

DEPARTMENT OF
ECOLOGY
State of Washington

Lower Duwamish Waterway Source Control Status Report 2018

June 2020

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DEPARTMENT OF
ECOLOGY
State of Washington

Lower Duwamish Waterway Source Control Status Report 2018

Produced by

Toxics Cleanup Program
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Washington State Department of Ecology
Bellevue, Washington

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With Assistance from:

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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
BTEX	benzene, toluene, ethylbenzene, and xylenes
CAP	Cleanup Action Plan
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
COC	chemical of concern
cPAH	carcinogenic polycyclic aromatic hydrocarbon
cDCE	cis-1,2-dichloroethene
CSL	cleanup screening level
CSO	combined sewer overflow
DCE	dichloroethene
DW	dry weight
EAA	early action area
Ecology	Washington State Department of Ecology
EMF	Electronics Manufacturing Facility
EOF	emergency overflow
EPA	U.S. Environmental Protection Agency
FS	feasibility study
GIS	geographic information systems
GSC	Grand Street Commons
GTSP	Georgetown Steam Plant
HPAH	high molecular weight polycyclic aromatic hydrocarbon
HWTR	Hazardous Waste & Toxics Reduction
IAA	Insurance Auto Auctions
ICS	Industrial Container Services
IDDE	illicit discharge detection and elimination
ISCO	in-situ chemical oxidation
ISGP	Industrial Stormwater General Permit
KCIA	King County International Airport
KCIW	King County Industrial Waste
LAET	Lowest Apparent Effects Threshold
LDW	Lower Duwamish Waterway
LDWG	Lower Duwamish Waterway Group
LPAH	low molecular weight polycyclic aromatic hydrocarbon
MBHA	Mount Baker Housing Association
MFC	Military Flight Center
µg/L	micrograms per liter
mg/kg	milligrams per kilogram
MOA	Memorandum of Agreement
MOU	Memorandum of Understanding
MS4	municipal separate storm sewer system
MTCA	Model Toxics Control Act

Acronyms and Abbreviations (Continued)

NBF	North Boeing Field
ng/kg	nanograms per kilogram
NPDES	National Pollutant Discharge Elimination System
ND	not detected
OC	organic carbon
PAH	polycyclic aromatic hydrocarbon
PCB	polychlorinated biphenyl
PCE	tetrachloroethene
PLA	Pollutant Loading Assessment
PLP	potentially liable person
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
SCAP	Source Control Action Plan
SCIP	Source Control Implementation Plan
SCL	Seattle City Light
SCO	sediment cleanup objective
SD	storm drain
SIM	Seattle Iron and Metals
SIU	significant industrial user
SMS	Washington State Sediment Management Standards
SPU	Seattle Public Utilities
SVOC	semivolatile organic compound
SWPPP	Stormwater Pollution Prevention Plan
TAC	Technical Advisory Committee
TCE	trichloroethylene
TCP	Toxics Cleanup Program
TEQ	toxic equivalent
TOC	total organic carbon
TPH	total petroleum hydrocarbons
TSCA	Toxic Substances Control Act
TSS	total suspended solids
USGS	U.S. Geological Survey
UST	underground storage tank
VC	vinyl chloride
VCP	Voluntary Cleanup Program
VOC	volatile organic compound
WQ	Water Quality
WSDOT	Washington State Department of Transportation

Executive Summary

This report summarizes source control activities conducted by the Lower Duwamish Waterway (LDW) Source Control Work Group between January 1 and December 31, 2018. Previous status reports provided an overview of the LDW site and a summary of source control activities conducted between 2003 and December 2017. This report contains updated information related to LDW source control, including:

- The status of source control action items, business inspections, and source tracing activities;
- The status of site assessments and cleanups;
- Other source control activities conducted during 2018 at each of the 24 identified source control areas.

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 710 source control action items have been identified; 507 of these action items have been completed or were no longer necessary (71 percent).

- 140 of 186 high priority action items (75 percent) have been completed;
- 217 of 331 medium priority action items (66 percent) have been completed;
- 150 of 193 low priority action items (78 percent) have been completed.

The status of 18 action items was updated to completed or canceled during the current reporting period; these are listed in Appendix B, Table B-1. The current status of action items is shown in Figure ES-1.

A total of 46 high priority action items remain to be completed (Appendix B, Table B-2); of these, 17 action items are in the upper reach, 18 are in the middle reach, and 11 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 (WQ) and Hazardous Waste & Toxics Reduction (HWTR) inspectors and Ecology Toxics Cleanup Program (TCP) 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 222 inspections/site visits at 139 facilities (Appendix C). King County Industrial Waste inspects significant industrial users operating under a waste discharge permit once per year, and other industrial users at least every five years; a total of 43 inspections were conducted at 35 facilities in 2018 (Appendix D, Table D-1). King County Stormwater Services

conducted 29 source control inspections at 12 facilities in unincorporated areas of the LDW basin in 2018 (Appendix D, Table D-2). Ecology conducted 85 inspections at 81 facilities during 2018 (Appendix E, Tables E-1, E-2 and E-3).

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 and at King County International Airport (KCIA).

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 (completed in 2018), and sediment site, Rhone-Poulenc, and Terminal 117 sites (See Table 2-6).

Ecology's TCP is managing the following sites under the Model Toxics Control Act (MTCA): 8801 Site, Boeing Field Chevron, Boeing Isaacson Thompson, Crowley Marine (8th Avenue Terminals), Douglas Management Dock, Duwamish Marine Center, Duwamish Shipyard, Emerald Gateway, Fox Avenue Building, Glacier Northwest/Reichhold Chemical, Industrial Container Services (ICS), Jorgensen Forge (upland of the EPA-managed area), North Boeing Field/Georgetown Steam Plant (NBF-GTSP), North Terminal 115, Snopac Property, South Park Landfill, South Park Marina, and the Whitehead Tye Site. Ecology's HWTR Program is managing the following cleanup sites: Burlington Environmental/East of 4th Site, West of 4th Site, and General Electric-Dawson Street Plant (See Table 2-7).

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

- Ecology and EPA continued work on the Pollutant Loading Assessment for the Green-Duwamish watershed.
- SPU cleaned storm drain lines.
- SPU continued testing new sediment trap designs to provide more effective collection of storm drain solids in small diameter pipes.
- SPU tested two treatment technologies for use at the planned South Park Water Quality Facility to treat stormwater runoff from the 7th Avenue S drainage system.
- King County continued to implement combined sewer overflow (CSO) control projects in the LDW: West Duwamish Wet Weather Storage, Georgetown Wet Weather Treatment Station, and Rainier Valley Wet Weather Storage and conveyance improvements.
- Ecology and King County worked on and published 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 5.

Upper Reach – East Side

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

- Ecology WQ and The Boeing Company (Boeing) negotiated Agreed Order DE-15600 for the Boeing Developmental Center (BDC) Site in January 2018. Agreed Order DE-15600 was signed on January 9, 2018 (Ecology 2018a [11246]). Under the Agreed Order, Boeing will conduct further evaluation of stormwater at BDC.
- Ecology HWTR identified Boeing as a potentially liable person (PLP) under MTCA for the release of hazardous substances at the BDC Site in March 2018 (Ecology 2018l [11281]).
- Ecology conducted a stormwater compliance inspection at the Boeing Military Flight Center (MFC) on April 4, 2018 (Ecology 2018p [11508]). Ecology concluded that the Boeing MFC facility was out of compliance. In May 2018 Ecology sent Boeing a warning letter (Ecology 2018u [11506]). The letter indicated that Boeing must comply with corrective actions, including the requirement to submit an engineering report that meets the requirements specified in Administrative Order 13932.
- Boeing submitted a second revised engineering report for the MFC to Ecology on August 14, 2018.
- Ecology sent Boeing MFC a warning letter in November 2018. In the warning letter, Ecology noted that exceedance of total suspended solids (TSS) limits has been a problem for this facility. Ecology required that Boeing MFC address the root source of this problem to prevent future exceedances at the MFC (Ecology 2018ao [11507]).
- The MFC discharge monitoring in the second quarter of 2018 indicated exceedances of the copper and zinc benchmarks, which triggered a corrective action. Ecology continues to work with Boeing to establish a clear path forward to meet Industrial Stormwater General Permit (ISGP) requirements at this facility.
- Ecology conducted a site hazard assessment at Unified Grocers in January 2018. Ecology determined that this site was contaminated with gasoline-range hydrocarbons, benzene, toluene, ethylbenzene, and total xylenes (BTEX). Ecology assigned the site a hazard ranking of five (Ecology 2018i [11512], 2018j [11511]).
- In September 2018, Supervalu announced that the facility was closing operations at the Unified Grocers location (3301 Norfolk Street). They submitted a notice of termination form to Ecology for their ISGP (Supervalu 2018 [11454]). On September 28, 2018 Ecology terminated their coverage under the permit (Ecology 2018ar [11510]).
- Ecology approved an extension for the Remedial Investigation schedule of deliverables for the Boeing Field Chevron Site in June 2018. According to the revised schedule, field activities must be completed by January 31, 2019 and data validation must be completed by March 31, 2019 (Ecology 2018w [11288]).

RM 4.3-4.8 East (Boeing Developmental Center)

- Ecology WQ and Boeing negotiated Agreed Order DE-15600 for the BDC Site in January 2018. Agreed Order DE-15600 was signed on January 9, 2018 (Ecology 2018a [11246]). Under the Agreed Order, Boeing will conduct further evaluation of stormwater at BDC.
- At the BDC Site, Ecology required Boeing to monitor for ISGP benchmark pollutants, TSS, total petroleum hydrocarbons (TPH), and polychlorinated biphenyls (PCBs), starting in January 2018. In addition, Ecology required accelerated consideration of advanced stormwater treatment if future benchmark exceedances meet the trigger conditions specified in the Order.
- In the first and second quarters of 2018, BDC was out of compliance with their effluents limits. As a result, Ecology WQ sent a warning letter to Boeing in November 2018. Ecology required that Boeing address the root source of the TSS limit problem and propose a solution designed to prevent future exceedances and submit the solution in writing (Ecology 2018aq [11494]).
- BDC exceeded the TSS effluent limit in the first quarter of 2018 at DC 11. As a result the facility triggered the requirement to implement Phase 2 advanced treatment, which was a condition detailed in the Agreed Order.
- Boeing continued cleanup activities under RCRA at the BDC property.
- Ecology HWTR identified Boeing as a PLP under MTCA for the release of hazardous substances at the BDC Site in March 2018 (Ecology 2018l [11281]).

RM 3.9-4.3 East (Slip 6)

- The PLPs for the 8801 Site submitted a revised draft of the Feasibility Study and a revised draft of the Interim Action Work Plan to Ecology in March 2018. Ecology provided review comments to both documents in November 2018.
- In 2018, Insurance Auto Auctions (IAA) submitted discharge monitoring reports to Ecology for the 8801 Site that indicated that the facility was out of compliance with effluent limits in the 4th quarter of 2017. Ecology WQ sent IAA a warning letter in November 2018 requiring IAA to comply with the National Pollutant Discharge Elimination System (NPDES) permit requirements (Ecology 2018ap [11503]).
- Ecology WQ and Boeing negotiated Agreed Order DE-15600 for the BDC Site in January 2018. Agreed Order DE-15600 was signed on January 9, 2018 (Ecology 2018a [11246]). Under the Agreed Order, Boeing will conduct further evaluation of stormwater at BDC.
- Ecology HWTR identified Boeing as a PLP under MTCA for the release of hazardous substances at the BDC Site in March 2018 (Ecology 2018l [11281]).

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

- Boeing submitted a draft Feasibility Study for the Boeing Isaacson/Thompson Site to Ecology in July 2018.

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

- Jorgensen Forge submitted a Modification of Coverage Form to Ecology, requesting a Level 2 Waiver for the corrective action related to copper exceedances on May 17, 2018. Ecology granted the waiver on August 27, 2018, subject to a number of conditions.
- Ecology reviewed and commented on the first Draft RI Work Plan for the Jorgensen Forge upland cleanup Site in July 2018. A revised RI Work Plan was due to Ecology in January 2019.
- Phase 2 of the Jorgensen Forge Outfall Site Removal Action was completed in 2017 (Floyd|Snider 2018a [11437]). EPA approved the removal action in May 2018 (EPA 2018a [11524]).

Upper Reach – West Side

RM 4.2-5.8 West (Restoration Areas)

- Ecology added the Duwamish Substation to the confirmed and suspected contaminated sites list in March 2018 (Ecology 2018m [11496]).

RM 3.8-4.2 West (Sea King Industrial Park)

- Quarterly groundwater samples collected at the Glen Acres Golf & Country Club in August 2018 contained lead and BTEX concentrations that were below the MTCA Method A Cleanup levels in samples collected from all four groundwater monitoring wells. Petroleum hydrocarbon concentrations were above MTCA Method A cleanup levels in the sample collected from MW3 (Aerotech 2018b [11492]).

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

- Ecology continued negotiating an Agreed Order to perform a Remedial Investigation and study the environmental conditions of the South Park Marina Site through 2018.
- The Port of Seattle and the city of Seattle submitted a draft final Joint Long-Term Monitoring and Maintenance Plan for Terminal 117 to EPA in June 2018. EPA approved the plan in July 2018 (Peterson 2018 [11522]); it was finalized in September 2018 (Integral 2018b [11520]). The plan addresses 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.

Middle Reach – East Side

RM 2.8 East (EAA-3: Slip 4)

- 8th Avenue Terminals submitted a revised draft Remedial Investigation Report for the Crowley Marine Services 8th Avenue S Site to Ecology in June 2018.
- Ecology approved a Phase II Engineering Report from Crowley Marine Services 8th Avenue S Site on August 6, 2018. The report described a new stormwater conveyance

system that would deliver the facility's stormwater runoff to one centralized Chitosan Enhanced Sand Filtration system for treatment.

- The Duwamish Reload Facility triggered copper, zinc, and turbidity benchmark exceedances in their stormwater samples collected from most of their outfalls during monitoring events in Quarters 1, 2, and 4 of 2018. Ecology WQ issued a Warning Letter to the facility on November 15, 2018.
- Boeing and Seattle City Light (SCL) conducted several groundwater sampling events at North Boeing Field and the Georgetown Steam Plant (NBF-GTSP) during 2018. This work was conducted as part of the Phase 3 supplemental groundwater investigation for the NBF-GTSP Remedial Investigation. One of the events involved sampling groundwater for PCB congeners at the NBF property boundary along East Marginal Way S. PCB congeners were detected at concentrations above the proposed cleanup level protective of LDW surface water (Landau 2018d [11312]).
- Boeing and SCL completed off-property soil vapor and groundwater sampling along Ellis Avenue in April and May 2018. Sampling was prompted by concerns that trichloroethylene (TCE) and vinyl chloride (VC) in groundwater could pose a vapor intrusion risk to businesses and residents in the area. The investigation showed no indication of a risk for vapor intrusion.

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

- Seattle Iron & Metals (SIM) submitted a draft Interim Action Completion Report for the Whitehead Tye Site to Ecology in August 2018. This document was in Ecology's review process through the end of 2018.
- In October 2018, SIM installed a Stormcapture Modular Wetland Treatment System at the Whitehead Tye Site. SIM amended their sampling point location and started monitoring stormwater from a single new sample point which is located post treatment system effluent.
- At the Whitehead Tye Site stormwater was not making it through the system to the point of discharge from the treatment system. Troubleshooting identified a leak in the system at the pre-treatment unit. As a result, no stormwater was discharged from the system in 2018. Repair work continued into early 2019.
- Ecology issued an Immediate Action Order (Administrative Order Docket No. 15573) to SIM on January 10, 2018 in response to the violations that were observed by Ecology at a November 2017 inspection.
- Stormwater samples collected at the SIM discharge monitoring locations exceeded permissible limits for a range of parameters, including lead, copper, zinc, TSS and TPH throughout 2018. Ecology issued a Warning Letter to SIM on October 4, 2018 (and ultimately a Notice of Penalty on February 11, 2019) for exceedances of the lead, copper, zinc effluent limits in samples collected during various quarterly monitoring periods in 2018.

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

- Duwamish Marine Center submitted a Draft Remedial Investigation Report in January 2018. Ecology reviewed the report and provided comments on March 21, 2018. Duwamish Marine Center revised the report and submitted a second draft to Ecology on May 4, 2018.
- At the Georgetown Wet Weather Treatment Station, deconstruction of the existing site building and site preparation construction work began in 2018. Work started on the construction on the new outfall structure in the summer of 2018. In the fall of 2018, preparation work started on constructing the conveyance pipeline, which will connect the treatment station to the outfall.
- Ecology added the Georgetown Wet Weather Treatment Station to the confirmed and suspected contaminated sites list in September 2018 (Ecology 2018al [11900]).
- Consolidated Freightways submitted a Cleanup Action Closure Report to Ecology in July 2018 (Farallon 2018e [11513]). In October 2018, Ecology determined that upon completion of the proposed cleanup, no further remedial action will likely be necessary to cleanup contamination at this site (Ecology 2018am [11495]).
- Ecology determined that upon completion of the proposed cleanup at the Kelly Moore Site, further remedial action will likely be necessary to cleanup contamination.
- In 2018 a soil vapor extraction system was installed and started operating at the Kelly Moore Site. An air sparge system was installed and was expected to become operational in 2019. Kelly Moore planned to collect indoor air samples to assess baseline conditions prior to starting up the sparge system, and to compare soil vapor concentrations against results from baseline samples collected for the soil vapor extraction system.
- Kelly Moore developed cleanup levels based on the suggestions presented by Ecology in a meeting on May 8, 2018 (Wood 2018a [11491], 2019 [11927]).
- A property adjoining the Emerald Tool Site, located at 6346 6th Avenue, conducted a Phase II Limited & Targeted Subsurface Investigation (Aerotech 2018c [12394]). Soil and groundwater samples were collected from six boring locations along the boundary between the two properties. One soil sample, from 3.5 to 4 feet below ground surface, contained TCE at a concentration of 0.16 milligrams per kilogram (mg/kg), above the MTCA Method A cleanup level of 0.03 mg/kg. One groundwater sample contained VC at 12 micrograms per liter (µg/L), above the MTCA Method A groundwater cleanup level of 0.2 µg/L.
- Ecology conducted an Initial Investigation on the property adjoining the Emerald Tool Site, and determined that the release of chlorinated volatile organic compounds (VOCs) observed on the northern portion of the property likely migrated from the Emerald Tool Site. Ecology issued a No Further Action Memorandum for the 6346 6th Avenue Site (Ecology 2018aa [12397]).

Middle Reach – West Side

RM 2.1-2.2 West (EAA-2: Trotsky Inlet)

- Industrial Container Services submitted a revised draft Remedial Investigation Report in April 2018. Ecology provided comments to the PLPs in July 2018. The PLPs revised and resubmitted the report in October 2018.
- Ecology provided comments on Douglas Management Dock’s 2017 draft Remedial Investigation Report in January 2018. The PLPs submitted a revised draft report to Ecology in August 2018.

RM 2.1 West (1st Avenue S Storm Drain)

- Ecology issued a Final Cleanup Action Plan (CAP) for the Former South Park Landfill site in March 2018. The CAP describes the cleanup action approved by Ecology for the “Settlement Area” portion of this site. The cleanup action consists of a landfill cap/cover, landfill gas controls, stormwater controls, long-term monitoring of groundwater, long-term monitoring of the cap/cover, the landfill gas controls, and the groundwater, and environmental covenants (Ecology 2018n [11904]).

RM 1.6-2.1 West (Terminal 115)

- Ecology provided comments on the North Terminal 115 Site Draft Remedial Investigation Report in December 2018. Ecology required the Port of Seattle to submit a second Draft Remedial Investigation Report in 2020.

Lower Reach – East Side

RM 1.0-1.2 East (King County Lease Parcels)

- At the East of 4th Site, Stericycle proceeded to prepare a Conceptual Design for a full-scale 1,4-dioxane in-situ chemical oxidation (ISCO)-based cleanup action using injections in 2018. Additional sampling and bench-scale tests were then performed to optimize the design of the remedy (ISOTEC 2018 [11997]).
- Ecology approved a Tier 5 Well Installation Work Plan for the East of 4th Site in August 2018 (Ecology 2018ak [11903], Pioneer 2018 [11998]).
- Ecology approved two pilot-study work plans for the West of 4th Site in January 2018: the In Situ Metals Immobilization Pilot Testing Work Plan and the Chlorinated VOC Pilot Study Work Plan. PLPs subsequently started preliminary pilot study work (Ecology 2018d [11906], Ecology 2018e [11908]).
- Ecology approved the West of 4th Site’s interim action work plan for remediating contaminated soils and shallow groundwater beneath Capital Industries’ Plant 4 in January 2018 (Ecology 2018f [11895]).
- Ecology approved a revised Metals Immobilization Pilot Study Field Implementation Work Plan for the West of 4th Site in August 2018 (Aspect 2018g [11809], Ecology 2018aj [11907]).

- At the West of 4th Site a potassium permanganate solution was injected into five first-phase locations below Capital Industries' Plant 4 slab in mid-August 2018.
- In November 2018, the West of 4th Site PLP Group collected direct-push groundwater samples in close proximity to vapor intrusion-mitigated homes located along Orcas Street (in Site Unit 2). They installed two new water table monitoring wells near homes located one block south and west. In both areas the objective is to determine the current levels of groundwater TCE concentrations and to determine whether there is still the potential for unacceptable vapor intrusion impacts to indoor air.
- General Electric (GE) completed Phase I of the ISCO remedy at the GE Aviation Site in March 2018. The ISCO remedy included injection of sodium persulfate into the shallow and intermediate groundwater, continued operation of the hydraulic control system, continued operation of the vapor intrusion mitigation system, and institutional controls. Post-injection groundwater monitoring indicated the method did not adequately destroy the TCE and other groundwater contaminants (AECOM 2018a [11282]).
- GE continued to operate the groundwater hydraulic control system, and the vapor intrusion mitigation system at the GE Aviation site, which are requirements of the Ecology CAP and final cleanup engineering design report (Ecology 2018ag [11286], Ecology 2018ah [11287]).
- In December 2018, Ecology approved an indoor air quality monitoring plan for GE to collect indoor air samples to verify indoor air quality for the south side of McKinstry's 5005 3rd Avenue building (AECOM 2018d [11208], Ecology 2018at [11899], Ecology 2018au [11285]).
- Ecology conducted a supplemental site investigation at Bob's Texaco Site in 2017 to provide current environmental data for the property; a draft report was published in May 2018 (Kennedy/Jenks 2018 [12392]). The investigation identified several data gaps, including insufficient information regarding the lateral extent of subsurface soil and groundwater contamination, and the lack of data to evaluate the vapor intrusion pathway.

RM 0.9-1.0 East (Slip 1)

- An Environmental Summary and Data Gap Analysis was prepared for the northern portion of the GSA Federal Center South property in 2018 (Kane 2019 [12388]). This report recommended redevelopment of all available groundwater monitoring wells followed by sampling and chemical analysis for TPH and VOCs. These data will be used to develop a plan for further investigation of soil and groundwater at the Site.

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

- EPA and the Port of Seattle signed an Administrative Settlement Agreement and Order on Consent for Removal Action, Preliminary Assessment and Site Investigation at Terminal 108 on April 5, 2018.
- The Terminal 108 Preliminary Assessment report was submitted to EPA in December 2018.

- Ecology entered into Prospective Purchaser Consent Decrees with Grand Street Commons and MBHA for the Grand Street Commons Site. The consent decrees require Grand Street Commons and MBHA to complete a Remedial Investigation and Feasibility Study to evaluate the extent of the contaminated area and to develop cleanup options.
- The Grand Street Commons Site PLPs started preparing a Remedial Investigation work plan in the fall of 2018 (Aspect 2018h [11722]).

Lower Reach – West Side

RM 1.3-1.6 West (Glacier Bay)

- Duwamish Shipyard continued revisions to the Remedial Investigation Report during 2018. A revised Remedial Investigation Report was expected to be completed in 2019.
- Glacier Northwest submitted a data gaps work plan to Ecology in July 2018, and a treatability testing work plan in October 2018.

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

- On September 19, 2018 Lafarge Cement violated the conditions of their NPDES permit when they dropped a super sack containing 21,300 pounds of soil predominantly contaminated with diesel and metals during transloading activities. Some of the contaminated soil fell into the LDW. Lafarge's contractor recovered approximately 4,000 pounds of the estimated 4,020 pounds of soil that spilled into the LDW.
- Ecology sent Lafarge a letter on September 19, 2018 requiring Lafarge to clean up the dock and barge to minimize the contaminated soil that could enter the storm drain or the waterway, and to update best management practices for transloading super sacks. Lafarge responded to Ecology on October 18, 2018.

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

Facility	Facility/ Site ID	Action Item	Action Item Category	Responsible Party	Status
Upper Reach					
RM 4.9 East (EAA-7: Norfolk CSO/SD)					
BDC-South	4581384	Continue sediment monitoring in the vicinity of the south storm drain sediment removal activities.	Cleanup	Boeing	In Progress
BDC-South	4581384	Continue monitoring storm drain solids.	Environmental Sampling	Boeing	In Progress
RM 3.9-4.3 East (Slip 6)					
8801 Site (Former PACCAR Site)	2072	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.	Cleanup	Ecology, Property owner/operator	In Progress
8801 Site (Former PACCAR Site)	2072	Complete Phase 2 of the Sediment Evaluation Work, which includes sediment core sampling in selected locations in the LDW adjacent to the site.	Cleanup	Ecology, Property owner/operator	
8801 Site (Former PACCAR Site)	2072	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.	Cleanup	Ecology, Property owner/operator	In Progress
Former Rhone-Poulenc Site	2150	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.	Cleanup	EPA, Property owner/operator	In Progress
Former Rhone-Poulenc Site	2150	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).	Cleanup	EPA, Property owner/operator	In Progress
Former Rhone-Poulenc Site	2150	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.	BMP Implementation	Ecology, Property owner/operator	

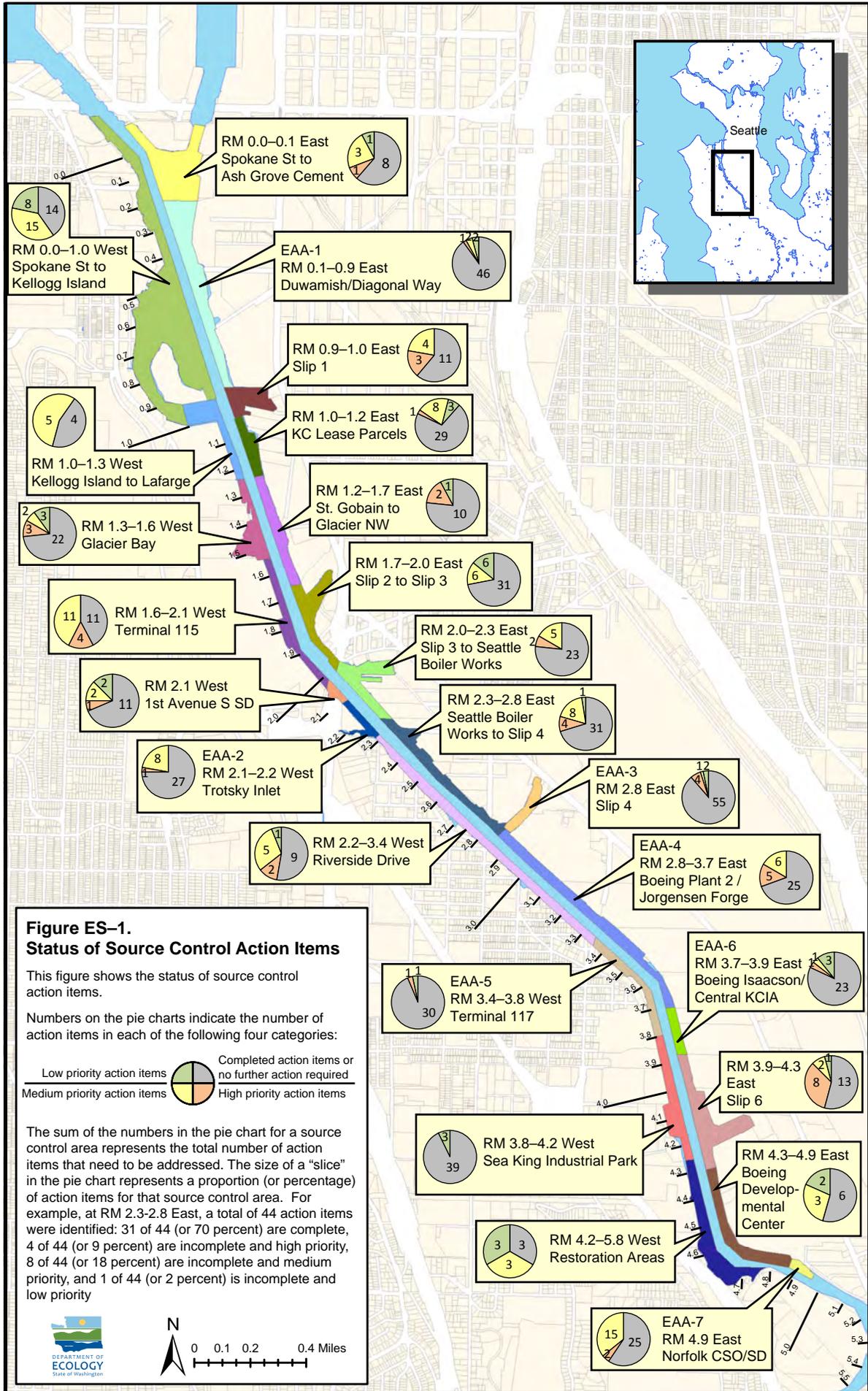
Facility	Facility/ Site ID	Action Item	Action Item Category	Responsible Party	Status
Museum of Flight (MOF)	98798343	Monitor stormwater and/or storm drain solids at MOF and former BDC properties in the vicinity of USTs and associated groundwater contamination.	Environmental Sampling	Ecology, Property owner/operator	In Progress
Museum of Flight (MOF)	98798343	Identify the source and extent of groundwater contamination on the former BDC property, and conduct remedial action, as necessary.	Cleanup	Ecology, Property owner/operator	In Progress
RM 3.7-3.9 East (EAA-6: Boeing Isaacson/Central KCIA)					
Boeing Isaacson/Thompson Site	2218	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.	Cleanup	Ecology, Boeing	In Progress
RM 2.8-3.7 East (EAA-4: Boeing Plant 2/Jorgensen Forge)					
Boeing Plant 2	2100	Continue shoreline groundwater monitoring.	Cleanup	EPA, Boeing	In Progress
Boeing Plant 2	2100	Conduct an investigation to provide additional hydrogeologic data at the boundary of the Boeing Plant 2/Jorgensen Forge facilities.	Source Assessment	Boeing	In Progress
Boeing Plant 2	2100	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.	Environmental Sampling	Ecology, Boeing	
Jorgensen Forge	2382	Develop a hydrogeologic site model as part of the source control investigation to characterize the groundwater system on site, including tidal influence.	Source Assessment	Jorgensen, Boeing	In Progress
Jorgensen Forge	2382	Complete a Remedial Investigation/Feasibility Study of the upland site area	Cleanup	Jorgensen, Boeing	In Progress
RM 3.4-3.8 West (EAA-5: Terminal 117)					
Adjacent Streets/Dallas Ave.	NA	Continue monitoring of storm drain solids	Environmental Sampling	SPU, Port of Seattle	In Progress
Middle Reach					
RM 2.8 East (EAA-3: Slip 4)					
North Boeing Field / KCIA / I-5 Storm Drains	2387398, 2753918	Reinstall sediment traps and continue monitoring as needed.	Environmental Sampling	SPU, Boeing, King County	In Progress

Facility	Facility/ Site ID	Action Item	Action Item Category	Responsible Party	Status
North Boeing Field	2753918	Determine impact of remaining joint sealant material on PCB concentrations in stormwater.	Source Assessment	Ecology	In Progress
North Boeing Field	2753918	Continue source tracing in north drain line to identify and/or eliminate transport of PCBs to Slip 4.	Source Assessment	Boeing	In Progress
NBF-GTSP	2050	Conduct RI/FS and implement interim actions (as needed).	Cleanup	Ecology, Boeing, City of Seattle, King County	In Progress
RM 2.3-2.8 East (Seattle Boiler Works to Slip 4)					
S Garden Street and S Myrtle Street Storm Drains	NA	Conduct source tracing to identify potential contaminant sources to stormwater discharging to the LDW.	Source Assessment	SPU, Ecology	In Progress
Seattle Boiler Works, Inc.	17577864	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.	Inspection	Ecology	
Puget Sound Truck Lines	41684823	Determine whether the five outfalls identified at the property are active, and identify the source of discharge from these outfalls, if any.	Source Assessment	Ecology, Property owner/operator	
Crowley Marine Services	1940187	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.	Cleanup	Property owner/operator	In Progress
RM 2.0-2.3 East (Slip 3 to Seattle Boiler Works)					
S Brighton Street SD	NA	Conduct source tracing in the S Brighton Street SD basin.	Source Assessment	SPU, Ecology	In Progress
S River Street SD	NA	Conduct source tracing in the S River Street SD basin.	Source Assessment	SPU, Ecology	In Progress
RM 2.2-3.4 West (Riverside Drive)					
Independent Metals Plant 2	16139	Request drainage information from Independent Metals or the current operator at this property for Outfalls 2109 and 2111 to determine if the outfalls are operational and to identify the drainage areas associated with the outfalls, if any.	Information Request	Ecology	

Facility	Facility/ Site ID	Action Item	Action Item Category	Responsible Party	Status
American Civil Constructors Barge Removal Ramp	NA	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.	Information Request	EPA, USACE	
RM 2.1-2.2 West (EAA-2: Trotsky Inlet)					
2nd Avenue S SD	NA	Continue source tracing to identify sources of phthalates and other COCs.	Source Assessment	SPU	In Progress
RM 2.1 West (1st Avenue S SD)					
1st Avenue S Bridge Drains (Outfalls 2505, 2507, 2510, 2512)	NA	Request additional information from WSDOT regarding the quantity and quality of stormwater and solids discharged to the LDW through the bridge drains.	Information Request	Ecology	
RM 1.6-2.1 West (Terminal 115)					
Terminal 115 - Port of Seattle Storm Drain Outfalls (Outfalls 2122, 2123, 2124, 2220, and POS 6146)	4040072	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.	Cleanup	Ecology, Port of Seattle	In Progress
Terminal 115 - Port of Seattle Storm Drain Outfalls (Outfalls 2122, 2123, 2124, 2220, and POS 6146)	4040072	Perform a video inspection of storm drain lines to identify areas where groundwater infiltrates the storm drain system.	BMP Implementation	Port of Seattle	
Terminal 115 - Port of Seattle Storm Drain Outfalls (Outfalls 2122, 2123, 2124, 2220, and POS 6146)	4040072	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.	Information Request	Port of Seattle	
Former Foss Environmental Services	36326474	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.	Environmental Sampling	Ecology	

Facility	Facility/ Site ID	Action Item	Action Item Category	Responsible Party	Status
Lower Reach					
RM 1.2-1.7 East (Saint Gobain to Glacier Northwest)					
Saint Gobain Containers Inc.	94925241	Determine appropriate engineering controls for the inaccessible contamination located beneath the soil/water separator described in the 1991 Limited UST Assessment.	Cleanup	Property Owner/Operator	
Longview Fibre Paper and Packaging	2226	Review the latest groundwater monitoring report regarding exceedances of diesel-range hydrocarbons.	Data Evaluation	Ecology	
RM 1.0-1.2 East (KC Lease Parcels)					
Cadman Seattle, Inc.	70313617	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.	Information Request	Ecology	
RM 0.9-1.0 East (Slip 1)					
Federal Center South	10233917	Perform Site Hazard Assessment	Source Assessment	Ecology	
Manson Construction Company	80333167	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.	Records Review	Ecology	
Manson Construction Company	80333167	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.	Environmental Sampling	Ecology	
RM 0.1-0.9 East (EAA-1: Duwamish/Diagonal Way)					
Rainier Commons / Former Rainier Brewery Property	8972, 9192461	Sample and remove PCB-contaminated building materials, including interior paint, as needed.	Cleanup	EPA/Property Owner	In Progress
RM 0.0-0.1 East (Spokane Street to Ash Grove Cement)					
Port of Seattle Terminal 104	72668645	Review post remediation reports and annual report as part of the VCP and determine whether further action is needed.	Records Review	Ecology	

Facility	Facility/ Site ID	Action Item	Action Item Category	Responsible Party	Status
RM 1.3-1.6 West (Glacier Bay)					
Duwamish Shipyard	2071	Conduct site investigations as specified in the Agreed Order Statement of Work.	Cleanup	Property owner/operator	In Progress
Duwamish Shipyard	2071	Review site investigation results and assess potential for sediment recontamination and need for remedial actions.	Cleanup	Ecology	In Progress
Glacier Northwest	23881883	Review site investigation results and assess potential for sediment recontamination and need for remedial actions.	Cleanup	Ecology	In Progress



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, 2018 through December 31, 2018. 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 2017 (Ecology 2007 [00021]², 2008a [00065], 2008d [00068], 2009c [00090], 2011c [00095], 2012b [00098], 2013 [10359], 2014 [10620], 2018y [12005], and 2019a [12262]).

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 (2018); 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 basin-wide source control activities. Sections 3.0, 4.0, and 5.0 describe site-specific source control activities for the upper, middle, and lower reach of the LDW, respectively. Section 6.0 contains a list of references.

Appendix A provides a folio with maps of each LDW source control area. 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. Appendices F and G provide SPU and King County source tracing sample results for 2018.

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

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.

² Numbers in bracket [xxxxx] refer to the LDW Source Control Document Number. For example, 'Ecology 2019a' is document number 12262. This number is provided to minimize confusion between documents with similar reference names.

and the separated stormwater drainage basins, and it encompasses 20,400 acres, or approximately 32 square miles.

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.

1.1.1 Lower Duwamish Waterway Sediment Cleanup

In December 2000, the Lower Duwamish Waterway Group (LDWG), composed of the City of Seattle, King County, the Port of Seattle, and The Boeing Company (Boeing), entered into an Administrative Order on Consent for Remedial Investigation/Feasibility Study. LDWG completed a remedial investigation (RI) and feasibility study (FS) for the LDW Superfund site in July 2010 and October 2012, respectively (Windward 2010 [00011]; AECOM 2012 [00099]).

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 [02415]). EPA issued a Record of Decision (ROD) for the site in November 2014 (EPA 2014 [12119]). 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 [11095]).

The Selected Remedy is a 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, and
- Cleanup of the remaining contamination in the LDW, including long-term monitoring to assess the success of the remedy in achieving cleanup goals.

EPA, Ecology, and the LDWG members signed a fourth amendment to the Agreed Order on Consent for the LDW on July 9, 2018 (EPA 2018b [11299]). The purpose of the fourth amendment is to design the remedy for the LDW upper reach (River Mile [RM] 3.0 to RM 5), to incorporate and supersede the work being carried out under the third amendment to the Agreed Order on Consent in support of the development of seafood consumption institutional controls for the site, and to provide for timely periodic monitoring of selected site conditions (EPA 2018b [11299]).

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 analyses have been conducted, and a remedy design has been completed.

1.1.2 Progress Toward Sediment Cleanup During 2017/2018

LDWG started working to design the cleanup for the upper reach in 2018.

Enhanced Natural Recovery/Activated Carbon Pilot Study

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 (AMEC 2015 [11213]). This study will determine whether enhanced natural recovery material impregnated with granular activated carbon can be successfully applied to reduce the bioavailability of PCBs in remediating contaminated sediments in the LDW. The pilot study construction was completed in early 2017 (AMEC 2018c [11441]), and Year 0 samples were subsequently collected between January and February 2017 (AMEC 2018a [11284]). Surface sediment and solid-phase microextraction extract samples were collected from the scour, intertidal, and subtidal plots to determine concentrations of freely dissolved PCBs in porewater, and PCBs, total organic carbon (TOC), activated carbon, and grain size in bulk sediment. The Year 1 data package (submitted in September 2018) characterized the conditions one year after the pilot study construction (Wood 2018b [11527]). Sampling will continue annually through Year 3 of the pilot study (March through June in 2019, and 2020).

In 2018, LDWG submitted a third Quality Assurance Project Plan (QAPP) addendum for the enhanced natural recovery/activated carbon pilot study. This addendum details modifications to the analytical methods for carbon analysis and it adds a sieving step to the preparation of samples comprised of the gravelly sand enhanced natural recovery substrate. It also formally documents a series of discussions and decisions that took place between LDWG, EPA, and Ecology (AMEC 2018 [11493]).

Pre-design Studies

LDWG is conducting pre-design studies to help EPA ensure that all remedial design data requirements are addressed in the correct sequence and schedule for the ROD implementation (Windward 2017c [11097]). The purpose of the pre-design studies is to:

- Establish post-EAA cleanup baseline conditions in environmental media,
- Evaluate the effectiveness of EAA cleanups and the degree to which natural recovery has occurred since the RI/FS,
- Establish baseline data for comparison to post-remedial action data,
- Aid in the evaluation of source control,
- Perform a survey of waterway users and an assessment of in-water structures to inform recovery category recommendations,
- Identify other site-wide and area-specific remedial design and remedial action information needs, and to
- Develop a strategy for remedial design phasing.

Fish and Crab Tissue. In July 2017, LDWG prepared a project plan for collection and chemical analysis of baseline fish and crab tissue samples (Windward 2017a [11450]). Fish and crab sampling was conducted between August 29 and September 1, 2017. Species targeted for collection included English sole, shiner surfperch, Dungeness crab, and graceful crabs. The Baseline Fish and Crab Tissue Data Report was completed in 2018 (Windward 2018e [11297]).

Surface Water. LDWG completed a project plan for baseline surface water sampling in August 2017(Windward 2017b [11443]). The baseline surface water sampling plan involved collection of composite grab surface water samples during eight sampling events at two locations in the LDW: RM 0.75 and RM 3.3, and at one reference location upstream of the LDW at RM 10. Sampling began in 2017 and continued through 2018. In addition, passive samplers were deployed approximately 1 meter above the sediment surface at two locations (RM 2.1 and RM 3.3) during dry baseflow conditions (August 2017 and August 2018). These samplers were used to measure freely dissolved PCB concentrations in LDW surface water (Windward 2018b [11295]). The results will be presented in a final baseline surface water data report in April 2019.

Surface Sediment. LDWG completed a surface sediment sampling plan in May 2018. Baseline samples of subtidal sediment were collected in February and March 2018. The results of the baseline chemical analyses of sediment samples were described in the Surface Sediment Data Report (Windward 2019 [12109]). Note, an initial draft data report with partial sediment data was developed in 2018 (Windward 2018e [11298]). This was later finalized in 2019 with all sediment data provided. The sediment data report provides QAPP deviations and the results of chemical analyses and validation of 0-10 cm surface sediment samples, near-outfall sediment samples, the 0-45 cm intertidal sediment samples, bank samples, and the PCB porewater assessment.

Clam Tissue. Clam tissue samples and co-located sediment samples were collected in May 2018. The results of the baseline chemical analyses of clam and co-located sediment samples will be presented in a final Clam Data Report in February 2019. In addition to the clam tissue results, the Clam Data Report will also present the results of the porewater investigation of carcinogenic PAHs (cPAHs).

Seeps. Seep sampling was performed in May/June 2018. The purpose of this seep study was to collect and analyze seep samples to help Ecology identify sources and assess source control sufficiency. The baseline chemical analysis of seep water samples were described in a draft Baseline Seep Data Report (Windward 2018i [11442]). The Seep Data Reports were later finalized in March 2019.

Compilation of Existing Data. In November 2018, LDWG completed a technical memorandum that compiled relevant in-waterway data, source control related data, and upstream data that were obtained or made available starting in April 2010 through June 15, 2018 (Windward 2018h [11526]). The goal of this technical memorandum was to compile all the relevant data that were collected after the RI/FS dataset.

Waterway User Survey and Assessment of In-Water Structures. LDWG developed a waterway user survey that was designed to gather physical information to facilitate an assessment for potential changes to recovery category designation and technology assignments, based on up-to-date waterway use information. The survey focused on collecting information on current and potential future waterway uses and activities that may have the potential to disturb the sediment bed to a degree that could alter the recovery potential and recovery category designation identified in the ROD. Examples of these types of activities include maneuvering and anchoring ships and barges, spud use, dragging bridle chains, and future berth and wharf development and maintenance projects.

Interviews were conducted between May 20 and December 10, 2017. The assessment of in-water structures was conducted between January 1 and February 28, 2018. The results of the user

survey and assessment provides an update of geographic information system (GIS) data and maps related to structures, berthing areas, and property ownership. These data will be used to support the identification of areas potentially subject to scour or other disturbances based on current vessel movement patterns and berthing operations. These potential scour areas were overlaid on the recovery category map to assess where adjustments may be needed and to help identify location-specific investigation or analyses that may be needed during design (Integral 2018 a [11310]). This information will be used to make decisions about future sampling, remedial design, and construction planning. EPA reviewed the Waterway Users Survey during the summer of 2018 (EPA 2018c [11300]).

Further information about the LDW sediment cleanup can be found at EPA's LDW website³ and the LDWG website.⁴

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 [00008], 2004 [00009]). 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 2014 [12132]). 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. The Strategy was revised in June 2016 (Ecology 2016b [11061]).

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.

³ <https://cumulis.epa.gov/supercpad/cursites/csinfo.cfm?id=1002020>

⁴ <http://www.ldwg.org/project-library/>

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 (WSDOT), and EPA have been active participants in coordinating source control work in the LDW. Together, they are known as the LDW Source Control Work Group (SCWG). The focus of the SCWG is to share information, discuss strategy, develop action plans, implement source control measures, and track progress through coordinated monthly meetings.

Further information about LDW source control can be found at Ecology's LDW website.⁵

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 considered part of this Strategy (Ecology 2016b [11061]). 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 (Seattle 2016 [12271]). Seattle submitted their annual summary of activities to Ecology in March 2019 as part of SPU's municipal separate storm sewer system (MS4) Phase 1 National Pollutant Discharge Elimination System (NPDES) annual report for 2018 (SPU 2019 [11926]). Relevant information has been incorporated into this LDW Source Control Status Report.

King County submitted a SCIP to Ecology in June 2014, followed by a revised plan in January 2016, which covers the period from 2014 through 2018 (King County 2016 [11543]). In November 2019, King County submitted their annual report to Ecology describing source control activities conducted in 2018 (King County 2019 [11925]). The 2018 annual report was King County's final annual report associated with the SCIP for 2014 through 2018. King County's next SCIP covers the period from 2019 to 2023. Relevant information has been incorporated into this LDW Source Control Status Report.

1.4 Source Control Process

The source control process is described in detail in the Strategy (Ecology 2016b [11061]). 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 to fill data gaps, and assessed the presence of ongoing sources that could recontaminate sediments after cleanup. SCAPs are available on Ecology's website.⁶

Ecology grouped the 24 source control areas into three larger sub-areas: upper reach, middle reach, and lower reach (Figure 1-3). Ecology plans to use an upstream-to-downstream approach to source control so 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

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

⁶ <https://ecology.wa.gov/Spills-Cleanup/Contamination-cleanup/Cleanup-sites/Toxic-cleanup-sites/Lower-Duwamish-Waterway/Source-control-area-map>

the upper reach, then the middle reach, and finally the lower reach. More information about Ecology’s plan for completing action items can be found in the Strategy (Ecology 2016b [11051]).

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

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

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

CSO = combined sewer overflow KCIA = King County International Airport SD = storm drain

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.

1.4.1 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 2016b [11061]). 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.

Section 2 of this Source Control Status Report summarizes new information obtained during the current reporting period (January through December 2018) in the categories listed above.

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

As described in the Strategy, Ecology is responsible for evaluating and documenting source control sufficiency. Ecology plans to provide source control sufficiency evaluations and recommendations to EPA.



Project Number: 11403, M&E 3 - Duwamish Waterway Rehabilitation, Action EPCO 48101, EAPL - Duwamish Bay - 48101, LCM - M&E 3 - Duwamish Waterway Rehabilitation, Seattle, WA

Figure 1-1. Lower Duwamish Waterway Source Area



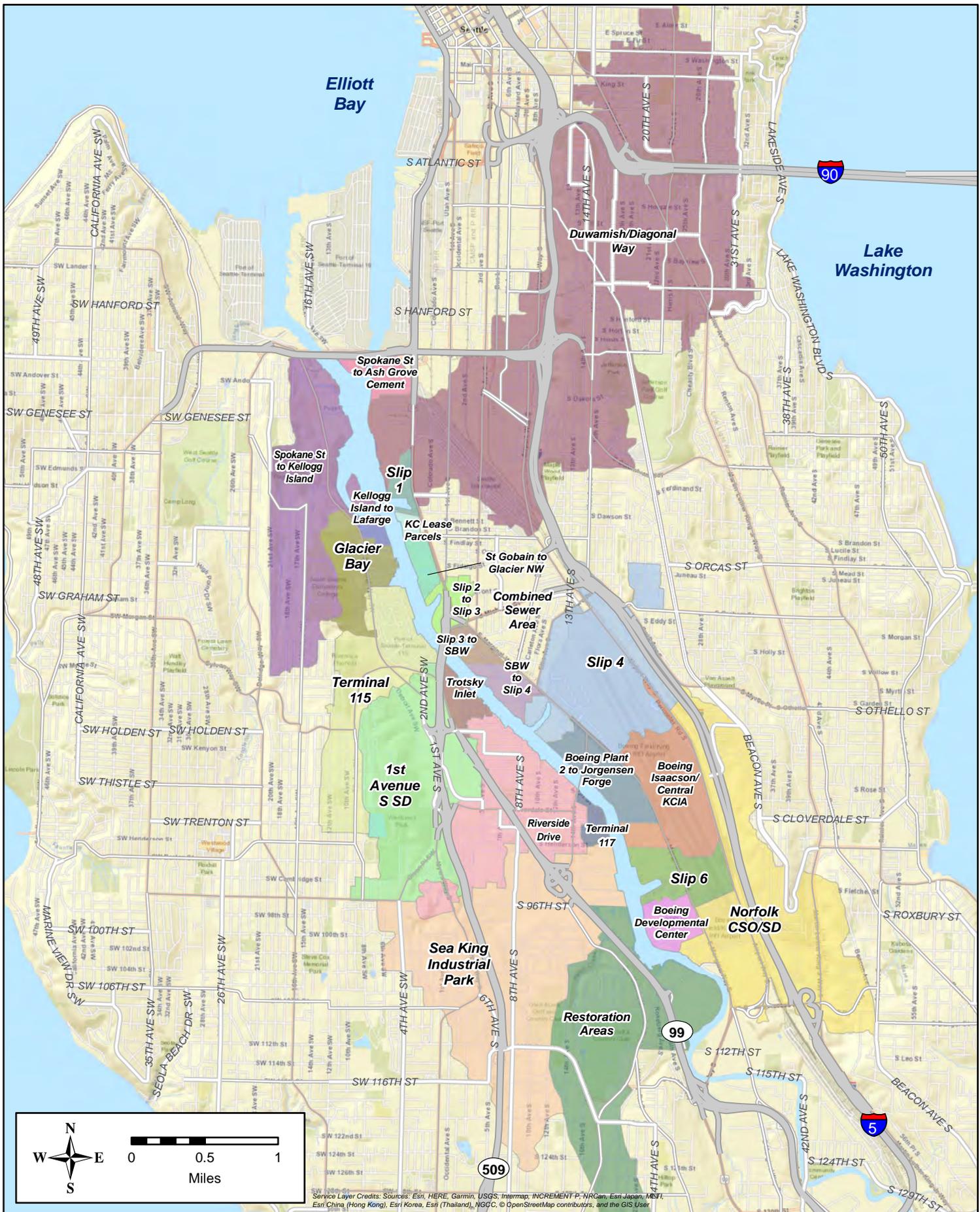


Figure 1-2. Lower Duwamish Waterway Source Control Areas



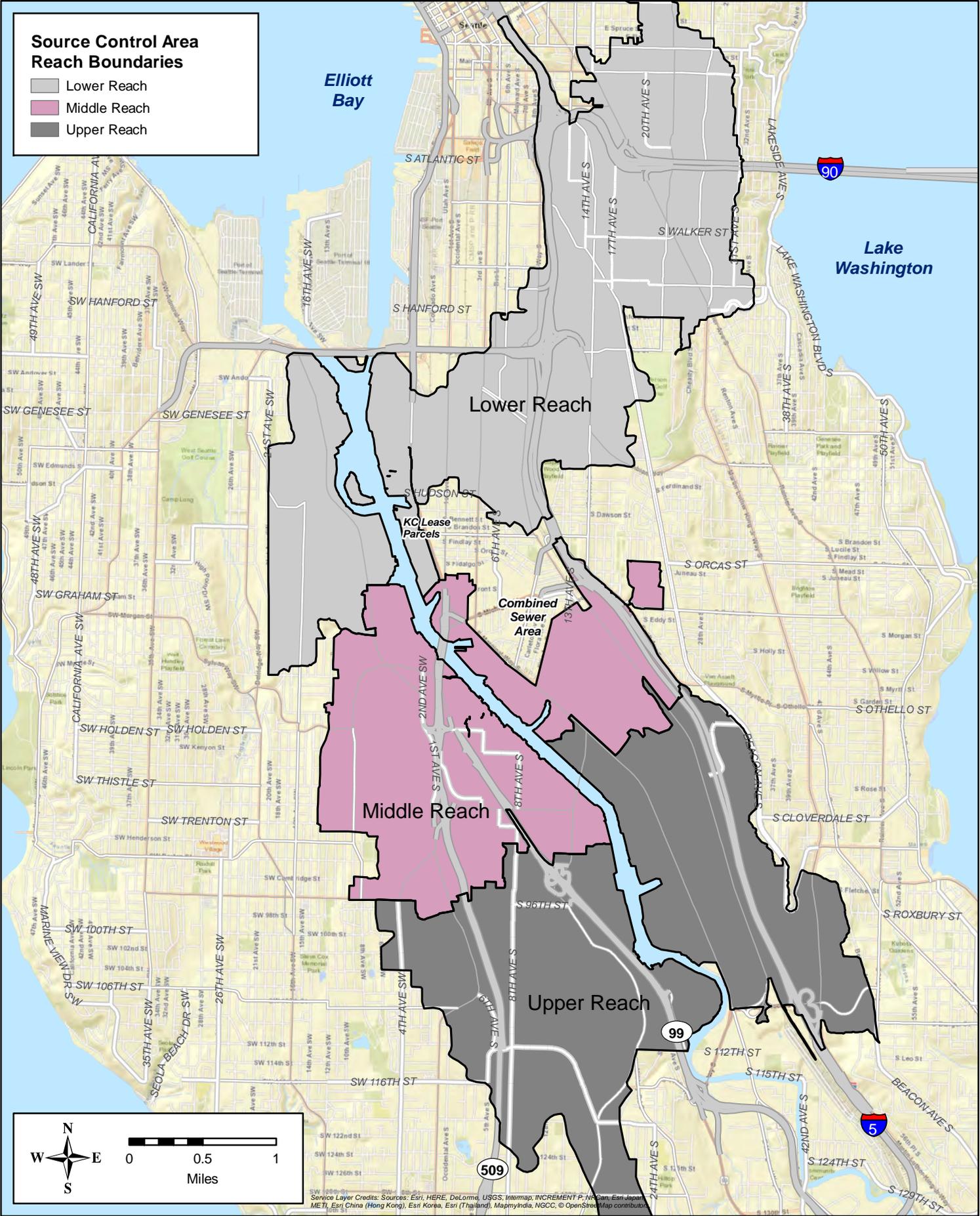


Figure 1-3. Lower Duwamish Waterway Reach Boundaries



2.0 Basin-wide Source Control Activities

2.1 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 2-1 lists 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 2-1. 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
Upper Reach					
RM 4.9 East (EAA-7: Norfolk CSO/SD)	42	60%	3	33%	2
RM 4.3-4.9 East (BDC)	11	55%	2	100%	0
RM 3.9-4.3 East (Slip 6)	24	54%	16	50%	8
RM 3.7-3.9 East (EAA-6: Boeing Isaacson/Central KCIA)	28	82%	8	88%	1
RM 2.8-3.7 East (EAA-4: Boeing Plant 2/Jorgensen Forge)	36	69%	24	79%	5
RM 4.2-5.8 West (Restoration Areas)	9	33%	0	NA	0
RM 3.8-4.2 West (Sea King Industrial Park)	42	93%	4	100%	0
RM 3.4-3.8 West (EAA-5: Terminal 117)	32	94%	9	89%	1
Total – Upper Reach	224	73%	66	74%	17
Middle Reach					
RM 2.8 East (EAA-3: Slip 4)	62	89%	25	84%	4

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
RM 2.3-2.8 East (Seattle Boiler Works to Slip 4)	44	70%	19	79%	4
RM 2.0-2.3 East (Slip 3 to Seattle Boiler Works)	30	77%	12	83%	2
RM 1.7-2.0 East (Slip 2 to Slip 3)	43	72%	5	100%	0
RM 2.2-3.4 West (Riverside Drive)	17	53%	3	33%	2
RM 2.1-2.2 West (EAA-2: Trotsky Inlet)	36	75%	8	88%	1
RM 2.1 West (1 st Avenue S SD)	16	69%	1	0%	1
RM 1.6-2.1 West (Terminal 115)	26	42%	7	43%	4
Total – Middle Reach	274	72%	80	78%	18
Lower Reach					
RM 1.2-1.7 East (Saint Gobain to Glacier Northwest)	13	77%	5	60%	2
RM 1.0-1.2 East (King County Lease Parcels)	41	71%	8	88%	1
RM 0.9-1.0 East (Slip 1)	18	61%	5	40%	3
RM 0.1-0.9 East (EAA-1: Duwamish/Diagonal Way)	51	90%	7	86%	1
RM 0.0-0.1 East (Spokane Street to Ash Grove Cement)	13	62%	5	80%	1
RM 1.3-1.6 West (Glacier Bay)	30	73%	10	70%	3
RM 1.0-1.3 West (Kellogg Island to Lafarge Cement)	9	44%	0	NA	0
RM 0.0-1.0 West (Spokane Street to Kellogg Island)	37	41%	0	NA	0
Total – Lower Reach	212	68%	40	73%	11
Total – All Reaches	710	71%	186	75%	46

^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).

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.

A total of 507 out of 710 action items (71 percent) have been completed or canceled:

- 140 of 186 high priority action items (75 percent) have been resolved;
- 217 of 331 medium priority action items (66 percent) have been resolved;
- 150 of 193 low priority action items (78 percent) have been resolved.

A total of 46 high priority action items remain to be completed; of these, 17 action items are in the upper reach, 18 are in the middle reach, and 11 are in the lower reach.

The 18 action items that were identified as complete or canceled (no longer needed) since publication of the last Source Control Status Report are listed in Appendix B, Table B-1. Action items that have not been completed are shown in Appendix B, Table B-2.

2.2 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 its city limits. 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 MS4 in unincorporated King County, and conducts inspections on county-owned and/or operated parcels within the incorporated municipal boundaries.⁷ The sanitary/combined sewer and storm drains (including private storm drains) within the LDW drainage basin 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. Seattle's storm drain basins are shown in Figure 2-1.
- King County provides technical support on industrial waste and small business 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. LDW CSO basins are shown in Figure 2-2. Through its Water and Land Resources Division Stormwater Services program, King County also inspects businesses in unincorporated areas, and on county-owned or operated parcels 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. 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.

⁷ On King County leased parcels, the tenants are responsible for maintenance activity but the County performs inspections for compliance.

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

2.2.1 Seattle Public Utilities Inspections

During the current reporting period, SPU continued inspections of local businesses in the LDW area to ensure that they are implementing appropriate pollution prevention practices and complying with local stormwater pollution prevention compliance, and triage for referrals for hazardous waste management and industrial waste management. In 2018, SPU conducted 222 inspections at 139 facilities in the LDW. The inspections resulted in 107 Corrective Action Letters. Four of these sites were referred to Ecology for potential NPDES Industrial Stormwater permit coverage. Seven facilities were issued notices of violation for non-compliance with the City’s Stormwater Code. SPU also inspects the flow control and/or treatment facility. Within the LDW, SPU inspected 54 facilities for code compliance with regard to flow control and treatment system code requirements during 2018 (SPU 2019 [11926]).

Facilities inspected by SPU in the LDW basin during the current reporting are listed in Appendix C. This list includes screening visits, initial inspections, and follow-up inspections. A summary of the number of facilities inspected by SPU by source control area during 2018 is shown in Table 2-2.

Table 2-2. Summary of 2018 SPU Inspections by Source Control Area

Source Control Area	Sub-Basin	No. of Facilities Inspected 2018
Upper Reach		
RM 4.9 East (EAA-7: Norfolk CSO/SD)	Norfolk CSO/PS17/EOF/SD	11
RM 3.8-4.2 West (Sea King Industrial Park)	S 96 th Street SD	6
Middle Reach		
RM 2.8 East (EAA-3: Slip 4)	I-5 SD at Slip 4, KCIA SD#3/PS 44 EOF, Georgetown SD	1
RM 2.3-2.8 East (Seattle Boiler Works to Slip 4)	Duwamish East Direct, S Garden Street SD, S Myrtle Street SD	3
RM 2.0-2.3 East (Slip 3 to Seattle Boiler Works)	S Brighton Street SD, S River Street SD	5
RM 1.7-2.0 East (Slip 2 to Slip 3)	Duwamish East Direct	2
RM 2.2-3.4 West (Riverside Drive)	Duwamish West Direct, 7 th Avenue S SD, 8 th Avenue S CSO	22
RM 2.1-2.2 West (EAA-2: Trotsky Inlet)	Duwamish West Direct, Trotsky Inlet, 2nd Avenue S SD	5
RM 2.1 West (1st Avenue S SD)	1st Avenue S SD	8
RM 1.6-2.1 West (Terminal 115)	Duwamish West Direct, SW Kenny SD, Highland Park Way SW SD	2
Lower Reach		
RM 0.1-0.9 East (EAA-1: Duwamish/Diagonal Way)	Diagonal Avenue S SD, Diagonal CSO/SD, S Nevada Street SD	71

Source Control Area	Sub-Basin	No. of Facilities Inspected 2018
RM 0.0-1.0 West (Spokane Street to Kellogg Island)	SW Dakota Street SD, SW Idaho Street SD	3
	Total	139

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

SPU inspectors respond to water quality complaints. In 2018, 76 water quality complaints were reported in the LDW, which resulted in six business inspections. SPU responded to 92 spills within the LDW in 2018 (SPU 2019 [11926]).

SPU conducted source control actions in combined sewer basins located within Seattle in 2018 (this includes the LDW drainage area plus all other combined basins within the City of Seattle served by King County and City CSOs). These actions include response to spills and water quality complaints, and street sweeping. In 2018, SPU responded to 169 spill reports and 118 water quality complaints in the King County combined sewer basins. In 2018, SPU and Seattle Department of Transportation swept 10,555 lane miles in combined sewer basins (King County 2019 [11925]).

Enhanced Business Inspection Program

SPU’s SCIP described several planned enhancements to streamline SPU’s business inspection program in the LDW. These efforts are described below (SPU 2019 [11926]).

- **Shortened Business Compliance Period:** The SPU source control team modified the business inspection process. Instead of sending a “second and final” letter before issuing a notice of violation, now inspected businesses have 30 days to come into compliance after receiving the corrective action letter. If the corrections are not made, SPU issues a notice of violation.

SPU also implemented a procedure for businesses that have been inspected multiple times. If the business does not maintain best management practices between inspection cycles, SPU can immediately issue a notice of violation. These changes have resulted in a reduction of process time which has allowed SPU to inspect more businesses (SPU 2019 [11926]).

- **Revisions to Business Inspection Information Gathering Protocols:** To improve efficiency with the inspection process, SPU decided to discontinue entering data for non-city stormwater code violations in 2017. SPU inspectors still act as a “triage” for other agencies such as KCIW and Ecology’s HWTR and WQ programs. The SPU inspector refers issues or problem sites to another agency for follow up and will take part in that agency’s enforcement activity to resolve the issue. These changes have helped to shorten SPU’s inspection time onsite, without compromising the integrity of the inspection and still providing important compliance information to other partner agencies (SPU 2019 [11926]).

- Transition to Electronic Information Collection: SPU has used paper inspection forms and two Microsoft Access databases to track business inspections, stormwater facility inspections, water quality complaints, and spills since 2003. To become more efficient, SPU designed and built a replacement database and mobile solution. The new database went “live” on July 31, 2018. The SPU Source Control Team has been using the database since that time (SPU 2019 [11926]).

2.2.2 King County Inspections

King County Industrial Waste 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 regional wastewater system (King County 2015 [12182]). KCIW issues several types of discharge approvals, including waste discharge permits for significant industrial users (SIUs) and lower-level discharge authorizations for non-SIUs. Active industrial users in the LDW basin are listed in King County's Source Control Annual Report (King County 2019 [11925]).

In 2018, there were 19 facilities operating under waste discharge permits in the LDW basin; these facilities are inspected on an annual basis (King County 2019 [11925]). KCIW conducts periodic inspections of major non-SIUs, typically once within each five-year permitting cycle or when significant facility modifications occur. Facilities inspected by KCIW during 2018 are listed in Appendix D, Table D-1.

A KCIW inspector 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.

KCIW conducted an industrial user survey from 2016-2018 to identify facilities with activities that may require a waste discharge permit or authorization. They identified six active facilities located within the LDW CSO basin that were categorized as the highest priority level for further evaluation by a KCIW inspector (King County 2019 [11925]).

King County Stormwater Services Inspections

King County Stormwater Services created an inventory of parcels in the unincorporated portion of the LDW drainage area and ranked each parcel according to its potential to pollute and its history of stormwater inspection compliance. King County started conducting accelerated source control inspections in 2016. King County conducted 29 source control inspections at 12 facilities in the LDW unincorporated area in 2018. Source control inspections conducted by King County are listed in Appendix D, Table D-2. These include 11 facilities in the RM 3.8-4.2 West (Sea King Industrial Park) source control area and one facility in the RM 3.4-3.8 West (EAA-5: Terminal 117) source control area. King County did not receive any water quality complaints in the LDW area in 2018 (King County 2019 [11925]).

Other King County Inspections

King County's Local Hazardous Waste Management Program team conducted 44 site visits in the LDW drainage area in 2018. Their efforts focus on technical assistance visits for hazardous

material and waste management, including discharges to sanitary and storm drains (King County 2019 [11925]).

King County International Airport (KCIA) performed annual stormwater facility inspections in October 2018. Six KCIA tenants are also covered by the Industrial Stormwater General Permit (ISGP) and comply directly with Ecology requirements. In September 2018, KCIA performed their annual illicit discharge/connection inspections. King County did not identify any suspected or obvious illicit connections (King County 2019 [11925]).

King County's Facilities Management Division performs inspections at properties that are under King County custodial control. Annual facility maintenance inspections are performed on all Facilities Management Division managed properties with constructed stormwater facilities, such as catch basins or storage and treatment ponds. During 2018, water quality inspections were performed at five undeveloped properties; all were found to be in compliance (King County 2019 [11925]). In addition, four businesses on leased County property fronting on the LDW were inspected (Manson Construction, Lehigh-Cadman, JA Jacks, and Ardagh Glass Company) along with one tax title property that is undeveloped except for a stormwater facility. The inspections found businesses were either in compliance or in need of catch basin cleaning (King County 2019 [11925]).

2.2.3 Ecology Inspections

Ecology Water Quality Inspections

Currently, 93 active NPDES permits are on record for areas within the 24 LDW source control areas.⁸ These include two industrial individual permits, 83 facilities covered under the ISGP, five facilities covered under the sand and gravel general permit, one facility covered under the vessel deconstruction 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, PAHs, arsenic, and mercury.

The following facilities were granted coverage under a NPDES general permit during 2018:

- MV Transportation Seattle (WAR307006)
- Orca Bay Foods, LLC (WAR308432)

Ecology is continuing to inspect NPDES-permitted facilities to ensure compliance with permit conditions. In addition, Ecology WQ 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 (2018), Ecology WQ conducted 17 inspections at 16 facilities. Ecology WQ inspections are listed in Appendix E, Table E-1.

⁸ The 93 active permits do not include construction stormwater permits.

Ecology HWTR Inspections

Ecology's HWTR program conducted hazardous waste inspections at 12 facilities within the LDW basin; these are listed in Appendix E, Table E-3.

Urban Waters Initiative Inspections

During the current reporting period, Ecology's WQ and HWTR inspectors and Toxics Cleanup Program (TCP) staff continued to coordinate facility inspections and priorities with SPU and King County inspectors to avoid overlap in the field. During 2018, a total of 56 Urban Waters Initiative inspections were conducted in the LDW basin; these are listed in Appendix E, Table E-2.

Table 2-3 summarizes Ecology and Urban Waters inspections conducted in 2018.

Table 2-3. Summary of 2018 Ecology Inspections by Source Control Area

Source Control Area	No. of Facilities Inspected in 2018		
	WQ Program	HWTR Program	Urban Waters Initiative
Upper Reach			
RM 4.9 East (EAA-7: Norfolk CSO/SD)	1		7
RM 3.9-4.3 East (Slip 6)			1
RM 2.8-3.7 East (EAA-4: Boeing Plant 2/Jorgensen Forge)	1		
RM 4.2-5.8 West (Restoration Areas)			4
RM 3.8-4.2 West (Sea King Industrial Park)	1	2	3
RM 3.4-3.8 West (EAA-5: Terminal 117)			1
Middle Reach			
RM 2.8 East (EAA-3: Slip 4)	1	1	5
RM 2.3-2.8 East (Seattle Boiler Works to Slip 4)	2		
RM 2.0-2.3 East (Slip 3 to Seattle Boiler Works)			1
RM 2.2-3.4 West (Riverside Drive)	2	1	13
RM 2.1-2.2 West (EAA-2: Trotsky Inlet)	1	1	1
RM 2.1 West (1 st Avenue S SD)			3
RM 1.6-2.1 West (Terminal 115)		1	
Lower Reach			
RM 1.2-1.7 East (St. Gobain to Glacier Northwest)	2		
RM 1.0-1.2 East (King County [KC] Lease Parcels)		3	3
RM 0.1-0.9 East (EAA-1: Duwamish/Diagonal Way)	5	3	13
Total	16	12	56*

*Source control area for one facility could not be determined.

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.

2.3 Source Tracing and Sampling

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.

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 benthic 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 2019b).

To determine whether source tracing should be initiated, SPU and King County compare storm drain solids data to the CSL/2LAET values.⁹ King County compares combined sewer solids data to twice the 2LAET.

For petroleum hydrocarbons, Model Toxics Control Act (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) toxicity equivalents (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 2-4.

⁹ Once storm drain solids are found to be below the CSL/2LAET, King County uses the SCO/LAET as well as other lines of evidence to determine the need for source tracing (King County 2016a).

Table 2-4. 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		
	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		
	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		

Chemical Class	Chemical Parameter	SCO	CSL	MTCA Method A	LDW RAL
	N-nitrosodiphenylamine	0.028	0.040		
Petroleum Hydrocarbons	Diesel-range hydrocarbons			2,000	
	Gasoline-range hydrocarbons			30	
	Oil-range hydrocarbons			2,000	

HPAH = high molecular weight PAH

LPAH = low molecular weight PAH

ND = non-detect

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 (2018) are shown on Figure 2-3. Results are discussed below and as relevant in subsequent sections for the specific source control areas in which they are located.

2.3.1 SPU Source Tracing Activities

SPU collects grab samples from private onsite catch basins and catch basins located in the public right-of-way, grab samples from inline maintenance holes in the conveyance system, and inline sediment trap samples. SPU has received funding from Ecology to develop new source tracing tools. Projects include the use of dogs to detect PCBs, and the development of an improved sediment trap.

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 dog can detect PCBs in the urban environment. This work was supported by an Ecology grant. In 2016, SPU conducted training and field testing 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.

SPU conducted additional training events for the detection dog/handler team in 2017. The team was used to screen areas where SPU suspected there may be PCB sources. They successfully identified PCBs in several areas that would not likely have been found by standard source tracing techniques. SPU submitted a final report describing the pilot test results to Ecology in October 2017. SPU considers this pilot test a success.

In 2018, SPU received another Stormwater Financial Assistance Grant from Ecology to continue their work with UW Conservation Canines. SPU plans to train an additional detection dog and develop protocols for incorporating detection dog services into SPU's source tracing efforts in 2019 (SPU 2019 [11926]).

Sediment Trap Pilot Test

SPU has been testing a new sediment trap design to support source tracing efforts. The new sediment trap is designed to collect storm drain solids more effectively. Ecology awarded a grant to SPU to support this work. In 2018, SPU continued field testing field prototype designs at two locations in the LDW (S Myrtle Street and Diagonal Ave S storm drain systems). SPU presented

the results of the 2018 Sediment Pilot testing to Ecology in a progress report in 2019. These results will be discussed in the next status report (SPU 2019 [11926]).

Illicit Discharge Detection and Elimination

SPU conducted illicit discharge detection and elimination (IDDE) screening in the Diagonal Avenue S MS4 basin from June to September 2018. SPU investigated 214 sample locations, and collected 152 samples. The results of this sampling allowed SPU to discover two illicit connections. The first illicit connection was from a large food processing operation. The second illicit connection was from eight newly constructed townhomes. The food processor stopped all discharges from the facility and is awaiting permits to replumb the facility. The townhomes were replumbed to discharge to the sanitary sewer. SPU also discovered a broken side sewer at a fueling station. The side sewer was repaired. SPU visually traced a discharge of grease to a catch basin located in a fast food parking lot. SPU determined that a neighboring grocery store had been pouring waste grease into this drain. At the end of 2018, there were three ongoing investigations that were triggered by the sampling: two investigations of elevated bacteria, and one investigation of elevated fluoride and potassium. SPU plans to investigate these during dry weather throughout 2019 to determine their sources.

In September 2018, SPU screened three sample locations in the SW Idaho Street storm drain (SD). SPU collected one sample and made one visual determination of no flow. The sample results did not trigger an investigation in this basin (SPU 2019 [11926]).

Collection of Source Tracing Samples

Table 2-5 lists outfalls owned by Seattle, or owned or installed by others to which the Seattle MS4 discharges. As part of the effectiveness monitoring program required under Seattle's MS4 permit, SPU is on track to install or collect one sample per calendar year from each outfall and near-end-of-pipe monitoring location listed below (SPU 2019 [11926]):

Table 2-5. City of Seattle Outfalls in the LDW Basin

Outfall Name	Outfall Ownership	Separated Stormwater Drainage Basin Area (acres)	Outfall Diameter (inches)	Effectiveness Monitoring Location
East Side of LDW				
S Nevada Street	Seattle	26	18	No
Diagonal Avenue S (a)	Seattle	2,666	144	Yes
1 st Avenue S (East)	Seattle	15	36	Yes
S River Street	Seattle	7.6	8	Yes
S Brighton Street	Seattle	19	30	Yes
S Myrtle Street	Seattle	8.6	30	Yes
North Boeing Field	Seattle	(b)	24	No
Georgetown	Seattle	4.5	24	Yes
Head of Slip 2	Private	12	24	Yes
S Garden Street (c)	Private	12	30	Yes
I5 SD at Slip 4	WSDOT	150 (d)	72	Yes

Outfall Name	Outfall Ownership	Separated Stormwater Drainage Basin Area (acres)	Outfall Diameter (inches)	Effectiveness Monitoring Location
16 th Avenue S (East)	Tukwila	12	12	No
KCIA SD#1	King County	192 (e)	30	No
S Norfolk Street (f)	Tukwila	676 (g)	84	Yes
I5 SD at S Ryan Street (h)	WSDOT	617 (i)	60	No
West Side of LDW				
SW Dakota Street	Seattle	54 (j)	30	Yes
SW Idaho Street	Seattle	423	72	Yes
SW Kenny Street (k)	Seattle	154	48	Yes
Highland Park Way SW	Seattle	296 (l)	72	Yes
S Webster Street	Seattle	(m)	6	No
7 th Avenue S	Seattle	238	72	Yes
17 th Avenue S	Seattle	2.9	18	Yes
Duwamish substation SD#1	Seattle	0.6	8	No
Duwamish substation SD#2	Seattle	1	8	No
Duwamish substation SD#3	Seattle	1.9	8	No
1 st Avenue S (West)	WSDOT	606	open channel	Yes
2 nd Avenue S	Private	38 (n)	24	No
S 96 th Street	Unknown	1,050 (o)	72	No
West Marginal Place SW	Unknown	4.9 (p)	36	No

(a) SPU's CSO #111 and King County's Hanford #1 CSO also discharge to this outfall.

(b) Based on recent video inspection findings, there are no longer active connections to this system.

(c) Outfall ownership transferred to Seattle Iron and Metals Company in 2012.

(d) Approximately 65 acres are served by Seattle-owned storm drains. The remainder is I-5 and railroad right-of-way drainage.

(e) Approximately 114 acres are served by Seattle-owned storm drains. The remainder is I-5 right-of-way and King County Airport property.

(f) King County's S Norfolk CSO and treated discharge from the Henderson/MLK Wet Weather Treatment Station discharge to this outfall.

(g) Approximately 431 acres are served by Seattle-owned storm drains. The remainder is in the City of Tukwila.

(h) Seattle installed a high flow bypass to the S Ryan Street system in 1992 to divert excess stormwater flow from the S Norfolk Street CSO/PS 17 EOF/SD drainage system to prevent flooding during large storm events.

(i) Approximately 407 acres are served by Seattle-owned storm drains. The remainder is in the City of Tukwila.

(j) 47 acres drains to the Seattle-owned SW Dakota Street SD system. An additional 9 acres drains to the constructed channel that discharges to the LDW downstream (east) of Seattle's outfall.

(k) King County's T115 CSO discharges to this outfall (100 acres).

(l) Does not include the approximately 7.3 acre overlap within the 1st Avenue S drainage basin.

(m) A single catch basin in S Riverside Drive is connected to this outfall.

(n) Approximately 18.4 acres are served by Seattle-owned storm drains. The remainder is privately-owned.

(o) Approximately 99 acres are served by Seattle-owned storm drains. The remainder is unincorporated King County.

(p) Seattle-owned drainage only.

In 2018, SPU collected 70 samples of storm drain solids from the City's MS4; sample results are provided in Appendix F. Sample results are summarized below:

- Arsenic concentrations ranged from 4.7 mg/kg DW to 150 mg/kg DW. Two samples in the Diagonal Avenue CSO/SD (CB324 and MH46) exceeded the CSL (93 mg/kg DW) for arsenic during 2018.

- Total PCB concentrations ranged from <0.018 mg/kg DW to 46 mg/kg DW. Six samples exceeded the CSL for PCBs (1.0 mg/kg DW); these were located in the S Myrtle Street SD, the 7th Avenue S SD, and the Diagonal Avenue S CSO/SD. The highest concentrations were detected at MH18 located near 6th Avenue S and S Snoqualmie Street (Diagonal Avenue S CSO/SD).
- The median concentration of PCBs in the Diagonal Ave S CSO/SD has increased by nearly a factor of two over the past four years. SPU thinks that this change may be due to the emphasis on following up in areas where the detection dog detected PCBs or where SPU inspectors suspected potential PCB sources. In 2018 SPU installed three additional traps in the S Snoqualmie sub-basin to assist in tracing elevated levels of PCBs found in the MH18 located at 6th Avenue S and S Snoqualmie Street (SPU 2019 [11926]).
- Total cPAH TEQ concentrations ranged from <0.086 mg/kg DW to 120 mg/kg DW; seven samples exceeded the LDW RAL (1.0 mg/kg DW). Exceedances were observed in the Norfolk CSO/PS17 EOF/SD, the Georgetown SD, the S Myrtle and S River Street SDs, and the Diagonal Avenue S CSO/SD.
- No samples were analyzed for dioxins/furans. Other chemicals with CSL exceedances in SPU storm drain solids samples include cadmium, chromium, copper, lead, mercury, zinc, various PAH compounds, phthalates, 1,2-dichlorobenzene, 1,4-dichlorobenzene, 4-methylphenol, benzoic acid, benzyl alcohol, dibenzofuran, n-nitrosodiphenylamine, and phenols. Diesel-range and oil-range hydrocarbons exceeded the storm drain screening levels.

SPU plans to conduct the following sampling in 2019 (SPU 2019 [11926]):

- Sample the city-owned portions of the S Garden Street SD, the 16th Avenue S SD (east), the S 96th Street SD, and the I-5 SD at S Ryan Street to check whether the city MS4 in these areas continues to be a low priority.
- Collect additional samples in the S Brighton Street SD to determine whether there are active sources of PCBs in this basin.
- Collect additional samples in the 2nd Avenue S SD to determine whether there are active sources of cPAHs in this basin.
- Resample the S Norfolk CSO/PS17 EOF/SD drainage system following the 2018 cleaning.
- Continue searching for sources of PCBs in the S Snoqualmie sub-basin of the Diagonal Avenue S CSO/SD.

2.3.2 King County Source Tracing Activities

King County's Sediment Management Program has been collecting solids samples from pipes, wet wells, and outfall weir structures in the combined sewer system since 2010. During 2018, King County sampled the T-115 CSO and Hanford #1 CSO basins. Sediment trap samples were collected in July 2018 following a 1-year deployment period; results are provided in Appendix G (King County 2019 [11925]). Concentrations of bis (2-ethylhexyl) phthalate (BEHP) and mercury were above the 2LAET in samples collected from these basins.

King County also collected sediment trap samples from two locations within the S Michigan CSO basin for another King County project in July 2018, after an approximately 1-year deployment period. Analytical results for the sediment trap samples analyzed by King County in 2018 are provided in Appendix G.

King County plans to continue to use sediment traps for source tracing activities at the Hanford #1 and T-115 combined sewer basin sampling locations in 2019. In addition, King County will conduct source investigations in the S Michigan CSO basin to evaluate potential sources of mercury in the system close to the regulator station (King County 2019 [11925]).

King County's Stormwater Services Section collected sediment trap samples from three locations in the S 96th Street SD (96-ST1, 06-ST2, and 96-ST3); these areas discharge stormwater into the north fork of Hamm Creek to the LDW. King County also obtained grab solids samples from four catch basins that contribute flow up-pipe to the 96-ST1 location. Analytical results for the sediment trap samples analyzed by King County in 2018 are provided in Appendix G.

King County plans to conduct sediment trap sampling (deployment in 2018 and retrieval in 2019) at 96-ST1 as follow-up to PAHs and zinc observed above screening levels in past samples. Future sampling will be described in King County's SCIP for 2019 to 2023.

King County collected four sediment trap samples and six grab samples representing storm drain solids from locations at KCIA that drain to Slip 4, Former Slip 5, and Slip 6 during 2018 (King County 2019 [11925]). Analytical results are presented in Appendix G.

2.4 Other Source Control Activities

2.4.1 Storm Drain Line Cleaning

In 2018, SPU cleaned approximately 11,500 linear feet of pipe in the Martin Luther King Jr. Way sub-basin of the S Norfolk CSO/PS17 EOF/SD system, and 500 linear feet of pipe in the Diagonal Avenue S CSO/SD system (SPU 2019 [11926]). These were identified as priority basins in the City's 2015 SCIP. SPU has identified and controlled several sources in the Norfolk system, but it continues to exhibit elevated levels of PAHs. The line was cleaned to facilitate future source tracing activities. The short segment in the Diagonal Avenue S CSO/SD was cleaned to remove PCBs (1.4 mg/kg DW) and arsenic (123 mg/kg) contamination that was found during routine source tracing sampling. This work is conducted to remove solids that have accumulated in the MS4 in order to prevent them from discharging into the LDW and to facilitate source tracing efforts. SPU plans to continue to inspect all catch basins in the MS4 system annually, and to perform maintenance as needed within six months. SPU will also conduct annual inspection and maintenance at Seattle-owned stormwater facilities. SPU will continue to clean a minimum of 4,000 linear feet of storm drain lines each year (SPU 2019 [11926]).

In 2019 SPU plans to:

- Finish cleaning the S Norfolk CSO/PS17 EOF/SD system.
- Clean a lateral on the S River Street SD system that was missed during the 2010 cleaning.

- Clean the S Dakota Street sub-basin, the Ohio Avenue S sub-basin, the 6th Avenue S/S Hinds Street sub-basin, and the Bush Place sub-basin, which are all located in industrial areas within the Diagonal Avenue S CSO/SD system (SPU 2019 [11926]).

KCIA is performing storm drain line cleaning in accordance with the ISGP. The 2015 ISGP requires stormwater line cleaning for permitted sites that discharge to the LDW. KCIA performs storm drain line cleaning in conjunction with their current catch basin cleaning schedule. KCIA East and Central Areas were cleaned in 2015 and 2016, respectively, per the ISGP. KCIA completed storm drain line cleaning in the KCIA West Areas in 2017 (taxiways, parking lots, maintenance shop, airparks, and outfalls) (King County 2019 [11925]).

2.4.2 Stormwater Treatment

SPU is planning to construct a South Park Water Quality Facility to treat stormwater runoff from the 7th Avenue S SD. In 2018, SPU conducted a preliminary feasibility analysis of bioretention treatment. SPU determined that bioretention could be used to treat runoff from the 230-acre drainage basin, but it would require more space for construction than a mechanical treatment system. In 2019, SPU will focus on identifying a site for the treatment system and beginning analysis of treatment options (SPU 2019 [11926]).

SPU completed a drainage system that was constructed as part of the Adjacent Streets and Stormwater Infrastructure project for the Terminal 117 EAA in 2017. The new drainage system routes stormwater from a 2.9-acre basin through nine bioretention cells and four Filterra™ tree box units. The bioretention cells are designed to infiltrate. Underdrains from the Filterra™ units, and overflows from the bioretention cells discharge to the LDW via a new 18-inch outfall.

SPU retrieved the end-of-pipe trap installed in the 17th Avenue S storm drain in June 2018, but there was insufficient material for analysis. Grab samples (RCB76 and RCB85) were collected from the pre-settling cells on bioretention cells C and D in 2018; PCBs were 0.063 mg/kg dw and 0.46 mg/kg dw, respectively. SPU will attempt to sample the sediment trap again in 2019. SPU also collected samples of treated stormwater flowing out of the bottom of Bioretention Cell B and Filterra™ unit D to assess the condition of the filter media (SPU 2019 [11926]). PCBs were not detected at 0.01 µg/L in any of the five samples collected from each location.

2.4.3 CSO Control Projects

Two King County CSO control projects are currently underway in the LDW. A third project was completed in 2018. The projects are the West Duwamish Wet Weather Storage Project (West Michigan and Terminal 115 CSOs), Georgetown Wet Weather Treatment Station (Brandon and Michigan CSOs), and Rainier Valley Wet Weather Storage Project and conveyance improvements (Hanford #1 CSO).

The objective of these projects is to control the remaining uncontrolled King County CSOs in the LDW to the state standard of no more than one untreated CSO discharge on average per year at each outfall, and will remove most of the untreated CSOs in the LDW.

King County submitted their 2018 CSO Control Program Consent Decree Annual Report to Ecology. This report includes the county's CSO control project and compliance activities from January through December 2018.

The West Duwamish project was in the predesign phase during this reporting period. King County expects this project to be in operation by 2030.

Construction work took place at the Georgetown Wet Weather Treatment Station throughout 2018. King County's contractor started treatment station construction in spring 2018. Work started on the construction on the new outfall structure in summer 2018. Preparation work started on constructing the conveyance pipeline, which will connect the treatment station to the outfall in the fall of 2018. The construction is expected to be completed in 2022.

The Rainier Valley Wet Weather Storage Project construction was completed in June 2018. This project became operational in 2018. King County is monitoring it for achievement of the performance standard (King County 2019 [11925]).

2.4.4 King County Mapping Updates

King County is required to map and document the MS4 on properties it owns or operates as part of their NPDES Phase 1 Municipal Stormwater Permit. King County created a stormwater asset inventory and initiated a project to resolve connectivity issues. In 2018 King County resolved 19 of these connectivity issues (King County 2019 [11925]).

2.5 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 2-6. Ecology is managing the cleanup sites listed in Table 2-7.

The current status of cleanup at each of these sites is shown in Table 2-8. The total number of sites that will require characterization and/or cleanup in the LDW basin is unknown at this time.

Table 2-6. 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)	CERCLA
	Boeing Plant 2	RCRA
	Jorgensen Forge, Outfall Site (Time Critical Removal Action) (Completed in 2018)	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

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.

Table 2-7. Cleanup Sites Under Ecology Oversight

Source Control Area	Facility Name	Regulatory Authority
Upper Reach		
RM 4.9 East (EAA-7: Norfolk CSO/SD)	Emerald Gateway	In negotiations
	Boeing Field Chevron	MTCA Agreed Order (Jul 2015)
RM 3.9-4.3 East (Slip 6)	8801 Site	MTCA Agreed Order (Jul 2006) MTCA Agreed Order (Nov 2008, amended Aug 2017)
RM 3.7-3.9 East (EAA-6: Boeing Isaacson/Central KCIA)	Boeing Isaacson Thompson	MTCA Agreed Order (Apr 2010)
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), MTCA Agreed Order (Jul 2017)
RM 3.4-3.8 West (EAA-5: Terminal 117)	South Park Marina	In negotiations
Middle Reach		
RM 2.8 East (EAA-3: Slip 4)	Crowley Marine Services 8 th Avenue S	MTCA Agreed Order (Oct 2009)
	North Boeing Field/Georgetown Steam Plant	MTCA Agreed Order (Aug 2008)
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 1.7-2.0 East (Slip 2 to Slip 3)	Duwamish Marine Center	MTCA Agreed Order (Sep 2011)
RM 2.1-2.2 West (EAA-2: Trotsky Inlet)	Douglas Management Dock	MTCA Agreed Order (May 2011)
	Industrial Container Services/Trotsky Property	MTCA Agreed Order (May 2010)
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 1.6-2.1 West (Terminal 115)	North Terminal 115	MTCA Agreed Order (Mar 2011)
Lower Reach		
RM 0.9-1.0 East (Slip 1)	Snopac Property	MTCA Agreed Order (July 2019)
RM 1.3-1.6 West (Glacier Bay)	Duwamish Shipyard	MTCA Agreed Order (Sep 2010)
	Glacier Northwest/Reichhold Chemical	MTCA Agreed Order (May 2009)
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), Amended (Nov 2017)
	General Electric-Dawson Street Plant	RCRA Agreed Order (May 2007)

Table 2-8. Ecology Cleanup Site Status

Site Name	Agreed Order	Remedial Investigation	Feasibility Study	Cleanup Action Plan	Cleanup	Interim Action
Upper Reach						
8801 Site	2006, 2008	2011	In progress	In progress		
Boeing Field Chevron	2015	In progress	In progress			
Boeing Isaacson/Thompson	2010	2014	In progress			
Emerald Gateway	Negotiations in progress					
Jorgensen Forge	2007, 2015, 2017	In progress				2014
South Park Marina	Negotiations in progress 2016-2018					
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, 2012, amended 2013	2011	2012	Agreed Order 2012, amended 2013	In progress	2009
Industrial Container Services	2011	In progress				
North Boeing Field/Georgetown Steam Plant	2008	In progress				2011
North Terminal 115	2011	In progress				
South Park Landfill	2009	2017	2017	2017		2014, 2016
Whitehead Tye	2016	In progress				2017
Lower Reach						
Duwamish Shipyard	2010	May 2019	In progress			
Glacier Northwest/Reichhold	2009	In progress	In progress			
Snopac Property	2019	In progress	In progress	In progress		2019

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 108, Terminal 117, Rhone-Poulenc, Rainier Commons, and Boeing Former EMF.

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.

2.6 Additional Studies Relevant to Source Control

2.6.1 Green River Loading Studies (Ecology/USGS)

Ecology worked in cooperation with the United States Geological Survey (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 August 2016 and March 2017, USGS collected representative samples of filtered and unfiltered water and suspended sediment at the Foster Links Golf Course sampling location. The samples were collected during 13 periods of differing flow conditions, and analyzed for metals, dioxins/furans, semivolatile organic compounds (SVOCs), butyltins, PCB congeners, and total and dissolved organic carbon. USGS published these results in 2018. The results of this study provide new data that can be used to estimate sediment and chemical loads transported by the Green River to the LDW (USGS 2018a [11274]).

Ecology also worked in cooperation with the USGS to better understand the amount of sediment transported by the river. The USGS collected discrete and time-series turbidity, discharge, suspended sediment concentration, and particle size data from February 2013 to January 2017 at the Foster Links Golf Course sampling location. The USGS quantified the timing and magnitude of suspended-sediment transported in the Duwamish River. To estimate 15 minute suspended-sediment concentrations, the USGS developed regression models between suspended sediment concentrations and turbidity, and between suspended sediment concentrations and discharge. Suspended sediment loads were calculated from the computed suspended sediment concentrations and time-series discharge data for every 15 minute interval during the study period. The estimate for the 3-year average (2014 through 2016) annual suspended sediment load was 117,246 tons. Most (97 percent) of the annual suspended sediment was transported during the wet season (October 16 through April 15), when brief periods of intense precipitation from storms, large releases from the Howard Hanson Dam, or a combination of both were more frequent. Streamflow and suspended-sediment concentrations were highest from October 16 to April 15 of each year (USGS 2018b [11301]).

2.6.2 Green-Duwamish Pollutant Loading Assessment (Ecology/EPA)

Ecology and EPA initiated a Pollutant Loading Assessment (PLA) for the Green-Duwamish River 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 River watershed. To accomplish these goals, the PLA is developing watershed-based models to evaluate the cumulative effects of toxic pollution, assess the relative contribution of toxic pollution from source 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 source control decisions for the Green-Duwamish River watershed.

The PLA is being developed with the participation of a Technical Advisory Committee (TAC). The TAC is made up of technical staff from public agencies, quasi-governmental groups, and community. The Interested Parties Group also provides input and is composed of agencies, businesses, nonprofit groups, and the general public. EPA's contract with TetraTech to develop the watershed model expired in 2018. Ecology, in coordination with modelers from King County

and technical staff from the City of Seattle, started to lead the modelling effort in 2018. The PLA TAC met in June 2018 to discuss the watershed model modification and sediment calibration, and receiving water modeling approach. The PLA is a long-term project which will be phased over many years. Additional information related to this project is posted on Ecology's PLA website¹⁰.

2.6.3 Inventory of Lower Duwamish Waterway Slivers (Ecology)

Ecology tasked their contractor, Leidos, to identify and map slivers of upland property along the LDW where ownership may be unknown, undetermined, or different from the ownership of the adjacent upland parcel, and to summarize information about these slivers. Leidos completed this inventory and submitted a summary report to Ecology in May 2018 (Leidos 2018 [12004]).

Data gaps and planned actions were identified for six areas:

- RM 4.3-4.6 East (Boeing Developmental Center) – Not characterized; PCBs and benzyl alcohol in nearby sediment. If an Agreed Order is negotiated for this site, the data gap will likely be filled as part of the subsequent investigation.
- RM 1.2-1.3 West (Alaska Marine Lines) – Not characterized; metals, PCBs, PAHs, phthalates, and benzyl alcohol in nearby sediment. Sampling of this sliver may not be possible due to its location under permanent piers.
- RM 1.9-2.1 West (Terminal 115) – Not characterized; PAHs, phthalates, and other SVOCs in sediment. Ecology is negotiating an Agreed Order for this site, which will include investigation and cleanup and will likely fill this data gap.
- RM 2.3-2.7 West (Boyer Towing) –Partially characterized; zinc, PCBs, and benzyl alcohol in sediment. Sliver 91W (RM 2.3-2.5 West) is considered not sampleable due to the presence of a dock and vertical bulkhead. Bank soil sampling at RM 2.5-2.7 West was conducted by LDWG in 2018; no analytes exceeded screening levels (Windward 2019 [12109]).
- RM 2.7-2.9 West (Riverside Drive-Central) – Not characterized; mercury, PCBs, dioxins/furans, PAHs, phthalates, phenols, and other SVOCs in sediment.
- RM 3.4-3.9 West (South Park Marina/Terminal 117/Boeing South Park) – Partially characterized; zinc, PCBs, PAHs, phthalates, phenols, and other SVOCs in sediment. The habitat restoration project for Terminal 117 included sampling and soil removal at RM 3.4 to 3.7 West.

2.6.4 Green River PCB Equipment Blank Study (King County)

King County conducted a study to better understand the magnitude of equipment contamination bias associated with the Green River water sample PCB data, as well as to determine which equipment components contribute to the contamination. This study had two parts: field sampling and analysis of water samples from the Green River and analysis of laboratory collected equipment blank samples. This sampling was conducted to determine specific PCB congener

¹⁰ <https://ecology.wa.gov/Water-Shorelines/Water-quality/Water-improvement/Total-Maximum-Daily-Load-process/Directory-of-improvement-projects/Green-Duwamish-Watershed-PLA>

contamination from autosampler equipment and to evaluate the potential bias to middle and lower Green River surface water samples collected in previous King County Green River Watershed studies. King County completed the sampling and analysis for this study in 2017. King County presented the findings of this study in a 2018 data report (King County 2018a [11314]).

The field portion of this study consisted of autosampler composites and hand-grab composites collected concurrently at two Green River mainstem locations: Kanaskat-Palmer State Park and Foster Links Golf Course. The contribution of PCBs by the autosampler equipment was evaluated by comparing PCB results between the sample pairs for each event and location. PCB concentrations in samples collected with the autosampler were consistently higher than levels in the concurrently collected hand-grab composite samples. PCB congeners PCB-47, PCB-51, and PCB-68 were the most prominent congeners in each autosampler composite (86% of total PCB concentrations on average), but were rarely detected in the concurrently collected hand-grab composite samples (5% of the total PCB concentrations on average) (King County 2018a [11314]).

The laboratory equipment blank samples evaluated the potential contamination associated with different types of tubing used for sample collection and processing. The findings indicate that the use of standard silicone tubing results in significant contributions of PCBs to environmental samples, specifically congeners PCB-47, PCB-51, and PCB-68. However, the use of platinum-cured silicone tubing did not contribute to PCB contamination, while use of Teflon tubing had a negligible contribution of PCBs in environmental samples (King County 2018a [11314]).

This study indicates that platinum-cured silicone tubing and Teflon tubing are acceptable for use in collection and processing of samples for PCB analysis (King County 2018a [11314]).

King County subsequently revised the 2014 and 2015 Green River surface water study reports to address the equipment contamination bias. Total PCB concentrations in these reports were adjusted to exclude the three PCB congeners affected by the standard silicon tubing (King County 2018b [11315], King County 2018c [11318]).

2.7 Source Control Area-Specific Activities

Ecology conducted source control investigations 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.¹¹

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

- Report 1 – 2003 to June 2007 (Ecology 2007 [00021])
- Report 2 - July 2007 to March 2008 (Ecology 2008a [00065]),
- Report 3 - April to August 2008 (Ecology 2008d [00068]),

¹¹ <https://ecology.wa.gov/Spills-Cleanup/Contamination-cleanup/Cleanup-sites/Toxic-cleanup-sites/Lower-Duwamish-Waterway>

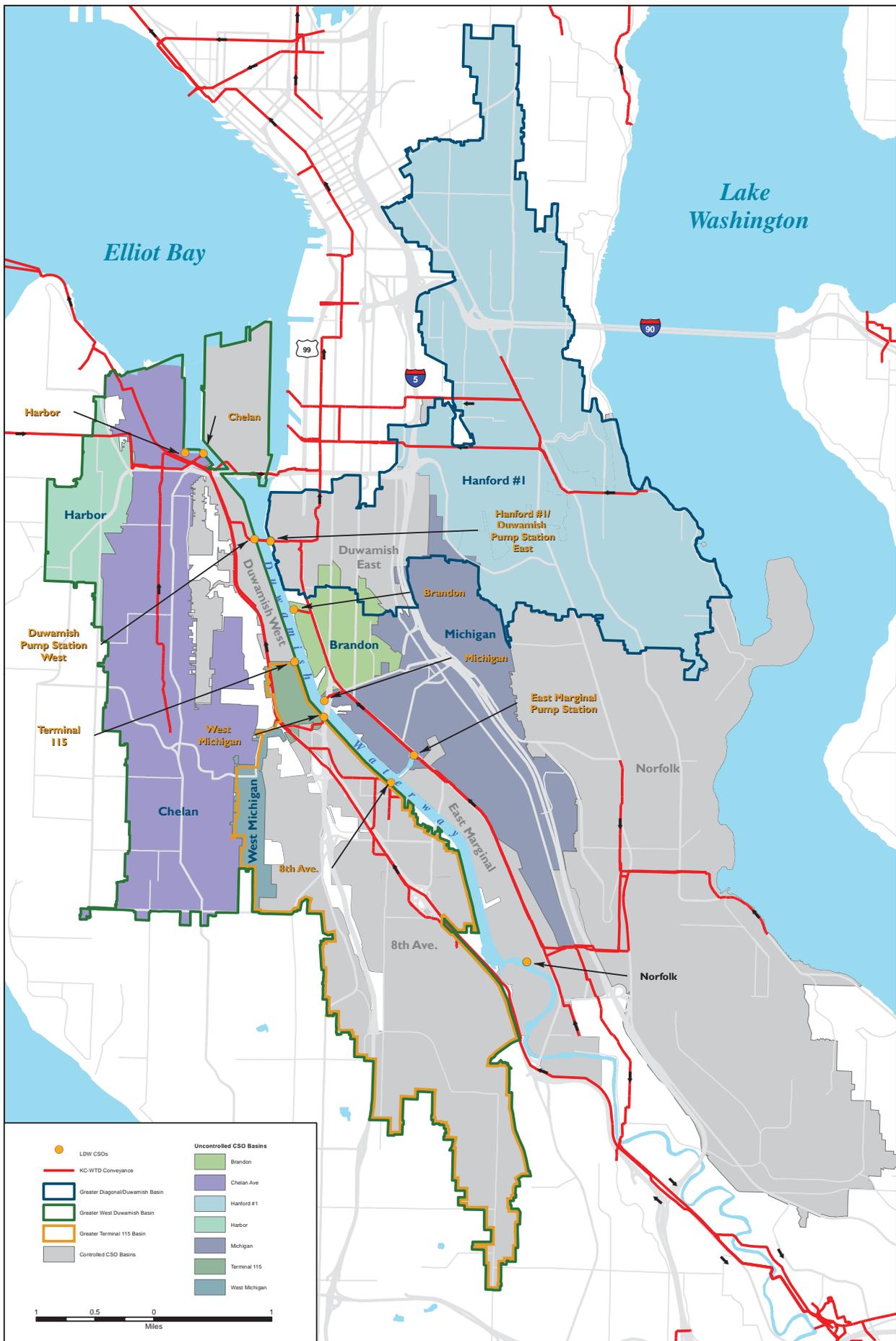
- Report 4 - September 2008 to June 2009 (Ecology 2009c [00090]),
- Report 5 - July 2009 to September 2010 (Ecology 2011c [00095]),
- Report 6 - October 2010 through December 2011 (Ecology 2012b [00098]),
- Report 7 - January through December 2012 (Ecology 2013 [10359]),
- Report 8 - January through December 2013 (Ecology 2014 [10620]), and
- Report 9 –January 2014 through December 2016 (Ecology 2018y [12005]).
- Report 10 – January through December 2017 (Ecology 2019a [12262]).

This current Source Control Status Report (Report 11) describes source control actions that were conducted from January through December 2018.

Appendix B, 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 through December 2018 are described in Sections 3 through 5:

- Section 3: Upper Reach
- Section 4: Middle Reach
- Section 5: Lower Reach

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 Appendix A. These maps are intended to help identify locations discussed in the text. Additional figures are available in the referenced reports.



3.0 Upper Reach Source Control Areas

The upper reach includes eight source control areas, including five on the east side of the LDW and three on the west side:

East Side:	Report Section
RM 4.9 East (EAA-7: Norfolk CSO/SD)	3.1
RM 4.3-4.9 East (Boeing Developmental Center)	3.2
RM 3.9-4.3 East (Slip 6)	3.3
RM 3.7-3.9 East (EAA-6; Boeing Isaacson/Central KCIA)	3.4
RM 2.8-3.7 East (EAA-4: Boeing Plant 2 to Jorgensen Forge)	3.5
West Side:	
RM 4.2-5.8 West (Restoration Areas)	3.6
RM 3.8-4.2 West (Sea King Industrial Park)	3.7
RM 3.2-3.8 West (EAA-5: Terminal 117)	3.8

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.

Source control activities specific to each source control area during the current reporting period are summarized in Section 3.1 through 3.8 below.

Several Ecology cleanup sites are located on the east side of the Upper Reach: Emerald Gateway (formerly Unified Grocers), Boeing Field Chevron, 8801 Site, Boeing Isaacson Thompson, and Jorgensen Forge. In addition, the former Rhone-Poulenc site, Boeing Plant 2, and the Jorgensen Forge sediment and outfall sites, which are under EPA oversight, are located within this source control area.

One cleanup site under Ecology oversight (South Park Marina) is located on the west side of the Upper Reach. The Terminal 117 Site, which is under EPA oversight, is also located on the west side of the Upper Reach.

3.1 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 and I-5 (Ryan Street) SD basins (Appendix A). The Norfolk CSO/PS17 EOF/SD as well as the Henderson/MLK Wet Weather Treatment Station discharge to the LDW within this source control area.

3.1.1 Business Inspections

SPU conducted 19 inspections at 11 facilities in the Norfolk CSO/PS17 EOF/SD basin during the current reporting period, including 12 initial inspections and seven follow-up inspections (Appendix C).

Ecology conducted a stormwater compliance inspection at the Boeing Military Flight Center on April 4, 2018 (Ecology 2018p [11508]). Details about this inspection are provided in Appendix E, Table E-1.

Four source control inspections were conducted in the Norfolk CSO/PS17 EOF/SD basin and three were conducted in the combined sewer area (outside of the RM 4.9 East source control area boundary) as part of the Urban Waters Initiative (Appendix E, Table E-2).

In 2018, SPU cleaned approximately 11,500 linear feet of pipe in the Martin Luther King Jr Way sub-basin of the south S Norfolk CSO/PS17 EOF/SD system. SPU has identified and controlled several sources in the Norfolk system, but there continue to be elevated levels of PAHs in this system. The line was cleaned to facilitate future source tracing activities (SPU 2019 [11926]).

3.1.2 Source Tracing

During the current reporting period, SPU collected five storm drain solids samples in this drainage basin, including three sediment trap samples and two in-line solids samples.

Complete sample results for the current reporting period are presented in Appendix F. Screening level exceedances are summarized in Table 3-1 below. Sample locations are shown on Figures A-2 and A-3. BEHP exceeded the CSL in three of the five samples, with concentrations ranging from 0.35 to 13 mg/kg DW. Benzyl alcohol exceeded the CSL in three samples, with one sample (sediment trap NST1) at 1.9 mg/kg DW (more than 25 times the CSL of 0.073 mg/kg DW).

Table 3-1. RM 4.9 East: Screening Level Exceedances in SPU Source Tracing Samples

Chemical Class	Chemical	Sediment Traps	In-line Solids
Metals	Zinc	×	×
PCBs	PCBs, total	×	×
PAHs	Individual HPAH compounds		☒
	Total cPAHs		☒
Phthalates	BEHP	☒	☒
	Butylbenzyl phthalate	×	☒
Phenols	4-Methylphenol	☒	
Other SVOCs	Benzyl alcohol	☒	☒
	Benzoic acid	☒	
Petroleum Hydrocarbons	Diesel range hydrocarbons		☒
	Motor oil range hydrocarbons	☒	☒

Storm drain screening levels are listed in Table 2-4. Several SVOCs reported high detection limits which exceeded screening levels. These are identified in Appendix F.

× = Exceedance of SCO (lower screening level) was observed during the current reporting period (2018).

☒ = Exceedance of CSL/RAL/Method A (upper screening level) was observed during the current reporting period (2018).

3.1.3 Facility-Specific Source Control Actions

Boeing Developmental Center - South

The Boeing Developmental Center (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 3.2.3; BDC-North is discussed in Section 3.3.3.

Ecology WQ issued Administrative Order 14012 to BDC on February 8, 2017. Boeing appealed Administrative Order 14012 to the Pollution Control Hearings Board in March 2017 (Ecology 2017a [11457]).

- In January 2018, Ecology WQ and Boeing negotiated Agreed Order DE-15600 and settled Boeing's appeal of Administrative Order 14012 (PCHB 2018 [11254]). Agreed Order DE-15600 was signed on January 9, 2018 (Ecology 2018a [11246]). Under the Agreed Order, Boeing will conduct further evaluation of stormwater at BDC. Boeing must modify the Stormwater Pollution Prevention Plan (SWPPP) and conduct monthly monitoring of the majority of outfalls at the site for ISGP benchmark pollutants, total petroleum hydrocarbons (TPH) and PCBs. Additional requirements under the Agreed Order are described in Section 3.2.3 (BDC-Central).

Boeing performed a removal action in the LDW immediately offshore of the BDC south storm drain outfall (DC2) under Ecology's Voluntary Cleanup Program (VCP) in 2003. Boeing performs annual monitoring on a voluntary basis for PCBs in the backfill material installed during the 2003 sediment removal action and accumulated solids in the Vortechincs 9000 sediment trap unit upstream of outfall DC2. The monitoring data are used to evaluate the effectiveness of source control measures that have been implemented in the south storm drain system.

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

- Sampling at outfall DC2 was conducted in 2016, 2017, and in January 2018. A portion of the sampling, focused on the south storm drain line, was conducted as part of a routine effort following the 2003 sediment removal action. Additional stormwater sampling was conducted to evaluation conditions in upgradient portions of the south storm drain line, specifically at the 9-101 Building.

PCB Aroclors were detected in the wipe, sediment, and water sample from the 9-101 building in February and April 2017. This indicated a source that may have contributed to PCBs in the stormwater conveyance system leading to the Vortechincs unit (OWS-2).

- One water sample was collected at OWS-2 in January 2018 for PCB Aroclor analysis. All PCB Aroclors were below the method reporting limit of 0.01 micrograms per liter ($\mu\text{g/L}$).

- The source tracing of the south storm drain included a wipe sample, water sample, and six sediment samples collected at the 9-101 building in February and April 2017. The results indicated potential PCB sources to the south storm drain from the roof solids as well as the drain pipe from AHU-9.
- Video inspection and a tracer study confirmed the connection of the AHU-9 drain system to the south storm drain. Boeing Facilities closed off the connection from AHU-9 to the south storm drain shortly after completing the source tracing monitoring.
- Boeing will continue to evaluate monthly monitoring of PCBs in stormwater discharges to evaluate the effectiveness of the Vortechincs sediment trap. Boeing will continue to sample solids within the Vortechincs unit to evaluate PCB concentration trends in accumulated solids (Calibre 2018 [11448]).
- Ecology HWTR identified Boeing as a potentially liable person (PLP) under MTCA for the release of hazardous substances at the BDC site in March 2018 (Ecology 2018l [11281]).

Boeing Military Flight Center

Boeing is conducting source control and cleanup work at the Military Flight Center (MFC) to address PCBs present in stormwater flowing offsite from the facility, in certain building materials, and in offsite soils. Stormwater discharges at the MFC are covered under the ISGP (WAR000150).

Source tracing samples collected in 2012 showed elevated concentrations of PCBs in storm drain solids; Boeing conducted cleanup activities of the storm drain system and surface soils in 2015 in locations impacted by PCBs (Ecology 2017b [11449]). In 2015 and 2016, discharge samples also exceeded the ISGP benchmark values and chronic marine water quality criteria for zinc and copper. Despite frequent catch basin cleaning, elevated levels of copper, zinc, PCBs, and diesel-range hydrocarbons continue to be found in storm drain solids.

Ecology determined that the elevated pollutant levels in stormwater and storm drain solids in 2015 and 2016 strongly indicate that source control at the Boeing MFC is inadequate and may lead to the release of pollutants into the waters of the state. As a result, Ecology WQ issued an Administrative Order (No. 13932) on March 23, 2017. The Administrative Order directed Boeing to submit an engineering report for Ecology review and approval by June 15, 2017, and to install and have operational all final stormwater treatment systems by October 31, 2017.

- Boeing submitted an engineering report to Ecology on July 7, 2017. Ecology did not approve the engineering report, concluding that the engineering design did not

Address	10002 East Marginal Way S
Facility/Site ID	14532 (Boeing Military Flight Center)
NPDES Permit	WAR000150 (Boeing Military Flight Center)
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 farming, and as a department store.
Chemicals of Concern	Volatile organic compounds (VOCs), PCBs, PAHs, metals, and petroleum hydrocarbons
Media Affected	Stormwater, storm drain solids, soil

demonstrate that the facility can meet the ISGP requirements. Boeing was required to address the issues identified by Ecology and to revise and resubmit the engineering report for Ecology review and approval. Implementation of stormwater treatment was due by October 31, 2017. Boeing submitted a revised engineering report on March 22, 2018.

- Ecology conducted a stormwater compliance inspection on April 4, 2018 (Ecology 2018p [11508]). Ecology concluded that the Boeing MFC facility was out of compliance. In May 2018 Ecology sent Boeing a warning letter (Ecology 2018u [11506]). The letter indicated that Boeing must comply with corrective actions, including the requirement to submit an engineering report that meets the requirements specified in Administrative Order 13932. As of April 2018, engineering report submittals received and reviewed by Ecology failed to meet engineering report requirements outlined in the administrative order and ISGP (Ecology 2018p [11508], Ecology 2018u [11506]).
- Boeing submitted a second revised engineering report to Ecology on August 14, 2018.
- In November 2018 Ecology sent Boeing MFC a warning letter. In the warning letter, Ecology noted that exceedance of total suspended solids (TSS) limits has been a problem for this facility. Ecology required that Boeing MFC address the root source of this problem to prevent future exceedances (Ecology 2018ao [11507]).
- Discharge monitoring in the second quarter of 2018 indicated exceedances of the copper and zinc benchmarks, which triggered a corrective action. In their 2018 Annual Report, Boeing stated that they performed an inspection to investigate potential causes of the exceedances, removed and replaced 190 feet of large diameter galvanized stormwater piping to eliminate an identified source of zinc, and they could not identify any source of copper present at the site that may have caused the exceedance. Ecology continues to work with Boeing to establish a clear path forward to meet ISGP requirements at this facility.

Unified Grocers

Unified Grocers has experienced historical exceedances of ISGP benchmarks for copper, zinc, and turbidity, requiring implementation of Level 3 best management practices (BMPs).

- Ecology conducted a site hazard assessment at Unified Grocers in January 2018. Ecology determined that this site was contaminated with gasoline-range hydrocarbons, benzene, toluene, ethylbenzene, and total xylenes (BTEX). Ecology assigned the site a hazard ranking of five, where a score of one represents the highest relative level of concern, and five represents the lowest (Ecology 2018i [11512], 2018j [11511]).

Address	3301 S Norfolk Street
Facility/Site ID	73338176 (Unified Grocers 3301 Norfolk)
NPDES Permit	WAR002040 (Terminated 9/28/2018)
Current Operations	Wholesale distribution of food products and related non-food items to retail markets and stores
Historical Operations	Truck shop, gasoline service station
Chemicals of Concern	Copper, mercury, zinc, PCBs, PAHs, cPAHs, phthalates, dioxins/furans, and petroleum hydrocarbons
Media Affected	Stormwater and storm drain solids

- In September 2018, Supervalu announced that the facility was closing operations at the Unified Grocers location (3301 Norfolk Street). They submitted a notice of termination form to Ecology for their ISGP (Supervalu 2018 [11454]). On September 28, 2018 Ecology terminated their coverage under the permit (Ecology 2018ar [11510]).
- The former Unified Grocers property at 3301 S Norfolk Street and the former Northwest Auto Wrecking property at 10230 East Marginal Way S have been purchased by Prologis-Exchange 3301 South Norfolk LLC, and the Site is now referred to as the Emerald Gateway Site.

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 this site 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 Cleanup Action Plan (CAP) (Ecology 2015d [12274]).

RI activities conducted in 2018 are described below:

- In January 2018 G-Logics (on behalf of Chevron) installed, developed, and sampled four additional groundwater monitoring wells (MW-25D, MW-29S, MW-29D, and MW-30). Soil

Address	10805 Tukwila International Boulevard
Facility/Site ID	2551 (Chevron Station 6009 3099)
NPDES Permit	None
Current Operations	Service station with underground gasoline storage
Historical Operations	Same as current (since 1940)
Chemicals of Concern	Petroleum hydrocarbons, VOCs
Media Affected	Soil and groundwater

samples were collected from the borings. One soil sample contained a concentration of 0.23 mg/kg DW of xylenes (MTCA Method A cleanup level is 9 mg/kg). No other analytes were detected above the laboratory reporting limit.

- Groundwater was collected from the new and existing monitoring wells in January, May, and August 2018. The analytical results for groundwater collected from seven of the monitoring wells did not contain detectable concentrations of analyzed contaminants. Two soil-gas samples were also collected in January 2018 (G-Logics 2018a [11289], 2018b [11290], 2018c [11291], 2018d [11292], 2018e [11515]).
- Ecology approved an extension for the RI schedule of deliverables in June 2018. According to the revised schedule, field activities must be completed by January 31, 2019 and data validation must be completed by March 31, 2019 (Ecology 2018w [11288]).
- Ecology reviewed a draft Feasibility Pilot Study Work Plan in May 2018. G-Logics met with Ecology to discuss the comments on May 25, 2018. G-Logics revised the Draft Feasibility Pilot Study Work plan to address Ecology’s comments and submitted a revised draft Feasibility Pilot Study Work Plan to Ecology in August 2018 (G-Logics 2018f [11518]).

3.2 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 Appendix A. This source control area consists of a single facility, the central portion of BDC, referred to as BDC-Central. The BDC-South is discussed in Section 3.1.3 (RM 4.9 East); BDC-North is discussed in Section 3.3.3 (RM 3.9-4.3 East).

3.2.1 Business Inspections

No inspections were conducted in this source control area during 2018.

3.2.2 Source Tracing

No source tracing activities were conducted at BDC during this reporting period, except as described in Section 3.2.3 below.

3.2.3 Facility-Specific Source Control Actions

Boeing Developmental Center - Central

On February 8, 2017, Ecology WQ issued Administrative Order 14012 to BDC. Boeing appealed Administrative Order 14012 to the Pollution Control Hearings Board in March 2017 (Ecology 2017a [11457]).

- Ecology WQ and Boeing negotiated Agreed Order DE-15600 and settled Boeing's appeal of Administrative Order 14012 in January 2018 (PCHB 2018 [11254]). Agreed Order DE-15600 was signed on January 9, 2018 (Ecology 2018a [11246]).
- Under Agreed Order DE-15600, Boeing agreed to modify the SWPPP and begin monitoring at least once in all months when discharge occurs during BDC regular business hours at 12 of the 19 drainage areas at BDC, including DC5, DC9, DC10, DC11, DC12, DC13, and DC19 within the RM 4.3-4.9 East source control area.
- Ecology required Boeing to monitor for ISGP benchmark pollutants, TSS, TPH, and PCBs, starting in January 2018. In addition, Ecology required accelerated consideration of advanced stormwater treatment if future benchmark exceedances meet the trigger conditions specified in the Order.
- In the first and second quarters of 2018, BDC was out of compliance with their effluents limits. As a result, Ecology WQ sent a warning letter to Boeing in November 2018. Ecology required that Boeing address the root source of the TSS limit problem and

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

propose a solution designed to prevent future exceedances and submit the solution in writing (Ecology 2018aq [11494]).

- Due to the TSS effluent limit exceedance in the first quarter of 2018 at DC 11, the facility triggered the requirement to implement Phase 2 advanced treatment, which was a condition detailed in the Agreed Order.
 - The Phase 2 treatment required an engineering report within 90 days of triggering the advanced treatment requirement, a pilot study to prove that the selected treatment system will meet the benchmark requirement consistently, and installation of the approved advanced treatment system by fall of 2018.
 - BDC did not meet the 2018 treatment installation deadline; however Boeing submitted an engineering report to Ecology on September 28, 2018. Ecology determined that the information in the engineering report was incomplete.
 - Ecology required BDC to submit more information and the pilot study by December 20, 2018. Ecology continues to work with Boeing to establish a clear path forward to installing treatment and meeting the ISGP requirements at the facility.
- Ecology HWTR identified Boeing as a PLP under MTCA for the release of hazardous substances at the BDC site in March 2018 (Ecology 2018l [11281]).

Boeing has also continued cleanup activities under RCRA at the BDC property. Activities during the current reporting period are summarized below (Landau 2019 [11458]):

- **AOC-05:** Full-scale nitrate injections to stimulate biodegradation of petroleum hydrocarbons in groundwater began in 2008. Anaerobic bioremediation at AOC-05 is accomplished through stimulation of microorganisms present in the aquifer that can degrade petroleum hydrocarbons. The last nitrate injection occurred in December 2017.
 - Between May 2017 and February 2018 there were four quarterly monitoring events and two semiannual monitoring events to measure nitrate at downgradient wells (Landau 2018c [11920]). Monitoring results indicate that bioremediation at AOC-05 is nearing completion; monitoring is scheduled to continue.
 - Semiannual groundwater monitoring was conducted in August and November 2017, and in February and May 2018. In 2017 and 2018, gasoline-range hydrocarbons and BTEX concentrations remained below their proposed cleanup levels at previously impacted well BDC-104 and downgradient wells BDC-101 and BDC-102. Gasoline-range hydrocarbons and BTEX concentrations at BDC-103 were above their proposed cleanup levels in 2016, but have been below the cleanup levels since February 2017 (Landau 2018a [11922], 2018e [11921]).
- **SWMU-17:** Anaerobic bioremediation of tetrachloroethene (PCE) in groundwater was selected as the remedial approach for this unit. Full-scale electron donor injections began in 2011. As of August 2017, chlorinated solvent concentrations were below preliminary cleanup levels at all but three wells. Additional electron donor injections were implemented at five wells in November 2017.

- /2017, and in May 2018. In August and November 2017, PCE, trichloroethylene (TCE), cis-1,2-dichloroethene (cDCE) and vinyl chloride (VC) concentrations were below proposed cleanup levels at all wells, except for TCE at BDC-05-02 and BDC-05018 where the TCE concentrations were 3.6 µg/L and 1.7 µg/L, respectively.
- After the groundwater sampling in November 2017, a donor injection (molasses) was completed at five wells at SWMU-17 to enhance treatment of residual contaminant concentrations (Landau 2018a [11922], 2018b [11923]).
- The May 2018 groundwater monitoring results show that *in situ* anaerobic bioremediation continues to be enhanced following the November 2017 electron donor injection (Landau 2018e [11921]). In May 2018 PCE, TCE, cDCE and VC concentrations were below proposed cleanup levels at all wells, except for TCE at BDC-05-02 and VC at two wells (BDC-05-09 and BDC-05-18). In BDC-05-02, TCE was detected at a concentration of 3.75 µg/L (the proposed cleanup level is 1.4 µg/L). In BDC-05-09 and BDC-05-18, VC was detected at a concentrations of 3.3 µg/L and 3.4 µg/L respectively (the proposed cleanup level is 2.4 µg/L) (Landau 2018e [11921]).
- **SWMU-20:** Actions at this unit include groundwater pump and treat followed by bioremediation for PCE and TCE in groundwater. A groundwater treatment system was in place between 1993 and 2001; a series of bioremediation injection events was performed between 2004 and 2015.
 - Semiannual groundwater monitoring was conducted in May and November 2017, and in May 2018. The November 2017 and May 2018 groundwater monitoring results indicate that concentrations of PCE, TCE, and breakdown products were below the proposed cleanup levels at all of the SWMU-20 monitoring wells (with the exception of VC at MW-17A) (Landau 2018a [11922], 2018e [11921]).

3.3 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, parcels owned by the Museum of Flight, and the northern portion of BDC (BDC-North). 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 Appendix A.

3.3.1 Business Inspections

Ecology performed a source control inspection at Insurance Auto Auctions on April 24, 2018 (Appendix E).

3.3.2 Source Tracing

SPU collected a grab inline solids sample at one location within the KCIA SD#1 storm drain basin in October 2018 (Figure A-3). No CSL (upper screening level) exceedances were identified

in this sample, although butylbenzyl phthalate and benzyl alcohol were present at concentrations above the SCO (lower screening level) (Appendix F).

In July 2018, King County collected annual inline sediment trap and storm drain solids grab samples from location KCIA1A, on the KCIA SD#1 storm drain line (Figure A-5). In addition, King County collected storm drain solids grab samples in February and April 2018 from a location at the upgradient boundary of the KCIA SD#1 basin along Perimeter Road S to evaluate the potential for offsite inputs to the KCIA drainage system.

King County sampling results are provided in Appendix G; screening level exceedances are summarized in Table 3-2 below. These data may suggest that the higher concentrations of zinc and PAHs observed in the KCIA1A sediment trap sample could be related to offsite inputs. King County will continue to sample the upgradient location as part of its sampling program (King County 2019 [11925]).

Table 3-2. RM 3.9-4.3 East: Screening Level Exceedances in King County Source Tracing Samples

Chemical Class	Chemical	Sediment Trap	In-line Solids	Upgradient Solids
Metals	Arsenic	☒		
	Lead	×		
	Zinc	☒	×	☒
PCBs	PCBs, total			
PAHs	Individual LPAH compounds	☒		☒
	Total LPAHs			☒
	Individual HPAH compounds	☒		☒
	Total HPAHs	☒		☒
Phthalates	BEHP	×		
Petroleum Hydrocarbons	Motor oil range hydrocarbons			☒

Storm drain screening levels are listed in Table 2-4. Several SVOCs reported high detection limits which exceeded screening levels. These are identified in Appendix G.

× = Exceedance of SCO (lower screening level) was observed during the current reporting period (2018).

☒ = Exceedance of CSL/RAL/Method A (upper screening level) was observed during the current reporting period (2018).

3.3.3 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 [06418]). Centerpoint Properties purchased the property from Merrill Creek holdings in 2015, and Agreed Order DE-6069 was amended to update the property owner in

August 2017 (Ecology 2017c [11459]). The site is currently leased by Insurance Auto Auctions (IAA).

- The PLPs submitted a revised draft of the Feasibility Study to Ecology in March 2018. Ecology provided review comments in November 2018.
- The PLPs submitted a revised draft of the Interim Action Work Plan to Ecology in March 2018. Ecology provided review comments to the PLPs in November 2018.
- In 2018, IAA submitted discharge monitoring reports to Ecology that indicated that the facility was out of compliance with effluent limits in the 4th quarter of 2017. Ecology WQ sent IAA a warning letter in November 2018 requiring IAA to comply with the NPDES permit requirements (Ecology 2018ap [11503]).

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

King County International Airport – South Central

The south-central area of KCIA is located within the RM 3.9 to 4.3 East source control area. The north-central portion of KCIA is discussed in Section 3.4.3. The north area is discussed in Section 4.1.3.

- King County continues to collect annual sediment trap and inline solids samples at location KCIA1A in the storm drain line discharging to the LDW at KCIA SD#1 (see Section 3.3.2).

Address	7277 Perimeter Road S (main terminal); various tenant addresses
Facility/Site ID	2387398 (King Cnty International Airport)
NPDES Permit	WAR000343 (King County Int Airport); Tenant: WAR127177 (Charles Air Hangar Starbucks)
Current Operations	General aviation airport and related activities
Historical Operations	Military airport operations; general aviation
Chemicals of Concern	PAHs, phthalates, copper, zinc, petroleum hydrocarbons, and PCBs
Media Affected	Stormwater and, groundwater

Boeing Developmental Center - North

The BDC property straddles three source control areas. BDC-North is located in the RM 3.9-4.3 East source control area and it is discussed below. BDC-South is discussed in Section 3.1.3; BDC-Central is discussed in Section 3.2.3.

On February 8, 2017, Ecology WQ issued Administrative Order 14012 to BDC. Boeing appealed Administrative Order 14012 to the Pollution Control Hearings Board in March 2017 (Ecology 2017a [11457]).

- In January 2018, Ecology WQ and Boeing negotiated Agreed Order DE-15600 and settled Boeing's appeal of Administrative Order 14012 in January 2018 (PCHB 2018 [11254]). Agreed Order DE-15600 was signed on January 9, 2018 (Ecology 2018a [11246]).
- Ecology HWTR identified Boeing as a PLP under MTCA for the release of hazardous substances at the BDC site in March 2018 (Ecology 2018l [11281]).

3.4 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 and the north-central portion of KCIA, which is within the drainage basin for KCIA SD#2/PS45 emergency overflow (EOF) (Appendix A). King County refers to this drainage as the KCIA central drainage basin (King County 2019 [11925]).

3.4.1 Business Inspections

KCIA performs annual tenant inspections in accordance with its ISGP and municipal permit requirements. No other business inspections were conducted during the current reporting period.

3.4.2 Source Tracing

KCIA collected annual an inline sediment trap sample at location KCIA2, a manhole east of East Marginal Way S, and grab storm drain samples at locations KCIA2 and KC-SPS, the South Pump Station inlet vault, in July 2018 (Figure A-6). No screening level exceedances were observed in samples collected KCIA2. At KC-SPS, up-gradient of KCIA2, no samples exceeded the CSL, however arsenic and zinc were present at concentrations above the SCO. Sampling results are provided in Appendix G.

3.4.3 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 [06812]). Boeing submitted an RI Report to Ecology in April.

- Boeing submitted a draft Feasibility Study to Ecology in July 2018.

Address	8625-8811 East Marginal Way S, Tukwila
Facility/Site ID	Facility Site ID: 2218 Cleanup Site ID: 1944
Current Operations	Storage of surplus vehicles
Historical Operations	Steel melting, forging, and fabricating, lumber
Chemicals of Concern	Antimony, arsenic, barium, cadmium, chromium, lead, mercury, nickel, zinc, PCBs, PAHs,
Media Affected	Soil, groundwater, stormwater

King County International Airport – North Central

This area of KCIA includes Drainage Basin #2, which discharges to the LDW through the KCIA

SD#2 outfall (Appendix A). 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.

King County continues to collect an annual inline sediment trap solids sample at location KCIA2 (a manhole east of East Marginal Way S) and grab storm drain samples at locations KCIA2 and KC-SPS (the South Pump Station inlet vault) (see Section 3.4.2).

Address	7277 Perimeter Road S (main terminal); various tenant addresses
Facility/Site ID	2387398 (King Cnty International Airport)
NPDES Permit	WAR000343 (King County Int Airport); Tenants: WAR002830 (Ameriflight Inc Hangar 5), WAR000607 (Landmark Aviation/Signature Aviation), WAR000434 (UPS Boeing Field)
Current Operations	General aviation airport and related activities
Historical Operations	Military airport operations; general aviation
Chemicals of Concern	PAHs, phthalates, copper, zinc, petroleum hydrocarbons, and PCBs
Media Affected	Stormwater and groundwater

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. Treatment BMPs such as oil water separators, water quality vaults, and StormFilter systems were installed and are being maintained (King County 2019 [11925]). KCIA performs stormwater line cleaning in accordance with the ISGP; line inspection and cleaning in the western portion of KCIA was completed in 2017.

3.5 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 2¹² and Jorgensen Forge, as shown in Appendix A. In addition, the 16th Avenue S (East) SD discharges to the LDW within this source control area.

3.5.1 Business Inspections

Ecology conducted a stormwater compliance inspection at Jorgensen Forge on January 24, 2018 (Ecology 2018h [11505]) (see Appendix E).

3.5.2 Source Tracing

No source tracing samples were collected in the RM 2.8-3.7 East source control area during 2018.

¹² 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 4.1).

3.5.3 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 included 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, Southwest Bank and other Plant 2 sediment areas.

Address	7755 East Marginal Way S
Facility/Site ID	2100 (Boeing Plant 2)
NPDES Permit	WAR000482
Current Operations	Airplane parts manufacturing
Historical Operations	Same
Chemicals of Concern	VOCs, PCBs, PAHs, metals, and petroleum hydrocarbons
Media Affected	Groundwater, stormwater, soil, and sediment

- The in-water work is complete. Boeing continues to monitor the quality of sediment at the site.
- A proposed final cleanup plan (or Statement of Basis) for the upland areas of the site is expected to be published by EPA in 2019.

Jorgensen Forge

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

- Ecology's WQ program conducted a compliance inspection at the Jorgensen Forge facility on January 24, 2018 to assess compliance with the NPDES ISGP. The majority of the stormwater at the facility flows to a vault which feeds an advanced stormwater treatment system that incorporates polymer/sand filtration.
- On May 17, 2018 Jorgensen Forge submitted a Modification of Coverage Form to Ecology, requesting a Level 2 Waiver for the corrective action related to copper exceedances. They based their request on a mechanical failure of their stormwater treatment system that led to a media replacement. Follow-up sampling indicated copper concentrations were below the benchmark. Ecology granted the waiver on August 27, 2018, subject to a number of conditions.

Address	8531 East Marginal Way S
Facility/Site ID	2382 (Jorgensen Forge Corp)
NPDES Permit	WAR003231 (Jorgensen Forge Corp)
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
Chemicals of Concern	PCBs, VOCs, petroleum hydrocarbons, metals
Media Affected	Soil and groundwater

- On April 18, 2018 Jorgensen Forge announced that it will end operations at this location in 2018 (Jorgensen Forge 2018 [11521]).

Upland Cleanup

In March 2015, Ecology issued Enforcement Order DE-11167 requiring Jorgensen Forge to complete an RI/FS and to prepare a draft CAP for the upland portion of the site (Ecology 2015c [12172]). Jorgensen Forge declared bankruptcy in 2016.

- Ecology reviewed and commented on the first Draft RI Work Plan for Jorgensen in July 2018. A revised RI Work Plan was due to Ecology in January 2019.

Sediment Cleanup

An underground 24-inch pipe adjacent to the Boeing Plant 2 facility released PCBs to the LDW. The pipe and contaminated soil were excavated under CERCLA removal authorities in phases; Phase 1 was completed in 2015.

- Phase 2 of the Jorgensen Forge Outfall Site Removal Action was completed in 2017 (Floyd|Snider 2018a [11437]). EPA approved the removal action in May 2018 (EPA 2018a [11524]).

Under a separate CERCLA removal action order, PCB-contaminated sediment and bank soils at the property were largely removed in 2014. Samples collected after the excavation indicated that some sediments were still contaminated.

- Jorgensen agreed to evaluate the need for additional cleanup work to address the remaining sediment contamination under an amendment to the order (effective August 2017). Sampling took place in December 2018 and January 2019.¹³

3.6 RM 4.2-5.8 West (Restoration Areas)

The RM 4.2-5.8 West (Restoration Areas) source control area includes a mixture of restored habitats and industrial properties along the LDW shoreline (Appendix A). Industrial properties adjacent to the LDW, including the city of Seattle's Duwamish substation and associated outfalls, and upland properties in the Hamm Creek basin are located within the RM 4.2-5.8 West source control area.

3.6.1 Business Inspections

Ecology conducted four Urban Waters source control inspections in this source control area during 2018 (Appendix E-2).

3.6.2 Source Tracing

No source tracing samples were collected in the RM 4.2-5.8 West source control area during 2018.

¹³ <https://cumulis.epa.gov/supercpad/SiteProfiles/index.cfm?fuseaction=second.cleanup&id=1002020>

3.6.3 Facility-Specific Source Control Actions

Duwamish Substation

- Ecology conducted an initial investigation at the Seattle City Light Substation in January 2018. This property includes a Seattle City Light substation surrounded by vacant land to the north and south. The property has previously used dredged river sediments as fill. It is unclear what the contamination status of the sediments was when they were used as fill (Ecology 2018b [11497]).
- Ecology added this facility to the confirmed and suspected contaminated sites list in March 2018 (Ecology 2018m [11496]).

Address	10000 West Marginal Place S Tukwila
Facility/Site ID	Facility Site ID: 17593/Cleanup Site ID: 14452
Current Operations	Seattle City Light substation
Historical Operations	Dredged river sediments were used as fill on this property.
Chemicals of Concern	PAHs
Media Affected	Soil

3.7 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 a small portion of LDW shoreline and upland facilities within the S 96th Street SD basin (Appendix A).

3.7.1 Business Inspections

SPU conducted nine inspections at six facilities in the RM 3.8-4.2 West source control area during the current reporting period, including four initial inspections and five follow-up inspections (Appendix C).

King County's Stormwater Services conducted 28 inspections at 11 facilities in this source control area during the current reporting period (Appendix D, Table D-2).

Ecology conducted one stormwater compliance inspection, at Gary Merlino Construction, during the current reporting period (Appendix E, Table E-1). In addition, Ecology conducted two hazardous waste inspections and three Urban Waters source control inspections in this source control area (Tables E-2 and E-3).

3.7.2 Source Tracing

SPU collected one grab storm drain solids sample in July 2018 from MH41, a maintenance hole along 10th Avenue S, between S Barton and S Cambridge Street (Figure A-9 in the S 96th Street SD system). Chromium, benzoic acid, and benzyl alcohol were detected at concentrations above the CSL (Appendix F).

King County collected three sediment trap samples and four grab storm drain solids samples in the S 96th Street SD basin in March 2018 (Figure A-9). The grab samples were collected at

locations upgradient of location 96-ST1 to source trace for zinc and PAHs (King County 2019 [11925]).

- In sediment trap 96-ST1, BEHP and three PAHs exceeded the CSL (upper screening level). No additional source tracing actions are planned for BEHP (King County 2019 [11925]).
- Grab samples were collected from four catch basins upgradient of location 96-ST1. No CSL (upper screening level) exceedances were observed, and only zinc exceeded the SCO in one sample.
- BEHP exceeded the CSL (upper screening level) in sediment trap 96-ST2.

King County sample results are provided in Appendix G; screening level exceedances are summarized in Table 3-3 below.

Table 3-3. RM 3.8-4.2 West: Screening Level Exceedances in King County Source Tracing Samples (S 96th Street SD)

Chemical Class	Chemical	Sediment Traps	Grab Samples
Metals	Zinc	×	×
PAHs	Individual LPAH compounds	☒	
	Individual HPAH compounds	☒	
	Total HPAHs	×	
Phthalates	BEHP	☒	
	Butylbenzyl phthalate	×	

Storm drain screening levels are listed in Table 2-4.

× = Exceedance of SCO (lower screening level) was observed during the current reporting period (2018).

☒ = Exceedance of CSL/RAL/Method A (upper screening level) was observed during the current reporting period (2018).

3.7.3 Facility-Specific Source Control Actions

Glen Acres Golf & Country Club

The Glen Acres Golf & Country Club, was developed in 1924. The site entered the VCP on July 12, 2013 under VCP No. NW2759. Contamination at the site is associated with a former gasoline underground storage tank (UST).

Address	1000 S 112 th Street
Facility/Site ID	18369741
NPDES Permit	None
Current Operations	Golf Course & Country Club
Historical Operations	Undeveloped land
Chemicals of Concern	BTEX, petroleum hydrocarbons
Media Affected	Soil and groundwater

- In January 2018 Ecology requested that Glen Acres Golf and Country Club send Ecology information on the status of the remedial actions that were conducted in 2017 (Ecology 2018g [11502]).

- Quarterly groundwater samples collected in February 2018 contained lead concentrations that were below the MTCA Method A cleanup levels in samples collected from all four groundwater monitoring wells. Petroleum hydrocarbon concentrations were above the MTCA Method A cleanup levels in samples collected from MW3 (gasoline-range hydrocarbons) and MW4 (gasoline-range hydrocarbons and benzene) (Aerotech 2018a [11455]).
- Quarterly groundwater samples collected in August 2018 contained lead and BTEX concentrations that were below the MTCA Method A Cleanup levels in samples collected from all four groundwater monitoring wells. Petroleum hydrocarbon concentrations were above MTCA Method A cleanup levels in the sample collected from MW3 (Aerotech 2018b [11492]).

3.8 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's Terminal 117, South Park Marina, and most of Boeing's South Park facility (Appendix A). It also includes the new 17th Avenue S SD system that was constructed as part of the Terminal 117 early action cleanup.

3.8.1 Business Inspections

King County Stormwater Services conducted an inspection at Terminal 117 in January 2018, and subsequently removed the site from their source control schedule (Appendix D, Table D-2).

Ecology conducted a source control inspection at Tire Factory Seattle in February 2018 (Appendix E, Table E-2).

3.8.2 Source Tracing

SPU collected solids samples from two right-of-way catch basins in the 17th Avenue S SD in December 2018 (Figure A-10). Results are provided in Appendix F, and screening level exceedances are summarized in Table 3-4 below. Samples contained BEHP at 13 to 89 mg/kg DW, significantly above the CSL of 1.9 mg/kg DW. Benzoic acid and benzyl alcohol were also substantially above their respective CSLs.

Table 3-4. RM 3.4-3.8 West: Screening Level Exceedances in SPU Source Tracing Samples

Chemical Class	Chemical	Right-of-Way CB Solids (SPU)
Metals	Zinc	×
PCBs	Total PCBs	×
PAHs	Chrysene	×
Phthalates	BEHP	☒
	Butylbenzyl phthalate	☒
	Dimethyl phthalate	☒
Other SVOCs	Benzoic acid	☒
	Benzyl alcohol	☒
	Phenol	×
Petroleum Hydrocarbons	Motor oil range hydrocarbons	☒

Storm drain screening levels are listed in Table 2-4.

× = Exceedance of SCO (lower screening level) was observed during the current reporting period (2018).

☒ = Exceedance of CSL/RAL/Method A (upper screening level) was observed during the current reporting period (2018).

In 2017 SPU installed two sediment traps at the last maintenance hole before the outfall in the new 17th Avenue S SD. SPU retrieved the trap in June 2018, but there was insufficient material for analysis (SPU 2019 [11926]). It was immediately redeployed for another year.

3.8.3 Facility-Specific Source Control Actions

South Park Marina

South Park Marina is located on the west bank of the LDW, north of the Port of Seattle's Terminal 117. The A&B Barrel Co. conducted drum reconditioning at this location between the mid-1950s and 1961. South Park Marina has been operating at this location since 1970.

- Ecology continued negotiating an Agreed Order to perform a Remedial Investigation and study the environmental conditions of the South Park Marina Site through 2018. The PLPs for this site are South Park Marina Limited Partnership, the City of Seattle, and the Port of Seattle. Ecology held a comment period for the Agreed Order and the Public Participation Plan from December 10, 2018 through January 23, 2019. Ecology plans to review the comments and finalize the Agreed Order in early 2019 (Ecology 2018av [11303], 2018as [11905], 2018aw [11304]).

Address	8604 Dallas Avenue S
Facility/Site ID	44653368
NPDES Permit	WAG030045 (Boatyard General Permit)
Current Operations	Marina with boat storage and repair
Historical Operations	Resort and marina; drum reconditioning
Chemicals of Concern	PCBs, PAHs, VOCs, dioxins/furans, phthalates, pesticides, petroleum hydrocarbons, metals
Media Affected	Stormwater and storm drain solids

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. 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 sediments adjacent to Terminal 117, the former industrial facility on terminal property, and 10 acres of soil in the nearby streets and residential area. The cleanup was completed in 2016.

SPU installed a green stormwater system that was constructed as part of the Adjacent Streets and Stormwater Infrastructure project for the Terminal 117 EAA in 2017. The new drainage system routes stormwater from a 2.9-acre basin through nine bioretention cells and four Filterra™ tree box units. The bioretention cells are designed to infiltrate. Underdrains from the Filterra™ units, and overflows from the bioretention cells are discharged to the LDW via a new 18-inch outfall.

- SPU retrieved the end-of-pipe trap installed in the 17th Avenue S storm drain in June 2018, but there was insufficient material for analysis. Grab samples (RCB76 and RCB85) were collected from the pre-settling cells on bioretention cells C and D in 2018; PCBs were 0.063 mg/kg dw and 0.46 mg/kg dw, respectively. SPU will attempt to sample the sediment trap again in 2019. SPU also collected samples of treated stormwater flowing out of the bottom of Bioretention Cell B and Filterra™ unit D to assess the condition of the filter media (SPU 2019 [11926]). PCBs were not detected at 0.01 µg/L in any of the five samples collected from each location.
- The Port of Seattle and the city of Seattle submitted a draft final Joint Long-Term Monitoring and Maintenance Plan to EPA in June 2018. EPA approved the plan in July 2018 (Peterson 2018 [11522]); it was finalized in September 2018 (Integral 2018b [11520]). The plan addresses 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.

Address	8700 Dallas Avenue S
Facility/Site ID	37657495 (Malarkey Asphalt Company)
NPDES Permit	None
Current Operations	Port of Seattle operations (International Inspection, Construction Services)
Historical Operations	Asphalt manufacturing; untreated lumber storage
Chemicals of Concern	PCBs
Media Affected	Soil, groundwater, and sediment

4.0 Middle Reach Source Control Areas

The middle reach includes eight source control areas, including four on the east side of the LDW and four on the west side:

East Side:	Report Section
RM 2.8 East (EAA-3: Slip 4)	4.1
RM 2.3-2.8 East (Seattle Boiler Works to Slip 4)	4.2
RM 2.0-2.3 East (Slip 3 to Seattle Boiler Works)	4.3
RM 1.7-2.0 East (Slip 2 to Slip 3)	4.4
West Side:	
RM 2.2-3.4 West (Riverside Drive)	4.5
RM 2.1-2.2 West (EAA-2: Trotsky Inlet)	4.6
RM 2.1 West (1 st Avenue S Storm Drain)	4.7
RM 1.6-2.1 West (Terminal 115)	4.8

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.

Source control activities specific to each source control area during the current reporting period are summarized in Sections 4.1 through 4.8 below.

Several Ecology cleanup sites are located on the east side of the Middle Reach: 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 EMF, which is under EPA oversight, is located within this source control area.

Four cleanup sites under Ecology oversight are located on the west side of the Middle Reach: South Park Landfill, North Terminal 115, Industrial Container Services (ICS), and Douglas Management Dock.

Slip 4 is a cleanup site under EPA oversight within the Middle Reach.

4.1 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, Cedar Grove Composting, 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 (Appendix A). Stormwater drainage from KCIA-North and most of the NBF-GTSP site discharges to Slip 4 via King County's KCIA SD#3. King County's East Marginal CSO Pump Station is also located at the head of Slip 4.

The City of Seattle completed a non-time critical removal action to address contaminated sediment at the Slip 4 EAA in 2012. This included the removal of contaminated bottom sediment and bank soil; creosote-treated timbers and piles; and a concrete pier structure.

The City completed Year 5 monitoring in July 2017; results were published during the current reporting period (Windward 2018a [11255]). Activities included a storm flow monitoring review; a visual inspection; an aerial survey; a hydrographic survey; sediment sampling from slope and waterway cap sampling locations; an institutional control update; and a review of source control activities and investigations performed by other parties. Physical conditions observed during Year 5 were similar to those noted previously. The monitoring results indicated that the sediment cap remains structurally sound, and sediment continues to accumulate on top of the cap. At least one analyte (BEHP, butylbenzyl phthalate, PCBs, benzyl alcohol, or zinc) was detected at concentrations above SMS criteria at six of the eight sampling locations. The average TOC and BEHP concentrations have increased since the cap was placed; the average total PCB concentration increased between 2013 and 2015 and decreased in 2017.

Monitoring was not scheduled for 2018. Long-term monitoring is scheduled to take place in 2019 (Windward 2018a [11255]).

4.1.1 Business Inspections

SPU conducted a follow-up inspection at Cedar Grove Composting during 2018 (Appendix C). No other SPU inspections were conducted in this source control area during 2018.

KCIW inspects the Waste Management 8th Avenue S/Reload Facility (Crowley property) at least annually, since it is classified as a SIU and is regulated under a waste discharge permit. The facility was inspected in June and October 2018.

Ecology conducted a stormwater compliance inspection at the Duwamish Reload Facility (former Crowley Marine Services site) in December 2018. Many compliance issues were identified, as described in more detail in Appendix E, Table E-1. In addition, one hazardous waste inspection and five Urban Waters source control inspections were conducted in the RM 2.8 East source control area during 2018 (Appendix E, Tables E-2 and E-3).

4.1.2 Source Tracing

Boeing, SPU, and/or KCIA have been sampling sediment traps in the storm drains discharging to Slip 4 since 2005 (Table 4-1). In 2011, Boeing installed a long-term stormwater treatment (LTST) system at NBF, which treats most of the stormwater discharging to Slip 4 from NBF and KCIA-North. The sediment traps are generally located upstream of the LTST system. Boeing discontinued sediment trap sampling at NBF in 2017. KCIA and SPU collected samples from some of the sediment traps in 2018.

In July 2018, KCIA collected sediment trap and grab samples from portions of the south-central and south subdrainage areas that are upgradient of the NBF Site (Appendix G). Beginning in 2019, KCIA will also sample the upgradient portions of the north and north-central subdrainage areas; these locations had been previously sampled by Boeing (King County 2019 [11925]). (It should be noted that King County collects samples upgradient of the NBF site. These samples do not represent inputs to the lateral lines from the NBF facility).

T3A (upstream of NBF on the south-central lateral SD): Several HPAH compounds exceeded screening levels in the sediment trap sample. Copper (1,200 mg/kg) and mercury (0.90 mg/kg) exceeded the CSL in the grab sample collected at this location.

T2A (upstream of NBF on the south lateral SD): A sediment trap sample collected at this location contained zinc at 3,400 mg/kg (above the CSL). Total PCBs (0.61 mg/kg DW) exceeded the SCO. There was insufficient sample material to analyze for SVOCs, or to collect an inline grab sample at this location.

SPU collected three samples in the RM 2.8 East source control area in 2018, including one sediment trap sample and an inline grab sample at T6 along the I-5 SD, and one grab sample on the Georgetown SD (Figure A-11). The I-5 SD and Georgetown SD discharge to Slip 4.

Phthalates, benzoic acid, and benzyl alcohol exceeded the CSL (upper screening level) in the sediment trap sample at T6. The concentration of butylbenzyl phthalate in the trap sample was 22 mg/kg DW, significantly above the CSL (upper screening level) of 0.9 mg/kg DW (Appendix F). However, butylbenzyl phthalate was not detected in the inline grab sample at this location. Dibutyl phthalate in this sample was present at 3.5 mg/kg DW, well above the CSL upper screening level of 1.4 mg/kg DW.

The Georgetown SD sample contained PAHs, phthalates, benzoic acid, and benzyl alcohol at concentrations above the CSL (upper screening level). The total HPAH concentration was 23 mg/kg DW; the BEHP concentration was 7.0 mg/kg DW, well above the CSL upper screening level of 1.9 mg/kg DW. The motor oil-range hydrocarbon was 2,400 mg/kg DW, exceeding the storm drain screening level of 2,000 mg/kg DW. (Appendix F).

The most recent PCB concentrations in all sediment traps except T6 remain at concentrations above the SCO (lower screening level) (0.13 mg/kg DW). The 2017 concentration of PCBs at T5 (4.2 mg/kg dw) was above the CS (upper screening level) (1.0 mg/kg DW); this sediment trap was not sampled in 2018. While not representative of discharges to Slip 4, these data help to inform source tracing efforts at the NBF-GTSP site.

Table 4-1. RM 2.8 East: PCB Concentrations in Slip 4 Sediment Traps

Sediment Trap Location	Range of All PCB Conc'ns, 2005-2018 (mg/kg DW)	2017 Samples (mg/kg DW)	2018 Samples (mg/kg DW)
T1 (Downstream end of north and north-central lateral SD)	0.62 – 420	0.93	ns
T2 (Downstream end of south lateral SD)	0.010 – 1.5	0.48	ns
T2A (Upstream of NBF on the south lateral SD)	<0.0061 – 1.0	0.61	0.61
T3 (Downstream end of south-central lateral SD)	0.026 – 1.8	0.30	ns
T3A (Upstream of NBF on the south-central lateral SD)	<0.02 – 0.73	<0.19	<0.19
T4 (Downstream end of north-central lateral SD)	0.24 – 2.8	0.89	ns
T4A (Upstream of NBF on the north-central lateral SD)	<0.011 – 5.6	0.18	ns
T5 (Downstream end of north lateral SD)	2.1 – 800	4.2	ns
T5A/T5A(2)/T5B (Upstream of NBF on the north lateral SD, now shifted to King County bypass line*)	0.086 – 0.67*	0.46	ns
T6 (I-5 SD at Slip 4)	<0.019 – 7.8	0.010	0.089

ns = not sampled

* Samples collected at T5A(2) are grab samples. King County currently refers to location T5A(2) as T5B.

Screening level exceedances in King County and SPU source tracing samples are summarized in Table 4-2 below. Complete results are provided in Appendix F and G.

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

Chemical Class	Chemical	Sediment Traps	Inline Samples
Metals	Arsenic	x	x
	Copper		☒
	Mercury		☒
	Zinc	☒	x
PCBs	PCBs, total	x	x
PAHs	Individual LPAH compounds		☒
	Individual HPAH compounds	☒	☒
	Total HPAHs	x	☒
	Total cPAHs		☒
Phthalates	BEHP	☒	☒
	Butylbenzyl phthalate	☒	x
	Dibutyl phthalate	☒	
	Dimethyl phthalate		x
Other SVOCs	Benzoic acid	☒	☒
	Benzyl alcohol	☒	☒
Petroleum Hydrocarbons	Motor oil range hydrocarbons		☒

Table does not include storm drain solids samples collected as part of ongoing investigations at the NBF-GTSP site. Storm drain screening levels are listed in Table 2-4.

x = Exceedance of SCO (lower screening level) was observed during the current reporting period (2018).

☒ = Exceedance of CSL/RAL/Method A (upper screening level) was observed during the current reporting period (2018).

4.1.3 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.

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)
Current Operations	Transloading
Historical Operations	Manufacture of pipe, chain, hydraulic equipment, and concrete; machinery and scrap iron storage; sawmill, lumber distribution; creosote treatment
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 [06804]).

The property owner, DeNovo Seattle, stopped work at the site due to financial difficulties in 2017. The property was placed in the hands of a court-appointed receiver.

- In December 2017, 8th Avenue Terminals agreed to take over work on the Agreed Order by addressing Ecology’s comments on the August 2016 Draft Remedial Investigation Report. 8th Avenue Terminals submitted a revised draft Remedial Investigation Report to Ecology in June 2018.

Ecology WQ issued an Immediate Action Order #12830 to Waste Management on September 3, 2015 to comply with the NPDES ISGP. The Immediate Action Order required Duwamish Reload Facility to submit an Engineering Report for stormwater treatment. Duwamish Reload Facility submitted a Phase I Engineering Report to Ecology that described using CleanWay catch basin filter insert system as the proposed treatment system. Ecology approved the Phase I treatment on August 1, 2016.

- Ecology received a Phase II Engineering Report describing a new stormwater conveyance system that would deliver the facility’s stormwater runoff to one centralized Chitosan Enhanced Sand Filtration system for treatment on August 4, 2017. The facility pursued the required permits during Ecology’s review of the Engineering Report. Ecology approved the Phase II Engineering Report on August 6, 2018.
- The Duwamish Reload Facility triggered copper, zinc, and turbidity benchmark exceedances in their stormwater samples collected from most of their outfalls during monitoring events in Quarters 1, 2, and 4 of 2018. In addition, the sample from outfall 5 in Quarter 2 of 2018 exceeded the effluent limit for TSS.

As a result, Ecology’s WQ Program issued a Warning Letter to the facility on November 15, 2018. Ecology requested that the facility determine the root cause of the TSS problem and propose a solution to prevent further exceedances.

- The facility responded to the warning letter in writing on December 13, 2018, noting that they planned to install the Chitosan-Enhanced Stormwater Filtration to treat the stormwater that was approved by Ecology in August 2018. The Advanced Treatment system was expected to be installed in early 2019.

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 [03425]), and was amended in February 2015 (Ecology 2015a [10933]). Under the terms of the Amended Agreed Order, the PLPs will complete an RI/FS and conduct 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

- Boeing and Seattle City Light (SCL) conducted several groundwater sampling events at North Boeing Field and the Georgetown Steam Plant during 2018. This work was conducted as part of the Phase 3 supplemental groundwater investigation for the NBF-GTSP Remedial Investigation. One of the events involved sampling groundwater for PCB congeners at the NBF property boundary along East Marginal Way S. PCB congeners were detected at concentrations above the proposed cleanup level protective of LDW surface water (Landau 2018d [11312]).
- Boeing and SCL completed off-property soil vapor and groundwater sampling along Ellis Avenue in April and May 2018. Sampling was prompted by concerns that TCE and VC in groundwater could pose a vapor intrusion risk to businesses and residents in the area. The investigation showed no indication of a risk for vapor intrusion.

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.

This area of KCIA includes Drainage Basin #1, which discharges to the LDW through the KCIA SD#3 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.

Address	7277 Perimeter Road S (main terminal); various tenant addresses
Facility/Site ID	2387398 (King Cnty International Airport)2051 (KCIA Maintenance Shop)
NPDES Permit	WAR000343 (King County Int Airport); Tenant: WAR010792 (KC WTD Georgetown Yard), WAR000226 (North Boeing Field)
Current Operations	General aviation airport and related activities
Historical Operations	Military airport operations; general aviation
Chemicals of Concern	PAHs, phthalates, copper, zinc, petroleum hydrocarbons, and PCBs
Media Affected	Stormwater and groundwater

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. Treatment BMPs such as oil water separators, water quality vaults, and StormFilter systems have been installed and are being maintained. KCIA performs stormwater line cleaning in accordance with the ISGP (King County 2019 [11925]).

KCIA performed data gap sampling of stormwater structures upgradient of the NBF-GTSP site in fall 2014. The sampling results identified elevated concentrations of PAH compounds, BEHP, and zinc. In 2018, KCIA developed a source tracing plan for Slip 4 to determine potential sources of contamination. KCIA will implement this source tracing plan in 2019 (King County 2019 [11925]).

4.2 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 (Appendix A) includes several properties adjacent to the LDW (Dawn Foods, Seattle Boiler Works, Seattle Iron & Metals (SIM), Pioneer Distribution, and Recology CleanScapes). In addition, it includes the S

Myrtle Street and S Garden Street SD basins. Upland cleanup sites in this source control area include the Fox Avenue Building and Whitehead Tyee sites.

4.2.1 Business Inspections

SPU conducted four inspections at three facilities, including SIM, during 2018 (Appendix C).

Ecology conducted three stormwater compliance inspections at two facilities in 2018 (Appendix E, Table E-1). This includes two inspections at SIM, and a follow-up inspection at the SIM Truck Parking site (also referred to as the Whitehead Tyee site).

4.2.2 Source Tracing

SPU collected one grab storm drain solids sample in the S Myrtle Street SD during 2018 (Figure A-12). In addition, SPU collected and analyzed three sediment trap samples associated with their sediment trap pilot testing, described in Section 2.3.1 above. Sampling results are provided in Appendix F, and screening level exceedances are summarized below. PCB concentrations ranged from 1.0 to 2.9 mg/kg DW.

Table 4-3. RM 2.3-2.8 East: Screening Level Exceedances in SPU Source Tracing Samples

Chemical Class	Chemical	Sediment Traps	Inline Sample
Metals	Cadmium	☒	
	Chromium	☒	
	Copper	☒	☒
	Lead	☒	×
	Mercury		☒
	Zinc	☒	☒
PCBs	PCBs, total	☒	×
PAHs	Individual HPAH compounds	☒	
	Total cPAHs	☒	
Phthalates	BEHP		☒
	Butylbenzyl phthalate		☒
	Dimethyl phthalate		☒
Other SVOCs	n-Nitrosodiphenylamine		☒
Petroleum Hydrocarbons	Motor oil range hydrocarbons		☒

Storm drain screening levels are listed in Table 2-4.

× = Exceedance of SCO (lower screening level) was observed during the current reporting period (2018).

☒ = Exceedance of CSL/RAL/Method A (upper screening level) was observed during the current reporting period (2018).

S Myrtle Street Sweeping and Catch Basin Inspections

In 2018, SPU conducted weekly sweeping at S Myrtle Street as part of the Street Sweeping for Water Quality Program. The city of Seattle Department of Transportation swept S Myrtle Street 43 times in 2018. SPU also conducted quarterly inspections of catch basins and mainline maintenance holes from 2011 through 2018. The evaluation determined that the catch basins on S Myrtle Street accumulate solids or require maintenance similar to those in the rest of the LDW

basins. SPU will continue quarterly inspections of catch basins and mainline maintenance holes (SPU 2019 [11926]).

4.2.3 Facility-Specific Source Control Actions

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 [09837]).

Cleanup actions at the site include thermal treatment of the chlorinated VOC compounds, followed by bi-polishing, until remediation levels are met.

Address	6900 Fox Avenue
Facility/Site ID	2282
NPDES Permit	None
Current Operations	Chemical distribution
Historical Operations	Chain manufacturing; chemical and petroleum repackaging and distribution
Chemicals of Concern	VOCs, dioxins/furans, petroleum hydrocarbons
Media Affected	Soil, groundwater, and stormwater

- In April 2018 the PLPs submitted an annual report to document the cleanup activities and monitoring that occurred in 2017 at the Fox Avenue Site. Soluble sugar substrate was injected in selected wells in 2017, and performance monitoring was conducted in areas that had previously been injected with soluble sugar or edible oil.
- Concentrations of chlorinated VOCs in most wells were less than the reporting limit of 250 µg/L by the end of 2017. The primary constituents are the daughter products of reductive dechlorination. Additional substrate injections and a site-wide groundwater monitoring event were performed in 2018 (Floyd|Snider 2018b [11915]).

Whitehead Tye Site

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. The site is also known as SIM Truck Parking. Ecology and SIM entered into Agreed Order DE-13458 in August 2016. The Order requires that the current property owner/operator complete a data summary report and interim action, conduct an RI/FS, and prepare a draft CAP (Ecology 2016c [11068]).

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

- SIM concluded an interim action that addressed limited areas of known soil contamination during installation of a stormwater conveyance and treatment system that is intended to reduce the transport of contaminants from the site to the LDW. SIM

submitted a draft Interim Action Completion Report to Ecology in August 2018. This document was in Ecology’s review process through the end of 2018.

- Ecology identified the following additional PLPs for this site in July 2018: the Fox Avenue Building, the Whitehead Company, Roberston-Ceco II Corporation and RCH Newco II, the City of Seattle, and the Reliable Transfer and Storage Company (Ecology 2018ab [11305], 2018ac [11306], 2018ad [11307], 2018ae [11308], and 2018af [11309]).
- Under a WQ Administrative Order (DE-13739), SIM was required to complete Phase 1 site improvements by September 30, 2017; Ecology subsequently extended the due date to November 30, 2017. The majority of Phase 1 improvements were completed in conjunction with the interim action in December 2017; final completion was in May 2018 (SIM 2018 [11523]).
- A revised Phase 2 Engineering Report, was submitted to Ecology on June 30, 2018. Ecology approved the report on July 20, 2018.
- In October 2018, SIM installed a Stormcapture Modular Wetland Treatment System, which is a passive filtration-enhanced treatment BMP. SIM amended their sampling point location and started monitoring stormwater from a single new sample point which is post treatment system effluent.
- Upon commissioning of the treatment system, stormwater was not making it through the system to the point of discharge. Troubleshooting identified a leak in the system at the pre-treatment unit. As a result, no stormwater was discharged from the system in 2018. Repair work continued into early 2019.

Seattle Iron & Metals

Ecology issued an industrial NPDES individual permit for SIM in September 2013. The individual permit 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 2015b [12205]).

Ecology and the city of Seattle conducted an unannounced inspection of SIM during a stormwater event on November 28, 2017. SIM violated several conditions of their NPDES individual permit, including the requirement to treat stormwater prior to discharge into the LDW (Ecology 2018c [11142]).

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

- Ecology issued an Immediate Action Order (Administrative Order Docket No. 15573) on January 10, 2018 in response to the violations that were observed by Ecology at the November 2017 inspection. The immediate action order requires SIM to comply with their individual NPDES Permit.

- SIM must monitor and maintain treatment system efficiency,
 - Cease all industrial activities on the South Dock,
 - Prevent sheet flow of stormwater to the LDW,
 - Cease all industrial activities on the North Dock, and
 - Submit an updated permit-compliant SWPPP (Ecology 2018c [11142]).
- SIM's consultant submitted a memorandum to Ecology on January 26, 2018 which stated that SIM had ceased using the South Dock and focused on interim upgrades on the North Dock.
 - A barge that was delivering junk cars and other items to SIM caught fire while tied to the North Dock on the night of June 26, 2018. Fire suppression water discharged from the barge into the LDW and discharged from SIM's dock area into its wastewater storage/treatment system.

After the fire, Ecology performed an inspection on June 27, 2018 to inspect the barge and docks, and to discuss the discharge of firefighting water contained in holding tanks at SIM. Ecology's WQ and Spills Programs assessed the barge and dock area, and found a spill containment boom was properly deployed around the barge, and minimal residual sheen was contained within the boom (Ecology 2018x [11538]).

The fire was a result of a punctured liquid propane tank on a truck that was being unloaded from a barge owned by ABC Recycling. On August 21, 2018 Ecology issued a Notice of Violation to ABC Recycling Nanaimo for violating provisions of Revised Code of Washington (RCW) 90.48 and the unlawful discharge to the LDW during the barge fire.

- SIM updated their SWPPP on August 20, 2018.
- At an Ecology/SIM meeting held on October 1, 2018, Ecology requested a summary of all activities completed by SIM to address the violations. SIM's consultant submitted a memorandum to Ecology to address Ecology's request on October 29, 2018. At that time, SIM had completed all of the corrective actions required by Ecology in the Immediate Action Order, with the exception of improvements to the South Dock.
- SIM's efforts in 2018 continued to be directed at improving the North and South Dock integrity and improving the performances of the stormwater treatment system in order to comply with the Immediate Action Order and the NPDES permit.
- Throughout 2018, stormwater samples collected at SIM's discharge monitoring locations exceeded permissible limits for a range of parameters, including lead, copper, zinc, TSS and TPH. Ecology issued a Warning Letter to SIM on October 4, 2018 (and ultimately a Notice of Penalty on February 11, 2019) for exceedances of the lead, copper, zinc effluent limits in samples collected during various quarterly monitoring periods in 2018.
- To minimize TPH and TSS in the treated effluent, SIM installed Polishing Absorptive Media filtration, optimizing the chemical dosing in the treatment tank, and more frequent backwashing of the filter units in 2018.

4.3 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 SD basins (Appendix A).

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

4.3.1 Business Inspections

SPU conducted six inspections at five facilities in the RM 2.0-2.3 East source control area during 2018, including five initial inspections and one follow-up inspection (Appendix C).

Ecology conducted one Urban Waters source control inspection within this source control area during the current reporting period (Appendix E).

4.3.2 Source Tracing

SPU collected two storm drain solids samples and one surface debris sample in this source control area during the current reporting period, including two locations in the S River Street SD and one in the S Brighton Street SD (Figure A-13). Results are presented in Appendix F; screening level exceedances are summarized below.

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

Chemical Class	Chemical	Inline Samples	Surface Debris Sample
Metals	Zinc	☒	☒
PCBs	PCBs, total	×	
PAHs	Individual LPAH compounds		☒
	Total LPAHs		☒
	Individual HPAH compounds		☒
	Total HPAHs		☒
	Total cPAHs		☒
Phthalates	BEHP	☒	☒
	Butylbenzyl phthalate	×	☒
	Dibutyl phthalate	☒	
	Dimethyl phthalate	×	☒
Other SVOCs	Benzoic acid		☒
	Dibenzofuran		☒
	Phenol		☒
Petroleum Hydrocarbons	Diesel range hydrocarbons		☒
	Motor oil range hydrocarbons	☒	☒

Storm drain screening levels are listed in Table 2-4.

× = Exceedance of SCO (lower screening level) was observed during the current reporting period (2018).

☒ = Exceedance of CSL/RAL/Method A (upper screening level) was observed during the current reporting period (2018).

SPU intends to collect additional samples in the S Brighton Street SD in 2019 to determine whether there are active sources of PCBs in this basin (SPU 2019 [11926]).

4.3.3 Facility-Specific Source Control Actions

No facility-specific source control updates were identified during this reporting period.

4.4 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, General Biodiesel, Samson Tug & Barge, and Duwamish Marine Center, and upland facilities in the 1st Avenue S (East) and Head of Slip 2 SD basins (Appendix A). In addition, King County's Michigan CSO (also referred to as the South Michigan CSO) discharges to the LDW at approximately RM 1.9; upland facilities associated with the Michigan combined sewer basin are included with this source control area.

4.4.1 Business Inspections

SPU conducted four inspections at two facilities (General Biodiesel and Samson Tug and Barge) in this source control area during 2018 (Appendix C).

4.4.2 Source Tracing

SPU collected one sample from a private maintenance hole in the Head of Slip 2 SD, and two samples (including one field duplicate) from a location under the northbound lanes of the 1st Avenue S bridge, within the 1st Avenue S (East) SD (Figure A-14). In the Head of Slip 2 SD, no results exceeded the CSL (upper screening level). In the 1st Avenue S (East) SD, zinc, BEHP, n-nitrosodiphenylamine, and motor oil-range hydrocarbons exceeded the CSL (upper screening level) (Appendix F).

King County collected sediment trap samples from two locations within the S Michigan combined sewer basin for another King County project in July 2018, after an approximately 1-year deployment period. Sampling locations were at Corson Ave S and S Eddy Street, and at the S Michigan Regulator Station (King County 2019 [11925]) (Figure A-15). Mercury, BEHP, benzoic acid, pentachlorophenol, and 3,4-methylphenol exceeded the CSL (upper screening level) in at least one of the samples within the S Michigan basin (Appendix G).

King County does not plan to conduct additional source tracing efforts for phthalates near the S Michigan CSO outfall at this time, but is planning to evaluate potential sources for mercury in this area (King County 2019 [11925]). The Georgetown Wet Weather Treatment Station is currently under construction and will control S Michigan CSO discharges; this is expected to greatly reduce solids discharges from the CSO and thus address phthalate and other contaminants within the discharge.

SPU and King County source tracing results are presented in Appendix F and G; screening level exceedances are summarized in Table 4-5 below.

Table 4-5. RM 1.7-2.0 East: Screening Level Exceedances

in SPU and King County Source Tracing Samples

Chemical Class	Chemical	Head of Slip 2 SD	1 st Avenue S (East) SD	S. Michigan CSO Basin
Metals	Mercury			☒
	Zinc		☒	×
PCBs	Total PCBs		×	×
Phthalates	BEHP		☒	☒
	Butylbenzyl phthalate		×	
Other SVOCs	1,2-Dichlorobenzene	×		
	3,4-Methylphenol			☒
	Benzoic acid			☒
	n-Nitrosodiphenylamine		☒	
	Pentachlorophenol			☒
Petroleum Hydrocarbons	Motor oil range hydrocarbons		☒	

Storm drain screening levels are listed in Table 2-4.

SD = storm drain

CS = combined sewer

× = Exceedance of the SCO (lower screening level) was observed during the current reporting period (2018).

☒ = Exceedance of CSL (upper screening level) was observed during the current reporting period (2018).

4.4.3 Facility-Specific Source Control Actions

Duwamish Marine Center

Ecology and the property owner entered into Agreed Order DE-8072 on September 2, 2011 (Ecology 2011d [07731]). 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.

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)
Current Operations	Tug and barge operations; metal fabrication
Historical Operations	Repair and maintenance of floating vessels; junk dealer; construction services; barge shipping terminal
Chemicals of Concern	PCBs, PAHs, petroleum hydrocarbons, metals
Media Affected	Soil and groundwater

- Duwamish Marine Center submitted a Draft RI Report in January 2018. Ecology reviewed the report and provided comments on March 21, 2018. Duwamish Marine Center revised the report and submitted a second draft to Ecology on May 4, 2018.

Georgetown Wet Weather Treatment Station

King County is developing four parcels as the site of the Georgetown Wet Weather Treatment Station. Previously, this property was referred to as Winters Investment LP/Riveretz's Auto Care. The Georgetown Wet Weather Treatment Station is currently under construction. Onsite work started in April 2017 and construction is expected to be completed in 2022. This project involves a significant dewatering and soil excavation project.

Address	6185 4 th Avenue S
Facility/Site ID	55698119 (Riveretz's Auto Care) Cleanup Site ID: 14744
NPDES Permit	None
Current Operations	Wet Weather Treatment Station
Historical Operations	Restaurants, retail and warehouse space, auto repair, and service station
Chemicals of Concern	Metals, VOCs, petroleum hydrocarbons
Media Affected	Soil and groundwater

King County designed the Georgetown Wet Weather Treatment Station to reduce the discharge of pollutants to the LDW by controlling combined sewer overflows from outfalls located at the ends of S Michigan Street and S Brandon Street. Between 2014 and 2018, these outfalls discharged an average of more than 140 million gallons per year of untreated combined sewage. Once completed, the facility will use a combination of storage and treatment to reduce the frequency of untreated CSOs to less than one per year, on a 20-year moving average.

The project includes the construction of the Wet Weather Treatment Station at the corner of 4th Avenue S and S Michigan Street. The project also includes modifying the combined sewer conveyance pipe network in the area and will install a new outfall structure adjacent to the 1st Avenue S Bridge to release the treated water into the LDW.

The approved design will treat up to 70 million gallons of combined sewage per day that would otherwise have discharged directly into the LDW without treatment during storm events. King County estimates that the project will result in a 95% reduction in the discharge of untreated combined sewage into the LDW from the Brandon and South Michigan Outfalls.

- Deconstruction of the existing site building and site preparation construction work began at the Georgetown Wet Weather Treatment Station in 2018. Work started on the construction on the new outfall structure in the summer of 2018. In the fall of 2018, preparation work started on constructing the conveyance pipeline, which will connect the treatment station to the outfall.
- In 2017 King County encountered contaminated soil and groundwater during the closure and removal of three USTs at the site. Ecology conducted an initial investigation at this site in August 2018. King County plans to conduct groundwater monitoring following the completion of the Treatment Station to test for contaminants identified during the UST removal work (Ecology 2018 ai [11501]).
- Ecology added this facility to the confirmed and suspected contaminated sites list in September 2018 (Ecology 2018al [11900]).
- King County will likely enter into the VCP (Ecology 2018ai [11501]).

Consolidated Freightways

Prologis, Inc. is the current owner of the Consolidated Freightways site. In January 2017, the site was enrolled in the VCP (NW3050). Development of the property for the construction of a 590,000-square foot industrial warehouse began in June 2017.

Consolidated Freightways conducted a cleanup action as an independent remedial action under the VCP in 2017.

Address	6050 East Marginal Way S
Facility/Site ID	54757868
NPDES Permit	None
Current Operations	Warehouse (to be completed 2018)
Historical Operations	Truck transport and motor freight
Chemicals of Concern	Naphthalene, VOCs, petroleum hydrocarbons
Media Affected	Soil and groundwater

- Consolidated Freightways submitted a Cleanup Action Closure Report to Ecology in July 2018 (Farallon 2018e [11513]).
- In October 2018, Ecology determined that upon completion of the proposed cleanup, no further remedial action will likely be necessary to cleanup contamination at the site (Ecology 2018am [11495]).

Kelly Moore Paint Company

Kelly Moore Paint Company operated at this site from 1994 to 2008. Kelly Moore entered the VCP (NW2305) in 2010 and completed an RI/FS in 2011. The southern portion of the site was sold to JST Georgetown, LLC in 2011. The northern portion of the site was sold to NCD GeorgeTown, LLC in 2014. NCD GeorgeTown, LLC demolished the buildings and warehouses on the northern portion of the property in 2015.

Address	5410 Airport Way S
Facility/Site ID	2163
NPDES Permit	None
Current Operations	Brewery
Historical Operations	Paint manufacturing plant, auto garage and wrecking yard, service station
Chemicals of Concern	PCBs, metals, SVOCs, VOCs, petroleum hydrocarbons
Media Affected	Soil and groundwater

Kelly Moore submitted an RI/FS and Disproportionate Cost Analysis to Ecology in March 2017. Kelly Moore requested an opinion from Ecology on their proposed independent cleanup.

- In February 2018 Ecology determined that upon completion of the proposed cleanup, further remedial action will likely be necessary to cleanup contamination at the site. Ecology stated that:
 - Additional site characterization is required to fully delineate the horizontal and vertical extent for each contaminant in site soil and groundwater,
 - A planned indoor air evaluation needs to be incorporated into the site characterization, and

- Additional work is required to locate and decommission two monitoring wells (KMW-03 and KMW-05) which were destroyed during property redevelopment.
- Ecology determined that the incomplete site characterization does not allow for a determination as to whether the cleanup action selected for the site meets MTCA requirements. An appropriate cleanup action can be selected only after the site is fully characterized and cleanup levels have been developed (Ecology 2018k [11498]).
- Kelly Moore conducted dry and wet season groundwater sampling events in September 2017, January 2018, and August 2018.
- In 2018 a soil vapor extraction system was installed and started operating. An air sparge system was installed and was expected to become operational in 2019. Kelly Moore planned to collect indoor air samples to assess baseline conditions prior to starting up the sparge system, and to compare soil vapor concentrations against results from baseline samples collected for the soil vapor extraction system.
- Kelly Moore developed cleanup levels based on the suggestions presented by Ecology in a meeting on May 8, 2018 (Wood 2018a [11491], 2019 [11927]).

Scougal Rubber

Scougal Rubber entered Ecology's VCP (NW1707) and developed a Remedial Action Plan to address chlorinated solvents in soil and groundwater on this site. A remedial excavation was performed at the site in April 2017 to remove residual TCE contamination in soil. An oxidation infiltration system was installed in the excavation to address the remaining TCE contamination in soil and residual chlorinated solvent (e.g., TCE, DCE, and vinyl chloride) contamination in groundwater.

Address	6239 Corson Avenue
Facility/Site ID	93637295
NPDES Permit	None
Current Operations	Rubber manufacturing
Historical Operations	Same
Chemicals of Concern	Chlorinated solvents
Media Affected	Soil and groundwater

- Supplemental groundwater characterization was conducted in April, June, and August of 2018. Samples were collected from five monitoring wells on the Scougal Rubber property and the adjacent Ewing property. TCE was detected at 31 µg/L in April 2018 (PGG 2019 [11994]).
- Oxidation infiltration events were conducted in January, April, and June 2018, with four quarters of performance monitoring planned following completion of the oxidation treatment. An additional infiltration event was scheduled for February 2019.

Emerald Tool

The Emerald Tool Site was used for electroplating, aluminum anodizing, metals grinding, and small parts manufacturing between 1968 and 1985. The site is awaiting cleanup; confirmed soil contamination includes metals and halogenated organics.

Address	6332 6 th Avenue S
Facility/Site ID	2084
Cleanup Site ID	1305
Current Operations	Electroplating, aluminum anodizing, metals grinding
Historical Operations	Manufacture and distribution of cutting tools
Chemicals of Concern	Metals, halogenated organics
Media Affected	Soil and groundwater

- In 2018, a Phase II Limited & Targeted Subsurface Investigation was conducted at an adjoining property located at 6346 6th Avenue S (Aerotech 2018c [12394]). Soil and groundwater samples were collected from six boring locations along the boundary between the two properties. One soil sample, from 3.5 to 4 feet below ground surface, contained TCE at a concentration of 0.16 mg/kg, above the MTCA Method A cleanup level of 0.03 mg/kg. One groundwater sample contained VC at 12 µg/L, above the MTCA Method A groundwater cleanup level of 0.2 µg/L.
- Ecology conducted an Initial Investigation and determined that the release of chlorinated VOCs observed on the northern portion of the property likely migrated from the Emerald Tool Site. Ecology issued a No Further Action Memorandum for the 6346 6th Avenue Site (Ecology 2018aa [12397]).

4.5 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 SD basin and most of the 8th Avenue combined sewer basin (Appendix A). Facilities adjacent to the LDW include Pacific Pile & Marine and Independent Metals Plant 2 (now closed), and United Site Services. The city of Seattle's 7th Avenue S SD and King County's 8th Avenue CSO discharge to the LDW within this source control area. The 8th Avenue CSO is controlled to no more than one untreated discharge event per year, on average.

4.5.1 Business Inspections

SPU conducted a total of 35 inspections at 22 facilities during the current reporting period, including 22 initial inspections, and 13 follow-up inspections (Appendix C).

Ecology conducted two stormwater compliance inspections (Pacific Pile & Marine Main Yard and United Site Services of Nevada) during 2018. In addition, Ecology conducted one hazardous waste inspection and 13 Urban Waters source control inspections in this source control area during 2018 (Appendix E). One other Urban Waters inspection was conducted within the 8th Avenue combined sewer basin (outside the source control area boundaries).

4.5.2 Source Tracing

SPU collected three sediment trap samples, two inline grab samples, one onsite catch basin sample, and one surface debris sample in the 7th Avenue S SD during 2018 (Figure A-16). Results are provided in Appendix F; screening level exceedances are summarized in Table 4-6 below.

Table 4-6. 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	Surface Debris
Metals	Copper			☒	
	Zinc	×		×	
PCBs	PCBs, total	×		☒	
Phthalates	BEHP	☒		☒	
	Butylbenzyl phthalate	×		×	
	Dimethyl phthalate			×	
Other SVOCs	4-Methylphenol	☒			
	Benzoic acid	☒	☒		
	Benzyl alcohol	☒	☒	☒	
Petroleum Hydrocarbons	Diesel range hydrocarbons			☒	
	Motor oil range hydrocarbons	☒		☒	

Storm drain screening levels are listed in Table 2-4.

× = Exceedance of SCO (lower screening level) was observed during the current reporting period (2018).

☒ = Exceedance of CSL/RAL/Method A (upper screening level) was observed during the current reporting period (2018).

4.5.3 Facility-Specific Source Control Actions

Independent Metals Plant 1

Ecology sent an Early Notice Letter to Independent Metals in February 2014. Independent Metals subsequently filed for bankruptcy and ceased operations in 2014. All Service Moving occupies this property and uses the site for storage and administrative operations.

- Partner Engineering conducted A Phase I Environmental Site Assessment at the Plant 1 location on behalf of First Citizens Bank. This assessment revealed evidence of environmental conditions connected with the property. Partner recommended that the property owner should follow

Address	747 S Monroe Street (Plant 1) 703 S Monroe Street (Storage Lot)
Facility/Site ID	9309618 (Plant 1) 21489 (Storage Lot)
NPDES Permit	None
Historical Operations	Scrap metals sorting, recycling, and processing.
Chemicals of Concern	PCBs, PAHs, phthalates, metals
Media Affected	Stormwater, soil, groundwater

all regulatory directives until regulatory closure is achieved for the Hazardous Sites List (Partner 2018 [11924]).

4.6 RM 2.1-2.2 West (EAA-2: Trotsky Inlet)

The RM 2.1-2.2 West (EAA-2: Trotsky Inlet) source control area includes facilities adjacent to the Trotsky Inlet (Douglas Management Company and ICS), and numerous parcels owned by Boyer Towing along the LDW shoreline (Appendix A). In addition, it includes facilities within the 2nd Avenue S SD basin.

4.6.1 Business Inspections

SPU conducted a total of 11 inspections at five facilities in this source control area in 2018, including five initial inspections and six follow-up inspections (Appendix C)

Ecology conducted one stormwater compliance inspection (Boyer Logistics) during the current reporting period (Appendix E, Table E-1). In addition, one hazardous waste inspection and one Urban Waters source control inspection were conducted in 2018 (Appendix E, Tables E-2 and E-3).

4.6.2 Source Tracing

No source tracing samples were collected in this source control area during the current reporting period.

4.6.3 Facility-Specific Source Control Actions

Industrial Container Services / Trotsky Property / Former Northwest Cooperage

Ecology entered into Agreed Order DE-6720 with Herman and Jacqueline Trotsky (owners) and ICS (operator) on May 18, 2010 (Ecology 2010b [06806]). The Agreed Order requires that the PLPs conduct an RI/FS to define the nature and extent of contamination in soil, groundwater, surface water, and sediments, and to prepare a draft CAP that identifies the preferred cleanup action and develops a schedule to remediate the contamination.

Address	7152 1 st Avenue S
Facility/Site ID	2154 (Industrial Container Services – WA, LLC)
NPDES Permit	None
Current Operations	Drum reconditioning
Historical Operations	Same as current operations
Chemicals of Concern	PCBs, PAHs, VOCs, pesticides, petroleum hydrocarbons, metals
Media Affected	Soil, groundwater, and sediment

- ICS submitted a revised draft RI Report in April 2018. Ecology provided comments to the PLPs in July 2018. The PLPs revised and resubmitted the report in October 2018.

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 prepare a draft CAP that identifies the preferred cleanup action and develops a schedule to remediate the contamination (Ecology 2011b [06425]).

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

- Ecology provided comments on Douglas Management Dock's 2017 draft RI Report in January 2018. The PLPs submitted a revised draft report to Ecology in August 2018.

4.7 RM 2.1 West (1st Avenue S Storm Drain)

The RM 2.1 West (1st Avenue S Storm Drain) source control area includes upland facilities within the 1st Avenue S SD basin (Appendix A). There are no properties adjacent to the LDW in this source control area.

4.7.1 Business Inspections

SPU conducted a total of 13 inspections at eight facilities in the 1st Avenue S storm drain basin during the current reporting period (Appendix C), including six initial inspections and seven follow-up inspections.

Ecology conducted three Urban Waters source control inspections within this source control area during 2018 (Appendix E, Table E-2).

4.7.2 Source Tracing

SPU collected three sediment trap samples, one in-line solids sample, and two onsite samples in the 1st Avenue S storm drain basin during 2018 (Figure A-18). Results are provided in Appendix F; screening level exceedances are summarized in Table 4-7 below.

Table 4-7. 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	☒		x
PCBs	PCBs, total	x		
PAHs	Benzo(g,h,i)perylene	☒		
Phthalates	BEHP	☒		☒
	Butylbenzyl phthalate			☒

Chemical Class	Chemical	Sediment Traps	In-line Solids	On-site CB Solids
	Dimethyl phthalate			☒
Other SVOCs	4-Methylphenol	☒		☒
	Benzoic acid	☒		☒
	Benzyl alcohol	☒		
	n-Nitrosodiphenylamine			☒
Petroleum Hydrocarbons	Motor oil range hydrocarbons	☒		☒

Storm drain screening levels are listed in Table 2-4.

× = Exceedance of SCO (lower screening level) was observed during the current reporting period (2018).

☒ = Exceedance of CSL/RAL/Method A (upper screening level) was observed during the current reporting period (2018).

4.7.3 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 CAP for this site (Ecology 2009a [06677]).

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 [12280]).

- Ecology issued a Final CAP for this site in March 2018. The CAP describes the cleanup action approved by Ecology for the “Settlement Area” portion of this site. The cleanup action for this portion of the site consists of a landfill cap/cover, landfill gas controls, stormwater controls, long-term monitoring of groundwater, long-term monitoring of the cap/cover, the landfill gas controls, and the groundwater, and environmental covenants (Ecology 2018n [11904]).
- Ecology finalized the Public Participation Plan for this site in May 2018 (Ecology 2018v [11302]).

The landfill cap and stormwater control elements of the Interim Action were constructed between April 2014 and April 2015.

- In April 2018 the PLPs submitted an annual inspection progress report to Ecology describing the results of the landfill cap annual inspections conducted in 2017. There were no penetrations of the asphaltic concrete low-permeable cap, erosion of soil on the property, or damage to the stormwater management facilities during the 2017 inspections.
- On September 6, 2017, the wellhead for H-19 was raised approximately 3 inches to meet with existing asphalt grade.

Address	8200 2 nd Avenue S
Facility/Site ID	2180
NPDES Permit	None
Current Operations	Solid waste transfer station, school bus parking
Historical Operations	Landfill, auto wrecking yard
Chemicals of Concern	VOCs, landfill gas, petroleum hydrocarbons, metals
Media Affected	Soil and groundwater

- The landfill cap and stormwater elements of the interim action were inspected on a quarterly basis in 2018 to monitor conditions of these systems and to make repairs as necessary (Farallon 2018b [11913]).

The landfill gas collection and control system was installed between June and December 2014.

- In April 2018 the PLPs submitted a technical memorandum describing the operation of the interim action landfill gas collection and control system during 2017. The landfill gas collection and control system operated continuously at a low extraction rate of approximately 10 standard cubic feet per minute for the whole system in 2017.
- Monitoring indicated that residual nitrogen tends to rise in landfill gas collected when the landfill gas collection and control system extraction rate is high, and methane concentrations tend to rise in perimeter probes when the extraction rate is low.
- Horizontal and vertical landfill gas collector extraction flow rates were adjusted periodically to control methane at the perimeter probes without over-extraction of landfill gas and to achieve compliance monitoring criteria.
- During 2018, the landfill gas collection and control system was monitored quarterly and operated to maintain compliance with compliance monitoring criteria, with a continued focus on maximizing methane control along 5th Avenue S, and on the northwestern portion of the interim action area. This will be documented in the 2018 summary report which was scheduled to be completed in the first quarter of 2019 (Farallon 2018c [11914]).

4.8 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, including Northland Services and Lineage Seafreeze (Appendix A). In addition, it includes properties located within the Highland Park Way SW SD basin and portions of the SW Kenny Street CSO/SD basin. The Terminal 115 CSO and West Michigan CSO discharge to the LDW within this source control area.

4.8.1 Business Inspections

SPU conducted three inspections at two facilities (Emswiler Construction and Gene Summy Lumber) in this source control area during the current reporting period (Appendix C).

Ecology conducted one hazardous waste inspection within this source control area during the current reporting period (Appendix E-3).

4.8.2 Source Tracing

SPU collected two sediment trap samples, two in-line solids grab samples, and one right-of-way catch basin sample in the Highland Park Way SW basin during the current reporting period. In the SW Kenny Street SD basin, SPU collected one sediment trap sample during 2018.

King County's T-115 CSO (which is within this source control area) is controlled by an overflow weir, not a regulator station. Because King County could obtain no access at or just upstream of this weir, a sediment trap sample was collected from a maintenance hole just north of the West

Marginal Pump Station to represent potential discharges from the West Duwamish Interceptor at T-115 CSO. BEHP and mercury were above the CSL at this location (see Appendix G).

Results are presented in Appendix F, and screening level exceedances are summarized in Table 4-8 below.

Table 4-8. RM 1.6-2.1 West: Screening Level Exceedances in SPU Source Tracing Samples

Chemical Class	Chemical	Highland Park Way SW SD			SW Kenny Street CSO/SD
		Sediment Traps	In-line Solids	ROW CB Solids	Sediment Trap
Metals	Zinc	×	×	×	
PCBs	PCBs, total	×	×	×	×
Phthalates	BEHP	☒	☒	☒	☒
	Butylbenzyl phthalate	×	×	☒	
	Dimethyl phthalate		☒	×	
Other SVOCs	4-Methylphenol				
	Benzoic acid		☒		
	Benzyl alcohol	☒	☒	☒	☒
Petroleum Hydrocarbons	Motor oil range hydrocarbons	☒	☒	☒	

Storm drain screening levels are listed in Table 2-4.

× = Exceedance of SCO (lower screening level) was observed during the current reporting period (2018).

☒ = Exceedance of CSL/RAL/Method A (upper screening level) was observed during the current reporting period (2018).

4.8.3 Facility-Specific Source Control Actions

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 is conducting an RI/FS and will prepare a draft CAP at this site (Ecology 2011a [06472]). The Port of Seattle submitted the first draft of the RI Report for the site in late 2017.

Address	6000 West Marginal Way SW
Facility/Site ID	2177
Current Operations	Lumber distribution, vehicle storage
Historical Operations	Tin reclamation
Chemicals of Concern	PAHs, SVOCs, petroleum hydrocarbons, metals, PCBs
Media Affected	Soil and groundwater

- Ecology provided comments on the Draft RI in December 2018. Ecology required the Port of Seattle to submit a second Draft RI in 2020.

5.0 Lower Reach Source Control Areas

This Lower Reach includes eight source control areas; five areas are located on the east side of the LDW, and three on the west side:

East Side:	Report Section
RM 1.2-1.7 East (Saint Gobain to Glacier Northwest)	5.1
RM 1.0-1.2 East (King County Lease Parcels)	5.2
RM 0.9-1.0 East (Slip 1)	5.3
RM 0.1-0.9 East (EAA-1: Duwamish/Diagonal Way)	5.4
RM 0.0-0.1 East (Spokane Street to Ash Grove Cement)	5.5
West Side:	
RM 1.3-1.6 West (Glacier Bay)	5.6
RM 1.0-1.3 West (Kellogg Island to Lafarge Cement)	5.7
RM 0.0-1.0 West (Spokane Street to Kellogg Island)	5.8

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.

The east side of the Lower Reach includes one Ecology TCP cleanup site (Snopac Property) and several Ecology HWTR cleanup sites within the Brandon CSO drainage basin: 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. These sites are in the greater LDW source area although not within a source control area boundary; they are discussed with the RM 1.0-1.2 East source control area (Section 5.2). In addition, the Rainier Commons site is an EPA-lead cleanup site under TSCA.

The west side of the Lower Reach includes two Ecology TCP cleanup sites: Glacier Northwest/Reichhold Chemical and Duwamish Shipyard.

5.1 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: Ardagh Glass (formerly Saint Gobain Containers), Longview Fibre, and CertainTeed Gypsum (Appendix A). Many 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 are discussed in Section 5.2 (RM 1.0-1.2 East).

5.1.1 Business Inspections

King County conducts annual inspections at Ardagh Glass. The September 2018 inspection of the Ardagh facility found six catch basins and two cisterns in need of cleaning and one catch basin required repair. This work was completed in December 2018 (King County 2019 [11925]).

Ecology conducted stormwater compliance inspections at CertainTeed Gypsum (December 2018) and Ardagh Glass (November 2018) during the current reporting period. Inspection findings are presented in Appendix E, Table E-1.

5.1.2 Source Tracing

No source tracing samples were collected in this source control area during the current reporting period.

5.1.3 Facility-Specific Source Control Actions

No facility specific source control updates were identified during this reporting period.

5.2 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) (Appendix A). In addition, the Brandon CSO discharges to the LDW within this source control area. Groundwater contamination associated with facilities in the Brandon CSO basin has migrated off the properties and into the RM 1.2-1.7 East source control area (Section 5.1) and the RM 1.7-2.0 East source control area (Section 4.4).

5.2.1 Business Inspections

King County conducts annual inspections at the Lehigh-Cadman facility. Six catch basins, two pipes, and a sediment vault needed cleaning, which was accomplished in September 2018 (King County 2019 [11925]). King County also inspected the J.A. Jacks facility and identified two catch basins that required cleaning. This work was performed in October 2018 (King County 2019 [11925]).

Ecology conducted three hazardous waste inspections and three Urban Waters source control inspections in this source control area (including in the Brandon CSO drainage basin which discharges to the LDW within this source control area) during the current reporting period (Appendix E, Tables E-2 and E-3).

5.2.2 Source Tracing

No source tracing samples were collected within this source control area during 2018.

5.2.3 Facility-Specific Source Control Actions

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 Union Pacific Railroad, 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).

Address	734 S Lucile Street
Facility/Site ID	47779679
NPDES Permit	None
Current Operations	Storage area for corrective actions in progress at the facility
Historical Operations	Hazardous waste treatment and storage
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; amended July 2015) and its attached CAP.

The area to the west of 4th Avenue S has been investigated by three additional PLPs: Art Brass Plating, Blaser Die Casting, and Capital Industries, under separate 2008 Orders. The 2018 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.

- Stericycle monitored two studies designed to evaluate the reduction of 1,4-dioxane in groundwater in 2018. Both studies utilized underground methods of treatment.
 - The in-situ chemical oxidation (ISCO) study utilized oxidant-containing wax “candles” inserted into three wells, which slowly released persulfate and permanganate into the contaminated groundwater. In the fall of 2018, Ecology and Stericycle concluded that the oxidant-containing wax “candles” did not offer improvements over the direct injection of oxidant.
 - The bioaugmentation study introduced 2.5 gallons of non-native microorganisms known to degrade 1,4-dioxane into groundwater through an existing monitoring well. By mid-year it was apparent that the new microorganisms were not thriving and 1,4-dioxane was not being significantly biodegraded.
- Stericycle proceeded to prepare a Conceptual Design for a full-scale 1,4-dioxane ISCO-based cleanup action using injections in 2018. Additional sampling and bench-scale tests were then performed to optimize the design of the remedy (ISOTEC 2018 [11997]).
- Throughout 2018 Stericycle continued work on the draft 95% Remedial Design and Remedial Action Work Plan (engineering design report), due to Ecology in early 2019 (Ecology 2018an [11989]).

- A multi-year bioremediation project, started in April 2016, targets chlorinated VOCs in groundwater within the area enclosed by the facility’s barrier wall (installed in 2004). This involves semi-annual injections of anaerobic-biodegradation enhancements followed by short intervals of recirculation to distribute the enhancement material. Two injection/recirculation events occurred in 2018. The last event is scheduled for May 2020.
- Ecology approved a Tier 5 Well Installation Work Plan in August 2018 (Ecology 2018ak [11903], Pioneer 2018 [11998]).
- In November 2018, Stericycle installed four new water table monitoring wells. The wells will be sampled for several seasonal monitoring rounds to determine how high TCE and other VOC groundwater concentrations remain in localized areas near the previously mitigated buildings. The monitoring data will be used to assess whether there is still the potential for unacceptable vapor intrusion impacts to indoor air.
- In 2018 Stericycle modified their facility’s RCRA permit to include by reference the West of 4th Agreed Order Amendment (see below).

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

Groundwater contamination from the PSC Georgetown facility has migrated offsite toward 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

west and southwest, toward the LDW. Cleanup activities have been underway at these facilities since 2008. The FS stage of the West of 4th site cleanup is governed by Agreed Order DE-10402 (April 2014; amended November 2017).

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

- In January 2018, Ecology approved two pilot-study work plans: the In Situ Metals Immobilization Pilot Testing Work Plan and the CVOC Pilot Study Work Plan. PLPs subsequently started preliminary pilot study work (Ecology 2018d [11906], Ecology 2018e [11908]).
- Ecology approved a revised Metals Immobilization Pilot Study Field Implementation Work Plan in August 2018 (Aspect 2018g [11809], Ecology 2018aj [11907]).
 - The field stage of the metals immobilization study was performed in mid-September 2018. Sodium bicarbonate was gravity-fed into two injection wells and performance monitoring was initiated.

- The first groundwater monitoring results were submitted to Ecology on November 30, 2018. They indicated that groundwater geochemistry changed immediately following the injections, but the pH shift was not as high as expected.
- Ecology commented on the CVOC Pilot Study Work Plan in April 2018 (Aspect 2018d [11774], Ecology 2018q [11909]).
 - Prior to beginning the injection-phase of the CVOC study, the PLPs measured methane levels in soil gas within the project area. Elevated methane levels were detected at one location. Soil gas methane monitoring was added to the project's post-injection monitoring program (Aspect 2018f [11775]).
 - Ecology approved the revised CVOC pilot study field investigation work plan in September 2018 (Ecology 2018z [11910]).
 - Treatment reagent was injected into groundwater in October 2018, monitoring commenced immediately thereafter. The PLPs intend to submit the first group of monitoring results in late February of 2019.

In 2017 the PLP Group submitted an interim action work plan for remediating contaminated soils and shallow groundwater beneath Capital Industries' Plant 4. Contaminants in this area include elevated levels of PCE and associated degradation products.

- Ecology approved the interim action work plan in January 2018 (Ecology 2018f [11895]).
- An interim action Field Implementation Work Plan, proposing the use of potassium permanganate as the ISCO oxidant, was subsequently submitted and its first-phase proposals were approved in May 2018 (Aspect 2018b [11642], Aspect 2018e [11656], Farallon 2018a [11911], Farallon 2018d [11912], Ecology 2018o [11898], Ecology 2018t [11897]).
- In mid-August 2018 a potassium permanganate solution was injected into five first-phase locations below the Plant 4 slab.
- Soil corings and groundwater sampling were conducted to evaluate the effectiveness of the first-phase injections in August and September 2018.
 - Ecology and the PLPs concluded from this information that the oxidant had not been uniformly or predictably distributed in the vadose zone.
 - Rather than proceed to the second phase of ISCO, in October, the PLPs proposed to submit a draft "Stage 1 report" for Ecology's review.
 - The report would compile the performance monitoring results and consider whether an optional cleanup technology (such as soil vapor extraction) should be tested before completing the interim action. The report was not submitted by the end of 2018.
- In November 2018, the PLP Group collected direct-push groundwater samples in close proximity to vapor intrusion-mitigated homes located along Orcas Street (in Site Unit 2). They installed two new water table monitoring wells near homes located one block south and west. In both areas the objective is to determine the current levels of groundwater

TCE concentrations and to determine whether there is still the potential for unacceptable vapor intrusion impacts to indoor air.

GE Aviation

Ecology approved a Focused Feasibility Study in 2009. A 2014 Final Consent Decree requires conducting remedial actions; these include installation of multi-phased in-situ groundwater treatment, a hydraulic control system and a vapor intrusion mitigation system to meet soil, groundwater and indoor air cleanup levels.

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

- GE completed Phase I of the ISCO remedy in March 2018. The ISCO remedy included injection of sodium persulfate into the shallow and intermediate groundwater, continued operation of the hydraulic control system, continued operation of the vapor intrusion mitigation system, and institutional controls. Post injection groundwater monitoring indicated the method did not adequately destroy the TCE and other groundwater contaminants (AECOM 2018a [11282]).
- GE applied a different cleanup method, releasing persulfate from slow diffusion bags into several groundwater wells on the property (General Electric 2018 [11996], AECOM 2018b [11123]). This method was also incapable of destroying the TCE and other groundwater contaminants. Groundwater contaminants still exceed Ecology cleanup levels.
- GE relocated one of the groundwater extraction wells (RW-3) to a new location (RW-4) in summer 2018. This requirement of the Ecology CAP and final cleanup engineering design report was expected to further minimize the amount of groundwater contaminated with TCE leaving the source property at 220 S Dawson Street (AECOM 2018c [11979]).
- GE continues to operate the groundwater hydraulic control system, and the vapor intrusion mitigation system which are requirements of the Ecology CAP and final cleanup engineering design report (Ecology 2018ag [11286], Ecology 2018ah [11287]).
- In December 2018, Ecology approved an indoor air quality monitoring plan for GE to collect indoor air samples to verify indoor air quality for the south side of McKinstry's 5005 3rd Avenue building (AECOM 2018d [11208], Ecology 2018at [11899], Ecology 2018au [11285]).

Bob's Texaco

Residual soil contamination was left in place after a 1995 removal of USTs at this property.

- A Phase 1 Environmental Site Assessment was completed in January 2017; it concluded that soil and groundwater contamination are suspected to remain at the property (Partner 2017 [12391]).

Address	5304 1 st Avenue S
Facility/Site ID	47157762
Cleanup Site ID	9354
Current Operations	Office, truck garage, warehouse
Historical Operations	Service station, fast food restaurant
Chemicals of Concern	Petroleum hydrocarbons, BTEX
Media Affected	Soil and groundwater

- A supplemental site investigation was performed by Ecology in 2017 to provide current environmental data for the property; a draft report was published in May 2018 (Kennedy/Jenks 2018 [12392]). The investigation identified several data gaps, including insufficient information regarding the lateral extent of subsurface soil and groundwater contamination, and the lack of data to evaluate the vapor intrusion pathway. Additional investigation was recommended.
-

5.3 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 (Appendix A). No public storm drain outfalls are located within RM 0.9-1.0 East.

5.3.1 Business Inspections

King County conducts annual inspections at the Manson Construction property; this parcel was found to be compliant at the September 2018 inspection (King County 2019 [11925])

5.3.2 Source Tracing

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

5.3.3 Facility-Specific Source Control Actions

Snopac Property

The Snopac property was identified as a potential source of contaminants to the LDW. Sediment samples collected in Slip 1 near the Snopac property contained PAHs, PCBs, and metals above screening levels. A seep near the southwest corner of Slip 1 contained metals, including arsenic, copper, lead, mercury, and zinc, at concentrations above the marine chronic water quality standard. The current owner of the property (5055 Properties LLC) is planning to demolish the warehouse building and remove contaminated soil containing sandblast grit. Between 2015 and 2018, 5055 Properties LLC conducted a remedial investigation at the Site.

Address	5053-5055 East Marginal Way S
Facility/Site ID	1523145, 3967301
Cleanup Site ID	12463
Current Operations	Construction equipment warehouse
Historical Operations	Disposal of spent sandblast grit, fish packing, marine equipment storage
Chemicals of Concern	Metals, PAHs, PCBs, petroleum hydrocarbons
Media Affected	Soil, groundwater, sediment

- Soil and groundwater characterization was conducted during 2017 and 2018, including sampling of 26 soil borings, 15 test pits, and 12 groundwater monitoring wells .
- In-water subsurface sediment samples were collected in 2018 due to the limited LDW RI/FS data available at the head of Slip 1. These samples were intended to support design of the LDW remedial action.
- An RI Report was expected to be completed in 2019; results will be summarized in the next Source Control Status Report.
- Ecology planned to negotiate an Agreed Order with 5055 Properties LLC during 2019.

GSA Federal Center South

This property is currently undergoing an independent cleanup by the U.S. General Services Administration. Soil and groundwater are contaminated with petroleum hydrocarbons and chlorinated solvents. A pilot groundwater remediation study was completed in 2012 to assess the potential effectiveness of enhanced bioremediation in reducing concentrations of VC in groundwater. In 2012, all structures on the central and northwestern portion of the property were removed and a new office building was constructed.

Address	4735 East Marginal Way S
Facility/Site ID	10233917
Cleanup Site ID	5512
Current Operations	Federal offices
Historical Operations	Automobile assembly and showroom; US Army general depot, missile production, motor pool
Chemicals of Concern	Petroleum hydrocarbons, benzene, non-halogenated solvents
Media Affected	Soil and groundwater

A site characterization was conducted in 2015 to address areas of concern identified by Ecology (EHSI 2015 [12389]). Results indicated three areas on the Site where MTCA cleanup levels are exceeded in soil. In groundwater, several areas were identified with petroleum hydrocarbons and VOCs in comingled plumes with concentrations above MTCA Method A cleanup levels. TCE in groundwater exceeded cleanup levels in the north center portion of the Site; VC in groundwater exceeded cleanup levels on the east side of the Site. Based on results of the site characterization, Ecology identified numerous data gaps and determined that an RI report that summarizes all previous investigations is required (Ecology 2015e [12390]).

- An Environmental Summary and Data Gap Analysis was prepared for the northern portion of the property in 2018 (Kane 2018, document not available). This report recommended redevelopment of all available groundwater monitoring wells followed by sampling and chemical analysis for TPH and VOCs. These data will be used to develop a plan for further investigation of soil and groundwater at the Site.
- A site reconnaissance visit was conducted by Kane Environmental in July 2018, and sampling was scheduled for April/May 2019 (Kane 2019 [12388]).

5.4 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 (Appendix A). In addition, it includes facilities within the Diagonal Avenue S and S Nevada Street SD basins. The Diagonal Avenue S CSO/SD outfall (which includes discharges from city and county CSOs) and King County's Duwamish East/Hanford #1 combined sewer pump station are located within this source control area.

5.4.1 Business Inspections

SPU conducted a total of 111 business inspections at 71 facilities in the Diagonal Avenue S CSO/SD and S Nevada Street drainage basins during the current reporting period (Appendix C).

Ecology conducted stormwater compliance inspections at five facilities within this source control area in 2018 (Appendix E, Table E-1). In addition, Ecology conducted 11 source control inspections and three hazardous waste inspections within the RM 0.1-0.9 East source control in 2018 (Appendix E, Tables E-2 and E-3). Two source control inspections were conducted within the Hanford #1 combined sewer area.

In 2018, SPU cleaned approximately 500 linear feet of pipe in the Diagonal Avenue S CSO/SD system. The short segment in the Diagonal Avenue S CSO/SD was cleaned to remove PCB and arsenic-contaminated material that was found during routine source tracing sampling. This work was conducted to remove solids that have accumulated in the MS4 in order to prevent them from discharging into the LDW and to facilitate source tracing efforts (SPU 2019 [11926]).

5.4.2 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, six sediment trap samples; six in-line solids samples (including two field duplicates); six on-site catch basin samples (including

one field duplicate); one right-of-way catch basin sample; and one surface debris sample were collected in this drainage basin (Figure A-25). In addition, four sediment trap samples were collected as part of SPU’s sediment trap pilot study (see Section 2.3.1).

One right-of-way catch basin sample was collected in the S Nevada Street SD in May 2018.

Total PCBs were detected in catch basin sample at MH18, located at 6th Avenue S and S Snoqualmie Street, at 46 mg/kg DW, over 350 times the lower screening level of 0.13 mg/kg DW. Complete sample results for the current reporting period are presented in Appendix F; screening level exceedances are summarized in Table 5-1 below.

King County collected sediment trap samples at two locations within the Hanford #1 CSO drainage basin. The two locations sampled were: the area of South Hanford Street & MLK Way South and the area of Rainier Ave South and South Estelle Street. BEHP and mercury were above the CSL at each location (see Appendix G).

Table 5-1. 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	Arsenic		☒	☒	
	Lead			x	
	Mercury		☒		
	Zinc	x	☒	☒	☒
PCBs	Total PCBs	x	☒	x	x
PAHs	Individual LPAH compounds	☒	☒	☒	☒
	Total LPAHs			**	
	Individual HPAH compounds		☒	☒	☒
	Total HPAHs		☒	**	☒
	Total cPAHs		☒	**	☒
Phthalates	BEHP	☒	☒	☒	☒
	Butylbenzyl phthalate	x	☒	x	x
	Dimethyl phthalate		x	☒	x
Other SVOCs	1,2-Dichlorobenzene		☒		
	1,4-Dichlorobenzene		☒		
	4-Methylphenol	☒		☒	☒
	Benzoic acid	☒	☒	☒	☒
	Benzyl alcohol	☒	x	☒	☒
	Dibenzofuran			☒	
	n-Nitrosodiphenylamine	☒		☒	☒
Phenol	x			x	
Petroleum hydrocarbons	Motor oil range hydrocarbons	☒	☒	☒	☒

Storm drain screening levels are listed in Table 2-4.

* Includes surface debris sample.

** Not calculated because several results were rejected during validation.

x = Exceedance of SCO (lower screening level) was observed during the current reporting period (2018).

☒ = Exceedance of CSL/RAL/Method A (upper screening level) was observed during the current reporting period (2018).

5.4.3 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.

- EPA and the Port of Seattle signed an Administrative Settlement Agreement and Order on Consent for Removal Action, Preliminary Assessment and Site Investigation at Terminal 108 on April 5, 2018.
- The Preliminary Assessment report was submitted to EPA in December 2018.

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

Rainier Commons / Former Rainier Brewery Property

The former Rainier Brewery property is currently known as Rainier Commons, a complex of 27 buildings. 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.

Rainier Commons prepared a general work plan for removal of paint from building exterior surfaces, sampling of some substrates, and complete removal of paint from the interior stairwell area in 2013. A Phase II work plan was submitted to EPA in April 2015. Abatement was completed for Phases I and IIa, which include the west side of Buildings 10 and 11, all of Building 13, and the south side of Building 15.

- A Phase IIb application was submitted to EPA in 2017. The application covers abatement of Building West, Building 7 West and South, Building 8 and 9 elevator shaft and parapet walls, Building 10 South and the catwalk. No information on the status of this effort was available at the time this Source Control Status Report was prepared.

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

- When the south side of Building 15 was abated, additional catch basin monitoring took place before, during, and after Phase IIa work. A completion report for this work from Rainier is forthcoming.

Mount Baker Properties

The Mount Baker Housing Association (MBHA) plans to redevelop the cluster of lots where S McClellan Street intersects with Martin Luther King Jr Way S. This is located one block from Sound Transit’s Mount Baker Link light rail station. MBHA plans to build 166 affordable housing units with street level retail.

Address	2800 MLK Jr. Way S, 2864 S McClellan Street, 2810 S McClellan Street, 2806 S McClellan Street, and 2802 S McClellan Street
Facility/Site ID	Facility Site ID: 96127971 / Cleanup Site ID: 13054
NPDES Permit	None
Current Operations	Housing Development
Historical Operations	Dry Cleaners, Gas Station, Auto Repair
Chemicals of Concern	Chlorinated solvents, petroleum hydrocarbons
Media Affected	Soil, groundwater, soil vapor

Ecology entered into a Prospective Purchaser Consent

Decree with MBHA in 2016 which was amended and filed February 24, 2017. The consent decree requires MBHA to complete an RI and FS for the site.

- In 2017 MBHA conducted RI drilling to refine the conceptual site model.
 - Field work consisted of direct-push and hollow-stem auger drilling, monitoring well installation, monitoring well development, and soil, groundwater and soil vapor sampling.
 - Ten monitoring wells were installed, seven soil vapor samples were obtained, and an additional 11 borings were completed (Aspect 2018c [11739]).
- MBHA started preparing the RI report in late 2017 (Aspect 2018a [11723]).
- In early 2018 MBHA continued to evaluate chemical analytical results of soil, groundwater, and soil vapor samples that were obtained during the RI drilling to refine the conceptual site model. They also discussed the next steps with Ecology (Aspect 2018c [11739]).
- MBHA plans to conduct a soil vapor investigation to determine whether the soil vapor intrusion pathway is complete for petroleum and chlorinated solvents. MBHA submitted a soil vapor investigation work plan to Ecology in September 2018. The results of the soil vapor investigation will be submitted to Ecology as a technical memo and included as part of the RI report for this site (GHD 2018 [11916]).

Grand Street Commons

Grand Street Commons (GSC) plans to redevelop several properties in southeast Seattle for a mix of affordable and market-rate housing project. GSC is a partnership between MBHA, Lake Union Partners, and HAL Real Estate. This project is expected to be completed by 2023 when the new East Link light rail station is scheduled to open nearby. As part of the project, they plan to clean up about 3.2 acres of contaminated property.

Address	1750 22 nd Avenue S Seattle
Facility/Site ID	Facility Site ID: 97763114/Cleanup Site ID: 3018
NPDES Permit	None
Current Operations	Housing development
Historical Operations	Manufacturing, welding, foundry, commercial dry cleaning, vehicle repair, service station
Chemicals of Concern	Petroleum hydrocarbons, benzene, xylenes, cadmium, lead, naphthalene, chlorinated solvents
Media Affected	Soil, groundwater

- Ecology entered into Prospective Purchaser Consent Decrees with GSC and MBHA. The consent decrees require GSC and MBHA to complete an RI and FS to evaluate the extent of the contaminated area and to develop cleanup options.
- Ecology held a comment period on the draft consent decrees and on the Public Participation Plan from April 20 through May 19, 2018 (Ecology 2018r [11901], 2018s [11902]).
- The Prospective Purchaser Consent Decrees were initially signed in May 2018, amended in July 2018, and finalized in early September 2018 (King County Superior Court 2018a [11919], 2018b [11917], and 2018c [11918]).
- The PLPs started preparing an RI work plan for this site in the fall of 2018 (Aspect 2018h [11722]).

5.5 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 (Appendix A).

5.5.1 Business Inspections

No business inspections were conducted in this source control area during 2018.

5.5.2 Source Tracing

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

5.5.3 Facility-Specific Source Control Actions

No facility-specific source control updates were identified during this reporting period.

5.6 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/West Marginal Way Site), and portions of the SW Kenny Street SD basin (Appendix A). The SW Kenny Street SD discharges to the LDW within the RM 1.6-2.1 West (Terminal 115) source control area, and is discussed in Section 4.8.

5.6.1 Business Inspections

No inspections were conducted in this source control area during 2018.

5.6.2 Source Tracing

No source tracing samples were collected in this source control area during the current reporting period.

5.6.3 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 [06819]). Stormwater from this property is currently treated and discharged at the Alaska Marine Lines outfall under NPDES Permit WAR001365.

- Duwamish Shipyard continued revisions to the RI report during 2018. A revised RI report was expected to be completed in 2019.

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

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 [06908]).

RI field investigations were completed between March 2009 and August 2014. Glacier Northwest submitted a draft RI report to Ecology in May 2015.

- Ecology provided Glacier Northwest with review comments of the draft RI in January 2018.

Glacier Northwest submitted a data gaps work plan to Ecology in July 2018, and a treatability testing work plan in October 2018.

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)
Current Operations	Cement storage and distribution
Historical Operations	Manufacture of activated charcoal, resins, glues, pentachlorophenol
Chemicals of Concern	Pentachlorophenol, dioxins/furans, metals
Media Affected	Soil, groundwater, surface water, and sediment

5.7 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 (Appendix A). There are no public storm drains that discharge to the LDW within this source control area.

5.7.1 Business Inspections

KCIW inspects the Lafarge Cement facility at least annually, since it is classified as a SIU and is regulated under a waste discharge permit. The facility was inspected on May 23, 2018.

5.7.2 Source Tracing

No source tracing samples were collected during this reporting period.

5.7.3 Facility-Specific Source Control Actions

Lafarge Cement

Lafarge is authorized under an individual permit to discharge stormwater to the LDW via outfall 008. This outfall drains the entire facility except for a small area around the truck wash and certain areas used periodically for material transloading or other activities. All other process wastewater is hauled offsite for disposal.

- On September 19, 2018 Lafarge violated the conditions of their NPDES permit when they dropped a super sack containing 21,300 pounds of soil predominantly contaminated with diesel and metals during transloading activities. Some of the contaminated soil fell into the LDW. Lafarge's contractor recovered approximately 4,000 pounds of the estimated 4,020 pounds of soil that spilled into the LDW.
- Ecology sent Lafarge a letter on September 19, 2018 requiring Lafarge to clean up the dock and barge to minimize the contaminated soil that could enter the storm drain or the waterway, and to update BMPs for transloading super sacks. Lafarge responded to Ecology on October 18, 2018.
- Ecology issued a Notice of Penalty for Lafarge on February 6, 2019 for violating the permit and RCW.

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

5.8 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 (Appendix A). In addition, it includes properties in the SW Dakota Street and SW Idaho Street SD basins. The Duwamish West CSO pump station is located within this source control area.

5.8.1 Business Inspections

SPU conducted initial and follow-up inspections at three Global Diving and Salvage Inc. facility locations within this source control area in 2018 (Appendix C).

5.8.2 Source Tracing

SPU collected three sediment trap samples in the SW Idaho Street SD basin and one inline grab sample in the SW Dakota Street SD during the current reporting period (Figure A-29). Sample

results are presented in Appendix F; screening level exceedances are summarized in Table 5-2 below.

Table 5-2. RM 0.0-1.0 West: Screening Level Exceedances in SPU Source Tracing Samples

Chemical Class	Chemical	Sediment Traps	In-line Solids
Metals	Zinc	☒	×
PCBs	PCBs, total	×	×
Phthalates	BEHP	☒	☒
	Butylbenzyl phthalate	×	
Other SVOCs	4-Methylphenol	☒	
	Benzoic acid	☒	☒
	Benzyl alcohol	☒	☒
	Phenol	×	
Petroleum Hydrocarbons	Motor oil range hydrocarbons		☒

Storm drain screening levels are listed in Table 2-4.

× = Exceedance of SCO (lower screening level) was observed during the current reporting period (2018).

☒ = Exceedance of CSL/RAL/Method A (upper screening level) was observed during the current reporting period (2018).

5.8.3 Facility-Specific Source Control Actions

No facility-specific source control activities were identified during the current reporting period.

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Appendix A: Source Control Area Maps

List of Maps

Figure A-1. Lower Duwamish Waterway Source Control Areas

Upper Reach:

Figure A-2. RM 4.9 East (EAA-7: Norfolk CSO/Storm Drain) Source Control Area

Figure A-3. RM 4.9 East (EAA07: Norfolk CSO/Storm Drain) Norfolk Basin

Figure A-4. RM 4.3-4.9 East (Boeing Developmental Center) Source Control Area

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

Figure A-6. RM 3.7-3.9 East (EAA-6: Boeing Isaacson/Central KCIA) Source Control Area

Figure A-7. RM 2.8-3.7 East (EAA-4: Boeing Plant 2 to Jorgensen Forge) Source Control Area

Figure A-8. RM 4.2-5.8 West (Restoration Areas) Source Control Area

Figure A-9. RM 3.8-4.2 West (Sea King Industrial Park) Source Control Area

Figure A-10. RM 3.4-3.8 West (EAA-5: Terminal 117) Source Control Area

Middle Reach:

Figure A-11. RM 2.8 East (EAA-3: Slip 4) Source Control Area

Figure A-12. RM 2.3-2.8 East (Seattle Boiler Works to Slip 4) Source Control Area

Figure A-13. RM 2.0-2.3 East (Slip 3 to Seattle Boiler Works) Source Control Area

Figure A-14. RM 1.7-2.0 East (Slip 2 to Slip 3) Source Control Area

Figure A-15. RM 1.7-2.0 East (Slip 2 to Slip 3) Michigan Street CSO Basin

Figure A-16. RM 2.2-3.4 West (Riverside Drive) Source Control Area

Figure A-17. RM 2.1-2.2 West (EAA-2: Trotsky Inlet) Source Control Area

Figure A-18. RM 2.1 West (1st Avenue South Storm Drain) Source Control Area

Figure A-19. RM 1.6-2.1 West (Terminal 115) Source Control Area

Lower Reach:

Figure A-20. RM 1.2-1.7 East (Saint Gobain to Glacier Northwest) Source Control Area

Figure A-21. RM 1.0-1.2 East (King County Lease Parcels) Source Control Area

Figure A-22. RM 1.0-1.2 East (King County Lease Parcels) Brandon CSO Basin

Figure A-23. RM 0.9-1.0 East (Slip 1) Source Control Area

Figure A-24. RM 0.1-0.9 East (EAA-1: Duwamish/Diagonal Way) Source Control Area

Figure A-25. RM 0.1-0.9 East (EAA-1: Duwamish/Diagonal Way) Diagonal Avenue S Storm Drain Basin

Figure A-26. RM 0.0-0.1 East (Spokane Street to Ash Grove Cement) Source Control Area

Figure A-27. RM 1.3-1.6 West (Glacier Bay) Source Control Area

Figure A-28. RM 1.0-1.3 West (Kellogg Island to Lafarge Cement) Source Control Area

Figure A-29. RM 0.0-1.0 West (Spokane Street to Kellogg Island) Source Control Area

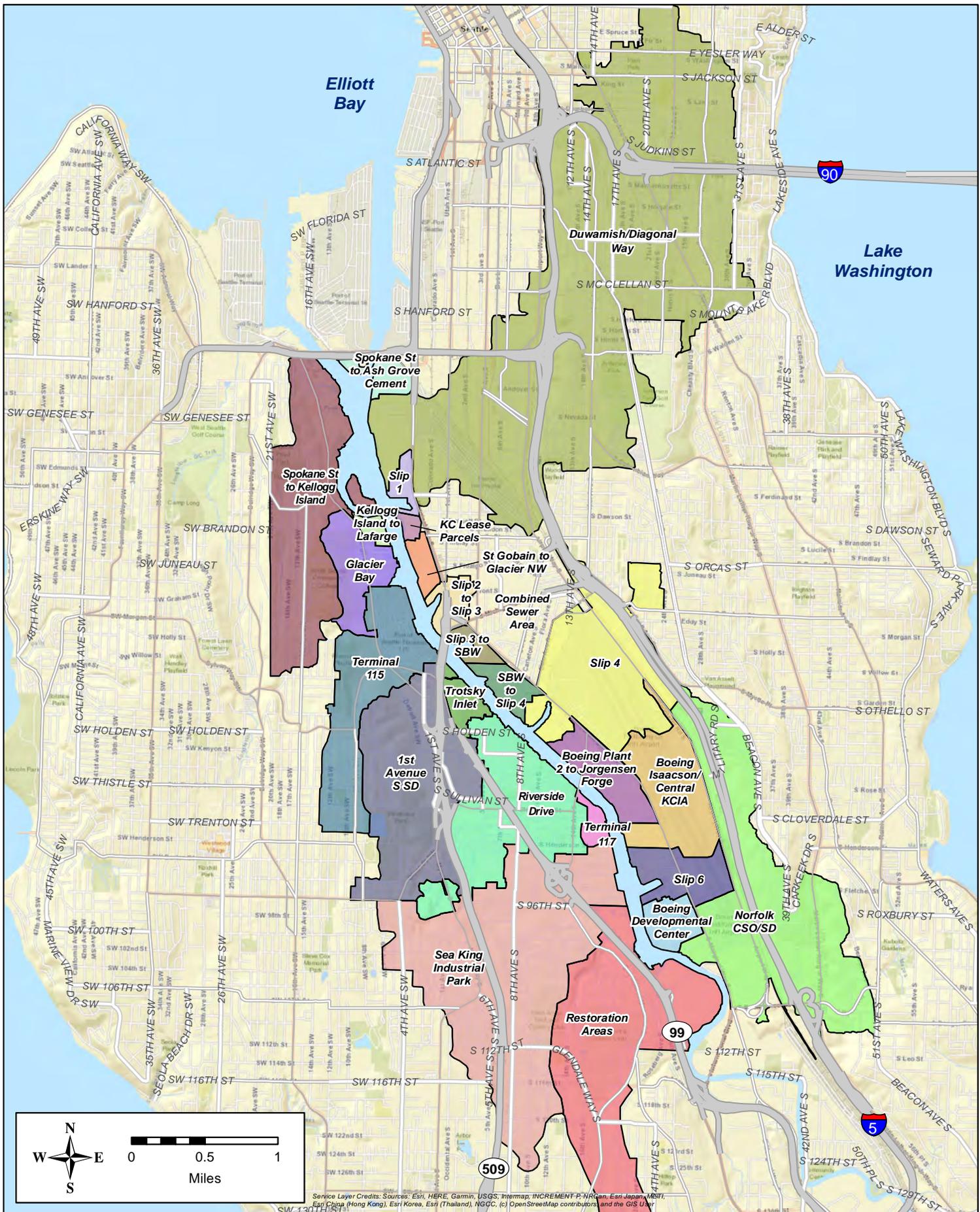


Figure A-1. Lower Duwamish Waterway Source Control Areas

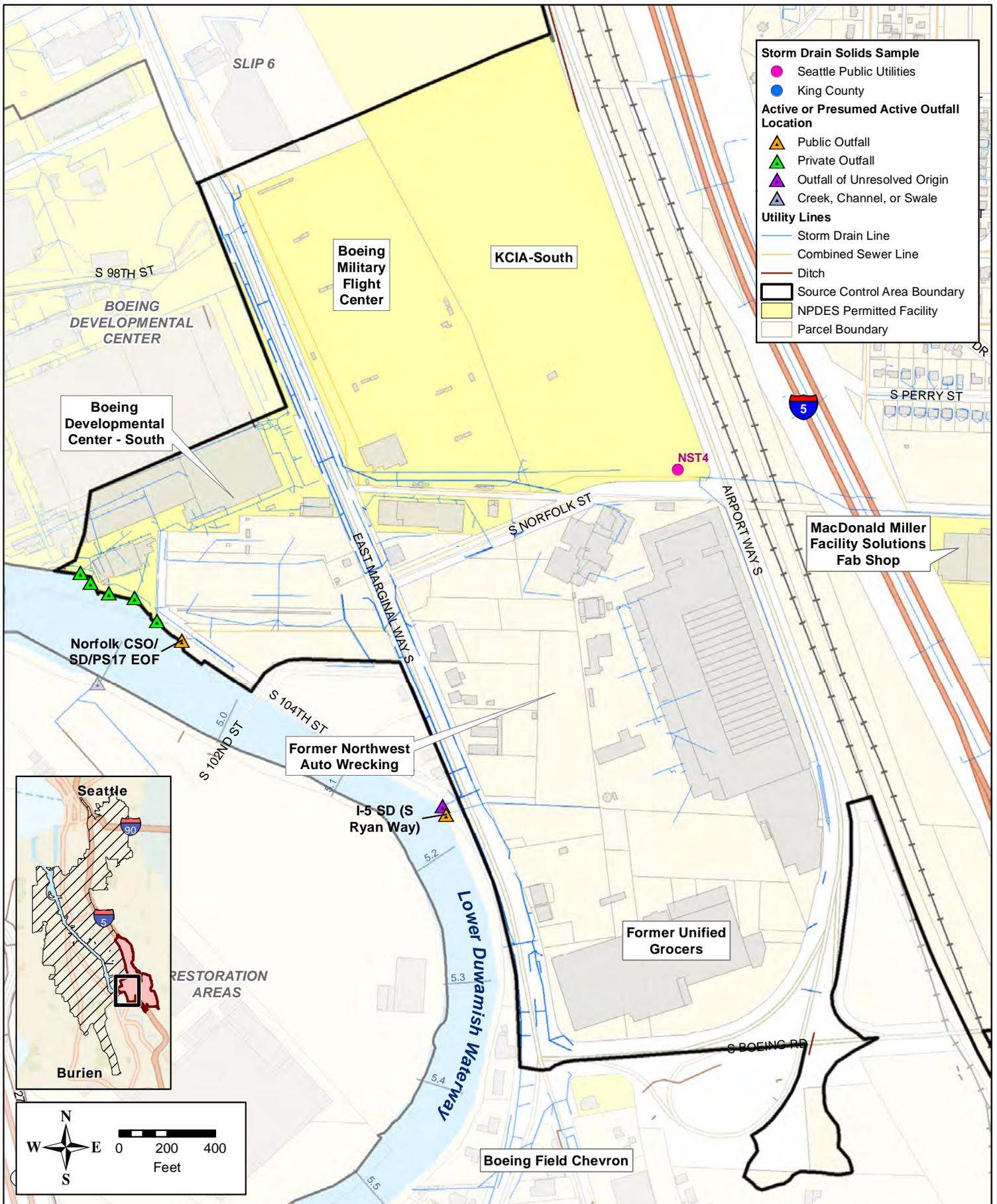


Figure A-2. RM 4.9 East
(EEA-7: Norfolk CSO/Storm Drain)
Source Control Area





**Figure A-4. RM 4.3-4.9 East
(Boeing Developmental Center)
Source Control Area**



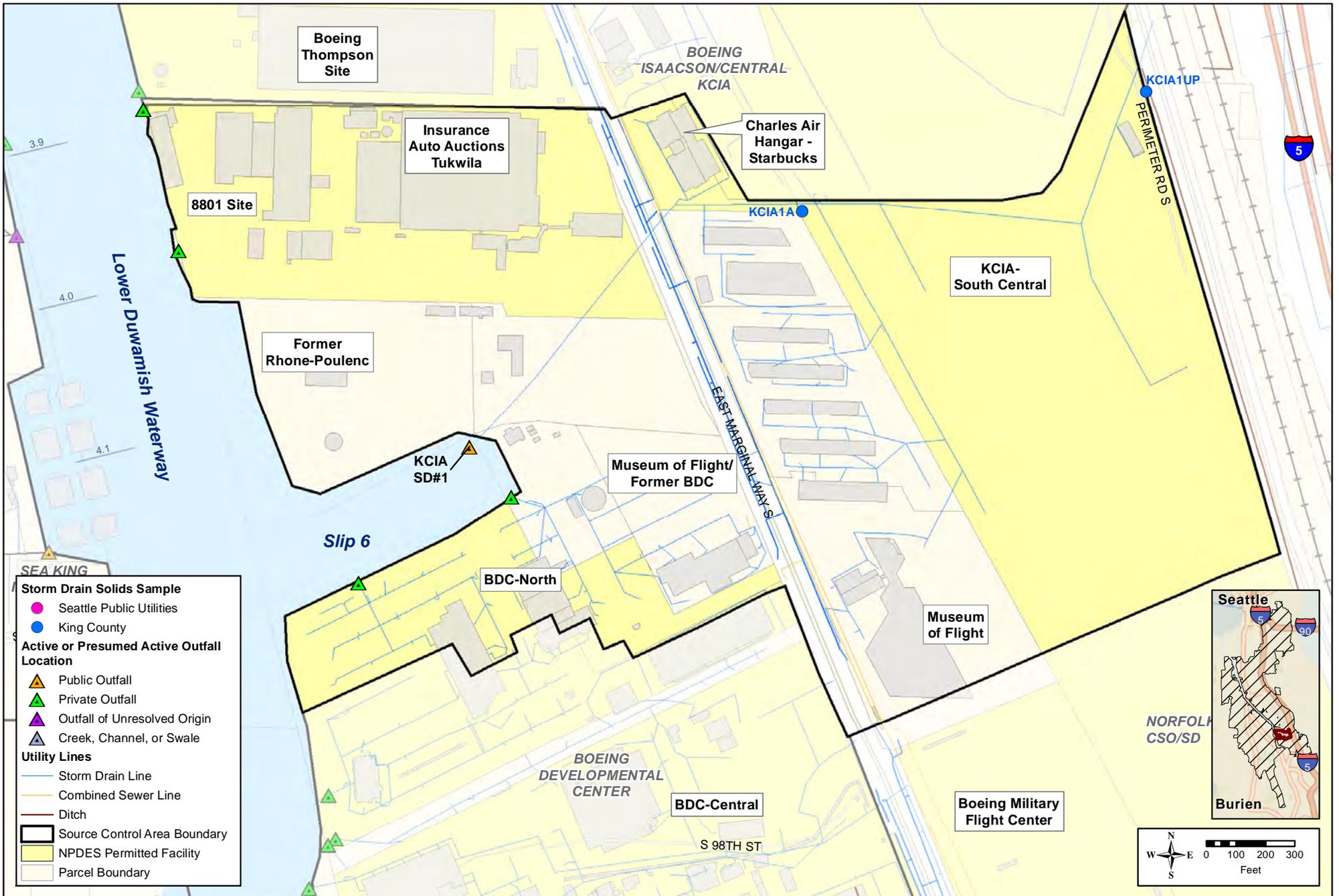
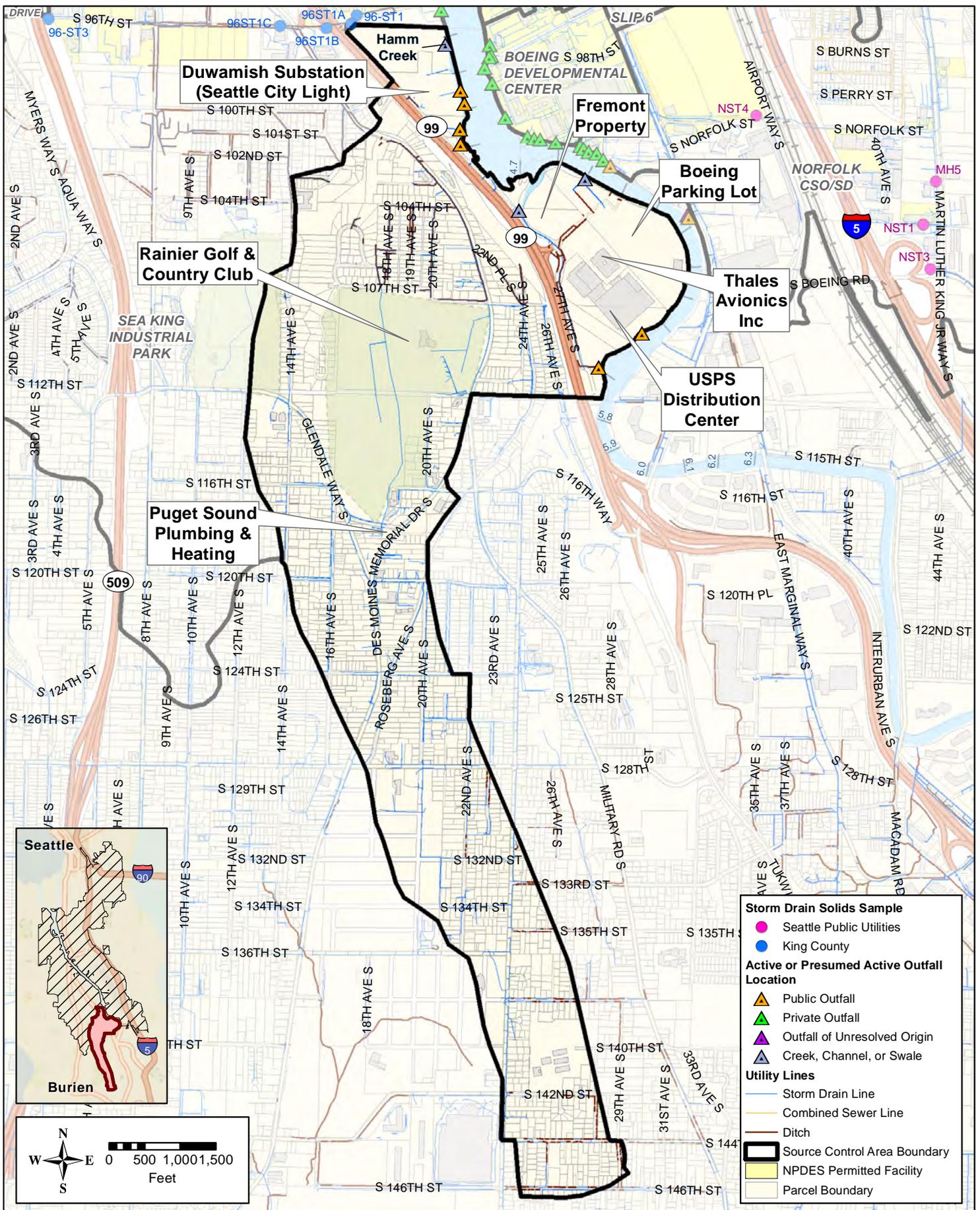
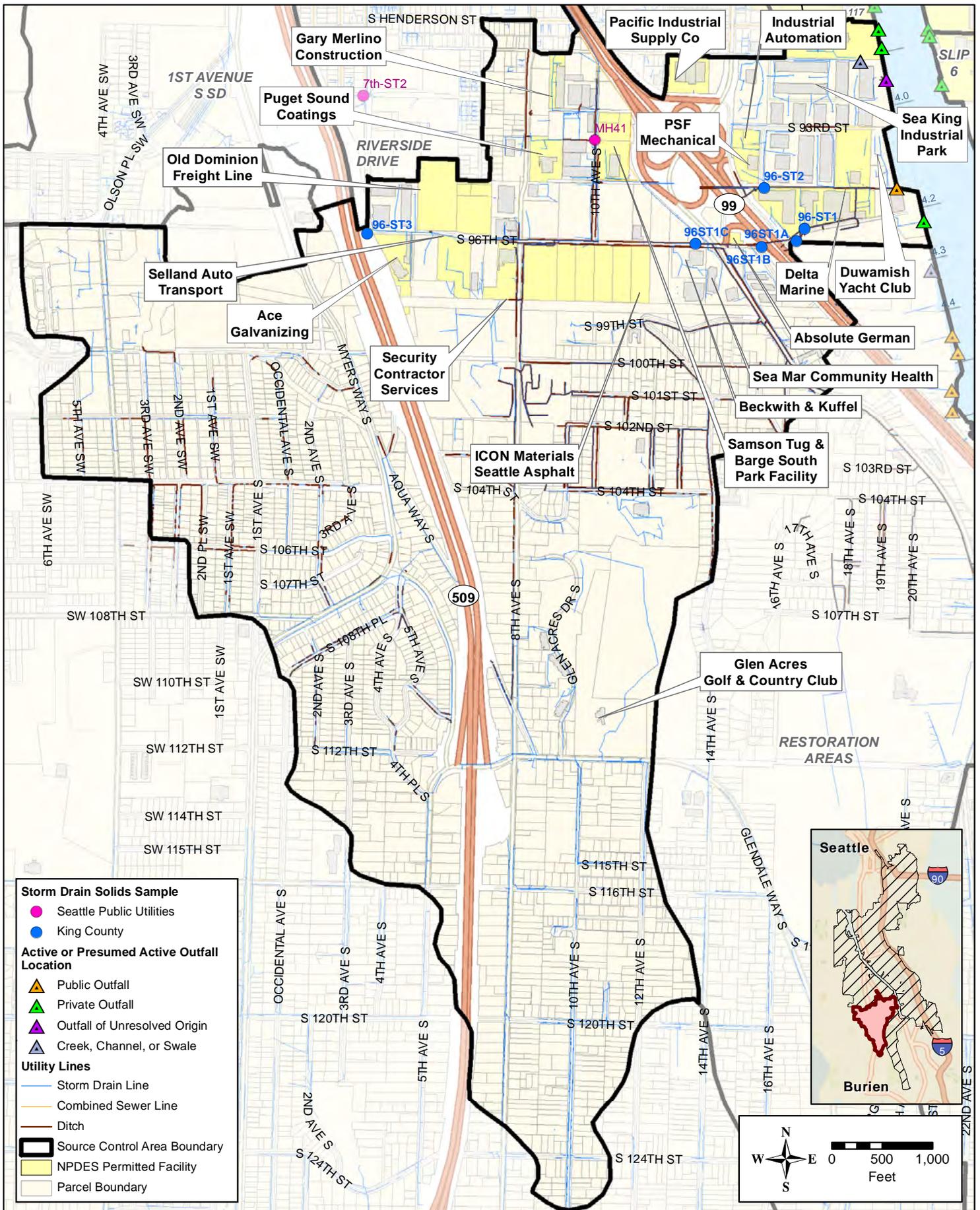


Figure A-5. RM 3.9-4.3 East (Slip 6) Source Control Area



**Figure A-8. RM 4.2-5.8 West
(Restoration Areas)
Source Control Area**





**Figure A-9. RM 3.8-4.2 West
(Sea King Industrial Park)
Source Control Area**

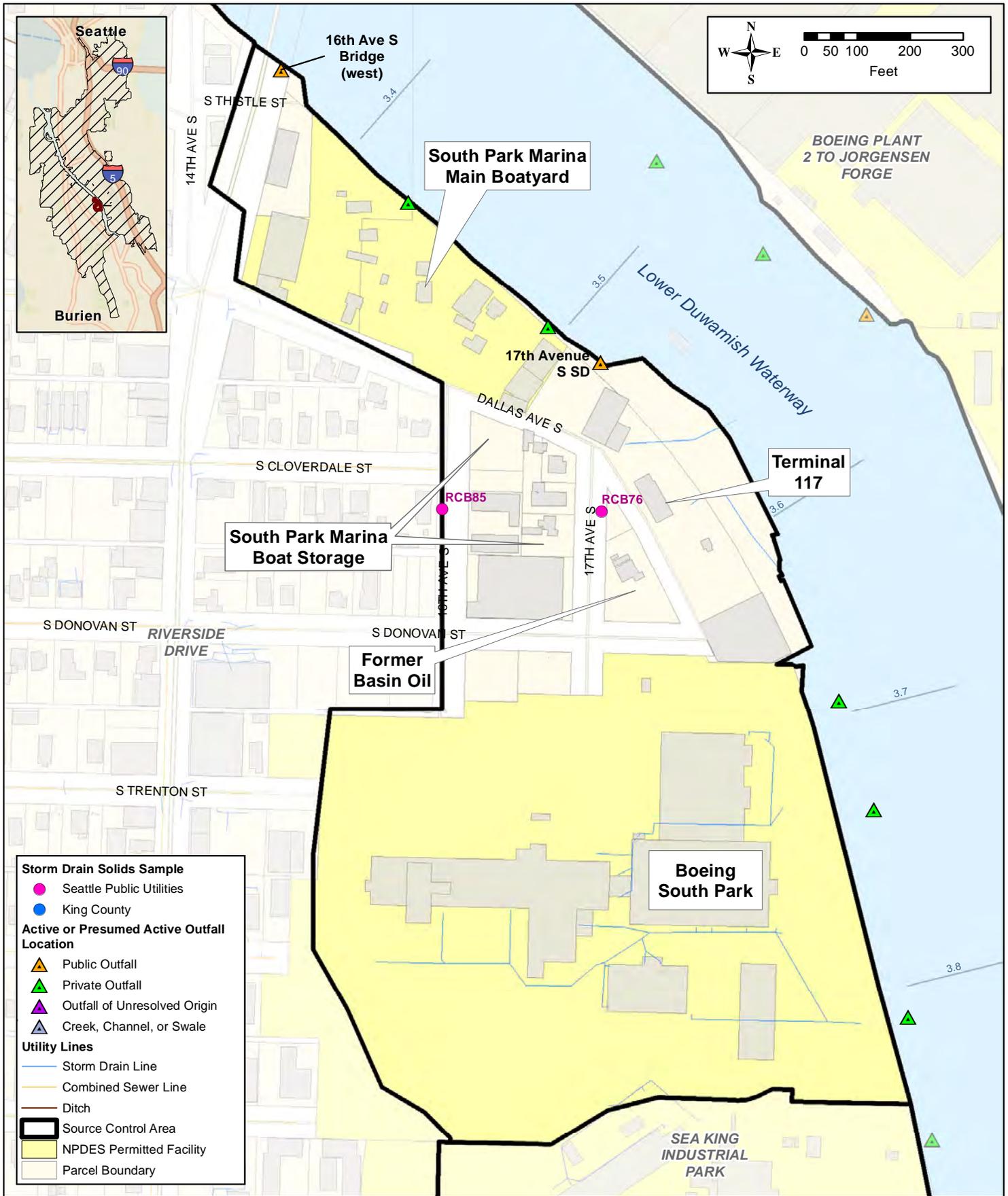
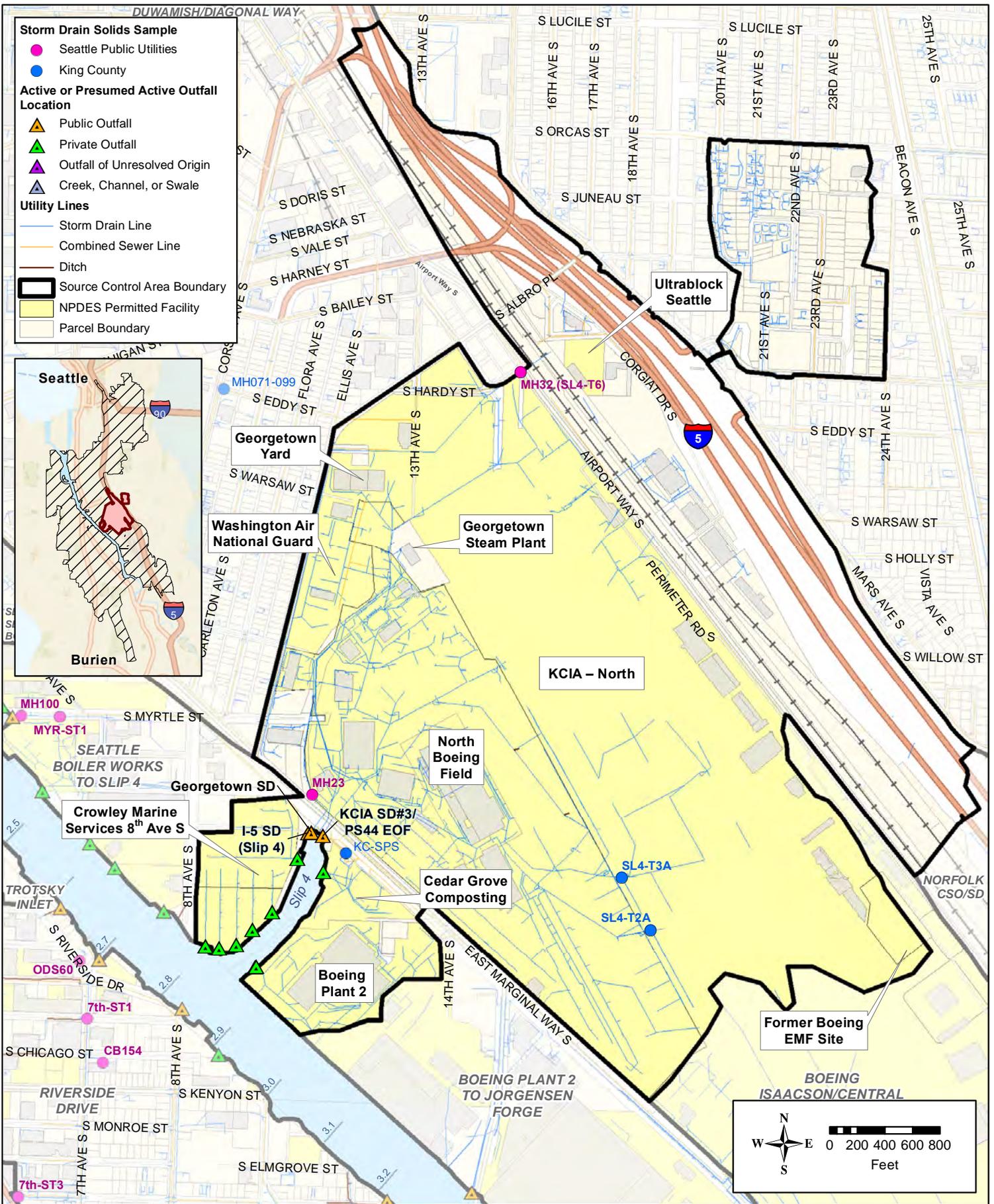
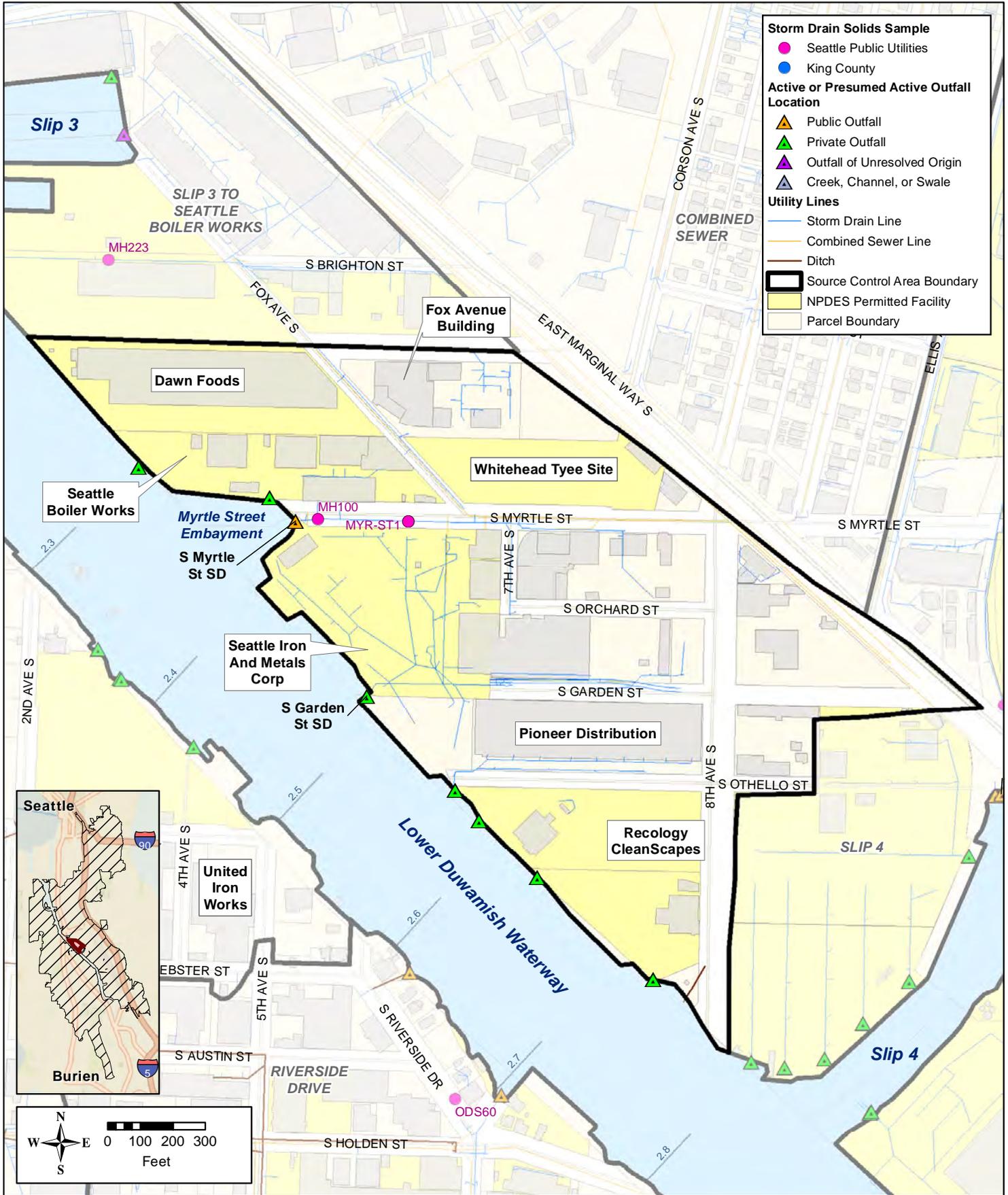


Figure A-10. RM 3.4-3.8 West
(EAA-5: Terminal 117)
Source Control Area



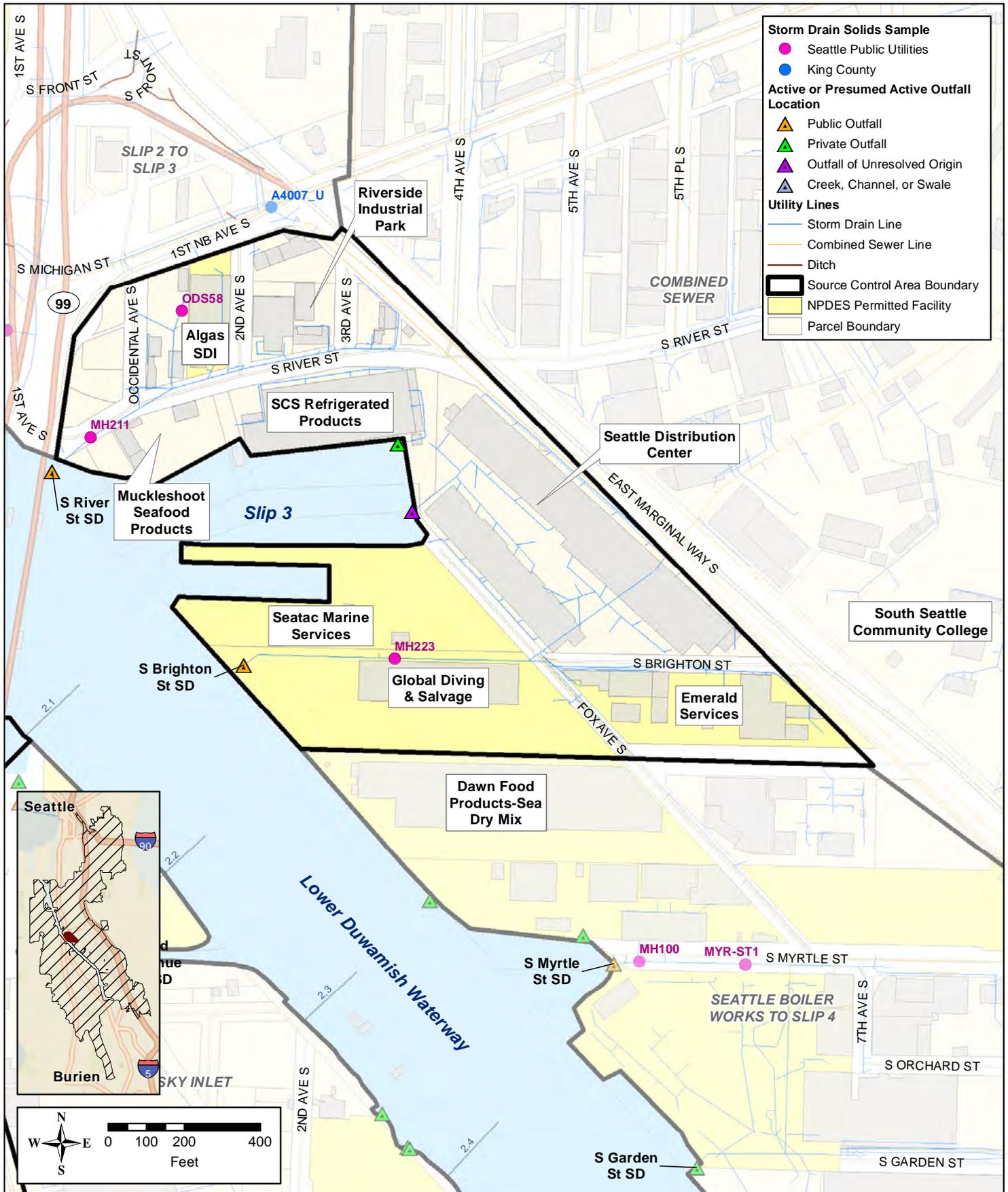
**Figure A-11. RM 2.8 East
(EAA-3: Slip 4)
Source Control Area**





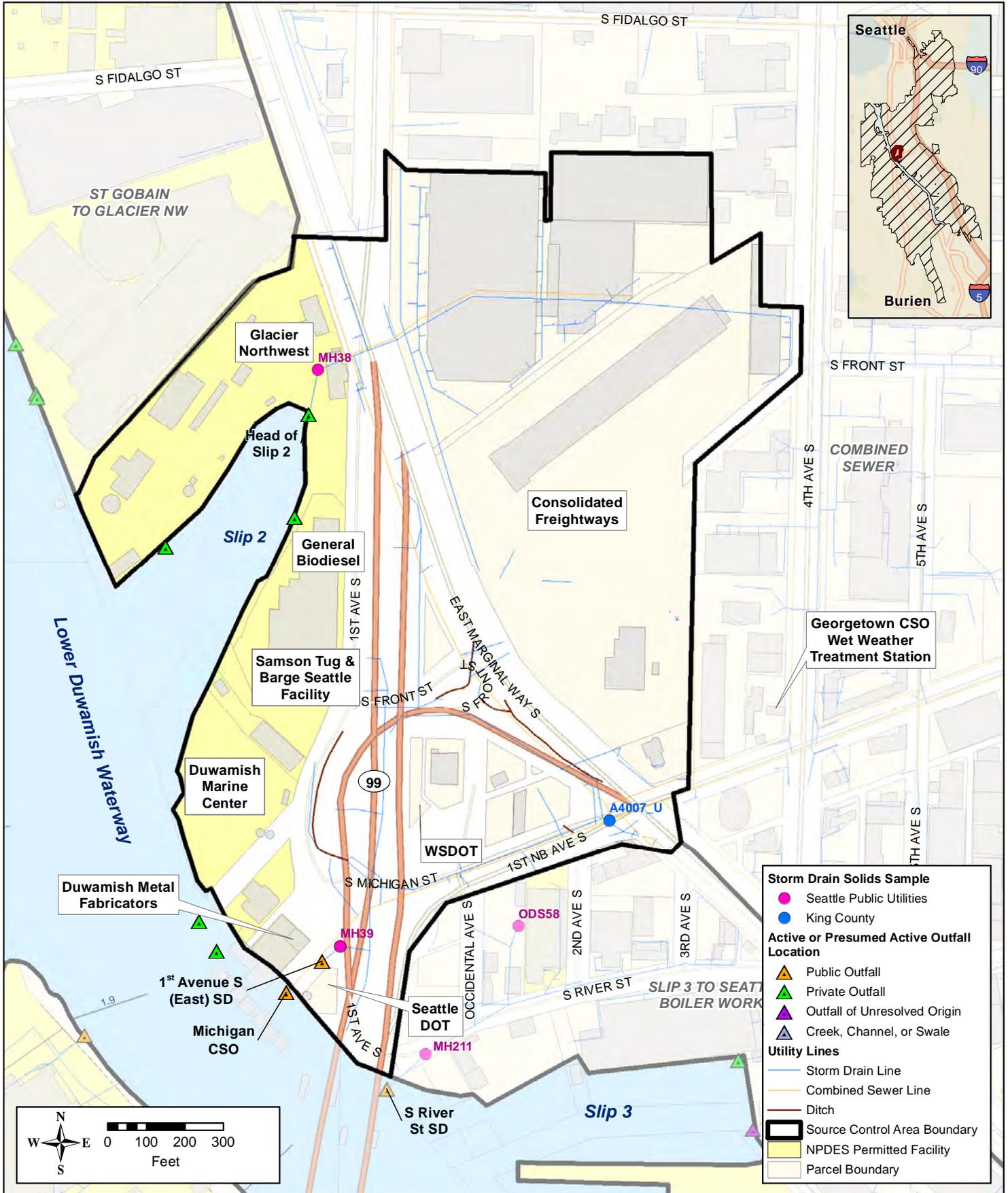
**Figure A-12. RM 2.3-2.8 East
(Seattle Boiler Works to Slip 4)
Source Control Area**





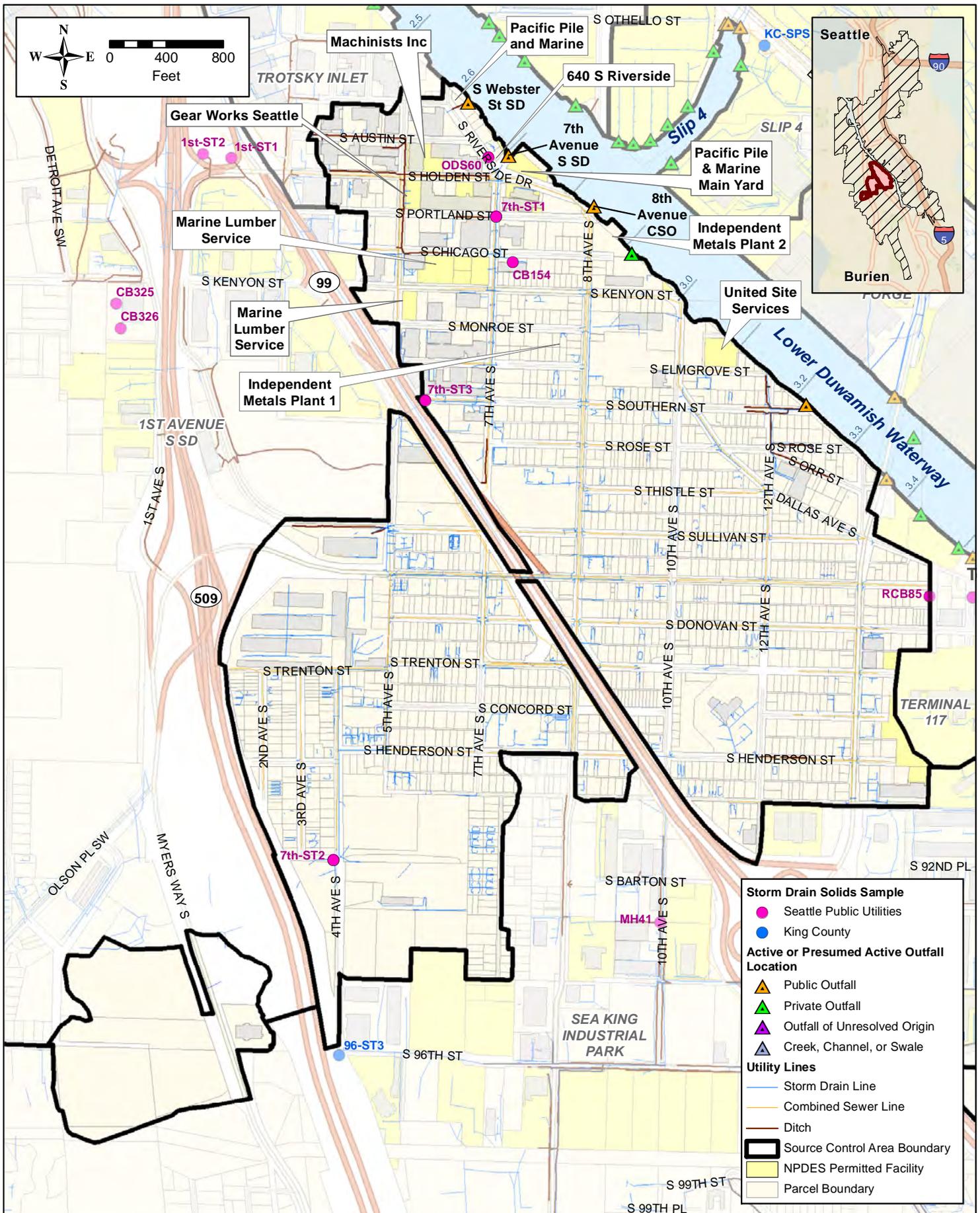
**Figure A-13. RM 2.0-2.3 East
(Slip 3 to Seattle Boiler Works)
Source Control Area**





**Figure A-14. RM 1.7-2.0 East
(Slip 2 to Slip 3)
Source Control Area**





**Figure A-16. RM 2.2-3.4 West
(Riverside Drive)
Source Control Area**

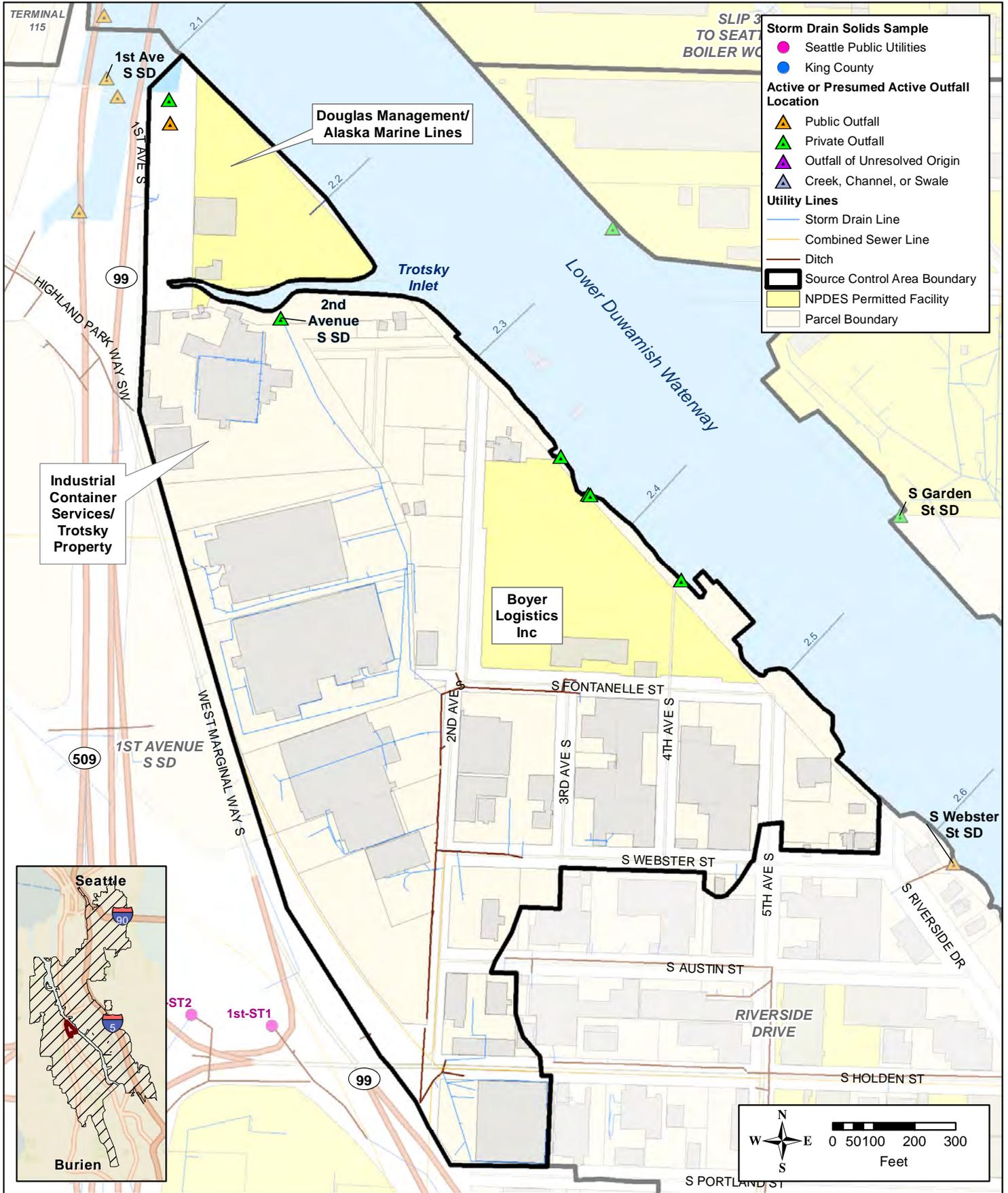
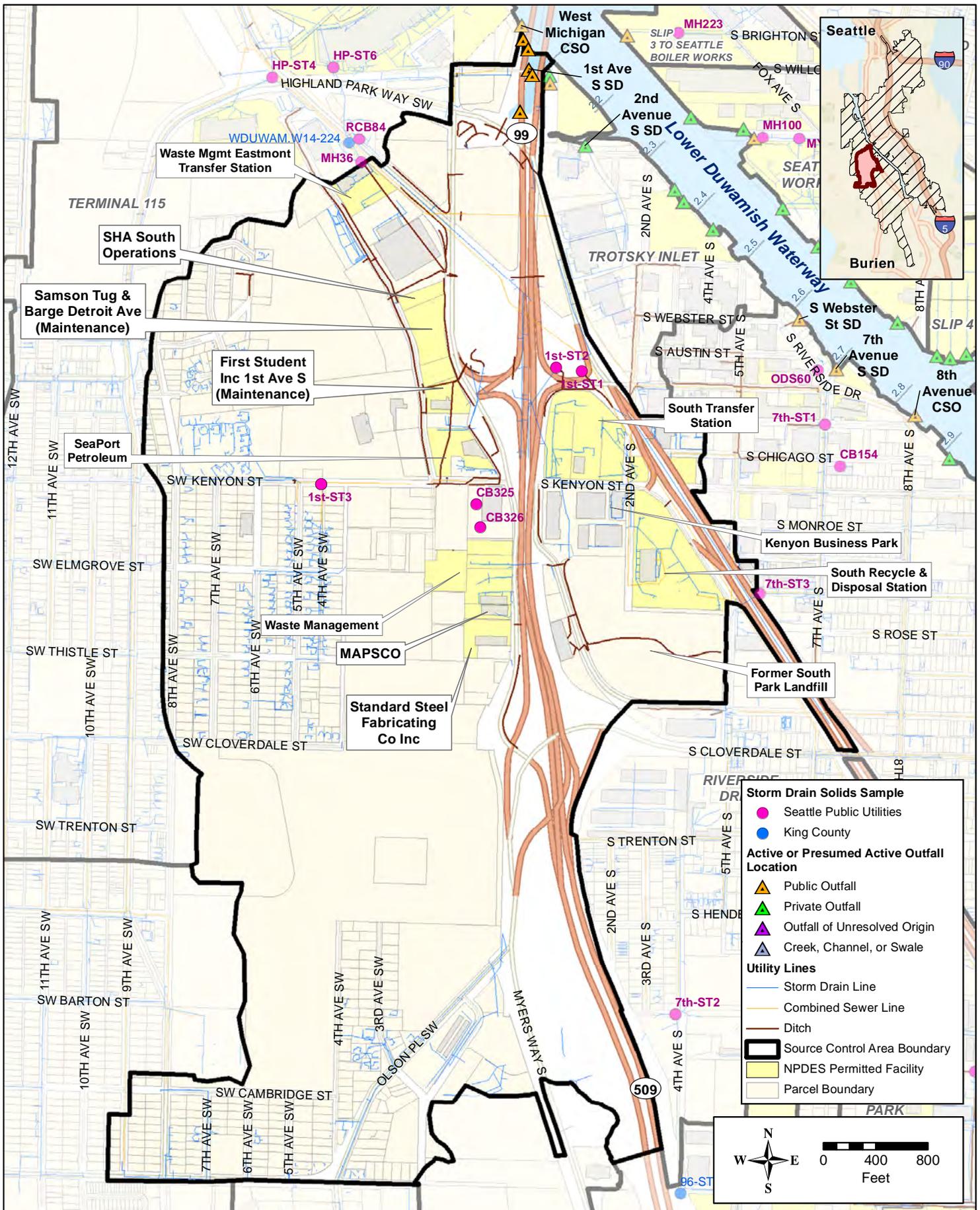


Figure A-17. RM 2.1-2.2 West
(EAA-2: Trotsky Inlet)
Source Control Area



**Figure A-18. RM 2.1 West
(1st Avenue South Storm Drain)
Source Control Area**



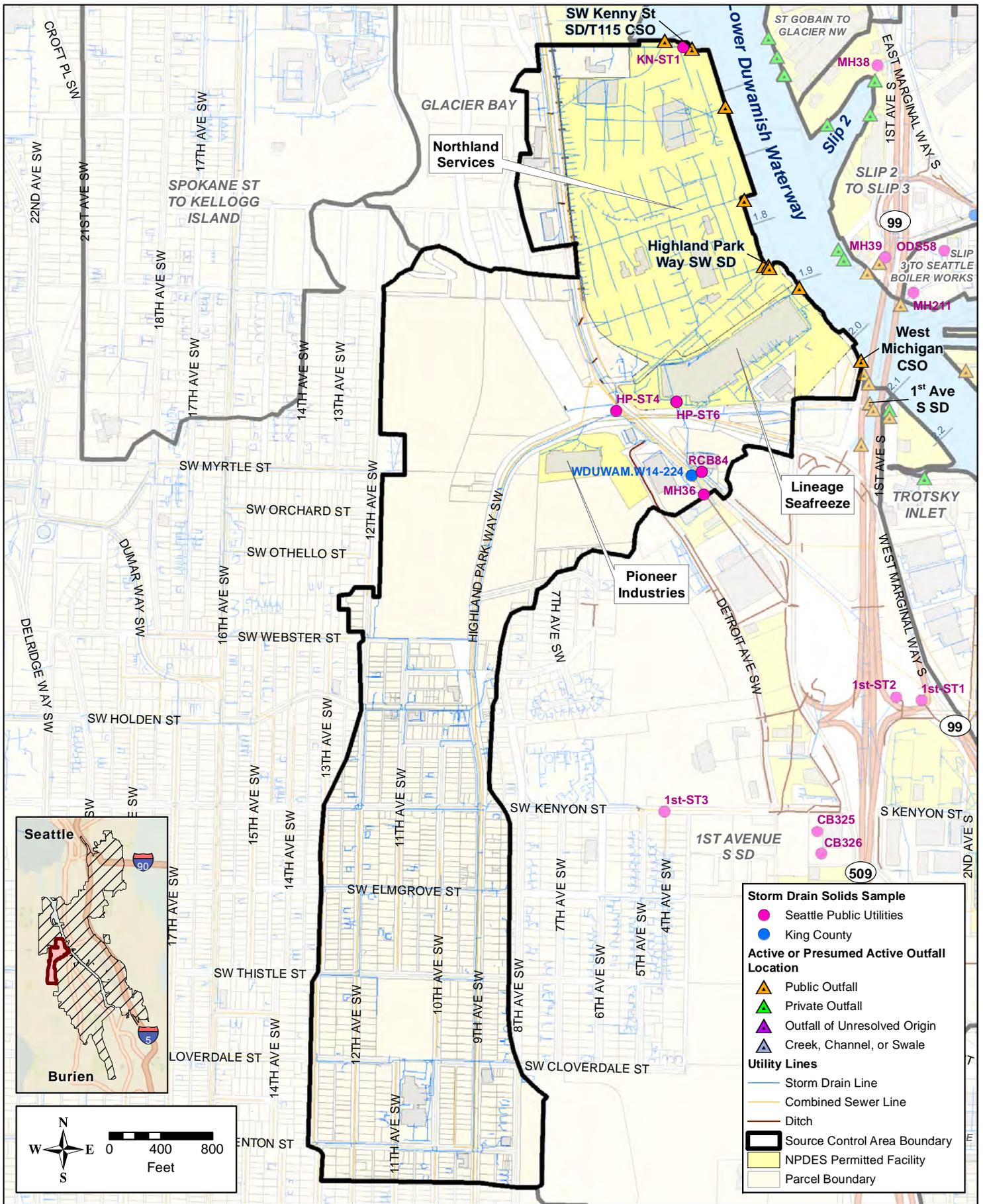
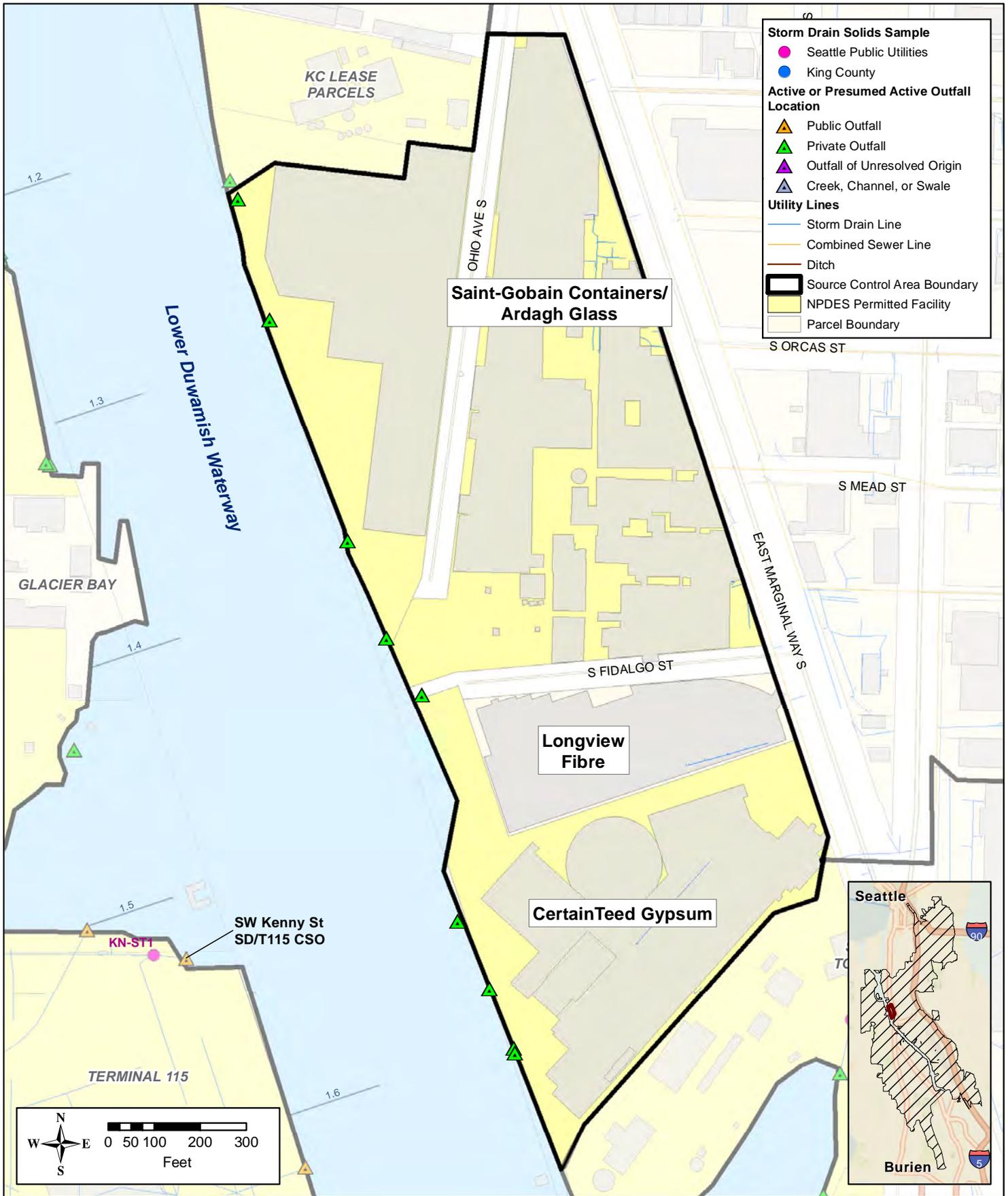
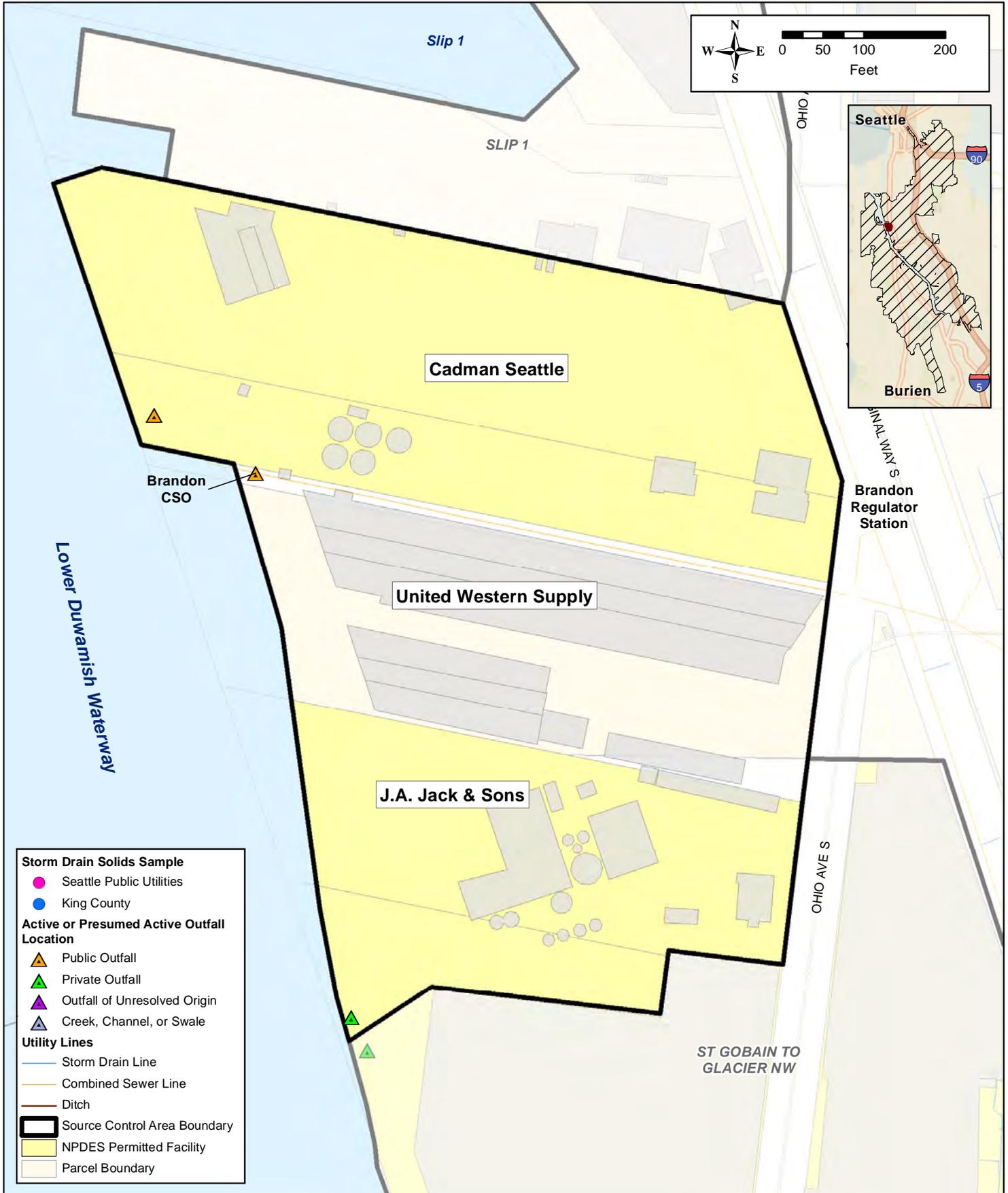


Figure A-19. RM 1.6-2.1 West
(Terminal 115)
Source Control Area





**Figure A-20. RM 1.2-1.7 East
(Saint Gobain to Glacier Northwest)
Source Control Area**



**Figure A-21. RM 1.0-1.2 East
(King County Lease Parcels)
Source Control Area**





**Figure A-22. RM 1.0-1.2 East
(King County Lease Parcels)
Brandon CSO Basin**



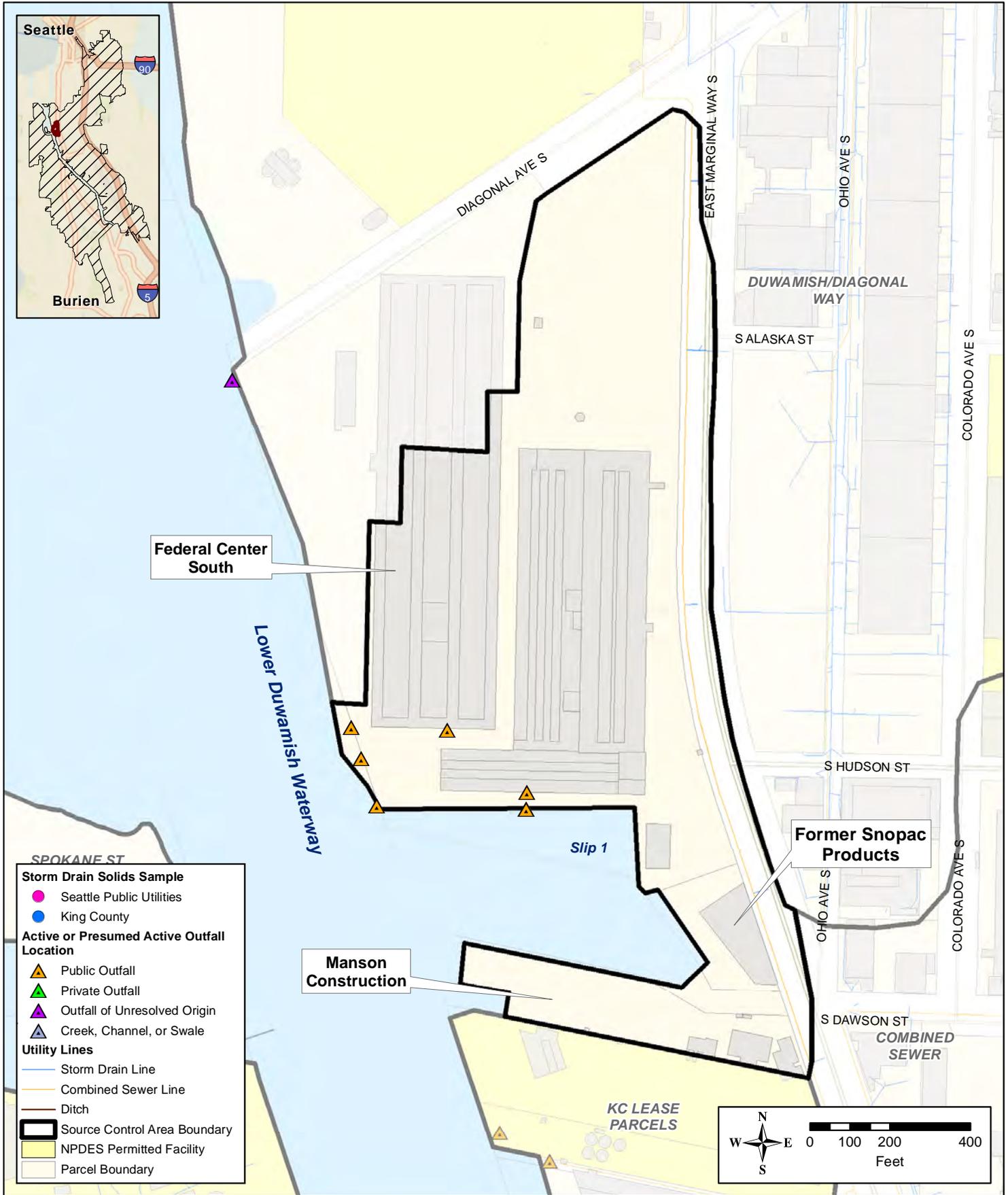
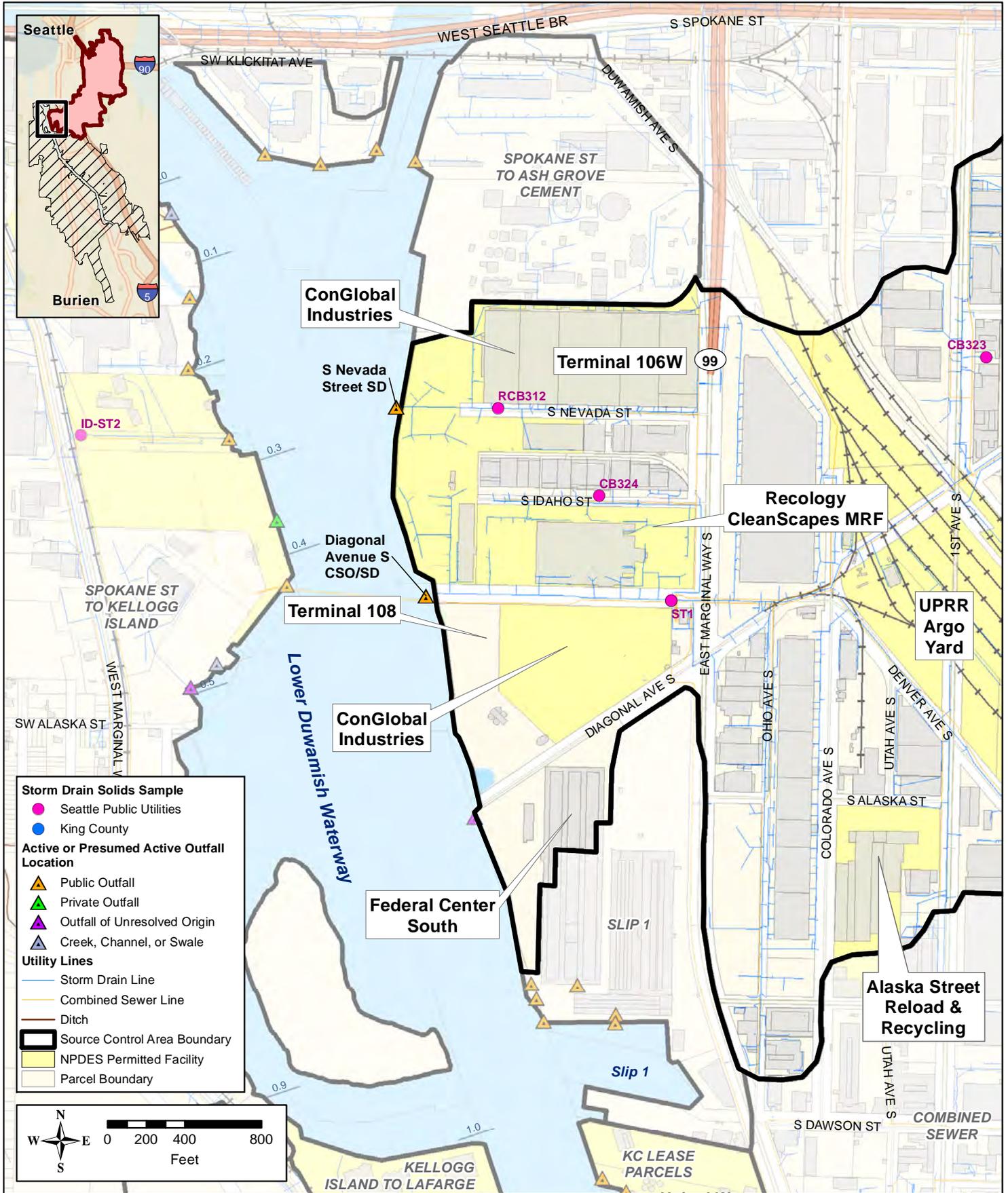
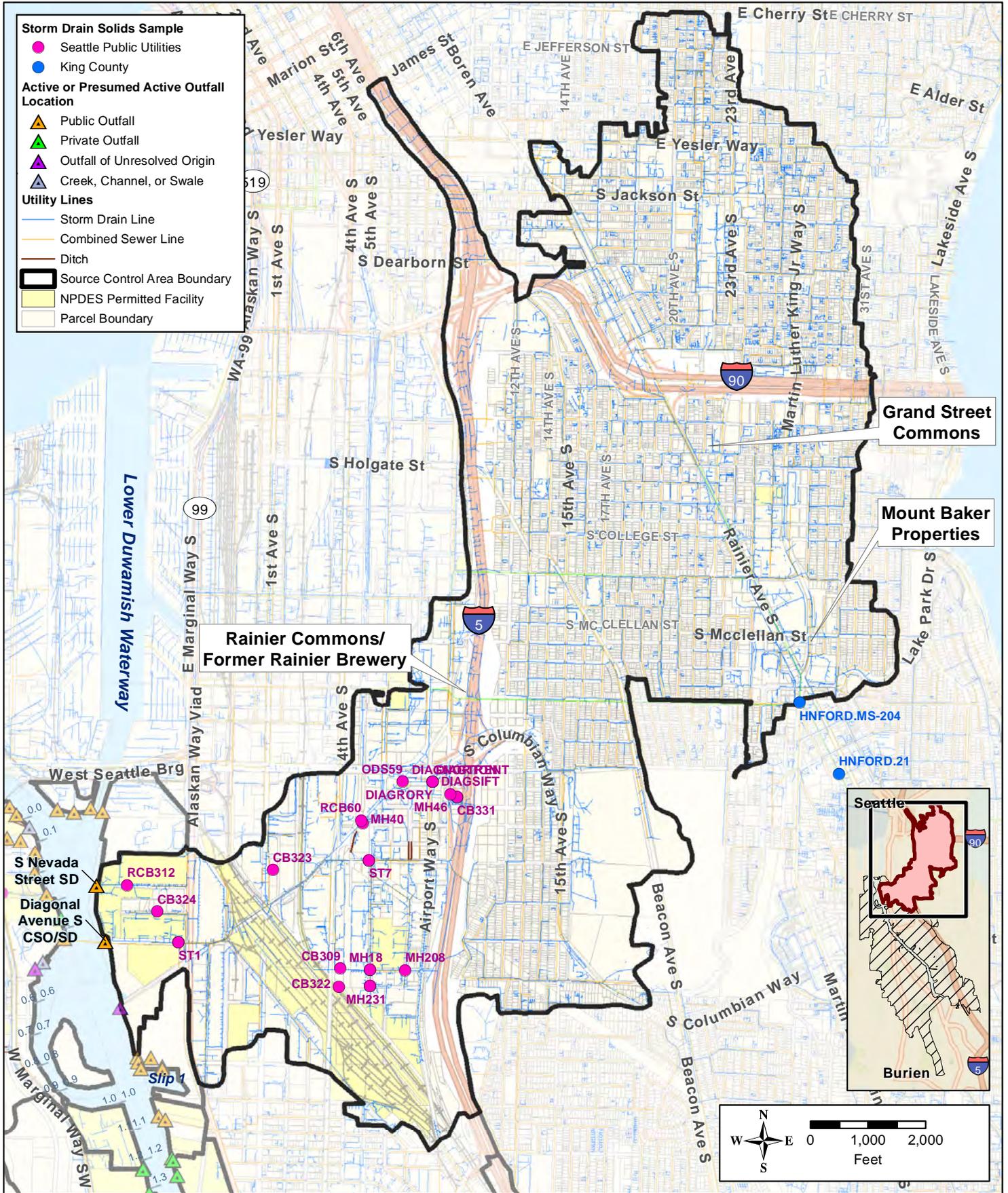


Figure A-23. RM 0.9-1.0 East (Slip 1) Source Control Area



**Figure A-24. RM 0.1-0.9 East
(EAA-1: Duwamish/Diagonal Way)
Source Control Area**





**Figure A-25. RM 0.1-0.9 East
(EAA-1: Duwamish/Diagonal Way)
Diagonal Avenue S Storm Drain Basin**



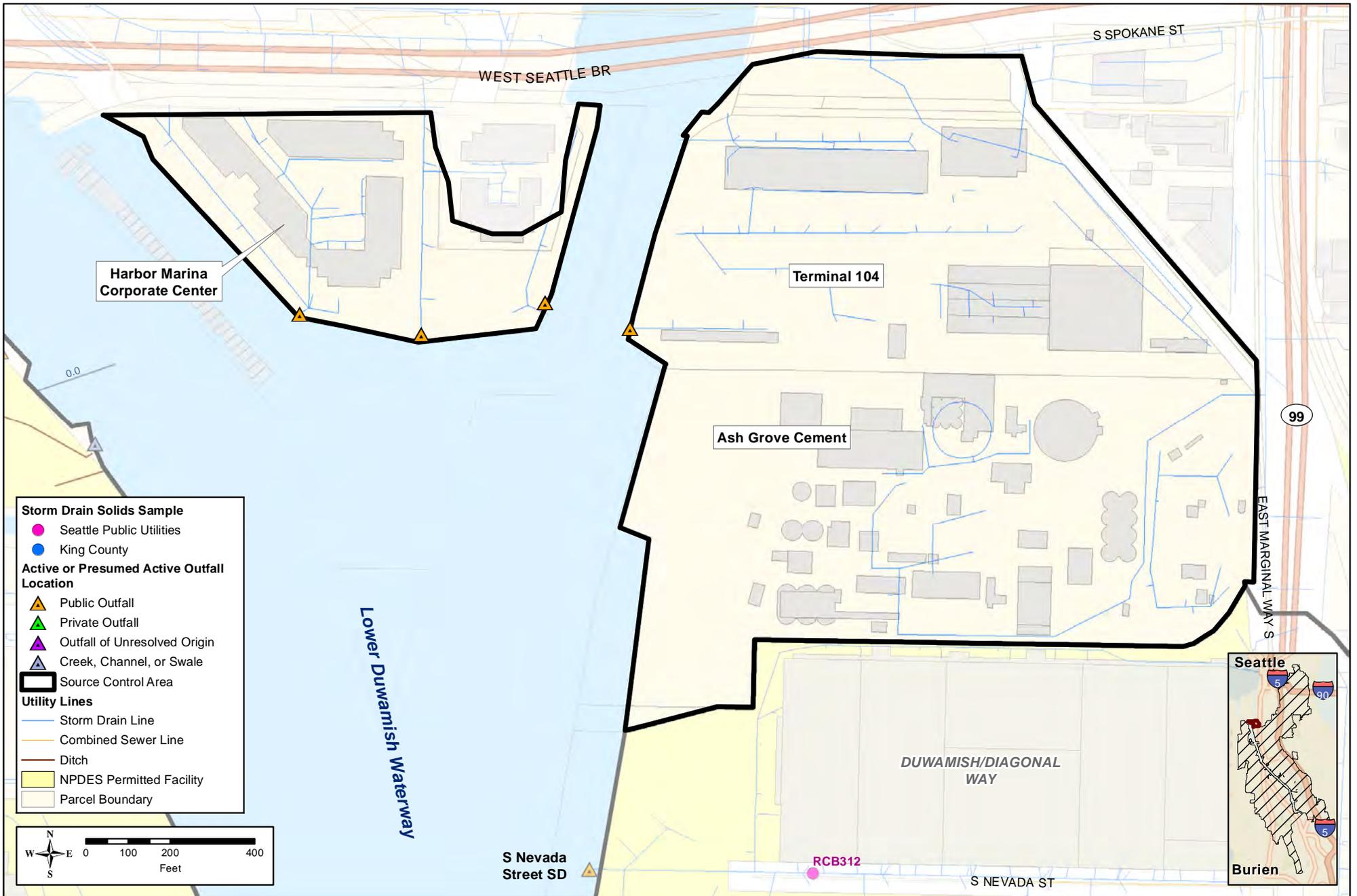


Figure A-26. RM 0.0-0.1 East
(Spokane Street to Ash Grove Cement)
Source Control Area

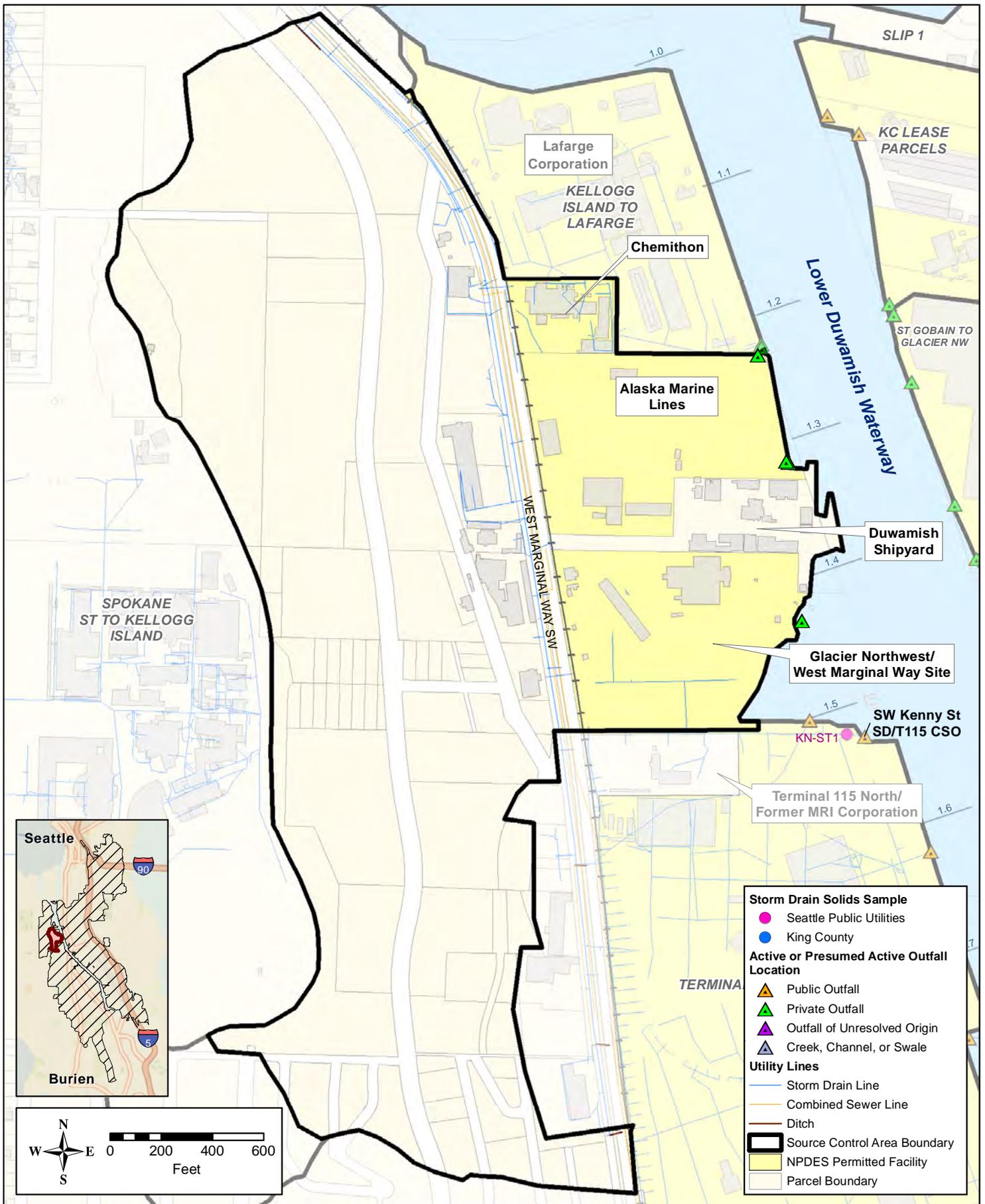
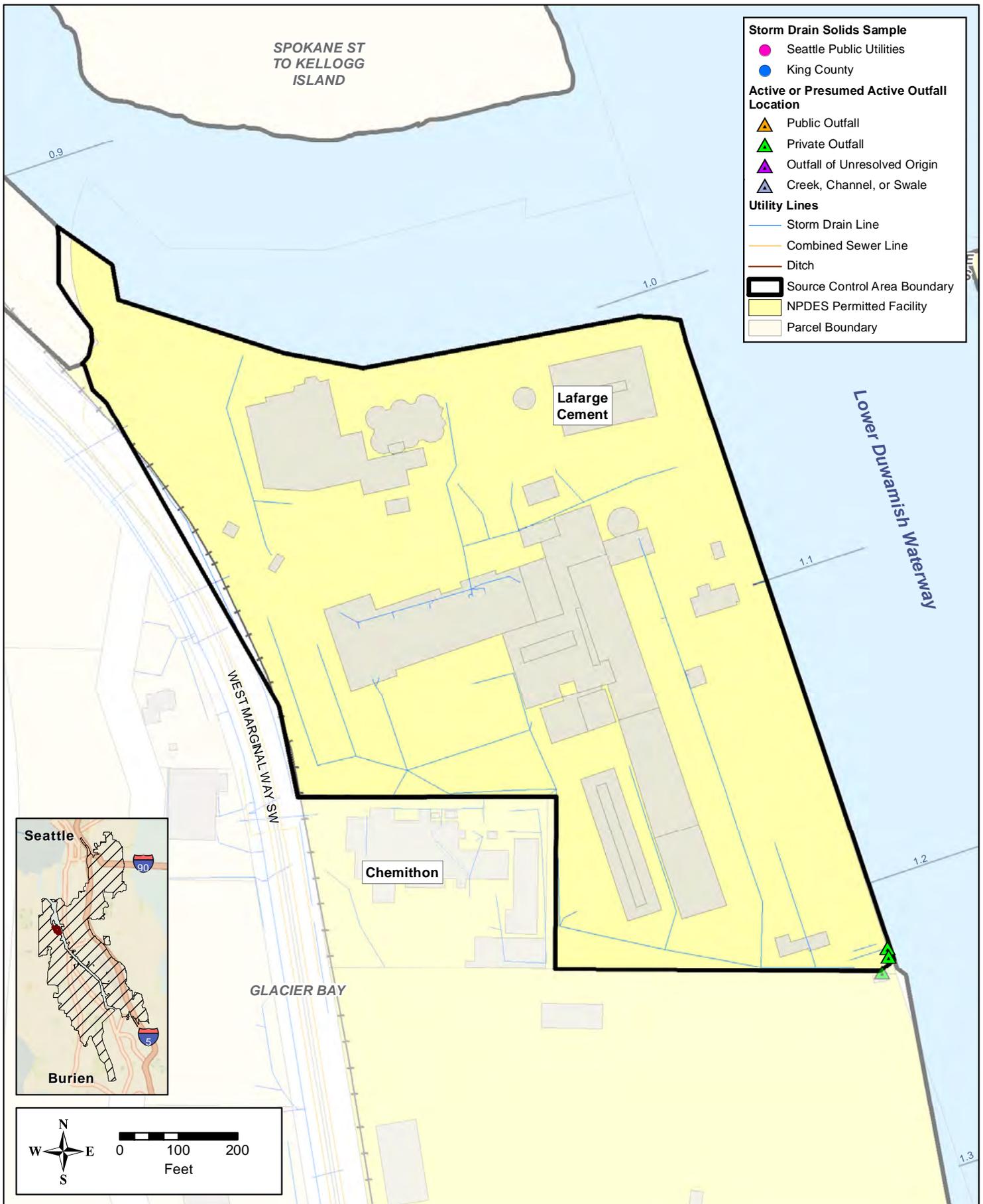


Figure A-27. RM 1.3-1.6 West (Glacier Bay) Source Control Area



**Figure A-28. RM 1.0-1.3 West
(Kellogg Island to Lafarge Cement)
Source Control Area**

Appendix B: Action Item Status

Table B-1. Action Items Completed During 2018

Table B-2. Incomplete Action Items

Table B-1. Action Items Completed or Canceled During This Reporting Period

Action Item No.	Action Item Category	Source Control Area	Property/ Facility/ Outfall	Property Number	Facility/ Site ID	Action Item	Priority	Responsible Party	Date Completed	Comments/Follow-On Actions
A01.10.02	BMP Implementation	RM 0.0-0.1 East (Spokane Street to Ash Grove Cement)	Ash Grove Cement	01001	2142	Demonstrate appropriate separation of wastewater from storm water and install an appropriate treatment system.	Medium	Property Owner/Operator	Apr 2014	Stormwater is managed under an individual NPDES permit (WA0032221). Stormwater from the central portion of the site is reused as process water; excess is pumped to the sanitary sewer. Other site stormwater is discharged to the East Waterway. A Chitosan Enhanced Sand Filtration treatment system was installed in 2014.
A02.37.00	Records Review	RM 0.1-0.9 East (EAA-1: Duwamish/Diagonal Way)	Seattle Radiator	02086	6433026	Review discharge permit/authorization records to determine if Discharge Authorization 366 is valid.	Low	King County/ Ecology	Nov 2019	KCIW regulates Seattle Radiator under Minor Discharge Authorization No. 796-03 (effective through 1/7/2024).
A03.01.00	Records Review	RM 0.9-1.0 East (Slip 1)	Federal Center South	03001	10233917	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	Ecology	Feb 2012	Historical property files regarding the USTs were completed as part of an Environmental Conditions Report completed in February 2012.
A03.02.00	Environmental Sampling	RM 0.9-1.0 East (Slip 1)	Federal Center South	03001	10233917	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	EPA	Feb 2012	Sediment COCs have not been detected in soil or groundwater at concentrations above screening levels. The site is undergoing cleanup for petroleum hydrocarbons and chlorinated solvents.
A03.07.00	Records Review	RM 0.9-1.0 East (Slip 1)	Former Snopac Products Property	03003	1523145, 3967301	Assess potential for historical release(s) of arsenic or other sediment COCs to soil and groundwater beneath this property.	Medium	Ecology	Jun 2019	Current property owner (5055 Properties LLC) conducted an RI between 2015 and 2018; soil and groundwater contamination was investigated and documented in the Agency Review Draft RI (June 2019).
A03.10.00	Environmental Sampling	RM 0.9-1.0 East (Slip 1)	Former Snopac Products Property, Manson Construction Company	03003, 03002	1523145, 3967301, 80333167	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	Ecology	Jul 2015	The property owner collected six seep samples along the Snopac shoreline at Slip 1 in 2015. Samples were analyzed for sediment COCs. Arsenic concentrations ranged from 40 to 76 ug/L, significantly lower than the 290 ug/L measured at Seep 76 in 2004 but still above the preliminary cleanup level for arsenic in nonpotable groundwater of 8 ug/L. Additional actions will be conducted as needed under Agreed Order DE-16300.
A03.11.00	Environmental Sampling	RM 0.9-1.0 East (Slip 1)	Former Snopac Products Property	03003	1523145, 3967301	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	Ecology	Oct 2019	The property owner collected bank soil/sediment samples along the Slip 1 shoreface as part of the RI. Results presented in the agency review draft RI Report submitted to Ecology in October 2019.
A03.12.00	Information Request	RM 0.9-1.0 East (Slip 1)	Former Snopac Products Property	03003	1523145, 3967301	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	Ecology	Oct 2019	The RI Report includes historical information about the dock. The dock and other subsidiary sources of contaminants generally fall within the mapped area of sandblast grit-containing fill, which was characterized during the RI.
A04.22.01	Records Review	RM 1.0-1.2 East (KC Lease Parcels)	Bob's Texaco Service	25094	47157762	Review information regarding LUSTs at Bob's Texaco Service to evaluate the potential for sediment recontamination, if any, that may be associated with these facilities.	Low	Ecology	May 2018	An SHA was completed in 2015, and a Phase I ESA was conducted in 2017. Ecology performed a site supplemental investigation in late 2017 which identified remaining data gaps; additional investigation of TPH/BTEX contamination is recommended.
A06.21.00	Cleanup	RM 1.7-2.0 East (Slip 2 to Slip 3)	Duwamish Marine Center	06003	21945598	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	Ecology	Jul 2019	Conducted as part Agreed Order DE-8072. The Public Review Draft RI Report was completed in July 2019; bank soil sample data are included in the report.
A07.17.00	Environmental Sampling	RM 2.0-2.3 East (Slip 3 to Seattle Boiler Works)	V. Van Dyke	07010	68427684	Work with V. Van Dyke to complete quarterly groundwater or other monitoring suggested by Adapt, if needed.	Medium	Ecology	Dec 2016	V. Van Dyke ceased operation at this location in December 2016. Action item canceled.
A08.25.00	Environmental Sampling	RM 2.3-2.8 East (Seattle Boiler Works to Slip 4)	Crowley Marine Services	09002	1940187	Collect stormwater and/or solids samples from storm drain system to determine if onsite system is source of COCs found in waterway sediment.	High	Ecology	Aug 2019	To be conducted in accordance with Agreed Order No. DE-6721. The Public Review Draft RI was completed in August 2019 and stormwater system data is included in the report. A supplemental investigation for the draft FS is in progress.
A13.10.00	Cleanup	RM 4.3-4.9 East (Boeing Developmental Center)	BDC - Central	13001	2101	Negotiate an Agreed Order to complete an RI/FS/CAP for the entire BDC Site.	Medium	Ecology	Jul 2019	Agreed Order DE-16275 was issued on July 23, 2019.

Table B-1. Action Items Completed or Canceled During This Reporting Period

Action Item No.	Action Item Category	Source Control Area	Property/ Facility/ Outfall	Property Number	Facility/ Site ID	Action Item	Priority	Responsible Party	Date Completed	Comments/Follow-On Actions
A15.04.00	Inspection	RM 0.0-1.0 West (Spokane Street to Kellogg Island)	Outfalls 2140, 2141, 2142, 2153, 2144, 2145, 2146	NA	NA	Conduct an inspection during a storm event to determine if Outfalls 2140 through 2146 are operational or have been abandoned. If discharge from these outfalls is observed, request that the property owners conduct dye testing to determine if storm drain lines are connected to the unresolved outfalls and delineate the associated drainage areas.	Medium	SPU, Ecology	Dec 2018	Outfalls 2140-2143 are located on City property at the Port's T107 Park at 4750 W Marginal Wy SW. Outfalls 2140-2141 are upstream/downstream ends of a culvert that conveys park runoff under the path to the Herring's House habitat area. Outfalls 2142-2143 are also upstream/downstream ends of culvert that convey runoff from the parking lot. Parking lot runoff sheet flows across a vegetated area before entering the culvert. SPU inspected these outfalls in 2018. Outfalls 2144, 2145, and 2146 were located on General Recycling property at 4260 W Marginal Wy SW. Based on a 2/19/2019 site map provided by General Recycling, these outfalls are no longer present.
A16.05.00	Records Review	RM 1.0-1.3 West (Kellogg Island to Lafarge Cement)	Lafarge North America Inc. Seattle	16001	2132	Review the response to the CERCLA Section 104(e) Supplemental Information Request sent to Lafarge by EPA.	Medium	Ecology		EPA is no longer provide 104(e) responses to Ecology for review.
A18.09.00	Environmental Sampling	RM 1.6-2.1 West (Terminal 115)	Terminal 115 - Port of Seattle Storm Drain Outfalls (Outfalls 2122, 2123, 2124, 2220, and POS 6146)	18014	4040072	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.	High	Port of Seattle	Dec 2015	Samples were collected from the storm drain lines discharging to Outfalls 2122, 2123, 2124, 2220, and POS 6146 by the Port of Seattle in 2015, following storm drain line cleaning activities in late 2014. A summary report was published in December 2015 and submitted to Ecology.
A21.02.00	Source Assessment	RM 2.2-3.4 West (Riverside Drive)	King County Outfall (Outfall 3037)	NA	NA	Conduct source tracing to identify potential sources of sediment COCs reported above screening levels in LDW sediments adjacent to Outfall 3037.	Medium	King County	Jun 2016	Outfall 3037 is at the terminus of S Southern Street within unincorporated King County. A sample collected from a catch basin associated with this outfall was collected in June 2016; no screening level exceedances were observed.
A23.05.00	Information Request	RM 3.8-4.2 West (Sea King Industrial Park)	Sea King Industrial Park	23038	NA	Request clarification from King County regarding the owner and operator status for the S Director Street Outfall and Outfall 2101.	Medium	Ecology	Jun 2020	According to King County, the right-of-way ends at 15th Avenue S. From there, the drainage and outfall are privately owned and part of the Sea King Industrial Park.

Table B-2. Incomplete Action Items

Action Item No.	Action Item Category	Source Control Area	Property/ Facility/ Outfall	Property Number	Facility/ Site ID	Action Item	Priority	Responsible Party	Status	Comments/Follow-On Actions
A01.04.00	Source Assessment	RM 0.0-0.1 East (Spokane Street to Ash Grove Cement)	Port of Seattle Terminal 104	01003	72668645	Determine how to address identified data gaps in the western portion of T-104.	Low	Ecology, Port of Seattle		Specific data gaps could not be identified. One outfall discharges to the LDW; it drains a 1.3-acre area in the southwest corner of the property. The tenant in this area is Pacific Coast Container (PCC), which operates under an ISGP (WAR125003). A 2018 stormwater utility assessment indicated some pipes that need repair, but considered low priority.
A01.05.00	Data Evaluation	RM 0.0-0.1 East (Spokane Street to Ash Grove Cement)	Port of Seattle Terminal 104	01003	72668645	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	Port of Seattle		Project is currently in final stages of property/project transfer to City of Seattle SDOT.
A01.07.00	Records Review	RM 0.0-0.1 East (Spokane Street to Ash Grove Cement)	Port of Seattle Terminal 104	01003	72668645	Review post remediation reports and annual report as part of the VCP and determine whether further action is needed.	High	Ecology		Project is currently in final stages of property/project transfer to City of Seattle SDOT.
A01.08.00	Cleanup	RM 0.0-0.1 East (Spokane Street to Ash Grove Cement)	Ash Grove Cement	01001	2142	Negotiate an agreed order for a Remedial Investigation/ Feasibility Study that will focus on potential soil and groundwater contamination at the site.	Medium	Ecology, Property owner/operator		Additional information about current soil and groundwater conditions is needed before negotiation of an Agreed Order
A01.11.00	Source Assessment	RM 0.0-0.1 East (Spokane Street to Ash Grove Cement)	Ash Grove Cement	01001	2142	Inspect condition and operational records of the groundwater well used for cooling water to ensure that it cannot release contaminants into the aquifer.	Medium	Ecology WQ		It is unknown whether this well is currently active.
A02.07.01	BMP Implementation	RM 0.1-0.9 East (EAA-1: Duwamish/Diagonal Way)	GSA / Federal Center South	03001	10233917	Clean and repair storm drain system; correct housekeeping issues	Medium	GSA		This action item was based on a 2004 inspection. Major storm drain system revisions were completed during construction of a new building at the site, based on design drawings dated August 2010 received from B. Schmoyer. An August 2010 Urban Waters inspection (during construction) found some issues. No inspection since 2010. Outfall inventory indicates there are still questions about which outfalls have been permanently plugged and which are currently active.
A02.10.02	Data Evaluation	RM 0.1-0.9 East (EAA-1: Duwamish/Diagonal Way)	Former JANCO-United, Inc.	02114	5568786	Review groundwater data collected under VCP; determine if further source control actions are needed.	Low	Ecology		Site is listed on CSCSL as Lennox Industries; status is 'awaiting cleanup.' Arsenic and 1,4-dichlorobenzene were detected in groundwater above MTCA Method A or B levels in 2009.
A02.20.04	Cleanup	RM 0.1-0.9 East (EAA-1: Duwamish/Diagonal Way)	Terminal 108	02119	2344	Implement appropriate source control actions.	Medium	Port of Seattle	In Progress	EPA and the Port of Seattle completed and EPA approved a Preliminary Assessment Report (PA-SI) in February 2019. The Port, City and County signed an ASAOC in 2020 to perform an EE/CA, which includes an evaluation of the need for a future removal action to address human health risks or source control.
A02.24.00	Cleanup	RM 0.1-0.9 East (EAA-1: Duwamish/Diagonal Way)	Rainier Commons / Former Rainier Brewery Property	02053	8972, 9192461	Sample and remove PCB-contaminated building materials, including interior paint, as needed.	High	EPA/Property Owner	In Progress	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. In 2017 Rainier Commons submitted an application for Phase II-b, paint removal of several building faces. No additional information available.
A02.32.00	Data Evaluation	RM 0.1-0.9 East (EAA-1: Duwamish/Diagonal Way)	North Star Casteel	02042	18301, 21195, 11628955	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	Ecology		
A03.03.00	Environmental Sampling	RM 0.9-1.0 East (Slip 1)	Federal Center South	03001	10233917	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	Ecology, Property owner/operator		
A03.04.00	Source Assessment	RM 0.9-1.0 East (Slip 1)	Federal Center South	03001	10233917	Perform Site Hazard Assessment	High	Ecology		
A03.06.00	Inspection	RM 0.9-1.0 East (Slip 1)	Federal Center South	03001	10233917	Determine if Federal Center South must apply for coverage under the Industrial Stormwater General Permit.	Medium	EPA, Ecology		

Table B-2. Incomplete Action Items

Action Item No.	Action Item Category	Source Control Area	Property/ Facility/ Outfall	Property Number	Facility/ Site ID	Action Item	Priority	Responsible Party	Status	Comments/Follow-On Actions
A03.08.00	Environmental Sampling	RM 0.9-1.0 East (Slip 1)	Former Snopac Products Property	03003	1523145, 3967301	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	Ecology	In Progress	Samples have been collected and analyzed; soil and groundwater remediation will be implemented as part of Agreed Order DE-16300.
A03.14.00	Records Review	RM 0.9-1.0 East (Slip 1)	Manson Construction Company	03002	80333167	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	Ecology		
A03.15.00	Environmental Sampling	RM 0.9-1.0 East (Slip 1)	Manson Construction Company	03002	80333167	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	Ecology		
A03.17.00	Environmental Sampling	RM 0.9-1.0 East (Slip 1)	Manson Construction Company	03002	80333167	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	Ecology		
A04.09.00	Information Request	RM 1.0-1.2 East (KC Lease Parcels)	Cadman Seattle, Inc.	04001	70313617	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	Ecology		
A04.14.00	Records Review	RM 1.0-1.2 East (KC Lease Parcels)	United Western Supply	04003	9953954	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	Ecology		
A04.19.00	Environmental Sampling	RM 1.0-1.2 East (KC Lease Parcels)	J.A. Jack & Sons	04002	37836248	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	Ecology		
A04.20.00	Inspection	RM 1.0-1.2 East (KC Lease Parcels)	J.A. Jack & Sons	04002	37836248	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	Ecology		
A04.22.02	Records Review	RM 1.0-1.2 East (KC Lease Parcels)	Chevron 9-0636	25101	1792892	Review information regarding LUSTs at Chevron 9-0636 to evaluate the potential for sediment recontamination, if any, that may be associated with these facilities.	Low	Ecology		Chevron 9-0636 is a state cleanup site; status is listed as Awaiting Cleanup. An SHA was performed in 2015, and the site was assigned a rank of 4. Contaminants are TPH and benzene.
A04.23.00	Inspection	RM 1.0-1.2 East (KC Lease Parcels)	Union Pacific Motor	2131	74589256	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	Ecology TCP		This is a state cleanup site; status is listed as Cleanup Started. An SHA was performed in 2015, and the site was assigned a rank of 5. A stormwater compliance inspection was conducted in February 2019; several permit violations were identified.
A04.24.02	Inspection	RM 1.0-1.2 East (KC Lease Parcels)	Seattle-SPU Materials Storage Yard	25156	NA	Perform an inspection at the SPU Materials Storage Yard; this facility holds a KCIW discharge authorization but had not been assigned a Facility/Site ID number by Ecology at the time the SCAP was prepared.	Low	Ecology		
A05.02.00	Cleanup	RM 1.2-1.7 East (Saint Gobain to Glacier Northwest)	Saint Gobain Containers Inc.	05003	94925241	Determine appropriate engineering controls for the inaccessible contamination located beneath the soil/water separator described in the 1991 Limited UST Assessment.	High	Property Owner/Operator		This is a state cleanup site; status is listed as Cleanup Started.

Table B-2. Incomplete Action Items

Action Item No.	Action Item Category	Source Control Area	Property/ Facility/ Outfall	Property Number	Facility/ Site ID	Action Item	Priority	Responsible Party	Status	Comments/Follow-On Actions
A05.06.00	Data Evaluation	RM 1.2-1.7 East (Saint Gobain to Glacier Northwest)	Longview Fibre Paper and Packaging	05002	2226	Review the latest groundwater monitoring report regarding exceedances of diesel-range hydrocarbons.	High	Ecology		If needed, require the property owner/operator to prepare a remedial action plan. This is a state cleanup site; status is listed as Cleanup Started. Most recent groundwater sampling was in 2012; diesel-range hydrocarbons exceeded MTCA and PCULs in one well.
A05.12.00	Records Review	RM 1.2-1.7 East (Saint Gobain to Glacier Northwest)	Certaineed Gypsum	05001	2253	Locate and review the 500-gallon UST closure report documented in Ecology's UST database. Evaluate the potential for groundwater contamination.	Low	Ecology		This is a state cleanup site; status is listed as Cleanup Started.
A05.13.01	Cleanup	RM 1.0-1.2 East (KC Lease Parcels)	Burlington Environmental/PSC Environmental Services	25163	47779679	Implement Cleanup Action Plan as specified in Agreed Order and Dangerous Waste Permit.	Medium	Property Owner/Operator	In Progress	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. Completion of in-situ bioremediation (1 above) is expected in May 2020.
A05.14.02	Cleanup	RM 1.0-1.2 East (KC Lease Parcels)	Art Brass Plating	25161	88531932	Complete the West of 4th Site Feasibility Study, finalize FS report and draft Cleanup Action Plan.	Medium	Ecology/Property Owner/Operator	In Progress	Pilot studies and interim action activities were initiated in the second half of 2018 and are scheduled to continue through 2019.
A05.16.02	Cleanup	RM 1.0-1.2 East (KC Lease Parcels)	Blaser Die Casting	25162	7118747	Complete the West of 4th Site Feasibility Study, finalize FS report and draft Cleanup Action Plan.	Medium	Ecology/Property Owner/Operator	In Progress	Pilot studies and interim action activities were initiated in the second half of 2018 and are scheduled to continue through 2019.
A05.17.02	Cleanup	RM 1.0-1.2 East (KC Lease Parcels)	Capital Industries Inc.	25164	11598755	Complete the West of 4th Site Feasibility Study, finalize FS report and draft Cleanup Action Plan.	Medium	Ecology/Property Owner/Operator	In Progress	Pilot studies and interim action activities were initiated in the second half of 2018 and are scheduled to continue through 2019.
A05.18.00	Cleanup	RM 1.0-1.2 East (KC Lease Parcels)	Burlington Environmental/PSC Environmental Services	25163	47779679	Complete the West of 4th Site Feasibility Study, finalize FS report and draft Cleanup Action Plan.	Medium	Ecology/Property Owner/Operator	In Progress	Pilot studies and interim action activities were initiated in the second half of 2018 and are scheduled to continue through 2019.
A06.01.00	BMP Implementation	RM 1.7-2.0 East (Slip 2 to Slip 3)	1st Avenue S Bridge Storm Drain (Outfall 2503)	NA	NA	Assess the effectiveness of the vegetated swale in treating stormwater discharged via Outfall 2503.	Medium	Ecology		
A06.14.00	Environmental Sampling	RM 1.7-2.0 East (Slip 2 to Slip 3)	Seattle Biodiesel	06007	5023482	Collect information regarding chemical concentrations in bank soils. A 2007 spill of process mixture flowed across the bank soils at this property.	Medium	Ecology		General Biodiesel now operates at this location.
A06.25.00	Source Assessment	RM 1.7-2.0 East (Slip 2 to Slip 3)	Former Frank's Used Cars	06005	2337	Review the current status of cleanup activities at this site to determine whether residual soil contamination poses a risk of sediment recontamination.	Medium	Ecology		This site is listed as 'awaiting cleanup' on the CSCSL. An SHA conducted at this site in 2015 assigned a rank of 4 due to arsenic, cadmium, lead, PCBs and BTEX in shallow soil.
A06.28.00	Inspection	RM 1.7-2.0 East (Slip 2 to Slip 3)	Fittings, Inc.	06004	22569	Determine whether this facility should apply for coverage under the Industrial Stormwater General Permit	Medium	Ecology		SPU inspected in 2015 and found illicit connection to the storm drain discharging to Slip 2. Facility corrected the problem in 2016.
A06.30.00	Data Evaluation	RM 1.7-2.0 East (Slip 2 to Slip 3)	Former Consolidated Freightways	06002	54757868	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	Ecology	In Progress	The current site owner (Prologis, Inc.) is conducting a cleanup of this site under the VCP (NW3050). A cleanup action closure report was submitted to Ecology in July 2018. Further remedial action is needed.
A06.31.00	Source Assessment	RM 1.7-2.0 East (Slip 2 to Slip 3)	Former Consolidated Freightways	06002	54757868	Search for additional information regarding the two dump areas located just east of East Marginal Way S in 1940, as identified in historical aerial photographs (Harper-Owest 1985, Item 21), and evaluate the potential for sediment recontamination associated with these areas.	Medium	Ecology		This area of the site was covered by industrial development in 1961. It is within the boundaries of Cleanup Site 6262 (Consolidated Freightways), which is being remediated under VCP NW3050.
A06.32.00	Inspection	RM 1.7-2.0 East (Slip 2 to Slip 3)	Emerald Tool, Inc.	25166	2084	Conduct a business inspection at this facility; request information regarding concentrations of sediment COCs in soil and catch basins at this property.	Low	Ecology		In 2018, a site investigation at an adjoining property found chlorinated solvents in groundwater above MTCA cleanup levels; Ecology concluded that contaminants likely migrated from Emerald Tool.
A06.34.00	Cleanup	RM 1.7-2.0 East (Slip 2 to Slip 3)	Kelly Moore Paint Company	25167	2163	Determine the current status of cleanup efforts to evaluate whether additional remedial activities are required.	Low	Ecology	In Progress	Cleanup is in progress at this site under the VCP (NW 2305).

Table B-2. Incomplete Action Items

Action Item No.	Action Item Category	Source Control Area	Property/ Facility/ Outfall	Property Number	Facility/ Site ID	Action Item	Priority	Responsible Party	Status	Comments/Follow-On Actions
A06.37.01	Source Assessment	RM 1.7-2.0 East (Slip 2 to Slip 3)	Pioneer Porcelain Enamel Company	25168	2161	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	Ecology		This site is listed on the CSCSL as 'awaiting cleanup' with confirmed metals contamination in soil.
A06.37.02	Source Assessment	RM 1.7-2.0 East (Slip 2 to Slip 3)	Scougal Rubber corp.	25169	93637295	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	Ecology	In Progress	Site cleanup is in progress under VCP NW1707. Soil was excavated in 2017 to remove residual TCE contamination. An oxidation infiltration system was installed and began operation in 2017; infiltration events were planned for 2018 and 2019.
A06.37.03	Source Assessment	RM 1.7-2.0 East (Slip 2 to Slip 3)	Sonn Property	25169	93637295	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	Ecology		Same FSID as Scougal Rubber above.
A06.37.04	Source Assessment	RM 1.7-2.0 East (Slip 2 to Slip 3)	Unocal Service Station 0907	25172	2825755	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	Ecology		The site is listed as 'cleanup started' on the CSCSL, with confirmed contamination of soil and groundwater (petroleum products, non-halogenated VOCs).
A07.02.00	Source Assessment	RM 2.0-2.3 East (Slip 3 to Seattle Boiler Works)	S Brighton Street SD	NA	NA	Conduct source tracing in the S Brighton Street SD basin.	High	SPU, Ecology	In Progress	SPU jetted and cleaned the entire drainage system in 2010. In 2018, zinc (970 mg/kg), TPH-oil (3,350 mg/kg), BEHP (4.04 mg/kg DW), and dibutyl phthalate (22.1 mg/kg DW), exceeded the CSL in an inline sample at MH223. These concentrations are higher than what was measured in this system two years after cleaning. SPU will continue to monitor this system.
A07.03.01	Records Review	RM 2.0-2.3 East (Slip 3 to Seattle Boiler Works)	S Brighton Street SD	07008	11887871, 2134	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	Ecology		Inland Transportation (Arrow Transportation) is a cleanup site (CSID 5061). Ecology has determined that no further action is needed at this site.
A07.04.00	Records Review	RM 2.0-2.3 East (Slip 3 to Seattle Boiler Works)	South Seattle Community College		NA	Based on the review of VCP files investigate, if necessary, 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 of concern.	Medium	Ecology		

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Action Item No.	Action Item Category	Source Control Area	Property/ Facility/ Outfall	Property Number	Facility/ Site ID	Action Item	Priority	Responsible Party	Status	Comments/Follow-On Actions
A07.06.00	Source Assessment	RM 2.0-2.3 East (Slip 3 to Seattle Boiler Works)	S River Street SD	NA	NA	Conduct source tracing in the S River Street SD basin.	High	SPU, Ecology	In Progress	SPU jetted and cleaned the entire system in 2010. Elevated levels of PAHs (1.2 mg/kg DW) were found in a surface dirt sample collected adjacent to an onsite catch basin in 2018. SPU had the owner clean/jet onsite drainage system and pressure wash the paved lot. SPU will resample in 2019/2020 to confirm that PAHs have been controlled. SPU conducted IDDE survey in this area in 2014. Did not find any evidence of cross connections in this system. SPU sampled the downstream-most MH in 2018. TPH-oil (2,860 mg/kg) and BEHP (4.4 mg/kg DW) exceeded the City's source tracing thresholds. SPU intends to continue monitoring storm drain solids at the downstream end of this system.
A07.14.00	Records Review	RM 2.0-2.3 East (Slip 3 to Seattle Boiler Works)	V. Van Dyke	07010	68427684	Determine whether a UST may have been removed from the property without a proper closure.	Medium	Ecology		
A07.16.00	Records Review	RM 2.0-2.3 East (Slip 3 to Seattle Boiler Works)	V. Van Dyke	07010	68427684	Locate and review additional reports related to V. Van Dyke property that are missing from Ecology's files.	Medium	Ecology		
A07.20.00	Cleanup	RM 2.0-2.3 East (Slip 3 to Seattle Boiler Works)	Riverside Industrial Park	07004	37289288, 44383713	Determine the status of cleanup at the facility and whether to pursue additional investigation and cleanup under an administrative order.	Medium	Ecology		This is a state cleanup site (CSID 4178); status is listed as 'Cleanup Started'. It is currently enrolled in the VCP Program.
A08.02.00	Source Assessment	RM 2.3-2.8 East (Seattle Boiler Works to Slip 4)	S Garden Street and S Myrtle Street Storm Drains	NA	NA	Conduct source tracing to identify potential contaminant sources to stormwater discharging to the LDW.	High	SPU, Ecology	In Progress	SPU cleaned the entire system in 2010. <u>S Garden Street SD</u> : Seattle Iron and Metals (SIM) owns the downstream end of the drainage system located on their property. SPU required Seattle Iron and Metals to install a Filterra treatment unit on S Garden Street to control pollutant track out from the processing area at 701 S Orchard St. No samples were collected in 2018. <u>S Myrtle Street SD</u> : SPU installed 5 styles of sediment traps in the 2 downstream-most MHs in this system in 2016 as part of the sediment trap pilot study. Samples collected from 3 of the traps in 2018 contained elevated levels of copper (540 to 660 mg/kg), lead (540 to 620 mg/kg), mercury (1.4 to 1.9 mg/kg), PCBs (2.3 to 2.9 mg/kg DW), and TPH-oil (8,000 mg/kg). SDOT sweeps S Myrtle Street and S Garden Street every week. SPU also required SIM to install Filterra stormwater water treatment units on S Myrtle Street adjacent to driveway to control track out. Per Puget SoundKeepers lawsuit, SIM is required to design/install a dust collection system for the shredder unit, install wind fences to capture fugitive dust emissions, and design/implement a 2-phase dust emission monitoring program (to start in 2019).
A08.06.00	Inspection	RM 2.3-2.8 East (Seattle Boiler Works to Slip 4)	Seattle Boiler Works, Inc.	08008	17577864	Determine if the five outfalls that are not included in Seattle Boiler Work's NPDES permit are in use. If in use and Seattle Boiler Works is the source of discharge, modify the facility's stormwater permit to include these outfalls.	High	Ecology		
A08.12.01	Source Assessment	RM 2.3-2.8 East (Seattle Boiler Works to Slip 4)	Seattle Iron & Metals Corporation	08010	94727791	Review stormwater improvements, when completed, to assess the potential for transport of ASR to the LDW.	Medium	Ecology		Stormwater treatment upgrade has been completed, however effluent violations continue.
A08.18.00	Source Assessment	RM 2.3-2.8 East (Seattle Boiler Works to Slip 4)	Puget Sound Truck Lines	08007	41684823	Determine whether the five outfalls identified at the property are active, and identify the source of discharge from these outfalls, if any.	High	Ecology, Property owner/operator		Current operator at this property is Recology CleanScapes.
A08.20.00	Records Review	RM 2.3-2.8 East (Seattle Boiler Works to Slip 4)	Seattle City Light Georgetown Pump Station	08009	21369	Obtain and review information about any groundwater sampling that has been conducted at this property. Based on this review, evaluate the need for further source control actions.	Medium	Ecology		

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A08.21.00	Cleanup	RM 2.3-2.8 East (Seattle Boiler Works to Slip 4)	Crowley Marine Services	09002	1940187	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	Property owner/operator	In Progress	To be conducted in accordance with Agreed Order No. DE-6721. A Public Review Draft RI Report was completed in 2019. A supplemental investigation for the draft FS is in progress.
A08.27.01	Cleanup	RM 2.3-2.8 East (Seattle Boiler Works to Slip 4)	Fox Avenue Building	08002	2282	Conduct sitewide groundwater monitoring and continue ERD treatment and additional substrate injection in the downgradient area at Seattle Boiler Works property.	Medium	Property owner/operator	In Progress	Groundwater monitoring and substrate injection (including on the Seattle Boiler Works property) is continuing under Agreed Order DE-8985.
A08.29.00	Cleanup	RM 2.3-2.8 East (Seattle Boiler Works to Slip 4)	Whitehead Company, Inc./Former Tyee Industries	08013	9809, 48578491	Require the property owner/operator to address the pentachlorophenol contamination in groundwater discovered by Cascade Columbia Distributions' consultant.	Medium	Ecology	In Progress	An Agreed Order (DE-13548) was signed in August 2016 requiring Seattle Iron and Metals and 730 Myrtle LLC to implement an interim action, conduct an RI/FS, and prepare a draft CAP. The interim action for removal of some of the PCP-contaminated soils (where the stormwater treatment system is to be installed) was completed in 2018.
A08.31.00	Inspection	RM 2.3-2.8 East (Seattle Boiler Works to Slip 4)	Whitehead Company, Inc./Former Perkins Lot	08006	43114188	Conduct facility inspection to determine if activities conducted by businesses at 720 S Orchard Street require an NPDES permit, and to ensure compliance with applicable codes and regulations.	Medium	Ecology, EPA	In Progress	In 2013 Taxi King was granted coverage under the NPDES ISGP; the permit was canceled in March 2014. No additional information available.
A08.34.00	Information Request	RM 2.3-2.8 East (Seattle Boiler Works to Slip 4)	Whitehead Company, Inc./Former Perkins Lot	08006	43114188	Obtain a list of previous tenants from the property owner to evaluate historical operations and to determine if these operations could have resulted in soil or groundwater contamination.	Medium	Ecology, Property owner/operator		An NFA determination for this site was made for this site (CSID 1257) by Ecology in 2006.
A08.39.00	Source Assessment	RM 2.3-2.8 East (Seattle Boiler Works to Slip 4)	Former Sternoff Parcel	08011	2057	Evaluate the need for additional soil and groundwater samples and analyze them for sediment COCs to determine the potential for sediment recontamination via the groundwater discharge pathway.	Medium	Ecology		This cleanup site (CSID 4466) is listed as 'awaiting cleanup.'
A08.40.00	Records Review	RM 2.3-2.8 East (Seattle Boiler Works to Slip 4)	Former Sternoff Parcel	08011	2057	Locate documentation verifying that a PCB-contaminated "trash pile" and approximately 52,187 pounds of contaminated soil have been removed from the property.	Medium	Ecology		
A08.41.00	Records Review	RM 2.3-2.8 East (Seattle Boiler Works to Slip 4)	Former Sternoff Parcel	08011	2057	Determine the disposition of petroleum-contaminated soil stockpiled at the property by Remedco and provide the documentation to Ecology.	Low	Ecology		
A09.03.00	Environmental Sampling	RM 2.8 East (EAA-3: Slip 4)	North Boeing Field / KCIA / I-5 Storm Drains	09006, 09009	2387398, 2753918	Reinstall sediment traps and continue monitoring as needed.	High	SPU, Boeing, King County	In Progress	Boeing has discontinued sediment trap sampling as of 2017. King County and SPU continue to reinstall and sample sediment traps at KCIA and the I-5 storm drain, respectively. In 2018, BEHP, butylbenzyl phthalate, dibutyl phthalate, benzoic acid, and benzyl alcohol exceeded the CSL in the sediment trap sample collected from the I-5 SD at Slip 4 (SL4-T6).
A09.04.02	Source Assessment	RM 2.8 East (EAA-3: Slip 4)	North Boeing Field	09009	2753918	Determine impact of remaining joint sealant material on PCB concentrations in stormwater.	High	Ecology	In Progress	Investigation of joint sealant is continuing as part of the RI/FS.
A09.08.02	Source Assessment	RM 2.8 East (EAA-3: Slip 4)	North Boeing Field	09009	2753918	Continue source tracing in north drain line to identify and/or eliminate transport of PCBs to Slip 4.	High	Boeing	In Progress	Source tracing is continuing as part of the RI/FS.
A09.29.00	Cleanup	RM 2.8 East (EAA-3: Slip 4)	Crowley Marine / 8th Avenue Terminals	09002	1940187	Conduct investigation and cleanup activities in accordance with the Agreed Order, including collection of groundwater and storm drain system samples as appropriate.	Medium	8th Avenue Terminals (Crowley)	In Progress	Stormwater catch basin samples have been collected. Results are reported in the Public Review Draft RI (August 2019). The tenant, Waste Management, installed stormwater treatment in early 2019. A supplemental investigation for the draft FS is in progress.
A09.38.00	Data Evaluation	RM 2.8 East (EAA-3: Slip 4)	Boeing Plant 2	10002	2100	Assess existing groundwater data in the area.	Low	Ecology, EPA		Boeing conducted shoreline groundwater monitoring during 2017, however reports were not available for review.
A09.43.03	Cleanup	RM 2.8 East (EAA-3: Slip 4)	KCIA	09006	2387398	Conduct soil and groundwater investigation and cleanup under Ecology's VCP.	Low	KCIA, property operator	In Progress	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.

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A09.54.00	Cleanup	RM 2.8 East (EAA-3: Slip 4)	NBF-GTSP	09005, 09006, 09009	2050	Conduct RI/FS and implement interim actions (as needed).	High	Ecology, Boeing, City of Seattle, King County	In Progress	RI/FS is in progress. During 2018, several groundwater sampling events were complete at NBF and the GTSP. Off-property soil vapor and groundwater sampling along Ellis Avenue were also conducted.
A10.01.00	Cleanup	RM 2.8-3.7 East (EAA-4: Boeing Plant 2/Jorgensen Forge)	Boeing Plant 2	10002	2100	Evaluate the remaining Plant 2 Corrective Measures Study study areas and continue to determine needed source control actions.	Medium	EPA, Boeing	In Progress	Boeing has completed many of the interim soil cleanups and installed stormwater treatment systems. EPA expects to publish a proposed final cleanup plan for the upland area of Boeing Plant 2 in 2019.
A10.02.00	Cleanup	RM 2.8-3.7 East (EAA-4: Boeing Plant 2/Jorgensen Forge)	Boeing Plant 2	09006	63879778	Continue to delineate and evaluate the EMF plume.	Medium	EPA, Boeing	In Progress	An EE/CA was completed in December 2015, and a public review period ended in August 2016. EPA has delayed preparation of the Action Memorandum due to prioritization of other sites. Boeing conducted bioremediation treatment in selected areas at the site in November 2017. Boeing intends to conduct additional treatments in 2018. King County continues to monitor activities.
A10.05.00	Cleanup	RM 2.8-3.7 East (EAA-4: Boeing Plant 2/Jorgensen Forge)	Boeing Plant 2	10002	2100	Conduct monthly sampling, including groundwater sampling and vapor sampling of the DDC wells and multiple points along the vapor treatment system.	Medium	EPA, Boeing	In Progress	
A10.06.00	Cleanup	RM 2.8-3.7 East (EAA-4: Boeing Plant 2/Jorgensen Forge)	Boeing Plant 2	10002	2100	Continue shoreline groundwater monitoring.	High	EPA, Boeing	In Progress	Shoreline groundwater monitoring was conducted during 2017, however reports were not available for review. EPA issued a determination that migration of contaminated groundwater is under control.
A10.09.01	Source Assessment	RM 2.8-3.7 East (EAA-4: Boeing Plant 2/Jorgensen Forge)	Boeing Plant 2	10002	2100	Conduct an investigation to provide additional hydrogeologic data at the boundary of the Boeing Plant 2/Jorgensen Forge facilities.	High	Boeing	In Progress	Activities at Plant 2 have reportedly been completed, however no documentation has been provided.
A10.09.02	Source Assessment	RM 2.8-3.7 East (EAA-4: Boeing Plant 2/Jorgensen Forge)	Jorgensen Forge	10003	2382	Conduct an to provide additional hydrogeologic data at the boundary of the Boeing Plant 2/Jorgensen Forge facilities.	Medium	Jorgensen Forge	In Progress	Jorgensen Forge will be investigated, as necessary, under new Agreed Order DE-14143, and results will be presented in the RI Report.
A10.11.00	Environmental Sampling	RM 2.8-3.7 East (EAA-4: Boeing Plant 2/Jorgensen Forge)	Boeing Plant 2	10002	2100	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	Ecology, Boeing		City of Seattle lines have been closed. Boeing is working with the city of Tukwila. In October 2017, EPA suspended stormwater monitoring under the Boeing RCRA Order in deference to Ecology's Water Quality Program.
A10.18.00	Source Assessment	RM 2.8-3.7 East (EAA-4: Boeing Plant 2/Jorgensen Forge)	Jorgensen Forge	10003	2382	Develop a hydrogeologic site model as part of the source control investigation to characterize the groundwater system on site, including tidal influence.	High	Jorgensen, Boeing	In Progress	For the Jorgensen site, a tidal study/ hydrogeologic investigation and conceptual model will be conducted, as necessary, under Agreed Order DE-14143. Results will be presented in the RI Report.
A10.33.00	Cleanup	RM 2.8-3.7 East (EAA-4: Boeing Plant 2/Jorgensen Forge)	Jorgensen Forge	10003	2382	Complete a Remedial Investigation/Feasibility Study of the upland site area	High	Jorgensen, Boeing	In Progress	Agreed Order (DE-14143) was signed in July 2017; this action item will be completed under the Agreed Order, and will be presented in the RI Report.
A10.34.00	BMP Implementation	RM 2.8-3.7 East (EAA-4: Boeing Plant 2/Jorgensen Forge)	East Marginal Way S.	11002	NA	Install stormwater treatment for roadway runoff discharged through the newly dedicated City of Tukwila outfall (the former Plant 2 Z line)	Medium	City of Tukwila	In Progress	This retrofit project is funded in part by an Ecology Stormwater Financial Assistance Program grant. Project has been delayed due to funding issues.
A11.12.00	Cleanup	RM 3.7-3.9 East (EAA-6: Boeing Isaacson/Central KCIA)	Boeing Isaacson/Thompson Site	11001	2218	Clarify the purpose, function, and configuration of the edge drains along the Boeing Isaacson shoreline.	Low	Boeing, Port of Seattle	In Progress	To be addressed as part of Agreed Order No. DE-7088 (Ecology 2010 [6812]).
A11.14.00	Cleanup	RM 3.7-3.9 East (EAA-6: Boeing Isaacson/Central KCIA)	Boeing Isaacson/Thompson Site	11001	2218	Investigate the status and source of the unidentified outfall pipe located near the Boeing Isaacson/Jorgensen Forge property boundary (Outfall 2063).	Low	Boeing		To be addressed as part of Agreed Order No. DE-7088.
A11.16.00	Cleanup	RM 3.7-3.9 East (EAA-6: Boeing Isaacson/Central KCIA)	Boeing Isaacson/Thompson Site	11001	2218	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	Ecology, Boeing	In Progress	To be addressed as part of Agreed Order No. DE-7088. Final RI submitted 4/21/2014. Supplemental Port of Seattle "sliver" property subsurface investigation conducted in 2015. PLP working on draft FS.
A11.19.00	Cleanup	RM 3.7-3.9 East (EAA-6: Boeing Isaacson/Central KCIA)	Boeing Isaacson/Thompson Site	11001	2218	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	Ecology	In Progress	To be addressed as part of Agreed Order No. DE-7088.

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A11.27.00	Source Assessment	RM 3.7-3.9 East (EAA-6: Boeing Isaacson/Central KCIA)	KCIA	11002	72811433	Assess/confirm the adequate completion of cleanup activities associated with petroleum Leaking Underground Storage Tanks at Hangar Holdings.	Low	Ecology		Site is listed as 'cleanup started' (CSID 6574), with confirmed contamination with petroleum products and non-halogenated solvents.
A11.31.00	Cleanup	RM 2.8-3.7 East (EAA-4: Boeing Plant 2/Jorgensen Forge)	KCIA	09006	63879778	Monitor remedial activities at the former Boeing EMF to ensure that contaminated soil does not enter the storm drain system.	Medium	King County, EPA	In Progress	Boeing conducted bioremediation treatment in selected areas at the site in November 2017. Boeing intends to conduct additional treatments in 2018. King County continues to monitor activities.
A12.06.00	Cleanup	RM 3.9-4.3 East (Slip 6)	8801 Site (Former PACCAR Site)	12001	2072	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	Ecology, Property owner/operator	In Progress	A revised draft FS and Interim Action Work Plan were submitted to Ecology in March 2018; Ecology provided review comments in November 2018.
A12.08.00	Cleanup	RM 3.9-4.3 East (Slip 6)	8801 Site (Former PACCAR Site)	12001	2072	Complete Phase 2 of the Sediment Evaluation Work, which includes sediment core sampling in selected locations in the LDW adjacent to the site.	High	Ecology, Property owner/operator		
A12.09.00	Cleanup	RM 3.9-4.3 East (Slip 6)	8801 Site (Former PACCAR Site)	12001	2072	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	Ecology, Property owner/operator	In Progress	
A12.10.00	BMP Implementation	RM 3.9-4.3 East (Slip 6)	8801 Site (Former PACCAR Site)	12001	2072	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 sediments via the stormwater system.	Medium	Ecology, Property owner/operator		Facility is covered under the ISGP (WAR008681), Insurance Auto Auctions.
A12.12.00	Cleanup	RM 3.9-4.3 East (Slip 6)	Former Rhône-Poulenc Site	12005	2150	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	EPA, Property owner/operator	In Progress	The HICM is still in operation and effective. An investigation of shoreline bank contamination was completed Sept 2012. 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. In 2017 EPA approved a work plan for a CO2 Injection Pilot Study to address high pH, and work will start in 2018. EPA will continue working with the property owner to conduct the pilot study, assess the current conditions of groundwater throughout the site, update the PRGs, and continue with the CMS.
A12.13.00	Cleanup	RM 3.9-4.3 East (Slip 6)	Former Rhône-Poulenc Site	12005	2150	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	EPA, Property owner/operator	In Progress	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. In 2017 EPA approved a work plan for a CO2 Injection Pilot Study to address high pH, and work will start in 2018. EPA will continue working with the property owner to conduct the pilot study, assess the current conditions of groundwater throughout the site, update the PRGs, and continue with the CMS.
A12.14.00	BMP Implementation	RM 3.9-4.3 East (Slip 6)	Former Rhône-Poulenc Site	12005	2150	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	Ecology, Property owner/operator		West parcel is leased by Container Properties to Insurance Auto Auctions; activities are covered IAA's permit.
A12.21.00	Environmental Sampling	RM 3.9-4.3 East (Slip 6)	Museum of Flight (MOF)	12004	98798343	Monitor stormwater and/or storm drain solids at MOF and former BDC properties in the vicinity of USTs and associated groundwater contamination.	High	Ecology, Property owner/operator	In Progress	Boeing is responsible for the former BDC property (west of East Marginal Way). Stormwater will be monitored under WQ AO 15600. Historical storm drain solids sampling data for the former BDC property will be reviewed under MTCA AO DE 16275. The presence of USTs at the former BDC property will be investigated by Boeing.

Table B-2. Incomplete Action Items

Action Item No.	Action Item Category	Source Control Area	Property/ Facility/ Outfall	Property Number	Facility/ Site ID	Action Item	Priority	Responsible Party	Status	Comments/Follow-On Actions
A12.22.00	Cleanup	RM 3.9-4.3 East (Slip 6)	Museum of Flight (MOF)	12004	98798343	Develop a plan to remove USTs and associated soil and groundwater contamination on the MOF property.	Medium	Ecology, Property owner/operator		If any USTs are identified on the former BDC property, Boeing will be required to develop a UST removal and soil/GW investigation plan. Presence of USTs in the MOF property east of East Marginal Way needs to be investigated separately.
A12.23.00	Cleanup	RM 3.9-4.3 East (Slip 6)	Museum of Flight (MOF)	12004	98798343	Identify the source and extent of groundwater contamination on the former BDC property, and conduct remedial action, as necessary.	High	Ecology, Property owner/operator	In Progress	Will be identified during the RI; remedial action will be conducted if needed.
A12.26.00	Information Request	RM 3.9-4.3 East (Slip 6)	BDC - North	12002	2101	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	Boeing	In Progress	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 RI will include investigation of the presence of USTs.
A13.02.00	Environmental Sampling	RM 4.3-4.9 East (Boeing Developmental Center)	BDC Outfalls	13001	2101	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	Ecology/Boeing	In Progress	Subsurface sediment sampling will be conducted during the RI.
A13.06.00	Cleanup	RM 4.3-4.9 East (Boeing Developmental Center)	BDC - Central	13001	2101	Continue to monitor RCRA cleanup activities to ensure contaminants present in groundwater as a result of historical releases are not entering the LDW.	Low	Ecology	In Progress	RCRA activities will be completed under Agreed Order DE-16275 as part of an RI/FS/CAP for the entire BDC Site. Cleanup activities will be completed with Ecology oversight
A13.08.00	Information Request	RM 4.3-4.9 East (Boeing Developmental Center)	BDC - Central	13001	2101	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	Boeing	In Progress	Air sampling will be conducted under Agreed Order DE-16275 as needed to address the air deposition pathway.
A13.09.00	Environmental Sampling	RM 4.3-4.9 East (Boeing Developmental Center)	BDC - Central	13001	2101	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	Boeing	In Progress	Seep sampling will be conducted under Agreed Order DE-16275 to address discharge of contaminants to the LDW via this pathway.
A13.10.01	Cleanup	RM 4.3-4.9 East (Boeing Developmental Center)	BDC - Central	13001	2101	Implement the actions specified in Agreed Order 16275, including preparation of an RI/FS/DCAP and implementation of an Interim Action.	Medium	Boeing	In Progress	Actions specified under the agreed order include completion of ongoing RCRA cleanup activities.
A14.05.00	Cleanup	RM 4.9 East (EAA-7: Norfolk CSO/SD)	BDC-South	14004	4581384	Continue sediment monitoring in the vicinity of the south storm drain sediment removal activities.	High	Boeing	In Progress	Boeing continues to voluntarily monitor sediment in the vicinity of the 2003 removal action. Samples were collected most recently in September 2017; results are slightly higher than in previous years.
A14.07.00	Environmental Sampling	RM 4.9 East (EAA-7: Norfolk CSO/SD)	BDC-South	14004	4581384	Continue monitoring storm drain solids.	High	Boeing	In Progress	Boeing continues to collect samples of accumulated solids in the Vortechincs sediment trap unit. Most recent samples were collected in September 2017. Results are significantly higher than the previous year.
A14.08.00	Environmental Sampling	RM 4.9 East (EAA-7: Norfolk CSO/SD)	BDC-South	14004	4581384	Determine need for cleanup of caulk and/or other building materials that may contribute PCBs to the south storm drain.	Medium	Ecology, Boeing	In Progress	Boeing continues to sample potential contaminant sources in the south storm drain. In 2017, Boeing collected solids samples from the Building 9-101 roof (0.072 to 0.19 mg/kg DW total PCBs), and water and wipe samples from a drain pipe inside the building (1.71 ug/L and 0.97 ug/wipe total PCBs, respectively).
A14.11.00	Source Assessment	RM 4.9 East (EAA-7: Norfolk CSO/SD)	BDC-South	14004	4581384	The 2007 SCAP identified a possible historical barge operation at Parcel 0423049016. Determine whether groundwater and soil sampling are needed at this parcel to assess possible historical contamination.	Medium	Ecology, Boeing	In Progress	The 2007 SCAP noted a barge visible in a historical aerial photo. The barge is still present (now rotten and abandoned) in the LDW adjacent to the noted parcel. Boeing has identified a historical Phase 1 assessment for this parcel and is attempting to obtain a copy of that report.
A14.15.00	Environmental Sampling	RM 4.9 East (EAA-7: Norfolk CSO/SD)	Military Flight Center	14005	14532, 72362672	Monitor stormwater for PCBs at discharge points to assess potential ongoing sources.	Medium	Boeing	In Progress	Under Administrative Order #10554 (dated 4/3/2014), Boeing is required to monitor for PCBs in stormwater monitoring is performed at all four designated outfall locations. In 2017, the maximum detected concentration of total PCBs was 0.096 ug/L.
A14.16.00	Cleanup	RM 4.9 East (EAA-7: Norfolk CSO/SD)	Military Flight Center	14005	14532, 72362672	Discuss cleanup options for removal of caulk containing PCBs at less than 50 mg/kg.	Medium	Ecology, Boeing		Boeing submitted a work plan to address PCBs in paint and caulk in April 2015; plans included application of a polymeric coating and installation of new exterior metal siding to encapsulate the materials that contain less than 50 mg/kg PCBs. Abatement of PCB-containing materials was expected to occur during late summer and fall of 2015; no information on the current status of this effort was available.

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Action Item No.	Action Item Category	Source Control Area	Property/ Facility/ Outfall	Property Number	Facility/ Site ID	Action Item	Priority	Responsible Party	Status	Comments/Follow-On Actions
A14.20.00	Environmental Sampling	RM 4.9 East (EAA-7: Norfolk CSO/SD)	Unified Grocers / Associated Grocers	14003	73338176	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	Property owner		
A14.21.00	Source Assessment	RM 4.9 East (EAA-7: Norfolk CSO/SD)	Unified Grocers / Associated Grocers	14003	73338176	Re-evaluate the free product removal strategy to determine its source control effectiveness.	Medium	Property owner		
A14.22.00	Environmental Sampling	RM 4.9 East (EAA-7: Norfolk CSO/SD)	Unified Grocers / Associated Grocers	14003	73338176	Determine whether additional groundwater and soil assessment is needed for the maintenance building where UST removal activities took place in 1995.	Medium	Ecology		
A14.27.00	Environmental Sampling	RM 4.9 East (EAA-7: Norfolk CSO/SD)	Northwest Auto Wrecking	14009	2287	Conduct soil, groundwater, surface water, and sediment sampling, as appropriate, to evaluate potential historical sources.	Medium	Northwest Auto Wrecking		Review sampling results and assess potential for sediment recontamination.
A14.28.00	Data Evaluation	RM 4.9 East (EAA-7: Norfolk CSO/SD)	Northwest Auto Wrecking	14009	2287	Review results of soil, groundwater, surface water, and/or sediment sampling to assess potential for sediment recontamination.	Medium	Ecology		
A14.33.00	Environmental Sampling	RM 4.9 East (EAA-7: Norfolk CSO/SD)	Affordable Auto Wrecking	14001	7163112	Confirmed soil and surface water contamination with metals and petroleum products. Conduct surface water, soil, and groundwater sampling to assess the potential for sediment recontamination.	Medium	Property owner/operator		Affordable Auto Wrecking ceased operations in 2013-2014. Site is now vacant. Confirmed soil and surface water contamination; groundwater contamination is likely. Listed on CSCSL as "awaiting cleanup."
A14.36.00	Cleanup	RM 4.9 East (EAA-7: Norfolk CSO/SD)	Affordable Auto Wrecking	14001	7163112	Determine cleanup options for removal of historically-contaminated media, as appropriate.	Medium	Ecology, Property owner/operator		Listed on CSCSL as "awaiting cleanup."
A14.38.00	Inspection	RM 4.9 East (EAA-7: Norfolk CSO/SD)	Affordable Auto Wrecking	14001	7163112	Oversee and monitor discharges to the combined sewer system.	Medium	KCIW		Site is vacant, but site runoff continues to discharge to sanitary sewer.
A14.39.00	Environmental Sampling	RM 4.9 East (EAA-7: Norfolk CSO/SD)	Arco Gas Station (Pacific Truck School)	14002	29429665	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	Arco		Cleanup Site name is Easteys ARCO (CSID 5834). Listed as "cleanup started" but no other information available. SHA was completed in 2015.
A14.40.00	Environmental Sampling	RM 4.9 East (EAA-7: Norfolk CSO/SD)	Arco Gas Station (Pacific Truck School)	14002	29429665	Conduct additional groundwater monitoring.	Medium	Arco		Cleanup Site name is Easteys ARCO (CSID 5834). Listed as "cleanup started" but no other information available.
A14.41.00	Data Evaluation	RM 4.9 East (EAA-7: Norfolk CSO/SD)	Arco Gas Station (Pacific Truck School)	14002	29429665	Based on results of soil and groundwater sampling, determine whether further actions are needed to address potential historical sources.	Medium	Ecology		Cleanup Site name is Easteys ARCO (CSID 5834). Listed as "cleanup started" but no other information available.
A15.01.00	Source Assessment	RM 0.0-1.0 West (Spokane Street to Kellogg Island)	SW Dakota Street SD Outfalls (Outfalls 2148, 2149, 2150, and 2233)	NA	NA	Continue source tracing to identify potential sources of the sediment COCs reported above screening levels in storm drain structures in the SW Dakota Street SD basin.	Medium	SPU, Ecology	In Progress	<u>Outfall 2149</u> 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 sampled the MH near the downstream end of the system in 2018. BEHP, benzyl alcohol, and benzoic acid exceeded the CSL. This MH is severely backwatered due to sediment accumulation in the habitat swale. SPU intends to attempt to install a trap near the high water line in 2019 to collect storm drain solids. <u>Outfall 2148</u> serves the Encore Oil property at 4034 West Marginal Way SW. <u>Outfall 2150</u> serves the Lipsett Co property just east of Encore. SPU GIS indicates that both of these drainage systems are privately owned. <u>Outfall 2233</u> is the outlet of the salt water habitat swale constructed by the Port in 1993-1994.

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Action Item No.	Action Item Category	Source Control Area	Property/ Facility/ Outfall	Property Number	Facility/ Site ID	Action Item	Priority	Responsible Party	Status	Comments/Follow-On Actions
A15.02.00	Source Assessment	RM 0.0-1.0 West (Spokane Street to Kellogg Island)	SW Idaho Street SD Outfalls (Outfall 2147)	NA	NA	Continue source tracing to identify potential sources of the sediment COCs reported above screening levels in storm drain structures in the SW Idaho Street SD basin.	Medium	SPU, Ecology	In Progress	SPU jetted and cleaned the entire SW Idaho Street SD system in 2013 and continues to operate 3 sediment traps in this drainage system. 2018 samples exceeded the CSL for zinc (1,200 mg/kg), BEHP (6.5 mg/kg DW), cPAH (1.1 mg/kg DW), benzoic acid (2.4 mg/kg DW), and benzyl alcohol (1.1 mg/kg DW) at ID-ST1; and BEHP (1.9 mg/kg DW), 4-methylphenol (.71 mg/kg DW), benzoic acid (8.5 mg/kg DW), and benzyl alcohol (1.6 mg/kg DW) at ID-ST3.
A15.06.00	Information Request	RM 0.0-1.0 West (Spokane Street to Kellogg Island)	Riverside Mill Property	15021	4091, 10931	Request information from the property owner regarding the 1999 excavation and removal of soil contaminated with PCBs and lead, to evaluate the potential for sediment recontamination via the groundwater discharge pathway.	Medium	Ecology TCP		
A15.09.00	Inspection	RM 0.0-1.0 West (Spokane Street to Kellogg Island)	Port of Seattle Terminal 103	15025	7754458	Perform a facility inspection at CalPortland to verify compliance with applicable regulations and source control BMPs.	Low	Port of Seattle		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.
A15.12.00	Records Review	RM 0.0-1.0 West (Spokane Street to Kellogg Island)	Port of Seattle Terminal 105	15026	NA	Determine if the Liquid Disposal Corporation USTs have been removed from Terminal 105 park.	Medium	Port of Seattle		
A15.13.00	Information Request	RM 0.0-1.0 West (Spokane Street to Kellogg Island)	Port of Seattle Terminal 105	15026	15026	Request that the Port of Seattle and Ferguson Enterprises provide information to determine if PCB-bearing dredge spoils were removed from parcel 3530 prior to the construction of the warehouse over the disposal area.	Medium	Ecology		
A15.14.00	Source Assessment	RM 0.0-1.0 West (Spokane Street to Kellogg Island)	Port of Seattle Terminal 105	15026	15026	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	Ecology		
A15.15.00	Source Assessment	RM 0.0-1.0 West (Spokane Street to Kellogg Island)	Encore Oils (former Pacific Rendering)	15018	10287	Assess the need for additional environmental investigations and/or cleanup of contaminated soil.	Medium	Ecology		
A15.18.00	Information Request	RM 0.0-1.0 West (Spokane Street to Kellogg Island)	Ferguson Enterprises	15008	18675	Request that the Port of Seattle and Ferguson Enterprises provide information to determine if PCB-bearing dredge spoils were removed from parcel 3530 prior to the construction of the warehouse over the disposal area.	Medium	Ecology		
A15.19.00	Source Assessment	RM 0.0-1.0 West (Spokane Street to Kellogg Island)	Ferguson Enterprises	15008	18675	Assess the need for additional environmental investigations and/or cleanup of contaminated soil and groundwater.	Medium	Ecology		
A15.20.00	BMP Implementation	RM 0.0-1.0 West (Spokane Street to Kellogg Island)	General Recycling of Washington	15011	18553	Request that General Recycling update the facility SWPPP to include the chemical treatment upgrades to the stormwater treatment system. General Recycling will be required to provide the updated SWPPP to Ecology.	Medium	Ecology		
A15.21.00	Source Assessment	RM 0.0-1.0 West (Spokane Street to Kellogg Island)	General Recycling of Washington	15011	18553	Assess the need for additional environmental investigations and/or cleanup of contaminated soil and groundwater.	Medium	Ecology		
A15.24.00	Source Assessment	RM 0.0-1.0 West (Spokane Street to Kellogg Island)	Former Seaboard Lumber Property	15022	88471591	Assess the need for additional environmental investigations at Evergreen Trails and Herring's House Park to define the nature and extent of residual soil and groundwater contamination at the properties to determine if LDW sediment near the properties is or has the potential to become contaminated via the groundwater discharge and bank erosion pathways.	Medium	Ecology		

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A15.25.00	Source Assessment	RM 0.0-1.0 West (Spokane Street to Kellogg Island)	Port of Seattle Terminal 107	15027	NA	Determine the potential inputs to a pipe located near the ravine in the northern portion of the Terminal 107 Park.	Medium	Port of Seattle		
A15.26.00	Environmental Sampling	RM 0.0-1.0 West (Spokane Street to Kellogg Island)	Port of Seattle Terminal 107	15027	NA	Perform an environmental investigation to determine if soil and groundwater are contaminated due to historical industrial operations and filling activities.	Medium	Port of Seattle		
A15.29.00	Source Assessment	RM 0.0-1.0 West (Spokane Street to Kellogg Island)	Former Fraser Properties	15010	14392257, 72321478	Assess the need for additional environmental investigations and/or cleanup of suspected soil and groundwater contamination at this property.	Low	Ecology		
A15.32.00	Information Request	RM 0.0-1.0 West (Spokane Street to Kellogg Island)	Former Concrete Restoration	15005	31119678	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	Ecology		
A15.33.00	Source Assessment	RM 0.0-1.0 West (Spokane Street to Kellogg Island)	Former Concrete Restoration	15005	9688	Assess the need for additional investigations and/or cleanup of suspected soil and groundwater contamination at this property.	Low	Ecology		
A15.34.00	Information Request	RM 0.0-1.0 West (Spokane Street to Kellogg Island)	West Seattle Estates	15030	3858982	Request information regarding cleanup and groundwater monitoring at West Seattle Estates to evaluate the potential for sediment recontamination via the groundwater discharge pathway.	Low	Ecology		
A15.35.00	Source Assessment	RM 0.0-1.0 West (Spokane Street to Kellogg Island)	West Seattle Estates	15030	3858982	Assess the need for additional investigations and/or cleanup of soil and groundwater contamination at this property.	Low	Ecology		
A15.36.00	Information Request	RM 0.0-1.0 West (Spokane Street to Kellogg Island)	Puget Park	15019	2479	Request information from Seattle Parks to determine if the leachate collection trench was installed down gradient of the Puget Park Lobe.	Low	Ecology		
A15.37.00	Source Assessment	RM 0.0-1.0 West (Spokane Street to Kellogg Island)	Puget Park	15019	2479	Assess the need for additional investigations and/or cleanup of soil and groundwater contamination at this property.	Low	Ecology		
A16.01.00	Information Request	RM 1.0-1.3 West (Kellogg Island to Lafarge Cement)	Lafarge North America Inc. Seattle	16001	2132	Request information from Lafarge regarding the status of Outfall 001/2139 and 004.	Medium	Ecology		
A16.03.00	Data Evaluation	RM 1.0-1.3 West (Kellogg Island to Lafarge Cement)	Lafarge North America Inc. Seattle	16001	2132	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	Ecology		
A16.06.00	Environmental Sampling	RM 1.0-1.3 West (Kellogg Island to Lafarge Cement)	Lafarge North America Inc. Seattle	16001	2132	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	Ecology		
A16.07.00	Environmental Sampling	RM 1.0-1.3 West (Kellogg Island to Lafarge Cement)	Lafarge North America Inc. Seattle	16001	2132	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	Ecology		
A16.09.00	Information Request	RM 1.0-1.3 West (Kellogg Island to Lafarge Cement)	Lafarge North America Inc. Seattle	16001	2132	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	Ecology		
A17.05.00	Environmental Sampling	RM 1.3-1.6 West (Glacier Bay)	Alaska Marine Lines	17001	17126	Sample groundwater along shoreline to determine whether residual site contaminants are being discharged to Glacier Bay.	Medium	Property owner/operator		
A17.06.00	Information Request	RM 1.3-1.6 West (Glacier Bay)	Alaska Marine Lines	17001	17126	Confirm location of former USTs that were removed in 1990.	Low	Property owner/operator		

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A17.08.00	Source Assessment	RM 1.3-1.6 West (Glacier Bay)	Alaska Marine Lines	17001	17126	Verify that remediation associated with filling of graving dock was completed and all conditions met.	Low	Ecology		
A17.14.00	Cleanup	RM 1.3-1.6 West (Glacier Bay)	Duwamish Shipyard	17003	2071	Conduct site investigations as specified in the Agreed Order Statement of Work.	High	Property owner/operator	In Progress	Revised RI Report was submitted in 2017. Ecology is working with the PLP to finalize the RI and move forward with the FS.
A17.15.00	Cleanup	RM 1.3-1.6 West (Glacier Bay)	Duwamish Shipyard	17003	2071	Review site investigation results and assess potential for sediment recontamination and need for remedial actions.	High	Ecology	In Progress	Revised RI Report was submitted in 2017. Ecology is working with the PLP to finalize the RI and move forward with the FS.
A17.21.00	Cleanup	RM 1.3-1.6 West (Glacier Bay)	Glacier Northwest	17004	23881883	Review site investigation results and assess potential for sediment recontamination and need for remedial actions.	High	Ecology	In Progress	Draft Remedial Investigation Report submitted to Ecology in 2015. Ecology is working with the PLP to complete the RI and move forward with the FS.
A17.29.00	BMP Implementation	RM 1.3-1.6 West (Glacier Bay)	Chemithon	17002	41953656	Prepare and/or update the SWPPP and processes to ensure that site activities do not result in transport of contaminants to the LDW.	Low	Property owner/operator		
A17.38.00	Cleanup	RM 1.3-1.6 West (Glacier Bay)	N Terminal 115 (Former MRI Corporation)	17006	2177	Conduct Remedial Investigation as specified in Agreed Order No. 8099.	Medium	Port of Seattle	In Progress	Draft RI Report submitted to Ecology in October 2017.
A18.01.00	Data Evaluation	RM 1.6-2.1 West (Terminal 115)	SW Kenny Street SD/POS SD 6132/Terminal 115 CSO (Outfall 2127)	NA	NA	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	SPU, Ecology	In Progress	SPU cleaned the entire system in 2017. The near end-of-pipe sediment trap was retrieved in 2018. BEHP (2.98 mg/kg DW and benzyl alcohol (0.19 mg/kg DW) are the only chemicals that exceeded CSL post cleaning . Samples are collected annually and results are uploaded to EIM.
A18.02.00	Data Evaluation	RM 1.6-2.1 West (Terminal 115)	Highland Park Way SW SD/POS 6162 (Outfall 2125)	NA	NA	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	SPU, Ecology	In Progress	SPU cleaned the Highland Park Way SW SD system in 2015 and will continue to maintain 2 sediment traps in this system (Outfall 2125). Of the 3 sediment trap samples collected in 2018, 2 exceeded the screening level for TPH-oil; 2 exceeded the CSL for zinc, 1 for benzoic acid, and 3 for benzyl alcohol.
A18.03.00	Data Evaluation	RM 1.6-2.1 West (Terminal 115)	Highland Park Way SW SD/POS 6162 (Outfall 2125)	NA	NA	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	Ecology, Port of Seattle		
A18.04.00	Data Evaluation	RM 1.6-2.1 West (Terminal 115)	West Michigan CSO (Outfall 2506)	NA	NA	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	Ecology		Sediment traps within combined sewer collection system within this basin were installed in 2019, to be retrieved in 2020.
A18.05.00	Data Evaluation	RM 1.6-2.1 West (Terminal 115)	Terminal 115 - Port of Seattle Storm Drain Outfalls (Outfalls 2122, 2123, 2124, 2220, and POS 6146)	18014	4040072	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	Ecology, Port of Seattle		
A18.06.00	Environmental Sampling	RM 1.6-2.1 West (Terminal 115)	Terminal 115 - Port of Seattle Storm Drain Outfalls (Outfalls 2122, 2123, 2124, 2220, and POS 6146)	18014	4040072	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	Port of Seattle		

Table B-2. Incomplete Action Items

Action Item No.	Action Item Category	Source Control Area	Property/ Facility/ Outfall	Property Number	Facility/ Site ID	Action Item	Priority	Responsible Party	Status	Comments/Follow-On Actions
A18.07.00	Cleanup	RM 1.6-2.1 West (Terminal 115)	Terminal 115 - Port of Seattle Storm Drain Outfalls (Outfalls 2122, 2123, 2124, 2220, and POS 6146)	18014	4040072	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	Ecology, Port of Seattle	In Progress	Ecology and the PLPs (Port of Seattle and Boeing) have completed MTCA Agreed Order negotiations to perform an RI/FS/CAP, and are expecting to sign the Order by the end of 2020.
A18.10.00	BMP Implementation	RM 1.6-2.1 West (Terminal 115)	Terminal 115 - Port of Seattle Storm Drain Outfalls (Outfalls 2122, 2123, 2124, 2220, and POS 6146)	18014	4040072	Perform a video inspection of storm drain lines to identify areas where groundwater infiltrates the storm drain system.	High	Port of Seattle		
A18.11.00	Information Request	RM 1.6-2.1 West (Terminal 115)	Terminal 115 - Port of Seattle Storm Drain Outfalls (Outfalls 2122, 2123, 2124, 2220, and POS 6146)	18014	4040072	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	Port of Seattle		
A18.20.00	Inspection	RM 1.6-2.1 West (Terminal 115)	Seattle Engineering Department Penn Yard	18012	NA	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	Ecology		
A18.21.00	Information Request	RM 1.6-2.1 West (Terminal 115)	Seattle Engineering Department Penn Yard	18012	NA	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	Ecology		
A18.22.00	Information Request	RM 1.6-2.1 West (Terminal 115)	Former Foss Environmental Services	18006	36326474	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	Ecology		
A18.23.00	Information Request	RM 1.6-2.1 West (Terminal 115)	Former Foss Environmental Services	18006	36326474	Request additional information from Haslund MP to determine the locations of storm drain lines on the former Foss Environmental property.	Medium	Ecology		
A18.25.00	Environmental Sampling	RM 1.6-2.1 West (Terminal 115)	Former Foss Environmental Services	18006	36326474	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	Ecology		
A18.27.00	Records Review	RM 1.6-2.1 West (Terminal 115)	Catholic Printery	18003	14533	Review the April 2010 local source control inspection report to determine if there is a potential for sediment recontamination via the stormwater pathway.	Medium	Ecology		
A19.01.00	Information Request	RM 2.1 West (1st Avenue S SD)	1st Avenue S Bridge Drains (Outfalls 2505, 2507, 2510, 2512)	NA	NA	Request additional information from WSDOT regarding the quantity and quality of stormwater and solids discharged to the LDW through the bridge drains.	High	Ecology		
A19.02.00	Information Request	RM 2.1 West (1st Avenue S SD)	1st Avenue S Storm Drain System	NA	NA	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	Ecology		

Table B-2. Incomplete Action Items

Action Item No.	Action Item Category	Source Control Area	Property/ Facility/ Outfall	Property Number	Facility/ Site ID	Action Item	Priority	Responsible Party	Status	Comments/Follow-On Actions
A19.03.00	Information Request	RM 2.1 West (1st Avenue S SD)	1st Avenue S Engineered Wetlands	NA	NA	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	Ecology		
A19.04.00	Environmental Sampling	RM 2.1 West (1st Avenue S SD)	1st Avenue S Engineered Wetlands	NA	NA	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.	Medium	Ecology		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.
A19.08.05	Inspection	RM 2.1 West (1st Avenue S SD)	Vista Pro Automotive	19012	96897184	Perform an evaluation to determine if the facility is required to obtain coverage under the ISGP or is eligible for a CNE certificate.	Low	Ecology		
A20.08.00	Cleanup	RM 2.1-2.2 West (EAA-2: Trotsky Inlet)	Industrial Container Services	20018	2154	Evaluate the need for stormwater characterization (solids and whole water) from this facility if overflow occurs during heavy rainfall events.	Medium	Ecology/ KCIW	In Progress	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. KCIW is allowing contaminated stormwater to be treated and discharged to the sanitary sewer on an interim basis while RI/FS activities are being conducted.
A20.12.00	Cleanup	RM 2.1-2.2 West (EAA-2: Trotsky Inlet)	Douglas Management Company	20006	97573251	Conduct cleanup as needed to eliminate sources of contaminants to EAA-2.	Medium	Property owner/operator, Ecology	In Progress	To be conducted in accordance with Agreed Order No. DE-8258. The RI Report was completed in 2019. A supplemental investigation for the draft FS is in progress.
A20.16.00	Cleanup	RM 2.1-2.2 West (EAA-2: Trotsky Inlet)	Douglas Management Company	20006	97573251	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	Ecology/ Property owner/operator		To be addressed in accordance with Agreed Order No. DE-8258. This is direct discharge. Does not affect City MS4.
A20.19.00	Source Assessment	RM 2.1-2.2 West (EAA-2: Trotsky Inlet)	2nd Avenue S SD	NA	NA	Continue source tracing to identify sources of phthalates and other COCs.	High	SPU	In Progress	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 12 samples in this system since cleaning. Chemicals that exceeded the CSL included copper (2 samples), mercury (4 samples), zinc (4 samples), TPH-oil (10 samples), cPAH (1 sample), BEHP (11 samples), other phthalates, PCBs (1 sample), 2-methylphenol (1 sample), 4-methylphenol (2 samples), benzoic acid (4 samples), and benzyl alcohol (7 samples). A diesel truck repair facility continues to be a source of oil to this drain. SPU has issued multiple NOV's to this facility.
A20.33.02	Cleanup	RM 2.1-2.2 West (EAA-2: Trotsky Inlet)	Industrial Container Services	20018	2154	Conduct RI/FS, implement interim actions (as needed), and prepare draft CAP.	Medium	Industrial Container Services	In Progress	To be conducted in accordance with Agreed Order No. DE-6720. RI Report was completed in 2019.
A20.35.00	Environmental Sampling	RM 2.1-2.2 West (EAA-2: Trotsky Inlet)	Douglas Management Company	20006	97573251	Conduct groundwater sampling along the LDW shoreline to assess the potential for sediment recontamination via groundwater transport.	Medium	Ecology		To be addressed in accordance with Agreed Order No. DE-8258. The RI Report was completed in 2019. Shoreline groundwater samples have been collected from three wells; data is included in the RI Report. Supplemental sampling for the FS is in progress.
A20.36.00	Data Evaluation	RM 2.1-2.2 West (EAA-2: Trotsky Inlet)	Boyer Towing	20002	15947, 37926748	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	Ecology	In Progress	Preliminary review indicates phthalates and metals may be present at elevated concentrations.
A20.36.01	Source Assessment	RM 2.1-2.2 West (EAA-2: Trotsky Inlet)	Boyer Towing	20002	15947, 37926748	Determine if additional storm drain samples are needed.	Medium	Ecology		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.
A20.37.00	Information Request	RM 2.1-2.2 West (EAA-2: Trotsky Inlet)	Boyer Towing	20002	15947, 37926748	Request additional data regarding potential soil contamination at Parcels F and G; evaluate the need for additional characterization.	Medium	Ecology		Action item identified in Supplemental Data Gaps Report.

Table B-2. Incomplete Action Items

Action Item No.	Action Item Category	Source Control Area	Property/ Facility/ Outfall	Property Number	Facility/ Site ID	Action Item	Priority	Responsible Party	Status	Comments/Follow-On Actions
A21.01.00	Source Assessment	RM 2.2-3.4 West (Riverside Drive)	7 th Avenue S SD Outfall (Outfall 2112)	NA	NA	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	SPU, Ecology	In Progress	SPU jetted and cleaned the entire 7th Ave S SD system in 2013 and continues to operate 3 sediment traps in this basin. SPU collected 13 trap samples between 2014 and 2018. Chemicals exceeding a CSL included cPAH (1 sample), BEHP (7 samples), dimethylphthalate (1 sample), 4-methylphenol (1 sample), benzoic acid (5 samples), and benzyl alcohol (10 samples). TPH-oil also exceeded the screening level (4 samples).
A21.03.00	Inspection	RM 2.2-3.4 West (Riverside Drive)	Private Outfalls (Outfalls 2106, 2108, and 2113)	NA	NA	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	SPU	In Progress	<u>Outfall 2113</u> is the City's S Webster Street SD. This outfall serves one catch basin located on S Riverside Dr. SPU sampled this CB in 2016. LPAH, HPAH, and BEHP exceeded the CSL. SPU will clean this CB in 2020. <u>Outfall 2106</u> is an abandoned 24" pipe that is full of sediment and no longer functional. <u>Outfall 2107</u> is no longer visible along the shoreline. SPU will double check during a low tide to confirm.
A21.04.00	Source Assessment	RM 2.2-3.4 West (Riverside Drive)	Private Outfalls (Outfalls 2106, 2108, and 2113)	NA	NA	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	Property Owners		Outfall 2113 is the City's S Webster Street SD. This outfall serves one catch basin located on S Riverside Dr. Outfalls 2106 and 2108 remain unresolved.
A21.07.00	Information Request	RM 2.2-3.4 West (Riverside Drive)	Independent Metals Plant 2	21032	16139	Request drainage information from Independent Metals or the current operator at this property 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	Ecology		Independent Metals Plant 2 is no longer in business. Silver Bay Logging is the current operator. The site is on the CSCSL and is awaiting cleanup.
A21.08.00	Inspection	RM 2.2-3.4 West (Riverside Drive)	Former Long Painting – 10 th Avenue S Facility	21036	71678662	Perform a facility inspection at Unity Electric to verify compliance with applicable regulations and BMPs.	Medium	SPU, King County		All of the commercial parcels are in the City of Seattle and drain to the combined sewer system. The parcels in King County are either residential or vacant.
A21.09.00	Information Request	RM 2.2-3.4 West (Riverside Drive)	American Civil Constructors Barge Removal Ramp	20002	NA	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	EPA, USACE		
A21.13.00	Inspection	RM 2.2-3.4 West (Riverside Drive)	Olympic Steel Door	21050	45787437	Request Olympic Steel Door, Redox, and All Metal Arts to obtain coverage under the ISGP or apply for a CNE.	Low	Ecology		
A21.17.00	Environmental Sampling	RM 2.2-3.4 West (Riverside Drive)	Independent Metals Plant 1	21030	9309618	Request Independent Metals to obtain environmental data to determine if soil and groundwater is contaminated by metals from recycling operations and if COCs in soil and groundwater may be transported to the LDW.	Medium	Ecology		Independent Metals Plant 1 is on the CSCSL and is awaiting cleanup with confirmed PCB contamination in soil and groundwater.
A22.01.01	Environmental Sampling	RM 3.4-3.8 West (EAA-5: Terminal 117)	Adjacent Streets/Dallas Ave.	NA	NA	Continue monitoring of storm drain solids	High	SPU, Port of Seattle	In Progress	City of Seattle and Port of Seattle completed the long term maintenance and monitoring plan for EPA in 2018. Long term monitoring of storm drain solids near the outfall to be conducted as part of Seattle's SCIP. SPU installed a sediment trap in the downstream-most MH on the 17th Ave S SD in 2017. The trap was retrieved in 2018 but insufficient material had accumulated to allow chemical analysis. SPU collected 5 stormwater samples from the underdrains in one bioretention cell and one Filterra unit in 2018 to assess condition of the filter media. PCBs were not detected at 0.01 ug/L in any samples. Next round of underdrain sampling is scheduled for 2021.
A22.05.00	Source Assessment	RM 3.4-3.8 West (EAA-5: Terminal 117)	South Park Marina	22003	44653368	Investigate sewer connections and discharge locations of storm drains and catch basins.	Low	Ecology		Site maps show two outfalls from South Park Marina facility to the LDW; only one is identified in the facility's NPDES permit. This will be addressed as part of an RI under an upcoming Agreed Order.

Table B-2. Incomplete Action Items

Action Item No.	Action Item Category	Source Control Area	Property/ Facility/ Outfall	Property Number	Facility/ Site ID	Action Item	Priority	Responsible Party	Status	Comments/Follow-On Actions
A23.06.00	Information Request	RM 3.8-4.2 West (Sea King Industrial Park)	Sea King Industrial Park	23038	NA	Sea King Industrial Park is not located within the S 96th Street SD basin, but discharges to a creek along S Director Street. Request information from the property owner regarding stormwater drainage features to evaluate the potential for contaminant transport to the LDW via stormwater discharge.	Low	Ecology		
A23.08.00	Information Request	RM 3.8-4.2 West (Sea King Industrial Park)	Sea King Industrial Park	23038	NA	Request information from the property owner regarding historical tenant operations to determine the potential for soil and/or groundwater contamination beneath the property.	Low	Ecology		
A23.09.00	Inspection	RM 3.8-4.2 West (Sea King Industrial Park)	KRS Marine	23024	90355185	Facility is adjacent to the LDW. Perform a source control inspection to verify compliance with applicable regulations and BMPs to prevent the release of contaminants to the LDW.	Low	Ecology		
A24.01.00	Information Request	RM 4.2-5.8 West (Restoration Areas)	Hamm Creek SD Basin	NA	NA	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	Ecology	In Progress	Based on Figure 3-3 in King County's Source Control Implementation Plan, the area in question is within the city of Burien.
A24.02.00	Information Request	RM 4.2-5.8 West (Restoration Areas)	Outfall 3842	NA	NA	Request additional information from the City of Tukwila to determine the drainage area associated with Outfall 3842.	Medium	Ecology		
A24.04.00	Environmental Sampling	RM 4.2-5.8 West (Restoration Areas)	Seattle City Light Power Substation	24021	17593	Request that SCL perform an environmental assessment to address the potential arsenic, mercury, benzo(a)pyrene, and BEHP contamination in fill material.	Medium	Ecology		
A24.05.00	Inspection	RM 4.2-5.8 West (Restoration Areas)	Boeing Parking Lot Property	24004	NA	Perform a source control inspection to verify compliance with applicable regulations and BMPs to prevent the release of contaminants to the LDW.	Low	Ecology		
A24.08.00	Environmental Sampling	RM 4.2-5.8 West (Restoration Areas)	USPS Seattle Distribution Center	24025	NA	Request that the Sabey Corporation collect groundwater data to assess the current concentrations of metals in groundwater beneath the property.	Low	Ecology		
A24.09.00	Records Review	RM 4.2-5.8 West (Restoration Areas)	USPS Seattle Distribution Center	24025	NA	Review the cleanup records associated with Atlas Demolition to assess the potential for sediment recontamination via the groundwater discharge pathway.	Low	Ecology		

**Appendix C:
SPU Source Control Inspections
(2018)**

Appendix C

SPU Source Control Inspections (2018)

Facility	Address	Date Inspected	Inspection Type	Corrective Actions					Rank
				Total	HW	IW	SP	SW	
Upper Reach									
RM 4.9 East (EAA-7: Norfolk CSO/SD)									
Becker Patrick	9447 Martin Luther KingJr Way S	5/1/2018	Initial	2	1			1	Medium
		5/29/2018	Follow Up	0					
Coluccio & Company LLC	9600 Martin Luther King Jr Wy S	4/3/2018	Initial	3				3	
		5/16/2018	Follow Up	0					
Emerald Tree Service Inc	9251 Martin Luther King Jr Way S	5/29/2018	Initial	4			3	1	Medium
Frank Coluccio Construction Co. - 9845 M L King Jr Way S	9845 Martin Luther King Jr Way S	4/3/2018	Initial	0					High
Gaston Bros Excavating	9639 Martin Luther King Jr Way S	12/5/2018	Initial	2			1	1	Medium
GTS Drywall Supply Co.	9830 40th Avenue S	2/12/2018	Initial	0					
Jacks Auto Parts Inc	9423 Martin Luther King Jr Way S	5/2/2018	Initial	0					
Marine Vacuum Service Inc	9401 Martin Luther King Jr Way S	6/21/2018	Initial	2			1	1	Low
		7/19/2018	Follow Up	1			1		
Root Cause LLC	9250 Martin Luther King Jr Way S	5/29/2018	Initial	1				1	Medium
		7/30/2018	Initial	1	1				
		10/5/2018	Follow Up	1				1	
Swan USA Net, LLC	8300 Military Road S	11/5/2018	Initial	5				5	Medium
		12/17/2018	Follow Up	0					
Van Asselt Elementary School	8311 Beacon Avenue S	7/26/2018	Initial	2			2		Low
		10/2/2018	Follow Up	0					
		11/13/2018	Follow Up	0					
RM 3.8-4.2 West (Sea King Industrial Park)									
Gary Merlino Construction Co.	9125 10th Avenue S	1/9/2018	Initial	1				1	High
		2/8/2018	Follow Up	0					
King Electrical Mfg. Company	821 S Barton Street	1/17/2018	Follow Up	0					Low
King Electrical Mfg. Company	9131 10th Avenue S	1/17/2018	Follow Up	0					High
Petrocard Systems Inc. - 9014 14th Ave S	9014 14th Avenue S	3/1/2018	Initial	3			2	1	Medium
		4/11/2018	Follow Up	0					
Puget Sound Coatings LLC	9220 8th Avenue S	7/10/2018	Initial	7	1			6	High
		10/10/2018	Follow Up	0					
THC PARTNERS LLC	9369 8th Avenue S	12/20/2018	Initial	0					Low
Middle Reach									
RM 2.8 East (EAA-3: Slip 4)									
Cedar Grove Composting, Inc	7343 East Marginal Wy S	1/10/2018	Follow Up	0					Medium
RM 2.3-2.8 East (Seattle Boiler Works to Slip 4)									
Big Dipper Wax Works Inc.	700 S Orchard Street	11/8/2018	Initial	0					Low
Sea Native USA Inc.	745 S Myrtle Street	9/24/2018	Initial	4	1			3	Medium
		11/27/2018	Follow Up	0					
Seattle Iron & Metals Corp	601 S Myrtle Street	1/26/2018	Follow Up	0					High
RM 2.0-2.3 East (Slip 3 to Seattle Boiler Works)									
Ben Butler Property	150 S River Street	2/5/2018	Initial	2				2	None
		5/2/2018	Follow Up	0					
Pike Brewing Co.	6725 East Marginal Way S	6/21/2018	Initial	3			1	2	Medium
Seattle Distribution Center	6701 East Marginal Way S	6/21/2018	Initial	0					Medium
Work Space Development LLC	303 S River Street	1/19/2018	Initial	1			1		Medium
WW Trailers Inc	150 S River Street	6/6/2018	Initial	5			3	2	High

Appendix C

SPU Source Control Inspections (2018)

Facility	Address	Date Inspected	Inspection Type	Corrective Actions					Rank
				Total	HW	IW	SP	SW	
RM 1.7-2.0 East (Slip 2 to Slip 3)									
General Biodiesel Seattle LLC	6333 1st Avenue S	1/11/2018	Initial	2		1		1	Medium
		3/1/2018	Follow Up	0					
Samson Tug and Barge	6361 1st Avenue S	9/25/2018	Initial	5	1			4	High
		10/26/2018	Follow Up	0					
RM 2.2-3.4 West (Riverside Drive)									
Aces Four Construction Co.	537 S Southern Street	2/28/2018	Initial	3			3		Medium
Bartlett Tree Experts	300 S Sullivan Street	3/1/2018	Initial	2				2	Low
Beeline Tours LTD	8110 7th Avenue S	2/28/2018	Initial	7			3	4	Medium
		4/9/2018	Follow Up	0					
BFC Architectural Metals Inc.	8300 7th Avenue S	2/28/2018	Initial	1				1	Low
		4/13/2018	Follow Up	0					
DMH Industrial Electric, Inc.	7800 7th Avenue S	3/16/2018	Initial	3		1		2	Medium
		5/30/2018	Follow Up	0					
Hazard Factory LLC	7800 7th Avenue S	3/31/2018	Initial	3				3	High
		5/30/2018	Follow Up	0					
Lumenomics Inc	7800 7th Avenue S	4/2/2018	Initial	4			3	1	Low
		5/30/2018	Follow Up	0					
Machinists Inc	516 S Chicago Street	10/16/2018	Initial	1				1	Medium
		11/21/2018	Follow Up	0					
Machinists Inc	8201 7th Avenue S	10/16/2018	Initial	0					Low
Machinists Inc.	500 S Portland Street	10/16/2018	Initial	2				2	Medium
		11/21/2018	Follow Up	0					
Machinists Inc.	707 S Riverside Drive	10/16/2018	Initial	0					
Machinists Inc.	7600 5th Avenue S	10/16/2018	Initial	3	1			2	High
		11/21/2018	Follow Up	0					
Machinists Inc.	8101 7th Avenue S	10/16/2018	Initial	0					Low
Modern Machine Co.	524 S Southern Street	4/12/2018	Initial	2			1	1	High
Pacific Pile & Marine LP	582 S Riverside Drive	1/25/2018	Initial	1				1	High
		3/23/2018	Follow Up	0					
Pacific Pile & Marine LP	620 S Riverside Drive	1/25/2018	Initial	1				1	Medium
		3/23/2018	Follow Up	0					
Pacific Pile & Marine LP	700 S Riverside Drive	1/25/2018	Initial	1			1		High
		3/23/2018	Follow Up	0					
Pacific Pile & Marine LP	707 S Riverside Drive	1/25/2018	Initial	1			1		Medium
		3/23/2018	Follow Up	0					
Scenic Bound Tours Co.	8221 7th Avenue S	2/28/2018	Initial	3				3	Medium
		4/13/2018	Follow Up	0					
The Gear Works Seattle Inc	500 S Portland Street	1/17/2018	Initial	0					High
The Gear Works Seattle Inc	516 S Chicago Street	1/17/2018	Initial	0					Medium
The Gear Works Seattle Inc.	707 S Riverside Drive	1/17/2018	Initial	0					Medium
RM 2.1-2.2 West (EAA-2: Trotsky Inlet)									
Bill's Mobile Service	7265 2nd Avenue S	1/18/2018	Initial	3				3	High
		2/16/2018	Follow Up	0					
Demolition Man Inc.	8151 Occidental Avenue S	1/26/2018	Initial	7			3	4	High
		3/5/2018	Follow Up	0					
		4/18/2018	Follow Up	0					
Demolition Man Inc.	8129 Occidental Avenue S	1/25/2018	Initial	8	1		3	4	Medium
		3/5/2018	Follow Up	0					
		4/18/2018	Follow Up	0					
LBA Realty	7272 West Marginal Way S	8/10/2018	Initial	1				1	Low
North Star Ice Equipment Corporation	8151 Occidental Avenue S	1/25/2018	Initial	8			3	5	Medium
		3/5/2018	Follow Up	0					

Appendix C

SPU Source Control Inspections (2018)

Facility	Address	Date Inspected	Inspection Type	Corrective Actions					Rank
				Total	HW	IW	SP	SW	
RM 2.1 West (1st Avenue S Storm Drain)									
Bay Area Concrete LLC	7245 West Marginal Way SW	7/27/2018	Initial	5	1		1	3	High
		10/19/2018	Follow Up	7	1			6	
		12/7/2018	Follow Up	0					
Beacon Sales Acquisition Inc.	7901 1st Avenue S	3/1/2018	Initial	3	2			1	Medium
		4/10/2018	Follow Up	0					
Christensen West LLC	7800 Detroit Ave SW	4/6/2018	Follow Up	0					High
		5/3/2018	Follow Up	0					
First Student Inc. - 8249 5th Ave S	8249 5th Avenue S	1/10/2018	Initial	3			1	2	Medium
		2/16/2018	Follow Up	0					
First Student Inc. -7739 1st Ave S	7739 1st Avenue S	1/10/2018	Initial	0					Medium
Pacific Rim Trench & Shoring	7745 1st Avenue S	12/31/2018	Initial	9			1	8	High
W.G. Clark Construction Co.	7958 Occidental Avenue S	3/2/2018	Initial	0					Medium
Waste Management of WA Inc	7201 West Marginal Way SW	1/10/2018	Follow Up	0					High
RM 1.6-2.1 West (Terminal 115)									
Emswiler Construction	6045 West Marginal Way SW	1/17/2018	Follow Up	0					High
		1/17/2018	Follow Up	0					
Gene Summy Lumber	6000 West Marginal Way SW	1/23/2018	Follow Up	0					Medium
Lower Reach									
RM 0.1-0.9 East (EAA-1: Duwamish/Diagonal Way)									
A&H Restaurant Corporation	1919 S Jackson Street	12/11/2018	Initial	1			1		Medium
A1 Building Supply - 4408 4th Ave S	4408 4th Avenue S	10/17/2018	Initial	2			2		Low
ABM Janitorial Services Northwest	2001 22nd Avenue S	6/29/2018	Initial	5			3	2	Low
Acco Engineered Systems Inc	5300 Denver Avenue S	1/9/2018	Initial	5	1		3	1	High
		2/28/2018	Follow Up	0					
Affordable Tire & Brake II	3300 Martin Luther King Jr Way S	8/13/2018	Initial	2				2	High
Amy Bistro LLC	4119 4th Avenue S	11/28/2018	Initial	4			2	2	Low
		12/26/2018	Follow Up	0					
Attilio A Merlino and Associates Inc.	4100 4th Avenue S	1/26/2018	Follow Up	0					Medium
AutoZone Stores Inc.	306 23rd Avenue S	9/12/2018	Initial	5			4	1	Medium
Beyene Bereket N	3800 Diagonal Avenue S	3/8/2018	Initial	4			3	1	Medium
		4/4/2018	Follow Up	0					
Blokable Inc	1136 Poplar Place S	1/17/2018	Initial	1				1	Low
		2/12/2018	Follow Up	0					
Buddha Bruddah LLC	2201 Rainier Avenue S	4/9/2018	Initial	4			3	1	Low
		5/9/2018	Follow Up	0					
Budget Batteries Inc.	2006 Rainier Avenue S	9/27/2018	Initial	0					Medium
Catholic Community Services of King County	100 23rd Avenue S	11/5/2018	Initial	1				1	Low
		12/21/2018	Follow Up	0					
Catholic Community Services of King County	2329 Rainier Avenue S	8/30/2018	Initial	4			1	3	Low
		10/3/2018	Follow Up	4			1		
		11/8/2018	Follow Up	0					
Cellco Partnerships	3440 6th Avenue S	12/7/2018	Initial	0					Low
City Investors LLC	306 23rd Avenue S	9/12/2018	Initial	2			2		Low
		12/5/2018	Follow Up	0					
Crosscut Hardwoods	4100 1st Avenue S	3/22/2018	Initial	5			1	4	
		4/27/2018	Follow Up	0					

Appendix C
SPU Source Control Inspections (2018)

Facility	Address	Date Inspected	Inspection Type	Corrective Actions					Rank
				Total	HW	IW	SP	SW	
Dakota Street LLC	655 S Andover Street	12/7/2018	Initial	1				1	None
		12/26/2018	Follow Up	0					
Daniel Smith Inc.	4150 1st Ave S	6/14/2018	Initial	1			1		
DTF Prep Seattle LLC	4025 1st Avenue S	5/10/2018	Initial	6		1	3	2	Low
		6/18/2018	Follow Up	2				2	
Dungeness Resources LLC	2101 23rd Avenue S	1/17/2018	Follow Up	0					Medium
		2/12/2018	Follow Up	0					
EH Enterprises Management Inc.	3922 6th Avenue S	10/31/2018	Initial	4			2	2	Medium
		12/7/2018	Follow Up	0					
Emerald City Bindery	4809 Airport Way S	11/6/2018	Initial	2				2	Low
		11/28/2018	Follow Up	0					
Emerald City Cleaners Inc	850 Rainier Avenue S	11/5/2018	Initial	0					Low
Golden Carriage Inc.	1917 S Jackson Street	12/11/2018	Initial	2			2		Low
Great Western Pacific Inc	14 S Idaho Street	2/2/2018	Initial	1				1	Low
		3/22/2018	Follow Up	0					
Hat Rack Wines	3861 1st Avenue S	5/2/2018	Initial	0					Low
Hudson Bay Insulation Co	4800 Denver Avenue S	2/1/2018	Initial	3			1	2	Medium
		3/5/2018	Follow Up	0					
IsGood Woodworks, LLC	4660 East Marginal Way S	11/8/2018	Initial	0					Low
Island Detail	308 14th Avenue S	11/5/2018	Initial	0					Low
Jergens Lawrence C	417 18th Avenue S	6/7/2018	Initial	0					
Johnson & Barrow	2203 23rd Avenue S	7/2/2018	Initial	4			3	1	Low
		7/20/2018	Follow Up	0					
Johnson & Barrow Inc	2024 21st Avenue S	7/2/2018	Initial	6			3	3	Medium
		7/20/2018	Follow Up	0					
Johnson & Barrow Inc	2202 22nd Avenue S	12/14/2018	Initial	3	1			2	Low
Kellans Autobody & Svcs Inc	1501 S Dearborn Street	1/23/2018	Initial	0					
KT Building Supply Inc	3623 6th Avenue S	2/26/2018	Initial	0					High
Lee Sang H	3002 Beacon Avenue S	12/12/2018	Initial	3				3	Medium
Lost Luggage	3849 1st Avenue S	5/2/2018	Initial	0					Low
		9/21/2018	Initial	0					
Lowe's Home Improvement Warehouse	2700 Rainier Avenue S	1/16/2018	Follow Up	0					High
		1/25/2018	Follow Up	0					
M & M Auto Repair	2116 22nd Avenue S	10/30/2018	Initial	2			1	1	Medium
		12/13/2018	Follow Up	0					
Madonna Properties, LLC	4660 East Marginal Way S	11/8/2018	Initial	1				1	Low
		12/12/2018	Follow Up	0					
Mediterranean Market Inc	2307 Rainier Avenue S	9/21/2018	Initial	0					Low
Modelwerks Inc.	655 S Andover Street	10/5/2018	Initial	4			1	3	Medium
		12/7/2018	Follow Up	0					
Nguyen's Pharmacy	2120 Rainier Avenue S	8/28/2018	Initial	2				2	Low
		9/4/2018	Follow Up	0					
Northwest Tofu Inc	1911 S Jackson Street	10/25/2018	Initial	4			2	2	Low
		11/29/2018	Follow Up	0					
O'Reilly Auto Parts #3697	2805 Rainier Avenue S	6/19/2018	Initial	2				2	High
Pacific Tower	1200 12th Avenue S	4/10/2018	Initial	2				2	Medium
		5/24/2018	Follow Up	0					
Pius Kitchen and Bath	3623 6th Avenue S	2/26/2018	Initial	1				1	High
Plymouth Poultry Co	4604 4th Avenue S	1/19/2018	Initial	4			3	1	Low
Rodda Paint Co.	3838 4th Avenue S	12/19/2018	Initial	0					Medium
S.A. Thompson LLC	4604 4th Avenue S	1/19/2018	Initial	2				2	None
		3/22/2018	Follow Up	0					
Safelite Fulfillment Inc	4005 6th Avenue S	5/7/2018	Initial	5			3	2	Medium
		6/18/2018	Follow Up	0					

Appendix C

SPU Source Control Inspections (2018)

Facility	Address	Date Inspected	Inspection Type	Corrective Actions					Rank
				Total	HW	IW	SP	SW	
Saffron Spice	1901 Rainier Avenue S	3/2/2018	Initial	4			3	1	Medium
		4/3/2018	Follow Up	0					
Seaself Storage LLC	1100 Poplar Place S	12/10/2018	Initial	2			1	1	Low
Seattle Rockeries & Construction	2200 22nd Avenue S	12/14/2018	Initial	2			2		Low
Seattle Towing LLC	3834 4th Avenue S	9/26/2018	Initial	2	1		1		High
		10/31/2018	Follow Up	0					
SFD - Fire Station #6	405 Martin Luther King Jr Way S	8/30/2018	Initial	0					Medium
SFD Fire Station #13	3601 Beacon Ave S	8/30/2018	Initial	0					Medium
Skyline Electric & MFG. Company	3619 7th Avenue S	3/28/2018	Initial	5			2	3	Low
		5/15/2018	Follow Up	0					
Snorkel Hot Tubs Inc	4216 6th Avenue S	10/8/2018	Initial	4			1	3	Low
		11/6/2018	Follow Up	0					
Song & Jenny Inc.	4117 4th Avenue S	11/6/2018	Initial	3			2	1	Low
Southern Wine & Spirits of Washington LLC	4101 1st Avenue S	5/7/2018	Initial	3			1	2	Medium
		6/18/2018	Follow Up	0					
Teklesus Fshahaye A	2114 22nd Avenue S	10/30/2018	Initial	4	1		1	2	Medium
		12/13/2018	Follow Up	1				1	
The Dog Resort LLC	629 S Industrial Way	9/21/2018	Initial	5			1	4	High
		11/19/2018	Follow Up	1				1	
Tung Enterprises Inc.	2009 Rainier Avenue S	3/21/2018	Initial	2				2	Medium
		5/4/2018	Follow Up	0					
Uli's Famous Sausage Inc.	843 Rainier Avenue S	10/17/2018	Initial	4			2	2	Low
		11/26/2018	Follow Up	0					
United Parcel Service	4201 6th Avenue S	1/3/2018	Initial	1				1	Medium
Uwajimaya	4601 6th Avenue S, Unit A	10/9/2018	Initial	2			1	1	Low
Walgreens #03632	2400 S Jackson Street	11/1/2018	Initial	3			1	2	Low
		12/5/2018	Follow Up	0					
Waste Management of WA Inc	70 S Alaska Street	1/11/2018	Initial	0					High
WSDOT - Signal Shop	3700 9th Avenue S	10/3/2018	Initial	7	1		2	4	Medium
		11/7/2018	Follow Up	0					
RM 0.0-1.0 West (Spokane Street to Kellogg Island)									
Global Diving and Salvage Inc.	3801 Marginal Place SW	6/28/2018	Initial	0					Medium
		7/25/2018	Follow Up	0					
Global Diving and Salvage Inc.	3840 West Marginal Way SW	6/28/2018	Initial	4			1	3	Medium
		7/25/2018	Follow Up	0					
Global Diving and Salvage Inc.	4025 West Marginal Way SW	6/29/2018	Initial	0					Medium
		7/25/2018	Follow Up	0					

**Appendix D:
King County Source Control Inspections
(2018)**

Table D-1. King County Industrial Waste Inspections in LDW Basin (2018)

Facility	Authorization Type	Authorization Number	Inspection Date	CSO Basin
Beckwith & Kuffel Inc. - Remediation Construction Project	Minor Discharge Authorization	11795-01	1/17/2018	8th Avenue
Coast Crane Company	Minor Discharge Authorization	788-03	4/6/2018	8th Avenue
Industrial Container Services - WA LLC	Permit	7929-01	9/18/2018	8th Avenue
Kerry Inc.	Permit	7854-02	5/25/2018	8th Avenue
Machinists, Inc. Plant 5	Permit	7892-01	7/13/2018	8th Avenue
Magnetic and Penetrant Services Co.	Permit	7873-02	11/28/2018	8th Avenue
National Products Inc.	Permit	7834-02	3/28/2018	8th Avenue
Seattle, City of - SPU - South Recycling and Disposal Station	NA	400-04	7/10/2018	8th Avenue
Seattle, City of - SPU - Storm Drainage Basin Cleaning Decant Site	Major Discharge Authorization	4425-01	7/17/2018	8th Avenue
Waste Management Inc. - Seattle	Minor Discharge Authorization	785-04	3/9/2018	8th Avenue
Seafreeze Acquisition, LLC (AKA Lineage Logistics - Seattle Michigan)	Permit	7896-01	2/14/2018 10/31/2018	8th Avenue or Terminal 115
Art Brass Plating Inc.	Permit	7722-05	11/15/2018	Brandon
General Biodiesel Seattle LLC	NA	400194-01	10/11/2018	Brandon
Seadrunar Recycling	Letter of Authorization	11430-01	9/26/2018	Brandon
Georgetown Brewing Co.	Major Discharge Authorization	4154-02	7/18/2018	Brandon or Duwamish
Schwartz Brothers Bakery - Seattle	Major Discharge Authorization	743-05	3/8/2018	Duwamish
Seattle Barrel Co.	Permit	7113-04	4/23/2018 5/21/2018	Duwamish
Alaska Marine Lines Inc.	Minor Discharge Authorization	459-05	10/10/2018	Duwamish West
Lafarge - Seattle Plant	Permit	7925-01	5/23/2018	Duwamish West
TLP Management Services LLC	Permit	7592-05	6/14/2018	Duwamish West
Vigor Shipyards Inc.	Permit	7782-07	2/7/2018 3/5/2018 10/15/2018	Duwamish West

Table D-1. King County Industrial Waste Inspections in LDW Basin (2018)

Facility	Authorization Type	Authorization Number	Inspection Date	CSO Basin
Boeing Company - Plant 2 Facility	Permit	7811-04	11/6/2018	E Marginal
Boeing Commercial Airplane - North Field	Permit	7594-06	10/25/2018	E Marginal or Michigan
Penthouse Drapery Cleaners and Manufacturers Former Prop	Letter of Authorization	1065-01	3/8/2018	Hanford 1/2 or Lander
Rainier Commons LLC - Old Rainier Brewery Site	Permit	7927-01	9/6/2018	Hanford 1/2 or Lander
Atwood Adhesives, Inc.	Letter of Authorization	11816-01	3/12/2018	Michigan
Cascade Columbia Distribution	Major Discharge Authorization	4156-02	7/17/2018	Michigan
Ceradyne Inc., A 3M Company - Seattle	Permit	7507-05	6/14/2018	Michigan
Eco Chemical Inc.	Minor Discharge Authorization	918-02	10/5/2018	Michigan
Evergreen Tractor LLC	Letter of Authorization	11008-02	3/8/2018	Michigan
First South Properties	Major Discharge Authorization	4472-01	5/23/2018	Michigan
King County WTD - Georgetown Wet Weather Treatment Station	Major Discharge Authorization	7939-01	5/24/2018	Michigan
			12/7/2018	
			12/20/2018	
Marine Vacuum Service Inc.	Permit	7676-06	10/18/2018	Michigan
			11/26/2018	
Waste Management National Services - 8th Avenue South Reload Facility	Permit	7928-02	6/28/2018	Michigan
			10/18/2018	
Seattle, City of - SPU - West Seattle Decant Station	Major Discharge Authorization	416-05	1/17/2018	West Michigan

Source: King County 2019 [11925]

Table D-2. King County Stormwater Services Inspections in LDW Basin (2018)

Facility Name	Address	Inspection Date	Inspection Type	Notes
RM 3.8-4.2 West (Sea King Industrial Park)				
Delta Marine	1608 S 96th Street	1/17/2018	Source Control	Final compliance after secondary containment, labeling, and covering issues were addressed.
		4/4/2018	Control	
Frog Hollow Corp.	1425 S 93rd Street	2/27/2018	Source Control	Improved storm drain cleaning and labeling and contaminated shop towel handling.
		4/4/2018	Control	
Goodyear Commercial Tire	9411 8th Avenue S	5/18/2018	Source Control	Conveyance system needed cleaning.
		6/11/2018		
		6/26/2018		
		7/19/2018		
Graffix	1312 S 96th Street	1/10/2018	Source Control	Follow-up inspection to address storm drain cleaning after labeling and storage issues. The condition of the S 96th St conveyance system is causing problems; referred to KC Roads Services Division for ongoing assistance.
NRC Environmental	9520 10th Avenue S, Ste 150	1/2/2018	Source Control	Improved spill cleanup, scrap metal storage, and degreasing practices.
		1/8/2018		
Pacific Northwest Motor Freight Lines	515 S 96th Street	1/8/2018	Source Control	Improved secondary containment, storm drain labeling, and spill response.
		1/31/2018		
PSF Industries (PSF Mechanical)	9322 14th Avenue S	8/9/2018	Source Control	Joint inspection with Ecology. Improved spill cleanup, vehicle washing, stenciling, waste
		8/23/2018		
Puget Sound Coatings	9220 8th Avenue S	1/10/2018	Source Control	Final re-inspection with Ecology after addressing labeling and storage issues. Additional follow-up addressed with emailed photos.
Shell Gas Station & Bikini Espresso	9525 14th Avenue S	1/2/2018	Source Control	Espresso stand discharging wastewater to storm drain, improper grease handling, and storage of oil/gas mixture. Also painting contractor washed tools outside. System pumped out, espresso stand re-plumbed, and waste handling improved.
		1/12/2018		
		1/17/2018		
		1/23/2018		
		1/29/2018		
		2/15/2018		
		2/20/2018		
3/2/2018				
SimplexGrinnell	9520 10th Avenue S, Ste 100	5/10/2018	Source Control	Joint inspection with Ecology. Improved waste handling and storage.
		5/30/2018		
South 96th Business Park	410 S 96th Street	1/17/2018	Source Control	Improved sawdust sweeping after education for one of the business park tenants.
		1/23/2018		

Table D-2. King County Stormwater Services Inspections in LDW Basin (2018)

Facility Name	Address	Inspection Date	Inspection Type	Notes
RM 3.4-3.8 West (EAA-5: Terminal 117)				
Terminal 117 Site	8700 Dallas Avenue S	1/25/2018	Source Control	Confirmed removal from source control inspection schedule.

Source: King County 2018, Table 3

**Appendix E:
Ecology Source Control Inspections
(2018)**

Table E-1. Ecology LDW Water Quality Inspections (2018)

NPDES Permit No.	Facility Name	Address	Date Inspected	Ecology Findings
Upper Reach				
RM 4.9 East (EAA-7: Norfolk CSO/SD)				
WAR000150	Boeing Military Flight Center	10002 East Marginal Way S	4/4/2018	Compliance inspection-without sampling. Update SWPPP; update sampling plan to include discharges from the eight representative discharge locations; do not allow sheet flow to areas that infiltrate without AKART; clean up spills promptly; maintain treatment and source control BMPs; collect stormwater from/near the ramp and gate area and convey to treatment; prepare an Engineering Report; install inserts in all catch basins; document modifications to conveyance structures in the sampling plan.
RM 2.8-3.7 East (EAA-4: Boeing Plant 2/Jorgensen Forge)				
WAR003231	Jorgensen Forge Corp	8531 East Marginal Way S	1/24/2018	Compliance inspection-without sampling. Include treatment system O&M manual in SWPPP.
RM 3.8-4.2 West (Sea King Industrial Park)				
WAR003120	Gary Merlino Construction	9125 10th Avenue S	11/28/2018	Compliance inspection-without sampling. Ensure that spills and leaks are cleaned up immediately; ensure that spill kits are kept within 25 feet of fueling areas, including the O'Neill Plumbing yard.
Middle Reach				
RM 2.8 East (EAA-3: Slip 4)				
WAR302034	Duwamish Reload Facility	7400 8th Avenue S	12/4/2018	Compliance inspection-without sampling. Ensure all transloading activities include a spotter to minimize spills and ensure proper reporting; update SWPPP with revised operations structural source control BMPs; inspect spill plate and remove sediment and debris; address runoff of stormwater contacting dredge sediments and other debris; revise sampling plan to include additional monitoring location at spill plate; minimize or stop discharge of dredge sediments, water, or other materials from transloading activities.
RM 2.3-2.8 East (Seattle Boiler Works to Slip 4)				
WA0031968	Seattle Iron & Metals Corp	601 S Myrtle Street	2/15/2018	Compliance follow-up inspection.
			6/27/2018	Compliance inspection-without sampling; inspection of barge and docks, and response to discharge of firefighting water related to June 26, 2018 fire at the facility.
WAR125002	Seattle Iron & Metals Corp Truck Parking	730 S Myrtle Street	2/15/2018	Compliance follow-up inspection.

Table E-1. Ecology LDW Water Quality Inspections (2018)

NPDES Permit No.	Facility Name	Address	Date Inspected	Ecology Findings
RM 2.2-3.4 West (Riverside Drive)				
WAR301516	Pacific Pile & Marine Main Yard	700 Riverside Drive	12/6/2018	Compliance inspection-without sampling. Update SWPPP to include Level 1, 2, and 3 corrective actions implemented; update site map; update sampling plan to include monitoring location for equipment laydown yard; include all areas where fueling is conducted and address applicable BMPs; cover dumpster and scrap metal bins; repond to Ecology warning letter re: TSS exceedances and address outstanding Level 2/3 actions for copper, zinc, and turbidity.
WAR304003	United Site Services of Nevada Inc Sea	1024 S Elmgrove Street	12/4/2018	Compliance inspection-without sampling. Designate a representative discharge location to direct discharges from northern perimeter; starting 2019Q1, collect samples from new discharge location; obtain copies of all required permit-related paperwork and retain on-site; submit a plan for addressing Level 3 corrective action triggered in 2017; update SWPPP to accurately reflect site conditions; respond to Ecology warning letter re: TSS exceedances; improve housekeeping, cleanup up spills and leaks, and maintain spill kits.
RM 2.1-2.2 West (EAA-2: Trotsky Inlet)				
WAR005598	Boyer Logistics	7318 4th Avenue S	6/6/2018	Compliance inspection-without sampling. No inspection report found in PARIS.
Lower Reach				
RM 1.2-1.7 East (St. Gobain to Glacier Northwest)				
WAR000056	Certainteed Gypsum	5931 East Marginal Way S	12/11/2018	Compliance inspection-without sampling. Immediately cleanup up and properly dispose of accumulated gypsum on the bank of the LDW. Stop discharge of gypsum to the LDW (direct and indirect) from the conveyor belt and area beneath the conveyor belt. Ensure that all chemical liquids are stored on an impervious service surrounded by a containment berm or dike. Starting 2019Q1, collect quarterly discharge samples of runoff to the LDW from the portion of the bank beneath the conveyor belt. Submit a DMR for 2018Q3.
WAR001134	Ardagh Glass	5801 East Marginal Way S	11/20/2018	Compliance inspection-without sampling. Inspect catch basin treatment BMPs, remove debris, replace treatment media; clean up spills immediately; conduct washing activities in areas where washwater can be collected and properly disposed of; develop a plan to control sediment, dust, and particulate debris on-site; update the SWPPP; store containers within secondary containment; respond to Ecology warning letter re: TSS exceedances; conduct additional discharge sampling for 2018Q4.

Table E-1. Ecology LDW Water Quality Inspections (2018)

NPDES Permit No.	Facility Name	Address	Date Inspected	Ecology Findings
RM 0.1-0.9 East (EAA-1: Duwamish/Diagonal Way)				
WAR004614	Lee & Eastes Tank Lines Inc	2418 Airport Way S	12/12/2018	Technical assistance visit.
WAR009970	Lighthouse for the Blind	2501 S Plum Street	12/12/2018	Compliance inspection-without sampling. Stop discharge of process wastewater to SW drainage system; respond to Warning Letter re: TSS exceedances; report future TSS exceedances; implement source control BMPs to control dust/debris; clean up spills and leaks immediately; complete a Level 3 corrective action in response to 2018 copper exceedances; retain permit-related documents onsite.
WAR011326	MacMillan Piper Inc Airport Way	655 S Edmunds Street	11/28/2018	Compliance inspection-without sampling. Update SWPPP to include Level 1, 2, and 3 corrections implemented; ensure vacuum sweeping to address accumulation of sediment and debris; update SWPPP to include BMPs for managing grain spills; maintain a spill log; review of site operations and BMPs to minimize TSS effluent limit exceedances.
WAR301360	NW Container Services Seattle Intermodal Yard	635 S Edmunds Street	11/28/2018	Compliance inspection-without sampling. Stop discharge of process wastewater to SW drainage system; store equipment with fuel tanks on impervious surface within secondary containment; update SWPPP to include BMPs for managing grain spills; provide update on installation status of treatment system in drainage basin 1; submit an O&M manual for treatment system; respond to Ecology warning letter re: TSS exceedances.
WAR001155	Union Pacific Railroad Co Dawson St	402 S Dawson Street	3/6/2018	Compliance inspection-without sampling. Update SWPPP; store liquids on impervious surface within proper secondary containment; prevent maintenance wastes and fluids from getting on pavement; monitor all SW drainage systems; vacuum paved surfaces at least once per quarter; prohibit washwater from entering storm drains or surface waters; correct DMRs back to 2016.

AKART = all known, available and reasonable methods of prevention, control and treatment

BMP = best management practice

DMR = discharge monitoring report

EAA = Early Action Area

LDW = Lower Duwamish Waterway

NPDES = National Pollutant Discharge Elimination System

O&M = operations and maintenance

RM = river mile

SWPPP = Stormwater Pollution Prevention Plan

TSS = total suspended solids

Table E-2. Ecology LDW Urban Waters Inspections (2018)

Facility Name	Address	Date Inspected
Upper Reach		
RM 4.9 East (EAA-7: Norfolk CSO/SD)		
Fairn & Swanson Inc.	9875 40th Avenue S	11/27/2018
Frank Colluccio Construction	9600 Martin Luther King Jr Way S	4/3/2018
Jack's Payless Auto Parts	9423 Martin Luther King Jr Way S	5/1/2018
Supervalu	3301 S Norfolk Street	5/3/2018
Catalyst Workplace Activation	10848 East Marginal Way S	8/30/2018
Otto Rosenau & Associates	6467 Martin Luther King Jr Way S	5/15/2018
System Seven Repair	10831 Tukwila International Blvd	10/18/2018
RM 3.9-4.3 East (Slip 6)		
Insurance Auto Auctions	8801 East Marginal Way S	4/24/2018
RM 4.2-5.8 West (Restoration Areas)		
Aussie Machine	12446 Des Moines Memorial Drive S	4/26/2018
Chavez Auto Repair	12025 Des Moines Memorial Drive S	8/2/2018
Glendale Heating and Air Conditioning	12462 Des Moines Memorial drive S	11/7/2018
Southern Heights Elementary School	11249 14th Avenue S	2/9/2018
RM 3.8-4.2 West (Sea King Industrial Park)		
Goodyear Commercial Tire & Svc	9411 8th Avenue S	5/10/2018
PSF Mechanical	9322 14th Avenue S	8/9/2018
Simplex Grinnell	9520 10th Avenue S	5/10/2018
RM 3.4-3.8 West (EAA-5: Terminal 117)		
Tire Factory Seattle	8510 Dallas Avenue S	2/1/2018
Middle Reach		
RM 2.8 East (EAA-3: Slip 4)		
Alaska Logistics	7400 8th Avenue S	9/14/2018
Deke River Merchandising	1900 S Corgiat Drive	5/8/2018
Eco Chemical	6600 Ursula Place S	6/13/2018
Envelope Converting Service	6603 Ursula Place S	10/16/2018
Linescape of Washington	6606 Ursula Place S	10/4/2018
RM 2.0-2.3 East (Slip 3 to Seattle Boiler Works)		
Open Square	303 S River Street	1/19/2018
RM 2.2-3.4 West (Riverside Drive)		
Cain Bolt & Gasket	7724 7th Avenue S	4/26/2018
Custom Crating Company	233 S Holden Street	5/3/2018
Evergreen Refrigeration	727 S Kenyon Street	9/20/2018
Federal Marine & Defense Services	8000 5th Avenue S	8/2/2018
Gear Works Seattle	500 S Portland Street	2/6/2018
Modern Machine	519 S Elmgrove Street	4/12/2018
Modern Machine	524 S Southern Street	1/26/2018
National Products	1017 S Elmgrove Street	2/15/2018
Pacific Pile & Marine Main Yard	700 Riverside Drive	2/1/2018
Pacific Pile & Marine	582 S Riverside Drive	2/1/2018
Rasmussen Equipment Company	8727 5th Avenue S	11/20/2018
West Coast Wire Rope & Rigging	7777 7th Avenue S	9/4/2018
Elliott Paint Company	11206 Des Moines Memorial Drive	8/23/2018
RM 2.1-2.2 West (EAA-2: Trotsky Inlet)		
Alaska Marine Lines	7100 1st Avenue S	1/23/2018
RM 2.1 West (1st Avenue S Storm Drain)		
Demolition Man	8151 Occidental Avenue S	1/26/2018
North Star Ice Equipment	8151 Occidental Avenue S	1/26/2018
Seaport Petroleum	7800 Detroit Avenue SW	3/23/2018

Table E-2. Ecology LDW Urban Waters Inspections (2018)

Facility Name	Address	Date Inspected
Lower Reach		
RM 1.0-1.2 East (KC Lease Parcels)		
Balancing Service Co	5512 6th Avenue S	9/4/2018
Dorse Air Products	5000 1st Avenue S	11/7/2018
McKinstry Co	5005 3rd Avenue S	4/10/2018
RM 0.1-0.9 East (EAA-1: Duwamish/Diagonal Way)		
Asa Mercer Middle School	1600 S Columbian Way	9/14/2018
Daniel Smith Inc	4150 1st Avenue S	6/14/2018
DCG One Seattle	4401 East Marginal Way S	4/10/2018
DHL Express	4450 East Marginal Way S	4/10/2018
Global Fulfillment	4 S Idaho Street	10/4/2018
Metal Solutions	5212 6th Avenue S	9/4/2018
Paramount Services	423 S Horton Street	11/27/2018
Recology CleanScapes	4401 East Marginal Way S	1/23/2018
Redsoul	3433 Airport Way S	2/15/2018
RH Brown Company	12 S Idaho Street	9/20/2018
Tube Art Group	920 S Bayview Street	4/26/2018
Seattle University	Broadway & East Madison	4/19/2018
Westcoast Auto Body	3815 Rainier Avenue S	2/9/2018

Note: An Urban Waters inspection was conducted on 5/8/2018 at NW Truck Transmission; an address for this facility could not be determined.

EAA = Early Action Area
 RM = river mile

Table E-3. Ecology LDW HWTR Inspections (2018)

EPA ID No.	Facility Name	Address	Date Inspected
Upper Reach			
RM 3.8-4.2 West (Sea King Industrial Park)			
WAD009286881	Ace Galvanizing	429 S 96th Street	8/29/2018
WAH000013730	Sherwin Williams Store 4317	9530 10th Avenue S	8/29/2018
Middle Reach			
RM 2.8 East (EAA-3: Slip 4)			
WAD980974521	Marine Vacuum Service	1516 S Graham Street	3/29/2018
RM 2.2-3.4 West (Riverside Drive)			
WAH000000125	Modern Machine	524 S Southern Street	10/30/2018
RM 2.1-2.2 West (EAA-2: Trotsky Inlet)			
WAD000066084	Industrial Container Services	7152 1st Avenue S	8/1/2018
RM 1.6-2.1 West (Terminal 115)			
WAH000011486	Northland Services Inc Transfer Facility	6700 West Marginal Way SW	3/6/2018
Lower Reach			
RM 1.0-1.2 East: Combined Sewer Area (Brandon CSO)			
WAH000046534	Art Brass Aerospace Finishing	313 S Findlay	2/6/2018
WAD981772957	Art Brass Plating	5516 3rd Avenue S	2/6/2018
WAD009245465	Capital Industries	5801 3rd Avenue S	6/28/2018
RM 0.1-0.9 East (EAA-1: Duwamish/Diagonal Way)			
WAD009282278	Lighthouse for the Blind	2501 S Plum Street	5/8/2018
WAD027470111	Seattle Barrel	4716 Airport Way	4/23/2018
None	Seattle Barrel	7th Avenue S & S Snoqualmie Street	4/23/2018

CSO = combined sewer overflow

EAA = Early Action Area

HWTR = Hazardous Waste & Toxics Reduction

RM = river mile

**Appendix F:
SPU Source Tracing Data
(2018)**

Appendix F-1.
SPU Source Tracing Sample Locations (2018)

Station ID	Sample No.	Date	Type	Sewer Type	Source Control Area	Outfall	Location	X Coordinate	Y Coordinate
UPPER REACH									
MH5	MKJ-041318-1	4/13/2018	Grab	SD	RM 4.9 East	Norfolk CSO/SD	MH SE corner 9901 MLK Jr Way S	1283219.82	189957.64
NST1	NST1-041618	4/16/2018	SedTrap	SD	RM 4.9 East	Norfolk CSO/SD	60-in line west of MLK Way	1283043.33	189358.24
NST1	NST1-041618-G	4/16/2018	Grab	SD	RM 4.9 East	Norfolk CSO/SD	60-in line west of MLK Way	1283043.33	189358.24
NST3	NST3-041618	4/16/2018	SedTrap	SD	RM 4.9 East	Norfolk CSO/SD	Ditch at MLK Way and Boeing Access Rd	1283147.01	188728.61
NST4	NST4-041718	4/17/2018	SedTrap	SD	RM 4.9 East	Norfolk CSO/SD	S Norfolk St at SE corner KC Airport	1280697.58	190890.74
MH47	CEW-101218-4	10/12/2018	Grab	SD	RM 3.9-4.3 East	KCIA SD#1		1279234.15	196772.27
RCB85	MBS-121818-1	12/18/2018	Grab	SD	RM 3.4-3.8 West	17th Ave S SD		1274886.08	195466.88
RCB76	MBS-121818-2	12/18/2018	Grab	SD	RM 3.4-3.8 West	17th Ave S SD	Presettling Cell on Bioretention Cell D	1275187.09	195461.78
MH41	CEW-073118-1	7/31/2018	Grab	SD	RM 3.8-4.2 West	S 96th St SD	Maintenance hole along 10th Avenue S, between S Barton and S Cambridge Street	1272995.33	193178.65
MIDDLE REACH									
MH23	MKJ-061218-1	6/12/2018	Grab	SD	RM 2.8 East	Georgetown SD	MH to east of motel	1273477.64	199762.41
MH32 (SL4-T6)	SL4-T6-041718	4/17/2018	SedTrap	SD	RM 2.8 East	I-5 SD (Slip 4)	MH at Airport Way S and S Hardy St	1274989.40	202834.00
MH32 (SL4-T6)	SL4-T6-041718-G	4/17/2018	Grab	SD	RM 2.8 East	I-5 SD (Slip 4)	MH at Airport Way S and S Hardy St	1274989.40	202834.00
MH100	MKJ-052518-6	5/25/2018	Grab	SD	RM 2.3-2.8 East	S Myrtle St SD	MH at W end S Myrtle St opposite Seattle Iron and Metals	1271369.99	200335.70
MYR-ST1	SMYRTLE_NORTON_053118	5/31/2018	SedTrap	SD	RM 2.3-2.8 East	S Myrtle St SD	Sediment trap test location	1271648.79	200328.28
MYR-ST1	SMYRTLE_RORY_053118	5/31/2018	SedTrap	SD	RM 2.3-2.8 East	S Myrtle St SD	Sediment trap test location	1271648.79	200328.28
MYR-ST1	SMYRTLE_TRENT_053118	5/31/2018	SedTrap	SD	RM 2.3-2.8 East	S Myrtle St SD	Sediment trap test location	1271648.79	200328.28
ODS58	CEW-020518-1	2/5/2018	SurfDebris	SD	RM 2.0-2.3 East	S River St SD	Site of V. Van Dyke Heavy Hauling, two CB lids in storage yard, East side.	1270166.94	202047.78
MH211	MKJ-052518-5	5/25/2018	Grab	SD	RM 2.0-2.3 East	S River St SD	Last MH on line	1269926.63	201715.30
MH223	MKJ-052518-7	5/25/2018	Grab	SD	RM 2.0-2.3 East	S Brighton St SD	Immediately u/s of MH222	1270726.75	201133.36
MH38	MKJ-052518-2	5/25/2018	Grab	SD	RM 1.7-2.0 East	Head of Slip 2	Private MH between truck shop B and Slip 2.	1269647.52	203488.33
MH39	MKJ-052518-3	5/25/2018	Grab	SD	RM 1.7-2.0 East	1st Ave S (East) SD	Under Northbound lanes of 1st Ave S bridge, south of Michigan	1269705.30	201995.80
MH39	MKJ-052518-4	5/25/2018	Grab	SD	RM 1.7-2.0 East	1st Ave S (East) SD	Under Northbound lanes of 1st Ave S bridge, south of Michigan	1269705.30	201995.80
7th-ST1	7TH-ST1-041818	4/18/2018	SedTrap	SD	RM 2.2-3.4 West	7th Ave S SD	7th Ave S at S Portland St, SPU #599721	1271845.54	198135.36
7th-ST1	7TH-ST1-041818-G	4/18/2018	Grab	SD	RM 2.2-3.4 West	7th Ave S SD	7th Ave S at S Portland St, SPU #599721	1271845.54	198135.36
7th-ST2	7TH-ST2-041718	4/17/2018	SedTrap	SD	RM 2.2-3.4 West	7th Ave S SD	4th Ave S at S Barton St, next to P-Patch, SPU #878755	1270702.00	193616.50
7th-ST2	7TH-ST2-041718-G	4/17/2018	Grab	SD	RM 2.2-3.4 West	7th Ave S SD	4th Ave S at S Barton St, next to P-Patch, SPU #878755	1270702.00	193616.50
7th-ST3	7TH-ST3-041918	4/19/2018	SedTrap	SD	RM 2.2-3.4 West	7th Ave S SD	S Southern St just W of 7th Ave S, SPU #599941	1271346.96	196842.03
CB154	CEW-021518-2	2/15/2018	Grab	SD	RM 2.2-3.4 West	7th Ave S SD	7800 7th Ave S	1271962.93	197815.58
ODS60	MKJ-062018-3	6/20/2018	SurfDebris	SD	RM 2.2-3.4 West	7th Ave S SD		1271791.98	198552.55
1st-ST1	1ST-ST1-041918	4/19/2018	SedTrap	SD	RM 2.1 West	1st Ave S SD	1st Ave S pond, N side of S Holden St--SR99 inlet	1269988.18	198544.26
1st-ST2	1ST-ST2-041918	4/19/2018	SedTrap	SD	RM 2.1 West	1st Ave S SD	1st Ave S pond, N side of S Holden St--SR509 inlet, SPU #786737	1269790.80	198570.70

Appendix F-1.
SPU Source Tracing Sample Locations (2018)

Station ID	Sample No.	Date	Type	Sewer Type	Source Control Area	Outfall	Location	X Coordinate	Y Coordinate
1st-ST3	1ST-ST3-041818	4/18/2018	SedTrap	SD	RM 2.1 West	1st Ave S SD	SW Kenyon St at 4th Ave SW, SPU #714106	1267991.38	197680.32
1st-ST3	1ST-ST3-041818-G	4/18/2018	Grab	SD	RM 2.1 West	1st Ave S SD	SW Kenyon St at 4th Ave SW, SPU #714106	1267991.38	197680.32
CB325	MKJ-041018-1	4/10/2018	Grab	SD	RM 2.1 West	1st Ave S SD	CB mid building west side	1269178.60	197522.80
CB326	MKJ-041018-2	4/10/2018	Grab	SD	RM 2.1 West	1st Ave S SD	CB at SW corner of bldg to west of ramp	1269210.69	197348.98
HP-ST4	HP-ST4-041718	4/17/2018	SedTrap	SD	RM 1.6-2.1 West	Highland Park Way SW SD	Northwest corner of W Marginal and Highland Pk Wy, SPU #599241	1267618.04	200796.20
HP-ST6	HP-ST6-041818	4/18/2018	SedTrap	SD	RM 1.6-2.1 West	Highland Park Way SW SD	SW Michigan St just east of W Marginal Wy S, SPU #599219	1268086.32	200870.80
HP-ST6	HP-ST6-041818-G	4/18/2018	Grab	SD	RM 1.6-2.1 West	Highland Park Way SW SD	SW Michigan St just east of W Marginal Wy S, SPU #599219	1268086.32	200870.80
MH36	CEW-011218-3	1/12/2018	Grab	SD	RM 1.6-2.1 West	Highland Park Way SW SD	In pond @outfall from Waste Management Eastmont	1268296.24	200146.63
RCB84	CEW-011218-1	1/12/2018	Grab	SD	RM 1.6-2.1 West	Highland Park Way SW SD	North Bound Lane of W Marginal Way SW	1268281.56	200324.03
RCB84	CEW-011218-2	1/12/2018	Grab	SD	RM 1.6-2.1 West	Highland Park Way SW SD	North Bound Lane of W Marginal Way SW	1268281.56	200324.03
KN-ST1	KN-ST1-041918	4/19/2018	SedTrap	SD	RM 1.6-2.1 West	SW Kenny St SD/T115 CSO	Eastern end of S Kenny St, on T115, SPU #598644	1268138.36	203628.91
LOWER REACH									
CB309	CEW-012418-1	1/24/2018	Grab	SD	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	North loading dock catch basin	1271232.61	208602.16
CB322	CEW-012418-2	1/24/2018	Grab	SD	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	Wet Vault & Pump Chamber in triangle south of building	1271200.02	208278.37
CB323	CEW-021518-1	2/15/2018	Grab	SD	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	Composite sample in loading dock of 2 cbs adjacent to ODS with PCB detection.	1270057.24	210313.51
CB324	MKJ-021518-1	2/15/2018	Grab	SD	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	Storage location for scrap/salvage wood.	1268045.66	209591.96
CB331	CEW-101218-2	10/12/2018	Grab	SD	RM 0.1-0.9 East	Diagonal Ave S CSO/SD		1273257.75	211583.52
CB331	CEW-101218-3	10/12/2018	Grab	SD	RM 0.1-0.9 East	Diagonal Ave S CSO/SD		1273257.75	211583.52
MH18	MKJ-021518-4	2/15/2018	Grab	SD	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	6th Ave S and S Snoqualmie St	1271741.79	208576.18
MH18	MKJ-021518-5	2/15/2018	Grab	SD	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	6th Ave S and S Snoqualmie St	1271741.79	208576.18
MH208	NCH-101918-1	10/19/2018	Grab	SD	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	MH u/s of MH 18 on S Snoqualmie St	1272356.61	208570.08
MH231	MKJ-021518-6	2/15/2018	Grab	SD	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	MH at S Alaska St and 6th Ave S	1271739.97	208296.78
MH231	NCH-101918-2	10/19/2018	Grab	SD	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	MH at S Alaska St and 6th Ave S	1271739.97	208296.78
MH40	CEW-51518-1	5/15/2018	Grab	SD	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	Maintenance Hole in Parking Lot/Loading dock	1271615.25	211126.87
MH46	CEW-101218-1	10/12/2018	Grab	SD	RM 0.1-0.9 East	Diagonal Ave S CSO/SD		1273142.18	211630.71
ODS59	CEW-51518-2	5/15/2018	SurfDebris	SD	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	North Fence line of Skyline Electric at Sump Pump Discharge	1272316.15	211855.66
RCB60	CEW-031218-1	3/12/2018	Grab	SD	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	West of intersection, north side of Diagonal Ave S	1271587.66	211174.27
ST1	ST1-041818	4/18/2018	SedTrap	SD	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	Sediment Trap 1: E Marginal Wy and S Oregon St	1268420.84	209048.79
ST1	ST1-041818-G	4/18/2018	Grab	SD	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	Sediment Trap 1: E Marginal Wy and S Oregon St	1268420.84	209048.79
DIAGNORTON	DIAGNORTON_072318	7/23/2018	SedTrap	SD	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	Sediment Trap 2: Airport Way S and 6th Ave S (I-5 SB RP)	1272836.86	211846.87

**Appendix F-1.
SPU Source Tracing Sample Locations (2018)**

Station ID	Sample No.	Date	Type	Sewer Type	Source Control Area	Outfall	Location	X Coordinate	Y Coordinate
DIAGRORY	DIAGRORY_072318	7/23/2018	SedTrap	SD	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	Sediment Trap 2: Airport Way S and 6th Ave S (I-5 SB RP)	1272836.86	211846.87
DIAGSIFT	DIAGSIFT_072318	7/23/2018	SedTrap	SD	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	Sediment Trap 2: Airport Way S and 6th Ave S (I-5 SB RP)	1272836.86	211846.87
DIAGTRENT	DIAGTRENT_072318	7/23/2018	SedTrap	SD	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	Sediment Trap 2: Airport Way S and 6th Ave S (I-5 SB RP)	1272836.86	211846.87
ST7	ST7-041918	4/19/2018	SedTrap	SD	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	Sediment Trap 7: S Dakota St and 6th Ave S	1271722.72	210480.65
ST7	ST7-041918-G	4/19/2018	Grab	SD	RM 0.1-0.9 East	Diagonal Ave S CSO/SD	Sediment Trap 7: S Dakota St and 6th Ave S	1271722.72	210480.65
RCB312	MKJ-052518-1	5/25/2018	Grab	SD	RM 0.1-0.9 East	S Nevada St SD	Composite sample of right-of-way catch basins and inline sediment	1267521.16	210048.13
ID-ST1	ID-ST1-041818	4/18/2018	SedTrap	SD	RM 0.0-1.0 West	SW Idaho St SD	18th Ave SW and S Hudson St, SPU #598047	1264220.16	206583.52
ID-ST2	ID-ST2-041918	4/19/2018	SedTrap	SD	RM 0.0-1.0 West	SW Idaho St SD	SW Idaho St just east of W Marginal Wy S, SPU #597411	1265352.84	209905.60
ID-ST3	ID-ST3-041818	4/18/2018	SedTrap	SD	RM 0.0-1.0 West	SW Idaho St SD	North end of 19th Ave SW at SW Dawson St	1263879.13	206423.86
RCB200a	MKJ-061218-2	6/12/2018	Grab	SD	RM 0.0-1.0 West	SW Dakota St SD	SW Dakota St just east of W Marginal Wy SW	1265107.54	210662.85

SedTrap - sediment trap

SurfDebris - surface debris/soil around storm drain structure

CB - catch basin

CSO - combined sewer overflow

KCIA - King County International Airport

MH - maintenance hole

SD - storm drain

**Appendix F-2
SPU Source Tracing Data 2018**

Station ID	Outfall	Date Sampled	Sample Type	Total Organic Carbon (%)	Arsenic (mg/kg)	Barium (mg/kg)	Cadmium (mg/kg)	Chromium (mg/kg)	Copper (mg/kg)	Lead (mg/kg)	Mercury (mg/kg)	Selenium (mg/kg)	Silver (mg/kg)	Zinc (mg/kg)	Diesel Range HC* (mg/kg)	Motor Oil Range HC* (mg/kg)	Aroclor 1242 (ug/kg)	Aroclor 1248 (ug/kg)	Aroclor 1254 (ug/kg)	Aroclor 1260 (ug/kg)	Total PCB Aroclors (ug/kg)
SCO				--	57	--	5.1	260	390	450	0.41	--	6.1	410	2,000	2,000	--	--	--	--	130
CSL/RAL/Method A				--	93	--	6.7	270	390	530	0.59	--	6.1	960	2,000	2,000	--	--	--	--	1,000
UPPER REACH																					
MH5	Norfolk CSO/SD	4/13/2018	Grab	6.7	13	na	na	na	160	71	0.14	na	na	720	2,200	6,700	19 U	19 U	19 U	64	64
NST1	Norfolk CSO/SD	4/16/2018	SedTrap	8.95	15	na	na	na	130	58	0.20	na	na	600	880	3,100	19 U	19 U	120	36	160
NST1	Norfolk CSO/SD	4/16/2018	Grab	6.51	15	na	na	na	130	80	0.16	na	na	930	890	2,900	20 U	130	230	120	480
NST3	Norfolk CSO/SD	4/16/2018	SedTrap	3.27	6.1 U	na	na	na	31	14	0.033 U	na	na	170	120	1,100	18 U				
NST4	Norfolk CSO/SD	4/17/2018	SedTrap	3.72	36 U	na	na	na	85	290	0.19 U	na	na	300	570	870	30 U	30 U	55	52	110
MH47	KCIA SD#1	10/12/2018	Grab	3.81	8.3	na	na	na	43	88	0.058	na	na	170	51	310	20 U	19	18	15	52
RCB85	17th Ave S SD	12/18/2018	Grab	6.65	19 U	na	na	na	150	61	0.088 J	na	na	600	750	3,600	20 U	20 U	180	270	450
RCB76	17th Ave S SD	12/18/2018	Grab	7.5	12	na	na	na	94	29	0.047 U	na	na	500	690	3,200	20 U	20 U	45 J	63	110 J
MH41	S 96th St SD	7/31/2018	Grab	5.18	38	na	na	800	62	86	0.065 U	na	na	800	130 U	750	20 U				
MIDDLE REACH																					
MH23	Georgetown SD	6/12/2018	Grab	9.42	7.9 U	na	na	na	87	66	0.085	na	na	430	360	2,400	19 U	68	98	87	250
MH32 (SL4-T6)	I-5 S (Slip 4)	4/17/2018	SedTrap	3.1	16	na	na	na	24	4.7	0.037	na	na	41	270	1,900	18 U	28	32	29	89
MH32 (SL4-T6)	I-5 S (Slip 4)	4/17/2018	Grab	1.51	13 U	na	na	na	77	140	0.029	na	na	180	58 U	360	19 U				
MH100	S Myrtle St SD	5/25/2018	Grab	8.37	17 U	na	na	na	440	500 J	1.4	na	na	2,900	810	2,500	19 U	400	470	170	1,000
SMYRTLE_NORTON	S Myrtle St SD	5/31/2018	SedTrap	na	13	360	7.1	120	540	540	na	1.5 J	2.3	3,300	na	na	20 U	1,200	860	310	2,400
SMYRTLE_RORY	S Myrtle St SD	5/31/2018	SedTrap	na	15	330	8.9	920	620	620	na	1.8 J	2.6	4,000	na	na	20 U	1,400	1,100	440	2,900
SMYRTLE_TRENT	S Myrtle St SD	5/31/2018	SedTrap	na	17	310	6.0	1,700	660	560	na	1.4 J	2.9	3,200	na	na	20 U	1,100	980	340	2,400
ODS58	S River St SD	2/5/2018	SurfDebris	5.05	25	na	na	na	230	240	0.043	na	na	1,000	2,300	4,200	20 U	20 U	30	30 U	30
MH211	S River St SD	5/25/2018	Grab	6.54	15	na	na	na	110	68 J	0.098	na	na	460	760	2,900	19 U	35	56	54	150
MH223	S Brighton St SD	5/25/2018	Grab	3.12	30	na	na	na	160	150 J	0.27	na	na	970	940	3,400	20 U	100	97	140	340
MH38	Head of Slip 2	5/25/2018	Grab	0.53	15	na	na	na	63	80 J	0.028	na	na	200	150	490	19 U	19 U	27	20 U	27
MH39	1st Ave S (East) SD	5/25/2018	Grab	6.8	23	na	na	na	190	120 J	0.13	na	na	1,000	720	3,100	19 U	68	150	110	330
MH39	1st Ave S (East) SD	5/25/2018	Grab	7.65	13	na	na	na	160	110 J	0.13	na	na	880	650	2,800	20 U	54	91	72	220
7th-ST1	7th Ave S SD	4/18/2018	SedTrap	4.83	20	na	na	na	160	97	0.18	na	na	610	1,000	3,100	20 U	67	91	63	220
7th-ST1	7th Ave S SD	4/18/2018	Grab	0.94	7.3 U	na	na	na	39	16	0.053	na	na	130	130	550	18 U	18 U	21	19	40
7th-ST2	7th Ave S SD	4/17/2018	SedTrap	3.45	8.7	na	na	na	13	10	0.037 U	na	na	86	11	51	18 U				
7th-ST2	7th Ave S SD	4/17/2018	Grab	0.23	5.9	na	na	na	17	4.7	0.022 U	na	na	52	5.9 U	18	20 U				
7th-ST3	7th Ave S SD	4/19/2018	SedTrap	9.22	24	na	na	na	97	69	0.17	na	na	560	390	2,100	20 U	20 U	20 U	43	43
CB154	7th Ave S SD	2/15/2018	Grab	7.04	17	na	na	na	640	130	0.11	na	na	750	2,300	7,800	95 U	480	670	310 J	1,500 J
ODS60	7th Ave S SD	6/20/2018	SurfDebris	na	12	120	0.72	30	39	99	0.092	5.7 U	0.34 U	140	7.7	52	19 U	19 U	19 U	19	19
1st-ST1	1st Ave S SD	4/19/2018	SedTrap	7.5	14	na	na	na	230	98	0.17	na	na	1,200	1,600	8,700	19 UJ	19 UJ	84 J	68 J	150 J
1st-ST2	1st Ave S SD	4/19/2018	SedTrap	7.46	13 U	na	na	na	83	84	0.24	na	na	380	310	2,100	19 U	19	49	47	120
1st-ST3	1st Ave S SD	4/18/2018	SedTrap	3.32	5.5 U	na	na	na	70	8.1	0.028 U	na	na	230	85	630	18 U				
1st-ST3	1st Ave S SD	4/18/2018	Grab	1.16	5.7 U	na	na	na	25	37	0.024 U	na	na	150	62 U	390	18 U				
CB325	1st Ave S SD	4/10/2018	Grab	2.44	6.8 U	na	na	na	36	15	0.030 U	na	na	260	250	1,400	19 U				
CB326	1st Ave S SD	4/10/2018	Grab	10.1	11 U	na	na	na	88	32	0.061	na	na	760	710	4,200	20 U	20 U	29	20 U	29
HP-ST4	Highland Park Way SW SD	4/17/2018	SedTrap	4.7	7.9 U	na	na	na	46	37	0.041 U	na	na	160	120	770	19 U	19 U	20	19 U	20
HP-ST6	Highland Park Way SW SD	4/18/2018	SedTrap	8.33	47	na	na	na	110	170	0.21	na	na	800	460	2,500	19 U	100	84	54	240
HP-ST6	Highland Park Way SW SD	4/18/2018	Grab	1.64	17	na	na	na	83	110	0.14	na	na	490	540	2,200	19 U	88	76	50	210
KN-ST1	Highland Park Way SW SD	4/19/2018	SedTrap	3.28	14	na	na	na	55	34	0.12	na	na	300	340	1,700	19 U	31	45	24	100
MH36	Highland Park Way SW SD	1/12/2018	Grab	9.1	43	na	na	na	120	260 J	0.23	na	na	490	500	2,400	20 U	100	140	92	330
RCB84	Highland Park Way SW SD	1/12/2018	Grab	7.1	16	na	na	na	160	180 J	0.20	na	na	770	1,000	5,500	20 U	66	65	51 J	180 J
RCB84	SW Kenny ST SD/T115 CSO	1/12/2018	Grab	8.23	15	na	na	na	160	140 J	0.22	na	na	660	1,200	6,700	19 U	60	78	66 J	200 J
LOWER REACH																					
CB309	Diagonal Ave S CSO/SD	1/24/2018	Grab	2.82	14	na	na	na	130 J	45	0.064	na	na	520	420	2,400	20 U	29	73	33	140
CB322	Diagonal Ave S CSO/SD	1/24/2018	Grab	2.97	35	na	na	na	140 J	57	0.065	na	na	690	710	3,300	19 U	170	100	42	310
CB323	Diagonal Ave S CSO/SD	2/15/2018	Grab	3.97	16	na	na	na	130	520	0.13	na	na	730	330	2,100	99 U	180	320	130	630
CB324	Diagonal Ave S CSO/SD	2/15/2018	Grab	3.65	150	na	na	na	280	210	0.18	na	na	1,700	940	3,100	135	20 U	76	120 J	330 J
CB331	Diagonal Ave S CSO/SD	10/12/2018	Grab	5.47	8.9	na	na	na	110	92	0.085	na	na	850	430	2,700	20 U	50	40	31	120
CB331	Diagonal Ave S CSO/SD	10/12/2018	Grab	9.66	9.5	na	na	na	150	95	0.087	na	na	1,000	420	2,700	20 U	50	35	32	120

**Appendix F-2
SPU Source Tracing Data 2018**

Station ID	Outfall	Date Sampled	Sample Type	Total Organic Carbon (%)	Arsenic (mg/kg)	Barium (mg/kg)	Cadmium (mg/kg)	Chromium (mg/kg)	Copper (mg/kg)	Lead (mg/kg)	Mercury (mg/kg)	Selenium (mg/kg)	Silver (mg/kg)	Zinc (mg/kg)	Diesel Range HC* (mg/kg)	Motor Oil Range HC* (mg/kg)	Aroclor 1242 (ug/kg)	Aroclor 1248 (ug/kg)	Aroclor 1254 (ug/kg)	Aroclor 1260 (ug/kg)	Total PCB Aroclors (ug/kg)
SCO				--	57	--	5.1	260	390	450	0.41	--	6.1	410	2,000	2,000	--	--	--	--	130
CSL/RAL/Method A				--	93	--	6.7	270	390	530	0.59	--	6.1	960	2,000	2,000	--	--	--	--	1,000
MH18	Diagonal Ave S CSO/SD	2/15/2018	Grab	4.63	30	na	na	na	270	420	4.7	na	na	660	1,800	4,800	31,000	200 U	13,000	1,900	46,000
MH18	Diagonal Ave S CSO/SD	2/15/2018	Grab	6.16	28	na	na	na	250	384	4.3	na	na	630	1,900	5,100	29,000	980 U	13,000	2,400	44,000
MH208	Diagonal Ave S CSO/SD	10/19/2018	Grab	2.12	10	na	na	na	60	90	0.51	na	na	630	na	na	18 U	71	120	49	240
MH231	Diagonal Ave S CSO/SD	2/15/2018	Grab	0.71	9.4	na	na	na	49	12	0.023	na	na	180	90	520	28	19 U	19 U	19 U	28
MH231	Diagonal Ave S CSO/SD	10/19/2018	Grab	11.5	11	na	na	na	97	63	0.064	na	na	1,100	890	4,400	19 U	49	45	120	210
MH40	Diagonal Ave S CSO/SD	5/15/2018	Grab	6.45	15	na	na	na	150 J	330	0.11	na	na	1,400 J	50 U	420	20 U	30	62	70	160
MH46	Diagonal Ave S CSO/SD	10/12/2018	Grab	3.28	130	na	na	na	65	42	0.059	na	na	870	68	500	20 U	28	31	15	74
ODS59	Diagonal Ave S CSO/SD	5/15/2018	SurfDebris	4.69	25 U	na	na	na	140 J	110	0.22	na	na	570 J	510	1,900	19 U	19 U	100	460	560
RCB60	Diagonal Ave S CSO/SD	3/12/2018	Grab	6.74	22	na	na	na	130	85	0.34	na	na	390	690	4,100	19 U	49 J	94	190	330 J
ST1	Diagonal Ave S CSO/SD	4/18/2018	SedTrap	5.39	16	na	na	na	150	68	0.13	na	na	580	660	3,300	20 U	77	120	62	260
ST1	Diagonal Ave S CSO/SD	4/18/2018	Grab	0.4	6.0 U	na	na	na	35	11	0.039	na	na	120	60 U	260	20 U				
DIAGNORTON	Diagonal Ave S CSO/SD	7/23/2018	SedTrap	4.94	8.2 U	na	na	na	97	56	0.039 U	na	na	320	430	2,100	24 U	57	47	22 J	130 J
DIAGRORY	Diagonal Ave S CSO/SD	7/23/2018	SedTrap	6.57	6.5 J	na	0.72	na	96 J	60	0.058	na	na	360	500	2,900	20 u	45	39	19 J	100 J
DIAGSIFT	Diagonal Ave S CSO/SD	7/23/2018	SedTrap	2.94	4.7 J	na	0.63	na	69 J	46	0.039 U	na	na	320	270	1,700	18 u	44	56	24	120
DIAGTRENT	Diagonal Ave S CSO/SD	7/23/2018	SedTrap	6.86	9.7 J	na	1.2	na	170 J	93	0.095	na	na	620	750	4,400	19 u	83	110	52	250
ST7	Diagonal Ave S CSO/SD	4/19/2018	SedTrap	2.4	10	na	na	na	71	39	0.053	na	na	310	1,600	4,600	19 U	43	78	38 J	160 J
ST7	Diagonal Ave S CSO/SD	4/19/2018	Grab	0.77	15 U	na	na	na	39	17	0.022 U	na	na	140	64 U	470	18 U				
RCB312	S Nevada St SD	5/25/2018	Grab	11.1	14	na	na	na	110	116 J	0.061	na	na	1,000	940	3,700	20 U	20 U	470	160	630
ID-ST1	SW Idaho St SD	4/18/2018	SedTrap	12.2	18	na	na	na	120	66	0.18	na	na	1,200	na	na	20 U	67 J	180	90	340 J
ID-ST2	SW Idaho St SD	4/19/2018	SedTrap	3.24	8.3	na	na	na	32	21	0.057	na	na	190	44	320	19 U	150	150	22	320
ID-ST3	SW Idaho St SD	4/18/2018	SedTrap	5.83	19	na	na	na	46	60	0.13	na	na	260	120	820	19 U	20 U	20 U	20 U	20 U
RCB200a	SW Dakota St SD	6/12/2018	Grab	8.87	17 U	na	na	na	140	110	0.17	na	na	930	610	3,100	20 U	84	120	57	260

Screening levels are listed in Table 2-4.

Sample results is above the CSL/RAL/Method A screening level

Sample result is above the SCO but below the CSL

Analyte was not detected, but detection limit is above the SCO

Detections are shown in **bold font**.

Only analytes detected in at least one sample are shown.

J - estimated

U - not detected

R - rejected

na - not analyzed

**Appendix F-2
SPU Source Tracing Data 2018**

Station ID	Outfall	Date Sampled	Sample Type	1-Methyl-naphthalene (ug/kg)	2-Methyl-naphthalene (ug/kg)	Acenaph-thene (ug/kg)	Acenaph-thylene (ug/kg)	Anthra-cene (ug/kg)	Fluorene (ug/kg)	Naphtha-lene (ug/kg)	Phenan-threne (ug/kg)	Total LPAHs (ug/kg)	Benzo(a) anthracene (ug/kg)	Benzo(a) pyrene (ug/kg)	Benzo(g,h,i) perylene (ug/kg)	Total Benzo-fluoranthenes (ug/kg)	Chrysene (ug/kg)	Dibenzo(a,h) anthracene (ug/kg)	Fluoran-thene (ug/kg)	Indeno (1,2,3-cd) pyrene (ug/kg)
SCO				--	670	500	1,300	960	540	2,100	1,500	5,200	1,300	1,600	670	3,200	1,400	230	1,700	600
CSL/RAL/Method A				--	670	500	1,300	960	540	2,100	1,500	5,200	1,600	1,600	720	3,600	2,800	230	2,500	690
UPPER REACH																				
MH5	Norfolk CSO/SD	4/13/2018	Grab	200 U	200 U	200 U	200 U	100 J	50 J	74 J	410	630 J	420	550	280	1,200	720	200 U	1,100	190 J
NST1	Norfolk CSO/SD	4/16/2018	SedTrap	99 U	43 J	99 U	99 U	100	99 U	62 J	390	550 J	270	280	490	680	490	99 U	750	230
NST1	Norfolk CSO/SD	4/16/2018	Grab	47 J	76 J	99 U	49 J	210	110	99 J	1,000	1,500 J	800	1,100	790	2,100	1,400	230	2,400	560
NST3	Norfolk CSO/SD	4/16/2018	SedTrap	96 U	96 U	96 U	96 U	96 U	96 U	96 U	67 J	67 J	88 J	130	110	280	140	96 U	200	96 U
NST4	Norfolk CSO/SD	4/17/2018	SedTrap	300 U	300 U	300 U	300 U	300 U	300 U	300 U	200 J	200 J	170 J	260 J	200 J	710	330	300 U	460	170 J
MH47	KCIA SD#1	10/12/2018	Grab	20 U	20 U	19 J	9.7 J	140	35	11 J	470	690 J	410	370	160	800	580	70	950	150
RCB85	17th Ave S SD	12/18/2018	Grab	98 U	51 J	98 U	98 U	51 J	98 U	66 J	310	430 J	230	320	400	1,000	590	110	730	290
RCB76	17th Ave S SD	12/18/2018	Grab	96 U	96 U	96 U	96 U	96 U	96 U	60 J	200	260 J	450	550	410	1,700	1,500	120	360	300
MH41	S 96th St SD	7/31/2018	Grab	43 J	40 J	350	55 J	52 J	320	32 J	360	1,200 J	90 J	130	150	290	260	40 J	180	76 J
MIDDLE REACH																				
MH23	Georgetown SD	6/12/2018	Grab	98 U	41 J	110	35 J	400	150	90 J	2,530	3,300 J	1,800	2,000	1,500	4,600	2,800	430	4,700	1,400
MH32 (SL4-T6)	I-5 S (Slip 4)	4/17/2018	SedTrap	99 U	99 U	99 U	99 U	61 J	31 J	42 J	310	440 J	250	270	110	640	340	99 U	740	99 U
MH32 (SL4-T6)	I-5 S (Slip 4)	4/17/2018	Grab	19 U	19 U	6.6 J	19 U	19 U	5.1 J	19 U	29	41 J	10 J	16 J	18 J	35 J	23	19 U	30	9.5 J
MH100	S Myrtle St SD	5/25/2018	Grab	47 J	110	30 J	53 J	100	47 J	130	390	750	310	380	430	930	500	100	510	290
SMYRTLE_NORTON	S Myrtle St SD	5/31/2018	SedTrap	210 J	420 J	160 J	190 J	290 J	380 J	190 J	1,100 J	2,300 J	680 J	640 J	920 J	1,200 J	1,100 J	220 J	1,500 J	500 J
SMYRTLE_RORY	S Myrtle St SD	5/31/2018	SedTrap	130 J	250 J	240 UJ	240 UJ	290 J	230 J	150 J	750 J	1,400 J	660 J	600 J	820 J	1,400 J	1,100 J	250 J	1,300 J	480 J
SMYRTLE_TRENT	S Myrtle St SD	5/31/2018	SedTrap	250 UJ	240 J	140 J	140 J	230 J	190 J	160 J	630 J	1,500 J	530 J	520 J	680 J	1,100 J	830 J	210 J	1,000 J	420 J
ODS58	S River St SD	2/5/2018	SurfDebris	120	160	1,700	240	12,000	2,600	590 B	101,000	120,000	92,000	81,000	66,000	170,000	120,000	14,000	270,000	58,000
MH211	S River St SD	5/25/2018	Grab	94 U	30 J	94 U	39 J	120	43 J	47 J	280	530	410	440	450	1,300	830	110	980	320
MH223	S Brighton St SD	5/25/2018	Grab	95 U	33 J	78 J	36 J	120	120	47 J	440	840	280	240	230	760	600	55 J	860	160
MH38	Head of Slip 2	5/25/2018	Grab	55 J	66 J	94 U	94 U	94 U	94 U	140	65 J	210	94 U	94 U	54 J	190 U	40 J	94 U	54 J	94 U
MH39	1st Ave S (East) SD	5/25/2018	Grab	94 U	72 J	28 J	39 J	150	65 J	110	410	800	460	380	530	1,000	890	86 J	810	300
MH39	1st Ave S (East) SD	5/25/2018	Grab	30 J	73 J	93 U	37 J	89 J	63 J	93	370	650	290	310	460	830	610	87 J	660	240
7th-ST1	7th Ave S SD	4/18/2018	SedTrap	96 U	41 J	80 J	96 U	86 J	96 U	49 J	360	580	220	320	280	670	490	96 U	720	220
7th-ST1	7th Ave S SD	4/18/2018	Grab	99 U	99 U	99 U	99 U	99 U	99 U	99 U	48 J	48 J	99 U	99 U	99 U	130 J	110	99 U	140	99 U
7th-ST2	7th Ave S SD	4/17/2018	SedTrap	8.1 J	7.9 J	7.4 J	19 U	19 U	19 U	7.6 J	47	62 J	27	23	19 U	42	35	19 U	71	19 U
7th-ST2	7th Ave S SD	4/17/2018	Grab	98 U	98 U	98 U	98 U	55 J	33 J	98 U	300	290 J	160	170	89 J	380	220	98 U	480	76 J
7th-ST3	7th Ave S SD	4/19/2018	SedTrap	35 J	47 J	99 U	99 U	78 J	99 U	68 J	390	540	260	290	280	780	520	99 U	760	120
CB154	7th Ave S SD	2/15/2018	Grab	210	470	96 U	96 U	41 J	47 J	180	490	760	220	220	360 J	580	550	77 J	850 J	190
ODS60	7th Ave S SD	6/20/2018	SurfDebris	19 U	19 U	19 U	19 U	19 U	19 U	5.0 J	10 J	15 J	8.1 J	19 U	17 J	40	18 J	19 U	16 J	14 J
1st-ST1	1st Ave S SD	4/19/2018	SedTrap	99 U	99 U	99 U	68 J	200	83 J	130	740	1,200	450	550	810	1,400	1,100	99 U	1,400	360
1st-ST2	1st Ave S SD	4/19/2018	SedTrap	100 U	40 J	100 U	100 U	40 J	100 U	46 J	250	340	160	240	240	580	340	100 U	610	190
1st-ST3	1st Ave S SD	4/18/2018	SedTrap	96 U	96 U	96 U	96 U	96 U	96 U	96 U	92 J	92	100	130	120	280	170	96 U	260	84 J
1st-ST3	1st Ave S SD	4/18/2018	Grab	95 U	95 U	95 U	95 U	95 U	95 U	95 U	56 J	56 J	35 J	72 J	95 U	130 J	70 J	95 U	98	95 U
CB325	1st Ave S SD	4/10/2018	Grab	97 U	97 U	97 U	97 U	97 U	97 U	97 U	71 J	71 J	26 J	97 U	52 J	81 J	89 J	97 U	120	97 U
CB326	1st Ave S SD	4/10/2018	Grab	200 U	200 U	200 U	200 U	200 U	200 U	200 U	240	240	89 J	140 J	110 J	310 J	280	100 U	410	200 U
HP-ST4	Highland Park Way SW SD	4/17/2018	SedTrap	95 U	95 U	95 U	95 U	95 U	95 U	95 U	95 U	95 U	95 U	95 U	95 U	190 U	95 U	95 U	73 J	95 U
HP-ST6	Highland Park Way SW SD	4/18/2018	SedTrap	97 U	97 U	150	97 U	77 J	120	60 J	260	670	180	290	270	450	410	97 U	590	97 U
HP-ST6	Highland Park Way SW SD	4/18/2018	Grab	99 U	99 U	170	37 J	130	120	72 J	160	690 J	220	160	270	460	380	99 U	560	110
KN-ST1	Highland Park Way SW SD	4/19/2018	SedTrap	99 U	99 U	99 U	99 U	65 J	99 U	32 J	270	370	150	250	190	540	380	99 U	440	160
MH36	Highland Park Way SW SD	1/12/2018	Grab	100 U	100 U	190	75	240	140	75	280	1,000	590	270	320	1,200	860	100	1,700	240
RCB84	Highland Park Way SW SD	1/12/2018	Grab	37	72	46	31	110	94	93	750	1,100	210	180	240	490	530	96 U	890	150
RCB84	SW Kenny ST SD/T115 CSO	1/12/2018	Grab	30	49	38	39	110	120	76	840	1,200	260	260	300	600	590	98 U	1,100	150
LOWER REACH																				
CB309	Diagonal Ave S CSO/SD	1/24/2018	Grab	290 U	290 U	290 U	290 U	290 U	290 U	290 U	390	390	160	210	300	360	310	290 U	460	160
CB322	Diagonal Ave S CSO/SD	1/24/2018	Grab	300 U	300 U	300 U	300 U	100	300 U	300 U	390	490	210	290	510	690	700	300 U	880	320
CB323	Diagonal Ave S CSO/SD	2/15/2018	Grab	33	69	30	25	51	62	95	410	670	160	190	400 J	420	410	50	640 J	140
CB324	Diagonal Ave S CSO/SD	2/15/2018	Grab	120	220	1,500	180	9,500 R	2,700	180	26,600 R	--	16,000 R	8,300	3,000 J	14,000	16,000 R	1,200	41,000 J	3,000
CB331	Diagonal Ave S CSO/SD	10/12/2018	Grab	40 J	89	60 U	60 U	82	63	270	450	870	230	270	330	690	690	75	670	180
CB331	Diagonal Ave S CSO/SD	10/12/2018	Grab	41 J	92	30 J	35 J	89	59	360	520	1,100 J	260	300	320	760	770	72	790	160

**Appendix F-2
SPU Source Tracing Data 2018**

Station ID	Outfall	Date Sampled	Sample Type	1-Methyl-naphthalene (ug/kg)	2-Methyl-naphthalene (ug/kg)	Acenaph-thene (ug/kg)	Acenaph-thylene (ug/kg)	Anthra-cene (ug/kg)	Fluorene (ug/kg)	Naphtha-lene (ug/kg)	Phenan-threne (ug/kg)	Total LPAHs (ug/kg)	Benzo(a)anthracene (ug/kg)	Benzo(a)pyrene (ug/kg)	Benzo(g,h,i)perylene (ug/kg)	Total Benzo-fluoranthenes (ug/kg)	Chrysene (ug/kg)	Dibenzo(a,h)anthracene (ug/kg)	Fluoran-thene (ug/kg)	Indeno (1,2,3-cd)pyrene (ug/kg)
SCO				--	670	500	1,300	960	540	2,100	1,500	5,200	1,300	1,600	670	3,200	1,400	230	1,700	600
CSL/RAL/Method A				--	670	500	1,300	960	540	2,100	1,500	5,200	1,600	1,600	720	3,600	2,800	230	2,500	690
MH18	Diagonal Ave S CSO/SD	2/15/2018	Grab	130	320	300	68 J	620	330	220	4,300	4,800 J	2,300	2,500	1,800	4,600	3,100	680	8,100	1,500
MH18	Diagonal Ave S CSO/SD	2/15/2018	Grab	100	250	170	81 J	490	250	170	2,600	3,800 J	1,800	2,100	1,300	3,800	2,400	390	6,300	1,200
MH208	Diagonal Ave S CSO/SD	10/19/2018	Grab	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na
MH231	Diagonal Ave S CSO/SD	2/15/2018	Grab	97 U	97 U	97 U	97 U	97 U	97 U	97 U	23 J	23 J	97 U	97 U	46 J	50 J	75 J	97 U	47 J	97 U
MH231	Diagonal Ave S CSO/SD	10/19/2018	Grab	63 J	150	100 U	100 U	97 J	58 J	220	560	940 J	250	260	520	530	760	76 J	580	170
MH40	Diagonal Ave S CSO/SD	5/15/2018	Grab	100 U	100 U	100 U	100 U	100 U	100 U	28 J	170	200	150	180	330	530	350	59 J	370	190
MH46	Diagonal Ave S CSO/SD	10/12/2018	Grab	12 J	27	6.1 J	20 U	22	8.9 J	61	110	210 J	65	92	120	220	140	30	170	68
ODS59	Diagonal Ave S CSO/SD	5/15/2018	SurfDebris	99 U	48 J	99 U	99 U	38 J	99 U	96 J	140	270	110	150	270	350	240	54 J	220	150
RCB60	Diagonal Ave S CSO/SD	3/12/2018	Grab	51 J	92 J	310	110	1,500	310	110	2,300	4,600	2,300	2,300	1,200	4,400	3,700	510	5,200	1,100
ST1	Diagonal Ave S CSO/SD	4/18/2018	SedTrap	62 J	94 J	100 U	100 U	180	100 U	470	550	1,200	350	450	380	730	620	100 U	870	220
ST1	Diagonal Ave S CSO/SD	4/18/2018	Grab	18 J	23	9.0 J	25	63	18 J	15 J	180 J	310.0 J	240 J	330 J	150 J	410	350 J	56	240 J	160
DIAGNORTON	Diagonal Ave S CSO/SD	7/23/2018	SedTrap	26 J	40 J	18 J	59 U	60	36 J	83	290	490 J	150	140	110	310	250	59 U	340	80
DIAGRORY	Diagonal Ave S CSO/SD	7/23/2018	SedTrap	60 U	27 J	60 U	60 U	28 J	60 U	52 J	150	230 J	94	98	130	200	180	60 U	210	69
DIAGSIFT	Diagonal Ave S CSO/SD	7/23/2018	SedTrap	58 U	25 J	58 U	58 U	36 J	22 J	47 J	190	300 J	130	150	200	310	240	44 J	310	120
DIAGTRENT	Diagonal Ave S CSO/SD	7/23/2018	SedTrap	60 U	40 J	60 U	60 U	42 J	60 U	71	230	340 J	130	150	200	320	310	32 J	340	110
ST7	Diagonal Ave S CSO/SD	4/19/2018	SedTrap	1,100	1,500	98 U	98 U	56 J	50 J	310	210	630	180	220	98 U	420	270	98 U	410	98 U
ST7	Diagonal Ave S CSO/SD	4/19/2018	Grab	98 U	98 U	98 U	98 U	98 U	98 U	98 U	98 U	98 U	41 J	98 U	98 U	99 J	75 J	98 U	67 J	98 U
RCB312	S Nevada St SD	5/25/2018	Grab	98 U	56 J	98 U	41 J	68 J	62 J	84 J	570	830	300	240	400	640	710	55 J	670	180
ID-ST1	SW Idaho St SD	4/18/2018	SedTrap	170 U	170 U	170 U	170 U	110 J	74 J	82 J	680	950	550	660	610	2,400	1,200	170 U	1,500	580
ID-ST2	SW Idaho St SD	4/19/2018	SedTrap	19 U	19 U	19 U	19 U	8.9 J	19 U	7.1 J	41	57	40	56	50	160	94	19 U	78	42
ID-ST3	SW Idaho St SD	4/18/2018	SedTrap	99 U	99 U	99 U	99 U	99 U	99 U	99 U	78 J	78	55 J	85 J	130	230	110	99 U	88 J	98 J
RCB200a	SW Dakota St SD	6/12/2018	Grab	300 U	300 U	300 U	300 U	300 U	300 U	120 J	430	550 J	260 J	270 J	340	750	550	150 J	530	250 J

Screening levels are listed in Table 2-4.

Sample results is above the CSL/RAL/Method A screening level

Sample result is above the SCO but below the CSL

Analyte was not detected, but detection limit is above the SCO

Detections are shown in **bold** font.

Only analytes detected in at least one sample are shown.

J - estimated

U - not detected

R - rejected

na - not analyzed

**Appendix F-2
SPU Source Tracing Data 2018**

Station ID	Outfall	Date Sampled	Sample Type	Pyrene (ug/kg)	Total HPAHs (ug/kg)	Total cPAH (ug TEQ/kg)	BEHP (ug/kg)	Butylbenzyl phthalate (ug/kg)	Dimethyl phthalate (ug/kg)	Dibutyl phthalate (ug/kg)	Di-n-octyl phthalate (ug/kg)	1,2-Dichloro-benzene (ug/kg)	1,4-Dichloro-benzene (ug/kg)	4-Methyl-phenol (ug/kg)	Benzoic acid (ug/kg)	Benzyl alcohol (ug/kg)	Carbazole (ug/kg)	Dibenzo-furan (ug/kg)	Iso-phorone (ug/kg)	n-Nitroso-diphenyl-amine (ug/kg)	Pentachloro-phenol (ug/kg)	Phenol (ug/kg)
SCO				2,600	12,000	1,000	1,300	63	71	1,400	6,200	35	110	670	650	57	--	540	--	28	360	420
CSL/RAL/Method A				3,300	17,000	1,000	1,900	900	160	1,400	6,200	50	110	670	650	73	--	540	--	40	690	1,200
UPPER REACH																						
MH5	Norfolk CSO/SD	4/13/2018	Grab	1,400	5,900 J	750 J	13,000	260	200 U	180 J	440	200 U	200 U	200 U	2,000 U	200 U	200 U	200 U	200 U	200 U	1,000 U	88 J
NST1	Norfolk CSO/SD	4/16/2018	SedTrap	820	4,000	410	7,200	250	99 U	170	4,200	99 U	99 U	1,100	2,700	1,900	99 U	99 U	99 U	99 U	500 U	330
NST1	Norfolk CSO/SD	4/16/2018	Grab	2,600	12,000	1,500	8,500	1,200	99 U	180	1,900	99 U	99 U	99 U	560 J	370	150	56 J	99 U	99 U	500 U	170
NST3	Norfolk CSO/SD	4/16/2018	SedTrap	170	1,100 J	180 J	350	96 U	96 U	48 J	96 U	96 U	96 U	96 U	96 U	96 U	96 U	96 U	96 U	96 U	480 U	96 U
NST4	Norfolk CSO/SD	4/17/2018	SedTrap	520	2,800 J	380 J	750	300 U	300 U	300 U	300 U	300 U	300 U	300 U	1,900 J	580	300 U	300 U	300 U	300 U	1,500 U	130 J
MH47	KCIA SD#1	10/12/2018	Grab	770	4,300	520	600	670	17 J	17 J	20 U	20 U	20 U	20 U	260	58	78	12 J	20 U	20 U	81 J	20 U
RCB85	17th Ave S SD	12/18/2018	Grab	690	4,400	490	13,000	98 U	89 J	580	460	98 U	98 U	98 U	3,000	2,100	98	98 U	98 U	98 U	490 U	650
RCB76	17th Ave S SD	12/18/2018	Grab	480	5,900	820	89,000	1,200	1,200	680	650	96 U	96 U	96 U	3,200	8,700	96 U	96 U	96 U	96 U	480 U	910
MH41	S 96th St SD	7/31/2018	Grab	190	1,400 J	180 J	680	320	98 U	43 J	98 U	98 U	98 U	72 J	2,300	140	37 J	320	98 U	98 U	490 U	480
MIDDLE REACH																						
MH23	Georgetown SD	6/12/2018	Grab	3,800	23,000	2,900	7,000	600	110	190	98 U	98 U	98 U	82 J	750 J	110	370	72 J	97 U	98 U	490 U	120
MH32 (SL4-T6)	I-5 S (Slip 4)	4/17/2018	SedTrap	710	3,100	370	3,500	22,000	99 U	3,500	180	99 U	99 U	160	760 J	110	69 J	99 U	99 U	99 U	490 U	110
MH32 (SL4-T6)	I-5 S (Slip 4)	4/17/2018	Grab	33	180 J	23 J	430	19 U	19 U	49	19 U	19 U	19 U	19 U	190 U	19 U	7.2 J	19 U	19 U	19 U	96 U	19 U
MH100	S Myrtle St SD	5/25/2018	Grab	550	4,000	550	4,100	1,300	329	540	330	96 U	96 U	96 U	340 J	96 U	68 J	41 J	96 U	80 J	480 U	290
SMYRTLE_NORTON	S Myrtle St SD	5/31/2018	SedTrap	1,800 J	8,500 J	1,400 J	na	na	na	na	na	na	na	na	na	na	na	150 J	na	na	na	na
SMYRTLE_RORY	S Myrtle St SD	5/31/2018	SedTrap	1,800 J	8,400 J	890 J	na	na	na	na	na	na	na	na	na	na	na	130 J	na	na	na	na
SMYRTLE_TRENT	S Myrtle St SD	5/31/2018	SedTrap	1,400 J	6,700 J	750 J	na	na	na	na	na	na	na	na	na	na	na	250 UJ	na	na	na	na
ODS58	S River St SD	2/5/2018	SurfDebris	220,000	#####	120,000	12,000	1,100	9,000	540	1,400	300 U	300 U	300 U	2,500	300 U	19,000	700	300 U	300 U	1,500 U	2,300
MH211	S River St SD	5/25/2018	Grab	1,000	5,800	660	4,400	160	150	100	250	94 U	94 U	94 U	940 U	94 U	82 J	26 J	94 U	94 U	470 U	77 J
MH223	S Brighton St SD	5/25/2018	Grab	800	4,000	370	4,000	410	95 U	22,000	130	95 U	95 U	95 U	950 U	95 U	150	61 J	95 U	95 U	480 U	110
MH38	Head of Slip 2	5/25/2018	Grab	78 J	230	71	460	94 U	94 U	49 J	94 U	49 J	94 U	94 U	94 U	94 U	94 U	94 U	94 U	94 U	470 U	94 U
MH39	1st Ave S (East) SD	5/25/2018	Grab	980	5,400	570	4,700	260	94 U	110	310	94 U	94 U	94 J	940 U	94 U	62 J	46 J	94 U	54 J	470 U	85 J
MH39	1st Ave S (East) SD	5/25/2018	Grab	810	4,300	460	4,900	310	93 U	85 J	350	93 U	93 U	87 J	930 U	93 U	55 J	39 J	93 U	73 J	470 U	93 U
7th-ST1	7th Ave S SD	4/18/2018	SedTrap	650	3,600	440	6,000	96 U	49 J	160	370	96 U	110	1,000	560 J	410	54 J	96 U	96 U	96 U	480 U	200
7th-ST1	7th Ave S SD	4/18/2018	Grab	140	520 J	78 J	880	99 U	99 U	50 J	99 U	99 U	99 U	320	990 U	160	99 U	99 U	99 U	99 U	490 U	99 U
7th-ST2	7th Ave S SD	4/17/2018	SedTrap	62	260	32	110	98	19 U	19 U	19 U	19 U	19 U	19 U	330	370	19 U	7.4 J	19 U	19 U	96 U	45
7th-ST2	7th Ave S SD	4/17/2018	Grab	400	2,000 J	240 J	800	98 U	98 U	72 J	98 U	98 U	98 U	98 U	860 J	98 U	54 J	98 U	98 U	98 U	490 U	98 U
7th-ST3	7th Ave S SD	4/19/2018	SedTrap	780	3,800	420	6,600	99 U	99 U	110	280	99 U	99 U	95 J	680 J	600	110	99 U	99 U	99 U	500 U	350
CB154	7th Ave S SD	2/15/2018	Grab	820	3,900 J	330	20,000	350	110	770	790	96 U	96 U	630	960 U	2,500	71 J	41 J	96 U	96 U	480 U	260
ODS60	7th Ave S SD	6/20/2018	SurfDebris	15 J	130 J	17 J	210	19 U	19 U	46	19 U	19 U	19 U	19 U	89 J	19 U	19 U	19 U	19 U	19 U	95 U	110
1st-ST1	1st Ave S SD	4/19/2018	SedTrap	2,100	8,200	790	13,000	99 U	99 U	99 U	720	99 U	99 U	530	950 J	500	130	70 J	99 U	99 U	500 U	260
1st-ST2	1st Ave S SD	4/19/2018	SedTrap	590	3,000	340	5,500	100 U	100 U	88 J	620	100 U	100 U	1,300	1,000	270	45 J	100 U	100 U	100 U	500 U	270
1st-ST3	1st Ave S SD	4/18/2018	SedTrap	210	1,400	180	300	96 U	96 U	50 J	96 U	96 U	96 U	96 U	960 U	96 U	96 U	96 U	96 U	96 U	480 U	96 U
1st-ST3	1st Ave S SD	4/18/2018	Grab	110	520 J	99 J	240	95 U	95 U	95 U	95 U	95 U	95 U	95 U	950 U	95 U	95 U	95 U	95 U	95 U	480 U	95 U
CB325	1st Ave S SD	4/10/2018	Grab	140	510 J	70 J	1,600	430	110	64 J	60 J	97 U	97 U	110	360 J	97 U	97 U	97 U	97 U	97 U	480 U	71 J
CB326	1st Ave S SD	4/10/2018	Grab	500	1,800 J	200 J	11,000	2,600	310	200 U	200 U	200 U	200 U	2,100	1,200 J	200 U	200 U	200 U	200 U	210	990 U	290
HP-ST4	Highland Park Way SW SD	4/17/2018	SedTrap	100	170 J	70 U	570	95 U	95 U	95 U	95 U	95 U	95 U	320	370 J	87 J	95 U	95 U	95 U	95 U	470 U	93 J
HP-ST6	Highland Park Way SW SD	4/18/2018	SedTrap	670	2,900	370	3,800	370	97 U	120	260	97 U	97 U	83 J	410 J	400	49 J	77 J	97 U	97 U	490 U	150
HP-ST6	Highland Park Way SW SD	4/18/2018	Grab	650	2,800	250	3,900	310	99 U	99 U	99 U	99 U	99 U	99 U	1,000	320	99 U	73 J	99 U	99 U	500 U	150
KN-ST1	Highland Park Way SW SD	4/19/2018	SedTrap	490	2,600	340	3,000	99 U	99 U	52 J	230	99 U	99 U	120	990 U	190	99 U	99 U	99 U	99 U	500 U	99 U
MH36	Highland Park Way SW SD	1/12/2018	Grab	1,600	6,900	490	4,000	330	170	100 U	100 U	100 U	100 U	110	880	910	69	75	100 U	100 U	500 U	190
RCB84	Highland Park Way SW SD	1/12/2018	Grab	880	3,600	280	8,200	9,500	110	150	870	96 U	96 U	620	960 U	680	93	55	96 U	96 U	480 U	120
RCB84	SW Kenny ST SD/T115 CSO	1/12/2018	Grab	1,100	4,400	370	7,700	2,400	170	140	630	98 U	98 U	690	980 U	1,400	110	46	98 U	98 U	490 U	190
LOWER REACH																						
CB309	Diagonal Ave S CSO/SD	1/24/2018	Grab	400	2,400	300	7,300	360	290 U	650	820	290 U	290 U	970	1,300	290 U	290 U	290 U	290 U	290 U	1,400 U	180
CB322	Diagonal Ave S CSO/SD	1/24/2018	Grab	940	4,500	430	3,100	300 U	300 U	97	300 U	300 U	300 U	300 U	3,000 U	300 U	300 U	300 U	300 U	300 U	1,500 U	300 U
CB323	Diagonal Ave S CSO/SD	2/15/2018	Grab	740	3,200 J	270	13,000	440	120	600	430	97 U	97 U	670	450	110	76	38	97 U	97 U	490 U	160
CB324	Diagonal Ave S CSO/SD	2/15/2018	Grab	32,000 R	--	--	7,700	510	250	210	170	99 U	99 U	210	990 U	310	5,600	840	99 U	99 U	500 U	150
CB331	Diagonal Ave S CSO/SD	10/12/2018	Grab	750	3,900	390	44,000	810	70	84	2,000	60 U	60 U	160	510 J	64	76	55 J	60 U	68	300 U	130
CB331	Diagonal Ave S CSO/SD	10/12/2018	Grab	850	4,300	430	63,000	260	140	96	1,800	58 U	58 U	170	580 U	80	84	58	58 U	71	130 J	120

**Appendix F-2
SPU Source Tracing Data 2018**

Station ID	Outfall	Date Sampled	Sample Type	Pyrene (ug/kg)	Total HPAHs (ug/kg)	Total cPAH (ug TEQ/kg)	BEHP (ug/kg)	Butylbenzyl phthalate (ug/kg)	Dimethyl phthalate (ug/kg)	Dibutyl phthalate (ug/kg)	Di-n-octyl phthalate (ug/kg)	1,2-Dichloro-benzene (ug/kg)	1,4-Dichloro-benzene (ug/kg)	4-Methyl-phenol (ug/kg)	Benzoic acid (ug/kg)	Benzyl alcohol (ug/kg)	Carbazole (ug/kg)	Dibenzo-furan (ug/kg)	Iso-phorone (ug/kg)	n-Nitroso-diphenyl-amine (ug/kg)	Pentachloro-phenol (ug/kg)	Phenol (ug/kg)
SCO				2,600	12,000	1,000	1,300	63	71	1,400	6,200	35	110	670	650	57	--	540	--	28	360	420
CSL/RAL/Method A				3,300	17,000	1,000	1,900	900	160	1,400	6,200	50	110	670	650	73	--	540	--	40	690	1,200
MH18	Diagonal Ave S CSO/SD	2/15/2018	Grab	6,300	31,000	3,400	7,500	3,200	75 J	120	250	84 J	290	190	590 J	98 U	940	210	170	98 U	490 U	190
MH18	Diagonal Ave S CSO/SD	2/15/2018	Grab	5,000	24,000	2,800	7,000	740	75 J	160	98 U	72 J	250	180	980 U	98 U	730	140	140	98 U	490 U	130
MH208	Diagonal Ave S CSO/SD	10/19/2018	Grab	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na	na
MH231	Diagonal Ave S CSO/SD	2/15/2018	Grab	78 J	300 J	69 J	420	97 U	97 U	86 J	97 U	97 U	97 U	97 U	970 U	97 U	97 U	97 U	97 U	97 U	480 U	97 U
MH231	Diagonal Ave S CSO/SD	10/19/2018	Grab	1,100	4,200 J	370 J	5,900	210	100 U	78 J	100 U	100 U	100 U	100	1,300	100 U	54 J	54 J	66 J	100 U	260 J	130
MH40	Diagonal Ave S CSO/SD	5/15/2018	Grab	380	2,500	280 J	940	300	100 U	87 J	100 U	100 U	100 U	100 U	1,000 U	100 U	100 U	100 U	100 U	100 U	500 U	100 U
MH46	Diagonal Ave S CSO/SD	10/12/2018	Grab	190	1,100	130	7,800	140	16 J	48	77	20 U	20 U	35	470	63	39	16 J	20 U	20 U	120	93
ODS59	Diagonal Ave S CSO/SD	5/15/2018	SurfDebris	240	1,800	220 J	1,300	170	99 U	87 J	99 U	99 U	57 J	99 U	990 U	99 U	99 U	99 U	99 U	99 U	490 U	100
RCB60	Diagonal Ave S CSO/SD	3/12/2018	Grab	5,100	26,000	3,200	6,300	120	100 U	92 J	200	100 U	100 U	6,200	890 J	88 J	310	160	100 U	61 J	500 U	640
ST1	Diagonal Ave S CSO/SD	4/18/2018	SedTrap	1,000	4,600	590	7,100	100 U	100 U	100 U	2,400	100 U	100 U	4,800	1,600	100 U	100	100 U	100 U	100 U	500 U	520
ST1	Diagonal Ave S CSO/SD	4/18/2018	Grab	310 J	2,200 J	420 J	300 J	20 U	20 U	20 U	20 U	20 U	20 U	20 U	200 U	20 U	22	7.8 J	20 U	20 U	99 U	20 U
DIAGNORTON	Diagonal Ave S CSO/SD	7/23/2018	SedTrap	400	1,800	200	4,300	260	35 J	23 J	1,100	59 U	59 U	270	280 J	59 U	48 J	59 U	59 U	59 U	290 U	89
DIAGRORY	Diagonal Ave S CSO/SD	7/23/2018	SedTrap	260	1,200	140	3,600	60 U	60 U	35 J	200	60 U	60 U	160	280 J	120	60 U	60 U	60 U	60 U	300 U	72
DIAGSIFT	Diagonal Ave S CSO/SD	7/23/2018	SedTrap	360	1,900 J	210 J	3,600	200	58 U	39 J	210	58 U	58 U	58 U	420 J	58 U	48 U	58 U	58 U	58 U	290 U	110
DIAGTRENT	Diagonal Ave S CSO/SD	7/23/2018	SedTrap	430	2,000 J	210 J	7,000	120	60 U	45 J	410	60 U	60 U	240	630 J	180	44 J	60 U	60 U	50 J	300 U	130
ST7	Diagonal Ave S CSO/SD	4/19/2018	SedTrap	520	2,000	290	7,400	98 U	98 U	98 U	430	98 U	98 U	1,700	980 U	98 U	98 U	98 U	98 U	98 U	490 U	640
ST7	Diagonal Ave S CSO/SD	4/19/2018	Grab	77 J	360 J	74 J	570	98 U	98 U	98 U	98 U	98 U	98 U	98 U	980 U	98 U	98 U	98 U	98 U	98 U	490 U	98 U
RCB312	S Nevada St SD	5/25/2018	Grab	840	4,000	370	10,000	730	130	450	330	98 U	98 U	1,200	370 J	98 U	65 J	36 J	98 U	100	490 U	100
ID-ST1	SW Idaho St SD	4/18/2018	SedTrap	1,500	9,000	1,000	6,500	410	170 U	130 J	170 U	170 U	170 U	520	2,400	1,100	150 J	170 U	170 U	170 U	830 U	390
ID-ST2	SW Idaho St SD	4/19/2018	SedTrap	96	620	82	610	73	19 U	19 U	31	19 U	19 U	28	79 J	19 U	19 U	19 U	19 U	19 U	95 U	20
ID-ST3	SW Idaho St SD	4/18/2018	SedTrap	93 J	890	130	1,900	99 U	99 U	120	99 U	99 U	99 U	710	8,500	1,600	99 U	99 U	99 U	99 U	500 U	510
RCB200a	SW Dakota St SD	6/12/2018	Grab	590	3,700 J	420 J	6,900	300 U	300 U	280 J	720	300 U	300 U	490	980 J	2,300	300 U	300 U	300 U	300 U	1,500 U	180 J

Screening levels are listed in Table 2-4.

Sample results is above the CSL/RAL/Method A screening level

Sample result is above the SCO but below the CSL

Analyte was not detected, but detection limit is above the SCO

Detections are shown in **bold** font.

Only analytes detected in at least one sample are shown.

J - estimated

U - not detected

R - rejected

na - not analyzed

**Appendix G:
King County Source Tracing Data
(2018)**

**Appendix G-1
King County Source Tracing
Sample Locations (2018)**

Station ID	Sample No.	Date	Type	Sewer Type	Source Control Area	Outfall	Description	X Coordinate	Y Coordinate
Upper Reach									
96-ST1	L69696-1	3/12/2018	Sediment Trap	SD	RM 3.8-4.2 West (Sea King Industrial Area)	S 96th Street SD	Traps in 8-ft deep type 2 catch basin with slotted lid, just east of the lawn of Delta Marine's admin building and just north of S 96th Street.	1275076.00	192295.60
96-ST2	L69696-2	3/12/2018	Sediment Trap	SD	RM 3.8-4.2 West (Sea King Industrial Area)	S 96th Street SD	Traps in 14-foot deep type-2 catch basin with vaned, slotted lid near NE corner of 15th Avenue S and S 96th Street. Downstream of 96-ST3.	1274675.00	192705.00
96-ST3	L69696-3	3/12/2018	Sediment Trap	SD	RM 3.8-4.2 West (Sea King Industrial Area)	S 96th Street SD	Traps on south wall of 13-ft deep stormwater vault at corner of 4th Avenue S and S 96th Street. Upstream of 96-ST2.	1270741.00	192246.70
96ST1A	L69699-1	3/28/2018	Catch Basin Grab	SD	RM 3.8-4.2 West (Sea King Industrial Area)	S 96th Street SD	Type-2 catch basin with birdcage. South side of S 96th Street, just E of West Marginal Place S.	1274997.00	192175.00
96ST1B	L69699-2	3/28/2018	Catch Basin Grab	SD	RM 3.8-4.2 West (Sea King Industrial Area)	S 96th Street SD	Type-2 catch basin with 24" solid lid marked "DRAIN." Located in grassy area west of SR-99.	1274653.00	192115.00
96ST1C	L69699-3	3/28/2018	Manhole Grab	SD	RM 3.8-4.2 West (Sea King Industrial Area)	S 96th Street SD	Access with 36" solid lid marked "DRAIN", located on N side, 1300 block of S 96th Street	1273997.00	192148.00
96ST1D	L69699-4	3/28/2018	Catch Basin Grab	SD	RM 3.8-4.2 West (Sea King Industrial Area)	S 96th Street SD	Non-standard catch basin with grated lid on west side of the 9600 block of Des Moines Memorial Drive, 30 ft N of crosswalk.	1274533.00	1901562.00
KCIA2	KCIA2 Trap	7/31/2018	Sediment Trap	SD	RM 3.7-3.9 East (EAA-6: Boeing Isaacson/Central KCIA)	KCIA SD#2	KC Airport SD#2 at former Slip 5, MH east of E Marginal Wy S	1277685.38	194822.09
KCIA2	KCIA2 Grab	7/31/2018	Catch Basin Grab	SD	RM 3.7-3.9 East (EAA-6: Boeing Isaacson/Central KCIA)	KCIA SD#2	KC Airport SD#2 at former Slip 5, MH east of E Marginal Wy S	1277685.38	194822.09
KC-SPS	SPS Grab	7/31/2018	Catch Basin Grab	SD	RM 3.7-3.9 East (EAA-6: Boeing Isaacson/Central KCIA)	KCIA SD#2	KCIA South Pump Station inlet vault, in KCIA drainage basin 2	1273725.09	199334.77
KCIA1A	KCIA1A Trap	7/31/2018	Sediment Trap	SD	RM 3.9-4.3 East (Slip 6)	KCIA SD#1	KC Airport SD #1 at Slip 6, MH east of E Marginal Wy S, upstream of former sampling location KCIA1	1278547.80	193860.70
KCIA1A	KCIA1A Grab	7/31/2018	Catch Basin Grab	SD	RM 3.9-4.3 East (Slip 6)	KCIA SD#1	KC Airport SD #1 at Slip 6, MH east of E Marginal Wy S, upstream of former sampling location KCIA1	1278547.80	193860.70

**Appendix G-1
King County Source Tracing
Sample Locations (2018)**

Station ID	Sample No.	Date	Type	Sewer Type	Source Control Area	Outfall	Description	X Coordinate	Y Coordinate
KCIA1UP	KCIA-SL6-Q1-S	2/2/2018	Catch Basin Grab	SD	RM 3.9-4.3 East (Slip 6)	KCIA SD#1	KC Airport SD#1 at upstream boundary of KCIA along Perimeter Road S	1279714.80	194265.00
KCIA1UP	KCIA-SL6-Q2-W	4/11/2018	Catch Basin Grab	SD	RM 3.9-4.3 East (Slip 6)	KCIA SD#1	KC Airport SD#1 at upstream boundary of KCIA along Perimeter Road S	1279714.80	194265.00
Middle Reach									
WDUWAM.W14-224	L70568-2	7/3/2018	Sediment Trap	CS	RM 1.6-2.1 West (Terminal 115)	Terminal 115 CSO	Manhole just north of W. Marginal Pump Station (T115 CSO)	1268203.38	200297.25
A4007_U	L70566-1	7/3/2018	Sediment Trap	CS	RM 1.7-2.0 East (Slip 2 to Slip 3)	Michigan CSO	S. Michigan Street Regulatory Station (Michigan CSO)	1270402.00	202321.00
MH071-099	L70566-2	7/3/2018	Sediment Trap	CS	NA	Michigan CSO	Corson Avenue S and S Eddy Street Intersection	1272840.00	202712.00
SL4-T3A Trap	SL4-T3A Trap	7/31/2018	Sediment Trap	SD	RM 2.8 East (EAA-3: Slip 4)	KCIA SD#3	KCIA SD#3, south-central lateral, upstream of NBF, downstream of KCIA runway	1275726.22	199160.79
SL4-T3A Grab	SL4-T3A Grab	7/31/2018	Catch Basin Grab	SD	RM 2.8 East (EAA-3: Slip 4)	KCIA SD#3	KCIA SD#3, south-central lateral, upstream of NBF, downstream of KCIA runway	1275726.22	199160.79
SL4-T2A Trap	SL4-T2A Trap	7/31/2018	Sediment Trap	SD	RM 2.8 East (EAA-3: Slip 4)	KCIA SD#3	KCIA SD#3, south lateral, upstream of NBF, downstream of KCIA runway	1275936.17	198779.19
SL4-T2A Grab	SL4-T2A Grab	7/31/2018	Catch Basin Grab	SD	RM 2.8 East (EAA-3: Slip 4)	KCIA SD#3	KCIA SD#3, south lateral, upstream of NBF, downstream of KCIA runway	1275936.17	198779.19
Lower Reach									
HNFORD.21	L70568-3	7/5/2018	Sediment Trap	CS	Combined Sewer Area	Duwamish/Diagonal CSO/SD	Near Rainier Avenue S & S Estelle Street (Hanford #1 CSO Basin)	1279899.13	211986.81
HNFORD.MS-204	L70568-1	7/5/2018	Sediment Trap	CS	Combined Sewer Area	Duwamish/Diagonal CSO/SD	Near S Hanford Street & Martin Luther King Jr Way S (Hanford #1 CSO Basin)	1279207.85	213225.16

SD = storm drain
CS = combined sewer

Appendix G-2
King County Source Tracing Sample Results (2018)
All concentrations in mg/kg DW except as noted

Station ID	Date Sampled	Total Organic Carbon (Percent)	Arsenic	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Silver	Vanadium	Zinc	Diesel Oil Range HC	Motor Oil Range HC	Aroclor 1242
SCO		NA	57	5.1	260	390	450	0.41	--	6.1	--	410	2,000	2,000	--
CSL/RAL/Method A		NA	93	6.7	270	390	530	0.59	--	6.1	--	960	2,000	2,000	--
Upper Reach															
96-ST1	3/12/2018	5.58	23	0.73	32 J	59	43	na	37	0.13	51	510	na	na	na
96-ST2	3/12/2018	5.97	14	0.88	100	85	68	na	50	0.14	48	900	na	na	na
96-ST3	3/12/2018	na	19	0.53	38	51	45	na	45	0.15	65	460	na	na	na
LDW_SG_96ST1A	3/28/2018	3.25	6.0	0.44	16	32	14	na	19	0.074	31	210	na	na	na
LDW_SG_96ST1B	3/28/2018	4.75	19	0.75	42	82	73	na	38	0.15	67	310	na	na	na
LDW_SG_96ST1C	3/28/2018	6.43	40	0.79	39	98	51	na	32	0.16	61	440	na	na	na
LDW_SG_96ST1D	3/28/2018	0.46	3.3	0.11	16	26	4.4	na	13	0.036	26	52	na	na	na
KCIA2 Trap	7/31/2018	0.56	na	na	na	na	na	0.17 J	na	na	na	na	130	310	0.14
KCIA2 Grab	7/31/2018	3.0	26	na	na	200	15	0.01 UJ	na	na	na	120	25 UJ	50 UJ	0.022
SPS Grab	7/31/2018	1.4	75	na	na	16	23	0.10 UJ	na	na	na	700	170 UJ	480 UJ	0.17
KCIA1A Trap	7/31/2018	3.4	141	na	na	29	460	0.18 UJ	na	na	na	3,400	130	440	0.30
KCIA1A Grab	7/31/2018	2.2	16	na	na	30	35	2.1 U	na	na	na	510	120 UJ	300 UJ	0.38
KCIA-SL6-Q1-S	2/2/2018	8.0	13	na	na	140	220	0.13	na	na	na	1,200	530 DJ	2,400 D	0.044
KCIA-SL6-Q2-W	4/11/2018	5.8	6.3	na	na	26	90	0.11	na	na	na	190	260	1,100	0.027
Middle Reach															
ST_WDUWAM.W14-224	7/3/2018	10.6	2.7	0.64	70	230	69	1.1 J	34	0.72	21	490	na	na	0.0081
ST_A4007_U	7/3/2018	9.41	4.8	2.4	44	160	260	1.6 J	30	3.2	37	500	na	na	0.76
ST_MH071-099	7/3/2018	4.35	4.2	1.5	48	170	340	0.31 J	33	2.6	44	340	na	na	0.018
SL4-T3A Trap	7/31/2018	2.4	26	na	na	16	47	0.15	na	na	na	170	230 UJ	810 UJ	0.19
SL4-T3A Grab	7/31/2018	0.40	70	na	na	1,200	120	0.90	na	na	na	340	480	400	1.5
SL4-T2A Trap	7/31/2018	na	66	na	na	280	360	na	na	na	na	3,400	na	na	0.14
SL4-T2A Grab	7/31/2018	na	na	na	na	na	na	na	na	na	na	na	na	na	na
Lower Reach															
ST_HNFORD.21	7/5/2018	na	4.8	1.1	55	220	110	0.57 J	39	1.5	43	460	na	na	0.013
ST_HNFORD.MS-204	7/5/2018	6.17	3.4	0.50	28	100	83	0.36	26	1.0	26	240	na	na	0.0037

Sample result is above the CSL/RAL/Method A screening level

Sample result is above the SCO but below the CSL

Analyte was not detected, but detection limit is above the SCO

Screening levels are presented in Table 2-4.

na - not analyzed

Only analytes detected in at least one sample are shown.

Detections are shown in **bold** font.

Appendix G-2
King County Source Tracing Sample Results (2018)
All concentrations in mg/kg DW except as noted

Station ID	r	Aroclor 1248	Aroclor 1254	Aroclor 1260	Total PCB Aroclors	Dioxin/Furan TEQ (ND=DL) (ng/kg)	1-Methyl-naphthalene	2-Methyl-naphthalene	Acenaph-thene	Anthra-cene	Fluorene	Naphtha-lene	Phenan-threne	Total LPAH
SCO		--	--	--	0.13	--	--	0.67	0.50	0.96	0.54	2.1	1.5	5.2
CSL/RAL/Method A		--	--	--	1.0	25	--	0.67	0.50	0.96	0.54	2.1	1.5	5.2
Upper Reach														
96-ST1		na	na	na	na	na	0.029 U	0.029 U	0.21	0.62	0.27	0.029 U	2.6 J	3.7 J
96-ST2		na	na	na	na	na	0.027 U	0.027 U	0.027 U	0.050 J	0.029 J	0.027 U	0.31 J	0.39 J
96-ST3		na	na	na	na	na	0.046 U	0.046 U	0.046 U	0.046 U	0.046 U	0.046 U	0.090 U	0.046 U
LDW_SG_96ST1A		na	na	na	na	na	0.0053 J	0.0056 J	0.029 J	0.083 J	0.038 J	0.0045 UJ	0.47 J	0.62 J
LDW_SG_96ST1B		na	na	na	na	na	0.011 U	0.011 U	0.041 J	0.057 J	0.036 J	0.011 UJ	0.26 J	0.39 J
LDW_SG_96ST1C		na	na	na	na	na	0.0088 UJ	0.017 J	0.0088 UJ	0.0088 UJ	0.0088 UJ	0.016 J	0.18 J	0.21 J
LDW_SG_96ST1D		na	na	na	na	na	0.0041 UJ	0.0041 UJ	0.0041 UJ	0.0041 UJ	0.0041 UJ	0.0041 UJ	0.018 J	0.018 J
KCIA2 Trap	U	0.14 U	0.14 U	0.14 U	0.14 U	na	na	0.56 U	0.56 U	0.56 U	0.56 U	0.56 U	0.56 U	0.56 U
KCIA2 Grab	U	0.022 U	0.022 U	0.022 U	0.02 U	na	na	0.089 U	0.089 U	0.089 U	0.089 U	0.089 U	0.089 U	0.089 U
SPS Grab	U	0.17 U	0.17 U	0.17 U	0.17 U	na	na	0.68 UJ	0.68 U	0.68 U	0.68 U	0.68 UJ	0.68 U	0.68 UJ
KCIA1A Trap	U	0.30 U	0.30 U	0.30 U	0.30 U	na	na	1.2 UJ	1.2 U	1.2 U	1.2 U	1.2 UJ	1.7	1.7
KCIA1A Grab	U	0.38 U	0.38 U	0.38 U	0.38 U	na	na	1.6 UJ	1.6 U	1.6 U	1.6 U	1.6 UJ	1.6 U	1.6 U
KCIA-SL6-Q1-S	U	0.044 U	0.044 U	0.044 U	0.044 U	na	na	0.18 U	0.28	0.92	0.39	0.18 U	11	12
KCIA-SL6-Q2-W	U	0.027 U	0.027 U	0.027 U	0.027 U	na	na	0.11 U	0.41	1.3	0.58	0.11 U	16	18
Middle Reach														
ST_WDUWAM.W14-224	U	0.0020 U	0.021 J	0.014	0.04 J	6.15	0.41 U	0.41 U	0.41 U	0.41 U	0.41 U	0.41 U	0.81 U	0.41 U
ST_A4007_U		0.011 U	0.15 U	0.043	0.80	na	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U	0.44 U	0.87 U	0.44 U
ST_MH071-099		0.0021 U	0.079	0.020	0.12	na	0.12 J	0.11 J	0.084 U	0.084 U	0.084 U	0.084 U	0.48	0.58
SL4-T3A Trap	U	0.19 U	0.19 U	0.19 U	0.19 U	na	na	0.78 UJ	0.78 UJ	0.78 U	0.78 U	0.78 U	0.86	0.86
SL4-T3A Grab	U	1.5 U	1.5 U	1.5 U	1.5 U	na	na	6.0 U	6.0 U	6.0 U	6.0 U	6.0 U	6.0 U	6.0 U
SL4-T2A Trap	U	0.14 U	0.14 U	0.61	0.61	na	na	na	na	na	na	na	na	na
SL4-T2A Grab		na	na	na	na	na	na	na	na	na	na	na	na	na
Lower Reach														
ST_HNFORD.21	U	0.0031 U	0.016 U	0.017	0.017	na	na	na	na	na	na	na	na	na
ST_HNFORD.MS-204	U	0.0019 U	0.0062	0.0034	0.010	3.09	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U	0.37 U	0.74 U	0.37 U

Appendix G-2
King County Source Tracing Sample Results (2018)
All concentrations in mg/kg DW except as noted

Station ID	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(g,h,i)perylene	Total Benzo-fluoranthenes	Chrysene	Dibenzo(a,h)anthracene	Fluoranthene	Indeno (1,2,3-cd)pyrene	Pyrene	Total HPAH	BEHP	Butylbenzyl phthalate
SCO	1.3	1.6	0.67	3.2	1.4	0.23	1.7	0.60	2.6	12	1.3	0.063
CSL/RAL/Method A	1.6	1.6	0.72	3.6	2.8	0.23	2.5	0.69	3.3	17	1.9	0.90
Upper Reach												
96-ST1	1.4 J	1.4 J	0.55 J	3.0 J	1.5 J	0.16 J	4.0 J	0.61 J	3.6 J	16 J	12 J	0.029 U
96-ST2	0.27	0.38	0.22	0.96	0.42	0.053 U	0.75 J	0.19	0.74 J	3.9 J	3.8	0.75
96-ST3	0.090 U	0.074 J	0.071 J	0.18	0.95	0.090 U	0.18 J	0.049 J	0.15 J	0.80 J	0.98	0.060 J
LDW_SG_96ST1A	0.32 J	0.23 J	0.016 J	0.92 J	0.50 J	0.0045 UJ	0.95 J	0.057 J	0.77 J	3.7 J	na	na
LDW_SG_96ST1B	0.011 UJ	0.057 UJ	0.057 UJ	0.057 UJ	0.53 J	0.057 UJ	0.83 J	0.057 UJ	0.70 J	2.1 J	na	na
LDW_SG_96ST1C	0.0088 UJ	0.045 UJ	0.045 UJ	0.045 UJ	0.0088 UJ	0.045 UJ	0.48 J	0.045 UJ	0.63 J	1.1 J	na	na
LDW_SG_96ST1D	0.023 J	0.021 UJ	0.021 UJ	0.021 UJ	0.045 J	0.021 UJ	0.063 J	0.021 UJ	0.052 J	0.18 J	na	na
KCIA2 Trap	0.56 U	0.56 U	0.56 U	0.33 T	0.56 U	0.56 U	0.40 T	0.56 U	0.39 T	1.1	0.56 U	0.56 U
KCIA2 Grab	0.025 JT	0.033 JT	0.034 JT	0.081 JT	0.047 JT	0.089 UJ	0.060 JT	0.029 JT	0.067 JT	0.47	0.025 JT	0.089 UJ
SPS Grab	0.68 U	0.68 U	0.68 U	0.68 U	0.68 U	0.68 U	0.68 U	0.68 U	0.68 U	0.68 U	0.68 U	0.68 U
KCIA1A Trap	1.2	1.3	1.9	4.5	2.1	1.2 U	3.7	1.6	3.8	20	1.8	1.2 U
KCIA1A Grab	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	3.7 U	1.6 U
KCIA-SL6-Q1-S	7.8	9.5	7.7	22	12	0.18 U	22	8.2	20	110	1.0	0.18 U
KCIA-SL6-Q2-W	10	12	13	31	17	0.11 U	32	13	28	160	0.30	0.11 U
Middle Reach												
ST_WDUWAM.W14-224	0.81 U	0.47 J	0.41 U	1.4	0.41 U	0.81 U	0.41 U	0.41 U	0.41 U	1.8	6.5	0.41 U
ST_A4007_U	0.87 U	0.44 U	0.44 U	1.3	0.44 U	0.87 U	1.2	0.44 U	1.1	3.6	7.5	0.44 U
ST_MH071-099	0.35 J	0.31	0.22	0.84	0.40	0.17 U	0.79	0.21	0.63	3.8 J	2.3	0.084 U
SL4-T3A Trap	0.58	0.92	1.5	3.2	1.6	0.78 U	2.1	1.2	2.1	13	1.9	0.78 U
SL4-T3A Grab	6.0 U	6.0 U	6.0 U	6.0 U	6.0 U	6.0 U	6.0 U	6.0 U	6.0 U	6.0 U	6.0 U	6.0 U
SL4-T2A Trap	na	na	na	na	na	na	na	na	na	na	na	na
SL4-T2A Grab	na	na	na	na	na	na	na	na	na	na	na	na
Lower Reach												
ST_HNFORD.21	na	na	na	na	na	na	na	na	na	na	na	na
ST_HNFORD.MS-204	0.74 U	0.37 U	0.37 U	0.37 U	0.37 U	0.74 U	0.48 J	0.37 U	0.39 J	0.87 J	3.3	0.37 U

Appendix G-2
King County Source Tracing Sample Results (2018)
All concentrations in mg/kg DW except as noted

Station ID	Dibutyl phthalate	Diethyl phthalate	Dimethyl phthalate	Di-n-octyl phthalate	3, 4-Methyl-phenol	Benzoic acid	Benzyl alcohol	Carbazole	Dibenzo-furan	Pentachloro phenol
SCO	1.4	0.20	0.071	6.2	0.67	0.65	0.057	--	0.54	0.36
CSL/RAL/Method A	1.4	1.2	0.16	6.2	0.67	0.65	0.073	--	0.54	0.69
Upper Reach										
96-ST1	0.029 U	0.29 UJ	0.014 J	0.029 U	0.14 U	0.19 J	0.011 U	0.25 J	0.12	0.056 U
96-ST2	0.057	0.27 UJ	0.012 J	0.027 U	0.18 J	0.19 J	0.014 J	0.053 J	0.027 U	0.053 U
96-ST3	0.046 U	0.46 UJ	0.018 U	0.046 U	0.23 U	0.30 J	0.018 U	0.046 U	0.046 U	0.090 U
LDW_SG_96ST1A	na	na	na	na	na	na	na	na	na	na
LDW_SG_96ST1B	na	na	na	na	na	na	na	na	na	na
LDW_SG_96ST1C	na	na	na	na	na	na	na	na	na	na
LDW_SG_96ST1D	na	na	na	na	na	na	na	na	na	na
KCIA2 Trap	0.56 U	0.56 U	0.56 U	0.28 U	na	na	na	na	na	na
KCIA2 Grab	0.089 UJ	0.089 UJ	0.089 UJ	0.045 UJ	na	na	na	na	na	na
SPS Grab	0.68 U	0.68 U	0.68 U	0.34 U	na	na	na	na	na	na
KCIA1A Trap	1.2 U	1.2 U	1.2 U	0.59 U	na	na	na	na	na	na
KCIA1A Grab	1.6 U	1.6 U	1.6 U	0.80 U	na	na	na	na	na	na
KCIA-SL6-Q1-S	0.18 U	0.18 U	0.18 U	0.090 U	na	na	na	na	na	na
KCIA-SL6-Q2-W	0.11 U	0.11 U	0.11 U	0.053 U	na	na	na	na	na	na
Middle Reach										
ST_WDUWAM.W14-224	0.41 U	4.1 U	1.6 U	0.4 U	98	19 J	1.6 UJ	0.41 U	0.41 U	8.1 U
ST_A4007_U	0.44 U	4.4 U	1.8 U	0.44 U	89	39 J	1.8 U	0.44 U	0.44 U	12 J
ST_MH071-099	0.084 U	0.84 U	0.33 U	0.084 U	23	4.2 J	0.33 U	0.084 U	0.084 U	1.7 U
SL4-T3A Trap	0.78 U	0.78 U	0.78 U	0.39	na	na	na	na	na	na
SL4-T3A Grab	6.0 U	6.0 U	6.0 U	3.0 U	na	na	na	na	na	na
SL4-T2A Trap	na	na	na	na	na	na	na	na	na	na
SL4-T2A Grab	na	na	na	na	na	na	na	na	na	na
Lower Reach										
ST_HNFORD.21	na	na	na	na	na	na	na	na	na	na
ST_HNFORD.MS-204	0.37 U	3.7 U	1.5 U	0.37 U	23	17	1.5 UJ	0.37 U	0.37 U	7.4 U