Dumpster with oily scrap metal was not under cover or lidded. All catch basins in the vicinity of the solids handling and processing area must be flagged as either a storm drain or a treatment plant drain. Catch basin filter inserts should be installed in all catch basin in both solids handling areas (Ecology 2014jj).
WAR302262	Ultrablock	1615 S Graham Street	4/2/2015	NPDES	SWPPP needs to be updated. Some oil sheens were visible on the ground and on puddles of standing water around the facility. Scrap metal waste in uncovered drum. The discharge monitoring point is located in the drainage ditch along the fenceline, and some sheen was visible on the surface water at this location; this monitoring point is not representative of the facility's discharge. There are many upstream points of discharge to this conveyance from other facilities, which could potentially dilute effluent concentrations from the facility, or introduce higher concentrations of contaminants from outside sources.
WAR302034	Waste Management "DeNovo" Transload Site	7400 8th Avenue S Transfer Facility	9/25/2014	Urban Waters	
			11/18/2014	NPDES	SWPPP needs to be updated. The facility must ensure that the conex boxes being used as perimeter containment are adequately sealed to the pavement to prevent contaminated stormwater from flowing under and to the storm drainage system. The wheel wash generates wastewater that can migrate out the wheel wash ramp and flow towards storm drains. Spillage of contaminated dirt was observed. Test pits need to be covered. Inadequate catch basin inlet protection. A warning letter was issued December 18, 2014 (Ecology 2014ccc, Ecology 2014iii).
			2/3/2015	NPDES	Sampling inspection; Ecology collected one water sample and three solids samples (Leidos 2015c).

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NPDES Permit No.	Facility Name	Address	Date Inspected	Type of Inspection	Ecology Findings
			8/6/2015 & 8/12/2015	NPDES, Urban Waters	Super Sacks containing contaminated soils were being stored outside of the containment bunker. Over 200 sacks stored outside the bunker. Many were split or torn and contaminated dirt was observed on the flats and pavement. Facility was told to move sacks to containment. On 8/12 many of the Super Sacks were still outside of containment where they were the previous week. SWPPP was out of date and did not cover all industrial activities at the site. Inspector recommended Ecology take formal enforcement action against the site.
RM 2.8-3.7 East (EAA-4: Boeing Plant 2 to Jorgensen Forge)					
WAR000482	Boeing Plant 2	7755 East Marginal Way S	6/25/2014	Urban Waters	
WAR003231	Jorgensen Forge	8531 East Marginal Way S	7/1/2014	NPDES	The facility installed a sand filter system in late 2013 but the system has not consistently met permit benchmarks. Jorgensen is submitting a supplement to their engineering report for additional treatment. The facility used to have 6 outfalls but all have been plugged or abandoned except Outfall #3 which is the only discharge to the LDW. The dark-colored staining on the outside of the cutting oil collection trench may indicate leakage. The scrap metal storage area looks like it has a dirt floor or the pavement has been compromised. The facility needs to ensure that contaminants from this area are not a threat to groundwater (Ecology 2014hh).
			3/17/2016	NPDES	SWPPP needs to be updated. T Jorgensen has abandoned all outfalls except one (outfall# 3). Jorgensen will need to recalibrate and properly set the bypass flow device to record bypass volumes. An annual grab sample needs to be collected for analysis.
RM 3.7-3.9 East (EAA-6: Boeing Isaacson/Central KCIA)					
WAR000148	Boeing Thompson	8701 East Marginal Way S	4/9/2015	Urban Waters	
WAR1 27177	Charles Air Hangar	9010 East Marginal Way S	11/14/2014	NPDES	No significant issues (Ecology 2014aaa).

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NPDES Permit No.	Facility Name	Address	Date Inspected	Type of Inspection	Ecology Findings
RM 3.9-4.3 East (Slip 6)					
WAR008681	Insurance Auto Auctions	8801 East Marginal Way S	10/20/2014	NPDES	Sampling inspection; Ecology collected three water samples (Leidos 2015c).
RM 4.3-4.9 East (Boeing Developmental Center)					
WAR000146	Boeing Developmental Center	9725 East Marginal Way S	6/24/2014	NPDES	A stormwater compliance inspection was conducted on June 24, 2014. A technical assistance visit occurred on November 20, 2014.
			12/1/2014	NPDES	Sampling inspection; Ecology collected six water samples and four solids samples.
RM 4.9 East (EAA-7: Norfolk CSO/SD)					
WAR000150	Boeing Military Flight Center	10002 East Marginal Way S	12/11/2014	NPDES	A stormwater compliance follow-up inspection was conducted on December 11, 2014.
			7/28/2016	NPDES	
WAR125005	MacDonald Miller Facility Solutions	3701 S Norfolk	6/4/2014	NPDES/ Urban Waters	Update site map. Investigate the plasma cutting equipment and venting system. A filter on the vent system should be considered and sampling of roof run-off should be conducted (Ecology 2014y). On 4/9/2015 Ecology approved the engineering report (SoundEarth Strategies 2015) for a proposed treatment system (Ecology 2015s).
			6/15/2016	NPDES	
WAR125421	Nelson Trucking	9777 Martin Luther King Jr Way S	7/8/2015	NPDES	
WAR125646	Special Asphalt Products	9243 Martin Luther King Jr Way S	6/19/2014	NPDES/ Urban Waters	Update site map to properly reflect which areas of the site flow to the combined sewer and which go to the storm drainage system. The site looked relatively clean and stormwater benchmarks are being met (Ecology 2014ee).
WAR002040	Unified Grocers, Inc.	3301 S Norfolk Street	9/11/2014	NPDES	SWPPP needs to be updated. Various materials stored outside without cover; scrap metal bins and dumpsters uncovered. Liquid chemical & petroleum products and wastes stored outside need cover and containment. The fuel island needs to be evaluated for compliance with the stormwater management manual (Ecology 2014ww). Ecology sent a warning letter on 11/18/14 (Ecology 2014ddd).
			4/16/2015	Urban Waters	Technical assistance visits performed 4/16/15 and 5/25/16

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NPDES Permit No.	Facility Name	Address	Date Inspected	Type of Inspection	Ecology Findings
RM 0.0-1.0 West (Spokane Street to Kellogg Island)					
WAR000474	Fogtite	4819 West Marginal Way SW	3/19/2015	NPDES	SWPPP needed to be updated. The area around the concrete silo and oil-water separator needs to have clearer and better segregation between areas that drain to the sanitary and storm systems (Ecology 2015w).
WAR002341	General Recycling	4260 West Marginal Way SW	5/26/2015	NPDES	Site map needs to be updated (Ecology 2015v). Ecology performed a technical assistance visit to the facility on December 15, 2015.
	Greyhound	4500 West Marginal Way SW	8/27/2014	Urban Waters	
	Horizon Coach Lines	4500 West Marginal Way SW	8/14/2014	Urban Waters	
	New Finishes Inc W Marginal Way	4235 West Marginal Way SW	2/20/2014	Urban Waters	
	Puget Sound Institute of Pathology	1001 SW Klickitat Way 205	1/16/2014		
	South Seattle Community College	6000 16th Avenue SW	12/4/2014	Urban Waters	
RM 1.3-1.6 West (Glacier Bay)					
WAR001365	Alaska Marine Lines 5615 W Marginal Way	5615 West Marginal Way SW	7/29/2014	Urban Waters	
WAR000033	Chemithon	5430 West Marginal Way SW	10/13/2014	NPDES	Sampling inspection; Ecology collected two water samples and three solids samples (Leidos 2015c).
		5430 West Marginal Way SW	3/29/2016	NPDES	
	Kleen Environmental 10-day	5955 West Marginal Way SW	2/5/2014	Urban Waters	
	Tank Wise	5405 West Marginal Way SW	4/14/2014	Urban Waters	
RM 1.6-2.1 West (Terminal 115)					
WAR000471	Northland Services Inc Transfer Facility	6700 West Marginal Way SW S Terminal 115 TR	4/22/2014	NPDES	SWPPP needs to be updated. The facility must work on source control and/or treatment for TSS in basins 1, 2, 5 and 6, which continues to be elevated (Ecology 2014r).
			7/29/2014		
			6/17/2015	NPDES	
WAR001897	Pioneer Industries	7000 Highland Park Way	3/31/2016	NPDES	Technical assistance visit performed on December 17, 2015.

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NPDES Permit No.	Facility Name	Address	Date Inspected	Type of Inspection	Ecology Findings
WAR127040	Seafreeze Cold Storage	206 SW Michigan Street	7/23/2014	NPDES/Urban Waters	SWPPP and sampling plan need to be updated. Facility needs to establish a sampling location that is representative of industrial stormwater discharges from the facility (Ecology 2014mm).
RM 2.1 West (1st Avenue S SD)					
WAR124991	First Student	7739 1st Avenue South	3/16/2016	NPDES	SWPPP site map needs to be updated. Small spills observed in parking area. Shed not bermed. Maintenance performed outside not in a bermed or covered area (Ecology 2016c).
	Flamespray Northwest Inc	250 S Chicago Street	3/11/2014	Urban Waters	
	Mapsco Plant 2	8165 1st Avenue S	7/9/2014	Urban Waters	
	Old Dominion Freight Line Inc	8425 1st Avenue S	4/22/2015	Urban Waters	
WAR011800	Samson Tug & Barge Maintenance	7553 Detroit Avenue SW	4/16/2014	NPDES/Urban Waters	SWPPP needs to be updated. Muddy stormwater observed discharging to the grassy ditch at the south exit gate. Track-out onto the roadway has been a chronic problem at this facility. Chemical containers lacked containment and cover (Ecology 2014q, Ecology 2014x).
WAR000581	Waste Management Eastmont Transfer Station	7201 West Marginal Way SW	1/22/2015	NPDES	Sampling inspection; Ecology collected one water sample and two solids samples (Leidos 2015c).
	Waste Management Biomedical Waste Facility	149 SW Kenyon Street	3/13/2015	Urban Waters	
RM 2.1-2.2 West (EAA-2: Trotsky Inlet)					
	Industrial Container Services WA LLC	7152 1st Avenue S	9/11/2014	Urban Waters	
	Pacific Western Agencies	7700 2nd Avenue S	7/17/2014	Urban Waters	
	Renewal by Anderson	7433 5th Avenue S	8/27/2014	Urban Waters	
	Tucker-Weitzel	230 S Austin Street	7/17/2014	Urban Waters	
	United Iron Works Inc	7421 5th Avenue S	2/12/2014	Urban Waters	
RM 2.2-3.4 West (Riverside Drive)					
	American Plastic	526 S Monroe Street	5/8/2015	Urban Waters	
	BFC Architectural Metals	8300 7th Avenue S	10/17/2014	Urban Waters	
	Cain Bolt & Gasket	7724 7th Avenue S	4/16/2014	Urban Waters	

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NPDES Permit No.	Facility Name	Address	Date Inspected	Type of Inspection	Ecology Findings
WAR003598	CDL Recycle	9208 4th Avenue S	3/26/2014	NPDES/Urban Waters	SWPPP needs to be updated. The facility should explore other methods and/or strategies to protect storm drains from the wallboard solids. The amount of wallboard slurry (wet wallboard dust) on pavement was excessive because it is difficult to sweep up. The facility must not allow any wastewater such as equipment or vehicle pressure washwater to get into surface waters or storm drains. The facility must visually monitor for "track-out" of solids (Ecology 2014n).
	Global Metal Fab Inc	7619 5th Avenue S	2/18/2014	Urban Waters	
	Independent Metals	747 S Monroe St	4/30/2014	Urban Waters	
	Industrial Tire Service	540 S Holden Street	7/29/2014	Urban Waters	
WAR011741	Marine Lumber Service	525 S Chicago Street	8/11/2015 & 8/12/2015	NPDES	
	Mechanical Agents	550 S Monroe Street	7/17/2014	Urban Waters	
	Modern Machine Co	524 S Southern Street	2/18/2014	Urban Waters	
	National Products DBA Ram Mounts	8410 Dallas Avenue S	7/17/2014	Urban Waters	
	New Leaf Enterprises (aka Dama)	460 South Kenyon Street	6/16/2015	Urban Waters	
	New Standard Building Materials	521 S Monroe Street	6/5/2015	Urban Waters	
WAR001918	Northwest Grating Products Inc	9230 4th Avenue S	3/26/2014	NPDES/Urban Waters	Northwest Grating must provide documentation that all industrial stormwater run-off is infiltrated on site or submit a copy of the SWPPP (Ecology 2014m).
WAR301516	Pacific Pile and Marine	700 S Riverside Drive	4/7/2015	NPDES	SWPPP incomplete and inadequate. Numerous drums, barrels, and buckets, of petroleum products stored outside and not in appropriate secondary containment. Numerous areas where staining of the gravel and pavement indicated recent spills of petroleum products to the surface. Dumpsters and scrap metal bins not under cover. Treated lumber sawdust on site is a potential stormwater pollutant (Ecology 2015q, Ecology 2015ee).
			11/12/2015	NPDES	
	Queen Anne Upholstery & Refinishing	1414 S Director Street	1/24/2014	Urban Waters	
	Redox	7800 7th Avenue S	8/12/2014	Urban Waters	
	Rogers Machinery Co Inc	7800 5th Avenue S	8/12/2014	Urban Waters	

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NPDES Permit No.	Facility Name	Address	Date Inspected	Type of Inspection	Ecology Findings
No permit	Silver Bay Logging (formerly Independent Metals Plant II)	816 S Kenyon Street	3/31/2014	NPDES	There was excessive oil floating on each chamber of the oil/water separators. Large amount of residual scrap metal wastes and debris. Heavy equipment and machinery was observed to be leaking petroleum or had been leaking petroleum. The inspector recommended that an Immediate Action Order be issued to Silver Bay Logging (Ecology 2014o).
	Sound Propeller Services	7916 8th Avenue S	4/2/2015	Urban Waters	
WAR000763	The Gear Works	500 S Portland Street	8/21/2015	NPDES	
	Washington Liftruck Inc	700 S Chicago Street	4/29/2014	Urban Waters	
WAR002111	West Coast Wire Rope Rigging	7777 7th Avenue S	3/11/2014	Urban Waters	Quarterly vacuum sweeping of paved areas associated with industrial activity is required. Not all points of discharge being sampled (Ecology 2014l).
RM 3.4-3.8 West (EAA-5: Terminal 117)					
	Ricks Master Marine Inc	8500 Dallas Avenue S	4/15/2014	Urban Waters	
WAG030045	South Park Marina	8604 Dallas Avenue S	10/8/2014	NPDES	Sampling inspection; Ecology collected one water sample and two solids samples.
	Tire Factory	8510 Dallas Avenue S	10/28/2014	Urban Waters	
RM 3.8-4.2 West (Sea King Industrial Park)					
WAR000154	Ace Galvanizing Inc 96th	429 S 96th Street	5/13/2014	Urban Waters	
WAG030091	Delta Marine Industries Inc	1608 S 96th Street	11/25/2014	Urban Waters	
WAR003120	Gary Merlino	9125 10th Avenue S	6/23/2015	NPDES/Urban Waters	Ecology granted a time extension for the installation of Level 3 treatment until 9/30/2015. The facility will be installing BaySaver's BayFilter EMC treatment vaults. The outdoor storage of miscellaneous construction materials may be a source of stormwater contamination. Near the Stoneway materials lab is a storm drain that seems to discharge directly to 8th Avenue S. The SWPPP must include written justification why this discharge location is not monitored. Source control in this area needs to be improved. SWPPP and site map need to be updated (Ecology 2015dd).
			11/18/2015	NPDES	
WAG503282	ICON Materials Seattle Asphalt	1115 S 96th Street	8/9/2016 and 12/6/2016	NPDES	
WAR001949	Industrial Automation	1421 S 93rd Street	6/10/2015	NPDES	
	International Paint LLC	1541 S 92nd Place	9/18/2014	Urban Waters	

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NPDES Permit No.	Facility Name	Address	Date Inspected	Type of Inspection	Ecology Findings
CNE126493	King Electrical Mfg Co	9131 10th Avenue S	8/8/2014	Urban Waters	
	Old Dominion Freight Line	600 S 96th Street	4/14/2015	Urban Waters	
WAR125474	Pacific Industrial Supply	1231 S Director Street	7/8/2015	NPDES	
WAR000264	PSF Mechanical	9322 14th Avenue S	1/7/2015	NPDES	SWPPP is incomplete. The filter insert in catch basin CB#2 had filled with sediment and was not draining. At the sampling location, boom surrounding CB#3 (containing the treatment intake) was in poor condition. Boom surrounding compressors was also in poor condition, and compressors did show evidence of some oil blow-by (Ecology 2015c).
WAR002142	Puget Sound Coatings	9220 8th Avenue S	9/9/2014	NPDES	Sampling inspection; Ecology collected two water samples and one solids sample (Leidos 2015c).
WAR011783(i nactive)	RMC Inc		8/21/2014	NPDES/Urban Waters	Dust collection issues. SWPPP needs to be updated (Ecology 2014ss). RMC filed a Notice of Termination with Ecology on January 4, 2016. The facility ceased operations on 12/18/15, and the property was vacated 12/31/15.
WAR301372	Samson Tug & Barge South Park	9228 10th Avenue S	1/27/2015 & 2/5/2015	NPDES	SWPPP out of date and incomplete. All monthly inspection reports indicated no visible sheen at the outfall catch basin, which was acknowledged by the facility consultant as being highly unlikely given the amount of petroleum observed on the ground and in the stormwater on site. Significant trackout was observed onto 10th Ave S from north entrance/exit though the facility claims to sweep 3 times per week. Inspectors documented oil sheens at numerous locations, presumably from leaking equipment, and in one instance what appeared to be a substantial spill of hydraulic fluid adjacent to a catch basin. A storage area for fuel cans and other products that lacked any sort of secondary containment. The facility was in significant noncompliance with their NPDES ISGP; formal enforcement was recommended for significant water quality and permit violations (Ecology 2015e).
			1/28, 10/05, & 10/20/2016	NPDES	
WAR125565	Security Contractor Services Inc.	9619 8th Avenue S	6/16/2014	Urban Waters	

Appendix E. Ecology Source Control Inspections (2014-2016)

NPDES Permit No.	Facility Name	Address	Date Inspected	Type of Inspection	Ecology Findings
WAR000650	Selland Auto Transport	615 S 96th Street	4/15/2014	Urban Waters	Trucks waiting for repair or maintenance are parked along the western fence line. This area has periodically experienced excessive petroleum drips and leaks. The area looked improved during this site visit but the facility should consider placing trays lined with absorbent pads under potentially leaking trucks and trailers. Routing the roof run-off onto the pavement and not into the bermied area is highly recommended.
			9/28/2016	NPDES	
	Sherwin Williams Store 4317	9530 10th Avenue S	12/2/2014	Urban Waters	
RM 4.2-5.8 West (Restoration Areas)					
WAR044503	Seattle City Light Duwamish Substation	10000 West Marginal Place S	12/16/2014	NPDES	Site map needs to be updated. Stormwater drainage system and oil containment system are one and the same system; a spill of oil will enter the stormwater system. The presence of pavement staining beneath substation equipment suggests potential pollution-generating materials and/or processes that occur over time (e.g., copper parts may leave green staining on the BUS pads). Materials Storage Area (south side of site) - This area is used for indoor and outdoor storage of materials, including historic lamp posts, solid (and/or potentially hazardous) waste and scrap metal. Facility does not have a SWPPP (Ecology 2014hhh).

BMP = best management practice
 CB = catch basin
 CNE = Conditional No Exposure certification
 EAA = Early Action Area
 EPA = Environmental Protection Agency
 ISGP = Industrial Stormwater General Permit
 NA = Not Available
 NPDES = National Pollutant Discharge Elimination System
 O&M = operations and maintenance
 RM = river mile
 SPU = Seattle Public Utilities
 SW = stormwater
 SWPPP = Stormwater Pollution Prevention Plan

**Appendix F:
SPU Source Tracing Data
(2014-2016)**

**Table F-1.
SPU Source Tracing Sample Locations (2014-2016)**

Station ID	Sample No.	Date	Type	Sewer Type	Source Control Area	Outfall	Location	X Coordinate	Y Coordinate
Lower Reach									
CB2	CB2-031314	3/13/2014	CB	SD	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	4429 Airport Wy S	1,272,462.25	209,087.51
CB27b	CB27-033116	3/30/2016	CB	CS	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	950 E Madison St	1,273,859.23	226,800.86
CB83	CB83-040816	4/8/2016	CB	SD	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	2006 Rainier Ave S	1,277,666.74	217,000.66
CB121	MKJ-092316	9/23/2016	CB	SD	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	620 S Industrial Way	1,271,815.50	210,402.96
CB176	CB176-022614	2/26/2014	CB	SD	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB at NW corner of property in asphalt parking lot. CB drains to Snoqualmie St	1,271,840.60	208,527.70
CB177	CB177-022614	2/26/2014	CB	SD	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB in parking lot north side of S Alaska St, east of 6th Ave S	1,271,889.39	208,332.95
CB178	CB178-022614	2/26/2014	CB	SD	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB on NE corner of parcel, parking lot, asphalt, seal coat. Delivery van parking in this area	1,271,937.46	208,523.30
CB179	CB179-022714	2/27/2014	CB	SD	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	Composite sample from 2 catch basins from 636 S Alaska St, Pacific Publishing	1,272,083.36	208,319.28
CB180	CB180-022714	2/27/2014	CB	SD	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	Composite of 2 catch basins in parking area	1,272,097.68	208,525.43
CB181	CB181-030414	3/4/2014	CB	SD	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	North sandfilter junction box	1,268,950.22	207,047.19
CB182	CB182-030414	3/4/2014	CB	SD	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB in center of storage area (round grate) enough sheet flow to collect from into CB	1,268,945.94	207,096.27
CB185	CB185-061215	6/12/2015	CB	SD	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB located in the central portion of the west parking lot	1,275,526.26	214,343.98
CB220	CB220-030714	3/7/2014	CB	SD	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	NW corner of lot in exit driveway taking flow from rail, end of 6th Ave S	1,271,725.88	207,972.73
CB221	CB221-030714	3/7/2014	CB	SD	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	Taken from employee parking lot on south side of property	1,272,241.07	208,327.22
CB222	CB222-030714	3/7/2014	CB	SD	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB at east side, north portion of lot	1,272,282.65	208,467.29
CB223	CB223-030714	3/7/2014	CB	SD	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	This sample taken in CB at west side of property near loading dock along 7th Ave S	1,272,376.50	208,327.89
CB224	CB224-030714	3/7/2014	CB	SD	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB at east side of property at same location as CB223	1,272,569.13	208,331.59
CB225	CB225-030714	3/7/2014	CB	SD	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	5 CB on west side of property composite sample. 3 CBs on west property line and 2 CBs at loading dock.	1,272,088.66	208,117.00
CB226	CB226-030714	3/7/2014	CB	SD	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	Sample composite taken from 3 FedEx CBs on south side of property	1,272,288.66	207,789.40
CB227	CB227-030714	3/7/2014	Inline	SD	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	Sample taken from MH on FedEx driveway which collectes parking lot runoff and neighboring property roof drains	1,272,025.10	208,250.90
CB230	CB230-032114	3/21/2014	CB	SD	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	4455 7th Ave S, 4 CBs in east parking lot	1,272,282.43	209,225.07
CB231	CB231-032114	3/21/2014	CB	SD	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	4455 7th Ave S, CB26, CB27 SE corner of property - parking lot	1,272,370.69	208,742.26
CB232	CB232-041614	4/16/2014	CB	SD	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	4201 6th Ave S	1,271,656.12	209,532.58
CB237	MKJ-122116-3	12/21/2016	CB	SD	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	Central lot CB on South side of Evoque Building, feakey 1586524	1,271,847.10	208,333.22
CB240	CB240-040414	4/4/2014	CB	SD	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	4715 6th Ave S, Central CB in Parking/Driveway area, last CB before MS4	1,271,571.86	208,227.84

**Table F-1.
SPU Source Tracing Sample Locations (2014-2016)**

Station ID	Sample No.	Date	Type	Sewer Type	Source Control Area	Outfall	Location	X Coordinate	Y Coordinate
CB240	CB240D-040414 (duplicate of CB240-040414)	4/4/2014	CB	SD	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	4715 6th Ave S, Central CB in Parking/Driveway area, last CB before MS4	1,271,571.86	208,227.84
CB240	CB240-072116	7/21/2016	CB	SD	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	4715 6th Ave S, Central CB in Parking/Driveway area, last CB before MS4	1,271,571.86	208,227.84
CB241	CB241-040414	4/4/2014	CB	SD	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	4715 6th Ave S, 2 CBs on far west side of property, 2 of 3, most southern 2	1,271,518.64	208,095.05
CB241	CB241-072116	7/21/2016	CB	SD	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	4715 6th Ave S, 2 CBs on far west side of property, 2 of 3, most southern 2	1,271,518.64	208,095.05
CB242	CB242-040414	4/4/2014	CB	SD	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	4715 6th Ave S, 2 CBs on either side of a large transformer, west side of bldg	1,271,569.69	208,066.66
CB243	CB243-041014	4/10/2014	CB	SD	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	615 S Alaska St, 2 CBs, one in parking area and one near loading dock	1,271,899.98	208,190.91
CB244	CB244-041014	4/10/2014	CB	SD	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	4601 6th Ave S, 3 CBs on east side of property	1,271,685.79	208,466.46
CB245	CB245-041014	4/10/2014	CB	SD	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	4601 6th Ave S, CB in employee parking at west end of north lot - property line	1,271,402.07	208,576.62
CB246	CB246-050714	5/17/2014	CB	SD	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB west of transformer CS198	1,271,520.27	208,075.28
CB247	CB247-050714	5/17/2014	CB	SD	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	Pump sump to SE of transformer CS198	1,271,575.23	208,053.79
CB248	CB248-050714	5/17/2014	CB	SD	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB located SW of transformer CS198	1,271,557.59	208,052.02
CB248	CB248-072116	7/21/2016	CB	SD	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB located SW of transformer CS198	1,271,557.59	208,052.02
CB250	CB250-041614	4/16/2014	CB	SD	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	Plymouth Poultry (north drain)	1,272,443.28	208,847.57
CB251	CB251-041614	4/16/2014	CB	SD	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	Western Waterproofing yard drain	1,272,436.27	209,023.34
CB251	CB251-051414	5/14/2014	CB	SD	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	Western Waterproofing yard drain	1,272,436.27	209,023.34
CB252	CB252-050814	5/8/2014	CB	SD	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	Drain in driveway of site, collects street run-off too (S Lane St / Dearborn PI S)	1,275,417.21	221,150.33
CB253	CB253-050814	5/8/2014	CB	CS	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	Drain in driveway of site (S Lane St / Dearborn PI S)	1,275,384.96	221,169.26
CB254	CB254-050814	5/8/2014	CB	SD	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	1400 S Lane St, CB in compactor storage area - discharges to combined	1,275,288.34	221,311.69
CB255	CB255-061114	6/11/2014	CB	SD	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB in parking lot	1,272,468.17	209,315.65
CB260	CB260-051414	5/14/2014	CB	SD	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	PCB aroma in air near this point	1,272,434.27	209,023.34
CB260	CB260-051414	6/29/2016	CB	SD	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	PCB aroma in air near this point	1,272,434.27	209,023.34
CB261	CB261-051414	5/14/2014	CB	SD	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	Small sump at bottom of loading ramp - surface dirt	1,272,508.98	209,031.52
CB267	CB267-110615	11/6/2015	CB	CS	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	SCL catch basin #52B in substation yard	1,271,073.71	210,829.73
CB268	CB268-110615	11/6/2015	CB	CS	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	Substation drains #52, #52A	1,271,041.16	210,982.33
CB271	CB271-062916	6/29/2016	CB	SD	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB in east exterior storage yard	1,272,636.25	209,254.77
CB273	CB273-071316	7/13/2016	CB	SD	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	Auto repair location	1,277,659.48	216,563.08
CB275	CB275-062916	6/29/2016	CB	SD	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB in north parking lot of Century Link	1,269,784.60	207,364.60
CB281	CB281-021116	2/11/2016	CB	SD	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	Type II grated flow control structure between 7-11 & Burger King	1,277,639.16	216,821.74
CB290	CB290-040116	4/1/2016	CB	SD	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB just north of Victor's in shared loading dock - some street runoff	1,268,888.22	208,104.28
CB291	CB291-041516	4/15/2016	CB	SD	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	Western CB in south property, north parking lot near SCL transformer	1,276,747.85	222,225.37

**Table F-1.
SPU Source Tracing Sample Locations (2014-2016)**

Station ID	Sample No.	Date	Type	Sewer Type	Source Control Area	Outfall	Location	X Coordinate	Y Coordinate
CB295	CB295-040816	4/8/2016	CB	SD	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB at south corner of property	1,277,722.86	216,882.78
CB311	CB274-062916	6/29/2016	CB	SD	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB at west loading dock	1,271,539.50	210,839.70
CB312	MKJ-081816-1	8/18/2016	CB	SD	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	Composite of western 2 catch basins	1,271,697.34	211,880.87
CB313	MKJ-081816-2	8/18/2016	CB	SD	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	Composite of eastern 2 catch basins	1,271,830.68	211,811.60
CB314	TJM-NCH-090116-1	9/1/2016	CB	SD	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	Composite of 2 catch basins near wet vault on NE portion of property	1,270,914.06	206,788.20
CB315	TJM-NCH-090116-2	9/1/2016	CB	SD	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	Sampled from the Flow Control Maintenance Hole on the north end of the property	1,279,259.64	212,851.98
CB317	CEW-093016-4	9/30/2016	CB	SD	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	Catch basin at the loading dock on NE portion of property	1,272,086.77	210,676.95
CB319	CEW-110716-2	11/7/2016	CB	SD	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB in central yard area, in SE corner of loading dock.	1,269,693.08	207,473.46
CB320	CEW-110716-1	11/7/2016	CB	SD	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB in customer parking lot.	1,269,777.19	207,544.04
CB321	MKJ-111616-1	11/16/2016	CB	SD	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB at middle of west wall refer house.	1,271,518.52	208,111.04
MH18	MH18-051414	5/14/2014	Inline	SD	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	6th Ave S and S Snoqualmie St	1,271,741.49	208,576.18
MH18	MH18-040616	4/6/2016	Inline	SD	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	6th Ave S and S Snoqualmie St	1,271,741.79	208,576.18
MH37	MH37-101515	10/15/2015	Inline	SD	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	Water quality vault in SCL employee parking lot east of 4th Ave S	1,271,298.87	211,472.43
ODS7	ODS7-022416	2/24/2016	ODS	SD	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	9th Ave S street end, I-5 downspout spill over	1,273,068.03	211,843.13
ODS11	CEW-093016-5	9/30/2016	ODS	SD	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	ODS sample from the northwest corner of the property	1,272,422.46	207,732.10
ODS15	MKJ-111616-2	11/16/2016	ODS	SD	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	Paint Chips off I-beam in silo area of Sun Foods	1,271,560.14	208,040.77
ODS16	MKJ-111616-3	11/16/2016	ODS	SD	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	Garbage bag inside plastic crate - yard sweeping	1,271,557.28	208,049.89
ODS17	MKJ-111616-4	11/16/2016	ODS	SD	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	Surface dirt between transformer and west wall of building	1,271,577.59	208,070.46
ODS18	MKJ-111616-5	11/16/2016	ODS	SD	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	Moss and soil from west fence line	1,271,513.01	208,083.22
ODS19	LAMAR-1	11/15/2016	ODS	SD	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	Painted fire cabinet in west yard. Surface wipe in gauze	1,271,730.72	211,959.79
ODS20	LAMAR-2	11/15/2016	ODS	SD	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	Sample was taken from 3' I-beam segments w/ gray paint.	1,271,729.94	211,913.96
ODS21	LAMAR-3	11/15/2016	ODS	SD	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	Sample was taken from 7' yellow steel beam surface.	1,271,673.43	211,804.06
ODS27	MKJ-111016-1	11/10/2016	ODS	SD	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	West side of bldg. Scraped from building edge at ramp slope.	1,271,833.95	210,383.00
ODS28	MKJ-111016-2	11/10/2016	ODS	SD	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	N side of bldg under stainless downspout.	1,271,899.58	210,416.07
ODS29	MKJ-111016-3	11/10/2016	ODS	SD	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	East side of bldg under roof drain, moss on asphalt	1,272,062.08	210,335.87
ODS30	MKJ-111016-4	11/10/2016	ODS	SD	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	Second window bay from SW corner of building, soil from bottom of wall.	1,271,912.34	210,288.21
ODS37	MKJ-121416-1	12/14/2016	ODS	SD	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	Moss at bottom of aggregate concrete wall at OCC carpenter shop	1,273,526.31	214,823.19
OWSC	OWSC-101515	10/15/2015	Inline	CS	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	North & east of the south substation	1,271,119.58	211,192.02
OWSE	OWSE-101515	10/15/2015	Inline	CS	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	O/W separator at transformer wash area, PCB <1ppm Transformers	1,270,831.86	211,215.61
RCB36	RCB36-041614	4/16/2014	RCB	SD	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	Airport Way S at S Alaska St	1,272,625.53	208,221.16

**Table F-1.
SPU Source Tracing Sample Locations (2014-2016)**

Station ID	Sample No.	Date	Type	Sewer Type	Source Control Area	Outfall	Location	X Coordinate	Y Coordinate
RCB51	RCB51-051414	5/14/2014	RCB	SD	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	4429 7th Ave S behind PSI	1,272,434.38	208,986.56
RCB57	RCB57-040214	4/2/2014	RCB	SD	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	1/2 block N of S Snoqualmie St on 6th Ave S, east side of ROW	1,271,764.73	208,992.30
RCB58	RCB58-040214	4/2/2014	RCB	SD	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	Between UPS and K2, 6th Ave S, west side, about 400' north of S Snoqualmie St	1,271,725.60	208,996.06
RCB59	RCB59-040214	4/2/2014	RCB	SD	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	6th Ave S, west side of street, about 800' north of S Snoqualmie St	1,271,769.74	209,386.39
RCB60	RCB60-040214	4/2/2014	RCB	SD	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	West of intersection, north side of Diagonal Ave S	1,271,587.66	211,174.27
RCB67	MKJ-122116-1	12/21/2016	RCB	CS	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	RCB on west side of 24th Ave S, just north of S Washington St.	1,278,308.63	222,664.71
RCB72	MKJ-122116-4	12/21/2016	RCB	SD	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	NE corner of 6th and S Alaska St, CB on 6th Ave S.	1,271,758.15	208,353.64
RCB215	RCB294-050714	5/17/2014	RCB	SD	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	6th Ave S south of S Alaska St	1,271,719.83	208,227.71
RCB215	RCB294-072116	7/21/2016	RCB	SD	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	6th Ave S south of S Alaska St	1,271,719.83	208,227.71
RCB217	RCB217-081116	8/11/2016	RCB	SD	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	E side of 7th Ave S at Seattle Barrel	1,272,380.26	208,636.57
RCB251	MKJ-122116-2	12/21/2016	RCB	CS	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	24th Ave S at S Washington St	1,278,343.26	222,646.59
RCB293	RCB293-041614	4/16/2014	RCB	SD	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	4848 Airport Way S right of way next to Olympic Foundry	1,272,637.42	207,181.20
RCB296	RCB296-041516	4/15/2016	CB	SD	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	In center of roadway in front of brewery and wood shop	1,268,916.65	208,125.57
RCB306	RCB165-061314	6/13/2014	RCB	SD	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	7th Ave S & S Oregon St, NE Corner	1,272,415.41	209,016.20
RCB306	RCB306-081116	8/11/2016	RCB	SD	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	7th Ave S & S Oregon St, NE Corner	1,272,415.41	209,016.20
RCB309	CEW-093016-2	9/30/2016	RCB	SD	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	Street sweeping pilot program on Andover	1,272,052.65	210,749.60
ST1	ST1-051914	5/19/2014	SedTrap	SD	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	Sediment Trap 1: E Marginal Wy and S Oregon St	1,268,420.85	209,048.79
ST1	ST1-051914G	5/19/2014	Inline	SD	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	Sediment Trap 1: E Marginal Wy and S Oregon St	1,268,420.85	209,048.79
ST1	ST1-052215	5/22/2015	SedTrap	SD	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	Sediment Trap 1: E Marginal Wy and S Oregon St	1,268,420.85	209,048.79
ST1	ST1-052215G	5/22/2015	Inline	SD	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	Sediment Trap 1: E Marginal Wy and S Oregon St	1,268,420.85	209,048.79
ST1	ST1-050916	5/9/2016	SedTrap	SD	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	Sediment Trap 1: E Marginal Wy and S Oregon St	1,268,420.85	209,048.79
ST1	ST1-050916G	5/9/2016	Inline	SD	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	Sediment Trap 1: E Marginal Wy and S Oregon St	1,268,420.85	209,048.79
ST7	ST7-050914	5/9/2014	SedTrap	SD	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	Sediment Trap 7: S Dakota St and 6th Ave S	1,271,722.72	210,480.65
ST7	ST7-050914G	5/9/2014	Inline	SD	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	Sediment Trap 7: S Dakota St and 6th Ave S	1,271,722.72	210,480.65
ST7	ST7-051815	5/18/2015	SedTrap	SD	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	Sediment Trap 7: S Dakota St and 6th Ave S	1,271,722.72	210,480.65
ST7	ST7-051815G	5/18/2015	Inline	SD	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	Sediment Trap 7: S Dakota St and 6th Ave S	1,271,722.72	210,480.65
ST7	ST7-050916	5/9/2016	SedTrap	SD	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	Sediment Trap 7: S Dakota St and 6th Ave S	1,271,722.72	210,480.65
ID-ST1	IDST1-051914	5/19/2014	SedTrap	SD	RM 0.0-1.0 West	SW Idaho St SD	18th Ave SW and S Hudson St	1,264,220.16	206,583.53
ID-ST1	IDST1-052115	5/21/2015	SedTrap	SD	RM 0.0-1.0 West	SW Idaho St SD	18th Ave SW and S Hudson St	1,264,220.16	206,583.53
ID-ST1	ID-ST1-051116	5/11/2016	SedTrap	SD	RM 0.0-1.0 West	SW Idaho St SD	18th Ave SW and S Hudson St	1,264,220.16	206,583.53
ID-ST2	IDST2-051914	5/19/2014	SedTrap	SD	RM 0.0-1.0 West	SW Idaho St SD	SW Idaho St just east of W Marginal Wy S	1,265,352.84	209,905.60
ID-ST2	IDST2-052115	5/21/2015	SedTrap	SD	RM 0.0-1.0 West	SW Idaho St SD	SW Idaho St just east of W Marginal Wy S	1,265,352.84	209,905.60
ID-ST2	ID-ST2-051016	5/10/2016	SedTrap	SD	RM 0.0-1.0 West	SW Idaho St SD	SW Idaho St just east of W Marginal Wy S	1,265,352.84	209,905.60
ID-ST3	IDST3-052314	5/23/2014	SedTrap	SD	RM 0.0-1.0 West	SW Idaho St SD	Channel at north end of 19th Ave SW at SW Dawson St	1,263,879.13	206,423.86

**Table F-1.
SPU Source Tracing Sample Locations (2014-2016)**

Station ID	Sample No.	Date	Type	Sewer Type	Source Control Area	Outfall	Location	X Coordinate	Y Coordinate
ID-ST3	IDST3-052215	5/22/2015	SedTrap	SD	RM 0.0-1.0 West	SW Idaho St SD	Channel at north end of 19th Ave SW at SW Dawson St	1,263,879.13	206,423.86
ID-ST3	ID-ST3-051116	5/11/2016	SedTrap	SD	RM 0.0-1.0 West	SW Idaho St SD	North end of 19th Ave SW at SW Dawson St	1,263,879.13	206,423.86
Middle Reach									
ODS8	ODS8-022416	2/24/2016	ODS	CS	RM 1.7-2.0 East	Michigan CSO	Shoulder mud along S Findlay St just west of 8th Ave S north side	1,272,852.92	205,155.10
ODS38	MKJ-121416-2	12/14/2016	ODS	SD	RM 2.0-2.3 East	S Brighton St SD	Near CB on east wall of SBW carpenter shop, immediately southwest of CB eq num 576051. PCB contaminated crate found here previously.	1,271,642.45	200,526.29
ODS38	MKJ-122216-1	12/22/2016	ODS	SD	RM 2.0-2.3 East	S Brighton St SD	Near CB on east wall of SBW carpenter shop, immediately southwest of CB eq num 576051. PCB contaminated crate found here previously.	1,271,642.45	200,526.29
RCB178	MKJ-122216-2	12/22/2016	RCB	SD	RM 2.0-2.3 East	S Brighton St SD	West side of Fox Ave s by Seattle Boiler Works	1,271,635.85	200,532.89
CB202	CB202-022316	2/23/2016	RCB	SD	RM 2.0-2.3 East	S River St SD	CB SE corner S River St and S Occidental St	1,270,056.10	201,845.70
CB270	CB270-022316	2/23/2016	CB	SD	RM 2.0-2.3 East	S River St SD	Southern most gate of V Van Dyke	1,270,119.63	201,854.99
CB288	CB288-022316	2/23/2016	CB	SD	RM 2.0-2.3 East	S River St SD	Two catch basin composite on sw corner of property	1,270,365.73	201,953.42
CB289	CB289-022316	2/23/2016	CB	SD	RM 2.0-2.3 East	S River St SD	Drain on SE corner of property	1,270,436.18	201,964.26
MH211	MH211-040116	4/1/2016	Inline	SD	RM 2.0-2.3 East	S River St SD	Last MH on line	1,269,926.63	201,715.30
MH220	MH220-032416	3/24/2016	Inline	SD	RM 2.0-2.3 East	S River St SD	MH north side S River St at 2nd Ave S	1,270,344.14	201,900.02
ODS10	ODS10-040116	4/1/2016	ODS	SD	RM 2.0-2.3 East	S River St SD	South shoulder of S River St along 306 S River St, composite of 4 locations	1,270,697.63	201,908.32
ODS9	ODS9-032416	3/24/2016	ODS	SD	RM 2.0-2.3 East	S River St SD	Surface mud collected from side of road on paved surfaces	1,270,345.78	201,935.01
RCB77	RCB77-032416	3/24/2016	RCB	SD	RM 2.0-2.3 East	S River St SD	CB at top of drainage on S River St, in gutter line near SCL pole #1359242	1,270,723.96	201,957.06
RCB78	RCB78-032416	3/24/2016	RCB	SD	RM 2.0-2.3 East	S River St SD	Grated CB at base of City Light pole 1359101, NW corner 2nd Ave S & S River St	1,270,287.14	201,894.60
RCB79	RCB79-032416	3/24/2016	RCB	SD	RM 2.0-2.3 East	S River St SD	Normal CB w/grated top, shown on GIS but not in inventory	1,270,330.26	201,906.46
RCB81	RCB81-040116	4/1/2016	RCB	SD	RM 2.0-2.3 East	S River St SD	Frontage road along E Marginal Way S & S 3rd Ave	1,270,599.72	202,160.15
RCB192	RCB192-040116	4/1/2016	RCB	SD	RM 2.0-2.3 East	S River St SD	NW corner of S River St & 3rd Ave S	1,270,529.81	201,943.84
STRANS1	STRANS1-031414	3/14/2014	ODS	SD	RM 2.3-2.8 East	S Garden St SD	Sample of the raw from the Seattle Transload operation occurring on the S Garden St ROW	1,272,293.41	199,783.54
STRANS2	STRANS2-031714	3/17/2014	ODS	SD	RM 2.3-2.8 East	S Garden St SD	Down S Garden St (West) sampled at Filterra just prior to entry	1,272,088.89	199,822.95
STRANS2	STRANS3-031714	3/17/2014	ODS	SD	RM 2.3-2.8 East	S Garden St SD	Down S Garden St (West) sampled at Filterra just prior to entry	1,272,088.89	199,822.95
STRANS2	STRANS4-031714	3/17/2014	ODS	SD	RM 2.3-2.8 East	S Garden St SD	Down S Garden St (West) sampled at Filterra just prior to entry	1,272,088.89	199,822.95
RCB65	RCB62-020515	2/5/2015	RCB	SD	RM 2.3-2.8 East	S Myrtle St SD	S Myrtle St	1,271,546.64	200,328.24
MH23	MH23-062014	6/20/2014	Inline	SD	RM 2.8 East	Slip 4	MH to east of motel	1,273,423.97	199,929.80
SL4-T6	SL4-T6-042414	4/24/2014	SedTrap	SD	RM 2.8 East	I-5 SD at Slip 4	I-5 SD at Airport Way S; MH at Airport Way S and S Hardy St	1,274,989.40	202,834.00

**Table F-1.
SPU Source Tracing Sample Locations (2014-2016)**

Station ID	Sample No.	Date	Type	Sewer Type	Source Control Area	Outfall	Location	X Coordinate	Y Coordinate
SL4-T6	SL4-T6-051815	5/18/2015	SedTrap	SD	RM 2.8 East	I-5 SD at Slip 4	I-5 SD at Airport Way S; MH at Airport Way S and S Hardy St	1,274,989.40	202,834.00
SL4-T6	SL4-T6-050916	5/9/2016	SedTrap	SD	RM 2.8 East	I-5 SD at Slip 4	I-5 SD at Airport Way S; MH at Airport Way S and S Hardy St	1,274,989.40	202,834.00
HP-ST4	HPST4-051914	5/19/2014	SedTrap	SD	RM 1.6-2.1 West	Highland Park Wy SW SD	NW corner of W Marginal and Highland Pk Wy	1,267,618.04	200,796.20
HP-ST4	HP-ST4-051815	5/18/2015	SedTrap	SD	RM 1.6-2.1 West	Highland Park Wy SW SD	NW corner of W Marginal and Highland Pk Wy	1,267,618.04	200,796.20
HP-ST4	HP-ST4-051016	5/10/2016	SedTrap	SD	RM 1.6-2.1 West	Highland Park Wy SW SD	NW corner of W Marginal and Highland Pk Wy	1,267,618.04	200,796.20
HP-ST6	HPST6-063014	6/30/2014	SedTrap	SD	RM 1.6-2.1 West	Highland Park Wy SW SD	SW Michigan St just east of W Marginal Wy S	1,268,086.32	200,870.80
HP-ST6	HPST6-063014G	6/30/2014	Inline	SD	RM 1.6-2.1 West	Highland Park Wy SW SD	SW Michigan St just east of W Marginal Wy S	1,268,086.32	200,870.80
HP-ST6	HP-ST6-051815	5/18/2015	SedTrap	SD	RM 1.6-2.1 West	Highland Park Wy SW SD	SW Michigan St just east of W Marginal Wy S	1,268,086.32	200,870.80
HP-ST6	HP-ST6-051815G	5/18/2015	Inline	SD	RM 1.6-2.1 West	Highland Park Wy SW SD	SW Michigan St just east of W Marginal Wy S	1,268,086.32	200,870.80
HP-ST6	HP-ST6-051016	5/10/2016	SedTrap	SD	RM 1.6-2.1 West	Highland Park Wy SW SD	SW Michigan St just east of W Marginal Wy S	1,268,086.32	200,870.80
ODS1	MPS7125-092614	9/26/2014	ODS	SD	RM 1.6-2.1 West	Highland Park Wy SW SD	7125 W Marginal Way SW	1,268,310.85	200,205.16
KN-ST1	KNST1-063014	6/30/2014	SedTrap	SD	RM 1.6-2.1 West	SW Kenny St SD/T115 CSO	Eastern end of S Kenny St, on T115	1,268,138.36	203,628.91
KN-ST1	KN-ST1-051815	5/18/2015	SedTrap	SD	RM 1.6-2.1 West	SW Kenny St SD/T115 CSO	Eastern end of S Kenny St, on T115	1,268,138.36	203,628.91
KN-ST1	KN-ST1-051016	5/10/2016	SedTrap	SD	RM 1.6-2.1 West	SW Kenny St SD/T115 CSO	Eastern end of S Kenny St, on T115	1,268,138.36	203,628.91
1st-ST1	1ST-ST2-052314	5/23/2014	SedTrap	SD	RM 2.1 West	1st Ave S SD, west	1st Ave S pond, N side of S Holden St - SR99 inlet	1,269,988.18	198,544.26
1st-ST1	1ST-ST1-052215	5/22/2015	SedTrap	SD	RM 2.1 West	1st Ave S SD, west	1st Ave S pond, N side of S Holden St - SR99 inlet	1,269,988.18	198,544.26
1st-ST1	1ST-ST1-051216	5/12/2016	SedTrap	SD	RM 2.1 West	1st Ave S SD, west	1st Ave S pond, N side of S Holden St - SR99 inlet	1,269,988.18	198,544.26
1st-ST2	1ST-ST2-052215	5/22/2015	SedTrap	SD	RM 2.1 West	1st Ave S SD, west	1st Ave S pond, N side of S Holden St - SR509 inlet	1,269,790.80	198,570.70
1st-ST2	1ST-ST2-051216	5/12/2016	SedTrap	SD	RM 2.1 West	1st Ave S SD, west	1st Ave S pond, N side of S Holden St - SR509 inlet	1,269,790.80	198,570.70
1st-ST3	1ST-ST3-051914	5/19/2014	SedTrap	SD	RM 2.1 West	1st Ave S SD, west	SW Kenyon St at 4th Ave SW	1,267,991.38	197,680.32
1st-ST3	1ST-ST3-051914G	5/19/2014	Inline	SD	RM 2.1 West	1st Ave S SD, west	SW Kenyon St at 4th Ave SW	1,267,991.38	197,680.32
1st-ST3	1ST-ST3-052115	5/21/2015	SedTrap	SD	RM 2.1 West	1st Ave S SD, west	SW Kenyon St at 4th Ave SW	1,267,991.38	197,680.32
1st-ST3	1ST-ST3-052115G	5/21/2015	Inline	SD	RM 2.1 West	1st Ave S SD, west	SW Kenyon St at 4th Ave SW	1,267,991.38	197,680.32
1st-ST3	1ST-ST3-051116	5/11/2016	SedTrap	SD	RM 2.1 West	1st Ave S SD, west	SW Kenyon St at 4th Ave SW	1,267,991.38	197,680.32
1st-ST3	1ST-ST3-051116G	5/11/2016	Inline	SD	RM 2.1 West	1st Ave S SD, west	SW Kenyon St at 4th Ave SW	1,267,991.38	197,680.32
1st-ST7	1ST-ST7-051914	5/19/2014	SedTrap	SD	RM 2.1 West	1st Ave S SD, west	In turn lane of Olsen PI SW just west of 1st Ave S	1,269,028.98	193,714.03
1st-ST7	1ST-ST7-052115	5/21/2015	SedTrap	SD	RM 2.1 West	1st Ave S SD, west	In turn lane of Olsen PI SW just west of 1st Ave S	1,269,028.98	193,714.03
1st-ST7	1ST-ST7-051116	5/11/2016	SedTrap	SD	RM 2.1 West	1st Ave S SD, west	In turn lane of Olsen PI SW just west of 1st Ave S	1,269,028.98	193,714.03
CB108	CB108-051415	5/14/2015	RCB	SD	RM 2.1-2.2 West	2nd Ave S SD	7265 2nd Ave S; NW corner of S Fontanelle St at 2nd Ave S	1,270,436.09	199,406.88
CB263	CB263-051415	5/14/2015	CB	SD	RM 2.1-2.2 West	2nd Ave S SD	South CB in lot to north of Bill's	1,270,341.11	199,554.08
RCB139	MKJ-122116-5	12/21/2016	RCB	SD	RM 2.1-2.2 West	2nd Ave S SD	S Austin St and 2nd Ave S	1,270,554.76	198,709.78
RCB203	MKJ-122116-6	12/21/2016	RCB	SD	RM 2.1-2.2 West	2nd Ave S SD	Sand box d/s of RCB139, 2nd structure east of 2nd ave s on S Austin St north side.	1,270,622.25	198,708.73
7th-ST1	7TH-ST1-051815	5/18/2015	SedTrap	SD	RM 2.2-3.4 West	7th Ave S SD	7th Ave S at S Portland St	1,271,845.54	198,135.36
7th-ST1	7TH-ST1-051815G	5/18/2015	Inline	SD	RM 2.2-3.4 West	7th Ave S SD	7th Ave S at S Portland St	1,271,845.54	198,135.36
7th-ST1	7TH-ST1-050916	5/9/2016	SedTrap	SD	RM 2.2-3.4 West	7th Ave S SD	7th Ave S at S Portland St	1,271,845.54	198,135.36
7th-ST1	7TH-ST1-050916G	5/9/2016	Inline	SD	RM 2.2-3.4 West	7th Ave S SD	7th Ave S at S Portland St	1,271,845.54	198,135.36

**Table F-1.
SPU Source Tracing Sample Locations (2014-2016)**

Station ID	Sample No.	Date	Type	Sewer Type	Source Control Area	Outfall	Location	X Coordinate	Y Coordinate
7th-ST2	7THST2-050914	5/9/2014	SedTrap	SD	RM 2.2-3.4 West	7th Ave S SD	4th Ave S at S Barton St, next to P-Patch	1,270,702.00	193,616.50
7th-ST2	7TH-ST2-052115	5/21/2015	SedTrap	SD	RM 2.2-3.4 West	7th Ave S SD	4th Ave S at S Barton St, next to P-Patch	1,270,702.00	193,616.50
7th-ST2	7TH-ST2-051016	5/10/2016	SedTrap	SD	RM 2.2-3.4 West	7th Ave S SD	4th Ave S at S Barton St, next to P-Patch	1,270,702.00	193,616.50
7th-ST2	7TH-ST2-051016G	5/10/2016	Inline	SD	RM 2.2-3.4 West	7th Ave S SD	4th Ave S at S Barton St, next to P-Patch	1,270,702.00	193,616.50
7th-ST3	7TH-ST3-052115	5/21/2015	SedTrap	SD	RM 2.2-3.4 West	7th Ave S SD	S Southern St just W of 7th Ave S	1,271,346.96	196,842.03
7th-ST3	7TH-ST3-051116	5/11/2016	SedTrap	SD	RM 2.2-3.4 West	7th Ave S SD	S Southern St just W of 7th Ave S	1,271,346.96	196,842.03
CB262	CB262-051315	5/13/2015	CB	SD	RM 2.2-3.4 West	7th Ave S SD	Central CB in storage yard (east of the building)	1,271,514.34	197,475.75
CB318	CEW-093016-6	9/30/2016	CB	SD	RM 2.2-3.4 West	7th Ave S SD	CB along the southern property line (FEAKEY 1842017)	1,270,665.30	198,474.39
ODS22	ELMGROVE-5	11/15/2016	ODS	SD	RM 2.2-3.4 West	7th Ave S SD	Sample taken from southwest gravel surface at coordinates. Samson did not indicate at location	1,271,860.40	197,179.84
ODS23	ELMGROVE-1	11/15/2016	ODS	SD	RM 2.2-3.4 West	7th Ave S SD	Sample on north side of gravel berm on north side of S Elmgrove street end. Sample is west of log across road end.	1,271,866.04	197,122.06
ODS24	ELMGROVE-2	11/15/2016	ODS	SD	RM 2.2-3.4 West	7th Ave S SD	Sample on north side of gravel berm on north side of S Elmgrove street end. Sample is east of log across road end.	1,271,910.66	197,121.51
ODS25	ELMGROVE-3	11/15/2016	ODS	SD	RM 2.2-3.4 West	7th Ave S SD	Sample along west side of gravel berm on east side of lot.	1,271,927.85	197,177.76
ODS26	ELMGROVE-4	11/15/2016	ODS	SD	RM 2.2-3.4 West	7th Ave S SD	North end of the berm running along the east property border.	1,271,931.23	197,321.51
ODS42	MKJ-121516-4	12/15/2016	ODS	SD	RM 2.2-3.4 West	7th Ave S SD	5' north of power pole 1379076 and at base of west post of gate.	1,270,593.91	198,727.01
ODS43	MKJ-121516-5	12/15/2016	ODS	SD	RM 2.2-3.4 West	7th Ave S SD	75' east of 2nd Ave S, North side of S Austin St	1,270,495.91	198,725.44
ODS44	MKJ-121516-6	12/15/2016	ODS	SD	RM 2.2-3.4 West	7th Ave S SD	NE corner of 2nd Ave S/S Austin St near Paco Fence	1,270,432.10	198,730.13
ODS45	MKJ-122916-6	12/29/2016	ODS	SD	RM 2.2-3.4 West	7th Ave S SD	Sediment deposited along roadway outfall ditch, 5th Ave S & S Fontanelle St NE corner	1,271,192.70	199,370.95
RCB61	RCB161-061314	6/13/2014	RCB	SD	RM 2.2-3.4 West	7th Ave S SD	S Holden St & 7th Ave S, SW corner	1,271,784.65	198,392.46
RCB61	RCB161-091114	9/11/2014	RCB	SD	RM 2.2-3.4 West	7th Ave S SD	S Holden St & 7th Ave S, SW corner	1,271,784.65	198,392.46
RCB62	RCB162-061314	6/13/2014	RCB	SD	RM 2.2-3.4 West	7th Ave S SD	S Holden St & 7th Ave S, SE corner	1,271,883.37	198,387.16
RCB62	RCB162-091114	9/11/2014	RCB	SD	RM 2.2-3.4 West	7th Ave S SD	S Holden St & 7th Ave S, SE corner	1,271,883.37	198,387.16
RCB63	RCB163-061314	6/13/2014	RCB	SD	RM 2.2-3.4 West	7th Ave S SD	S Riverside Dr just north of intersection w/S Holden St & 7th Ave S	1,271,844.32	198,473.84
RCB63	RCB163-091114	9/11/2014	RCB	SD	RM 2.2-3.4 West	7th Ave S SD	S Riverside Dr just north of intersection w/S Holden St & 7th Ave S	1,271,844.32	198,473.84
RCB64	RCB164-061314	6/13/2014	RCB	SD	RM 2.2-3.4 West	7th Ave S SD	S Riverside Dr just north of intersection w/S Holden St & 7th Ave S	1,271,824.84	198,460.76
RCB64	RCB164-091114	9/11/2014	RCB	SD	RM 2.2-3.4 West	7th Ave S SD	S Riverside Dr just north of intersection w/S Holden St & 7th Ave S	1,271,824.84	198,460.76
RCB70	MKJ-122116-8	12/21/2016	RCB	SD	RM 2.2-3.4 West	7th Ave S SD	3rd CB east of 2nd Ave S on north side of S Austin St	1,270,703.70	198,706.23
RCB71	MKJ-122116-9	12/21/2016	RCB	SD	RM 2.2-3.4 West	7th Ave S SD	CB on south side of S Austin St, 1st CB this side of road and east of 2nd Ave S	1,270,622.00	198,674.84
RCB165	RCB165-061314	6/13/2014	RCB	SD	RM 2.2-3.4 West	7th Ave S SD	NE of Marine Lumber main office on S Chicago St	1,271,525.29	197,873.88

**Table F-1.
SPU Source Tracing Sample Locations (2014-2016)**

Station ID	Sample No.	Date	Type	Sewer Type	Source Control Area	Outfall	Location	X Coordinate	Y Coordinate
ODS39	MKJ-121516-1	12/15/2016	ODS	CS	CSO	8th Ave CSO	Dirt from curbline (north) S Kenyon St to east of 8th Ave S	1,272,658.68	197,611.08
ODS40	MKJ-121516-2	11/15/2016	ODS	CS	RM 2.2-3.4 West	8th Ave CSO	South gate to Independent Metals Plant 1 on S Elmgrove planter area to east of gate	1,272,276.00	197,118.89
ODS41	MKJ-121516-3	12/15/2016	ODS	CS	RM 2.2-3.4 West	8th Ave CSO	South fence line at IM plant 1, east side of gate	1,272,274.00	197,124.36
ODS50	MKJ-122216-3	12/22/2016	ODS	CS	RM 2.2-3.4 West	8th Ave CSO	Dirt from a roadway concrete panel crack between Cbs on S Kenyon St, Panel is due south of door to bldg at 836 S Kenyon St	1,272,911.88	197,588.83
RCB73	MKJ-122116-10	12/21/2016	RCB	CS	RM 2.2-3.4 West	8th Ave CSO	NW corner CB, 8th Ave S & S Elmgrove	1,272,442.95	197,098.96
RCB74	MKJ-122216-5	12/22/2016	RCB	CS	RM 2.2-3.4 West	8th Ave CSO	CB on South side of S Kenyon St near former Ind Metals Plant 2.	1,272,881.88	197,578.83
RCB278	MKJ-122216-4	12/22/2016	RCB	CS	RM 2.2-3.4 West	8th Ave CSO	S Kenyon St between 8th Ave S and the River, N side of Kenyon	1,272,884.20	197,603.31
RCB279	MKJ-122916-4	12/29/2016	RCB	CS	RM 2.2-3.4 West	8th Ave CSO	S Chicago St and 8th Ave S, NW corner	1,272,468.88	197,876.78
RCB310	MKJ-122916-3	12/29/2016	RCB	CS	RM 2.2-3.4 West	8th Ave CSO	SE corner CB at 8th Ave S & S Chicago St	1,272,507.56	197,838.90
RCB311	MKJ-122916-5	12/29/2016	RCB	CS	RM 2.2-3.4 West	8th Ave CSO	SW corner CB of 8th Ave S and S Chicago St	1,272,464.15	197,844.13
RCB229	MKJ-122916-2	12/29/2016	RCB	CS	RM 2.2-3.4 West	CS-1	8th Ave S at S Chicago St	1,272,506.24	197,874.63
RCB298	RCB298-040616	4/6/2016	RCB	SD	RM 2.2-3.4 West	S Webster St SD	RCB at south side of S Riverside Dr near S Webster St	1,271,537.36	198,892.91
Upper Reach									
CB78	CB78-062515	6/25/2015	CB	SD	RM 4.9 East	S Norfolk St CSO/PS17 EOF/SD	9883 40th Ave S	1,282,440.23	189,816.89
CB189	CB189-042315	4/23/2015	CB	SD	RM 4.9 East	S Norfolk St CSO/PS17 EOF/SD	CB along the western property line at MLK Jr Way S located at the south entrance	1,283,242.95	191,326.29
CB189	CB189-040616	4/6/2016	CB	SD	RM 4.9 East	S Norfolk St CSO/PS17 EOF/SD	CB along the western property line at MLK Jr Way S located at the south entrance	1,283,242.95	191,326.29
CB193	CB193-062215	6/22/2015	CB	SD	RM 4.9 East	S Norfolk St CSO/PS17 EOF/SD	Construction laydown yard and a metal fabrication shop	1,283,147.63	191,069.29
CB195	CB195-062215	6/22/2015	CB	SD	RM 4.9 East	S Norfolk St CSO/PS17 EOF/SD	SW corner of property at FCMH	1,283,276.38	190,976.07
CB196	CB196-062215	6/22/2015	CB	SD	RM 4.9 East	S Norfolk St CSO/PS17 EOF/SD	Behind fence at back of property	1,283,433.23	190,999.36
CB197	CB197-071515	7/15/2015	CB	SD	RM 4.9 East	S Norfolk St CSO/PS17 EOF/SD	Frank Coluccio construction yard	1,283,287.00	191,926.00
CB198	CB198-071515	7/15/2015	CB	SD	RM 4.9 East	S Norfolk St CSO/PS17 EOF/SD	Frank Coluccio construction north yard	1,283,235.70	192,030.70
CB199	CB199-071515	7/15/2015	CB	SD	RM 4.9 East	S Norfolk St CSO/PS17 EOF/SD	Driveway to NRC Environmental	1,283,238.26	191,392.05
CB210	CB210-072915	7/29/2015	CB	SD	RM 4.9 East	S Norfolk St CSO/PS17 EOF/SD	MLK Jr. Way S near Merton Way S	1,282,931.10	192,804.75
CB214	CB214-072915	7/29/2015	CB	SD	RM 4.9 East	S Norfolk St CSO/PS17 EOF/SD	East of front door 20ft	1,271,256.56	210,407.79
CB215	CB215-072915	7/29/2015	CB	SD	RM 4.9 East	S Norfolk St CSO/PS17 EOF/SD	Northeast corner of property near Ecoblock wall near property line	1,282,965.02	192,545.00
CB216	CB216-072915	7/29/2015	CB	SD	RM 4.9 East	S Norfolk St CSO/PS17 EOF/SD	Southern end of Jack's Payless site	1,283,041.50	192,087.05
CB217	CB217-080515	8/5/2015	CB	SD	RM 4.9 East	S Norfolk St CSO/PS17 EOF/SD	Shallow catch basin on south side of building	1,273,381.21	215,142.86
CB218	CB218-080715	8/7/2015	CB	SD	RM 4.9 East	S Norfolk St CSO/PS17 EOF/SD	Flow control vault, property vacant	1,283,261.79	191,445.11
CB219	CB219-080715	8/7/2015	CB	SD	RM 4.9 East	S Norfolk St CSO/PS17 EOF/SD	Vacant property	1,283,233.27	191,679.42
CB228	CB228-071715	7/17/2015	CB	SD	RM 4.9 East	S Norfolk St CSO/PS17 EOF/SD	Composite of 2 CBs on south side of maint shop	1,283,006.38	190,499.41
CB233	CB233-052715	5/27/2015	CB	SD	RM 4.9 East	S Norfolk St CSO/PS17 EOF/SD	CB at the SE corner of the storage building	1,282,967.30	190,721.10
CB234	CB234-062515	6/25/2015	CB	SD	RM 4.9 East	S Norfolk St CSO/PS17 EOF/SD	4 CB composite from the west, north, and east sides of the building	1,282,553.91	190,512.56

**Table F-1.
SPU Source Tracing Sample Locations (2014-2016)**

Station ID	Sample No.	Date	Type	Sewer Type	Source Control Area	Outfall	Location	X Coordinate	Y Coordinate
CB235	CB235-062515	6/25/2015	CB	SD	RM 4.9 East	S Norfolk St CSO/PS17 EOF/SD	3 CB composite from the north and west side of the building	1,282,639.33	190,342.77
CB236	CB236-080515	8/5/2015	CB	SD	RM 4.9 East	S Norfolk St CSO/PS17 EOF/SD	West side of building located at 9860 40th Ave S	1,282,666.94	189,861.86
CB264	CB264-071715	7/17/2015	CB	SD	RM 4.9 East	S Norfolk St CSO/PS17 EOF/SD	CB in SE corner of building where system junctions	1,283,197.61	189,738.07
CB296	CB296-042716	4/27/2016	CB	SD	RM 4.9 East	S Norfolk St CSO/PS17 EOF/SD	Collucio lay down yard, private CB	1,283,192.10	190,126.89
MH7	MH7-040616	4/6/2016	Inline	SD	RM 4.9 East	S Norfolk St CSO/PS17 EOF/SD	MH ML King Jr Wy S and S Norfolk St, NE corner	1,283,180.18	190,589.12
MH54	MH54-050416	5/4/2016	Inline	SD	RM 4.9 East	S Norfolk St CSO/PS17 EOF/SD	MH in righthand NB lane on MLK at 10020 MLK Jr Way S	1,283,335.57	189,357.30
MH55	MH55-050516	5/5/2016	Inline	SD	RM 4.9 East	S Norfolk St CSO/PS17 EOF/SD	MH in righthand SB lane of MLK at 10023 MLK Jr Way S	1,283,240.48	189,352.95
ODS2	ODS02-090115	9/1/2015	ODS	SD	RM 4.9 East	S Norfolk St CSO/PS17 EOF/SD	Dirt from site border and MLK	1,283,196.27	190,003.33
ODS4	ODS4-090915	9/9/2015	ODS	SD	RM 4.9 East	S Norfolk St CSO/PS17 EOF/SD	Soil sample collected to the south of the building from ground in damp depression	1,283,136.00	192,656.00
NST1	NST1-063014	6/30/2014	SedTrap	SD	RM 4.9 East	S Norfolk St CSO/PS17 EOF/SD	60-in line west of MLK Way	1,283,043.33	189,358.24
NST1	NST1-063014G	6/30/2014	Inline	SD	RM 4.9 East	S Norfolk St CSO/PS17 EOF/SD	60-in line west of MLK Way	1,283,043.33	189,358.24
NST1	NST1-052115	5/21/2015	SedTrap	SD	RM 4.9 East	S Norfolk St CSO/PS17 EOF/SD	60-in line west of MLK Way	1,283,043.33	189,358.24
NST1	NST1-052115G	5/21/2015	Inline	SD	RM 4.9 East	S Norfolk St CSO/PS17 EOF/SD	60-in line west of MLK Way	1,283,043.33	189,358.24
NST1	NST1-051016	5/10/2016	SedTrap	SD	RM 4.9 East	S Norfolk St CSO/PS17 EOF/SD	60-in line west of MLK Way	1,283,043.33	189,358.24
NST1	NST1-051016G	5/10/2016	Inline	SD	RM 4.9 East	S Norfolk St CSO/PS17 EOF/SD	60-in line west of MLK Way	1,283,043.33	189,358.24
NST2	NST2-063014	6/30/2014	SedTrap	SD	RM 4.9 East	S Norfolk St CSO/PS17 EOF/SD	Overflow to WSDOT system	1,280,892.65	189,496.66
NST2	NST2-063014G	6/30/2014	Inline	SD	RM 4.9 East	S Norfolk St CSO/PS17 EOF/SD	Overflow to WSDOT system	1,280,892.65	189,496.66
NST2	NST2-051815	5/18/2015	SedTrap	SD	RM 4.9 East	S Norfolk St CSO/PS17 EOF/SD	Overflow to WSDOT system	1,280,892.65	189,496.66
NST2	NST2-051815G	5/18/2015	Inline	SD	RM 4.9 East	S Norfolk St CSO/PS17 EOF/SD	Overflow to WSDOT system	1,280,892.65	189,496.66
NST2	NST2-050916	5/9/2016	SedTrap	SD	RM 4.9 East	S Norfolk St CSO/PS17 EOF/SD	Overflow to WSDOT system	1,280,892.65	189,496.66
NST2	NST2-050916G	5/9/2016	Inline	SD	RM 4.9 East	S Norfolk St CSO/PS17 EOF/SD	Overflow to WSDOT system	1,280,892.65	189,496.66
NST3	NST3-052314	5/23/2014	SedTrap	SD	RM 4.9 East	S Norfolk St CSO/PS17 EOF/SD	Ditch at MLK Way and Boeing Access Road	1,283,147.01	188,728.61
NST3	NST3-052314G	5/23/2014	Inline	SD	RM 4.9 East	S Norfolk St CSO/PS17 EOF/SD	Ditch at MLK Way and Boeing Access Road	1,283,147.01	188,728.61
NST3	NST3-052215	5/22/2015	SedTrap	SD	RM 4.9 East	S Norfolk St CSO/PS17 EOF/SD	Ditch at MLK Way and Boeing Access Road	1,283,147.01	188,728.61
NST3	NST3-052215G	5/22/2015	Inline	SD	RM 4.9 East	S Norfolk St CSO/PS17 EOF/SD	Ditch at MLK Way and Boeing Access Road	1,283,147.01	188,728.61
NST3	NST3-051216	5/12/2016	SedTrap	SD	RM 4.9 East	S Norfolk St CSO/PS17 EOF/SD	Ditch at MLK Way and Boeing Access Rd	1,283,147.01	188,728.61
NST4	NST4-063014	6/30/2014	SedTrap	SD	RM 4.9 East	S Norfolk St CSO/PS17 EOF/SD	S Norfolk St at SE corner KC Airport	1,280,697.59	190,890.74
NST4	NST4-063014G	6/30/2014	Inline	SD	RM 4.9 East	S Norfolk St CSO/PS17 EOF/SD	S Norfolk St at SE corner KC Airport	1,280,697.59	190,890.74
NST4	NST4-052115	5/21/2015	SedTrap	SD	RM 4.9 East	S Norfolk St CSO/PS17 EOF/SD	S Norfolk St at SE corner KC Airport	1,280,697.59	190,890.74
NST4	NST4-052115G	5/21/2015	Inline	SD	RM 4.9 East	S Norfolk St CSO/PS17 EOF/SD	S Norfolk St at SE corner KC Airport	1,280,697.59	190,890.74
NST4	NST4-051216	5/12/2016	SedTrap	SD	RM 4.9 East	S Norfolk St CSO/PS17 EOF/SD	S Norfolk St at SE corner KC Airport	1,280,697.59	190,890.74
NST4	NST4-051216G	5/12/2016	Inline	SD	RM 4.9 East	S Norfolk St CSO/PS17 EOF/SD	S Norfolk St at SE corner KC Airport	1,280,697.59	190,890.74
NST5	NST5-063014	6/30/2014	SedTrap	SD	RM 4.9 East	S Norfolk St CSO/PS17 EOF/SD	E Marginal Wy S at S Norfolk St	1,279,322.05	190,882.62
NST5	NST5-051815	5/18/2015	SedTrap	SD	RM 4.9 East	S Norfolk St CSO/PS17 EOF/SD	E Marginal Wy S at S Norfolk St	1,279,322.05	190,882.62
NST5	NST5-050916	5/9/2016	SedTrap	SD	RM 4.9 East	S Norfolk St CSO/PS17 EOF/SD	E Marginal Wy S at S Norfolk St	1,279,322.05	190,882.62
RCB299	RCB299-042716	4/27/2016	RCB	SD	RM 4.9 East	S Norfolk St CSO/PS17 EOF/SD	RCB at the intersection of Merton Way S and MLK Jr Way S	1,283,050.60	192,037.67

**Table F-1.
SPU Source Tracing Sample Locations (2014-2016)**

Station ID	Sample No.	Date	Type	Sewer Type	Source Control Area	Outfall	Location	X Coordinate	Y Coordinate
RCB300	RCB300-050416	5/4/2016	RCB	SD	RM 4.9 East	S Norfolk St CSO/PS17 EOF/SD	NE corner of intersection, RCB in righthand lane of NB MLK Jr Way S	1,283,266.01	190,705.16
RCB301	RCB301-050416	5/4/2016	RCB	SD	RM 4.9 East	S Norfolk St CSO/PS17 EOF/SD	RCB at curb line of righthand NB lane of MLK Jr Way S	1,283,207.68	191,612.01
RCB302	RCB302-050416	5/4/2016	RCB	SD	RM 4.9 East	S Norfolk St CSO/PS17 EOF/SD	RCB at curbline in righthand NB lane of MLK at 9250 MLK Jr Way S	1,283,097.32	192,436.88
RCB303	RCB303-050416	5/4/2016	RCB	SD	RM 4.9 East	S Norfolk St CSO/PS17 EOF/SD	RCB in righthand northbound lane at 9242 MLK Jr Way S	1,283,058.85	192,717.44
RCB304	RCB304-050416	5/4/2016	RCB	SD	RM 4.9 East	S Norfolk St CSO/PS17 EOF/SD	RCB in righthand northbound lane of MLK Jr Way S	1,283,038.14	193,009.72
RCB305	RCB305-050516	5/5/2016	RCB	SD	RM 4.9 East	S Norfolk St CSO/PS17 EOF/SD	RCB in righthand SB lane of MLK at 9645 MLK Jr Way S	1,283,157.56	191,386.16
PS1	PS1-051214	5/12/2014	Inline	CS	RM 3.4-3.8 West	CS-1	NW corner of the Basin Oil property close to 17th Ave S and ~70 feet south of the intersection with Dallas Ave S	1,275,181.84	195,464.73
PS2	PS2-051214	5/12/2014	Inline	CS	RM 3.4-3.8 West	CS-1	SE corner of the bend in Dallas Ave S, east of the SE corner of the Basin Oil property	1,275,355.29	195,250.46
96-ST1	96-ST1-050914	5/9/2014	SedTrap	SD	RM 3.8-4.2 West	S 96th St SD	Driveway north of S 96th Street, west of West Marginal Place S	1,275,063.56	192,278.28
96-ST1	96-ST1-050914G	5/9/2014	Inline	SD	RM 3.8-4.2 West	S 96th St SD	Driveway north of S 96th Street, west of West Marginal Place S	1,275,063.56	192,278.28
96-ST2	96-ST2-051914	5/19/2014	SedTrap	SD	RM 3.8-4.2 West	S 96th St SD	S 96th Street east of West Marginal Place S	1,274,675.40	192,704.99
96-ST2	96-ST2-051914G	5/19/2014	Inline	SD	RM 3.8-4.2 West	S 96th St SD	S 96th Street east of West Marginal Place S	1,274,675.40	192,704.99
96-ST3	96-ST3-050914	5/9/2014	SedTrap	SD	RM 3.8-4.2 West	S 96th St SD	Vault at 4th Avenue S and S 96th Street	1,270,741.32	192,246.67
96-ST3	96-ST3-050914G	5/9/2014	Inline	SD	RM 3.8-4.2 West	S 96th St SD	Vault at 4th Avenue S and S 96th Street	1,270,741.32	192,246.67
HC-ST1	HCST1-052314	5/23/2014	SedTrap	SD	RM 4.2-5.8 West	Hamm Creek	Culvert under Des Moines Memorial Dr S near 17th Pl S	1,275,382.75	190,530.64

RCB = right-of-way catch basin

SD = storm drain

ODS = dirt sample collected near a catch basin or other storm drain structure

Table F-2. SPU Source Tracing Sample Results (2014 - 2016)

Station ID	Source Control Area	Outfall	Type	Date Sampled	Total Organic Carbon (%)	Arsenic (mg/kg DW)	Barium (mg/kg DW)	Cadmium (mg/kg DW)	Chromium (mg/kg DW)	Copper (mg/kg DW)	Lead (mg/kg DW)	Mercury (mg/kg DW)	Silver (mg/kg DW)	Zinc (mg/kg DW)	Diesel Range HC* (mg/kg DW)	Motor Oil Range HC* (mg/kg DW)
SCO					NA	57	NA	5.1	260	390	450	0.41	6.1	410	2,000	2,000
CSL					NA	93	NA	6.7	270	390	530	0.59	6.1	960	2,000	2,000
CB2	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	3/13/2014	13.6	24 J				1,160	260	0.22		1,830	6,100	13,000
CB27b	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	3/30/2016	11.1	5.4				179	104	0.090		668	6,900	28,000
CB83	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	4/8/2016	8.93	10 U				185	981	0.070		343	710	4,100
CB121	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	9/23/2016		10										
CB176	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	2/26/2014	11.1	19				132	93	0.21		934	1,900	10,000
CB177	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	2/26/2014	17.5	11				185	80	0.31		1,080	3,500	14,000
CB178	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	2/26/2014	15.7	6.7				156	50	0.07		683	5,800	13,000
CB179	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	2/27/2014	15.8	7.6				144	103	0.13		791	2,100	13,000
CB180	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	2/27/2014	13.5	7.6				151	189	0.18		939	1,800	9,900
CB181	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	3/4/2014												
CB182	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	3/4/2014												
CB185	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	6/12/2015	22.2	10 U	75	0.50 U	25	48	16	0.060 U	0.70 U	187	2,700	5,100
CB220	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	3/7/2014	18.5	8.0 U				93	63	0.050		2,240	2,700	14,000
CB221	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	3/7/2014	15	10 U				94	146	0.070		367	3,600	8,000
CB222	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	3/7/2014	16.4	11				139	220	0.11		909	3,900	7,800
CB223	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	3/7/2014	15.9	10 U				117	357	0.34		763	1,700	10,000
CB224	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	3/7/2014	8.11	7.3				211	89	0.14		998	1,000	6,200
CB225	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	3/7/2014	4.37	9.0 U				119	79	0.050		608	730	3,800
CB226	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	3/7/2014	11.1	10 U				115	76	0.070		1,360	810	3,200
CB227	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	3/7/2014	1.23	6.0 U				17	8.0	0.030 U		97	100 U	870
CB230	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	3/21/2014	9.85	10				67	68	0.050 U		404	2,100	8,300
CB231	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	3/21/2014	20.8	3.8				124	85	0.090		509	2,500	14,000
CB232	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	4/16/2014	2.73	10				43	18	0.030 U		293	450	1,400
CB237	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	12/21/2016	13.9											
CB240	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	4/4/2014	5.23	10				41	22	0.020 U		307	660	1,800
CB240	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	4/4/2014	6.28	9.0				44	23	0.020 U		330	780	2,000
CB240	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	7/21/2016	8.04	7.0 U				60	31	0.030		476	260	2,600
CB241	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	4/4/2014	3.94	20				374	136	0.17		4,000	1,400	4,000
CB241	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	7/21/2016	10.1	10 U				336	121	0.090		3,520	510	2,600
CB242	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	4/4/2014	2.77	10				143	97	0.10		1,900	1,000	2,400
CB243	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	4/10/2014	11	19				1,160	109	0.54		554	2,500	13,000
CB244	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	4/10/2014	10	20				114 J	63 J	0.060 J		906	6,000	12,000
CB245	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	4/10/2014	5.03	14				63 J	111 J	0.26 J		475	530	4,300
CB246	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	5/17/2014												
CB247	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	5/17/2014												
CB248	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	5/17/2014												
CB248	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	7/21/2016	12.7	11				178	105	0.41		1,960	690	3,100
CB250	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	4/16/2014	13.4	20 U				128	42	0.080 U		955	7,100	9,300
CB251	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	4/16/2014	8.82	20 U				198	107	0.080 U		1,020	2,300	8,000
CB251	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	5/14/2014												
CB252	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	5/8/2014	5.02	14	106	0.70	29	56	50	0.10 J	0.40 U	248 J	650	2,800
CB253	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	5/8/2014	5.61	20	215	4.0	61	185	223	1.15 J	3.1	1,040 J	3,700	19,000
CB254	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	5/8/2014	26.8	20				957	367	11.5 J		1,610 J	25,000	90,000
CB255	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	6/11/2014	11.8	4.1				420	46	0.4		596	2,900	7,000

Table F-2. SPU Source Tracing Sample Results (2014 - 2016)

Station ID	Source Control Area	Outfall	Type	Date Sampled	Total Organic Carbon (%)	Arsenic (mg/kg DW)	Barium (mg/kg DW)	Cadmium (mg/kg DW)	Chromium (mg/kg DW)	Copper (mg/kg DW)	Lead (mg/kg DW)	Mercury (mg/kg DW)	Silver (mg/kg DW)	Zinc (mg/kg DW)	Diesel Range HC* (mg/kg DW)	Motor Oil Range HC* (mg/kg DW)
SCO					NA	57	NA	5.1	260	390	450	0.41	6.1	410	2,000	2,000
CSL					NA	93	NA	6.7	270	390	530	0.59	6.1	960	2,000	2,000
CB260	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	5/14/2014												
CB260	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	ODS	6/29/2016	3.36	30				120	30	0.09 U		677	400	1,600
CB261	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	5/14/2014												
CB267	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	11/6/2015	16.2	10				180	224 J	0.080		1,940	1,200	5,500
CB268	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	11/6/2015	7.18	40				501	1,040 J	25		12,100	1,000	2,300
CB271	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	6/29/2016	8.64	30				784	176 J	0.12		1,450	79	690
CB273	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	7/13/2016	10.3	7.0 U				174 J	76	0.030		617	6,000	22,000
CB275	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	6/29/2016	3.67	7.0 U				77	34	0.030 U		420	340	1,800
CB281	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	2/11/2016		4.7									2,100	8,900
CB290	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	4/1/2016	7.61	16				134 J	87	0.12		613	940	3,900
CB291	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	4/15/2016	10.1	10 U				120	51	0.090		492	290	2,000
CB295	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	4/8/2016	3.78	10				142	264	0.070		363	360	1,500
CB311	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	6/29/2016	6.7	10 U				116	59	0.040 U		845	1,000	4,500
CB312	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	8/18/2016	18.2	15.8				203	120	0.451		2,890	1,780 J	5,740
CB313	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	8/18/2016	10.4	11.2 J				204	129	0.184		2,060	1,390	5,820
CB314	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	9/1/2016	3.83	14				129	83	0.051		8,620	865	2,160
CB315	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	9/1/2016	18.2	13				626	286	0.18		1,480		
CB317	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	9/30/2016	2.25	9.8				65	21	0.022 U		263	82	629
CB319	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	11/7/2016	4.33	8.5 U				129	67	0.16		3,440	1,570	5,660
CB320	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	11/7/2016	7.02	8.6 U				196	217	0.20		2,670	1,320	5,660
CB321	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	11/16/2016	6.91											
MH18	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	Inline	5/14/2014	5.05	18				121	102	0.44		310	850	3,200
MH18	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	Inline	4/6/2016	10.7	36				255	478	1.1		600	750	2,800
MH37	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	Inline	10/15/2015	5.47	20				227	103	0.17		1,460	1,300	5,100
ODS11	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	ODS	9/30/2016	2.66	9.01				71	58.5	0.076		278	206	1,270
ODS15	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	ODS	11/16/2016												
ODS16	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	ODS	11/16/2016	10.8											
ODS17	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	ODS	11/16/2016	4.43											
ODS18	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	ODS	11/16/2016	6.63											
ODS19	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	ODS	11/15/2016												
ODS20	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	ODS	11/15/2016												
ODS21	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	ODS	11/15/2016												
ODS27	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	ODS	11/10/2016	9.81											
ODS28	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	ODS	11/10/2016	9.32											
ODS29	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	ODS	11/10/2016	9.11											
ODS30	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	ODS	11/10/2016	14.5											
ODS37	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	ODS	12/14/2016												
ODS7	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	ODS	2/24/2016	1.17	5 U				36.1	29	0.02 U		240	150	830
OWSC	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	Inline	10/15/2015	8.73	31				395	660	70 U		2,240	3,900	6,700
OWSE	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	Inline	10/15/2015	6.27	13				917	588	1.1		5,210	27,000	12,000
RCB36	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	RCB	4/16/2014	2.8	18				86	69	0.15		324	1,200	4,400
RCB51	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	RCB	5/14/2014												
RCB57	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	RCB	4/2/2014	12.6	20 U				258	128 J	0.10		1,220	3,100	13,000
RCB58	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	RCB	4/2/2014	12.8	10				1,500	262 J	0.080		1,230	3,500	14,000

Table F-2. SPU Source Tracing Sample Results (2014 - 2016)

Station ID	Source Control Area	Outfall	Type	Date Sampled	Total Organic Carbon (%)	Arsenic (mg/kg DW)	Barium (mg/kg DW)	Cadmium (mg/kg DW)	Chromium (mg/kg DW)	Copper (mg/kg DW)	Lead (mg/kg DW)	Mercury (mg/kg DW)	Silver (mg/kg DW)	Zinc (mg/kg DW)	Diesel Range HC* (mg/kg DW)	Motor Oil Range HC* (mg/kg DW)
SCO					NA	57	NA	5.1	260	390	450	0.41	6.1	410	2,000	2,000
CSL					NA	93	NA	6.7	270	390	530	0.59	6.1	960	2,000	2,000
RCB59	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	RCB	4/2/2014	10.3	10 U				136	60 J	0.060		834	3,000	18,000
RCB60	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	RCB	4/2/2014	5.8	9.0 U				962	56 J	0.19		529	1,500	5,000
RCB67	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	RCB	12/21/2016	4.18											
RCB72	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	RCB	12/21/2016	19.7											
RCB215	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	RCB	5/17/2014												
RCB215	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	RCB	7/21/2016	3.86	6.0 U				51	30	0.030		528	550	1,900
RCB217	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	RCB	8/11/2016	2.42	8.71 U				31.6	52.6	0.046 U		299	2,020	2,820
RCB251	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	RCB	12/21/2016	22.2											
RCB293	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	RCB	4/16/2014	3.53	20				270	41	0.04		398	420	1,900
RCB296	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	RCB	4/15/2016	5.92	9.0 U				69	40	0.060		294	560	3,700
RCB306	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	RCB	6/13/2014	8.74	10 U				73.4	52	0.05 U		905	1,300	3,900
RCB306	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	RCB	8/11/2016		3.8										
RCB309	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	RCB	9/30/2016	3.16	10				100	55	0.046		285	464	2,620
ST1	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	SedTrap	5/19/2014	1.94	20				172	123	0.24		695	1,600	5,000
ST1	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	Inline	5/19/2014	0.72	23				72	30	0.55		170	92	440
ST1	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	SedTrap	5/22/2015	7.5	20				152	82	0.78		556	1,300	4,900
ST1	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	Inline	5/22/2015	1.21	7.0				42	24	0.060		134	120	1,400
ST1	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	SedTrap	5/9/2016	9.65	10				160	88	0.18		714	570	2,800
ST1	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	Inline	5/9/2016	0.624	26				59	23	0.13		158	39	220
ST7	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	SedTrap	5/9/2014	13.1	19				174	86	0.13		607	610	2,400
ST7	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	Inline	5/9/2014	1.01	16				60	368	0.020 U		205	69	670
ST7	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	SedTrap	5/18/2015	6.85	8.0				76	43	0.070		270	860	3,000
ST7	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	Inline	5/18/2015	0.628	6.0 U				32	13	0.030 U		120	92	490
ST7	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	SedTrap	5/9/2016	3.32	9.0				87	60	0.070		350	250	1,400
ODS8	RM 1.7-2.0 East	Michigan CSO	ODS	2/24/2016	3.87	7 U				48.6	95	0.08		189	300	1,000
ODS38	RM 2.0-2.3 East	S Brighton St SD	ODS	12/14/2016												
ODS38	RM 2.0-2.3 East	S Brighton St SD	ODS	12/22/2016	3.56											
RCB178	RM 2.0-2.3 East	S Brighton St SD	RCB	12/22/2016	7.02											
CB202	RM 2.0-2.3 East	S River St SD	RCB	2/23/2016	3.18	23				96	45 J	0.050		399	890	4,500
CB270	RM 2.0-2.3 East	S River St SD	CB	2/23/2016	4.44	14				156	93 J	0.090		1,140	2,000	4,400
CB288	RM 2.0-2.3 East	S River St SD	CB	2/23/2016	6.65	50				271	142 J	4.4		2,020	1,600	6,800
CB289	RM 2.0-2.3 East	S River St SD	CB	2/23/2016	5.91	20				193	124 J	0.11		1,270	970	3,800
MH211	RM 2.0-2.3 East	S River St SD	Inline	4/1/2016	3.13	8.0				92	20	0.030		386	340	1,400
MH220	RM 2.0-2.3 East	S River St SD	Inline	3/24/2016	6.93	10				103	87	0.070		433	650	3,000
ODS10	RM 2.0-2.3 East	S River St SD	ODS	4/1/2016	1.6	12				74	25	0.020 U		212	120	580
ODS9	RM 2.0-2.3 East	S River St SD	ODS	3/24/2016	11.6	9.9				218	108	0.130		1,460	1,000	5,300
RCB77	RM 2.0-2.3 East	S River St SD	RCB	3/24/2016	11.8	10 U				120	68	0.10		727	1,900	6,600
RCB78	RM 2.0-2.3 East	S River St SD	RCB	3/24/2016	5.8	22				151	88	0.030 U		705	600	2,900
RCB79	RM 2.0-2.3 East	S River St SD	RCB	3/24/2016	3.48	7.0 U				65	24	0.020 U		296	1,100	3,700
RCB81	RM 2.0-2.3 East	S River St SD	RCB	4/1/2016	3.33	19				94	61	0.040		296	690	3,200
RCB192	RM 2.0-2.3 East	S River St SD	RCB	4/1/2016	10.6	8.0 U				68	35	0.040		273	930	2,800
STRANS1	RM 2.3-2.8 East	S Garden St SD	ODS	3/14/2014		1,270				159,000	31,900	0.380		65,200		
STRANS2	RM 2.3-2.8 East	S Garden St SD	ODS	3/17/2014												
STRANS2	RM 2.3-2.8 East	S Garden St SD	ODS	3/17/2014												

Table F-2. SPU Source Tracing Sample Results (2014 - 2016)

Station ID	Source Control Area	Outfall	Type	Date Sampled	Total Organic Carbon (%)	Arsenic (mg/kg DW)	Barium (mg/kg DW)	Cadmium (mg/kg DW)	Chromium (mg/kg DW)	Copper (mg/kg DW)	Lead (mg/kg DW)	Mercury (mg/kg DW)	Silver (mg/kg DW)	Zinc (mg/kg DW)	Diesel Range HC* (mg/kg DW)	Motor Oil Range HC* (mg/kg DW)
SCO					NA	57	NA	5.1	260	390	450	0.41	6.1	410	2,000	2,000
CSL					NA	93	NA	6.7	270	390	530	0.59	6.1	960	2,000	2,000
STRANS2	RM 2.3-2.8 East	S Garden St SD	ODS	3/17/2014		22				899	747	0.71		1,250		
RCB65	RM 2.3-2.8 East	S Myrtle St SD	RCB	2/5/2015	7.27	20	413	6.1	105	382	334	0.69	0.70	2,470	2,000	7,100
SL4-T6	RM 2.8 East	I-5 SD at Slip 4	SedTrap	4/24/2014	2.48	17				142	133	0.040		918 J	720	3,100
SL4-T6	RM 2.8 East	I-5 SD at Slip 4	SedTrap	5/18/2015	4.9	11				157	68	0.070		503	1,300	3,400
SL4-T6	RM 2.8 East	I-5 SD at Slip 4	SedTrap	5/9/2016	2.72	9.0				110	55	0.040		445		1,300
MH23	RM 2.8 East	Slip 4	Inline	6/20/2014	3.77	10 U				153	143	0.17		878	1,500	7,900
CB78	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	CB	6/25/2015	2.53	4.3 J				3,590	40	0.040		1,330	940	3,200
CB189	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	CB	4/23/2015	4.62	2.8			525	643	40	0.12		593	1,200	4,400
CB189	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	CB	4/6/2016	2.85	2.7				1,560	35	0.11		483	380	2,800
CB193	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	CB	6/22/2015	5.1	30	1,130	0.90 U	129	171	42	0.10	1.0 U	1,160	9,500	16,000
CB195	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	CB	6/22/2015	5.06	20	201	1.6	68	96	81	0.20	1.0 U	1,810	280	1,900
CB196	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	CB	6/22/2015	1.57	12	117	0.30	26	27	34	0.11	0.40 U	79	68	140
CB197	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	CB	7/15/2015	2.65	20				82	43	0.04		362	1,000	3,300
CB198	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	CB	7/15/2015	2.79	20				112	62	0.030 U		277	270	1,400
CB199	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	CB	7/15/2015	10.6	20				563	60	0.070		1,000	700	3,000
CB210	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	CB	7/29/2015	16.3	20				172	74	0.10		1,120	1,100	3,300
CB214	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	CB	7/29/2015	13.1	10 U				84	100	0.060 UJ		950 J	790	3,800
CB215	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	CB	7/29/2015	5.88	30				94	85	0.080		1,570	160	780
CB216	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	CB	7/29/2015	4.74	17				142	133	0.080		1,130	300	1,200
CB217	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	CB	8/5/2015	7.52	11				163	58	0.13 J		386	600	2,100
CB218	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	CB	8/7/2015	1.51	6.4				106	138	0.10		2,220	250	1,000
CB219	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	CB	8/7/2015	5.17	20				387	158	0.090		1,200	1,100	3,200
CB228	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	CB	7/17/2015	4.33	11				190	15	0.030		247 J	770	2,500
CB233	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	CB	5/27/2015	4.61	10 U				120	56	0.060		441	1,000	3,800
CB234	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	CB	6/25/2015	11.4	20				97	63	0.170		516	940	4,700
CB235	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	CB	6/25/2015	11.9	13.3 J				83	29	0.090 U		881	2,700	13,000
CB236	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	CB	8/5/2015	8.96	20				121	78	0.080		964	1,600	4,500
CB264	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	CB	7/17/2015	4.95	20				105	70	0.060		748	2,500	7,200
CB296	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	CB	4/27/2016	4.62	30				133	44	0.030 U		602	250	1,200
MH7	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	Inline	4/6/2016	0.99	6.0 U				28	43	0.030		132	76	370
MH54	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	Inline	5/4/2016	0.62	10 U				27	10	0.040		168	60 U	120 U
MH55	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	Inline	5/5/2016	4.06	9.0				61	31	0.070		797	360	1,600
NST1	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	SedTrap	6/30/2014	4.14	10				139	67	0.12		858	1,800	7,200
NST1	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	Inline	6/30/2014	2.89	10 U				102	49	0.070		639		
NST1	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	SedTrap	5/21/2015	12.3	20				164	79	0.15		889	1,000	4,400
NST1	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	Inline	5/21/2015	7.32	20				105	62	0.11		598	2,300	6,800
NST1	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	SedTrap	5/10/2016	9.1	10				120	57	0.11		695	740	3,400
NST1	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	Inline	5/10/2016	5.6	20				137	72	0.11		879	840	3,500
NST2	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	SedTrap	6/30/2014	10.5	20				178	180	0.24		2,390	1,200	4,300
NST2	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	Inline	6/30/2014	0.567	12				54	74	0.030 U		446	2,100	8,500
NST2	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	SedTrap	5/18/2015	20.4	30				196	207	0.28		1,890	66	370
NST2	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	Inline	5/18/2015	1.1	10 U				80 J	23 J	0.020 U		170 J	88	330
NST2	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	SedTrap	5/9/2016	10.3	30				249	227	0.24		2,850		
NST2	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	Inline	5/9/2016	0.544	20				78	79	0.17		532	25	150

Table F-2. SPU Source Tracing Sample Results (2014 - 2016)

Station ID	Source Control Area	Outfall	Type	Date Sampled	Total Organic Carbon (%)	Arsenic (mg/kg DW)	Barium (mg/kg DW)	Cadmium (mg/kg DW)	Chromium (mg/kg DW)	Copper (mg/kg DW)	Lead (mg/kg DW)	Mercury (mg/kg DW)	Silver (mg/kg DW)	Zinc (mg/kg DW)	Diesel Range HC* (mg/kg DW)	Motor Oil Range HC* (mg/kg DW)
SCO					NA	57	NA	5.1	260	390	450	0.41	6.1	410	2,000	2,000
CSL					NA	93	NA	6.7	270	390	530	0.59	6.1	960	2,000	2,000
NST3	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	SedTrap	5/23/2014	1.77	21				207	95	0.12		1,300	280	1,600
NST3	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	Inline	5/23/2014	3.57	10				28	17	0.030 U		158	82	500
NST3	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	SedTrap	5/22/2015	5.1	8.0 U				76	36	0.060		358	540	2,500
NST3	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	Inline	5/22/2015	1.15	7.0				37	15	0.030		191	120	780
NST3	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	SedTrap	5/12/2016	2.49	7.0				48	26	0.030 U		228	74	570
NST4	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	SedTrap	6/30/2014	4.28	20				86	120	0.20		275		
NST4	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	Inline	6/30/2014	1.1	9.0 U				32	59	0.060		136	76 J	420
NST4	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	SedTrap	5/21/2015	5.34	40 U				59	100	0.20 U		195		
NST4	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	Inline	5/21/2015	1.63	9.0				28	48	0.060		116	86	340
NST4	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	SedTrap	5/12/2016	6.52	20 U				73	163	0.13		226		
NST4	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	Inline	5/12/2016	1.05	9.0 U				30	56	0.050		130	23	140
NST5	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	SedTrap	6/30/2014	3.33	30				127	533	0.15		1,670		
NST5	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	SedTrap	5/18/2015												
NST5	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	SedTrap	5/9/2016	6.69											
ODS2	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	ODS	9/1/2015	2.8	20				197	112	0.170		2,210	400	1,700
ODS4	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	ODS	9/9/2015	2.95	10 U				89	27	0.060		286	440	2,300
RCB299	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	RCB	4/27/2016	7.57	10 U				92	81	0.040 U		1,500	260	1,800
RCB300	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	RCB	5/4/2016	5.99	10 U				193	54	0.050		612	2,100	7,500
RCB301	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	RCB	5/4/2016	14.3	9.0				291	37	0.050		722	1,200	3,700
RCB302	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	RCB	5/4/2016	2.66	9.0				44	14	0.020 U		305	250	1,000
RCB303	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	RCB	5/4/2016	3.74	11				53	16	0.030 U		596	280	1,100
RCB304	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	RCB	5/4/2016	6.87	10				92	35	0.040 U		537	590	2,700
RCB305	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	RCB	5/5/2016	9.46	9.0 U				104	31	0.040 U		357	650	3,500
ID-ST1	RM 0.0-1.0 West	SW Idaho St SD	SedTrap	5/19/2014	4.72	30				139	98	0.23		1,110	2,200	5,700
ID-ST1	RM 0.0-1.0 West	SW Idaho St SD	SedTrap	5/21/2015	18											
ID-ST1	RM 0.0-1.0 West	SW Idaho St SD	SedTrap	5/11/2016	8.09	20				125	86	0.18		923	490	2,400
ID-ST2	RM 0.0-1.0 West	SW Idaho St SD	SedTrap	5/19/2014	0.973	15				31	20	0.050		122	87	340
ID-ST2	RM 0.0-1.0 West	SW Idaho St SD	SedTrap	5/21/2015	1.5	9.0				29	15	0.060		101	65	250
ID-ST2	RM 0.0-1.0 West	SW Idaho St SD	SedTrap	5/10/2016	0.754	6.0 U				20	11	0.030		74	10	53
ID-ST3	RM 0.0-1.0 West	SW Idaho St SD	SedTrap	5/23/2014	3.28	19				35	50	0.11		275	180	1,000
ID-ST3	RM 0.0-1.0 West	SW Idaho St SD	SedTrap	5/22/2015	3.17	15				26	59	0.080		167	180	960
ID-ST3	RM 0.0-1.0 West	SW Idaho St SD	SedTrap	5/11/2016	2.3	10				37	46	0.19		230	180	660
HP-ST4	RM 1.6-2.1 West	Highland Park Wy SW SD	SedTrap	5/19/2014	0.967	13				64	36	0.030 U		89	170	770
HP-ST4	RM 1.6-2.1 West	Highland Park Wy SW SD	SedTrap	5/18/2015	8.98	9.0				38	40	0.050		212	700	2,300
HP-ST4	RM 1.6-2.1 West	Highland Park Wy SW SD	SedTrap	5/10/2016	8.43	6.0 U				20	11	0.030 U		85	40	290
HP-ST6	RM 1.6-2.1 West	Highland Park Wy SW SD	SedTrap	6/30/2014	7.71	30				129	200	0.25		888	530	2,000
HP-ST6	RM 1.6-2.1 West	Highland Park Wy SW SD	Inline	6/30/2014	1.59	10				85	52	0.040		678	300	1,500
HP-ST6	RM 1.6-2.1 West	Highland Park Wy SW SD	SedTrap	5/18/2015	11.9	50				131	200	0.27		759	1,300	4,500
HP-ST6	RM 1.6-2.1 West	Highland Park Wy SW SD	Inline	5/18/2015	2.35	7 U				52	40	0.060		495	170	750
HP-ST6	RM 1.6-2.1 West	Highland Park Wy SW SD	SedTrap	5/10/2016	10.9	30				113	160	0.24		793	560	2,800
ODS1	RM 1.6-2.1 West	Highland Park Wy SW SD	ODS	9/26/2014		5 U				16	46	0.02 U		287		
KN-ST1	RM 1.6-2.1 West	SW Kenny St SD/T115 CSO	SedTrap	6/30/2014	3.35	20				87	57	0.15		445	900	2,400
KN-ST1	RM 1.6-2.1 West	SW Kenny St SD/T115 CSO	SedTrap	5/18/2015	4.44	19				64	42	0.14		324	520	2,000
KN-ST1	RM 1.6-2.1 West	SW Kenny St SD/T115 CSO	SedTrap	5/10/2016	2.74	13				64	39	0.11		299	250	1,200

Table F-2. SPU Source Tracing Sample Results (2014 - 2016)

Station ID	Source Control Area	Outfall	Type	Date Sampled	Total Organic Carbon (%)	Arsenic (mg/kg DW)	Barium (mg/kg DW)	Cadmium (mg/kg DW)	Chromium (mg/kg DW)	Copper (mg/kg DW)	Lead (mg/kg DW)	Mercury (mg/kg DW)	Silver (mg/kg DW)	Zinc (mg/kg DW)	Diesel Range HC* (mg/kg DW)	Motor Oil Range HC* (mg/kg DW)
SCO					NA	57	NA	5.1	260	390	450	0.41	6.1	410	2,000	2,000
CSL					NA	93	NA	6.7	270	390	530	0.59	6.1	960	2,000	2,000
1st-ST1	RM 2.1 West	1st Ave S SD, west	SedTrap	5/23/2014	13.3	20				123	61	0.22		2,010	3,000	12,000
1st-ST1	RM 2.1 West	1st Ave S SD, west	SedTrap	5/22/2015	10.8	20				259	110	0.23		1,310	2,800	13,000
1st-ST1	RM 2.1 West	1st Ave S SD, west	SedTrap	5/12/2016	15.5	10				239	107	0.31		1,420	1,100	6,600
1st-ST2	RM 2.1 West	1st Ave S SD, west	SedTrap	5/22/2015	5.59	10 U				75	73	0.14		362	890	3,000
1st-ST2	RM 2.1 West	1st Ave S SD, west	SedTrap	5/12/2016	6.81	10 U				83	78	0.13		442	280	1,900
1st-ST3	RM 2.1 West	1st Ave S SD, west	SedTrap	5/19/2014	2.45	12				37	5.0	0.030 U		165	120	760
1st-ST3	RM 2.1 West	1st Ave S SD, west	Inline	5/19/2014	2.53	11				41	6.0	0.030 U		236	140	820
1st-ST3	RM 2.1 West	1st Ave S SD, west	Inline	5/21/2015	0.516	6.0				55	5.0	0.030 U		255	150	830
1st-ST3	RM 2.1 West	1st Ave S SD, west	SedTrap	5/21/2015	3.61	8.0				30	8.0	0.040		258	400	1,600
1st-ST3	RM 2.1 West	1st Ave S SD, west	SedTrap	5/11/2016	1.59	6.0 U				37	6.0	0.030 U		200	50	350
1st-ST3	RM 2.1 West	1st Ave S SD, west	Inline	5/11/2016	0.755	6.0 U				37	5.0	0.020 U		164	25	220
1st-ST7	RM 2.1 West	1st Ave S SD, west	SedTrap	5/19/2014	5.28	20				197	163	0.18		604	1,700	4,700
1st-ST7	RM 2.1 West	1st Ave S SD, west	SedTrap	5/21/2015	16.8	20				149	261	0.25		919	2,500	10,000
1st-ST7	RM 2.1 West	1st Ave S SD, west	SedTrap	5/11/2016		11				157	201	0.26		901	1,000	6,000
CB108	RM 2.1-2.2 West	2nd Ave S SD	CB	5/14/2015	8.89	7.0 U				218	35	0.030 U		216	1,600	6,500
CB263	RM 2.1-2.2 West	2nd Ave S SD	CB	5/14/2015	9.42	6.7 J				158	33	0.10		302	2,000	6,600
RCB139	RM 2.1-2.2 West	2nd Ave S SD	RCB	12/21/2016	6.15											
RCB203	RM 2.1-2.2 West	2nd Ave S SD	RCB	12/21/2016	2.11											
CB262	RM 2.2-3.4 West	7th Ave S SD	CB	5/13/2015	10.8	30			62.5	257	225	0.14		674	890	3,800
CB318	RM 2.2-3.4 West	7th Ave S SD	CB	9/30/2016	2.45	5.4				171	96.1	0.024 U		415	117	763
7th-ST1	RM 2.2-3.4 West	7th Ave S SD	SedTrap	5/18/2015	1.44	7.0				20	6	0.030 U		54	91	250
7th-ST1	RM 2.2-3.4 West	7th Ave S SD	Inline	5/18/2015	0.896	7.0 U				34	14	0.040		99	170	620
7th-ST1	RM 2.2-3.4 West	7th Ave S SD	SedTrap	5/9/2016	8.25	30				142	68	0.18		496		
7th-ST1	RM 2.2-3.4 West	7th Ave S SD	Inline	5/9/2016	1.43	9.0				51	25	0.070		176		
7th-ST2	RM 2.2-3.4 West	7th Ave S SD	SedTrap	5/9/2014	12.3	40 U				38	20	0.050		183	64	200
7th-ST2	RM 2.2-3.4 West	7th Ave S SD	SedTrap	5/21/2015	6.04	20				21	20	0.060		170	85	340
7th-ST2	RM 2.2-3.4 West	7th Ave S SD	SedTrap	5/10/2016	5.43	30				26	30	0.13		250		
7th-ST2	RM 2.2-3.4 West	7th Ave S SD	Inline	5/10/2016	0.173	10 U				11	6 U	0.03 U		72		
7th-ST3	RM 2.2-3.4 West	7th Ave S SD	SedTrap	5/21/2015	10.2	30				137	103	0.26		659	860	3,600
7th-ST3	RM 2.2-3.4 West	7th Ave S SD	SedTrap	5/11/2016	10.5	30				136	88	0.20		628		
ODS22	RM 2.2-3.4 West	7th Ave S SD	ODS	11/15/2016	0.22											
ODS23	RM 2.2-3.4 West	7th Ave S SD	ODS	11/15/2016	0.81											
ODS24	RM 2.2-3.4 West	7th Ave S SD	ODS	11/15/2016	0.57											
ODS25	RM 2.2-3.4 West	7th Ave S SD	ODS	11/15/2016	0.34											
ODS26	RM 2.2-3.4 West	7th Ave S SD	ODS	11/15/2016	0.54											
ODS42	RM 2.2-3.4 West	7th Ave S SD	ODS	12/15/2016	4.13											
ODS43	RM 2.2-3.4 West	7th Ave S SD	ODS	12/15/2016	1.67											
ODS44	RM 2.2-3.4 West	7th Ave S SD	ODS	12/15/2016	6.21											
ODS45	RM 2.2-3.4 West	7th Ave S SD	ODS	12/29/2016	1.72	6.73				22	18.6	0.02 U		105	347	2,140
RCB61	RM 2.2-3.4 West	7th Ave S SD	RCB	6/13/2014	4.16	10	144	1.5	71	177	90	0.040 U	0.60 U	1,670	2,800	9,900
RCB61	RM 2.2-3.4 West	7th Ave S SD	RCB	9/11/2014	6.7	9.0 U	136	1.4	93	186	85	0.060	0.50 U	1,450	1,800	8,800
RCB62	RM 2.2-3.4 West	7th Ave S SD	RCB	6/13/2014	3.74	10 U	121	0.70	60	110	43	0.13	0.70 U	293	1,200	5,700
RCB62	RM 2.2-3.4 West	7th Ave S SD	RCB	9/11/2014	2.3	8.0 U	103	0.50	60	100	32	0.060	0.50 U	255	670	3,900
RCB63	RM 2.2-3.4 West	7th Ave S SD	RCB	6/13/2014	3.75	9.0	117	0.80	57	128	93	0.070	0.50 U	351	1,100	4,300

Table F-2. SPU Source Tracing Sample Results (2014 - 2016)

Station ID	Source Control Area	Outfall	Type	Date Sampled	Total Organic Carbon (%)	Arsenic (mg/kg DW)	Barium (mg/kg DW)	Cadmium (mg/kg DW)	Chromium (mg/kg DW)	Copper (mg/kg DW)	Lead (mg/kg DW)	Mercury (mg/kg DW)	Silver (mg/kg DW)	Zinc (mg/kg DW)	Diesel Range HC* (mg/kg DW)	Motor Oil Range HC* (mg/kg DW)
SCO					NA	57	NA	5.1	260	390	450	0.41	6.1	410	2,000	2,000
CSL					NA	93	NA	6.7	270	390	530	0.59	6.1	960	2,000	2,000
RCB63	RM 2.2-3.4 West	7th Ave S SD	RCB	9/11/2014	5.48	9.0 U	117	0.70	72	138	95	0.050	0.50 U	393	820	4,800
RCB64	RM 2.2-3.4 West	7th Ave S SD	RCB	6/13/2014	4.25	10	122	0.90	64	147	155	0.11	0.60 U	464	1,600	6,700
RCB64	RM 2.2-3.4 West	7th Ave S SD	RCB	9/11/2014	6.22	9.0 U	113	0.80	65	128	143	0.060	0.50 U	616	1,500	8,100
RCB70	RM 2.2-3.4 West	7th Ave S SD	RCB	12/21/2016	2.74											
RCB71	RM 2.2-3.4 West	7th Ave S SD	RCB	12/21/2016	12.1											
RCB165	RM 2.2-3.4 West	7th Ave S SD	RCB	6/13/2014	8.74	10 U				73	52	0.050 U		905	1,300	3,900
RCB229	RM 2.2-3.4 West	CS-1	RCB	12/29/2016	1.79											
ODS39	RM 2.2-3.4 West	CSO	ODS	12/15/2016	11											
ODS40	RM 2.2-3.4 West	8th Ave S	ODS	11/15/2016	15											
ODS41	RM 2.2-3.4 West	8th Ave S	ODS	12/15/2016	10											
ODS50	RM 2.2-3.4 West	8th Ave S	ODS	12/22/2016	2.91											
RCB73	RM 2.2-3.4 West	8th Ave S	RCB	12/21/2016	11.1							0.727 J				
RCB74	RM 2.2-3.4 West	8th Ave S	RCB	12/22/2016	2.77											
RCB278	RM 2.2-3.4 West	8th Ave S	RCB	12/22/2016	12.5											
RCB279	RM 2.2-3.4 West	8th Ave S	RCB	12/29/2016	1.84											
RCB310	RM 2.2-3.4 West	8th Ave S	RCB	12/29/2016	5.89							0.211 J				
RCB311	RM 2.2-3.4 West	8th Ave S	RCB	12/29/2016	0.86							0.0349 J				
RCB298	RM 2.2-3.4 West	S Webster St SD	RCB	4/6/2016	5.43	8.0 U				66	19	0.030		201	400	1,700
PS1	RM 3.4-3.8 West	CS-1	Inline	5/12/2014	6.67	20				364	164	0.11		1,330	2,500	11,000
PS2	RM 3.4-3.8 West	CS-1	Inline	5/12/2014	6.14	20				176	95	0.090		847	2,000	9,500
96-ST1	RM 3.8-4.2 West	S 96th St SD	SedTrap	5/9/2014	6.09	40				78	60	0.090		902	1,200	2,400
96-ST1	RM 3.8-4.2 West	S 96th St SD	Inline	5/9/2014	1.01	23				49	58	0.030		365	250	1,000
96-ST2	RM 3.8-4.2 West	S 96th St SD	SedTrap	5/19/2014	4.03	21				64	61	0.070		718	280	1,000
96-ST2	RM 3.8-4.2 West	S 96th St SD	Inline	5/19/2014	0.704	12				19	22	0.030 U		348	33	130
96-ST3	RM 3.8-4.2 West	S 96th St SD	SedTrap	5/9/2014	3.85	30				41	46	0.11		160	120	390
96-ST3	RM 3.8-4.2 West	S 96th St SD	Inline	5/9/2014	4.19	10				9	7.0	0.030 U		47	7.9	33
HC-ST1	RM 4.2-5.8 West	Hamm Creek	SedTrap	5/23/2014	0.821	12				15	12	0.020 U		93	34	140

Source: Seattle Public Utilities

Bold text indicates chemical was detected.

Not detected; reporting limit is above the SCO

Exceeds SCO

Exceeds CSL/RAL/MTCA Method A

* MTCA Method A Soil Cleanup Level

mg/kg DW - milligram per kilogram dry weight

ug/kg DW - microgram per kilogram dry weight

BEHP - bis(2-ethylhexyl)phthalate

HC - hydrocarbon

LPAH - Low molecular weight polycyclic aromatic hydrocarbon

HPAH - High molecular weight polycyclic aromatic hydrocarbon

cPAH - carcinogenic polycyclic aromatic hydrocarbon

PCB - polychlorinated biphenyl

NA - Not applicable

Table F-2. SPU Source Tracing Sample Results (2014 - 2016)

Station ID	Source Control Area	Outfall	Type	Date Sampled	Aroclor 1242 (ug/kg DW)	Aroclor 1248 (ug/kg DW)	Aroclor 1254 (ug/kg DW)	Aroclor 1260 (ug/kg DW)	Total PCBs (ug/kg DW)	1-Methyl-naphthalene (ug/kg DW)	2-Methyl-naphthalene (ug/kg DW)	Acenaphthene (ug/kg DW)	Acenaphthylene (ug/kg DW)	Anthracene (ug/kg DW)	Fluorene (ug/kg DW)
SCO					NA	NA	NA	NA	130	NA	670	500	1,300	960	540
CSL					NA	NA	NA	NA	1,000	NA	670	500	1,300	960	540
CB2	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	3/13/2014	19 U	190 U	580	390	970	460	830	330 U	330 U	250 J	260 J
CB27b	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	3/30/2016	20 U	40 U	120 J	120	240 J	1,100 U	450 J	1,100 U	1,100 U	390 J	1,100 U
CB83	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	4/8/2016	19 U	19 U	42	18 J	60 J	120 U	64 J	120 U	120 U	120 U	120 U
CB121	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	9/23/2016											
CB176	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	2/26/2014	19 U	67	180	130	377	520 U	520 U	520 U	520 U	520 U	520 U
CB177	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	2/26/2014	20 U	98 U	1,300	270 J	1,570 J	280 U	140 J	280 U	280 U	280 U	150 J
CB178	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	2/26/2014	20 U	58	130	82	270	540 U	540 U	540 U	540 U	540 U	540 U
CB179	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	2/27/2014	19 U	48 U	100	66	166	810 U	810 U	810 U	810 U	810 U	810 U
CB180	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	2/27/2014	19 U	95 U	300	150 J	450 J	790 U	790 U	790 U	790 U	790 U	790 U
CB181	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	3/4/2014											
CB182	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	3/4/2014											
CB185	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	6/12/2015	19 U	24 U	42 J	19 U	42 J	180 U	81 J	180 U	180 U	72 J	54 J
CB220	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	3/7/2014	19 U	29 U	31	68	99	580 U	580 U	580 U	580 U	410 J	580 U
CB221	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	3/7/2014	90 U	90 U	98	93	191	460 J	760 J	5,700	840 U	18,000	7,600
CB222	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	3/7/2014	110 U	110 U	98 J	110	208 J	1,500 U	1,500 U	2,800	1,500 U	12,000	3,600
CB223	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	3/7/2014	19 U	49 U	150	110	260	630 U	630 U	630 U	630 U	630 U	630 U
CB224	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	3/7/2014	19 U	48 U	76	47	123	580 U	580 U	580 U	580 U	580 U	580 U
CB225	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	3/7/2014	19 U	19 U	41	36	77	350 U	350 U	350 U	350 U	350 U	350 U
CB226	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	3/7/2014	18 U	18 U	78	140	218	280 U	280 U	280 U	280 U	280 U	280 U
CB227	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	3/7/2014	19 U	19 U	19 U	19 U	19 U	110 U	110 U	110 U	110 U	110 U	110 U
CB230	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	3/21/2014	19 U	19 U	22	16 J	38 J	190 U	190 U	190 U	190 U	140 J	190 U
CB231	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	3/21/2014	19 U	24 U	160	130	290	890 U	890 U	890 U	890 U	890 U	890 U
CB232	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	4/16/2014	19 U	19 U	14 J	11 J	25 J	100 U	100 U	100 U	100 U	100 U	100 U
CB237	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	12/21/2016	13.9	19 U	145 U	217	791						
CB240	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	4/4/2014	18 U	18 U	54 U	270	270	290 U	290 U	290 U	290 U	290 U	290 U
CB240	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	4/4/2014	18 U	18 U	35 U	120	120	280 U	280 U	280 U	280 U	280 U	280 U
CB240	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	7/21/2016	18 U	18 U	44 U	270	270	280 U	280 U	280 U	280 U	280 U	280 U
CB241	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	4/4/2014	180 U	180 U	1,400 U	10,000	10,000	780 U	780 U	780 U	780 U	780 U	780 U
CB241	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	7/21/2016	18 U	37 U	100 J	150	250 J	290 U	290 U	290 U	290 U	290 U	130 J
CB242	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	4/4/2014	96 U	96 U	960 U	6,200	6,200	620 U	620 U	620 U	620 U	620 U	620 U
CB243	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	4/10/2014	18 U	37 U	110	73 J	183 J	630 U	630 U	1,200	630 U	2,800	1,400
CB244	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	4/10/2014	20 U	24	48	51	123	650 U	650 U	650 U	650 U	650 U	650 U
CB245	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	4/10/2014	18 U	27 U	65	68	133	290 U	290 U	290 U	290 U	150 J	290 U
CB246	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	5/17/2014	860 U	860 U	4,300 U	32,000	32,000						
CB247	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	5/17/2014	180 U	180 U	1,800 U	14,000	14,000						
CB248	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	5/17/2014	200 U	200 U	800 U	2,900	2,900						
CB248	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	7/21/2016	1,200 U	1,200 U	2,500 U	30,000	30,000	300 U	300 U	300 U	300 U	88 J	120 J
CB250	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	4/16/2014	19 U	190 U	770	140 U	770	720 U	720 U	720 U	720 U	720 U	720 U
CB251	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	4/16/2014	1,200 U	6,000 U	49,000	96,000	145,000	630 J	1,100	660 U	660 U	660 U	660 U
CB251	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	5/14/2014	170 U	1,700 Y	12,000	4,100	16,100						
CB252	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	5/8/2014	20 U	40 U	170	150	320	140 U	140 U	140 U	140 U	140 U	140 U
CB253	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	5/8/2014	18 U	140 U	440	470	910	260 U	150 J	260 U	260 U	260 U	260 U
CB254	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	5/8/2014	19 U	480 U	2,500	2,800	5,300	710	1,200	490 U	490 U	710	320 J
CB255	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	6/11/2014	97 U	120 Y	240	100	340	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U

Table F-2. SPU Source Tracing Sample Results (2014 - 2016)

Station ID	Source Control Area	Outfall	Type	Date Sampled	Aroclor 1242 (ug/kg DW)	Aroclor 1248 (ug/kg DW)	Aroclor 1254 (ug/kg DW)	Aroclor 1260 (ug/kg DW)	Total PCBs (ug/kg DW)	1-Methyl-naphthalene (ug/kg DW)	2-Methyl-naphthalene (ug/kg DW)	Acenaphthene (ug/kg DW)	Acenaphthylene (ug/kg DW)	Anthracene (ug/kg DW)	Fluorene (ug/kg DW)
SCO					NA	NA	NA	NA	130	NA	670	500	1,300	960	540
CSL					NA	NA	NA	NA	1,000	NA	670	500	1,300	960	540
CB260	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	5/14/2014	750 U	2,200 Y	21,000	7,900 J	28,900 J						
CB260	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	ODS	6/29/2016	19 U	19 U	580	280	860	20 U	20 U	20 U	20 U	17 J	20 U
CB261	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	5/14/2014	310 U	3,100 Y	28,000	11,000	39,000						
CB267	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	11/6/2015	19 U	29 U	59	38	97	2,000 U	2,000 U	2,000 U	2,000 U	2,000 U	2,000 U
CB268	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	11/6/2015	19 U	140 J	340	740	1,220 J	290 U	290 U	290 U	290 U	350	290 U
CB271	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	6/29/2016	18 U	230 U	420	210	630	97 U	53 J	78 J	97 U	97	97 U
CB273	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	7/13/2016	19 U	19 U	47	20	20	1,800	3,700	450 U	450 U	140 J	270 J
CB275	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	6/29/2016	20 U	29 U	64	55 J	119 J	98 U	64 J	98 U	98 U	34 J	59 J
CB281	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	2/11/2016											
CB290	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	4/1/2016	19 U	57 U	92	65	157	230 U	230 U	230 U	80 J	240	230 U
CB291	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	4/15/2016	20 U	20 U	53	59 U	53	240 U	240 U	240 U	240 U	280	120 J
CB295	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	4/8/2016	19 U	19 U	35	20	55	110 U	110 U	110 U	110 U	110 U	110 U
CB311	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	6/29/2016	18 U	27 U	100	120 J	220 J	97 U	97 U	97 U	97 U	97 U	97 U
CB312	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	8/18/2016	19.4 U	97 U	3,000	341	3,341	193 U	193 U	193 U	193 U	193 U	193 U
CB313	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	8/18/2016	29.4 U	19.6 U	83.6	39.3 U	83.6	195 U	69.9 J	69.3 J	56.9 J	59.4 J	82.5 J
CB314	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	9/1/2016	7.7 U	29 U	30	31	61	33 J	61	45 J	18 J	53 J	69
CB315	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	9/1/2016	7.5 U	57 U	57 U	94 U	94 U	19,400		864	112 U	233 J	2,880
CB317	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	9/30/2016	24 U	24 U	24 U	24 U	24 U	27.2 U	26 U	23.4 U	22 U	27 U	23 U
CB319	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	11/7/2016	39 U	146 U	557	816	1,373	52.6 U	50 U	45.3 U	42 U	52 U	44 U
CB320	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	11/7/2016	37.5 U	328 U	2,000	1,570	3,570	53.3 J	109 J	43.6 U	62 J	50 U	50 J
CB321	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	11/16/2016	19.8 U	29.7 U	113	609 J	722 J						
MH18	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	Inline	5/14/2014	87 U	1,800	900	360	3,060	200	290	370	200 U	690	350
MH18	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	Inline	4/6/2016	2,000	190 U	1,800	550	4,350	290 U	290 U	310	290 U	510	280 J
MH37	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	Inline	10/15/2015	18 U	18 U	18 U	11 J	11 J	96 U	91 J	96 U	91 J	130	62 J
ODS11	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	ODS	9/30/2016	25.5 U	25.5 U	43.3	55.6	98.9	20.1	23.1	22.8	25	56.6	30.3
ODS15	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	ODS	11/16/2016	3,850 U	3,850 U	28,800 U	130,000	130,000						
ODS16	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	ODS	11/16/2016	43.7 U	131 U	1,920	31,500	1,920						
ODS17	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	ODS	11/16/2016	17.5 U	17.5 U	143	825	968						
ODS18	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	ODS	11/16/2016	19.6 U	19.6 U	71.6	934 J	1,005.6 J						
ODS19	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	ODS	11/15/2016											
ODS20	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	ODS	11/15/2016											
ODS21	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	ODS	11/15/2016											
ODS27	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	ODS	11/10/2016	387 U	387 U	5950	1360 U	5,950						
ODS28	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	ODS	11/10/2016	19.2 U	47.9 U	412	133	545						
ODS29	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	ODS	11/10/2016	372 U	372 U	372 U	1670 U	372 U						
ODS30	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	ODS	11/10/2016	95.7 U	95.7 U	312	95.7 U	312						
ODS37	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	ODS	12/14/2016	19.1 U	41.7	199	238 J	478.7 J						
ODS7	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	ODS	2/24/2016	18 U	18 U	18 U	18 U	18 U	92 U	92 U	92 U	92 U	92 U	92 U
OWSC	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	Inline	10/15/2015	19 U	19 U	16 J	48	64 J	480 U	480 U	270 J	480 U	650	270 J
OWSE	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	Inline	10/15/2015	200 U	5,900	2,700	1,100	9,700	560 U	560 U	560 U	560 U	980	560 U
RCB36	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	RCB	4/16/2014	18 U	130 U	420	130	550	80 J	130	300	95 U	90 J	90 J
RCB51	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	RCB	5/14/2014	18 U	54 Y	290	210	500						
RCB57	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	RCB	4/2/2014	19 U	38 U	97	70	167	260 J	390	310 U	310 U	310 U	310 U
RCB58	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	RCB	4/2/2014	18 U	92 U	380	300	680	130 J	260	260 U	260 U	260 U	260 U

Table F-2. SPU Source Tracing Sample Results (2014 - 2016)

Station ID	Source Control Area	Outfall	Type	Date Sampled	Aroclor 1242 (ug/kg DW)	Aroclor 1248 (ug/kg DW)	Aroclor 1254 (ug/kg DW)	Aroclor 1260 (ug/kg DW)	Total PCBs (ug/kg DW)	1-Methyl-naphthalene (ug/kg DW)	2-Methyl-naphthalene (ug/kg DW)	Acenaphthene (ug/kg DW)	Acenaphthylene (ug/kg DW)	Anthracene (ug/kg DW)	Fluorene (ug/kg DW)
SCO					NA	NA	NA	NA	130	NA	670	500	1,300	960	540
CSL					NA	NA	NA	NA	1,000	NA	670	500	1,300	960	540
RCB59	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	RCB	4/2/2014	20 U	20 U	40 U	76	76	480 U	480 U	480 U	480 U	480 U	480 U
RCB60	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	RCB	4/2/2014	18 U	37 U	130	89	219	48 J	100	210	160	2,000	290
RCB67	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	RCB	12/21/2016	19.4 U	19.4 U	28.2	24.2	52.4						
RCB72	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	RCB	12/21/2016	19.3 U	35	66	149.3	149.3						
RCB215	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	RCB	5/17/2014	19 U	19 U	20	74	94						
RCB215	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	RCB	7/21/2016	20 U	20 U	20 U	27	27	27 J	51 J	60 U	60 U	27 J	15 J
RCB217	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	RCB	8/11/2016	18.2 U	27.4 U	27.4 U	18.2 J	18.2 J	294	598	108	97 U	75.8 J	97 U
RCB251	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	RCB	12/21/2016	19.7 U	20 U	49.1 U	35	35						
RCB293	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	RCB	4/16/2014	18 U	34	46	24	104	57 U	52 J	57 U	57 U	52 J	29 J
RCB296	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	RCB	4/15/2016	19 U	47 U	170	130	300	260 U	260 U	150 J	260 U	300	180 J
RCB306	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	RCB	6/13/2014	19 U	140 U	1400	1800 J	3,200 J	36	56	26 J	22 J	89	60
RCB306	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	RCB	8/11/2016											
RCB309	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	RCB	9/30/2016	24.8 U	25 U	37	36	73	28.2 U	27 U	24 U	23 U	28 U	24 U
ST1	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	SedTrap	5/19/2014	18 U	370 U	280	94	374	150 U	150	150 U	150 U	260	80 J
ST1	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	Inline	5/19/2014	20 U	20 U	19 J	20 U	19 J	93 U	93 U	93 U	93 U	93 U	93 U
ST1	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	SedTrap	5/22/2015	20 U	140	130	44	314	190 U	68 J	68 J	190 U	120 J	190 U
ST1	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	Inline	5/22/2015	18 U	18 U	37 J	20 J	57 J	77 U	77 U	38 J	77 U	130 J	42 J
ST1	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	SedTrap	5/9/2016	19 U	75 U	130	120 J	250 J	290 U	290 U	290 U	290 U	290 U	290 U
ST1	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	Inline	5/9/2016	19 U	19 U	26	19 U	26	19 U	19 U	19 U	19 U	19 U	19 U
ST7	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	SedTrap	5/9/2014	19 U	57 U	120	38	158	280 U	280 U	280 U	280 U	280 U	280 U
ST7	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	Inline	5/9/2014	73 J	20 U	20	20 U	93 J	60 U	60 U	60 U	60 U	60 U	60 U
ST7	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	SedTrap	5/18/2015	19 U	78	89	30 J	197 J	250 U	250 U	250 U	250 U	250 U	63 J
ST7	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	Inline	5/18/2015	20 U	20 U	19 J	20 U	19 J	5.8 J	11 J	11 J	19 U	6.8 J	9.7 J
ST7	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	SedTrap	5/9/2016	18 U	46 U	90	18 U	90	300 U	300 U	300 U	300 U	300 U	300 U
ODS8	RM 1.7-2.0 East	Michigan CSO	ODS	2/24/2016	19 U	29 U	110	61	171	95 U	29 J	95 U	95 U	95 U	95 U
ODS38	RM 2.0-2.3 East	S Brighton St SD	ODS	12/14/2016	74,500	2,450 U	12,300 U	2,450 U	74,500						
ODS38	RM 2.0-2.3 East	S Brighton St SD	ODS	12/22/2016	19 U	81.1	130	149 J	360.1 J						
RCB178	RM 2.0-2.3 East	S Brighton St SD	RCB	12/22/2016	18 U	261	195	106 J	562 J						
CB202	RM 2.0-2.3 East	S River St SD	RCB	2/23/2016	19 U	47 U	56 J	31	87 J	280 U	280 U	280 U	280 U	140 J	280 U
CB270	RM 2.0-2.3 East	S River St SD	CB	2/23/2016	19 U	56 U	100	54	154	290 U	88 J	100 J	290 U	380	160 J
CB288	RM 2.0-2.3 East	S River St SD	CB	2/23/2016	20 U	49 U	260 J	72	332 J	220 U	220 U	220 U	64 J	220	86 J
CB289	RM 2.0-2.3 East	S River St SD	CB	2/23/2016	20 U	98	130	77	305	320 U	130 J	320 U	320 U	110 J	140 J
MH211	RM 2.0-2.3 East	S River St SD	Inline	4/1/2016	19 U	19 U	28	25	53	230 U	230 U	230 U	230 U	230 U	230 U
MH220	RM 2.0-2.3 East	S River St SD	Inline	3/24/2016	20 U	30 U	90 J	110	200 J	240 U	240 U	240 U	240 U	130 J	240 U
ODS10	RM 2.0-2.3 East	S River St SD	ODS	4/1/2016	17 U	17 U	15 J	23	38 J	56 U	56 U	56 U	42 J	59	56 U
ODS9	RM 2.0-2.3 East	S River St SD	ODS	3/24/2016	18 U	110	130	120	360	290 U	290 U	290 U	73 J	250 J	290 U
RCB77	RM 2.0-2.3 East	S River St SD	RCB	3/24/2016	19 U	65 U	94	100	194	290 U	290 U	290 U	130 J	600	290 U
RCB78	RM 2.0-2.3 East	S River St SD	RCB	3/24/2016	18 U	27 U	64	41	105	230 U	230 U	81 J	69 J	160 J	120 J
RCB79	RM 2.0-2.3 East	S River St SD	RCB	3/24/2016	19 U	19 U	84 J	27	111 J	220 U	220 U	220 U	220 U	78 J	220 U
RCB81	RM 2.0-2.3 East	S River St SD	RCB	4/1/2016	19 U	19 U	37	43	80	280 U	280 U	280 U	280 U	110 J	280 U
RCB192	RM 2.0-2.3 East	S River St SD	RCB	4/1/2016	19 U	47 U	60	54	114	300 U	300 U	300 U	300 U	1,300	180 J
STRANS1	RM 2.3-2.8 East	S Garden St SD	ODS	3/14/2014											
STRANS2	RM 2.3-2.8 East	S Garden St SD	ODS	3/17/2014											
STRANS2	RM 2.3-2.8 East	S Garden St SD	ODS	3/17/2014											

Table F-2. SPU Source Tracing Sample Results (2014 - 2016)

Station ID	Source Control Area	Outfall	Type	Date Sampled	Aroclor 1242 (ug/kg DW)	Aroclor 1248 (ug/kg DW)	Aroclor 1254 (ug/kg DW)	Aroclor 1260 (ug/kg DW)	Total PCBs (ug/kg DW)	1-Methyl-naphthalene (ug/kg DW)	2-Methyl-naphthalene (ug/kg DW)	Acenaphthene (ug/kg DW)	Acenaphthylene (ug/kg DW)	Anthracene (ug/kg DW)	Fluorene (ug/kg DW)
SCO					NA	NA	NA	NA	130	NA	670	500	1,300	960	540
CSL					NA	NA	NA	NA	1,000	NA	670	500	1,300	960	540
STRANS2	RM 2.3-2.8 East	S Garden St SD	ODS	3/17/2014											
RCB65	RM 2.3-2.8 East	S Myrtle St SD	RCB	2/5/2015	930	19 U	670	150	1,750	110 J	220	140 U	36 J	140 J	86 J
SL4-T6	RM 2.8 East	I-5 SD at Slip 4	SedTrap	4/24/2014	58 U	19 U	440	320	760	61 J	96	61 J	71 U	86	71
SL4-T6	RM 2.8 East	I-5 SD at Slip 4	SedTrap	5/18/2015	17 U	64	73	34 J	171 J	85 J	120 J	85 J	240 U	220 J	97 J
SL4-T6	RM 2.8 East	I-5 SD at Slip 4	SedTrap	5/9/2016	20 U	29 U	45	35	80	97 U	49 J	97 U	97 U	63 J	58 J
MH23	RM 2.8 East	Slip 4	Inline	6/20/2014	19 U	120	240	180	540	620 U	620 U	620 U	620 U	680	620 U
CB78	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	CB	6/25/2015	18 U	18 U	35	23	58	40 J	62 J	110 U	110 U	200	96 J
CB189	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	CB	4/23/2015	18 U	18 U	42	44	86	110 U	110 U	110 U	110 U	110 U	110 U
CB189	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	CB	4/6/2016	19 U	19 U	50	31	81	300 U	300 U	300 U	300 U	300 U	300 U
CB193	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	CB	6/22/2015	19 U	19 U	29 U	24 U	29 U	230 U	230 U	230 U	230 U	230 U	230 U
CB195	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	CB	6/22/2015	19 U	19 U	48 J	34	82 J	120 U	47 J	120 U	120 U	35 J	120 U
CB196	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	CB	6/22/2015	19 U	19 U	57	22	79	19 U	9.7 J	19 U	19 U	16 J	19 U
CB197	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	CB	7/15/2015	19 U	480 U	2,100	140 U	2,100	29 J	49 J	23 J	17 J	52 J	37 J
CB198	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	CB	7/15/2015	19 U	47 U	92	94 U	92	110 U	110 U	56 J	110 U	190	66 J
CB199	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	CB	7/15/2015	18 U	27 U	78	250	328	180	170 U	170 U	170 U	67 J	76 J
CB210	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	CB	7/29/2015	19 U	19 U	47 J	15 J	62 J	150 U	75 J	150 U	150 U	100 J	52 J
CB214	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	CB	7/29/2015	18 U	18 U	57 J	30	87 J	34 J	57 J	34 J	110 U	63 J	110 U
CB215	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	CB	7/29/2015	20 U	30 U	79	42	121	99 U	99 U	99 U	99 U	99 U	99 U
CB216	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	CB	7/29/2015	18 U	44 U	150	37	187	94 U	94 U	94 U	94 U	94 U	94 U
CB217	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	CB	8/5/2015	18 U	36 U	230	69	299	77 U	77 U	77 U	77 U	84	77 U
CB218	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	CB	8/7/2015	19 U	19 U	19 U	15 J	15 J	19 U	16 J	19 U	19 U	19 U	19 U
CB219	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	CB	8/7/2015	19 U	240 U	300	190 J	490 J	490 U	490 U	490 U	490 U	490 U	490 U
CB228	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	CB	7/17/2015	18 U	18 U	33	18 U	33	120 U	59 J	35 J	47 J	53 J	120 U
CB233	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	CB	5/27/2015	19 UJ	19 U	11 J	19 U	11 J	44 J	78 J	39 J	110 U	66 J	44 J
CB234	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	CB	6/25/2015	18 U	46 J	53 J	12 J	111 J	200 U	60 J	200 U	200 U	200 U	200 U
CB235	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	CB	6/25/2015	18 U	28 U	42 J	18 J	60 J	340 U	340 U	340 U	340 U	340 U	340 U
CB236	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	CB	8/5/2015	20 U	29 U	45	49	94	120 U	120 U	120 U	120 U	120 U	120 U
CB264	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	CB	7/17/2015	20 U	30 U	43 J	18 J	61 J	300 U	88 J	300 U	300 U	300 U	130 J
CB296	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	CB	4/27/2016	18 U	93	140	18 U	233	120 U	120 U	210	120 U	740	200
MH7	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	Inline	4/6/2016	17 U	17 U	17 U	17 U	17 U	110 U	110 U	110 U	110 U	110 U	110 U
MH54	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	Inline	5/4/2016	20 U	20 U	20 U	20 U	20 U	18 U	18 U	18 U	18 U	18 U	18 U
MH55	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	Inline	5/5/2016	89 U	240	460	89 U	700	110 U	110 U	110 U	110 U	74 J	110 U
NST1	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	SedTrap	6/30/2014	19 U	95 U	420	84	504	190 U	110 J	210	190 U	420	210
NST1	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	Inline	6/30/2014	20 U	49 Y	180	37	217	100 U	65 J	75 J	100 U	120	70 J
NST1	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	SedTrap	5/21/2015	20 U	150 U	400	82 J	482 J	300 U	300 U	100 J	300 U	190 J	120 J
NST1	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	Inline	5/21/2015	19 U	57 U	180	62 J	242 J	120 U	110 J	58 J	58 J	160	52 J
NST1	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	SedTrap	5/10/2016	18 U	74 U	240	61	301	120 U	120 U	120 U	120 U	160	58 J
NST1	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	Inline	5/10/2016	20 U	20 U	580	99 U	580	200 U	200 U	200 U	200 U	140 J	89 J
NST2	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	SedTrap	6/30/2014	20 U	79 U	170	140	310	600 U	600 U	600 U	600 U	600 U	600 U
NST2	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	Inline	6/30/2014	18 U	18 U	18 U	18 U	18 U	19 U	19 U	19 U	19 U	19 U	19 U
NST2	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	SedTrap	5/18/2015	19 U	47 U	110	120 J	230 J	570 U	570 U	570 U	570 U	570 U	570 U
NST2	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	Inline	5/18/2015	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U	31	7.8 J
NST2	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	SedTrap	5/9/2016	19 U	57 U	84	70 J	154 J	320 U	320 U	320 U	320 U	320 U	320 U
NST2	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	Inline	5/9/2016	20 U	20 U	20 U	20 U	20 U	19 U	19 U	19 U	19 U	6.8 J	19 U

Table F-2. SPU Source Tracing Sample Results (2014 - 2016)

Station ID	Source Control Area	Outfall	Type	Date Sampled	Aroclor 1242 (ug/kg DW)	Aroclor 1248 (ug/kg DW)	Aroclor 1254 (ug/kg DW)	Aroclor 1260 (ug/kg DW)	Total PCBs (ug/kg DW)	1-Methyl-naphthalene (ug/kg DW)	2-Methyl-naphthalene (ug/kg DW)	Acenaphthene (ug/kg DW)	Acenaphthylene (ug/kg DW)	Anthracene (ug/kg DW)	Fluorene (ug/kg DW)
SCO					NA	NA	NA	NA	130	NA	670	500	1,300	960	540
CSL					NA	NA	NA	NA	1,000	NA	670	500	1,300	960	540
NST3	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	SedTrap	5/23/2014	19 U	19 U	19 UJ	19 U	19 U	62 U	40 J	62 U	62 U	62 U	62 U
NST3	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	Inline	5/23/2014	17 U	17 U	17 U	17 U	17 U	56 U	56 U	56 U	56 U	56 U	56 U
NST3	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	SedTrap	5/22/2015	19 U	19 U	19 U	19 U	19 U	120 U	120 U	120 U	120 U	34 J	120 U
NST3	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	Inline	5/22/2015	17 U	17 U	17 U	17 U	17 U	77 U	34 J	77 U	19 J	77 UJ	19 J
NST3	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	SedTrap	5/12/2016	19 U	19 U	19 U	19 U	19 U	500	600	4,600	80 J	7,700	4,400
NST4	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	SedTrap	6/30/2014	20 U	20 U	80	56	136	330 U	330 U	330 U	330 U	330 U	330 U
NST4	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	Inline	6/30/2014	20 U	20 U	24	18 J	42 J	20 U	14 J	18 J	15 J	91	15 J
NST4	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	SedTrap	5/21/2015	20 U	20 U	59 J	36	95 J	120 U	46 J	120 U	120 U	130	120 U
NST4	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	Inline	5/21/2015	19 U	19 U	18 J	19 J	37 J	9.4 J	18 J	11 J	10 J	31	11 J
NST4	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	SedTrap	5/12/2016	20 U	20 U	120	60	180	100 U	100 U	100 U	100 U	78 J	100 U
NST4	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	Inline	5/12/2016	18 U	18 U	15 J	12 J	27 J	56 U	34 J	56 U	56 U	40 J	56 U
NST5	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	SedTrap	6/30/2014	58 U	88 U	380	300	680						
NST5	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	SedTrap	5/18/2015	73 U	73 U	130 J	180	310 J						
NST5	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	SedTrap	5/9/2016	27 U	41 U	120	89	209						
ODS2	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	ODS	9/1/2015	19 U	28 U	94	35	129	42 J	77 J	120 U	71 J	95 J	120 U
ODS4	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	ODS	9/9/2015	19 U	19 U	42	16 J	58 J	21 U	12 J	35	9.4 J	79	28
RCB299	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	RCB	4/27/2016	20 U	36	60	20 U	96	300 U	300 U	300 U	300 U	300 U	300 U
RCB300	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	RCB	5/4/2016	19 U	46	38	26	110	490 U	490 U	490 U	490 U	490 U	490 U
RCB301	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	RCB	5/4/2016	18 U	31 U	53	21	74	470 U	470 U	470 U	470 U	470 U	470 U
RCB302	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	RCB	5/4/2016	19 U	19 U	32	19 U	32	120 U	120 U	120 U	120 U	120 U	120 U
RCB303	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	RCB	5/4/2016	18 U	18 U	21	18 U	21	110 U	110 U	110 U	110 U	110 U	110 U
RCB304	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	RCB	5/4/2016	19 U	20	32	12 J	64 J	120 U	120 U	120 U	120 U	120 U	120 U
RCB305	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	RCB	5/5/2016	92 U	120	210	92 U	330	120 U	120 U	120 U	120 U	120 U	120 U
ID-ST1	RM 0.0-1.0 West	SW Idaho St SD	SedTrap	5/19/2014	19 U	93 U	320	82	402	190 U	190 U	190 U	190 U	190 U	190 U
ID-ST1	RM 0.0-1.0 West	SW Idaho St SD	SedTrap	5/21/2015	20 U	99 U	310	74 J	384 J						
ID-ST1	RM 0.0-1.0 West	SW Idaho St SD	SedTrap	5/11/2016	19 U	29 U	200	75 J	275 J	140 U	140 U	140 U	140 U	42 J	140 U
ID-ST2	RM 0.0-1.0 West	SW Idaho St SD	SedTrap	5/19/2014	19 U	94 U	72	20	92	58 U	58 U	58 U	58 U	58 U	58 U
ID-ST2	RM 0.0-1.0 West	SW Idaho St SD	SedTrap	5/21/2015	18 U	46 U	40	18 U	40	6.8 J	12 J	19 U	19 U	5.8 J	19 U
ID-ST2	RM 0.0-1.0 West	SW Idaho St SD	SedTrap	5/10/2016	19 U	28 U	17 J	19 U	17 J	19 U	19 U	19 U	19 U	19 U	19 U
ID-ST3	RM 0.0-1.0 West	SW Idaho St SD	SedTrap	5/23/2014	19 U	19 U	23 UJ	13 J	13 J	58 U	58 U	58 U	58 U	58 U	58 U
ID-ST3	RM 0.0-1.0 West	SW Idaho St SD	SedTrap	5/22/2015	19 U	19 U	19 U	19 U	19 U	57 U	57 U	57 U	57 U	57 U	57 U
ID-ST3	RM 0.0-1.0 West	SW Idaho St SD	SedTrap	5/11/2016	20 U	20 U	22	17 J	39 J	99 U	99 U	99 U	99 U	99 U	99 U
HP-ST4	RM 1.6-2.1 West	Highland Park Wy SW SD	SedTrap	5/19/2014	17 U	17 U	34 U	17 U	34 U	57 U	57 U	57 U	57 U	57 U	57 U
HP-ST4	RM 1.6-2.1 West	Highland Park Wy SW SD	SedTrap	5/18/2015	18 U	18 U	34 J	18 U	34 J	110 U	32 J	110 U	110 U	110 U	110 U
HP-ST4	RM 1.6-2.1 West	Highland Park Wy SW SD	SedTrap	5/10/2016	18 U	18 U	13 J	18 U	13 J	60 U	60 U	60 U	60 U	60 U	60 U
HP-ST6	RM 1.6-2.1 West	Highland Park Wy SW SD	SedTrap	6/30/2014	19 U	150 J	130	87	367 J	97 U	97 U	130	97 U	82 J	120
HP-ST6	RM 1.6-2.1 West	Highland Park Wy SW SD	Inline	6/30/2014	19 U	94 Y	590	110	700	56 U	56 U	48 J	56 U	130	45 J
HP-ST6	RM 1.6-2.1 West	Highland Park Wy SW SD	SedTrap	5/18/2015	19 U	230	170	69 J	469 J	360 U	360 U	290 J	360 U	140 J	220 J
HP-ST6	RM 1.6-2.1 West	Highland Park Wy SW SD	Inline	5/18/2015	18 U	35 U	44	24	68	19 U	22	42	19 U	640	68
HP-ST6	RM 1.6-2.1 West	Highland Park Wy SW SD	SedTrap	5/10/2016	19 U	140 U	97	78	175	120 U	120 U	160	120 U	110 J	130
ODS1	RM 1.6-2.1 West	Highland Park Wy SW SD	ODS	9/26/2014	800 U	800 U	800 U	800 U	800 U	500 UJ	500 UJ	500 UJ	500 UJ	500 UJ	500 UJ
KN-ST1	RM 1.6-2.1 West	SW Kenny St SD/T115 CSO	SedTrap	6/30/2014	19 U	38 U	100	55	155	84 U	84 U	84 U	84 U	97	80 J
KN-ST1	RM 1.6-2.1 West	SW Kenny St SD/T115 CSO	SedTrap	5/18/2015	19 U	40	67	36 J	143 J	120 U	46 J	58 J	120 U	64 J	120 U
KN-ST1	RM 1.6-2.1 West	SW Kenny St SD/T115 CSO	SedTrap	5/10/2016	18 U	36 U	60	23	83	57 U	57 U	57 U	57 U	29 J	57 U

Table F-2. SPU Source Tracing Sample Results (2014 - 2016)

Station ID	Source Control Area	Outfall	Type	Date Sampled	Aroclor 1242 (ug/kg DW)	Aroclor 1248 (ug/kg DW)	Aroclor 1254 (ug/kg DW)	Aroclor 1260 (ug/kg DW)	Total PCBs (ug/kg DW)	1-Methyl-naphthalene (ug/kg DW)	2-Methyl-naphthalene (ug/kg DW)	Acenaphthene (ug/kg DW)	Acenaphthylene (ug/kg DW)	Anthracene (ug/kg DW)	Fluorene (ug/kg DW)
SCO					NA	NA	NA	NA	130	NA	670	500	1,300	960	540
CSL					NA	NA	NA	NA	1,000	NA	670	500	1,300	960	540
1st-ST1	RM 2.1 West	1st Ave S SD, west	SedTrap	5/23/2014	19 U	78	140 J	150	368 J	290 U	290 U	290 U	290 U	290 U	290 U
1st-ST1	RM 2.1 West	1st Ave S SD, west	SedTrap	5/22/2015	18 U	84 J	100 J	58	242 J	300 U	110 J	300 U	300 U	180 J	91 J
1st-ST1	RM 2.1 West	1st Ave S SD, west	SedTrap	5/12/2016	20 UJ	40 U	140	94	234	140 U	58 J	140 U	140 U	150	140 U
1st-ST2	RM 2.1 West	1st Ave S SD, west	SedTrap	5/22/2015	19 U	30	52	18 J	100 J	120 U	120 U	120 U	120 U	35 J	120 U
1st-ST2	RM 2.1 West	1st Ave S SD, west	SedTrap	5/12/2016	19 U	48 U	93	52 J	145 J	99 U	99 U	99 U	99 U	54 J	99 U
1st-ST3	RM 2.1 West	1st Ave S SD, west	SedTrap	5/19/2014	16 U	16 U	16 U	16 U	16 U	55 U	55 U	55 U	55 U	44 J	55 U
1st-ST3	RM 2.1 West	1st Ave S SD, west	Inline	5/19/2014	18 U	18 U	18 U	18 U	18 U	93 U	93 U	93 U	93 U	93 U	93 U
1st-ST3	RM 2.1 West	1st Ave S SD, west	Inline	5/21/2015	20 U	20 U	20 U	20 U	20 U	39 U	39 U	39 U	39 U	32 J	16 J
1st-ST3	RM 2.1 West	1st Ave S SD, west	SedTrap	5/21/2015	20 U	20 U	20 U	20 U	20 U	290 U	290 U	290 U	290 U	290 U	290 U
1st-ST3	RM 2.1 West	1st Ave S SD, west	SedTrap	5/11/2016	20 U	20 U	20 U	20 U	20 U	99 U	99 U	99 U	99 U	99 U	99 U
1st-ST3	RM 2.1 West	1st Ave S SD, west	Inline	5/11/2016	19 U	19 U	19 U	19 U	19 U	57 U	57 U	57 U	57 U	57 U	57 U
1st-ST7	RM 2.1 West	1st Ave S SD, west	SedTrap	5/19/2014	18 U	91 U	740	310	1,050	150 U	81 J	150 U	150 U	150 U	150 U
1st-ST7	RM 2.1 West	1st Ave S SD, west	SedTrap	5/21/2015	20 U	250 U	1,300	650 J	1,950 J	200 U	78 J	200 U	200 U	78 J	200 U
1st-ST7	RM 2.1 West	1st Ave S SD, west	SedTrap	5/11/2016	19 U	48 U	940	490	1,430	200 U	110 J	200 U	200 U	170 J	200 U
CB108	RM 2.1-2.2 West	2nd Ave S SD	CB	5/14/2015	18 U	18 U	33	64	97	59 U	59 U	59 U	59 U	59 U	59 U
CB263	RM 2.1-2.2 West	2nd Ave S SD	CB	5/14/2015	18 U	45 U	54 U	16 J	16 J	120	100 J	100 J	170	72 J	220
RCB139	RM 2.1-2.2 West	2nd Ave S SD	RCB	12/21/2016	18.2 U	36	105	106	300.8						
RCB203	RM 2.1-2.2 West	2nd Ave S SD	RCB	12/21/2016	17.1 U	59	52	72.8	186.6						
CB262	RM 2.2-3.4 West	7th Ave S SD	CB	5/13/2015	18 U	52	88	71	211	290 U	290 U	290 UJ	290 U	290 U	290 U
CB318	RM 2.2-3.4 West	7th Ave S SD	CB	9/30/2016	23.3 U	23 U	76 J	54	130 J	7.7 J	12 J	17 J	4.6 U	10 J	7.1 J
7th-ST1	RM 2.2-3.4 West	7th Ave S SD	SedTrap	5/18/2015	18 U	18 U	18 U	18 U	18 U	5.6 J	7.4 J	18 U	18 U	5.6 J	18 U
7th-ST1	RM 2.2-3.4 West	7th Ave S SD	Inline	5/18/2015	20 U	20 U	32 J	32 J	64 J	5.9 J	9.8 J	20 U	20 U	6.9 J	20 U
7th-ST1	RM 2.2-3.4 West	7th Ave S SD	SedTrap	5/9/2016	18 U	55 U	89	75	164	96 U	96 U	96 U	96 U	58 J	96 U
7th-ST1	RM 2.2-3.4 West	7th Ave S SD	Inline	5/9/2016	20 U	20 U	47	35	82	60 U	60 U	60 U	60 U	60 U	60 U
7th-ST2	RM 2.2-3.4 West	7th Ave S SD	SedTrap	5/9/2014	19 U	19 U	19 U	19 U	19 U	19 U	19 U	19 U	19 U	19 U	19 U
7th-ST2	RM 2.2-3.4 West	7th Ave S SD	SedTrap	5/21/2015	19 U	19 U	16 J	19 U	16 J	20 U	20 U	20 U	20 U	7.8 J	20 U
7th-ST2	RM 2.2-3.4 West	7th Ave S SD	SedTrap	5/10/2016	19 U	19 U	19 U	19 U	19 U	58 U	58 U	58 U	58 U	58 U	58 U
7th-ST2	RM 2.2-3.4 West	7th Ave S SD	Inline	5/10/2016	9.3 U	9.3 U	9.3 U	9.3 U	9.3 U	19 U	19 U	19 U	19 U	19 U	19 U
7th-ST3	RM 2.2-3.4 West	7th Ave S SD	SedTrap	5/21/2015	20 U	30 U	120 J	97 J	217 J	580 U	580 U	580 U	580 U	580 U	580 U
7th-ST3	RM 2.2-3.4 West	7th Ave S SD	SedTrap	5/11/2016	19 U	38 U	96 U	90	90	280 U	280 U	280 U	280 U	280 U	280 U
ODS22	RM 2.2-3.4 West	7th Ave S SD	ODS	11/15/2016	18.6 U	18.6 U	18.6 U	18.6 U	18.6 U						
ODS23	RM 2.2-3.4 West	7th Ave S SD	ODS	11/15/2016	19.3 U	19.3 U	19.3 U	22.9	22.9						
ODS24	RM 2.2-3.4 West	7th Ave S SD	ODS	11/15/2016	18.4 U	18.4 U	18.4 U	18.4 U	18.4 U						
ODS25	RM 2.2-3.4 West	7th Ave S SD	ODS	11/15/2016	18.7 U	18.7 U	18.7 U	18.7 U	18.7 U						
ODS26	RM 2.2-3.4 West	7th Ave S SD	ODS	11/15/2016	19.4 U	19.4 U	43.2	33.5	76.7						
ODS42	RM 2.2-3.4 West	7th Ave S SD	ODS	12/15/2016	188 U	188 U	621	2,030	2,651						
ODS43	RM 2.2-3.4 West	7th Ave S SD	ODS	12/15/2016	17 U	17 U	46.6	49.6	96.2						
ODS44	RM 2.2-3.4 West	7th Ave S SD	ODS	12/15/2016	17.2 U	17.2 U	79.2	425	504.2						
ODS45	RM 2.2-3.4 West	7th Ave S SD	ODS	12/29/2016	17 U	17 U	29.3	38	67.3	36.8 U	17.9 J	10.3 J	36.8 U	16.2 J	36.8 U
RCB61	RM 2.2-3.4 West	7th Ave S SD	RCB	6/13/2014	19 U	86 J	160	150	396 J	420 U	420 U	420 U	420 U	420 U	420 U
RCB61	RM 2.2-3.4 West	7th Ave S SD	RCB	9/11/2014	20 U	98 U	200	210	410	230 U	230 U	230 U	230 U	130 J	230 U
RCB62	RM 2.2-3.4 West	7th Ave S SD	RCB	6/13/2014	19 U	91	140 U	450	541	220 U	220 U	220 U	220 U	320	220 U
RCB62	RM 2.2-3.4 West	7th Ave S SD	RCB	9/11/2014	19 U	81	180	310	571	140 U	140 U	140 U	140 U	290	87 J
RCB63	RM 2.2-3.4 West	7th Ave S SD	RCB	6/13/2014	19 U	58	140	190	388	220 U	220 U	220 U	220 U	600	110 J

Table F-2. SPU Source Tracing Sample Results (2014 - 2016)

Station ID	Source Control Area	Outfall	Type	Date Sampled	Aroclor 1242 (ug/kg DW)	Aroclor 1248 (ug/kg DW)	Aroclor 1254 (ug/kg DW)	Aroclor 1260 (ug/kg DW)	Total PCBs (ug/kg DW)	1-Methyl-naphthalene (ug/kg DW)	2-Methyl-naphthalene (ug/kg DW)	Acenaphthene (ug/kg DW)	Acenaphthylene (ug/kg DW)	Anthracene (ug/kg DW)	Fluorene (ug/kg DW)
SCO					NA	NA	NA	NA	130	NA	670	500	1,300	960	540
CSL					NA	NA	NA	NA	1,000	NA	670	500	1,300	960	540
RCB63	RM 2.2-3.4 West	7th Ave S SD	RCB	9/11/2014	20 U	62 J	130	230	422 J	180 U	180 U	180 U	180 U	300	130 J
RCB64	RM 2.2-3.4 West	7th Ave S SD	RCB	6/13/2014	92 U	92 U	130	240	370	320 U	320 U	320 U	320 U	250 J	320 U
RCB64	RM 2.2-3.4 West	7th Ave S SD	RCB	9/11/2014	18 U	59	170	200	429	220 U	220 U	220 U	220 U	1,300	300
RCB70	RM 2.2-3.4 West	7th Ave S SD	RCB	12/21/2016	18 U	24	47.8	76.3	148.5						
RCB71	RM 2.2-3.4 West	7th Ave S SD	RCB	12/21/2016	19 U	57	166	643	866						
RCB165	RM 2.2-3.4 West	7th Ave S SD	RCB	6/13/2014	19 U	140 U	1,400	1,800 J	3,200 J	36	56	26 J	22 J	89	60
RCB229	RM 2.2-3.4 West	CS-1	RCB	12/29/2016	19 U	24	53	87	163.8						
ODS39	RM 2.2-3.4 West	CSO	ODS	12/15/2016	18 U	154	186	163	503						
ODS40	RM 2.2-3.4 West	8th Ave S	ODS	11/15/2016	1850 U	57,200	13,900 U	6,610	63,810						
ODS41	RM 2.2-3.4 West	8th Ave S	ODS	12/15/2016	885 U	39,500	11,100 U	7,410	46,910						
ODS50	RM 2.2-3.4 West	8th Ave S	ODS	12/22/2016	18 U	127	197	167 J	491 J						
RCB73	RM 2.2-3.4 West	8th Ave S	RCB	12/21/2016	20 U	297	380	247	924						
RCB74	RM 2.2-3.4 West	8th Ave S	RCB	12/22/2016	19 U	21	36	36	92.7						
RCB278	RM 2.2-3.4 West	8th Ave S	RCB	12/22/2016	20 U	92	131	79	302.2						
RCB279	RM 2.2-3.4 West	8th Ave S	RCB	12/29/2016	18 U	63	183	273	519.3						
RCB310	RM 2.2-3.4 West	8th Ave S	RCB	12/29/2016	19.9 U	72	126	175 J	373.3 J						
RCB311	RM 2.2-3.4 West	8th Ave S	RCB	12/29/2016	18.6 U	19	139 U	38.8	57.8						
RCB298	RM 2.2-3.4 West	S Webster St SD	RCB	4/6/2016	19 U	19 U	35	40	75	280 U	280 U	280	280 U	1,200	310
PS1	RM 3.4-3.8 West	CS-1	Inline	5/12/2014	19 U	77 U	400	1,300	1,700	1,600 U	1,600 U	1,600 U	1,600 U	1,600 U	1,600 U
PS2	RM 3.4-3.8 West	CS-1	Inline	5/12/2014	200 U	200 U	1,900	5,900	7,800	930 U	930 U	930 U	930 U	930 U	930 U
96-ST1	RM 3.8-4.2 West	S 96th St SD	SedTrap	5/9/2014	28 U	18 U	44	29	73	240 U	240 U	240 U	240 U	130 J	240 U
96-ST1	RM 3.8-4.2 West	S 96th St SD	Inline	5/9/2014	20 U	20 U	21	16 J	37 J	120 U	120 U	120 U	120 U	120 U	120 U
96-ST2	RM 3.8-4.2 West	S 96th St SD	SedTrap	5/19/2014	19 U	19 U	70	22	92	57 U	57 U	57 U	57 U	54 J	57 U
96-ST2	RM 3.8-4.2 West	S 96th St SD	Inline	5/19/2014	18 U	18 U	18 U	18 U	18 U	19 U	19 U	6.8 J	19 U	22	19 U
96-ST3	RM 3.8-4.2 West	S 96th St SD	SedTrap	5/9/2014	18 U	18 U	18 U	18 U	18 U	19 U	19 U	19 U	19 U	19 U	19 U
96-ST3	RM 3.8-4.2 West	S 96th St SD	Inline	5/9/2014	18 U	18 U	18 U	18 U	18 U	19 U	19 U	19 U	19 U	19 U	19 U
HC-ST1	RM 4.2-5.8 West	Hamm Creek	SedTrap	5/23/2014	18 U	18 U	18 UJ	18 U	18 U	19 U	19 U	19 U	19 U	11 J	19 U

Source: Seattle Public Utilities

Bold text indicates chemical was detected.

Not detected; reporting limit is above the SCO

Exceeds SCO

Exceeds CSL/RAL/MTCA Method A

* MTCA Method A Soil Cleanup Level

mg/kg DW - milligram per kilogram dry weight

ug/kg DW - microgram per kilogram dry weight

BEHP - bis(2-ethylhexyl)phthalate

HC - hydrocarbon

LPAH - Low molecular weight polycyclic aromatic hydrocarbon

HPAH - High molecular weight polycyclic aromatic hydrocarbon

cPAH - carcinogenic polycyclic aromatic hydrocarbon

PCB - polychlorinated biphenyl

NA - Not applicable

Table F-2. SPU Source Tracing Sample Results (2014 - 2016)

Station ID	Source Control Area	Outfall	Type	Date Sampled	Naphthalene (ug/kg DW)	Phenanthrene (ug/kg DW)	Total LPAH (ug/kg DW)	Benzo(a)anthracene (ug/kg DW)	Benzo(a)pyrene (ug/kg DW)	Benzo(g,h,i) perylene (ug/kg DW)	Total Benzo-fluoranthenes (ug/kg DW)	Chrysene (ug/kg DW)	Dibenzo(a,h)anthracene (ug/kg DW)	Fluoranthene (ug/kg DW)	Indeno (1,2,3-cd) pyrene (ug/kg DW)
SCO					2,100	1,500	5,200	1,300	1,600	670	3,200	1,400	230	1,700	600
CSL					2,100	1,500	5,200	1,600	1,600	720	3,600	2,800	230	2,500	690
CB2	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	3/13/2014	280 J	2,000	2,790 J	1,800	2,400	3,100	7,600	3,800	680	2,800	2,400
CB27b	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	3/30/2016	1,100 U	1,800	2,190 J	1,000 J	1,100 U	1,700	3,200	2,700	1,100 U	4,200	960 J
CB83	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	4/8/2016	93 J	200	293 J	120	120	270	420	260	120 U	320	100 J
CB121	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	9/23/2016											
CB176	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	2/26/2014	520 U	1,400	1,400	420 J	600	1,100	1,200 J	1,200	520 U	1,300	470 J
CB177	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	2/26/2014	280 U	670	820 J	210 J	260 J	330	630	610	280 U	680	280 U
CB178	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	2/26/2014	300 J	2,000	2,300 J	1,100	1,200	1,800	3,100 J	2,100	350 J	2,800	910
CB179	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	2/27/2014	810 U	1,000	1,000	650 J	850	650 J	1,700 J	1,500	810 U	1,600	490 J
CB180	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	2/27/2014	790 U	750 J	750 J	790 U	790 U	510 J	980 J	870	790 U	1,200	790 U
CB181	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	3/4/2014											
CB182	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	3/4/2014											
CB185	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	6/12/2015	90 J	320	536 J	140 J	120 J	200	360	400	180 U	440	180 U
CB220	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	3/7/2014	350 J	2,800	3,560 J	1,800	1,600	1,900	3,200	3,200	410 J	4,200	960
CB221	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	3/7/2014	1,900	140,000	173,200	94,000	130,000	64,000	210,000	130,000	16,000	320,000	62,000
CB222	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	3/7/2014	1,700	120,000	140,100	100,000	140,000	83,000	280,000	180,000	23,000	370,000	89,000
CB223	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	3/7/2014	630 U	850	850	510 J	820	890	2,000	1,300	630 U	1,700	630
CB224	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	3/7/2014	580 U	610	610	350 J	520 J	640	1,100 J	840	580 U	1,000	350 J
CB225	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	3/7/2014	350 U	630	630	300 J	370	510	860	720	350 U	970	280 J
CB226	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	3/7/2014	280 U	510	510	230 J	280	300	550 J	680	280 U	780	180 J
CB227	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	3/7/2014	110 U	73 J	73 J	110 U	110 U	110 U	100 J	120	110 U	120	110 U
CB230	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	3/21/2014	190 U	1,100	1,240 J	550	580	550	1,200	920	190 U	1,700	300
CB231	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	3/21/2014	890 U	710 J	710 J	890 U	890 U	620 J	940 J	800 J	890 U	1,000	890 U
CB232	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	4/16/2014	100 U	290	290	140	140	120	280	230	100 U	330	100 U
CB237	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	12/21/2016											
CB240	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	4/4/2014	290 U	250 J	250 J	290 U	290 U	160 J	260 J	250 J	290 U	380	290 U
CB240	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	4/4/2014	280 U	240 J	240 J	280 U	280 U	280 U	260 J	240 J	280 U	360	280 U
CB240	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	7/21/2016	280 U	270 J	270 J	280 U	280 U	260 U	180 J	210 J	280 U	340	280 U
CB241	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	4/4/2014	780 U	1,100	1,100	780 U	430 J	510 J	1,200 J	900	780 U	1,400	780 U
CB241	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	7/21/2016	160 J	860	1,150 J	130 J	170 J	350 J	450 J	450	290 U	870	140 J
CB242	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	4/4/2014	620 U	650	650	620 U	620 U	620 U	620 J	440 J	620 U	780	620 U
CB243	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	4/10/2014	630 U	16,000	21,400	8,900	8,600	5,600	20,000	13,000	1,600	24,000	5,500
CB244	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	4/10/2014	650 U	750	750	650 U	320 J	650	880 J	460 J	650 U	750	650 U
CB245	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	4/10/2014	290 U	1,200	1,350 J	710	880	1,100	1,900	1,200	290 U	2,300	520
CB246	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	5/17/2014											
CB247	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	5/17/2014											
CB248	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	5/17/2014											
CB248	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	7/21/2016	130 J	880	1,218 J	240 J	260 J	380	630	530	300 U	960	220 J
CB250	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	4/16/2014	720 U	610 J	610 J	720 U	720 U	650 J	580 J	510 J	720 U	690 J	720 U
CB251	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	4/16/2014	660 U	1,000	1,000	990	890	920	1,800	1,400	660 U	1,600	600 J
CB251	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	5/14/2014											
CB252	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	5/8/2014	140 U	150	150	140 U	120 J	90 J	140 J	170	140 U	180	140 U
CB253	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	5/8/2014	860	600	1,460	200 J	200 J	240 J	480 J	520	260 U	420	260 U
CB254	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	5/8/2014	1,600	3,000	5,630 J	1,600	1,300	760	3,000	2,400	490 U	2,800	660
CB255	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	6/11/2014	1,000 U	1,200	1,200	610 J	660 J	910 J	1,300 J	1,100	1,000 U	1,700	1,000 U

Table F-2. SPU Source Tracing Sample Results (2014 - 2016)

Station ID	Source Control Area	Outfall	Type	Date Sampled	Naphthalene (ug/kg DW)	Phenanthrene (ug/kg DW)	Total LPAH (ug/kg DW)	Benzo(a)anthracene (ug/kg DW)	Benzo(a)pyrene (ug/kg DW)	Benzo(g,h,i) perylene (ug/kg DW)	Total Benzo-fluoranthenes (ug/kg DW)	Chrysene (ug/kg DW)	Dibenzo(a,h)anthracene (ug/kg DW)	Fluoranthene (ug/kg DW)	Indeno (1,2,3-cd) pyrene (ug/kg DW)
SCO					2,100	1,500	5,200	1,300	1,600	670	3,200	1,400	230	1,700	600
CSL					2,100	1,500	5,200	1,600	1,600	720	3,600	2,800	230	2,500	690
CB260	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	5/14/2014											
CB260	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	ODS	6/29/2016	13 J	93	123 J	33	45	60	110	110	20 U	80	30
CB261	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	5/14/2014											
CB267	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	11/6/2015	2,000 U	590 J	590 J	2,000 U	2,000 U	2,000 U	3,900 U	2,000 U	2,000 U	690 J	2,000 U
CB268	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	11/6/2015	180 J	1,400 J	1,930 J	2,200	1,900	1,600	3,800	2,500	610	4,000	1,400
CB271	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	6/29/2016	120	800	1,095 J	370	420	630	1,100	770	83 J	1,300	370
CB273	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	7/13/2016	1,600	1,100	3,110 J	520	380 J	900 J	1,100	930	450 U	790	340 J
CB275	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	6/29/2016	59 J	270	422 J	110	170	170	310	310	98 U	360	98
CB281	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	2/11/2016											
CB290	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	4/1/2016	130 J	340	790 J	460	480	600	1,500	940	120 J	1,500	370
CB291	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	4/15/2016	240 U	1,600	2,000 J	810	980	960 J	1,800	1,400	220 J	2,300	750 J
CB295	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	4/8/2016	110 U	120	120	140	180	250	360	220	110 U	290	150
CB311	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	6/29/2016	68 J	300	368	140	160	330	430	420	97 U	380	83 J
CB312	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	8/18/2016	345	375	720	134 J	152 J	343	350 J	438	193 U	435	125 J
CB313	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	8/18/2016	280	534 J	1,082 J	157 J	179 J	724 J	463	759 J	195 U	727 J	158 J
CB314	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	9/1/2016	109	252	545 J	112	117	169	242	290	42 J	228	1,660 J
CB315	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	9/1/2016	18,500	1,510	23,987 J	537	490	1,130	1,290	1,420	145 U	958	343 J
CB317	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	9/30/2016	24 U	67 J	67.4 J	30 J	38.6 J	45.6 J	104 J	86 J	28 U	76 J	31.9 J
CB319	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	11/7/2016	65 J	209	274.1 J	89 J	130 J	274	351 J	319	54 U	239	101 J
CB320	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	11/7/2016	174	418	704.3 J	162 J	193	404	562	596	52 U	452	173
CB321	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	11/16/2016											
MH18	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	Inline	5/14/2014	220	3,500	5,130	1,900	2,100	1,300	3,400	2,500	350	4,200	1,100
MH18	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	Inline	4/6/2016	160 J	5,300	6,560 J	2,200	2,400	2,100	4,800	3,300	510	7,700	1,800 J
MH37	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	Inline	10/15/2015	360	630	1,273	320	550	620	1,300	1,000	120	890	300
ODS11	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	ODS	9/30/2016	27	351	512.7	189	272	285 J	659	414	102 J	296	226 J
ODS15	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	ODS	11/16/2016											
ODS16	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	ODS	11/16/2016											
ODS17	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	ODS	11/16/2016											
ODS18	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	ODS	11/16/2016											
ODS19	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	ODS	11/15/2016											
ODS20	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	ODS	11/15/2016											
ODS21	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	ODS	11/15/2016											
ODS27	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	ODS	11/10/2016											
ODS28	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	ODS	11/10/2016											
ODS29	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	ODS	11/10/2016											
ODS30	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	ODS	11/10/2016											
ODS37	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	ODS	12/14/2016											
ODS7	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	ODS	2/24/2016	92 U	46 J	46 J	37 J	60 J	100	92 J	69 J	92 U	97	41 J
OWSC	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	Inline	10/15/2015	310 J	3,700	5,200 J	2,000	1,600	1,100	3,200	3,000	340 J	3,400	890
OWSE	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	Inline	10/15/2015	560 U	1,900	2,880	640	840	920	2,400	1,900	560 U	2,200	530 J
RCB36	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	RCB	4/16/2014	99	670	1,249 J	200	220	170	470	390	95 U	670	99
RCB51	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	RCB	5/14/2014											
RCB57	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	RCB	4/2/2014	180 J	1,000	1,180 J	510	570	960	1,400	1,100	310 U	1,500	430
RCB58	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	RCB	4/2/2014	150 J	680	830 J	420	410	700	1,000	950	260 U	870	320

Table F-2. SPU Source Tracing Sample Results (2014 - 2016)

Station ID	Source Control Area	Outfall	Type	Date Sampled	Naphthalene (ug/kg DW)	Phenanthrene (ug/kg DW)	Total LPAH (ug/kg DW)	Benzo(a)anthracene (ug/kg DW)	Benzo(a)pyrene (ug/kg DW)	Benzo(g,h,i)perylene (ug/kg DW)	Total Benzo-fluoranthenes (ug/kg DW)	Chrysene (ug/kg DW)	Dibenzo(a,h)anthracene (ug/kg DW)	Fluoranthene (ug/kg DW)	Indeno (1,2,3-cd)pyrene (ug/kg DW)
SCO					2,100	1,500	5,200	1,300	1,600	670	3,200	1,400	230	1,700	600
CSL					2,100	1,500	5,200	1,600	1,600	720	3,600	2,800	230	2,500	690
RCB59	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	RCB	4/2/2014	480 U	700	700	340 J	410 J	700	890 J	840	480 U	1,000	480 U
RCB60	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	RCB	4/2/2014	140	2,800	5,600	3,200	3,000	1,000	6,600	5,100	370	6,100	990
RCB67	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	RCB	12/21/2016											
RCB72	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	RCB	12/21/2016											
RCB215	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	RCB	5/17/2014											
RCB215	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	RCB	7/21/2016	42 J	160	244 J	63	69	110	140	200	60 U	190	36 J
RCB217	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	RCB	8/11/2016	178	422	783.8 J	76.5 J	71.9 J	168	181 J	160	97 U	215	97 U
RCB251	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	RCB	12/21/2016											
RCB293	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	RCB	4/16/2014	54 J	310	445 J	190	200	120	450	340	57 U	440	92
RCB296	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	RCB	4/15/2016	260 U	1,500	2,130 J	720	730	670 J	1,300	1,100	140 J	1,900	450 J
RCB306	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	RCB	6/13/2014	70	680	947 J	350	430	240	1,000	620	24 J	1,100	150
RCB306	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	RCB	8/11/2016											
RCB309	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	RCB	9/30/2016	26 J	69 J	94 J	25 U	88.9 J	204 J	202	182	29 U	106	75 J
ST1	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	SedTrap	5/19/2014	140 J	870	1,350 J	520	590	340	1,300	980	150 U	1,700	270
ST1	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	Inline	5/19/2014	93 U	93 U	93 U	93 U	93 U	93 U	98 J	74	93 U	70 J	93 U
ST1	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	SedTrap	5/22/2015	87 J	820	1,095 J	450	390	160 J	1,100	850	190 U	1,500	240
ST1	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	Inline	5/22/2015	77 U	560	770 J	290	260 J	180	510	370	88	880	170
ST1	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	SedTrap	5/9/2016	88 J	410	498 J	290 U	340	350	790 J	510	290 U	690	220 J
ST1	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	Inline	5/9/2016	19 U	22	22	12 J	14 J	21	36 J	27	19 U	38	12 J
ST7	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	SedTrap	5/9/2014	280 U	560	560	340	400	360	710	540	280 U	870	240 J
ST7	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	Inline	5/9/2014	60 U	57 J	57 J	36 J	45 J	51 J	100 J	69	60 U	100	33 J
ST7	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	SedTrap	5/18/2015	250 U	730	793 J	250	330	290	820	600	250 U	970	260
ST7	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	Inline	5/18/2015	14 J	32	73.5 J	19	20	23	52	47	19 U	50	11 J
ST7	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	SedTrap	5/9/2016	300 U	240 J	240 J	150 J	160 J	180 J	420 J	300	300 U	360	89 J
ODS8	RM 1.7-2.0 East	Michigan CSO	ODS	2/24/2016	38 J	67 J	105 J	43 J	72 J	110	140 J	120	95 U	100	67 J
ODS38	RM 2.0-2.3 East	S Brighton St SD	ODS	12/14/2016											
ODS38	RM 2.0-2.3 East	S Brighton St SD	ODS	12/22/2016											
RCB178	RM 2.0-2.3 East	S Brighton St SD	RCB	12/22/2016											
CB202	RM 2.0-2.3 East	S River St SD	RCB	2/23/2016	280 U	400	540 J	370	370	450	1,200	880	280 U	860	260 J
CB270	RM 2.0-2.3 East	S River St SD	CB	2/23/2016	130 J	1,700	2,470 J	1,500	1,400	1,200	3,300	2,800	310	3,800	990
CB288	RM 2.0-2.3 East	S River St SD	CB	2/23/2016	170 J	410	950 J	360	420	460	1,500	1,200	130 J	1,300	350
CB289	RM 2.0-2.3 East	S River St SD	CB	2/23/2016	230 J	770	1,250 J	340	450	790	1,100	900	320 U	1,000	370
MH211	RM 2.0-2.3 East	S River St SD	Inline	4/1/2016	230 U	230 U	230 U	230 U	230 U	230 U	160 J	120 J	230 U	120 J	230 U
MH220	RM 2.0-2.3 East	S River St SD	Inline	3/24/2016	240 U	280	410 J	240	300	500	750	530	240 U	660	240
ODS10	RM 2.0-2.3 East	S River St SD	ODS	4/1/2016	56 U	45 J	146 J	120	290	250	660	360	84	210	200
ODS9	RM 2.0-2.3 East	S River St SD	ODS	3/24/2016	160 J	570	1053 J	480	440	1,000	1,900	1,600	290 U	1,700	410
RCB77	RM 2.0-2.3 East	S River St SD	RCB	3/24/2016	160 J	1,300	2,190	1,100	1,100	940	2,500	2,800	290 U	2,500	560
RCB78	RM 2.0-2.3 East	S River St SD	RCB	3/24/2016	81 J	1,100	1,611 J	690	470	500	1,800	1,600	130 J	2,700	320
RCB79	RM 2.0-2.3 East	S River St SD	RCB	3/24/2016	220 U	320	398 J	260	190 J	340	760	650	220 U	960	170 J
RCB81	RM 2.0-2.3 East	S River St SD	RCB	4/1/2016	280 U	440	550 J	240 J	240 J	300	590	590	280 U	630	160 J
RCB192	RM 2.0-2.3 East	S River St SD	RCB	4/1/2016	300 U	850	2,330 J	430	330	310	880	860	300 U	1,400	210 J
STRANS1	RM 2.3-2.8 East	S Garden St SD	ODS	3/14/2014											
STRANS2	RM 2.3-2.8 East	S Garden St SD	ODS	3/17/2014											
STRANS2	RM 2.3-2.8 East	S Garden St SD	ODS	3/17/2014											

Table F-2. SPU Source Tracing Sample Results (2014 - 2016)

Station ID	Source Control Area	Outfall	Type	Date Sampled	Naphthalene (ug/kg DW)	Phenanthrene (ug/kg DW)	Total LPAH (ug/kg DW)	Benzo(a)anthracene (ug/kg DW)	Benzo(a)pyrene (ug/kg DW)	Benzo(g,h,i)perylene (ug/kg DW)	Total Benzo-fluoranthenes (ug/kg DW)	Chrysene (ug/kg DW)	Dibenzo(a,h)anthracene (ug/kg DW)	Fluoranthene (ug/kg DW)	Indeno (1,2,3-cd)pyrene (ug/kg DW)
SCO					2,100	1,500	5,200	1,300	1,600	670	3,200	1,400	230	1,700	600
CSL					2,100	1,500	5,200	1,600	1,600	720	3,600	2,800	230	2,500	690
STRANS2	RM 2.3-2.8 East	S Garden St SD	ODS	3/17/2014											
RCB65	RM 2.3-2.8 East	S Myrtle St SD	RCB	2/5/2015	180	690	1,132 J	480	540	270 J	1,200	800	100 J	1,100	220 J
SL4-T6	RM 2.8 East	I-5 SD at Slip 4	SedTrap	4/24/2014	68 J	550	836 J	320	330	190	730	480	57 J	800	170
SL4-T6	RM 2.8 East	I-5 SD at Slip 4	SedTrap	5/18/2015	120 J	1,000	1,522 J	680	640	530	1,400	1,000	170 J	1,800	440
SL4-T6	RM 2.8 East	I-5 SD at Slip 4	SedTrap	5/9/2016	63 J	420	604 J	200	270	300	620 J	440	73 J	680	180
MH23	RM 2.8 East	Slip 4	Inline	6/20/2014	620 U	5,100	5,780	4,900	6,000	5,900	14,000	9,100	1,000	16,000	4,400
CB78	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	CB	6/25/2015	51 J	1,100	1,447 J	950	770	430	1,900	1,500	160	2,100	460
CB189	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	CB	4/23/2015	46 J	120	166 J	63 J	68 J	220	170 J	160	110 U	150	63 J
CB189	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	CB	4/6/2016	300 U	160 J	160 J	300 U	300 U	270 J	600 U	300 U	300 U	250 J	300 U
CB193	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	CB	6/22/2015	70 J	320	390 J	100 J	230 U	220 J	350 J	400	230 U	370	230 U
CB195	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	CB	6/22/2015	93 J	290	418 J	160	200	240	540	340	41 J	420	150
CB196	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	CB	6/22/2015	6.8 J	47	69.8 J	59	63	51	140	95	14 J	150	44
CB197	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	CB	7/15/2015	49 J	240	418 J	95	120	120	200	180	57 U	290	77
CB198	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	CB	7/15/2015	110 U	880	1,192 J	900	610	290	1,400	1,400	120	2,000	260
CB199	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	CB	7/15/2015	190	410	743 J	200	240	340	570	450	170 U	560	200
CB210	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	CB	7/29/2015	100 J	620	872 J	390	500	500	1,300	1,100	200	1,100	340
CB214	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	CB	7/29/2015	110 J	580	787 J	210	270	410	570	580	91 J	790	170
CB215	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	CB	7/29/2015	99 U	94 J	94 J	75 J	110	130	250	200	99 U	190	70 J
CB216	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	CB	7/29/2015	33 J	99	132 J	66 J	80 J	140	200	140	94 U	170	66 J
CB217	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	CB	8/5/2015	46 J	570	700 J	370	460	470	1,100	830	100	1,200	370
CB218	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	CB	8/7/2015	17 J	34	51 J	13 J	24	60	74	59	10 J	45	33
CB219	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	CB	8/7/2015	490 U	460 J	460 J	490 U	490 U	490	530 J	580	490 U	510	490 U
CB228	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	CB	7/17/2015	82 J	290	507 J	150	240	250	410	340	59 J	420	160
CB233	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	CB	5/27/2015	100 J	450	699	160	140	150	440	540	110 U	530	100 J
CB234	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	CB	6/25/2015	69 J	330	399 J	170 J	190 J	170 J	520	360	200 U	500	150 J
CB235	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	CB	6/25/2015	100 J	390	490 J	140 J	170 J	420	610 J	470	340 U	560	190 J
CB236	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	CB	8/5/2015	120 U	410	410	210	280	510	660	650	75 J	660	220
CB264	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	CB	7/17/2015	100 J	1,300	1,530 J	220 J	220 J	310	620	620	300 U	990	160 J
CB296	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	CB	4/27/2016	120 U	3,400	4,550	1,700	1,200	740	2,500	2,500	280	5,000	730
MH7	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	Inline	4/6/2016	110 U	110 U	110 U	110 U	110 U	110 U	220 U	110 U	110 U	130	110 U
MH54	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	Inline	5/4/2016	18 U	18 U	18 U	18 U	18 U	18 U	10 J	18 U	18 U	18 U	18 U
MH55	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	Inline	5/5/2016	110 U	290	364 J	220	260	360	480	380	63 J	540	180
NST1	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	SedTrap	6/30/2014	120 J	1,600	2,560 J	1,100	1,500	1,400	4,400	2,800	330	2,600	1,200
NST1	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	Inline	6/30/2014	85 J	700	1,050 J	450 J	610	460	1,300	810	75 J	1,300	320
NST1	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	SedTrap	5/21/2015	300 U	900	1,310 J	660	720	610	1,700	1,200	190 J	1,800	620
NST1	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	Inline	5/21/2015	110 J	740	1,178 J	460	620	550	1,400	920	160	1,200	450
NST1	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	SedTrap	5/10/2016	99 J	610	927 J	440	520	710 J	970	760	140 J	1,200	380 J
NST1	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	Inline	5/10/2016	110 J	500	839 J	370	410	520	920	630	110 J	1,000	320
NST2	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	SedTrap	6/30/2014	390 J	1,200	1,590 J	750	1,000	2,000	2,300	1,600	600 U	2,300	860
NST2	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	Inline	6/30/2014	19 U	22	22	19 J	20	24	42	34	19 U	40	16 J
NST2	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	SedTrap	5/18/2015	570 U	600 J	600 J	570 U	570 U	800 J	1,100 U	820 J	570 U	1,000 J	570 U
NST2	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	Inline	5/18/2015	16 J	110	165 J	86	72	56	150	110	16 J	180	43
NST2	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	SedTrap	5/9/2016	230 J	640	870 J	240 J	450	980	1,000 J	870	320 U	970	360
NST2	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	Inline	5/9/2016	19 U	24	31 J	13 J	14 J	23	34 J	25	19 U	37	12 J

Table F-2. SPU Source Tracing Sample Results (2014 - 2016)

Station ID	Source Control Area	Outfall	Type	Date Sampled	Naphthalene (ug/kg DW)	Phenanthrene (ug/kg DW)	Total LPAH (ug/kg DW)	Benzo(a)anthracene (ug/kg DW)	Benzo(a)pyrene (ug/kg DW)	Benzo(g,h,i)perylene (ug/kg DW)	Total Benzo-fluoranthenes (ug/kg DW)	Chrysene (ug/kg DW)	Dibenzo(a,h)anthracene (ug/kg DW)	Fluoranthene (ug/kg DW)	Indeno (1,2,3-cd)pyrene (ug/kg DW)
SCO					2,100	1,500	5,200	1,300	1,600	670	3,200	1,400	230	1,700	600
CSL					2,100	1,500	5,200	1,600	1,600	720	3,600	2,800	230	2,500	690
NST3	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	SedTrap	5/23/2014	62 U	74	74	68	140	130	330	150	62 U	170	96
NST3	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	Inline	5/23/2014	56 U	68	68	54 J	99	76	230	130	56 UJ	160	54 J
NST3	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	SedTrap	5/22/2015	40 J	200	274 J	150	220	180	680	120 U	120 U	490	180
NST3	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	Inline	5/22/2015	27 J	77	142 J	65 J	88 J	140	270	150	42 J	160	100
NST3	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	SedTrap	5/12/2016	1,000	32,000	49,780 J	9,500	9,600	3,200	16,000	11,000	1,500	32,000	3,700
NST4	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	SedTrap	6/30/2014	330 U	280 J	280 J	300 J	390	560	1,100	720	330 U	800	430
NST4	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	Inline	6/30/2014	33	180	352 J	180 J	270	330	770	470	67	520	270
NST4	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	SedTrap	5/21/2015	92 J	210	432 J	180	240	270	750	510	98 J	490	280
NST4	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	Inline	5/21/2015	26	160	249 J	110	160	170	470	260	71	320	190
NST4	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	SedTrap	5/12/2016	42 J	220	340 J	200 J	300	250	680	430 J	100 U	530 J	200
NST4	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	Inline	5/12/2016	71	240	351 J	160	260	410	610	350	85	510	320
NST5	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	SedTrap	6/30/2014											
NST5	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	SedTrap	5/18/2015											
NST5	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	SedTrap	5/9/2016											
ODS2	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	ODS	9/1/2015	170	500	836 J	330	450	680	980	780	120	840	360
ODS4	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	ODS	9/9/2015	16 J	320	487.4 J	220	270	270	560	400	78	510	200
RCB299	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	RCB	4/27/2016	300 U	210 J	210 J	150 J	160 J	310	360 J	340	300 U	360	300 U
RCB300	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	RCB	5/4/2016	490 U	630	630	490 U	490 U	490	510 J	560	490 U	1,000	490 U
RCB301	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	RCB	5/4/2016	470 U	240 J	240 J	470 U	470 U	260 J	380 J	380 J	470 U	500	470 U
RCB302	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	RCB	5/4/2016	120 U	120	120	80 J	86 J	130	170 J	140	120 U	200	63 J
RCB303	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	RCB	5/4/2016	110 U	120	120	56 J	73 J	160	130 J	130	110 U	170	61 J
RCB304	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	RCB	5/4/2016	120 U	270	270	130	140	240	330	320	120 U	510	110 J
RCB305	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	RCB	5/5/2016	120 U	180	180	94 J	94 J	190	200 J	180	120 U	250	82 J
ID-ST1	RM 0.0-1.0 West	SW Idaho St SD	SedTrap	5/19/2014	120 J	490	610 J	440	660	630	2,000	1,100	190 U	1,100	500
ID-ST1	RM 0.0-1.0 West	SW Idaho St SD	SedTrap	5/21/2015											
ID-ST1	RM 0.0-1.0 West	SW Idaho St SD	SedTrap	5/11/2016	70 J	340	452 J	240 J	430	400	1200	700 J	140 U	660 J	330
ID-ST2	RM 0.0-1.0 West	SW Idaho St SD	SedTrap	5/19/2014	29 J	93	122 J	55 J	72	78	190	110	58 U	150	55 J
ID-ST2	RM 0.0-1.0 West	SW Idaho St SD	SedTrap	5/21/2015	17 J	31	54 J	21	29	19 U	86	48	19 U	57	19 U
ID-ST2	RM 0.0-1.0 West	SW Idaho St SD	SedTrap	5/10/2016	19 U	31	31	14 J	18 J	22 J	41	30	19 U	44	16 J
ID-ST3	RM 0.0-1.0 West	SW Idaho St SD	SedTrap	5/23/2014	58 U	44 J	44 J	58 U	32 J	41 J	76 J	56 J	58 U	70	29 J
ID-ST3	RM 0.0-1.0 West	SW Idaho St SD	SedTrap	5/22/2015	57 U	20 J	20 J	17 J	20 J	46 J	54 J	34 J	57 U	28 J	23 J
ID-ST3	RM 0.0-1.0 West	SW Idaho St SD	SedTrap	5/11/2016	99 U	99 U	99 U	99 U	99 U	99 U	200 U	54 J	99 U	60 J	99 U
HP-ST4	RM 1.6-2.1 West	Highland Park Wy SW SD	SedTrap	5/19/2014	57 U	43 J	43 J	57 U	31 J	37 J	77 J	71	57 U	63	57 U
HP-ST4	RM 1.6-2.1 West	Highland Park Wy SW SD	SedTrap	5/18/2015	110 U	140	140	60 J	81 J	98 J	210 J	160	110 U	190	49 J
HP-ST4	RM 1.6-2.1 West	Highland Park Wy SW SD	SedTrap	5/10/2016	60 U	27 J	27 J	60 U	60 U	39 J	33 J	36 J	60 U	36 J	60 U
HP-ST6	RM 1.6-2.1 West	Highland Park Wy SW SD	SedTrap	6/30/2014	82 J	320	734 J	160	220	230	570	470	97 U	610	130
HP-ST6	RM 1.6-2.1 West	Highland Park Wy SW SD	Inline	6/30/2014	39 J	190	452 J	240 J	250	150	630	450	39 J	540	130
HP-ST6	RM 1.6-2.1 West	Highland Park Wy SW SD	SedTrap	5/18/2015	220 J	540	1,410 J	290 J	290 J	600	830	710	360 U	980	290 J
HP-ST6	RM 1.6-2.1 West	Highland Park Wy SW SD	Inline	5/18/2015	27	230	1,007	170	140	92	450	550	22	470	74
HP-ST6	RM 1.6-2.1 West	Highland Park Wy SW SD	SedTrap	5/10/2016	130	420	950 J	250	220	420 J	520	510	64 J	740	180 J
ODS1	RM 1.6-2.1 West	Highland Park Wy SW SD	ODS	9/26/2014	500 UJ	500 UJ	500	500 UJ	500 UJ	500 UJ	500 UJ	500 UJ	500 UJ	500 UJ	500 UJ
KN-ST1	RM 1.6-2.1 West	SW Kenny St SD/T115 CSO	SedTrap	6/30/2014	67 J	540	784 J	340	480	530	1,600	910	84 U	940	400
KN-ST1	RM 1.6-2.1 West	SW Kenny St SD/T115 CSO	SedTrap	5/18/2015	98 J	340	560 J	180	210	250	700	500	75 J	530	210
KN-ST1	RM 1.6-2.1 West	SW Kenny St SD/T115 CSO	SedTrap	5/10/2016	34 J	150	213 J	94	120	210 J	340	230	34 J	240	120 J

Table F-2. SPU Source Tracing Sample Results (2014 - 2016)

Station ID	Source Control Area	Outfall	Type	Date Sampled	Naphthalene (ug/kg DW)	Phenanthrene (ug/kg DW)	Total LPAH (ug/kg DW)	Benzo(a)anthracene (ug/kg DW)	Benzo(a)pyrene (ug/kg DW)	Benzo(g,h,i) perylene (ug/kg DW)	Total Benzo-fluoranthenes (ug/kg DW)	Chrysene (ug/kg DW)	Dibenzo(a,h)anthracene (ug/kg DW)	Fluoranthene (ug/kg DW)	Indeno (1,2,3-cd) pyrene (ug/kg DW)
SCO					2,100	1,500	5,200	1,300	1,600	670	3,200	1,400	230	1,700	600
CSL					2,100	1,500	5,200	1,600	1,600	720	3,600	2,800	230	2,500	690
1st-ST1	RM 2.1 West	1st Ave S SD, west	SedTrap	5/23/2014	160 J	790	950 J	540	620	810	1,400	1,200	290 U	1,600	380
1st-ST1	RM 2.1 West	1st Ave S SD, west	SedTrap	5/22/2015	240 J	890	1,401 J	500	560	800	1,300	1,300	170 J	1,500	450
1st-ST1	RM 2.1 West	1st Ave S SD, west	SedTrap	5/12/2016	100 J	430	680 J	450	460	510	1,500	1,200	140 U	810	240
1st-ST2	RM 2.1 West	1st Ave S SD, west	SedTrap	5/22/2015	70 J	190	295 J	120	130	120 U	340	270	120 U	330	130
1st-ST2	RM 2.1 West	1st Ave S SD, west	SedTrap	5/12/2016	40 J	190	284	140	190	200	500	320	99 U	400	110
1st-ST3	RM 2.1 West	1st Ave S SD, west	SedTrap	5/19/2014	55 U	280	324 J	160	180	120	320	240	30 J	450	96
1st-ST3	RM 2.1 West	1st Ave S SD, west	Inline	5/19/2014	93 U	150	150	84 J	110	93 U	210	140	93 U	250	93 U
1st-ST3	RM 2.1 West	1st Ave S SD, west	Inline	5/21/2015	39 U	200	248 J	120	150	83	300	220	35 J	390	89
1st-ST3	RM 2.1 West	1st Ave S SD, west	SedTrap	5/21/2015	290 U	220 J	220 J	170 J	200 J	130 J	520 J	360	290 U	520	130 J
1st-ST3	RM 2.1 West	1st Ave S SD, west	SedTrap	5/11/2016	99 U	54 J	54 J	49 J	69 J	54 J	160 J	120 J	99 U	140 J	99 U
1st-ST3	RM 2.1 West	1st Ave S SD, west	Inline	5/11/2016	57 U	160	160	120	120	120	230	180	31 J	310	91
1st-ST7	RM 2.1 West	1st Ave S SD, west	SedTrap	5/19/2014	89 J	980	1,069 J	730	910	620	2,100	1,200	120 J	2,300	490
1st-ST7	RM 2.1 West	1st Ave S SD, west	SedTrap	5/21/2015	120 J	710	908 J	520	580	400	1,500	1,100	200 U	1,700	470
1st-ST7	RM 2.1 West	1st Ave S SD, west	SedTrap	5/11/2016	100 J	1,000	1,270 J	1,000 J	1,100	860	2,800	1,800 J	250	2,600 J	680
CB108	RM 2.1-2.2 West	2nd Ave S SD	CB	5/14/2015	59 U	110	110	32 J	56 J	67	140	120	59 U	110	56 J
CB263	RM 2.1-2.2 West	2nd Ave S SD	CB	5/14/2015	580	2,800	3,942 J	260	510	420	1,200	920	78 J	2,200	360
RCB139	RM 2.1-2.2 West	2nd Ave S SD	RCB	12/21/2016											
RCB203	RM 2.1-2.2 West	2nd Ave S SD	RCB	12/21/2016											
CB262	RM 2.2-3.4 West	7th Ave S SD	CB	5/13/2015	290 U	350	350	160 J	290 U	290 U	390 J	320	290 U	400	290 U
CB318	RM 2.2-3.4 West	7th Ave S SD	CB	9/30/2016	11 J	66	111 J	42	61	83.1 J	135	104	21 J	101	47.8 J
7th-ST1	RM 2.2-3.4 West	7th Ave S SD	SedTrap	5/18/2015	6.5 J	15 J	27 J	12 J	13 J	20	33 J	23	7.4 J	22	12 J
7th-ST1	RM 2.2-3.4 West	7th Ave S SD	Inline	5/18/2015	8.8 J	46	62 J	37	46	39	120	93	20 U	95	37
7th-ST1	RM 2.2-3.4 West	7th Ave S SD	SedTrap	5/9/2016	58 J	230	346 J	180	240	96 U	600 J	470	96 U	440	130
7th-ST1	RM 2.2-3.4 West	7th Ave S SD	Inline	5/9/2016	60 U	66	66	54 J	75	95	170	120	60 U	150	54 J
7th-ST2	RM 2.2-3.4 West	7th Ave S SD	SedTrap	5/9/2014	19 U	14 J	14 J	19 U	12 J	12 J	23 J	15 J	19 U	22	19 U
7th-ST2	RM 2.2-3.4 West	7th Ave S SD	SedTrap	5/21/2015	8.8 J	49	66 J	20	26	20 U	77	46	20 U	71	18 J
7th-ST2	RM 2.2-3.4 West	7th Ave S SD	SedTrap	5/10/2016	58 U	32 J	32 J	58 U	58 U	35 J	44 J	38 J	58 U	46 J	58 U
7th-ST2	RM 2.2-3.4 West	7th Ave S SD	Inline	5/10/2016	19 U	19 U	19 U	19 U	19 U	19 U	38 U	19 U	19 U	19 U	19 U
7th-ST3	RM 2.2-3.4 West	7th Ave S SD	SedTrap	5/21/2015	580 U	500 J	500 J	470 J	640	440 J	1,700	990	580 U	1,300	530 J
7th-ST3	RM 2.2-3.4 West	7th Ave S SD	SedTrap	5/11/2016	280 U	270 J	270 J	230 J	300	340	660	520 J	280 U	580 J	170 J
ODS22	RM 2.2-3.4 West	7th Ave S SD	ODS	11/15/2016											
ODS23	RM 2.2-3.4 West	7th Ave S SD	ODS	11/15/2016											
ODS24	RM 2.2-3.4 West	7th Ave S SD	ODS	11/15/2016											
ODS25	RM 2.2-3.4 West	7th Ave S SD	ODS	11/15/2016											
ODS26	RM 2.2-3.4 West	7th Ave S SD	ODS	11/15/2016											
ODS42	RM 2.2-3.4 West	7th Ave S SD	ODS	12/15/2016											
ODS43	RM 2.2-3.4 West	7th Ave S SD	ODS	12/15/2016											
ODS44	RM 2.2-3.4 West	7th Ave S SD	ODS	12/15/2016											
ODS45	RM 2.2-3.4 West	7th Ave S SD	ODS	12/29/2016	22.2 J	86.7	135.4 J	65.1	79.7	86.2	229	165	39.5	188	61.3
RCB61	RM 2.2-3.4 West	7th Ave S SD	RCB	6/13/2014	420 U	620	620	290 J	330 J	400 J	790 J	900	420 U	1,000	420 U
RCB61	RM 2.2-3.4 West	7th Ave S SD	RCB	9/11/2014	230 U	560	690	330	330	260	860	960	230 U	820	150 J
RCB62	RM 2.2-3.4 West	7th Ave S SD	RCB	6/13/2014	220 U	550	870	550	520	460	1,600	1,600	220 U	1,400	390
RCB62	RM 2.2-3.4 West	7th Ave S SD	RCB	9/11/2014	40 J	400	817	320	300	160	1,100	1,100	140 U	770	160
RCB63	RM 2.2-3.4 West	7th Ave S SD	RCB	6/13/2014	220 U	920	1,630 J	650	580	450	1,600	1,400	220 U	1,800	390

Table F-2. SPU Source Tracing Sample Results (2014 - 2016)

Station ID	Source Control Area	Outfall	Type	Date Sampled	Naphthalene (ug/kg DW)	Phenanthrene (ug/kg DW)	Total LPAH (ug/kg DW)	Benzo(a)anthracene (ug/kg DW)	Benzo(a)pyrene (ug/kg DW)	Benzo(g,h,i) perylene (ug/kg DW)	Total Benzo-fluoranthenes (ug/kg DW)	Chrysene (ug/kg DW)	Dibenzo(a,h)anthracene (ug/kg DW)	Fluoranthene (ug/kg DW)	Indeno (1,2,3-cd) pyrene (ug/kg DW)
SCO					2,100	1,500	5,200	1,300	1,600	670	3,200	1,400	230	1,700	600
CSL					2,100	1,500	5,200	1,600	1,600	720	3,600	2,800	230	2,500	690
RCB63	RM 2.2-3.4 West	7th Ave S SD	RCB	9/11/2014	180 U	1,000	1,430	650	670	420	1,900	1,600	120 J	1,900	290
RCB64	RM 2.2-3.4 West	7th Ave S SD	RCB	6/13/2014	320 U	1,300	1,550 J	980	1,200	650	2,800	2,300	320 U	3,000	650
RCB64	RM 2.2-3.4 West	7th Ave S SD	RCB	9/11/2014	220 U	2,100	3,900	1,200	1,200	810	3,300	2,600	220	3,200	640
RCB70	RM 2.2-3.4 West	7th Ave S SD	RCB	12/21/2016											
RCB71	RM 2.2-3.4 West	7th Ave S SD	RCB	12/21/2016											
RCB165	RM 2.2-3.4 West	7th Ave S SD	RCB	6/13/2014	70	680	947 J	350	430	240	1,000	620	24 J	1,100	150
RCB229	RM 2.2-3.4 West	CS-1	RCB	12/29/2016											
ODS39	RM 2.2-3.4 West	CSO	ODS	12/15/2016											
ODS40	RM 2.2-3.4 West	8th Ave S	ODS	11/15/2016											
ODS41	RM 2.2-3.4 West	8th Ave S	ODS	12/15/2016											
ODS50	RM 2.2-3.4 West	8th Ave S	ODS	12/22/2016											
RCB73	RM 2.2-3.4 West	8th Ave S	RCB	12/21/2016											
RCB74	RM 2.2-3.4 West	8th Ave S	RCB	12/22/2016											
RCB278	RM 2.2-3.4 West	8th Ave S	RCB	12/22/2016											
RCB279	RM 2.2-3.4 West	8th Ave S	RCB	12/29/2016											
RCB310	RM 2.2-3.4 West	8th Ave S	RCB	12/29/2016											
RCB311	RM 2.2-3.4 West	8th Ave S	RCB	12/29/2016											
RCB298	RM 2.2-3.4 West	S Webster St SD	RCB	4/6/2016	280 U	6,600	8,390	5,600	5,500	3,800	10,000	7,300	1,200	14,000	3,700 J
PS1	RM 3.4-3.8 West	CS-1	Inline	5/12/2014	1,600 U	1,100 J	1,100 J	1,600 U	1,600 U	900 J	1,300 J	1,200 J	1,600 U	1,600 J	1,600 U
PS2	RM 3.4-3.8 West	CS-1	Inline	5/12/2014	930 U	700 J	700 J	930 U	930 U	740 J	790 J	510 J	930 U	980	930 U
96-ST1	RM 3.8-4.2 West	S 96th St SD	SedTrap	5/9/2014	240 U	700	830 J	390	480	370	880	580	240 U	1,000	300
96-ST1	RM 3.8-4.2 West	S 96th St SD	Inline	5/9/2014	120 U	88 J	88 J	82 J	110 J	82 J	220 J	130	120 U	190	65 J
96-ST2	RM 3.8-4.2 West	S 96th St SD	SedTrap	5/19/2014	28 J	270	352 J	220	280	230	570	360	54 J	570	180
96-ST2	RM 3.8-4.2 West	S 96th St SD	Inline	5/19/2014	19 U	75	104 J	61	65	30	120	74	19 U	120	32
96-ST3	RM 3.8-4.2 West	S 96th St SD	SedTrap	5/9/2014	19 U	40	40	37	54	50	130	67	19 U	96	40
96-ST3	RM 3.8-4.2 West	S 96th St SD	Inline	5/9/2014	19 U	19 U	19 U	19 U	19 U	19 U	12 J	19 U	19 U	19 U	19 U
HC-ST1	RM 4.2-5.8 West	Hamm Creek	SedTrap	5/23/2014	19 U	61	72 J	35	38	26	70	47	19 U	82	23

Source: Seattle Public Utilities

Bold text indicates chemical was detected.

Not detected; reporting limit is above the SCO

Exceeds SCO

Exceeds CSL/RAL/MTCA Method A

* MTCA Method A Soil Cleanup Level

mg/kg DW - milligram per kilogram dry weight

ug/kg DW - microgram per kilogram dry weight

BEHP - bis(2-ethylhexyl)phthalate

HC - hydrocarbon

LPAH - Low molecular weight polycyclic aromatic hydrocarbon

HPAH - High molecular weight polycyclic aromatic hydrocarbon

cPAH - carcinogenic polycyclic aromatic hydrocarbon

PCB - polychlorinated biphenyl

NA - Not applicable

Table F-2. SPU Source Tracing Sample Results (2014 - 2016)

Station ID	Source Control Area	Outfall	Type	Date Sampled	Pyrene (ug/kg DW)	Total HPAH (ug/kg DW)	Total cPAH (ug/kg DW)	BEHP (ug/kg DW)	Butylbenzyl phthalate (ug/kg DW)	Diethyl phthalate (ug/kg DW)	Dimethyl phthalate (ug/kg DW)	Di-n-butyl phthalate (ug/kg DW)	Di-n-octyl phthalate (ug/kg DW)	1,2,4-Trichlorobenzene (ug/kg DW)	1,4-Dichlorobenzene (ug/kg DW)
SCO					2,600	12,000	1,000	1,300	63	200	71	1,400	6,200	31	110
CSL					3,300	17,000	1,000	1,900	900	1,200	160	1,400	6,200	51	110
CB2	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	3/13/2014	2,900	27,480	3,890	47,000 B	1,400 J	330 U	260 J	800	1,700	330 U	330 U
CB27b	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	3/30/2016	3,900	18,760 J	1,863	56,000	1,100 U	1,100 U	1,100 U	1,100 U	1,400	1,100 U	1,100 U
CB83	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	4/8/2016	360	1,970 J	211 J	5,900	250	120 U	120 U	58 J	200	120 U	120 U
CB121	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	9/23/2016											
CB176	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	2/26/2014	1,700	7,990 J	925 J	30,000 B	960	520 U	520 U	520 U	2,000	520 U	520 U
CB177	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	2/26/2014	1,100	3,820 J	420.1 J	25,000 B	500	280 U	280 U	280 U	820	280 U	280 U
CB178	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	2/26/2014	3,100	16,460 J	1,872 J	36,000 B	1,400	540 U	430 J	430 J	2,400	540 U	540 U
CB179	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	2/27/2014	1,400	8,840 J	1,311 J	40,000 B	65,000	810 U	810 U	3,300	1,600	810 U	810 U
CB180	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	2/27/2014	1,100	4,660 J	739 J	48,000 B	7,800	790 U	790 U	670 J	830	790 U	790 U
CB181	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	3/4/2014											
CB182	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	3/4/2014											
CB185	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	6/12/2015	440	2,100 J	219 J	17,000	390	180 U	180 U	72 J	930	180 U	180 U
CB220	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	3/7/2014	4,200	21,470 J	2,392 J	17,000 B	1,700 J	580 U	580 U	440 J	3,700	580 U	580 U
CB221	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	3/7/2014	270,000	1,296,000	174,300	35,000 B		840 U	840 U	840 U	840 U	840 U	840 U
CB222	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	3/7/2014	290,000	1,555,000	197,900	47,000 B	1,500 J	1,500 U	1,500 U	1,500 U	1,700	1,500 U	1,500 U
CB223	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	3/7/2014	1,400	9,250 J	1,273 J	13,000 B	630 J	630 U	760	630 U	380 J	630 U	630 U
CB224	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	3/7/2014	1,100	5,900 J	824 J	9,900 B	550 J	580 U	580 U	580 U	490 J	580 U	580 U
CB225	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	3/7/2014	880	4,890 J	591 J	9,300 B	1,400 J	350 U	350 U	350 U	320 J	350 U	350 U
CB226	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	3/7/2014	820	3,820 J	439 J	15,000 B	160,000	280 U	280 U	5,800	280 U	280 U	280 U
CB227	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	3/7/2014	100 J	440 J	99 J	830 B	56 J	110 U	290	110 U	110 U	110 U	110 U
CB230	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	3/21/2014	1,600	7,400	832	18,000 B	700 J	640 U	190 U	350	2,400	190 U	190 U
CB231	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	3/21/2014	1,100	4,460 J	814 J	16,000 B	3,700 J	1,300 U	890 U	890 U	1,400	890 U	890 U
CB232	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	4/16/2014	400	1,640	209	11,000	160	100 U	75 J	100 U	120	100 U	100 U
CB237	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	12/21/2016											
CB240	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	4/4/2014	330	1,380 J	261 J	3,700	290 U	290 U	290 U	290 U	1,600	290 U	290 U
CB240	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	4/4/2014	300	1,160 J	252 J	2,200	280 U	280 U	280 U	280 U	280 U	280 U	280 U
CB240	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	7/21/2016	410	1,400 J	244 J	11,000	140 J	280 U	280 U	85 J	280 U	280 U	280 U
CB241	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	4/4/2014	1,200	5,640 J	793 J	7,600	740 J	780 U	780 U	780 U	780 U	780 U	780 U
CB241	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	7/21/2016	620	3,180 J	305 J	7,700	640	290 U	290 U	200 J	170 J	290 U	290 U
CB242	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	4/4/2014	650	2,490 J	562 J	2,900	620 U	620 U	620 U	620 U	560 J	620 U	620 U
CB243	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	4/10/2014	22,000	109,200	12,810	19,000	350 J	630 U	1,600	940	470 J	630 U	630 U
CB244	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	4/10/2014	1,000	4,060 J	608 J	27,000 B	1,500 Q	650 U	650 U	650 U	980	650 U	650 U
CB245	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	4/10/2014	2,100	10,710	1,263	2,500 B	260 J	290 U	290 U	180 J	200 J	290 U	290 U
CB246	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	5/17/2014											
CB247	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	5/17/2014											
CB248	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	5/17/2014											
CB248	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	7/21/2016	740	3,960 J	434	2,600	180 J	300 U	300 U	300 U	300 U	300 U	300 U
CB250	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	4/16/2014	980	3,410 J	639 J	34,000 B	9,500	720 U	540 J	1,600	1,800 B	720 U	720 U
CB251	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	4/16/2014	1,700	9,900 J	1,375 J	32,000 B	630 J	660 U	660 U	460 J	1,100 U	660 U	660 U
CB251	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	5/14/2014											
CB252	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	5/8/2014	270	970 J	178 J	14,000	350	140 U	140 U	120 J	5,000	140 U	140 U
CB253	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	5/8/2014	600	2,660 J	338 J	62,000	930	260 U	260 U	1,200	3,000	260 U	260 U
CB254	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	5/8/2014	3,200	15,720	1,948	110,000	3,800	780 B	490 U	6,000	4,100	490 U	390 J
CB255	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	6/11/2014	1,300	7,580 J	1,112 J	9,000	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U

Table F-2. SPU Source Tracing Sample Results (2014 - 2016)

Station ID	Source Control Area	Outfall	Type	Date Sampled	Pyrene (ug/kg DW)	Total HPAH (ug/kg DW)	Total cPAH (ug/kg DW)	BEHP (ug/kg DW)	Butylbenzyl phthalate (ug/kg DW)	Diethyl phthalate (ug/kg DW)	Dimethyl phthalate (ug/kg DW)	Di-n-butyl phthalate (ug/kg DW)	Di-n-octyl phthalate (ug/kg DW)	1,2,4-Trichlorobenzene (ug/kg DW)	1,4-Dichlorobenzene (ug/kg DW)
SCO					2,600	12,000	1,000	1,300	63	200	71	1,400	6,200	31	110
CSL					3,300	17,000	1,000	1,900	900	1,200	160	1,400	6,200	51	110
CB260	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	5/14/2014											
CB260	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	ODS	6/29/2016	140	608	67	6,800	59	31 U	20 U	110	660	20 U	20 U
CB261	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	5/14/2014											
CB267	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	11/6/2015	590 J	1,280 J	1,805 U	3,600 J	2,000 U	2,000	2,000 U	2,000 U	2,000 U	2,000 U	2,000 U
CB268	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	11/6/2015	4,000	22,010	2,909	4,400	310	290 U	290 U	23 J	150 J	290 U	290 U
CB271	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	6/29/2016	1,100	6,143 J	645	3,700	210	97 U	97 U	150	97 U	97 U	97 U
CB273	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	7/13/2016	1,200	6,160 J	675 J	47,000	1,500	450 U	450 U	630	1,200	450 U	450 U
CB275	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	6/29/2016	340	1,868	245	8,600	33,000	98 U	49 J	810	3,400	98 U	98 U
CB281	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	2/11/2016											
CB290	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	4/1/2016	1,500	7,470 J	770 J	4,100	290	230 U	220 U	80 J	210 J	230 U	230 U
CB291	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	4/15/2016	2,100	11,320 J	1,418 J	6,400	260	240 U	240 U	240 U	240 U	240 U	240 U
CB295	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	4/8/2016	280	1,870	269	2,300	190	110 U	67 J	110 U	180	110 U	110 U
CB311	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	6/29/2016	560	2,503 J	249	9,500 J	230	97 U	97 U	73 J	97 U	97 U	97 U
CB312	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	8/18/2016	531	2,508 J	256 J	112,000	470	193 U	1,100	203	1,280	193 U	193 U
CB313	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	8/18/2016	799 J	3,966 J	303 J	51,800	325	195 U	195 U	106 J	1,510	195 U	195 U
CB314	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	9/1/2016	374	1,660 J	181 J	3,150	709	51 U	54 J	76	3,220	17.2 U	13 U
CB315	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	9/1/2016	1,670	7,838 J	815	170,000	1,710	416 U	151 U	302 J	6,650	140 U	103 U
CB317	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	9/30/2016	72.3 J	484 J	74 J	1,130	165	81 U	31 J	24 U	73.1 J	27 U	20 U
CB319	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	11/7/2016	425	1,928 J	223 J	8,080	71 U		57 J	111 J	236	53 U	39 U
CB320	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	11/7/2016	538	3,080 J	323 J	8,000	369		55 U	91 J	557	51 U	37 U
CB321	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	11/16/2016											
MH18	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	Inline	5/14/2014	4,000	20,850	2,905	2,000	130 J	200 U	200 U	200 U	200 U	200 U	200 U
MH18	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	Inline	4/6/2016	5,600	30,410 J	3,517	4,800	410	290 U	890	290 U	290 U	290 U	290 U
MH37	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	Inline	10/15/2015	1,200	6,300	800	7,500	96 U	96 U	96 U	82 J	96 U	96 U	96 U
ODS11	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	ODS	9/30/2016	348	2,791 J	424 J	838	90.6	27.8 U	29.4	46.9	18.1 J	19.4 U	19.4 U
ODS15	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	ODS	11/16/2016											
ODS16	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	ODS	11/16/2016											
ODS17	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	ODS	11/16/2016											
ODS18	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	ODS	11/16/2016											
ODS19	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	ODS	11/15/2016											
ODS20	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	ODS	11/15/2016											
ODS21	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	ODS	11/15/2016											
ODS27	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	ODS	11/10/2016											
ODS28	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	ODS	11/10/2016											
ODS29	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	ODS	11/10/2016											
ODS30	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	ODS	11/10/2016											
ODS37	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	ODS	12/14/2016											
ODS7	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	ODS	2/24/2016	140	636 J	96 J	1,500	92 U	92 U	92 U	92 U	280	92 U	92 U
OWSC	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	Inline	10/15/2015	4,300	19,830	2,375	37,000	600	480 U	480 U	290 J	480 U	480 U	480 U
OWSE	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	Inline	10/15/2015	2,400	11,830 J	1,328 J	98,000	9,700	560 U	560 U	560 U	12,000	560 U	560 U
RCB36	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	RCB	4/16/2014	760	2,979	320	9,400	480	95 U	190	140	1,300	95 U	95 U
RCB51	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	RCB	5/14/2014											
RCB57	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	RCB	4/2/2014	1,700	8,170	877	18,000	1,300 J	310 U	170 J	1,100	310 U	310 U	310 U
RCB58	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	RCB	4/2/2014	1,100	5,770	646	18,000	1,100 J	260 U	260 U	520	260 U	300	260 U

Table F-2. SPU Source Tracing Sample Results (2014 - 2016)

Station ID	Source Control Area	Outfall	Type	Date Sampled	Pyrene (ug/kg DW)	Total HPAH (ug/kg DW)	Total cPAH (ug/kg DW)	BEHP (ug/kg DW)	Butylbenzyl phthalate (ug/kg DW)	Diethyl phthalate (ug/kg DW)	Dimethyl phthalate (ug/kg DW)	Di-n-butyl phthalate (ug/kg DW)	Di-n-octyl phthalate (ug/kg DW)	1,2,4-Trichlorobenzene (ug/kg DW)	1,4-Dichlorobenzene (ug/kg DW)
SCO					2,600	12,000	1,000	1,300	63	200	71	1,400	6,200	31	110
CSL					3,300	17,000	1,000	1,900	900	1,200	160	1,400	6,200	51	110
RCB59	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	RCB	4/2/2014	1,200	5,380 J	661	31,000	720 J	480 U	480 U	480 U	700	480 U	480 U
RCB60	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	RCB	4/2/2014	6,200	32,560	4,278	5,100	280 J	95 U	95 U	150	95 U	95 U	95 U
RCB67	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	RCB	12/21/2016											
RCB72	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	RCB	12/21/2016											
RCB215	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	RCB	5/17/2014											
RCB215	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	RCB	7/21/2016	270	1,078 J	107	2,100	57 J	60 U	60 U	33 J	60 U	60 U	60 U
RCB217	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	RCB	8/11/2016	453	1,325 J	124 J	21,300	490	97 U	79 J	960	111	97 U	97 U
RCB251	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	RCB	12/21/2016											
RCB293	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	RCB	4/16/2014	560	2,392	288	2,900	410	57 U	69	230	140	57 U	57 U
RCB296	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	RCB	4/15/2016	1,900	8,910 J	1,044	14,000	400	260 U	260 U	310	260 U	260 U	260 U
RCB306	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	RCB	6/13/2014	1,000	4,914 J	596 J	5,200	510	56 B	34 U	51	160 U	34 U	34 U
RCB306	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	RCB	8/11/2016											
RCB309	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	RCB	9/30/2016	136	993.7 J	142	2,010	830	84	31 U	53 J	41.3 U	28 U	21 U
ST1	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	SedTrap	5/19/2014	1,600	7,300	839	11,000	370	150 U	150 U	1,100	830	150 U	150 U
ST1	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	Inline	5/19/2014	88 J	330 J	85	510	93 U	93 U	93 U	93 U	93 U	93 U	93 U
ST1	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	SedTrap	5/22/2015	1,100	5,790 J	616	8,300	300	190 U	190 U	130 J	730	190 U	190 U
ST1	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	Inline	5/22/2015	670	3,418 J	396	770	440	77 U	77 U	77 U	77 U	77 U	77
ST1	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	SedTrap	5/9/2016	690	3,590 J	519	5,900	290 U	290 U	290 U	290 U	570	290 U	290 U
ST1	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	Inline	5/9/2016	40	200 J	24 J	360	19 U	24 J	19 U	19 U	19 U	19 U	19 U
ST7	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	SedTrap	5/9/2014	850	4,310 J	590	4,100	280 U	280 U	280 U	280 U	630	280 U	280 U
ST7	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	Inline	5/9/2014	100	534 J	75	910	60	60 U	60 U	60 U	110	60 U	60 U
ST7	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	SedTrap	5/18/2015	840	4,360	519	4,000	350	250 U	250 U	250 U	820	250 U	250 U
ST7	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	Inline	5/18/2015	52	274 J	32	630	19 U	19 U	19 U	19 U	55	19 U	19 U
ST7	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	SedTrap	5/9/2016	380	2,039 J	289 J	3,600	300 U	300 U	2,500	300 U	520	300 U	300 U
ODS8	RM 1.7-2.0 East	Michigan CSO	ODS	2/24/2016	100	752 J	117.2 J	910	100	95 U	95 U	95 U	95 U	95 U	95 U
ODS38	RM 2.0-2.3 East	S Brighton St SD	ODS	12/14/2016											
ODS38	RM 2.0-2.3 East	S Brighton St SD	ODS	12/22/2016											
RCB178	RM 2.0-2.3 East	S Brighton St SD	RCB	12/22/2016											
CB202	RM 2.0-2.3 East	S River St SD	RCB	2/23/2016	980	5,370 J	618 J	3,600	280 U	280 U	280 U	170 J	280 U	280 U	280 U
CB270	RM 2.0-2.3 East	S River St SD	CB	2/23/2016	3,600	18,900	2,131	7,600	320	290 U	590	120 J	750	290 U	290 U
CB288	RM 2.0-2.3 East	S River St SD	CB	2/23/2016	1,300	7,020 J	705 J	5,800	280	220 U	220	240	530	220 U	220 U
CB289	RM 2.0-2.3 East	S River St SD	CB	2/23/2016	1,000	5,950	704	5,800	970	320 U	210 J	180 J	530	320 U	320 U
MH211	RM 2.0-2.3 East	S River St SD	Inline	4/1/2016	130 J	530 J	201 J	5,900	290	230 U	230 U	230 U	230 U	230 U	230 U
MH220	RM 2.0-2.3 East	S River St SD	Inline	3/24/2016	790 J	4,010 J	476	2,700	300	240 U	240 U	240 U	240 U	240 U	240 U
ODS10	RM 2.0-2.3 East	S River St SD	ODS	4/1/2016	310	2,484	425	220	110	56 U	56 U	56 U	39 J	56 U	56 U
ODS9	RM 2.0-2.3 East	S River St SD	ODS	3/24/2016	1,700 J	9,230 J	793	12,000	500	290 U	340	290 U	840	290 U	290 U
RCB77	RM 2.0-2.3 East	S River St SD	RCB	3/24/2016	2,800 J	14,300 J	1,602	6,400	790	290 U	290 U	100 J	290 U	290 U	290 U
RCB78	RM 2.0-2.3 East	S River St SD	RCB	3/24/2016	2,000 J	10,210 J	819 J	3,800	560	230 U	130 J	81 J	250	230 U	230 U
RCB79	RM 2.0-2.3 East	S River St SD	RCB	3/24/2016	700 J	4,030 J	360 J	3,700	220 U	220 U	190 J	220 U	220 U	220 U	220 U
RCB81	RM 2.0-2.3 East	S River St SD	RCB	4/1/2016	790	3,540 J	401 J	3,200	380	280 U	280 U	84 J	180 J	280 U	280 U
RCB192	RM 2.0-2.3 East	S River St SD	RCB	4/1/2016	1,400	5,820 J	551 J	2,100	340	300 U	240 J	300 U	250 J	300 U	300 U
STRANS1	RM 2.3-2.8 East	S Garden St SD	ODS	3/14/2014											
STRANS2	RM 2.3-2.8 East	S Garden St SD	ODS	3/17/2014											
STRANS2	RM 2.3-2.8 East	S Garden St SD	ODS	3/17/2014											

Table F-2. SPU Source Tracing Sample Results (2014 - 2016)

Station ID	Source Control Area	Outfall	Type	Date Sampled	Pyrene (ug/kg DW)	Total HPAH (ug/kg DW)	Total cPAH (ug/kg DW)	BEHP (ug/kg DW)	Butylbenzyl phthalate (ug/kg DW)	Diethyl phthalate (ug/kg DW)	Dimethyl phthalate (ug/kg DW)	Di-n-butyl phthalate (ug/kg DW)	Di-n-octyl phthalate (ug/kg DW)	1,2,4-Trichlorobenzene (ug/kg DW)	1,4-Dichlorobenzene (ug/kg DW)
SCO					2,600	12,000	1,000	1,300	63	200	71	1,400	6,200	31	110
CSL					3,300	17,000	1,000	1,900	900	1,200	160	1,400	6,200	51	110
STRANS2	RM 2.3-2.8 East	S Garden St SD	ODS	3/17/2014											
RCB65	RM 2.3-2.8 East	S Myrtle St SD	RCB	2/5/2015	1,100	5,810 J	778	14,000	1,900 J	140 U	430	550	140 UJ	140 U	140 U
SL4-T6	RM 2.8 East	I-5 SD at Slip 4	SedTrap	4/24/2014	870	3,947 J	480	7,000	650	71 U	96	79	660	71 U	71 U
SL4-T6	RM 2.8 East	I-5 SD at Slip 4	SedTrap	5/18/2015	1,600	8,260 J	970	20,000	280	240 U	97 J	140 J	1100	240 U	240 U
SL4-T6	RM 2.8 East	I-5 SD at Slip 4	SedTrap	5/9/2016	670	3,433 J	404	4,100	340	97 U	97 U	53 J	360	97 U	97 U
MH23	RM 2.8 East	Slip 4	Inline	6/20/2014	13,000	74,300	8,821	18,000	1,300	620 U	620 U	620 U	650	620 U	620 U
CB78	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	CB	6/25/2015	2,000	10,270	1,180	7,600	430	110 U	280	62 J	470	110 U	110 U
CB189	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	CB	4/23/2015	230	1,124 J	121 J	6,500	110	110 U	110 U	510	110 U	110 U	110 U
CB189	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	CB	4/6/2016	370	890 J	272 U	6,800	730	300 U	300 U	680	300 U	300 U	300 U
CB193	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	CB	6/22/2015	430	1,870 J	222 J	74,000	230	230 U	230 U	610	1,200	230 U	230 U
CB195	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	CB	6/22/2015	450	2,541 J	305 J	5,400	180	120 U	120 U	76 J	430	120 U	120 U
CB196	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	CB	6/22/2015	140	756 J	94 J	150	16	35	19 U	19 U	19 U	19 U	19 U
CB197	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	CB	7/15/2015	320	1,402	170	10,000	980	57 U	57 U	160	230	57 U	57 U
CB198	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	CB	7/15/2015	2,000	8,980	928	720	110 U	110 U	110 U	39 J	110 U	110 U	110 U
CB199	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	CB	7/15/2015	750	3,310	376	20,000	170 U	170 U	170 U	220	650	170 U	170 U
CB210	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	CB	7/29/2015	1,300	6,730	794	40,000	280	150 U	68 J	1,100	2,000	150 U	150 U
CB214	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	CB	7/29/2015	930	4,021 J	407 J	22,000	330	110 U	63 J	120	460	110 U	110 U
CB215	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	CB	7/29/2015	250	1,275 J	171 J	670	220	99 U	99 U	99 U	99 U	99 U	99 U
CB216	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	CB	7/29/2015	190	1,052 J	133 J	1,900	240	94 U	94 U	1,100	47 J	94 U	94 U
CB217	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	CB	8/5/2015	1,200	6,100	692	8,600	1,300	110	96	110	430	77 U	77 U
CB218	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	CB	8/7/2015	58	376 J	41 J	380	67	31 J	19 U	10 J	19 U	19 U	26
CB219	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	CB	8/7/2015	660	2,770 J	451 J	9,000	1,200	490 U	490 U	490 U	3,500	490 U	490 U
CB228	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	CB	7/17/2015	610	2,639 J	339 J	5,500	100 J	120 U	120 U	120 U	310	120 U	120 U
CB233	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	CB	5/27/2015	600	2,660	237 J	11,000	1,600	110 U	110 U	290	8,100	110 U	110 U
CB234	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	CB	6/25/2015	460	2,520 J	318 J	5,000	370	200 U	99 J	200 U	200 U	200 U	200 U
CB235	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	CB	6/25/2015	910	3,470 J	337 J	28,000	580	340 U	340 U	340 U	340 U	340 U	340 U
CB236	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	CB	8/5/2015	840	4,105 J	426 J	7,400	370	120 U	120 U	120 U	320	120 U	120 U
CB264	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	CB	7/17/2015	880	4,020 J	386 J	6,700	380	300 U	300 U	300 U	240 J	300 U	300 U
CB296	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	CB	4/27/2016	4,500	19,150	1,830	1,700	76 J	120 U	120 U	140	120 U	120 U	120 U
MH7	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	Inline	4/6/2016	130	260	100 U	690	110 U	110 U	110 U	15,000	270	110 U	110 U
MH54	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	Inline	5/4/2016	9.2 J	19 J	15 J	40 J	18 U	18 U	18 U	18 U	18 U	18 U	18 U
MH55	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	Inline	5/5/2016	740	3,223 J	377 J	2,400	57 J	110 U	110 U	110 U	800	110 U	110 U
NST1	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	SedTrap	6/30/2014	2,700	18,030	2,330	16,000	190 U	190 U	190 U	120 J	190 U	190 U	190 U
NST1	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	Inline	6/30/2014	1,400	6,725 J	855 J	8,200	140	100 U	100 U	100	100 U	100 U	100 U
NST1	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	SedTrap	5/21/2015	1,800	9,300 J	1,106 J	13,000	340	300 U	300 U	280 J	9,900	300 U	300 U
NST1	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	Inline	5/21/2015	1,200	6,960	924	8,000	120 U	120 U	120 U	69 J	3,600	120 U	120 U
NST1	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	SedTrap	5/10/2016	1,300	6,420 J	763 J	6,300	270	120 U	120 U	130 U	3,700	120 U	120 U
NST1	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	Inline	5/10/2016	980	5,260 J	621 J	5,600	200 U	200 U	200 U	120 J	2,500	200 U	200 U
NST2	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	SedTrap	6/30/2014	3,600	14,410	1,527	17,000	450 J	600 U	540 J	600 U	900	600 U	600 U
NST2	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	Inline	6/30/2014	46	241 J	31.8 J	200	19 U	19 U	220	19 U	19 U	19 U	19 U
NST2	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	SedTrap	5/18/2015	1,300 J	3,920 J	519 J	8,800	340 J	570 U	230 J	570 U	570 U	570 U	570 U
NST2	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	Inline	5/18/2015	180	893 J	107 J	1,700	20	20 U	20 U	6.8 J	20 U	20 U	20 U
NST2	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	SedTrap	5/9/2016	1,400	6,270 J	683 J	7,500	400	320 U	320 U	320 U	370	320 U	320 U
NST2	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	Inline	5/9/2016	38	196 J	24 J	200	19 U	17 J	19 U	19 U	19 U	19 U	19 U

Table F-2. SPU Source Tracing Sample Results (2014 - 2016)

Station ID	Source Control Area	Outfall	Type	Date Sampled	Pyrene (ug/kg DW)	Total HPAH (ug/kg DW)	Total cPAH (ug/kg DW)	BEHP (ug/kg DW)	Butylbenzyl phthalate (ug/kg DW)	Diethyl phthalate (ug/kg DW)	Dimethyl phthalate (ug/kg DW)	Di-n-butyl phthalate (ug/kg DW)	Di-n-octyl phthalate (ug/kg DW)	1,2,4-Trichlorobenzene (ug/kg DW)	1,4-Dichlorobenzene (ug/kg DW)
SCO					2,600	12,000	1,000	1,300	63	200	71	1,400	6,200	31	110
CSL					3,300	17,000	1,000	1,900	900	1,200	160	1,400	6,200	51	110
NST3	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	SedTrap	5/23/2014	180	1,264	203	800	62 U	62 U	62 U	62 U	46 J	62 U	62 U
NST3	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	Inline	5/23/2014	140	943 J	145 J	300	56 U	56 U	56 U	56 U	56 U	56 U	56 U
NST3	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	SedTrap	5/22/2015	450	2,350	346	3,300	120 U	120 U	120 U	120 U	1,900	120 U	120 U
NST3	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	Inline	5/22/2015	160	1,175 J	150 J	480	38 J	77 U	77 U	23 J	77 U	77 U	77 U
NST3	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	SedTrap	5/12/2016	27,000	113,500	13,230	780	94 U	94 U	94 U	94 U	94 U	94 U	94 U
NST4	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	SedTrap	6/30/2014	720	5,020 J	646 J	1,400	330 U	330 U	330 U	330 U	330 U	330 U	330 U
NST4	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	Inline	6/30/2014	470	3,347 J	424 J	180	32	20 U	16 J	20 U	13 J	20 U	20 U
NST4	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	SedTrap	5/21/2015	410	3,228 J	405 J	1,300	120	120 U	120 U	120 U	100 J	120 U	120 U
NST4	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	Inline	5/21/2015	290	2,041	268	120	16 J	19 U	18 J	11 J	19 U	19 U	19 U
NST4	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	SedTrap	5/12/2016	480	3,070 J	432 J	850	100 U	100 U	100 U	100 U	100 U	100 U	100 U
NST4	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	Inline	5/12/2016	440	3,145	407	180	56 U	56 U	56 U	56 U	56 U	56 U	56 U
NST5	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	SedTrap	6/30/2014											
NST5	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	SedTrap	5/18/2015											
NST5	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	SedTrap	5/9/2016											
ODS2	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	ODS	9/1/2015	920	5,460	673	7,700	180	120 U	140	340	280	120 U	120 U
ODS4	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	ODS	9/9/2015	520	3,028	403	2,300	21 U	23 U	8 J	96	21 U	21 U	21 U
RCB299	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	RCB	4/27/2016	400	2,080 J	289 J	1,700	270 J	300 U	300 U	300 U	300 U	300 U	300 U
RCB300	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	RCB	5/4/2016	950	3,510 J	449 J	16,000	440 J	490 U	490 U	490 U	490 U	490 U	490 U
RCB301	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	RCB	5/4/2016	570	2,090 J	418 J	3,500	470 U	470 U	470 U	470 U	470 U	470 U	470 U
RCB302	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	RCB	5/4/2016	220	1,089 J	143 J	1,100	280	120 U	120 U	120 U	120 U	120 U	120 U
RCB303	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	RCB	5/4/2016	250	1,030 J	121 J	1,400	73 J	110 U	110 U	110 U	110 U	110 U	110 U
RCB304	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	RCB	5/4/2016	500	2,280 J	224 J	4,500	120 U	120 U	120 U	120 U	120 U	120 U	120 U
RCB305	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	RCB	5/5/2016	310	1,400 J	157 J	5,500	610	120 U	120 U	120 U	120 U	120 U	120 U
ID-ST1	RM 0.0-1.0 West	SW Idaho St SD	SedTrap	5/19/2014	1,000	7,430	1,003	12,000	880	190 U	190 U	210	190 U	190 U	190 U
ID-ST1	RM 0.0-1.0 West	SW Idaho St SD	SedTrap	5/21/2015											
ID-ST1	RM 0.0-1.0 West	SW Idaho St SD	SedTrap	5/11/2016	640	4,600 J	672 J	5,000	140 U	140 U	140 U	70 J	400	140 U	140 U
ID-ST2	RM 0.0-1.0 West	SW Idaho St SD	SedTrap	5/19/2014	130	840 J	115 J	2,900	55 J	58 U	58 U	58 U	58 U	58 U	58 U
ID-ST2	RM 0.0-1.0 West	SW Idaho St SD	SedTrap	5/21/2015	49	290	45	230	17 J	19 U	19 U	15 J	19 U	19 U	19 U
ID-ST2	RM 0.0-1.0 West	SW Idaho St SD	SedTrap	5/10/2016	41 J	226 J	29 J	140	19 U	19 U	19 U	110	19 U	19 U	19 U
ID-ST3	RM 0.0-1.0 West	SW Idaho St SD	SedTrap	5/23/2014	67	371 J	58 J	480	70	58 U	58 U	58 U	58 U	58 U	58 U
ID-ST3	RM 0.0-1.0 West	SW Idaho St SD	SedTrap	5/22/2015	28 J	250 J	41 J	420	37 J	57 U	57 U	23 J	57 U	57 U	57 U
ID-ST3	RM 0.0-1.0 West	SW Idaho St SD	SedTrap	5/11/2016	50 J	164	89 J	9,100	99 U	99 U	99 U	150	99 U	99 U	99 U
HP-ST4	RM 1.6-2.1 West	Highland Park Wy SW SD	SedTrap	5/19/2014	83	362 J	57 J	960	140	57 U	57 U	57 U	97	57 U	57 U
HP-ST4	RM 1.6-2.1 West	Highland Park Wy SW SD	SedTrap	5/18/2015	210	1,058 J	137 J	2,200	570	110 U	110 U	320	300	110 U	110 U
HP-ST4	RM 1.6-2.1 West	Highland Park Wy SW SD	SedTrap	5/10/2016	48 J	192 J	52 J	340	84 J	60 U	60 U	60 U	48 J	60 U	60 U
HP-ST6	RM 1.6-2.1 West	Highland Park Wy SW SD	SedTrap	6/30/2014	710	3,100	330	5,000	560	97 U	82 J	97 U	97 U	97 U	97 U
HP-ST6	RM 1.6-2.1 West	Highland Park Wy SW SD	Inline	6/30/2014	560	2,989 J	370 J	2,000	190	56 U	320	42 J	1,100	56 U	56 U
HP-ST6	RM 1.6-2.1 West	Highland Park Wy SW SD	SedTrap	5/18/2015	1,000	4,990 J	510 J	8,300	580	360 U	330 J	360 U	440	360 U	360 U
HP-ST6	RM 1.6-2.1 West	Highland Park Wy SW SD	Inline	5/18/2015	430	2,398	224	1,900	87	19 U	19 U	84	19 U	19 U	19 U
HP-ST6	RM 1.6-2.1 West	Highland Park Wy SW SD	SedTrap	5/10/2016	810	3,714 J	346 J	4,600	270	120 U	82 J	120 U	380	120 U	120 U
ODS1	RM 1.6-2.1 West	Highland Park Wy SW SD	ODS	9/26/2014	500 UJ	500	428 U	520 J	500 UJ	500 UJ	500 UJ	500 UJ	780 J	500 UJ	500 UJ
KN-ST1	RM 1.6-2.1 West	SW Kenny St SD/T115 CSO	SedTrap	6/30/2014	970	6,170	740	3,700	520	84 U	84 U	67 J	84 U	84 U	84 U
KN-ST1	RM 1.6-2.1 West	SW Kenny St SD/T115 CSO	SedTrap	5/18/2015	490	3,145 J	354 J	3,900	220	200	81 J	58 J	120 U	120 U	120 U
KN-ST1	RM 1.6-2.1 West	SW Kenny St SD/T115 CSO	SedTrap	5/10/2016	260	1,648 J	191 J	1,400	170	57 U	57 U	37 J	110	57 U	57 U

Table F-2. SPU Source Tracing Sample Results (2014 - 2016)

Station ID	Source Control Area	Outfall	Type	Date Sampled	Pyrene (ug/kg DW)	Total HPAH (ug/kg DW)	Total cPAH (ug/kg DW)	BEHP (ug/kg DW)	Butylbenzyl phthalate (ug/kg DW)	Diethyl phthalate (ug/kg DW)	Dimethyl phthalate (ug/kg DW)	Di-n-butyl phthalate (ug/kg DW)	Di-n-octyl phthalate (ug/kg DW)	1,2,4-Trichlorobenzene (ug/kg DW)	1,4-Dichlorobenzene (ug/kg DW)
SCO					2,600	12,000	1,000	1,300	63	200	71	1,400	6,200	31	110
CSL					3,300	17,000	1,000	1,900	900	1,200	160	1,400	6,200	51	110
1st-ST1	RM 2.1 West	1st Ave S SD, west	SedTrap	5/23/2014	2,100	8,650	922	27,000	520	290 U	290 U	210 J	290 U	290 U	290 U
1st-ST1	RM 2.1 West	1st Ave S SD, west	SedTrap	5/22/2015	2,000	8,580 J	866 J	21,000	480	300 U	300 U	300 U	300 U	300 U	300 U
1st-ST1	RM 2.1 West	1st Ave S SD, west	SedTrap	5/12/2016	1,300	6,610 J	747 J	12,000	300	140 U	140 U	120 J	140 U	140 U	140 U
1st-ST2	RM 2.1 West	1st Ave S SD, west	SedTrap	5/22/2015	370	1,690	216	4,000	120	120 U	140	120 U	120 U	120 U	120 U
1st-ST2	RM 2.1 West	1st Ave S SD, west	SedTrap	5/12/2016	440	2,300	288	4,400	99 U	99 U	99 U	99 U	460	99 U	99 U
1st-ST3	RM 2.1 West	1st Ave S SD, west	SedTrap	5/19/2014	400	1,996 J	252 J	410	55	55 U	55 U	55 U	55 U	55 U	55 U
1st-ST3	RM 2.1 West	1st Ave S SD, west	Inline	5/19/2014	230	1,024 J	164 J	310	93	93 U	93 U	93 U	93 U	93 U	93 U
1st-ST3	RM 2.1 West	1st Ave S SD, west	Inline	5/21/2015	300	1,687 J	217 J	360	39	39 U	39 U	39 U	39 U	39 U	39 U
1st-ST3	RM 2.1 West	1st Ave S SD, west	SedTrap	5/21/2015	420	2,450 J	344 J	1,000 J	290	290 U	290 U	290 U	290 U	290 U	290 U
1st-ST3	RM 2.1 West	1st Ave S SD, west	SedTrap	5/11/2016	110	702 J	116 J	300	99 U	99 U	99 U	99 U	99 U	99 U	99 U
1st-ST3	RM 2.1 West	1st Ave S SD, west	Inline	5/11/2016	280	1,482 J	178 J	210	57 U	57 U	57 U	57 U	57 U	57 U	57 U
1st-ST7	RM 2.1 West	1st Ave S SD, west	SedTrap	5/19/2014	1,900	10,370 J	1,302 J	5,700	500	150 U	150 U	110 J	150 U	150 U	150 U
1st-ST7	RM 2.1 West	1st Ave S SD, west	SedTrap	5/21/2015	1,400	7,670	880	7,400	200	200 U	200 U	380	200 U	200 U	200 U
1st-ST7	RM 2.1 West	1st Ave S SD, west	SedTrap	5/11/2016	2,400	13,490 J	1,666 J	8,500	200 U	200 U	200 U	200 U	750	200 U	200 U
CB108	RM 2.1-2.2 West	2nd Ave S SD	CB	5/14/2015	180	761 J	92 J	4,400	59	59 U	59 U	44 J	59 U	59 U	59 U
CB263	RM 2.1-2.2 West	2nd Ave S SD	CB	5/14/2015	1,800	7,748 J	732 J	6,600	580	110 U	110 U	89 J	290	110 U	110 U
RCB139	RM 2.1-2.2 West	2nd Ave S SD	RCB	12/21/2016											
RCB203	RM 2.1-2.2 West	2nd Ave S SD	RCB	12/21/2016											
CB262	RM 2.2-3.4 West	7th Ave S SD	CB	5/13/2015	400	1,670 J	276 J	12,000	980	290 U	270 J	200 J	1,200	290 U	290 U
CB318	RM 2.2-3.4 West	7th Ave S SD	CB	9/30/2016	116	711 J	93 J	1,150	417	26 U	22	124	400	5.7 U	4.2 U
7th-ST1	RM 2.2-3.4 West	7th Ave S SD	SedTrap	5/18/2015	25	167 J	22 J	200	18	18 U	18 U	18 U	15 J	18 U	18 U
7th-ST1	RM 2.2-3.4 West	7th Ave S SD	Inline	5/18/2015	110	577	70	800	43	20 U	9.8 J	11 J	20 U	20 U	20 U
7th-ST1	RM 2.2-3.4 West	7th Ave S SD	SedTrap	5/9/2016	480	2,540 J	355 J	5,700	280	96 U	96 U	140	96 U	96 U	96 U
7th-ST1	RM 2.2-3.4 West	7th Ave S SD	Inline	5/9/2016	190	908 J	116 J	1,000	60 U	60 U	60 U	60 U	60 U	60 U	60 U
7th-ST2	RM 2.2-3.4 West	7th Ave S SD	SedTrap	5/9/2014	24	108 J	20 J	76	19	22	19 U	25	19 U	19 U	19 U
7th-ST2	RM 2.2-3.4 West	7th Ave S SD	SedTrap	5/21/2015	63	321 J	42 J	280	24	20 U	20 U	20 U	20 U	20 U	20 U
7th-ST2	RM 2.2-3.4 West	7th Ave S SD	SedTrap	5/10/2016	58	221 J	51 J	210	58 U	58 U	58 U	58 U	110	58 U	58 U
7th-ST2	RM 2.2-3.4 West	7th Ave S SD	Inline	5/10/2016	19 U	38 U	17 U	47 U	19 U	19 U	19 U	19 U	19 U	19 U	19 U
7th-ST3	RM 2.2-3.4 West	7th Ave S SD	SedTrap	5/21/2015	1,200	7,270 J	1,036 J	6,700	320	580 U	580 U	580 U	580 U	580 U	580 U
7th-ST3	RM 2.2-3.4 West	7th Ave S SD	SedTrap	5/11/2016	680	3,480 J	467 J	7,300	280 U	280 U	280 U	280 U	250 J	280 U	280 U
ODS22	RM 2.2-3.4 West	7th Ave S SD	ODS	11/15/2016											
ODS23	RM 2.2-3.4 West	7th Ave S SD	ODS	11/15/2016											
ODS24	RM 2.2-3.4 West	7th Ave S SD	ODS	11/15/2016											
ODS25	RM 2.2-3.4 West	7th Ave S SD	ODS	11/15/2016											
ODS26	RM 2.2-3.4 West	7th Ave S SD	ODS	11/15/2016											
ODS42	RM 2.2-3.4 West	7th Ave S SD	ODS	12/15/2016											
ODS43	RM 2.2-3.4 West	7th Ave S SD	ODS	12/15/2016											
ODS44	RM 2.2-3.4 West	7th Ave S SD	ODS	12/15/2016											
ODS45	RM 2.2-3.4 West	7th Ave S SD	ODS	12/29/2016	209	1,123	133	460	36.4 J	36.8 U	36.8 U	18.1 J	36.8 U	36.8 U	36.8 U
RCB61	RM 2.2-3.4 West	7th Ave S SD	RCB	6/13/2014	1,300	5,010 J	552	12,000	500	420 U	270 J	420 U	420 U	420 U	420 U
RCB61	RM 2.2-3.4 West	7th Ave S SD	RCB	9/11/2014	1,100	4,810	520	7,700	380	230 U	230 U	120 J	230 U	230 U	230 U
RCB62	RM 2.2-3.4 West	7th Ave S SD	RCB	6/13/2014	1,600	8,120	834	3,300	220 U	220 U	220 U	220 U	220 U	220 U	220 U
RCB62	RM 2.2-3.4 West	7th Ave S SD	RCB	9/11/2014	800	4,710	497	2,200	180	140 U	140 U	140 U	110 J	140 U	140 U
RCB63	RM 2.2-3.4 West	7th Ave S SD	RCB	6/13/2014	1,700	8,570	902	4,700	360	220 U	220 U	220 U	160 J	220 U	220 U

Table F-2. SPU Source Tracing Sample Results (2014 - 2016)

Station ID	Source Control Area	Outfall	Type	Date Sampled	Pyrene (ug/kg DW)	Total HPAH (ug/kg DW)	Total cPAH (ug/kg DW)	BEHP (ug/kg DW)	Butylbenzyl phthalate (ug/kg DW)	Diethyl phthalate (ug/kg DW)	Dimethyl phthalate (ug/kg DW)	Di-n-butyl phthalate (ug/kg DW)	Di-n-octyl phthalate (ug/kg DW)	1,2,4-Trichlorobenzene (ug/kg DW)	1,4-Dichlorobenzene (ug/kg DW)
SCO					2,600	12,000	1,000	1,300	63	200	71	1,400	6,200	31	110
CSL					3,300	17,000	1,000	1,900	900	1,200	160	1,400	6,200	51	110
RCB63	RM 2.2-3.4 West	7th Ave S SD	RCB	9/11/2014	1,800	9,350 J	1,018	5,000	230	180 U	98 J	110 J	220	180 U	180 U
RCB64	RM 2.2-3.4 West	7th Ave S SD	RCB	6/13/2014	2,800	14,380	1,730	7,100	320 U	320 U	320 U	320 U	320 U	320 U	320 U
RCB64	RM 2.2-3.4 West	7th Ave S SD	RCB	9/11/2014	3,000	16,170	1,828	4,600	220 U	220 U	220 U	220 U	170 J	220 U	220 U
RCB70	RM 2.2-3.4 West	7th Ave S SD	RCB	12/21/2016											
RCB71	RM 2.2-3.4 West	7th Ave S SD	RCB	12/21/2016											
RCB165	RM 2.2-3.4 West	7th Ave S SD	RCB	6/13/2014	1,000	4,914 J	596 J	5,200	510	56 B	34 U	51	160 U	34 U	34 U
RCB229	RM 2.2-3.4 West	CS-1	RCB	12/29/2016											
ODS39	RM 2.2-3.4 West	CSO	ODS	12/15/2016											
ODS40	RM 2.2-3.4 West	8th Ave S	ODS	11/15/2016											
ODS41	RM 2.2-3.4 West	8th Ave S	ODS	12/15/2016											
ODS50	RM 2.2-3.4 West	8th Ave S	ODS	12/22/2016											
RCB73	RM 2.2-3.4 West	8th Ave S	RCB	12/21/2016											
RCB74	RM 2.2-3.4 West	8th Ave S	RCB	12/22/2016											
RCB278	RM 2.2-3.4 West	8th Ave S	RCB	12/22/2016											
RCB279	RM 2.2-3.4 West	8th Ave S	RCB	12/29/2016											
RCB310	RM 2.2-3.4 West	8th Ave S	RCB	12/29/2016											
RCB311	RM 2.2-3.4 West	8th Ave S	RCB	12/29/2016											
RCB298	RM 2.2-3.4 West	S Webster St SD	RCB	4/6/2016	11,000	62,100 J	7,983 J	2,400	280 U	280 U	280 U	280 U	280 U	280 U	280 U
PS1	RM 3.4-3.8 West	CS-1	Inline	5/12/2014	1,700	6,700 J	1,422 J	21,000	1,600 U	1,600 U	1,100 J	1,600 U	1,600 J	1,600 U	1,600 U
PS2	RM 3.4-3.8 West	CS-1	Inline	5/12/2014	1,600	4,620 J	828 J	24,000	930 U	930 U	930 U	930 U	880 J	930 U	930 U
96-ST1	RM 3.8-4.2 West	S 96th St SD	SedTrap	5/9/2014	950	4,950	691	2,500	240	240 U	190 J	240 U	160 J	240 U	240 U
96-ST1	RM 3.8-4.2 West	S 96th St SD	Inline	5/9/2014	190	1,069 J	172 J	680	120	120 U	120 U	120 U	120 U	120 U	120 U
96-ST2	RM 3.8-4.2 West	S 96th St SD	SedTrap	5/19/2014	500	2,964 J	402 J	2,100	500	57 U	57	71	120	57 U	57 U
96-ST2	RM 3.8-4.2 West	S 96th St SD	Inline	5/19/2014	100	602	91	230	19	19 U	19 U	19 U	19 U	19 U	19 U
96-ST3	RM 3.8-4.2 West	S 96th St SD	SedTrap	5/9/2014	93	567	79	460	24	19 U	19 U	71	19 U	19 U	19 U
96-ST3	RM 3.8-4.2 West	S 96th St SD	Inline	5/9/2014	19 U	12 J	16 J	42 J	19	19 U	19 U	19 U	19 U	19 U	19 U
HC-ST1	RM 4.2-5.8 West	Hamm Creek	SedTrap	5/23/2014	75	396	55	570	19 U	19 U	19 U	19 U	19 U	19 U	19 U

Source: Seattle Public Utilities

Bold text indicates chemical was detected.

Not detected; reporting limit is above the SCO

Exceeds SCO

Exceeds CSL/RAL/MTCA Method A

* MTCA Method A Soil Cleanup Level

mg/kg DW - milligram per kilogram dry weight

ug/kg DW - microgram per kilogram dry weight

BEHP - bis(2-ethylhexyl)phthalate

HC - hydrocarbon

LPAH - Low molecular weight polycyclic aromatic hydrocarbon

HPAH - High molecular weight polycyclic aromatic hydrocarbon

cPAH - carcinogenic polycyclic aromatic hydrocarbon

PCB - polychlorinated biphenyl

NA - Not applicable

Table F-2. SPU Source Tracing Sample Results (2014 - 2016)

Station ID	Source Control Area	Outfall	Type	Date Sampled	2-Chloro-naphthalene (ug/kg DW)	2-Methyl-phenol (ug/kg DW)	4-Methyl-phenol (ug/kg DW)	Benzoic acid (ug/kg DW)	Benzyl alcohol (ug/kg DW)	Bis-(2-chloroethyl) ether (ug/kg DW)	Carbazole (ug/kg DW)	Dibenzofuran (ug/kg DW)	Isophorone (ug/kg DW)	N-Nitroso-diphenylamine (ug/kg DW)	Pentachloro-phenol (ug/kg DW)
SCO					NA	63	670	650	57	NA	NA	540	NA	28	360
CSL					NA	63	670	650	73	NA	NA	540	NA	40	690
CB2	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	3/13/2014	330 U	330 U	4,500	2,400 J	300 J	330 U	740	200 J	330 U	330 U	1,700 U
CB27b	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	3/30/2016	1,100 U	1,100 U	3,700	11,000 U	1,100 U	1,100 U	1,100 U	1,100 U	1,100 U	1,100 U	5,600 UJ
CB83	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	4/8/2016	120 U	120 U	620	1,300 J	190	120 U	120 U	120 U	120 U	120 U	580 U
CB121	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	9/23/2016											
CB176	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	2/26/2014	520 U	520 U	3,300	3,300 J	520 U	520 U	520 U	520 U	520 U	520 U	2,600 U
CB177	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	2/26/2014	280 U	280 U	4,400	1,700 J	280 U	280 U	280 U	280 U	280 U	280 U	1,400 U
CB178	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	2/26/2014	540 U	540 U	4,100	2,600 J	510 J	540 U	320 J	540 U	540 U	540 U	2,700 U
CB179	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	2/27/2014	810 U	810 U	810	8,100 U	930	810 U	810 U	810 U	810 U	3,000	4,000 U
CB180	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	2/27/2014	790 U	790 U	790 U	7,900 U	790 U	790 U	790 U	790 U	790 U	790 U	3,900 U
CB181	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	3/4/2014											
CB182	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	3/4/2014											
CB185	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	6/12/2015	180 U	180 U	34,000	4,300		180 U	180 U	180 U	180 U	180 U	900 U
CB220	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	3/7/2014	580 U	580 U	670	5,800 U	580 U	580 U	350 J	580 U	580 U	440 J	2,900 U
CB221	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	3/7/2014	840 U	840 U	1,400	8,400 U	1,800	840 U	22,000	3,300	840 U	840 U	4,200 U
CB222	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	3/7/2014	1,500 U	1,500 U	1,500 U	15,000 U	1,500 U	1,500 U	23,000	1,600	1,500 U	1,500 U	7,500 U
CB223	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	3/7/2014	630 U	3,100	1,200	6,300 U	630 U	630 U	630 U	630 U	630 U	630 U	3,200 U
CB224	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	3/7/2014	580 U	580 U	640	5,800 U	580 U	580 U	580 U	580 U	580 U	580 U	2,900 U
CB225	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	3/7/2014	350 U	350 U	350 U	3,500 U	350 U	350 U	350 U	350 U	350 U	350 U	1,800 U
CB226	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	3/7/2014	280 U	280 U	400	2,800 U	280 U	280 U	280 U	280 U	280 U	280 U	1,400 U
CB227	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	3/7/2014	110 U	110 U	110 U	1,100 U	110 U	110 U	110 U	110 U	110 U	110 U	560 U
CB230	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	3/21/2014	190 U	190 U	4,900	1,900	400	190 U	130 J	190 U	190 U	190 U	970 U
CB231	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	3/21/2014	890 U	890 U	1,200	8,900 U	890 U	890 U	890 U	670 J	890 U	890 U	4,400 U
CB232	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	4/16/2014	100 U	100 U	1,300	1,000 U	100 U	100 U	100 U	100 U	100 U	100 U	500 U
CB237	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	12/21/2016											
CB240	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	4/4/2014	290 U	290 U	2,200	2,900 U	290 U	290 U	290 U	290 U	290 U	290 U	1,400 U
CB240	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	4/4/2014	280 U	280 U	2,200	2,800 U	280 U	280 U	280 U	280 U	280 U	280 U	1,400 U
CB240	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	7/21/2016	280 U	280 U	280 U	2,800 U	280 U	280 U	280 UJ	280 U	280 U	280 U	1,400 U
CB241	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	4/4/2014	780 U	780 U	1,100	7,800 U	780 U	780 U	780 U	780 U	780 U	780 U	3,900 U
CB241	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	7/21/2016	290 U	290 U	860	1,600 J	290 U	290 U	290 UJ	140 J	290 U	290 U	1,400 U
CB242	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	4/4/2014	620 U	620 U	620 U	6,200 U	620 U	620 U	620 U	620 U	620 U	620 U	3,100 U
CB243	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	4/10/2014	630 U	630 U	630 U	6,300 U	630 U	630 U	3,100	850	630 U	630 U	3,200 U
CB244	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	4/10/2014	650 U	650 U	2,200	6,500 UJ	650 U	650 U	650 U	650 U	650 U	650 U	3,200 U
CB245	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	4/10/2014	290 U	290 U	340	2,900 UJ	290 U	290 U	150 J	290 U	290 U	290 U	1,500 U
CB246	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	5/17/2014											
CB247	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	5/17/2014											
CB248	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	5/17/2014											
CB248	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	7/21/2016	300 U	300 U	370	1,800 J	300 U	300 U	300 UJ	130 J	300 U	300 U	1,500 UJ
CB250	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	4/16/2014	720 U	720 U	##### B	3,600 J	5,000	720 U	720 U	720 U	720 U	720 U	3,600 UJ
CB251	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	4/16/2014	660 U	660 U	2,100 U	6,600 U	660 U	660 U	660 U	660 U	660 U	660 U	3,300 UJ
CB251	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	5/14/2014											
CB252	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	5/8/2014	140 U	140 U	680	1,400 UJ	140 U	140 U	140 U	140 U	140 U	140 U	690 UJ
CB253	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	5/8/2014	260 U	260 U	1,300	2,600 UJ	260 U	260 U	260 U	260 U	260 U	260 U	1,300 UJ
CB254	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	5/8/2014	490 U	490 U	1,400	4,900 UJ	490 U	490 U	510	490 U	490 U	270 J	2,400 UJ
CB255	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	6/11/2014	1,000 U	1,000 U	23,000	10,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	1,000 U	5,100 U

Table F-2. SPU Source Tracing Sample Results (2014 - 2016)

Station ID	Source Control Area	Outfall	Type	Date Sampled	2-Chloro-naphthalene (ug/kg DW)	2-Methyl-phenol (ug/kg DW)	4-Methyl-phenol (ug/kg DW)	Benzoic acid (ug/kg DW)	Benzyl alcohol (ug/kg DW)	Bis-(2-chloroethyl) ether (ug/kg DW)	Carbazole (ug/kg DW)	Dibenzofuran (ug/kg DW)	Isophorone (ug/kg DW)	N-Nitroso-diphenylamine (ug/kg DW)	Pentachloro-phenol (ug/kg DW)
SCO					NA	63	670	650	57	NA	NA	540	NA	28	360
CSL					NA	63	670	650	73	NA	NA	540	NA	40	690
CB260	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	5/14/2014											
CB260	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	ODS	6/29/2016	20 U	20 UJ	600 J	200 UJ	20 UJ	20 U	24	20 U	20 U	20 U	98 UJ
CB261	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	5/14/2014											
CB267	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	11/6/2015	2,000 U	2,000 U	2,000 U	20,000 U	2,000 U	2,000 U	2,000 U	2,000 U	2,000 U	2,000 U	9,900 U
CB268	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	11/6/2015	290 U	290 U	250 J	2,900 U	290 U	290 U	200 J	290 U	290 U	290 U	1,500 U
CB271	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	6/29/2016	97 U	120	320	1,200	97 U	97 U	150	78 J	97 U	97 U	490 U
CB273	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	7/13/2016	450 U	450 U	1,400	4,500 UJ	2,000	450 U	450 U	450 U	450 U	540	2,300 U
CB275	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	6/29/2016	98 U	98 U	150	980 U	5,600	98 U	98 U	98 U	98 U	98 U	490 U
CB281	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	2/11/2016											
CB290	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	4/1/2016	230 U	230 U	230 U	720 J	230 U	230 U	150 J	230 U	230 U	230 U	1,200 UJ
CB291	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	4/15/2016	240 U	240 U	620	1,200 J	240 U	290	370 J	240 U	240 U	240 U	1,200 U
CB295	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	4/8/2016	110 U	110 U	110 U	680 J	110 U	110 U	110 U	110 U	110 U	110 U	560 U
CB311	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	6/29/2016	97 U	97 U	1,500	480 J	97 U	97 U	97 U	44 J	97 U	97 U	490 U
CB312	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	8/18/2016	193 U	193 U	1,570	4,890	4,940	193 U	82.1 J	193 U	193 U	193 U	966 U
CB313	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	8/18/2016	195 U	12,000 U	217	1,710 J	16,800	195 U	195 U	82.7 J	195 U	195 U	975 U
CB314	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	9/1/2016	18.8 U	23 U	91	1,290	503	19.5 U	26 J	39 J	22.3 U	81.6	118 J
CB315	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	9/1/2016	104 U	184 U	346 U	1,390 U	351 U	159 U	173 U	108 U	182 U	1,780	736 U
CB317	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	9/30/2016	20.3 U	36 U	79 J	270 UJ	68 U	31 U	33.7 U	21 U	35.4 U	44 U	143 U
CB319	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	11/7/2016	39.2 U	69 U	130 U	869 J	132 U		65.1 U	41 U	68.5 U	627	276 U
CB320	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	11/7/2016	37.8 U	67 U	621	1,140 J	127 U		67 J	60 J	65.9 U	81 U	266 U
CB321	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	11/16/2016											
MH18	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	Inline	5/14/2014	200 U	200 U	200 U	2,000 UJ	200 U	200 U	500	220	200 U	200 U	1,000 UJ
MH18	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	Inline	4/6/2016	290 U	290 U	320	2,100 J	290 UJ	290 U	1,200 J	250 J	290 U	290 U	1,500 U
MH37	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	Inline	10/15/2015	96 U	96 U	210	690 J	96 U	96 U	110 J	48 J	96 U	120	480 U
ODS11	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	ODS	9/30/2016	19.4 U	19.4 U	14 J	202	19.4 U	19.4 U	29	13.3 J	19.4 U	19.4 U	52 J
ODS15	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	ODS	11/16/2016											
ODS16	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	ODS	11/16/2016											
ODS17	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	ODS	11/16/2016											
ODS18	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	ODS	11/16/2016											
ODS19	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	ODS	11/15/2016											
ODS20	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	ODS	11/15/2016											
ODS21	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	ODS	11/15/2016											
ODS27	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	ODS	11/10/2016											
ODS28	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	ODS	11/10/2016											
ODS29	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	ODS	11/10/2016											
ODS30	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	ODS	11/10/2016											
ODS37	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	ODS	12/14/2016											
ODS7	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	ODS	2/24/2016	92 U	92 U	92 U	920 U	92 U	92 U	92 U	92 U	92 U	92 U	460 UJ
OWSC	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	Inline	10/15/2015	480 U	480 U	480 U	4,800 U	480 U	480 U	480 UJ	480 U	480 U	480 U	2,400 U
OWSE	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	Inline	10/15/2015	560 U	560 U	1,000	5,600 U	560 U	560 U	560 UJ	560 U	560 U	560 U	2,800 U
RCB36	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	RCB	4/16/2014	95 U	95 U	400	470 J	85 J	95 U	80 J	57 J	95 U	95 U	470 U
RCB51	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	RCB	5/14/2014											
RCB57	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	RCB	4/2/2014	310 U	310 U	3,300	1,800 J	490	310 U	150 J	310 U	310 U	310 U	1,500 U
RCB58	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	RCB	4/2/2014	260 U	260 U	650	1,100 J	260 U	260 U	260 U	260 U	260 U	330	1,300 U

Table F-2. SPU Source Tracing Sample Results (2014 - 2016)

Station ID	Source Control Area	Outfall	Type	Date Sampled	2-Chloro-naphthalene (ug/kg DW)	2-Methyl-phenol (ug/kg DW)	4-Methyl-phenol (ug/kg DW)	Benzoic acid (ug/kg DW)	Benzyl alcohol (ug/kg DW)	Bis-(2-chloroethyl) ether (ug/kg DW)	Carbazole (ug/kg DW)	Dibenzofuran (ug/kg DW)	Isophorone (ug/kg DW)	N-Nitroso-diphenylamine (ug/kg DW)	Pentachloro-phenol (ug/kg DW)
SCO					NA	63	670	650	57	NA	NA	540	NA	28	360
CSL					NA	63	670	650	73	NA	NA	540	NA	40	690
RCB59	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	RCB	4/2/2014	480 U	480 U	670	4,800 U	480 U	480 U	480 U	480 U	480 U	480 U	2,400 U
RCB60	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	RCB	4/2/2014	95 U	95 U	470	1,000	110	95 U	290	140	95 U	95 U	150 J
RCB67	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	RCB	12/21/2016											
RCB72	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	RCB	12/21/2016											
RCB215	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	RCB	5/17/2014											
RCB215	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	RCB	7/21/2016	60 U	60 U	5,900	800	60 U	60 U	60 UJ	60 U	60 U	60 U	300 U
RCB217	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	RCB	8/11/2016	97 U	97 U	2,380	970 U	97 U	97 U	97 U	41 J	97 U	257	485 U
RCB251	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	RCB	12/21/2016											
RCB293	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	RCB	4/16/2014	57 U	57 U	180	330 J	120	57 U	46 J	57 U	57 U	32 J	290 U
RCB296	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	RCB	4/15/2016	260 U	260 U	680	2,600 UJ	5,200	260 U	180 J	260 U	260 U	260 U	1300 U
RCB306	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	RCB	6/13/2014	34 U	51	3,400	1,200 J	170	34 U	85	38	34 U	34 U	170 U
RCB306	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	RCB	8/11/2016											
RCB309	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	RCB	9/30/2016	21.1 U	37 U	70 U	280 UJ	184	32.1 U	34.9 U	22 U	37 U	45 U	148 U
ST1	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	SedTrap	5/19/2014	150 U	150 U	280	1,900	360	150 U	150	150 U	150 U	150 U	730 U
ST1	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	Inline	5/19/2014	93 U	93 U	93 U	930 U	93 U	93 U	93 U	93 U	93 U	93 U	460 U
ST1	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	SedTrap	5/22/2015	190 U	190 U	230	1,200 J	320 J	190 U	120 J	58 J	190 U	190 U	970 U
ST1	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	Inline	5/22/2015	77 U	77 U	77 U	240 J		77 U	42 J	23 J	77 U	77 U	380 U
ST1	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	SedTrap	5/9/2016	290 U	290 U	1,100	1,400 J	380 J	290 U	290 U	290 U	290 U	290 U	1,500 U
ST1	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	Inline	5/9/2016	19 U	19 U	19 U	170 J	19 U	19 U	19 U	19 U	19 U	19 U	96 U
ST7	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	SedTrap	5/9/2014	280 U	280 U	680	2,800 UJ	280 U	280 U	280 U	280 U	280 U	280 U	1,400 UJ
ST7	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	Inline	5/9/2014	60 U	60 U	60 U	600 UJ	60 U	60 U	60 U	60 U	60 U	60 U	300 UJ
ST7	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	SedTrap	5/18/2015	250 U	250 U	400	2,500 U		250 U	110 J	250 U	250 U	250 U	1,300 U
ST7	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	Inline	5/18/2015	19 U	19 U	19 U	300		19 U	8.8 J	19 U	19 U	19 U	97 U
ST7	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	SedTrap	5/9/2016	300 U	300 U	300 U	3,000 U	300 U	300 U	300 U	300 U	300 U	300 U	1,500 U
ODS8	RM 1.7-2.0 East	Michigan CSO	ODS	2/24/2016	95 U	95 U	510	1,200	190	95 U	95 U	95 U	95 U	95 U	480 UJ
ODS38	RM 2.0-2.3 East	S Brighton St SD	ODS	12/14/2016											
ODS38	RM 2.0-2.3 East	S Brighton St SD	ODS	12/22/2016											
RCB178	RM 2.0-2.3 East	S Brighton St SD	RCB	12/22/2016											
CB202	RM 2.0-2.3 East	S River St SD	RCB	2/23/2016	280 U	280 U	280 U	2,800 U	280 U	280 U	280 U	280 U	280 U	280 U	1,400 UJ
CB270	RM 2.0-2.3 East	S River St SD	CB	2/23/2016	290 U	290 U	870	2,900 U	290 U	290 U	350	290 U	290 U	290 U	1,500 UJ
CB288	RM 2.0-2.3 East	S River St SD	CB	2/23/2016	220 U	220 U	220 U	2,200 U	220 U	220 U	140 J	220 U	220 U	220 U	1,100 UJ
CB289	RM 2.0-2.3 East	S River St SD	CB	2/23/2016	320 U	320 U	340	3,200 U	320 U	320 U	130 J	81 J	320 U	320 U	1,600 UJ
MH211	RM 2.0-2.3 East	S River St SD	Inline	4/1/2016	230 U	230 U	970	2,300 U	2,500	230 U	230 U	230 U	230 U	230 U	1,200 UJ
MH220	RM 2.0-2.3 East	S River St SD	Inline	3/24/2016	240 U	240 U	240 UJ	2,400 UJ	240 U	240 U	240 U	240 U	240 U	240 U	1,200 UJ
ODS10	RM 2.0-2.3 East	S River St SD	ODS	4/1/2016	56 U	56 U	56 U	560 U	56 U	56 U	22 J	56 U	56 U	56 U	280 UJ
ODS9	RM 2.0-2.3 East	S River St SD	ODS	3/24/2016	290 U	290 U	2,000 J	1,500 J	290 U	290 UJ	130	87 J	290 U	290 U	1,500 UJ
RCB77	RM 2.0-2.3 East	S River St SD	RCB	3/24/2016	290 U	290 U	1,500 J	2,900 UJ	290 U	290 UJ	200	290 U	290 U	290 U	1,400 UJ
RCB78	RM 2.0-2.3 East	S River St SD	RCB	3/24/2016	230 U	230 U	560 J	2,300 UJ	230 U	230 UJ	210	58 J	230 U	230 U	1,200 UJ
RCB79	RM 2.0-2.3 East	S River St SD	RCB	3/24/2016	220 U	220 U	220 UJ	2,200 UJ	220 U	220 UJ	220 U	220 U	220 U	220 U	1,100 UJ
RCB81	RM 2.0-2.3 East	S River St SD	RCB	4/1/2016	280 U	280 U	2,300	2,800 U	280 U	280 U	280 U	280 U	280 U	280 U	1,400 UJ
RCB192	RM 2.0-2.3 East	S River St SD	RCB	4/1/2016	300 U	300 U	4,900	1,100 J	300 U	300 U	490	300 U	300 U	300 U	1,500 UJ
STRANS1	RM 2.3-2.8 East	S Garden St SD	ODS	3/14/2014											
STRANS2	RM 2.3-2.8 East	S Garden St SD	ODS	3/17/2014											
STRANS2	RM 2.3-2.8 East	S Garden St SD	ODS	3/17/2014											

Table F-2. SPU Source Tracing Sample Results (2014 - 2016)

Station ID	Source Control Area	Outfall	Type	Date Sampled	2-Chloro-naphthalene (ug/kg DW)	2-Methyl-phenol (ug/kg DW)	4-Methyl-phenol (ug/kg DW)	Benzoic acid (ug/kg DW)	Benzyl alcohol (ug/kg DW)	Bis-(2-chloroethyl) ether (ug/kg DW)	Carbazole (ug/kg DW)	Dibenzofuran (ug/kg DW)	Isophorone (ug/kg DW)	N-Nitrosodiphenylamine (ug/kg DW)	Pentachlorophenol (ug/kg DW)
SCO					NA	63	670	650	57	NA	NA	540	NA	28	360
CSL					NA	63	670	650	73	NA	NA	540	NA	40	690
STRANS2	RM 2.3-2.8 East	S Garden St SD	ODS	3/17/2014											
RCB65	RM 2.3-2.8 East	S Myrtle St SD	RCB	2/5/2015	140 U	140 U	910	480 J	140 U	140 U	93 J	140 U	140 U	140 U	710 U
SL4-T6	RM 2.8 East	I-5 SD at Slip 4	SedTrap	4/24/2014	71 U	71 U	680	710 UJ	140	71 U	120	43 J	71 U	71 U	360 U
SL4-T6	RM 2.8 East	I-5 SD at Slip 4	SedTrap	5/18/2015	240 U	240 U	730	850 J		240 U	170 J	240 U	240 U	240 U	1,200 U
SL4-T6	RM 2.8 East	I-5 SD at Slip 4	SedTrap	5/9/2016	97 U	97 U	1,400	660 J	240 J	97 U	100	97 U	97 U	97 U	490 U
MH23	RM 2.8 East	Slip 4	Inline	6/20/2014	620 U	620 U	470 J	5,100 J	620 U	620 U	1,600	620 U	620 U	620 U	3100 U
CB78	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	CB	6/25/2015	110 U	110 U	150	450 J	110 UJ	110 U	240	62 J	110 U	110 U	570 U
CB189	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	CB	4/23/2015	110 U	110 U	350	2,600	470	110 UJ	110 U	110 U	110 U	110 UJ	570 U
CB189	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	CB	4/6/2016	300 U	300 U	330	1,100 J	300 UJ	300 U	300 UJ	300 U	300 U	300 U	1,500 U
CB193	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	CB	6/22/2015	230 U	230 U	4,600	2,300 U	430	230 U	230 U	230 U	230 U	230 U	1,200 U
CB195	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	CB	6/22/2015	120 U	120 U	220	2,000	1,000	120 U	120 U	47 J	120 U	120 U	580 U
CB196	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	CB	6/22/2015	19 U	9.7 J	23	590	190	19 U	9.7 J	19 U	19 U	19 U	31 J
CB197	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	CB	7/15/2015	57 U	57 U	200	580		57 U	34 J	57 U	57 U	49 J	290 U
CB198	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	CB	7/15/2015	110 U	110 U	140	1,100 U		110 U	130	33 J	110 U	110 U	2,700
CB199	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	CB	7/15/2015	170 U	170 U	300	1,700 U		170 U	170 U	170 U	170 U	170 U	840 U
CB210	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	CB	7/29/2015	150 U	150 U	440	820 J		150 U	75 J	38 J	150 U	150 U	750 U
CB214	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	CB	7/29/2015	46 J	350	580	850 J		110 U	51 J	51 J	110 U	110 U	200 J
CB215	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	CB	7/29/2015	99 U	99 U	99 U	990 U		99 U	99 U	99 U	99 U	99 U	500 U
CB216	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	CB	7/29/2015	94 U	94 U	160	360 J		94 U	94 U	94 U	94 U	94 U	470 U
CB217	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	CB	8/5/2015	77 U	77 U	270	880	120	77 U	96	77 U	77 U	77 U	380 U
CB218	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	CB	8/7/2015	19 U	13 J	26	690	190	19 U	19 U	19 U	19 U	19 U	83 J
CB219	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	CB	8/7/2015	490 U	830	1,200	4,900 U	1,600	490 U	490 U	490 U	490 U	490 U	2,400 U
CB228	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	CB	7/17/2015	120 U	120 U	140	370 J	1,300 J	120 U	120 U	120 U	120 U	120 U	590 U
CB233	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	CB	5/27/2015	110 U	110 U	180	1,500		110 U	110 U	110 U	110 U	110 U	560 U
CB234	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	CB	6/25/2015	200 U	200 U	200 U	2,000 U	200 UJ	200 U	200 U	200 U	200 U	200 U	990 U
CB235	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	CB	6/25/2015	340 U	340 U	2,000	3,400 U	340 UJ	340 U	340 U	340 U	340 U	340 U	1,700 U
CB236	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	CB	8/5/2015	120 U	120 U	100 J	1,500	120 U	120 U	62 J	120 U	120 U	120 U	620 U
CB264	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	CB	7/17/2015	300 U	300 U	300 U	1,300 J		300 U	300 U	88 J	300 U	300 U	1,500 U
CB296	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	CB	4/27/2016	120 U	120 U	3,500	570 J	120 U	120 U	770 J	100 J	120 U	120 U	580 U
MH7	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	Inline	4/6/2016	110 U	110 U	110 U	1,100 U	110 UJ	110 U	110 UJ	110 U	110 U	110 U	560 U
MH54	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	Inline	5/4/2016	18 U	18 U	18 U	120 J	18 J	18 U	18 UJ	18 U	18 U	18 U	92 U
MH55	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	Inline	5/5/2016	110 U	110 U	160	1,100 UJ	170	110 U	110 UJ	110 U	110 U	110 U	570 U
NST1	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	SedTrap	6/30/2014	190 U	190 U	310	1,900 UJ	560	190 U	500 J	100 J	190 U	190 U	950 UJ
NST1	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	Inline	6/30/2014	100 U	100 U	140	1,600 J	1,200	100 U	180 J	100 U	100 U	100 U	500 UJ
NST1	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	SedTrap	5/21/2015	300 U	300 U	300 U	2,900 J		300 U	120 J	300 U	300 U	300 U	1,500 U
NST1	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	Inline	5/21/2015	120 U	120 U	120 U	2,200	120 U	120 UJ	150 J	120 U	120 U	120 U	580 U
NST1	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	SedTrap	5/10/2016	120 U	120 U	350	2,500	1,100	120 U	120	120 U	120 U	120 U	580 U
NST1	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	Inline	5/10/2016	200 U	200 U	200 U	1,000 J	200 U	200 U	200 U	200 U	200 U	200 U	990 U
NST2	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	SedTrap	6/30/2014	600 U	600 U	690	3,600 J	600 U	600 U	390 J	600 U	600 U	600 U	3,000 UJ
NST2	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	Inline	6/30/2014	19 U	19 U	19 U	190 UJ	19 U	19 U	19 U	19 U	19 U	19 U	93 UJ
NST2	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	SedTrap	5/18/2015	570 U	570 U	570 U	2,400 J		570 U	570 U	570 U	570 U	570 U	2,800 U
NST2	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	Inline	5/18/2015	20 U	20 U	34	330		20 U	19 J	8.8 J	20 U	20 U	98 U
NST2	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	SedTrap	5/9/2016	320 U	320 U	690	2,200 J	690	320 U	140 J	320 U	320 U	320 U	1,600 U
NST2	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	Inline	5/9/2016	19 U	19 U	20	1,800 J	380	19 U	19 U	19 U	19 U	19 U	49 J

Table F-2. SPU Source Tracing Sample Results (2014 - 2016)

Station ID	Source Control Area	Outfall	Type	Date Sampled	2-Chloro-naphthalene (ug/kg DW)	2-Methyl-phenol (ug/kg DW)	4-Methyl-phenol (ug/kg DW)	Benzoic acid (ug/kg DW)	Benzyl alcohol (ug/kg DW)	Bis-(2-chloroethyl) ether (ug/kg DW)	Carbazole (ug/kg DW)	Dibenzofuran (ug/kg DW)	Isophorone (ug/kg DW)	N-Nitroso-diphenylamine (ug/kg DW)	Pentachloro-phenol (ug/kg DW)
SCO					NA	63	670	650	57	NA	NA	540	NA	28	360
CSL					NA	63	670	650	73	NA	NA	540	NA	40	690
NST3	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	SedTrap	5/23/2014	62 U	62 U	120	620 U	83	62 U	62 U	62 U	62 U	62 U	310 U
NST3	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	Inline	5/23/2014	56 U	56 U	56 U	560 U	48 J	56 U	56 U	56 U	56 U	56 U	280 U
NST3	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	SedTrap	5/22/2015	120 U	46 J	560	950 J	300 J	120 U	46 J	120 U	120 U	120 U	580 U
NST3	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	Inline	5/22/2015	77 U	77 U	77 U	380 J		77 U	77 U	77 U	77 U	77 U	380 U
NST3	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	SedTrap	5/12/2016	94 U	94 U	270	940 U	94 U	94 U	4,000	2,700	94 U	94 U	470 UJ
NST4	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	SedTrap	6/30/2014	330 U	330 U	330 U	3,300 UJ	690	330 U	180 J	330 U	330 U	330 U	1,600 UJ
NST4	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	Inline	6/30/2014	20 U	20 U	17 J	220 J	66	20 U	82 J	22	20 U	20 U	98 UJ
NST4	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	SedTrap	5/21/2015	120 U	120 U	120 U	4,600	19 U	120 U	69 J	120 U	120 U	120 U	580 U
NST4	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	Inline	5/21/2015	19 U	19 U	19 U	280		19 UJ	51 J	17 J	19 U	19 U	94 U
NST4	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	SedTrap	5/12/2016	100 U	100 U	150	690 J	560	100 U	68 J	100 U	100 U	100 U	520 UJ
NST4	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	Inline	5/12/2016	56 U	56 U	56 U	240 J	59	56 U	71 J	56 U	56 U	56 U	280 U
NST5	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	SedTrap	6/30/2014											
NST5	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	SedTrap	5/18/2015											
NST5	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	SedTrap	5/9/2016											
ODS2	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	ODS	9/1/2015	120 U	120 U	95 J	2,200	120 U	120 U	120 U	120 U	89 J	120 U	590 U
ODS4	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	ODS	9/9/2015	21 U	21 U	21 U	160 J	21 U	21 U	34	18 J	21 U	21 U	100 U
RCB299	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	RCB	4/27/2016	300 U	300 U	300 U	3,000 U	300 U	300 U	300 UJ	300 U	300 U	300 U	1,500 U
RCB300	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	RCB	5/4/2016	490 U	490 U	1,900	4,900 UJ	490 U	490 U	490 UJ	490 U	490 U	490 U	2,400 U
RCB301	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	RCB	5/4/2016	470 U	470 U	660	4,700 UJ	470 U	470 U	470 UJ	470 U	470 U	470 U	2,400 U
RCB302	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	RCB	5/4/2016	120 U	120 U	460	1,200 UJ	120 U	120 U	120 UJ	120 U	120 U	120 U	570 U
RCB303	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	RCB	5/4/2016	110 U	110 U	370	1,100 UJ	110 U	110 U	110 UJ	110 U	110 U	110 U	560 U
RCB304	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	RCB	5/4/2016	120 U	120 U	260	1,200 UJ	120 U	120 U	120 UJ	120 U	120 U	120 U	600 U
RCB305	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	RCB	5/5/2016	120 U	120 U	520	1,200 UJ	480	120 U	120 UJ	120 U	120 U	120 U	590 U
ID-ST1	RM 0.0-1.0 West	SW Idaho St SD	SedTrap	5/19/2014	190 U	190 U	3,000	10,000	4,400	190 U	120 J	190 U	190 U	190 U	950 U
ID-ST1	RM 0.0-1.0 West	SW Idaho St SD	SedTrap	5/21/2015											
ID-ST1	RM 0.0-1.0 West	SW Idaho St SD	SedTrap	5/11/2016	140 U	140 U	1,300	750 J	590	140 U	98 J	140 U	140 U	140 U	700 UJ
ID-ST2	RM 0.0-1.0 West	SW Idaho St SD	SedTrap	5/19/2014	58 U	58 U	640	670	490	58 U	58 U	58 U	58 U	58 U	290 U
ID-ST2	RM 0.0-1.0 West	SW Idaho St SD	SedTrap	5/21/2015	19 U	19 U	15 J	440		19 U	19 U	19 U	19 U	19 U	96 U
ID-ST2	RM 0.0-1.0 West	SW Idaho St SD	SedTrap	5/10/2016	19 U	19 U	44	95 J	34	19 U	19 U	19 U	19 U	19 U	96 U
ID-ST3	RM 0.0-1.0 West	SW Idaho St SD	SedTrap	5/23/2014	58 U	58 U	500	4,400	6,400	58 U	58 U	58 U	58 U	58 U	290 U
ID-ST3	RM 0.0-1.0 West	SW Idaho St SD	SedTrap	5/22/2015	57 U	250	220	1,900		57 U	57 U	57 U	57 U	57 U	180 J
ID-ST3	RM 0.0-1.0 West	SW Idaho St SD	SedTrap	5/11/2016	99 U	99 U	520	520 J	690	99 U	99 U	99 U	99 U	99 U	500 UJ
HP-ST4	RM 1.6-2.1 West	Highland Park Wy SW SD	SedTrap	5/19/2014	57 U	57 U	150	570 U	57 U	57 U	57 U	57 U	57 U	57 U	280 U
HP-ST4	RM 1.6-2.1 West	Highland Park Wy SW SD	SedTrap	5/18/2015	110 U	110 U	1,100	940 J		110 U	110 U	110 U	110 U	110 U	540 U
HP-ST4	RM 1.6-2.1 West	Highland Park Wy SW SD	SedTrap	5/10/2016	60 U	60 U	900	600 U	60 U	60 U	60 U	60 U	60 U	60 U	300 U
HP-ST6	RM 1.6-2.1 West	Highland Park Wy SW SD	SedTrap	6/30/2014	97 U	97 U	220	740 J	960	97 U	97 U	87 J	97 U	97 U	480 UJ
HP-ST6	RM 1.6-2.1 West	Highland Park Wy SW SD	Inline	6/30/2014	56 U	56 U	42 J	180 J	130	56 U	64 J	31 J	56 U	56 U	280 UJ
HP-ST6	RM 1.6-2.1 West	Highland Park Wy SW SD	SedTrap	5/18/2015	360 U	360 U	360 U	7,500		360 U	360 U	360 U	360 U	360 U	1,800 U
HP-ST6	RM 1.6-2.1 West	Highland Park Wy SW SD	Inline	5/18/2015	19 U	19 U	31	430		19 U	250	30	19 U	19 U	94 U
HP-ST6	RM 1.6-2.1 West	Highland Park Wy SW SD	SedTrap	5/10/2016	120 U	120 U	120	2,100	860	120 U	120 U	100 J	120 U	120 U	590 U
ODS1	RM 1.6-2.1 West	Highland Park Wy SW SD	ODS	9/26/2014	500 UJ					500 UJ	500 UJ	500 UJ	500 UJ	500 UJ	
KN-ST1	RM 1.6-2.1 West	SW Kenny St SD/T115 CSO	SedTrap	6/30/2014	84 U	84 U	220	840 UJ	600	84 U	160 J	50 J	84 U	84 U	420 UJ
KN-ST1	RM 1.6-2.1 West	SW Kenny St SD/T115 CSO	SedTrap	5/18/2015	120 U	120 U	120 U	1,800		120 U	64 J	120 U	120 U	120 U	580 U
KN-ST1	RM 1.6-2.1 West	SW Kenny St SD/T115 CSO	SedTrap	5/10/2016	57 U	57 U	390	430 J	320	57 U	34 J	57 U	57 U	57 U	290 U

Table F-2. SPU Source Tracing Sample Results (2014 - 2016)

Station ID	Source Control Area	Outfall	Type	Date Sampled	2-Chloro-naphthalene (ug/kg DW)	2-Methyl-phenol (ug/kg DW)	4-Methyl-phenol (ug/kg DW)	Benzoic acid (ug/kg DW)	Benzyl alcohol (ug/kg DW)	Bis-(2-chloroethyl) ether (ug/kg DW)	Carbazole (ug/kg DW)	Dibenzofuran (ug/kg DW)	Isophorone (ug/kg DW)	N-Nitroso-diphenylamine (ug/kg DW)	Pentachloro-phenol (ug/kg DW)
SCO					NA	63	670	650	57	NA	NA	540	NA	28	360
CSL					NA	63	670	650	73	NA	NA	540	NA	40	690
1st-ST1	RM 2.1 West	1st Ave S SD, west	SedTrap	5/23/2014	290 U	290 U	710	2,900 U	250 J	290 U	290 U	290 U	290 U	290 U	1,500 U
1st-ST1	RM 2.1 West	1st Ave S SD, west	SedTrap	5/22/2015	300 U	300 U	300	4,000		300 U	300 U	300 U	300 U	300 U	1,500 U
1st-ST1	RM 2.1 West	1st Ave S SD, west	SedTrap	5/12/2016	140 U	140 U	140 U	1,400 U	140 U	140 U	140 U	140 U	140 U	140 U	720 UJ
1st-ST2	RM 2.1 West	1st Ave S SD, west	SedTrap	5/22/2015	120 U	120 U	270	4,800	3,800 J	120 U	120 U	120 U	120 U	120 U	580 U
1st-ST2	RM 2.1 West	1st Ave S SD, west	SedTrap	5/12/2016	99 U	99 U	1,000	410 J	99 U	99 U	50 J	99 U	99 U	99 U	500 UJ
1st-ST3	RM 2.1 West	1st Ave S SD, west	SedTrap	5/19/2014	55 U	55 U	44 J	550 U	55 U	55 U	36 J	55 U	55 U	55 U	280 U
1st-ST3	RM 2.1 West	1st Ave S SD, west	Inline	5/19/2014	93 U	93 U	93 U	930 U	93 U	93 U	93 U	93 U	93 U	93 U	470 U
1st-ST3	RM 2.1 West	1st Ave S SD, west	Inline	5/21/2015	39 U	39 U	39 U	390 U	39 U	39 U	43 J	39 U	39 U	39 U	200 U
1st-ST3	RM 2.1 West	1st Ave S SD, west	SedTrap	5/21/2015	290 U	290 U	290 U	2,900 U		290 U	290 U	290 U	290 U	290 U	1,400 U
1st-ST3	RM 2.1 West	1st Ave S SD, west	SedTrap	5/11/2016	99 U	99 U	99 U	990 U	280	99 U	99 U	99 U	99 U	99 U	490 UJ
1st-ST3	RM 2.1 West	1st Ave S SD, west	Inline	5/11/2016	57 U	57 U	57 U	570 U	57 U	57 U	40 J	57 U	57 U	57 U	280 U
1st-ST7	RM 2.1 West	1st Ave S SD, west	SedTrap	5/19/2014	150 U	150 U	1,600	1,400 J	490	150 U	190	150 U	150 U	150 U	740 U
1st-ST7	RM 2.1 West	1st Ave S SD, west	SedTrap	5/21/2015	200 U	780	470	4,700		200 U	110 J	200 U	200 U	200 U	980 U
1st-ST7	RM 2.1 West	1st Ave S SD, west	SedTrap	5/11/2016	200 U	200 U	1000	2,000 U	200 U	200 U	250	200 U	200 U	200 U	1,000 UJ
CB108	RM 2.1-2.2 West	2nd Ave S SD	CB	5/14/2015	59 U	59 U	210	620		59 U	59 U	59 U	59 U	59 U	290 U
CB263	RM 2.1-2.2 West	2nd Ave S SD	CB	5/14/2015	110 U	110 U	490	900 J		110 U	290 J	270	110 U	110 U	550 U
RCB139	RM 2.1-2.2 West	2nd Ave S SD	RCB	12/21/2016											
RCB203	RM 2.1-2.2 West	2nd Ave S SD	RCB	12/21/2016											
CB262	RM 2.2-3.4 West	7th Ave S SD	CB	5/13/2015	290 U	290 U	290 U	2,900 U		290 U	290 U	290 U	290 U	290 U	1,400 UJ
CB318	RM 2.2-3.4 West	7th Ave S SD	CB	9/30/2016	4.2 U	7.5 U	14 U	202	14 U	6.5 U	11 J	13 J	9.8 J	32.3	30 UJ
7th-ST1	RM 2.2-3.4 West	7th Ave S SD	SedTrap	5/18/2015	18 U	18 U	94	180 U		18 U	18 U	18 U	18 U	18 U	93 U
7th-ST1	RM 2.2-3.4 West	7th Ave S SD	Inline	5/18/2015	20 U	20 U	32	230		20 U	20 U	20 U	20 U	20 U	98 U
7th-ST1	RM 2.2-3.4 West	7th Ave S SD	SedTrap	5/9/2016	96 U	96 U	100	670 J	1,200	96 U	62 J	29 J	96 U	96 U	480 U
7th-ST1	RM 2.2-3.4 West	7th Ave S SD	Inline	5/9/2016	60 U	60 U	60 U	190 J	100	60 U	60 U	60 U	60 U	60 U	300 U
7th-ST2	RM 2.2-3.4 West	7th Ave S SD	SedTrap	5/9/2014	19 U	19 U	19 U	110 J	380	19 U	19 U	19 U	19 U	19 U	96 UJ
7th-ST2	RM 2.2-3.4 West	7th Ave S SD	SedTrap	5/21/2015	20 U	20 U	20 U	1,400		20 U	12 J	20 U	20 U	20 U	98 U
7th-ST2	RM 2.2-3.4 West	7th Ave S SD	SedTrap	5/10/2016	58 U	58 U	64	3,800	9,400	58 U	29 J	58 U	58 U	58 U	290 U
7th-ST2	RM 2.2-3.4 West	7th Ave S SD	Inline	5/10/2016	19 U	19 U	19 U	190 UJ	19 U	19 U	19 U	19 U	19 U	19 U	94 U
7th-ST3	RM 2.2-3.4 West	7th Ave S SD	SedTrap	5/21/2015	580 U	580 U	580 U	3,100 J		580 U	580 U	580 U	580 U	580 U	2,900 U
7th-ST3	RM 2.2-3.4 West	7th Ave S SD	SedTrap	5/11/2016	280 U	280 U	280 U	2,800 U	420	280 U	280 U	280 U	280 U	280 U	1,400 UJ
ODS22	RM 2.2-3.4 West	7th Ave S SD	ODS	11/15/2016											
ODS23	RM 2.2-3.4 West	7th Ave S SD	ODS	11/15/2016											
ODS24	RM 2.2-3.4 West	7th Ave S SD	ODS	11/15/2016											
ODS25	RM 2.2-3.4 West	7th Ave S SD	ODS	11/15/2016											
ODS26	RM 2.2-3.4 West	7th Ave S SD	ODS	11/15/2016											
ODS42	RM 2.2-3.4 West	7th Ave S SD	ODS	12/15/2016											
ODS43	RM 2.2-3.4 West	7th Ave S SD	ODS	12/15/2016											
ODS44	RM 2.2-3.4 West	7th Ave S SD	ODS	12/15/2016											
ODS45	RM 2.2-3.4 West	7th Ave S SD	ODS	12/29/2016	36.8 U	36.8 U	36.8 U	204 J	36.8 UJ	36.8 U	28.2 J	11.4 J	36.8 U	36.8 U	184 U
RCB61	RM 2.2-3.4 West	7th Ave S SD	RCB	6/13/2014	420 U	420 U	11,000	4,200 U	420 U	420 U	420 U	420 U	420 U	420 U	2,100 UJ
RCB61	RM 2.2-3.4 West	7th Ave S SD	RCB	9/11/2014	230 U	230 U	4,200	2,300 U	230 U	230 U	120 J	230 U	230 U	230 U	1,200 U
RCB62	RM 2.2-3.4 West	7th Ave S SD	RCB	6/13/2014	220 U	220 U	8,000	1,300 J	510	220 U	140 J	220 U	220 U	220 U	1,100 UJ
RCB62	RM 2.2-3.4 West	7th Ave S SD	RCB	9/11/2014	140 U	140 U	540	610 J	350	140 U	150	140 U	140 U	140 U	670 U
RCB63	RM 2.2-3.4 West	7th Ave S SD	RCB	6/13/2014	220 U	220 U	4,700	1,000 J	160 J	220 U	250	220 U	220 U	220 U	1,100 UJ

Table F-2. SPU Source Tracing Sample Results (2014 - 2016)

Station ID	Source Control Area	Outfall	Type	Date Sampled	2-Chloro-naphthalene (ug/kg DW)	2-Methyl-phenol (ug/kg DW)	4-Methyl-phenol (ug/kg DW)	Benzoic acid (ug/kg DW)	Benzyl alcohol (ug/kg DW)	Bis-(2-chloroethyl) ether (ug/kg DW)	Carbazole (ug/kg DW)	Dibenzofuran (ug/kg DW)	Isophorone (ug/kg DW)	N-Nitroso-diphenylamine (ug/kg DW)	Pentachloro-phenol (ug/kg DW)
SCO					NA	63	670	650	57	NA	NA	540	NA	28	360
CSL					NA	63	670	650	73	NA	NA	540	NA	40	690
RCB63	RM 2.2-3.4 West	7th Ave S SD	RCB	9/11/2014	180 U	180 U	740	810 J	320	180 U	200	180 U	180 U	180 U	890 U
RCB64	RM 2.2-3.4 West	7th Ave S SD	RCB	6/13/2014	320 U	320 U	4,000	3,200 U	320 U	320 U	160 J	320 U	320 U	320 U	1,600 UJ
RCB64	RM 2.2-3.4 West	7th Ave S SD	RCB	9/11/2014	220 U	220 U	460	960 J	220 U	220 U	660	220 U	220 U	220 U	1,100 U
RCB70	RM 2.2-3.4 West	7th Ave S SD	RCB	12/21/2016											
RCB71	RM 2.2-3.4 West	7th Ave S SD	RCB	12/21/2016											
RCB165	RM 2.2-3.4 West	7th Ave S SD	RCB	6/13/2014	34 U	51	3,400	1,200 J	170	34 U	85	38	34 U	34 U	170 U
RCB229	RM 2.2-3.4 West	CS-1	RCB	12/29/2016											
ODS39	RM 2.2-3.4 West	CSO	ODS	12/15/2016											
ODS40	RM 2.2-3.4 West	8th Ave S	ODS	11/15/2016											
ODS41	RM 2.2-3.4 West	8th Ave S	ODS	12/15/2016											
ODS50	RM 2.2-3.4 West	8th Ave S	ODS	12/22/2016											
RCB73	RM 2.2-3.4 West	8th Ave S	RCB	12/21/2016											
RCB74	RM 2.2-3.4 West	8th Ave S	RCB	12/22/2016											
RCB278	RM 2.2-3.4 West	8th Ave S	RCB	12/22/2016											
RCB279	RM 2.2-3.4 West	8th Ave S	RCB	12/29/2016											
RCB310	RM 2.2-3.4 West	8th Ave S	RCB	12/29/2016											
RCB311	RM 2.2-3.4 West	8th Ave S	RCB	12/29/2016											
RCB298	RM 2.2-3.4 West	S Webster St SD	RCB	4/6/2016	280 U	280 U	1,300	2,800 U	280 UJ	280 U	1,700 J	280 U	280 U	280 U	1,400 U
PS1	RM 3.4-3.8 West	CS-1	Inline	5/12/2014	1,600 U	1,600 U	3,600	16,000 UJ	1,700	1,600 U	1,600 U	1,600 U	1,600 U	1,600 U	8,200 UJ
PS2	RM 3.4-3.8 West	CS-1	Inline	5/12/2014	930 U	930 U	880 J	9,300 UJ	790 J	930 U	930 U	930 U	930 U	930 U	4,600 UJ
96-ST1	RM 3.8-4.2 West	S 96th St SD	SedTrap	5/9/2014	240 U	240 U	430	2,400 UJ	240 U	240 U	240 U	240 U	240 U	240 U	1,200 UJ
96-ST1	RM 3.8-4.2 West	S 96th St SD	Inline	5/9/2014	120 U	120 U	120 U	1,200 UJ	120 U	120 U	120 U	120 U	120 U	120 U	590 UJ
96-ST2	RM 3.8-4.2 West	S 96th St SD	SedTrap	5/19/2014	57 U	57 U	180	870	190	120 U	54 J	57 U	57 U	57 U	280 U
96-ST2	RM 3.8-4.2 West	S 96th St SD	Inline	5/19/2014	19 U	19 U	19 U	60 J	19 U	19 U	19 U	5.8 J	19 U	19 U	97 U
96-ST3	RM 3.8-4.2 West	S 96th St SD	SedTrap	5/9/2014	19 U	19 U	35	150 J	140	19 U	19 U	19 U	19 U	19 U	97 UJ
96-ST3	RM 3.8-4.2 West	S 96th St SD	Inline	5/9/2014	19 U	19 U	19 U	190 UJ	19 U	19 U	19 U	19 U	19 U	19 U	96 UJ
HC-ST1	RM 4.2-5.8 West	Hamm Creek	SedTrap	5/23/2014	19 U	19 U	52	190 U	32	19 U	19 U	19 U	19 U	19 U	95 U

Source: Seattle Public Utilities

Bold text indicates chemical was detected.

Not detected; reporting limit is above the SCO

Exceeds SCO

Exceeds CSL/RAL/MTCA Method A

* MTCA Method A Soil Cleanup Level

mg/kg DW - milligram per kilogram dry weight

ug/kg DW - microgram per kilogram dry weight

BEHP - bis(2-ethylhexyl)phthalate

HC - hydrocarbon

LPAH - Low molecular weight polycyclic aromatic hydrocarbon

HPAH - High molecular weight polycyclic aromatic hydrocarbon

cPAH - carcinogenic polycyclic aromatic hydrocarbon

PCB - polychlorinated biphenyl

NA - Not applicable

Table F-2. SPU Source Tracing Sample Results (2014 - 2016)

Station ID	Source Control Area	Outfall	Type	Date Sampled	Phenol (ug/kg DW)
SCO					420
CSL					1,200
CB2	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	3/13/2014	1,300
CB27b	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	3/30/2016	1,100
CB83	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	4/8/2016	410
CB121	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	9/23/2016	
CB176	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	2/26/2014	650
CB177	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	2/26/2014	320
CB178	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	2/26/2014	560
CB179	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	2/27/2014	690 J
CB180	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	2/27/2014	790 U
CB181	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	3/4/2014	
CB182	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	3/4/2014	
CB185	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	6/12/2015	2,700
CB220	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	3/7/2014	580 U
CB221	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	3/7/2014	720 J
CB222	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	3/7/2014	1,500 U
CB223	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	3/7/2014	410 J
CB224	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	3/7/2014	320 J
CB225	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	3/7/2014	350 U
CB226	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	3/7/2014	160 J
CB227	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	3/7/2014	110 U
CB230	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	3/21/2014	330
CB231	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	3/21/2014	890 U
CB232	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	4/16/2014	140
CB237	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	12/21/2016	
CB240	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	4/4/2014	190 J
CB240	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	4/4/2014	280 U
CB240	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	7/21/2016	180 J
CB241	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	4/4/2014	430 J
CB241	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	7/21/2016	740
CB242	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	4/4/2014	620 U
CB243	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	4/10/2014	630 U
CB244	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	4/10/2014	650 U
CB245	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	4/10/2014	290 U
CB246	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	5/17/2014	
CB247	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	5/17/2014	
CB248	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	5/17/2014	
CB248	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	7/21/2016	440
CB250	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	4/16/2014	2,000
CB251	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	4/16/2014	660 U
CB251	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	5/14/2014	
CB252	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	5/8/2014	69 J
CB253	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	5/8/2014	420
CB254	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	5/8/2014	510
CB255	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	6/11/2014	1,000 U

Table F-2. SPU Source Tracing Sample Results (2014 - 2016)

Station ID	Source Control Area	Outfall	Type	Date Sampled	Phenol (ug/kg DW)
SCO					420
CSL					1,200
CB260	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	5/14/2014	
CB260	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	ODS	6/29/2016	360 J
CB261	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	5/14/2014	
CB267	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	11/6/2015	2,000 U
CB268	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	11/6/2015	160 J
CB271	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	6/29/2016	430
CB273	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	7/13/2016	630
CB275	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	6/29/2016	98 U
CB281	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	2/11/2016	
CB290	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	4/1/2016	230
CB291	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	4/15/2016	160 J
CB295	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	4/8/2016	290
CB311	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	6/29/2016	140
CB312	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	8/18/2016	425
CB313	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	8/18/2016	389
CB314	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	9/1/2016	267
CB315	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	9/1/2016	283 J
CB317	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	9/30/2016	38 UJ
CB319	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	11/7/2016	233
CB320	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	11/7/2016	220
CB321	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	CB	11/16/2016	
MH18	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	Inline	5/14/2014	210
MH18	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	Inline	4/6/2016	280 J
MH37	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	Inline	10/15/2015	350 J
ODS11	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	ODS	9/30/2016	41.7
ODS15	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	ODS	11/16/2016	
ODS16	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	ODS	11/16/2016	
ODS17	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	ODS	11/16/2016	
ODS18	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	ODS	11/16/2016	
ODS19	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	ODS	11/15/2016	
ODS20	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	ODS	11/15/2016	
ODS21	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	ODS	11/15/2016	
ODS27	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	ODS	11/10/2016	
ODS28	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	ODS	11/10/2016	
ODS29	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	ODS	11/10/2016	
ODS30	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	ODS	11/10/2016	
ODS37	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	ODS	12/14/2016	
ODS7	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	ODS	2/24/2016	46 J
OWSC	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	Inline	10/15/2015	360 J
OWSE	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	Inline	10/15/2015	670 J
RCB36	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	RCB	4/16/2014	180
RCB51	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	RCB	5/14/2014	
RCB57	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	RCB	4/2/2014	360
RCB58	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	RCB	4/2/2014	660

Table F-2. SPU Source Tracing Sample Results (2014 - 2016)

Station ID	Source Control Area	Outfall	Type	Date Sampled	Phenol (ug/kg DW)
SCO					420
CSL					1,200
RCB59	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	RCB	4/2/2014	480 U
RCB60	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	RCB	4/2/2014	320
RCB67	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	RCB	12/21/2016	
RCB72	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	RCB	12/21/2016	
RCB215	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	RCB	5/17/2014	
RCB215	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	RCB	7/21/2016	350
RCB217	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	RCB	8/11/2016	159
RCB251	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	RCB	12/21/2016	
RCB293	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	RCB	4/16/2014	180
RCB296	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	RCB	4/15/2016	220 J
RCB306	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	RCB	6/13/2014	230
RCB306	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	RCB	8/11/2016	
RCB309	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	RCB	9/30/2016	56.9 J
ST1	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	SedTrap	5/19/2014	260
ST1	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	Inline	5/19/2014	93 U
ST1	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	SedTrap	5/22/2015	240 J
ST1	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	Inline	5/22/2015	77 U
ST1	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	SedTrap	5/9/2016	220 J
ST1	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	Inline	5/9/2016	18 J
ST7	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	SedTrap	5/9/2014	210 J
ST7	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	Inline	5/9/2014	60 U
ST7	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	SedTrap	5/18/2015	130 J
ST7	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	Inline	5/18/2015	39 J
ST7	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	SedTrap	5/9/2016	210 J
ODS8	RM 1.7-2.0 East	Michigan CSO	ODS	2/24/2016	170
ODS38	RM 2.0-2.3 East	S Brighton St SD	ODS	12/14/2016	
ODS38	RM 2.0-2.3 East	S Brighton St SD	ODS	12/22/2016	
RCB178	RM 2.0-2.3 East	S Brighton St SD	RCB	12/22/2016	
CB202	RM 2.0-2.3 East	S River St SD	RCB	2/23/2016	280 U
CB270	RM 2.0-2.3 East	S River St SD	CB	2/23/2016	260 J
CB288	RM 2.0-2.3 East	S River St SD	CB	2/23/2016	290
CB289	RM 2.0-2.3 East	S River St SD	CB	2/23/2016	210 J
MH211	RM 2.0-2.3 East	S River St SD	Inline	4/1/2016	460
MH220	RM 2.0-2.3 East	S River St SD	Inline	3/24/2016	140 J
ODS10	RM 2.0-2.3 East	S River St SD	ODS	4/1/2016	56 U
ODS9	RM 2.0-2.3 East	S River St SD	ODS	3/24/2016	360
RCB77	RM 2.0-2.3 East	S River St SD	RCB	3/24/2016	300
RCB78	RM 2.0-2.3 East	S River St SD	RCB	3/24/2016	250
RCB79	RM 2.0-2.3 East	S River St SD	RCB	3/24/2016	220 U
RCB81	RM 2.0-2.3 East	S River St SD	RCB	4/1/2016	170 J
RCB192	RM 2.0-2.3 East	S River St SD	RCB	4/1/2016	1,100
STRANS1	RM 2.3-2.8 East	S Garden St SD	ODS	3/14/2014	
STRANS2	RM 2.3-2.8 East	S Garden St SD	ODS	3/17/2014	
STRANS2	RM 2.3-2.8 East	S Garden St SD	ODS	3/17/2014	

Table F-2. SPU Source Tracing Sample Results (2014 - 2016)

Station ID	Source Control Area	Outfall	Type	Date Sampled	Phenol (ug/kg DW)
SCO					420
CSL					1,200
STRANS2	RM 2.3-2.8 East	S Garden St SD	ODS	3/17/2014	
RCB65	RM 2.3-2.8 East	S Myrtle St SD	RCB	2/5/2015	1,000
SL4-T6	RM 2.8 East	I-5 SD at Slip 4	SedTrap	4/24/2014	200
SL4-T6	RM 2.8 East	I-5 SD at Slip 4	SedTrap	5/18/2015	170 J
SL4-T6	RM 2.8 East	I-5 SD at Slip 4	SedTrap	5/9/2016	180
MH23	RM 2.8 East	Slip 4	Inline	6/20/2014	960
CB78	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	CB	6/25/2015	400
CB189	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	CB	4/23/2015	450
CB189	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	CB	4/6/2016	330
CB193	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	CB	6/22/2015	450
CB195	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	CB	6/22/2015	260
CB196	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	CB	6/22/2015	30
CB197	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	CB	7/15/2015	160
CB198	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	CB	7/15/2015	89 J
CB199	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	CB	7/15/2015	470
CB210	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	CB	7/29/2015	160
CB214	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	CB	7/29/2015	320
CB215	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	CB	7/29/2015	140
CB216	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	CB	7/29/2015	200
CB217	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	CB	8/5/2015	220 J
CB218	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	CB	8/7/2015	67 J
CB219	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	CB	8/7/2015	750 J
CB228	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	CB	7/17/2015	240
CB233	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	CB	5/27/2015	220
CB234	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	CB	6/25/2015	200 U
CB235	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	CB	6/25/2015	1,000
CB236	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	CB	8/5/2015	270 J
CB264	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	CB	7/17/2015	260 J
CB296	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	CB	4/27/2016	130
MH7	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	Inline	4/6/2016	110 U
MH54	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	Inline	5/4/2016	15 J
MH55	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	Inline	5/5/2016	97 J
NST1	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	SedTrap	6/30/2014	260
NST1	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	Inline	6/30/2014	240
NST1	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	SedTrap	5/21/2015	700
NST1	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	Inline	5/21/2015	120 U
NST1	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	SedTrap	5/10/2016	310 J
NST1	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	Inline	5/10/2016	130 J
NST2	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	SedTrap	6/30/2014	450 J
NST2	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	Inline	6/30/2014	19 U
NST2	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	SedTrap	5/18/2015	310 J
NST2	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	Inline	5/18/2015	53 J
NST2	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	SedTrap	5/9/2016	420
NST2	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	Inline	5/9/2016	19 U

Table F-2. SPU Source Tracing Sample Results (2014 - 2016)

Station ID	Source Control Area	Outfall	Type	Date Sampled	Phenol (ug/kg DW)
SCO					420
CSL					1,200
NST3	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	SedTrap	5/23/2014	43 J
NST3	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	Inline	5/23/2014	56 U
NST3	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	SedTrap	5/22/2015	160 J
NST3	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	Inline	5/22/2015	77 U
NST3	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	SedTrap	5/12/2016	94 U
NST4	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	SedTrap	6/30/2014	330 U
NST4	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	Inline	6/30/2014	35
NST4	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	SedTrap	5/21/2015	390
NST4	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	Inline	5/21/2015	40 J
NST4	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	SedTrap	5/12/2016	110
NST4	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	Inline	5/12/2016	56 U
NST5	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	SedTrap	6/30/2014	
NST5	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	SedTrap	5/18/2015	
NST5	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	SedTrap	5/9/2016	
ODS2	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	ODS	9/1/2015	660
ODS4	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	ODS	9/9/2015	38 J
RCB299	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	RCB	4/27/2016	300 U
RCB300	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	RCB	5/4/2016	490 U
RCB301	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	RCB	5/4/2016	470 U
RCB302	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	RCB	5/4/2016	120 U
RCB303	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	RCB	5/4/2016	110 U
RCB304	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	RCB	5/4/2016	83 J
RCB305	RM 4.9 East	S Norfolk St CSO/PS17 EOF/S	RCB	5/5/2016	76 J
ID-ST1	RM 0.0-1.0 West	SW Idaho St SD	SedTrap	5/19/2014	620
ID-ST1	RM 0.0-1.0 West	SW Idaho St SD	SedTrap	5/21/2015	
ID-ST1	RM 0.0-1.0 West	SW Idaho St SD	SedTrap	5/11/2016	340
ID-ST2	RM 0.0-1.0 West	SW Idaho St SD	SedTrap	5/19/2014	150
ID-ST2	RM 0.0-1.0 West	SW Idaho St SD	SedTrap	5/21/2015	45
ID-ST2	RM 0.0-1.0 West	SW Idaho St SD	SedTrap	5/10/2016	16 J
ID-ST3	RM 0.0-1.0 West	SW Idaho St SD	SedTrap	5/23/2014	790
ID-ST3	RM 0.0-1.0 West	SW Idaho St SD	SedTrap	5/22/2015	100 J
ID-ST3	RM 0.0-1.0 West	SW Idaho St SD	SedTrap	5/11/2016	190
HP-ST4	RM 1.6-2.1 West	Highland Park Wy SW SD	SedTrap	5/19/2014	34 J
HP-ST4	RM 1.6-2.1 West	Highland Park Wy SW SD	SedTrap	5/18/2015	260
HP-ST4	RM 1.6-2.1 West	Highland Park Wy SW SD	SedTrap	5/10/2016	60 U
HP-ST6	RM 1.6-2.1 West	Highland Park Wy SW SD	SedTrap	6/30/2014	240
HP-ST6	RM 1.6-2.1 West	Highland Park Wy SW SD	Inline	6/30/2014	67
HP-ST6	RM 1.6-2.1 West	Highland Park Wy SW SD	SedTrap	5/18/2015	690
HP-ST6	RM 1.6-2.1 West	Highland Park Wy SW SD	Inline	5/18/2015	66 J
HP-ST6	RM 1.6-2.1 West	Highland Park Wy SW SD	SedTrap	5/10/2016	320 J
ODS1	RM 1.6-2.1 West	Highland Park Wy SW SD	ODS	9/26/2014	
KN-ST1	RM 1.6-2.1 West	SW Kenny St SD/T115 CSO	SedTrap	6/30/2014	140
KN-ST1	RM 1.6-2.1 West	SW Kenny St SD/T115 CSO	SedTrap	5/18/2015	300
KN-ST1	RM 1.6-2.1 West	SW Kenny St SD/T115 CSO	SedTrap	5/10/2016	72 J

Table F-2. SPU Source Tracing Sample Results (2014 - 2016)

Station ID	Source Control Area	Outfall	Type	Date Sampled	Phenol (ug/kg DW)
SCO					420
CSL					1,200
1st-ST1	RM 2.1 West	1st Ave S SD, west	SedTrap	5/23/2014	190 J
1st-ST1	RM 2.1 West	1st Ave S SD, west	SedTrap	5/22/2015	420 J
1st-ST1	RM 2.1 West	1st Ave S SD, west	SedTrap	5/12/2016	170
1st-ST2	RM 2.1 West	1st Ave S SD, west	SedTrap	5/22/2015	500 J
1st-ST2	RM 2.1 West	1st Ave S SD, west	SedTrap	5/12/2016	430
1st-ST3	RM 2.1 West	1st Ave S SD, west	SedTrap	5/19/2014	55 U
1st-ST3	RM 2.1 West	1st Ave S SD, west	Inline	5/19/2014	93 U
1st-ST3	RM 2.1 West	1st Ave S SD, west	Inline	5/21/2015	39 U
1st-ST3	RM 2.1 West	1st Ave S SD, west	SedTrap	5/21/2015	190 J
1st-ST3	RM 2.1 West	1st Ave S SD, west	SedTrap	5/11/2016	99 U
1st-ST3	RM 2.1 West	1st Ave S SD, west	Inline	5/11/2016	57 U
1st-ST7	RM 2.1 West	1st Ave S SD, west	SedTrap	5/19/2014	190
1st-ST7	RM 2.1 West	1st Ave S SD, west	SedTrap	5/21/2015	460
1st-ST7	RM 2.1 West	1st Ave S SD, west	SedTrap	5/11/2016	370
CB108	RM 2.1-2.2 West	2nd Ave S SD	CB	5/14/2015	76 J
CB263	RM 2.1-2.2 West	2nd Ave S SD	CB	5/14/2015	250 J
RCB139	RM 2.1-2.2 West	2nd Ave S SD	RCB	12/21/2016	
RCB203	RM 2.1-2.2 West	2nd Ave S SD	RCB	12/21/2016	
CB262	RM 2.2-3.4 West	7th Ave S SD	CB	5/13/2015	290 U
CB318	RM 2.2-3.4 West	7th Ave S SD	CB	9/30/2016	41
7th-ST1	RM 2.2-3.4 West	7th Ave S SD	SedTrap	5/18/2015	230
7th-ST1	RM 2.2-3.4 West	7th Ave S SD	Inline	5/18/2015	42 J
7th-ST1	RM 2.2-3.4 West	7th Ave S SD	SedTrap	5/9/2016	230
7th-ST1	RM 2.2-3.4 West	7th Ave S SD	Inline	5/9/2016	63
7th-ST2	RM 2.2-3.4 West	7th Ave S SD	SedTrap	5/9/2014	19 U
7th-ST2	RM 2.2-3.4 West	7th Ave S SD	SedTrap	5/21/2015	64
7th-ST2	RM 2.2-3.4 West	7th Ave S SD	SedTrap	5/10/2016	1,400 J
7th-ST2	RM 2.2-3.4 West	7th Ave S SD	Inline	5/10/2016	19 U
7th-ST3	RM 2.2-3.4 West	7th Ave S SD	SedTrap	5/21/2015	440 J
7th-ST3	RM 2.2-3.4 West	7th Ave S SD	SedTrap	5/11/2016	310
ODS22	RM 2.2-3.4 West	7th Ave S SD	ODS	11/15/2016	
ODS23	RM 2.2-3.4 West	7th Ave S SD	ODS	11/15/2016	
ODS24	RM 2.2-3.4 West	7th Ave S SD	ODS	11/15/2016	
ODS25	RM 2.2-3.4 West	7th Ave S SD	ODS	11/15/2016	
ODS26	RM 2.2-3.4 West	7th Ave S SD	ODS	11/15/2016	
ODS42	RM 2.2-3.4 West	7th Ave S SD	ODS	12/15/2016	
ODS43	RM 2.2-3.4 West	7th Ave S SD	ODS	12/15/2016	
ODS44	RM 2.2-3.4 West	7th Ave S SD	ODS	12/15/2016	
ODS45	RM 2.2-3.4 West	7th Ave S SD	ODS	12/29/2016	33.8 J
RCB61	RM 2.2-3.4 West	7th Ave S SD	RCB	6/13/2014	210 J
RCB61	RM 2.2-3.4 West	7th Ave S SD	RCB	9/11/2014	270
RCB62	RM 2.2-3.4 West	7th Ave S SD	RCB	6/13/2014	460
RCB62	RM 2.2-3.4 West	7th Ave S SD	RCB	9/11/2014	470
RCB63	RM 2.2-3.4 West	7th Ave S SD	RCB	6/13/2014	160 J

Table F-2. SPU Source Tracing Sample Results (2014 - 2016)

Station ID	Source Control Area	Outfall	Type	Date Sampled	Phenol (ug/kg DW)
SCO					420
CSL					1,200
RCB63	RM 2.2-3.4 West	7th Ave S SD	RCB	9/11/2014	590
RCB64	RM 2.2-3.4 West	7th Ave S SD	RCB	6/13/2014	320 U
RCB64	RM 2.2-3.4 West	7th Ave S SD	RCB	9/11/2014	230
RCB70	RM 2.2-3.4 West	7th Ave S SD	RCB	12/21/2016	
RCB71	RM 2.2-3.4 West	7th Ave S SD	RCB	12/21/2016	
RCB165	RM 2.2-3.4 West	7th Ave S SD	RCB	6/13/2014	230
RCB229	RM 2.2-3.4 West	CS-1	RCB	12/29/2016	
ODS39	RM 2.2-3.4 West	CSO	ODS	12/15/2016	
ODS40	RM 2.2-3.4 West	8th Ave S	ODS	11/15/2016	
ODS41	RM 2.2-3.4 West	8th Ave S	ODS	12/15/2016	
ODS50	RM 2.2-3.4 West	8th Ave S	ODS	12/22/2016	
RCB73	RM 2.2-3.4 West	8th Ave S	RCB	12/21/2016	
RCB74	RM 2.2-3.4 West	8th Ave S	RCB	12/22/2016	
RCB278	RM 2.2-3.4 West	8th Ave S	RCB	12/22/2016	
RCB279	RM 2.2-3.4 West	8th Ave S	RCB	12/29/2016	
RCB310	RM 2.2-3.4 West	8th Ave S	RCB	12/29/2016	
RCB311	RM 2.2-3.4 West	8th Ave S	RCB	12/29/2016	
RCB298	RM 2.2-3.4 West	S Webster St SD	RCB	4/6/2016	280 U
PS1	RM 3.4-3.8 West	CS-1	Inline	5/12/2014	1,300 J
PS2	RM 3.4-3.8 West	CS-1	Inline	5/12/2014	560 J
96-ST1	RM 3.8-4.2 West	S 96th St SD	SedTrap	5/9/2014	180 J
96-ST1	RM 3.8-4.2 West	S 96th St SD	Inline	5/9/2014	120 U
96-ST2	RM 3.8-4.2 West	S 96th St SD	SedTrap	5/19/2014	110
96-ST2	RM 3.8-4.2 West	S 96th St SD	Inline	5/19/2014	12 J
96-ST3	RM 3.8-4.2 West	S 96th St SD	SedTrap	5/9/2014	30
96-ST3	RM 3.8-4.2 West	S 96th St SD	Inline	5/9/2014	19 U
HC-ST1	RM 4.2-5.8 West	Hamm Creek	SedTrap	5/23/2014	11 J

Source: Seattle Public Utilities

Bold text indicates chemical was detected.

Not detected; reporting limit is above the SCO

Exceeds SCO

Exceeds CSL/RAL/MTCA Method A

* MTCA Method A Soil Cleanup Level

mg/kg DW - milligram per kilogram dry weight

ug/kg DW - microgram per kilogram dry weight

BEHP - bis(2-ethylhexyl)phthalate

HC - hydrocarbon

LPAH - Low molecular weight polycyclic aromatic hydrocarbon

HPAH - High molecular weight polycyclic aromatic hydrocarbon

cPAH - carcinogenic polycyclic aromatic hydrocarbon

PCB - polychlorinated biphenyl

NA - Not applicable