DEPARTMENT OF ECOLOGY
State of Washington

Lower Duwamish Waterway
RM 2.1 West
(1st Avenue South Storm Drain)

Source Control Action Plan

March 2013

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Lower Duwamish Waterway
RM 2.1 West
(1st Avenue South Storm Drain)

Source Control Action Plan

Produced by

Toxics Cleanup Program
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Washington State Department of Ecology
Bellevue, Washington

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Executive Summary

The purpose of this Source Control Action Plan (SCAP) is to describe potential sources of contaminants to sediments along the Lower Duwamish Waterway (LDW) River Mile (RM) 2.1 West, and to identify actions necessary to minimize recontamination of sediment after cleanup. This SCAP is based on a thorough review of information pertinent to sediment recontamination, as documented in *Lower Duwamish Waterway, RM 2.1 West (1st Avenue South Storm Drain), Summary of Existing Information and Identification of Data Gaps* (SAIC 2012).

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

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

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

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

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

Section 3 contains the following: a description of potential sources of contamination that may affect sediments near the 1st Avenue S SD source control area, including outfalls, spills to the

waterway, and releases from storm drain outfalls and discharges from upland properties; an evaluation of the significance of these potential sources; and a listing of the actions that are planned or underway to control potential contaminant sources. Section 4 discusses monitoring activities that will be conducted to identify additional sources and assess progress, and Section 5 describes how source control efforts will be tracked and reported. Section 6 lists documents reviewed during preparation of this SCAP.

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

A removal action for sediment near the 1st Avenue S SD source control area was not scheduled at the time this SCAP was prepared.

Table ES-1. Source Control Actions – 1st Avenue South Storm Drain Source Control Area

Potential Sources	Action Items	Priority	Responsible Party(ies)	Status	Target Date
1st Avenue S Bridge Drains (Outfalls 2505, 2507, 2510, 2512)					
Motor vehicles crossing the bridge may be a source of PAHs, phthalates, metals, and petroleum hydrocarbons contamination to stormwater and discharged to the LDW through the 1st Avenue S Bridge drains.	Request additional information from WSDOT regarding the quantity and quality of stormwater and solids discharged to the LDW through the bridge drains.	High	Ecology	Planned	TBD
1st Avenue S Storm Drain System					
Sediment trap, inline, and catch basin storm drain solids sampling has indicated that concentrations of sediment COCs above storm drain screening levels are present in the 1st Avenue S SD basin. Specifically, mercury, acenaphthene, BEHP, BBP, PCBs, and dioxins/furans exceeded screening levels in both storm drain solids and surface sediment samples in this source control area.	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 S SD.	Low	Ecology	Planned	TBD

Table ES-1. Source Control Actions – 1st Avenue South Storm Drain Source Control Area

Potential Sources	Action Items	Priority	Responsible Party(ies)	Status	Target Date
1st Avenue S Engineered Wetlands					
LDW sediment COCs were detected in wetland sediment samples collected in 1994. More recent environmental data from the wetland were not available for review. Storm drain solids sampling data collected at locations upstream of the wetland in 2008 and 2011 indicate the presence of mercury, acenaphthene, BBP, BEHP, PCBs, and dioxins/furans, which have also been identified as LDW sediment COCs. These contaminants may be transported to the 1st Avenue S wetlands. If the treatment capacity of the wetlands has been reached, these sediment COCs would be conveyed to the LDW.	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	Planned	TBD
	Design a study to identify/evaluate sediment and water sampling locations at the confluence of the 1st Avenue S wetlands and the LDW, taking tidal fluctuations and accessibility into consideration. The purpose of the study will be to assess the potential for discharge of sediment COCs from the wetland to LDW sediment and to verify that COCs are not being released from the wetlands to the LDW. If it is determined that sediment COCs are being released, determine what measures may be necessary to mitigate contaminant release to the LDW and re-evaluate the priority of source control actions for the upland properties within the 1st Avenue S SD basin.	Medium	Ecology	Planned	TBD

Table ES-1. Source Control Actions – 1st Avenue South Storm Drain Source Control Area

Potential Sources	Action Items	Priority	Responsible Party(ies)	Status	Target Date
Properties in the 1st Avenue S SD Basin					
Burkheimer Family Property Samson Tug & Barge 7553 Detroit Avenue SW 7739 1st Avenue S 7600 2nd Avenue SW Lion Trucking 8425 1st Avenue S 98108 South Recycle & Disposal Station 8100 2nd Avenue S 98108 8105 5th Avenue S 98108 Waste Management Eastmont Transfer Station 7201 West Marginal Way SW 98108	Perform a follow-up inspection to verify compliance with Ecology's recommendations, applicable regulations, and BMPs to prevent the release of contaminants to the LDW.	Low	Ecology	Planned	TBD
North Star Ice Equipment 8151 Occidental Avenue S 98108	Review reports from recent inspections to verify compliance with Ecology's recommendations, applicable regulations, and BMPs to prevent the release of contaminants to the LDW.	Low	Ecology	Planned	TBD
MAPSCO 8135 1st Avenue S 98106 South Transfer Station/Former S Kenyon Street Bus Yard 110, 130, 150 & 200 S Kenyon Street 98108	Request additional information regarding the locations, materials, and condition of storm drain system pipes and structures at this property from the property owner.	Low	Ecology	Planned	TBD

Table ES-1. Source Control Actions – 1st Avenue South Storm Drain Source Control Area

Potential Sources	Action Items	Priority	Responsible Party(ies)	Status	Target Date
Non-Ferrous Metals 230 S Chicago Street 98108 North Star Ice Equipment 8151 Occidental Avenue S 98108 Seattle Housing Authority 7500 Detroit Avenue SW 98106 Urban Hardwoods Inc. 8427 1st Avenue S 98108 Vista Pro Automotive 7951 2nd Avenue S 98108	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	Planned	TBD

Priority:

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

Acronyms/Abbreviations

BBP	butyl benzyl phthalate
BEHP	bis(2-ethylhexyl)phthalate
BMP	best management practice
CNE	Certificate of No Exposure
COC	chemical of concern
ISGP	Industrial Stormwater General Permit
LDW	Lower Duwamish Waterway
PAH	polycyclic aromatic hydrocarbon
PCB	polychlorinated biphenyl
SD	storm drain
SPU	Seattle Public Utilities
TBD	to be determined
WSDOT	Washington State Department of Transportation

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Acronyms/Abbreviations

2LAET	second lowest apparent effects threshold
AET	apparent effects threshold
BBP	butyl benzyl phthalate
BEHP	bis(2-ethylhexyl)phthalate
BMP	best management practice
BTEX	benzene, toluene, ethylbenzene, and xylenes
CKD	cement kiln dust
CNE	Certificate of No Exposure
COC	chemical of concern
cPAHs	carcinogenic polycyclic aromatic hydrocarbons
CSCSL	Confirmed and Suspected Contaminated Sites List
CSL	Cleanup Screening Level
CSO	combined sewer overflow
DCE	dichloroethene
DW	dry weight
EAA	Early Action Area
Ecology	Washington State Department of Ecology
EOF	emergency overflow
EPA	United States Environmental Protection Agency
FS	Feasibility Study
FSID	Facility/Site Identification
GW	groundwater
HPAH	high molecular weight polycyclic aromatic hydrocarbon
ID	identification
ISGP	Industrial Stormwater General Permit
KCIW	King County Industrial Waste
LAET	lowest apparent effects threshold
LDW	Lower Duwamish Waterway
LDWG	Lower Duwamish Waterway Group
LPAH	low molecular weight polycyclic aromatic hydrocarbon
LUST	leaking underground storage tank
MAPSCO	Magnetic & Penetrant Services
mg/kg	milligrams per kilogram
MTBE	methyl tertiary butyl ether
MTCA	Model Toxics Control Act
NFA	No Further Action
ng/kg	nanograms per kilogram
NPDES	National Pollutant Discharge Elimination System
OC	organic carbon
PAH	polycyclic aromatic hydrocarbon
PCB	polychlorinated biphenyl
PCE	tetrachloroethene
PSCAA	Puget Sound Clean Air Agency
PVC	polyvinyl chloride
RCRA	Resource Conservation and Recovery Act
RI	Remedial Investigation

RM	river mile
ROD	Record of Decision
SAIC	Science Applications International Corporation
SCAP	Source Control Action Plan
SCWG	Source Control Work Group
SD	storm drain
SDOT	Seattle Department of Transportation
SKCDPH	Seattle/King County Department of Public Health
SL	Screening Level
SMS	Sediment Management Standards
SPU	Seattle Public Utilities
SQS	Sediment Quality Standard
SR	State Route
SVOC	semivolatile organic compound
TCA	trichloroethane
TCE	trichloroethylene
TEQ	toxic equivalency
TOC	total organic carbon
TPH	total petroleum hydrocarbons
USEPA	United States Environmental Protection Agency
UST	underground storage tank
VOC	volatile organic compound
WAC	Washington Administrative Code
WSDOT	Washington State Department of Transportation
µg/L	micrograms per liter

1.0 Introduction

This Source Control Action Plan (SCAP) describes potential sources of contamination that may affect sediments in and adjacent to the River Mile (RM) 2.1 West[1] (1st Avenue South Storm Drain) source control area of the Lower Duwamish Waterway (LDW). The purpose of this plan is to evaluate the significance of these sources and to determine if actions are needed to minimize the potential for recontamination of sediment near the 1st Avenue South Storm Drain (1st Avenue S SD) source control area after cleanup. In addition, this SCAP describes:

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

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

- *Lower Duwamish Waterway, RM 2.1 West (1st Avenue South Storm Drain) – Summary of Existing Information and Identification of Data Gaps*, (Data Gaps Report), Science Applications International Corporation (SAIC), September 2012, located on Ecology's website: http://www.ecy.wa.gov/programs/tcp/sites_brochure/lower_duwamish/sites/RM_21_W_First_Ave/RM_21_W_First_Ave.html
- *Lower Duwamish Waterway Source Control Strategy*, Washington State Department of Ecology (Ecology), January 2004, located on Ecology's website: http://www.ecy.wa.gov/biblio/0409043.html
- *Lower Duwamish Waterway Remedial Investigation*, Windward Environmental LLC (Windward), July 9, 2010, located on Lower Duwamish Waterway Group's website: http://www.ldwg.org/assets/phase2_ri/final%20ri/Final_LDW_RI.pdf
- *Lower Duwamish Waterway Final Feasibility Study*, AECOM , October 31, 2012, located on Lower Duwamish Waterway Group's website: http://www.ldwg.org/rifs_docs9.htm#final2012

1.1 Organization of Document

Section 1 of this SCAP describes the LDW site, the strategy for source control, and the responsibilities of the public agencies involved in source control for the LDW. Section 2 provides background information on the 1st Avenue S SD source control area, including a description of the chemicals of concern (COCs) for sediments adjacent to the source control area. Section 3 provides

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

an overview of potential sources of contaminants that may affect sediments near the 1st Avenue S SD source control area, including storm drain outfalls and discharges from upland properties. Section 3 also describes actions planned or currently underway to control potential sources of contaminants. Sections 4 and 5 describe monitoring and tracking/reporting activities, respectively. References are listed in Section 6, and figures and tables are presented at the end of the document.

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

1.2 Lower Duwamish Waterway Site

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

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

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

In December 2000, EPA and Ecology signed an agreement with King County, the Port of Seattle, the City of Seattle, and The Boeing Company, collectively known as the Lower Duwamish Waterway Group (LDWG). Under the agreement, the LDWG conducted a Remedial Investigation (RI) and Feasibility Study (FS) of the LDW to assess risks to human health and the

environment and to evaluate cleanup alternatives. The RI for the site was completed in two phases. Results of Phase 1 were published in July 2003 (Windward 2003b). The Phase 1 RI used existing data to characterize the nature and extent of chemical distributions in LDW sediments, develop preliminary risk estimates, and identify candidate sites for early cleanup action. The Phase 2 RI was published in July 2010, and presents the results of investigations conducted for the LDW study area between 2003 and 2009, including studies to assess sediment dynamics, the nature and extent of contamination in the LDW, preliminary background concentrations, ecological and human health risks, and potential chemical sources (Windward 2010b). No additional early cleanup areas were identified. The final FS, which addresses cleanup options for contaminated sediments in the LDW, was completed in October 2012 (AECOM 2012). A Proposed Plan for cleanup of the LDW is currently in progress.

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

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

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

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

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

Of the seven candidate EAAs, five either had sponsors to begin investigations or were already under investigation by a member or group of members of the LDWG. These five sites are: Slip 4, Terminal 117, Boeing Plant 2, Duwamish/Diagonal CSO/SD, and Norfolk CSO/SD.[3] EPA is the lead agency for managing cleanup at Terminal 117 and Slip 4. The other three early action

[3] These five sites are identified as EAAs in the Final FS for the Lower Duwamish Waterway, published on October 31, 2012 (AECOM 2012). The two candidate EAAs without sponsors are identified in the Final FS as Areas of Potential Concern.

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

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

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

1.3 LDW Source Control Strategy

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

The strategy is being implemented through the development of a series of detailed, area-specific SCAPs that will be coordinated with sediment cleanups, beginning with the candidate EAAs. Each SCAP will document what is known about the area, the potential sources of recontamination, actions taken to address them, and how to determine when adequate source control is achieved for an area. Because the scope of source control for each area will vary, it is necessary to adapt each plan to the specific situation at that area. The success of this strategy depends on the coordination and cooperation of all public agencies with responsibility for source

[4] Washington Administrative Code (WAC) 173-204

control in the LDW area, as well as prompt compliance by the businesses that must make necessary changes to control releases from their properties.

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

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

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

1.4 Source Control Work Group

The primary public agencies responsible for source control for the LDW are Ecology, the City of Seattle, King County, the Port of Seattle, City of Tukwila, and EPA. All of these agencies, except the Port and the City of Tukwila, are involved in the source control activities for the 1st Avenue S SD source control area.

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

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

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2.0 River Mile 2.1 West (1st Avenue S SD)

The 1st Avenue S SD source control area is located along the western side of the LDW Superfund Site at RM 2.1, as measured from the southern end of Harbor Island (Figure 1). The source control area is south of the Port of Seattle's Terminal 115, east of Highland Park Way SW, west of the Trotsky Inlet and Riverside Drive source control areas, and extends south to SW Roxbury Street (Figure 3). The source control area is located along the base of a hill, which rises to over 400 feet along the west side of the source control area. Some of the industrial properties on the west side of Detroit Avenue SW and 1st Avenue S abut the heavily vegetated hillside; residential areas are generally located at the top of the hill to the west, above 300 feet in elevation. A large park, Westcrest Park, is located in the southern portion of the source control area, as is the West Seattle Reservoir.

Stormwater in the 1st Avenue S SD basin is transported via underground pipes and surface ditches to a series of engineered wetlands, referred to in this report as the 1st Avenue S wetlands or 1st Avenue S central wetlands, which discharge to an intertidal slough under the 1st Avenue S bridge (Figure 4) in the northern portion of the source control area, adjacent to State Route (SR) 99/SR 509.

Stormwater in the northern portion of the source control area historically drained to the McAllister Slough, which discharged to the LDW near Boeing Plant 1; additional information is provided in the Terminal 115 Data Gaps Report (SAIC 2011a). The approaches to the current bridge from the south are situated on fill material that was placed in the area in the late 1950s and early 1960s, in conjunction with filling of the Duwamish River oxbow that is now the Douglas Management Company property, within the Trotsky Inlet source control area. During construction of the bridge, the portion of West Marginal Way S to the west of SR 509 was relocated 1,000 feet to the north of its prior position.

During reconstruction of the 1st Avenue S bridge during the mid-1990s, impacts to natural wetlands in this area were mitigated by the construction of a 2.08-acre Y-shaped wetland, which is hydraulically connected to the tidally influenced, pre-existing wetland (Figure 5). The constructed wetland was intended to enhance the functions and values of the wetland system and assist in enhancing the water quality of the LDW and estuary system (WSDOT 1994a).

At the same time, impacts to a 400-square foot area of intertidal habitat along the shore of the LDW was mitigated by pulling back the bank of the river to increase the size of the existing intertidal area by 29,500 square feet (WSDOT 1994a). The intertidal area was designated as a potential clamming area in the LDW FS (AECOM 2012).

The 1st Avenue S SD source control area is unique in that there are no facilities located directly adjacent to the LDW; the right-of-way for the 1st Avenue S bridge is included in the 1st Avenue S SD source control area, but adjacent properties to the southeast and northwest are addressed as part of other source control areas. Parcel ownership near the 1st Avenue S bridge is shown in Figure 6.

Douglas Management Company (southeast of the bridge) leases 50,408 square feet of land from the Washington State Department of Transportation (WSDOT); this property is used for storage

of empty cargo, shipping containers, and related equipment, and contains a weight scale for loading and unloading of gravel (WSDOT 2004). Activities at Douglas Management Company are discussed in more detail in *Early Action Area 2 Supplemental Data Gaps Report, Douglas Management Company Property, 7100 2nd Avenue SW, Seattle* (SAIC 2008).

The Seattle Department of Transportation (SDOT) parcels (5367202518 and 5367202510) and State of Washington parcels (5367202512 and 5367202514) located to the northwest of the bridge and north of SW Michigan Street are discussed in the Terminal 115 Data Gaps Report; these parcels are identified as the Seattle Engineering Department Penn Yard (SAIC 2011a).

The Duwamish Bikeway is a 2.95-mile trail from SR 99 and S Holden Street (in the 1st Avenue S SD source control area) to West Marginal Way SW and SW Idaho Street. It passes through the north end of the source control area (Figure 3). The neighborhoods of Highland Park and White Center are partially within the 1st Avenue S SD source control area.

There are 73 upland facilities in the 1st Avenue S SD source control area that are listed in Ecology's Facility/Site Database; these are identified in Table 1. Releases from these facilities could potentially affect LDW sediments near RM 2.1 West.

2.1 Chemicals of Concern in Sediment

Sediments near the 1st Avenue S SD source control area generally consist of 40 to 60 percent fines. Total organic carbon (TOC) in this area ranges from 1 to 3 percent TOC (Windward 2010b).

Several environmental investigations have included the collection of sediment near the 1st Avenue S SD source control area (Figure 7), including the following:

- One surface sediment sample collected during an EPA Site Inspection in 1998 (Weston 1999);
- Five surface sediment and four subsurface sediment samples from two coring locations collected during the LDW RI from 2004 to 2006 (Windward 2005a, 2005b, 2007a, and 2007b);
- One surface sediment sample collected during LDW RI dioxin/furan sampling effort in 2009 (Windward 2010a); and
- Five surface sediment samples collected as part of Ecology's outfall surface sediment sampling effort in 2011 (SAIC 2011b).

Additional information regarding the sampling dates and chemical analyses performed is provided on Table 2.

Sediment data near the 1st Avenue S SD source control area are detailed in the 1st Avenue S SD Data Gaps Report (SAIC 2012). Chemical data were compared to the SMS, which include both the Sediment Quality Standards (SQS) and Cleanup Screening Levels (CSLs) (WAC 173-204). Sediments that meet the SQS criteria have a low likelihood of adverse effects on sediment-dwelling biological resources. However, an exceedance of the SQS numerical criteria does not

necessarily indicate adverse effects or toxicity, and the degree of SQS exceedance does not correspond to the level of sediment toxicity. The CSL is greater than or equal to the SQS and represents a higher level of risk to benthic organisms than SQS levels. The SQS and CSL values provide a basis for identifying sediments that may pose a risk to some ecological receptors. The SMS for most organic chemicals are based on total organic carbon (OC)-normalized concentrations. OC normalization is not considered appropriate for TOC concentrations less than or equal to 0.5 percent or greater than or equal to 4.0 percent (Michelsen and Bragdon-Cook 1993, as cited in Windward 2010b). For samples with TOC concentrations outside this range, analytical results for non-polar organics were compared to the lowest apparent effects threshold (LAET) and the second lowest apparent effects threshold (2LAET), as identified in the LDW RI (Windward 2010b). The LAET and 2LAET are functionally equivalent to the SQS and CSL, respectively. The results of this comparison are provided in Table 3.

Chemicals that exceeded the SQS in at least one surface or subsurface sediment sample are considered COCs for the 1st Avenue S SD source control area and are listed below. The greatest exceedances occurred in subsurface sample LDW-SC38a for PCBs, with an exceedance factor of 19. Additional information on SQS/CSL exceedances is provided in the 1st Avenue S SD Data Gaps Report (SAIC 2012).

Chemicals Detected at Concentrations Above the SQS/CSL	Surface Sediment		Subsurface Sediment	
	> SQS	> CSL	> SQS	> CSL
Metals				
Mercury			●	
PAHs				
Acenaphthene			●	
Phthalates				
Bis(2-ethylhexyl)phthalate	●	●		
Butyl benzyl phthalate	●			
Other SVOCs				
1,4-Dichlorobenzene	●			
Benzyl alcohol	●	●		
Dibenzofuran			●	
PCBs				
PCBs (total)	●		●	●

Exceedance factors, which are a measure of the degree to which maximum detected concentrations exceed the SQS/CSL values, are listed in Table 3.
PAH – polycyclic aromatic hydrocarbon
PCB – polychlorinated biphenyl

Arsenic concentrations in sediment samples collected near the source control area did not exceed the SQS. Arsenic was detected in 10 surface sediment samples, with concentrations in six samples exceeding the LDW background level (7 mg/kg). Arsenic was detected in three subsurface sediment samples, with concentrations in all samples exceeding the LDW background level.

Concentrations of individual cPAHs were detected in 11 surface sediment samples and exceeded the LDW background (0.009 mg TEQ/kg) in 10 samples. Concentrations of individual cPAHs were detected in all four subsurface samples and exceeded the LDW background in the two samples collected below 2 feet.

PCBs were detected in 10 surface and 4 subsurface sediment samples collected near the source control area. Total PCB concentrations in all of these samples exceeded the LDW background level (0.002 mg/kg).

Dioxins/furans were analyzed in one sample collected in 2009. The total dioxin/furan toxic equivalency (TEQ) was 9.1 ng TEQ/kg, above the LDW background level of 1.6 ng/kg. Therefore, dioxins are considered COCs in the 1st Avenue S SD source control area.

2.2 Potential Pathways to Sediment

Potential sources of COCs to LDW sediments near RM 2.1 West include storm drain outfalls and discharges from upland properties. There are no facilities located adjacent to the LDW within the 1st Avenue S SD source control area. Transport pathways that could contribute to the recontamination of sediments within the source control area following remedial activities include direct discharges via outfalls, bank erosion, groundwater discharges, surface runoff from upland facilities to storm drain ditches and wetland areas, and air deposition. Relevant pathways are described briefly below, and are discussed in more detail in the 1st Avenue S SD Data Gaps Report (SAIC 2012). Specific contaminant sources are discussed in Section 3.

2.2.1 Direct Discharges from Outfalls

Direct discharges may occur from public or private storm drain systems, CSOs, and emergency overflows (EOFs). Four WSDOT bridge drains discharge to the LDW within the 1st Avenue S SD source control area. In addition, the 1st Avenue S SD central wetland discharges to the LDW under the 1st Avenue S bridge via an open channel (Figure 4). No CSOs or EOFs discharge to the LDW within this source control area.

Upland areas within the LDW are served by a combination of separated storm/sanitary systems and combined sewer systems. Storm drains convey stormwater runoff collected from pervious surfaces (yards, parks) and impervious surfaces (streets, parking lots, driveways, and rooftops) in the drainage basin. In the LDW, there are both public and private SD systems. Most of the waterfront properties are served by privately owned systems that discharge directly to the waterway. The other upland areas are served by a combination of private and publicly owned systems. Typically, private onsite storm drain systems discharge to the public storm drain in the street, which conveys runoff from private property and public rights-of-way to the LDW.

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

collects wastewater from the trunk lines is owned and operated by King County. A King County interceptor extends along the west side of West Marginal Way SW.

Some areas of the LDW are served by combined sewer systems, which carry both stormwater and municipal/industrial wastewater in a single pipe. These systems were generally constructed before about 1970 because it was less expensive to install a single pipe rather than separate storm and sanitary systems. Under normal rainfall conditions, wastewater and stormwater are conveyed through this combined sewer pipe to a wastewater treatment facility. During large storm events, however, the total volume of wastewater and stormwater can sometimes exceed the conveyance and treatment capacity of the combined sewer system. When this occurs, the combined sewer system is designed to overflow through relief points, called CSOs. The CSOs prevent the combined sewer system from backing up and creating flooding problems. The 1st Avenue S SD system is a separated system.

Large spills of hazardous substances and waste materials containing COCs may be transported to a storm drain and therefore have the potential to impact sediment in the LDW. There is a potential for spills of COCs from many of the industrial and commercial businesses operating at upland properties, as well as from trucks and trains transporting hazardous substances and waste materials. Spills that occur at upland properties could enter the onsite or public storm drain system and be discharged to the LDW. Spill prevention is a major element of the business inspections conducted by Seattle Public Utilities (SPU), King County, and Ecology. Many businesses are required to have spill prevention plans. In the event of a spill, Ecology and SPU respond to and investigate spill incidents.

2.2.2 Surface Runoff (Sheet Flow)

In areas lacking collection systems, spills or leaks on properties adjacent to the LDW could flow directly over impervious surfaces or through creeks and ditches to the waterway. Surface runoff from the right-of-way under the 1st Avenue S bridge and its approaches may be transported to the LDW.

2.2.3 Spills to the LDW

Near-water and over-water activities have the potential to impact adjacent sediment from spills of material containing COCs directly to the LDW. There are no industrial properties adjacent to the LDW within the 1st Avenue S SD source control area. However, the 1st Avenue S bridge (SR 509/SR 99) is a busy roadway that carries thousands of vehicles each day, including a large volume of industrial traffic. An accident on the 1st Avenue S bridge or its approaches could result in transport of contaminants directly to the LDW.

Large spills of hazardous substances and waste materials containing COCs may be transported to a storm drain and therefore have the potential to impact sediment in the LDW (Section 2.2.1).

2.2.4 Bank Erosion

The banks of the LDW shoreline are susceptible to erosion by wind and surface water, particularly in areas where banks are steep. Shoreline armoring and the presence of vegetation

reduce the potential for bank erosion. Contaminants in soils along the banks of the LDW, if any, could be released directly to sediments via erosion. In the 1st Avenue S SD source control area, the shoreline consists of an intertidal/mud flat area under the bridge and its approaches.

2.2.5 Groundwater Discharges

Contaminants in soil resulting from spills and releases to upland properties may be transported to groundwater and subsequently released to the LDW. Concentrations of chemicals in soil and groundwater were compared to draft soil-to-sediment or groundwater-to-sediment screening levels (SAIC 2006).

These screening levels were initially developed to assist in the identification of upland properties that may pose a potential risk of recontamination of sediments at Slip 4 (RM 2.8 East). The screening levels incorporate a number of conservative assumptions, including the absence of contaminant dilution and ample time for contaminant concentrations in soil, sediment, and groundwater to achieve equilibrium. In addition, the screening levels do not address issues of contaminant mass flux from upland media to sediments, nor do they address the area or volume of sediment that might be affected by upland contaminants. Because of these assumptions and uncertainties, these screening levels are most appropriately used for one-sided comparisons. If contaminant concentrations in upland soil or groundwater are below these screening levels, then it is unlikely that they will lead to exceedances of the SMS. However, upland concentrations that exceed these screening levels *may or may not* pose a threat to marine sediments; additional property-specific information must be considered in order to make such an assessment. While not currently considered COCs in sediment, these chemicals may warrant further investigation, depending on property-specific conditions, to evaluate the likelihood that they will lead to exceedances of the SMS.

Contaminants in soil as a result of spills and releases to upland properties may be transported to groundwater, which generally flows toward the central wetlands area along 1st Avenue S and 2nd Avenue SW (Figure 3), and could subsequently be released to the LDW.

Soil and groundwater contamination has been documented at several properties with the 1st Avenue S SD source control area. Mercury is the only sediment COC for the 1st Avenue S SD source control area that has been detected in soil and groundwater above the draft soil-to-sediment and groundwater-to-sediment screening levels. Mercury exceedances were observed in soil and groundwater samples collected in the 1990s and four groundwater samples collected in 2005.[5] Mercury also exceeded the SQS in one sediment sample (LDW-SC38a) collected in 2006 near the source control area (Figure 7). In more recent sediment sampling events, mercury concentrations have not exceeded the SQS (SAIC 2011b).

Two seeps (LDW-SP-57 and LDW-SP-58) were identified in this area during a 2004 seep reconnaissance survey, but were not selected for chemical analysis (Windward 2004). RM 2.1 West was identified as an area with a higher general seepage level.

[5] The 1990s soil and groundwater samples were collected at former Eastern Supply Company, former First Avenue Bridge Landfill, and former West Coast Equipment 2 (Figure 11); the 2005 groundwater samples were collected at Intermountain Supply/Recycle America (Figure 12).

2.2.6 Atmospheric Deposition

Atmospheric deposition occurs when air pollutants enter the LDW directly or through stormwater. Air pollutants may be generated from point or non-point sources. Point sources include industrial facilities; air pollutants may be generated from painting, sandblasting, loading/unloading of raw materials, and other activities, or through industrial smokestacks. Non-point sources include dispersed sources such as vehicle emissions, aircraft exhaust, and off-gassing from common materials such as plastics. Air pollutants may be transported over long distances by wind and can be deposited to land and water surfaces by precipitation or particle deposition. Four facilities within the 1st Avenue S SD source control area are registered with PSCAA:

- Flamespray Northwest – Registration No. 17127
- Magnetic & Penetrant Services (MAPSCO) – Registration No. 11575
- Non Ferrous Metals – Registration No. 18428
- Seaport Food Mart/Shell Service Station – Registration No. 10298[6]

Contaminants originating from nearby properties and streets may be transported through the air and deposited at RM 2.1 West or in areas that drain to the LDW. Although chemical deposition from air directly to the LDW probably occurs, this mechanism is not likely to result in sediment concentrations above local background levels. Secondary impacts of air sources on the stormwater pathway to receiving waters and sediment are not well understood; additional information is needed. Recent and ongoing atmospheric deposition studies in the LDW area are summarized in the LDW Source Control Status Report (Ecology 2007 and subsequent updates). Ecology will continue to monitor these efforts.

[6] Registered as Eternity Parks, Inc.

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3.0 Potential Sources of Sediment Recontamination

Potential sources of sediment recontamination are described in detail in the 1st Avenue S SD Data Gaps Report (SAIC 2012). This section summarizes the information on outfalls and the 1st Avenue S SD system (Section 3.1) and properties within the 1st Avenue SD basin (Section 3.2).

3.1 Outfalls and 1st Avenue S SD System

3.1.1 Outfalls

Within the 1st Avenue S SD source control area, four piped outfalls discharge to the LDW. All are owned by WSDOT and are believed to be bridge drains. The public outfalls are shown in Figure 8 and are listed below, from north to south:

Outfall No.	Secondary ID	Location	Pipe Diameter/Material	Outfall Type
2505	340W	2.0 W	12- to 18-inch corrugated metal pipe	WSDOT SD
2512	342W	2.1 W	4-inch ABS plastic	WSDOT SD
2507	344W	2.1 W	8-inch steel	WSDOT SD
2510	347W	2.1 W	8-inch polyvinyl chloride (PVC)	WSDOT SD

Source: LDW RI Report (Windward 2010b, Appendix H)

The West Michigan CSO (outfall 2506) is located just to the north of the source control area boundary and was addressed in the Data Gaps Report for the Terminal 115 source control area (SAIC 2011a).

Outfalls 2508, 2509, and 2121 are located just to the east, within the Trotsky Inlet source control area (Early Action Area 2), on property currently occupied by Douglas Management Company. Outfall 2508 appears to be inactive (SAIC 2008). Outfall 2509 may be a fifth WSDOT bridge drain, but it may also be another identifier for Outfall 2121. Stormwater drainage from the northwest portion of the area occupied by Douglas Management Company is transported to the LDW through a drainage swale that discharges to the LDW via a 12-inch concrete pipe at a location identified as Outfall 2121 (Figure 3).

Outfall No.	Secondary ID	Location	Pipe Diameter/Material	Outfall Type
2508	343W	2.1 W	18-inch concrete	Unknown
2509	345W	2.1 W	12-inch concrete	WSDOT SD
2121	346W	2.1 W	12-inch concrete	Unknown

Source: LDW RI Report (Windward 2010b, Appendix H)

3.1.2 1st Avenue S Storm Drain System

The 1st Avenue S SD collects drainage from an area of approximately 609 acres (Figure 8). Stormwater in the 1st Avenue S SD basin is transported via underground pipes and surface ditches to a series of wetlands, which discharge to the LDW under the 1st Avenue S bridge. The surface water discharge from these wetlands does not correspond to a numbered outfall.

Storm Drain Solids Sampling

SPU collected sediment trap, inline grab, and catch basin samples of storm drain solids in the 1st Avenue S SD basin between September 2008 and April 2011 (Figure 8). Table 4 lists analytical results for chemicals detected at concentrations above screening levels in storm drain samples.

The SCWG compares analytical results from these samples to the SQS/CSL and LAET/2LAET. Petroleum hydrocarbon results are compared to the Model Toxics Control Act (MTCA) Method A cleanup standards. Although these regulatory standards are not applicable to storm drain solids, the SCWG uses these values as a benchmark to describe storm drain solids quality (SPU 2010). In this document, values described above (SQS/CSL, LAET/2LAET, and MTCA Method A) that are used for comparison to storm drain 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.

Screening results are summarized below:

Chemical	Sediment Trap	Inline Grab	Right-of-Way Catch Basin	Onsite Catch Basin	Sediment COC
	>Storm Drain Screening Level	>Storm Drain Screening Level	>Storm Drain Screening Level	>Storm Drain Screening Level	
Metals					
Mercury		●			✓
Zinc	●	●		●	
PAHs					
Acenaphthene		●			✓
Benzo(a)anthracene			●		
Benzo(a)pyrene	●		●		
Benzo(g,h,i)perylene	●				
Benzofluoranthenes			●		
Chrysene	●		●		
Fluoranthene	●	●	●		
Indeno(1,2,3-cd)pyrene	●				
Phenanthrene	●	●	●		
Pyrene	●		●		

Chemical	Sediment Trap	Inline Grab	Right-of-Way Catch Basin	Onsite Catch Basin	Sediment COC
	>Storm Drain Screening Level	>Storm Drain Screening Level	>Storm Drain Screening Level	>Storm Drain Screening Level	
Total HPAH	●	●	●		
Phthalates					
BBP	●	●		●	✓
BEHP	●	●	●	●	✓
Dimethylphthalate		●			
Other SVOCs					
4-Methylphenol	●		●		
Benzoic acid	●			●	
PCBs					
Total PCBs	●	●		●	✓
Dioxins/Furans					
Dioxin/Furan TEQ		●			✓
Petroleum Hydrocarbons					
TPH-Diesel	●	●			No
TPH-Oil	●	●		●	No

●	Detected concentrations exceeded the SQS/LAET/MTCA Method A
	Detected concentrations exceeded the CSL/2LAET
✓	COC exceeds SQS/LDW RAL in LDW sediment adjacent to the source control area

BBP – butyl benzyl phthalate
BEHP – bis(2-ethylhexyl)phthalate
HPAH – high molecular weight polycyclic aromatic hydrocarbon
TPH – total petroleum hydrocarbons
All chemicals listed in the table, with the exception of TPH-Diesel and TPH-Oil, are sediment COCs for the LDW Superfund Site.
Individual chemical concentrations are provided in Table 4.

In addition, the LDW background concentration for cPAHs (0.009 mg TEQ/kg) was exceeded in two storm drain solids samples, 1st-ST7 (collected 11/11/2010) and RCB152 (9/17/2008). Total PCBs exceeded the LDW background concentration in all storm drain solids samples. The dioxin/furan TEQ in sample 1st-ST1 exceeded the LDW background.

Potential for Future Releases to LDW Sediments

Given the large traffic volume that crosses this bridge daily, it is likely that PAHs, phthalates, metals, and petroleum hydrocarbons are discharged to the LDW through the WSDOT bridge drains. No information was available about the volume of stormwater that is discharged through these structures, and no data on contaminant concentrations in these discharges were identified. PAHs, and phthalates were identified as sediment COCs in Section 2. Therefore, the WSDOT bridge drains are believed to represent a potential source of LDW sediment recontamination.

Sediment trap, inline, and catch basin storm drain solids sampling has indicated that concentrations of sediment COCs above storm drain screening levels are present in the 1st Avenue S SD basin. Specifically, mercury, acenaphthene, BEHP, butyl benzyl phthalate (BBP), PCBs, and dioxins/furans exceeded screening levels in both storm drain solids and surface sediment samples in this source control area. These COCs in storm drain discharges from the 1st Avenue S SD may represent a potential source of LDW sediment recontamination.

Source Control Actions

Ecology will continue to perform facility inspections to determine if undocumented industrial operations are occurring within the 1st Avenue S SD basin that may be an ongoing source of sediment recontamination. SPU plans to inspect high-risk businesses throughout the LDW storm drain basins every two years. High-risk businesses perform operations that present a high potential for sediment recontamination. During the summer of 2013, SPU plans to clean the storm drain system downstream of Jones Stevedoring (Figure 10) to remove accumulated sediment and improve drainage (Schmoyer 2013).

Information needed to assess the potential for sediment recontamination associated with the public storm drain outfalls was summarized in the 1st Avenue S SD Data Gaps Report (SAIC 2012. The following source control actions will be conducted to fill the identified data gaps and reduce the potential for recontamination of sediments near the source control area:

- Stormwater from upland facilities may enter the 1st Avenue S SD system via surface ditches or underground piping. Ecology will 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 S SD.
- Ecology will request additional information from WSDOT regarding the quantity and quality of stormwater and solids discharged to the LDW through the bridge drains.

3.1.3 1st Avenue S Engineered Wetlands

Stormwater and runoff from the 1st Avenue S SD source control area flows to an engineered wetland system located on either side of the SR 99/SR 509 approach (Figures 3 and 5). The wetlands discharge to an intertidal slough under the 1st Avenue S bridge (Figure 4). The constructed wetland was intended to enhance the functions and values of the wetland system and assist in enhancing the water quality of the LDW and estuary system (WSDOT 1994a). The wetland is owned and maintained by WSDOT.

The wetland was designed to intercept tidal water from Wetland No. 1, and to receive freshwater from biofiltration swales located at the north and south ends of the site. According to the WSDOT wetland mitigation plan, all stormwater was to be treated in drainage swales before entering Wetland No. 1 (WSDOT 1994a).

In February 1994, prior to wetland mitigation performed during the reconstruction of the 1st Avenue S bridge (Section 2.0), a spill of approximately 5,500 gallons of blended fuel, oil, and paint products at 8105 1st Avenue S (Northwest EnviroService, currently Waste Management 1st

Avenue S) occurred adjacent to the wetland area. Although most of the spilled material was recovered, some of the material entered the wetlands, causing concern over the impacts of the spill on project construction and mitigation. WSDOT determined that the proposed mitigation areas were not significantly adversely affected by the spill (WSDOT 1994b). Areas designated for filling were impacted by the spill; WSDOT agreed to characterize and remediate any contamination within the footprint of the fill prior to fill placement (WSDOT 1994b).

A total of 19 sediment samples were collected at randomly selected locations in Wetlands No. 1, No. 3, No. 4, and No. 5 at a depth of 0 to 6 inches below ground surface. Metals, PAHs, phthalates, other SVOCs (pentachlorophenol), chlorinated volatile organic compounds (VOCs), benzene, toluene, ethylbenzene, and xylenes (BTEX) compounds, and petroleum hydrocarbons were detected at concentrations exceeding MTCA Method B soil cleanup levels. The following exceedances were noted: arsenic, cadmium, lead, PAHs, and TPH in Wetland No. 1; arsenic, cadmium, and TPH in Wetland No. 3; arsenic, cadmium, lead, and TPH in Wetland No. 5; and cadmium in Wetland No. 4, which was designated as the background sampling location.

Samples collected in Wetland No. 1 exceeded the SQS and CSL for lead, BEHP, and total high molecular weight polycyclic aromatic hydrocarbons (HPAH), and exceeded the SQS for mercury, BBP, fluoranthene, and phenanthrene. Two surface water samples collected from Wetland No. 1 contained zinc at 390 µg/L, above the state surface water criterion. Samples collected in Wetland No. 5 exceeded the SQS and CSL for lead and BEHP, and exceeded the SQS for total HPAH (CH2M Hill 1994).

Chemical	Wetland No. 1		Wetland No. 5		Sediment COC?
	>SQS	>CSL	>SQS	>CSL	
Metals					
Lead	●	●	●	●	
Mercury	●				✓
PAHs					
Fluoranthene	●				
Phenanthrene	●				
Total HPAH	●	●	●		
Phthalates					
BBP	●				✓
BEHP	●	●	●	●	✓

✓ COC exceeds SQS/LDW RAL in LDW sediment adjacent to the source control area

All chemicals listed in the table are sediment COCs for the LDW Superfund Site.

On December 12, 2012, approximately 80 gallons of diesel fuel was spilled on SR 99, just south of the 1st Avenue S bridge. The fuel spill entered the storm drain system (Ecology 2012c).

Potential for Future Releases to LDW Sediments

LDW sediment COCs were detected in wetland sediment samples collected in 1994. More recent environmental data from the wetland, if any, were not available for review. The wetland filters contaminants from stormwater and reduces the transport potential of contaminants, such as metals. Storm drain solids sampling data collected at locations upstream of the wetland in 2008 and 2011 (Section 3.1.2) indicate the presence of contaminants above the storm drain screening levels, including mercury, acenaphthene, BBP, BEHP, and PCBs. In addition, dioxins/furans were present above the LDW background concentration. These contaminants may be transported to the 1st Avenue S wetlands and the LDW. Information regarding monitoring and maintenance of the engineered wetlands is needed from WSDOT to assess the current effectiveness of the wetlands in terms of preventing the release of contaminants to the LDW.

Source Control Actions

Ecology will 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.

Ecology will 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. The purpose of the study will be to assess the potential for discharge of sediment COCs from the wetlands to LDW sediment and to verify that COCs are not being released from the wetlands to the LDW.

If it is determined that sediment COCs are being released, Ecology will determine what measures may be necessary to mitigate contaminant release to the LDW.

Ecology will re-evaluate the priority of source control actions for the upland properties (identified in Section 3.2), if it is determined that sediment COCs are being released to the LDW. If it is determined that sediment COCs are not currently being released to the LDW, the priority levels will remain low.

3.2 Properties in the 1st Avenue S SD Basin

Seventy-three current and historical industrial and commercial facilities within the 1st Avenue S SD basin have been assigned Ecology Facility/Site Identification (FSID) numbers (Table 1). Many of these represent historical operations at properties with current operations for which FSID numbers have also been assigned. As a result, a given property may have as many as eight FSID numbers. To facilitate the discussion in the 1st Avenue S SD Data Gaps Report and SCAP, the facilities have been grouped into 35 "properties." Figure 9 shows property locations by parcel number. Figures 10 through 14 show the property locations on aerial photographs. Table 5 lists the facilities associated with each property, including addresses, applicable parcel numbers, and the current taxpayer for each parcel as listed in King County's property tax records.[7]

[7] http://www.kingcounty.gov/operations/GIS/PropResearch/ParcelViewer.aspx

Ecology interactions have been identified as follows:

- 35 current facilities with FSID numbers.
- 38 historical facilities with FSID numbers.
- 16 of these facilities on 14 properties are listed on the Confirmed and Suspected Contaminated Sites List (CSCSL) (Table 6).
- 10 of these facilities have active EPA ID numbers (Table 7).
- 11 of the facilities hold active National Pollutant Discharge Elimination System (NPDES) permits (Table 8).
- 3 of these facilities have King County Industrial Waste (KCIW) discharge authorizations or permits (Table 9).
- 13 of these facilities are listed on Ecology's underground storage tank **(**UST)/leaking underground storage tank (LUST) lists (Table 10).

In addition to the 73 facilities with FSID numbers, Table 5 includes several facilities for which no FSID number has been assigned. These include Second Use Building Materials (two locations), Intermountain Supply, Global Diving & Salvage, and several facilities within the Kenyon Business Park and tenants at Jones Stevedoring. Relevant information about these facilities was summarized in the 1st Avenue S SD Data Gaps Report (SAIC 2012).

Between 2008 and 2012, Ecology or SPU has performed source control inspections at 47 facilities within the 1st Avenue S source control area. This total includes several facilities that have not been assigned an FSID. The results of these source control inspections are summarized in Table 11.

Precise locations of the following sites could not be determined based on the limited information available:

Facility/Site Name	Facility/ Site ID	Location Description	Ecology Program ID	Ecology Interaction
1st Kenyon Drum	46918719	1st Avenue S and SW Kenyon Street	WAD988476073	Hazardous waste generator (Aug 1990 to Dec 1991)
Kenyon Drum	29892767	Kenyon Street S at Transfer Station	WAD980985659	Hazardous waste generator (Jul 1986 to Dec 1996)
Metro Holden Marginal Way	9677878	West Marginal Way SW and S Holden Street	WAD980985956	Hazardous waste generator (Aug 1986 to Jun 1987)
Transfer Sta Barrel	39937726	8100 Occidental Ave S	WAD988524237	Hazardous waste generator (Sep 1993 to Nov 1993)

Facility/Site Name	Facility/ Site ID	Location Description	Ecology Program ID	Ecology Interaction
Greg Peterson Duwamish River	7130166	None provided	NA	Spills: Enforcement Final (Feb 2007)
Exxon Co USA Div of Exxon Cor	5542431	7150 2nd Avenue SW	WAD980978621	Hazardous waste generator (Aug 1985 to Jan 1987)[8]

No additional information about these facilities/sites was available in the files reviewed during preparation of the 1st Avenue S SD Data Gaps Report (SAIC 2012). All appear to be historical spills or unidentified drums for which cleanup/disposal has been completed. These facilities/sites are not discussed further in this SCAP, and are not included on figures presented in this report.

Additionally, an unknown number of undocumented industrial operations may take place within the 1st Avenue S SD basin. Undocumented industrial activities may be an ongoing source of contaminants to sediments near the 1st Avenue S SD source control area.

3.2.1 Potential for Sediment Recontamination

Stormwater

Stormwater runoff from the facilities/properties in the 1st Avenue S SD basin is transported to the 1st Avenue S wetlands or 1st Avenue S central wetlands. The constructed wetland was intended to enhance the functions and values of the wetland system and assist in enhancing the water quality of the LDW and estuary system (WSDOT 1994a). There is a potential that storm drain discharges could transport contaminants to the central wetland area and ultimately contribute to LDW sediment recontamination.

Limited data are available regarding chemical concentrations in sediment and surface water in the 1st Avenue S central wetlands. However, LDW sediment COCs were detected in wetland sediment samples collected in 1994; concentrations of lead, BEHP, and total HPAH exceeded the SQS and CSL, and concentrations of mercury, BBP, fluoranthene, and phenanthrene exceeded the SQS. Storm drain solids sampling data collected at locations upstream of the wetland in 2008 and 2011 (Section 3.1.2) indicate the presence of contaminants above the storm drain screening levels, including mercury, acenaphthene, BBP, BEHP, PCBs, and dioxins/furans, which have also been identified as LDW sediment COCs. These contaminants may be transported to the 1st Avenue S wetlands and the LDW. If the treatment capacity of the 1st Avenue S wetlands has been reached, then there is potential for these sediment COCs to be conveyed to the LDW.

Soil and Groundwater

Soil and groundwater contamination has been documented at several properties within the 1st Avenue S SD basin. Releases of contaminants generally occurred more than 20 years ago. Data

[8] A 1985 aerial photo does not show a gas station in this area (SAIC 2011a, Figure B-7).

gaps related to these historical releases were identified in the 1st Avenue S SD Data Gaps Report (SAIC 2012). Contaminants in soil as a result of spills and releases to upland properties may be transported to groundwater, which generally flows toward the central wetlands area along 1st Avenue S and 2nd Avenue SW and could subsequently be released to the LDW. The potential for LDW sediment recontamination via this pathway is believed to be low.

Sediment COCs were detected in soil and groundwater at concentrations above MTCA cleanup levels and/or the draft soil-to-sediment and groundwater-to-sediment screening levels. Mercury is the only sediment COC for the 1st Avenue S SD source control area that has been detected in soil and groundwater above the draft soil-to-sediment and groundwater-to-sediment screening levels. Mercury exceedances were observed in soil and groundwater samples collected in the 1990s and four groundwater samples collected in 2005.[9] Mercury also exceeded the SQS in one sediment sample (LDW-SC38a) collected in 2006 near the source control area (Figure 7). In more recent sediment sampling events, mercury concentrations have not exceeded the SQS (SAIC 2011b). Source control efforts should therefore be focused on current operations within the 1st Avenue S SD basin in order to minimize contamination to the wetland drainage area. Continued inspections of the businesses operating at the properties are recommended, as deemed appropriate by Ecology and SPU.

Ecology may elect to further investigate soil and groundwater contamination at these properties under MTCA or other regulatory channels, but pursuing additional information with regard to historical contamination is not recommended as a source control action to protect LDW sediments. The soil-to-sediment and groundwater-to-sediment pathways associated with these properties are not discussed further in this SCAP. Additional information regarding environmental investigations and cleanups and chemical concentrations in soil and groundwater is provided in the 1st Avenue S SD Data Gaps Report (SAIC 2012).

3.2.2 Facility-Specific Source Control Actions

Source control actions identified for the following upland facilities in the 1st Avenue S SD basin fall into four categories:

- Follow-up inspections by Ecology,
- Requests by Ecology for information regarding the facility storm drain system,
- Ecology review of recent inspection report(s), and
- Ecology to evaluate the facility to determine if it requires coverage under the Industrial Stormwater General Permit (ISGP) or is eligible for a Certificate of No Exposure (CNE).

[9] The 1990s soil and groundwater samples were collected at former Eastern Supply Company, former First Avenue Bridge Landfill, and former West Coast Equipment 2 (Figure 11); the 2005 groundwater samples were collected at Intermountain Supply/Recycle America (Figure 12).

Source Control Action: Follow-up Inspection

A follow-up inspection is needed to verify compliance with Ecology's recommendations, applicable regulations, and best management practices (BMPs) to prevent the release of contaminants to the LDW. Ecology will conduct follow-up inspections at the following facility.

Facility or Property Name	Address	Facility/ Site ID	Previous Inspection Information
Burkheimer Family Property Samson Tug & Barge	7553 Detroit Avenue SW 7739 1st Avenue S 7600 2nd Avenue SW	24041 15539 21272	Samson Tug & Barge is not in compliance with the ISGP.
Lion Trucking	8425 1st Avenue S 98108	16981594 17445	SPU, Initial inspection, 10/11/12. 2nd and final letter sent 1/9/13 requiring spill kits, cleaning onsite detention vault and catch basins, installing traps on catch basins.
South Recycle & Disposal Station	8100 2nd Avenue S 98108 8105 5th Avenue S 98108	2175 3665320 89337496 91256919	Ecology Stormwater Compliance Inspection, 11/8/2012. Review and improve source control practices and adequacy of the catch basin treatment at the lower southeast corner of the transfer station. Accurately map all outside areas that are tributary to the sanitary sewer (Ecology 2012b).
Waste Management Eastmont Transfer Station	7201 West Marginal Way SW 98108	2425; 91926231	Ecology, NPDES permit compliance, 9/15/10. Corrective actions: update facility map, improve source control for waste oil (Ecology 2011).

All Facility/Site ID numbers associated with a facility/property are listed in the table.

Source Control Action: Review Inspection Report

Recent inspections have been performed at the following facilities. The reports from these inspections were not yet available for review at the time this draft SCAP was prepared. Inspection reports need to be reviewed to verify compliance with Ecology's or SPU's recommendations, applicable regulations, and BMPs to prevent the release of contaminants to the LDW. Information from the inspection reports will be incorporated into the final SCAP or a Source Control Status Report, as appropriate:

Facility or Property Name	Address	Facility/ Site ID	Inspection Information
Flamespray Northwest	250 S Chicago Street, Seattle 98108	1736255	Ecology Water Quality Inspection, 11/7/12
North Star Ice Equipment	8151 Occidental Avenue S 98108	25963342	Ecology, Water Quality Inspection, 9/30/10

All Facility/Site ID numbers associated with a facility/property are listed in the table.

Source Control Action: Request Information on Facility Storm Drain System

Ecology will request additional information regarding the locations, materials, and condition of storm drain system pipes and structures at this property from the property owner.

Facility or Property Name	Address	Facility/ Site ID	Rationale
MAPSCO	8135 1st Avenue S 98106	46338473	A map showing the current facility layout, including catch basins, storm drain, and sanitary sewer connections, was not provided in MAPSCO's 2011 Stormwater Pollution Prevention Plan (MAPSCO 2011). The map should identify which catch basins on the property are connected to the storm drain system.
South Transfer Station/Former S Kenyon Street Bus Yard	110 S Kenyon Street 98108 130 S Kenyon Street 98108 150 S Kenyon Street 98108 200 S Kenyon Street98108	3453 3329 29892767 3388037 47374256 63293426 90247719 96838255	SPU will complete construction of the South Transfer Station in summer 2012. After completion of construction, the stormwater drainage pathways at the property are unknown to Ecology. Ecology will request the as-builts for this site from SPU.
South Recycle & Disposal Station	8100 2nd Avenue S 98108 8105 5th Avenue S 98108	2175 3665320 89337496 91256919	Information on proposed handling of stormwater drainage during and after the 2013/2014 construction is needed to assess the potential for sediment recontamination associated with the stormwater pathway. Appropriate TESC plans will be implemented during construction. SPU will provide drainage plans when site design is complete.

All Facility/Site ID numbers associated with a facility/property are listed in the table.

Source Control Action: Industrial Stormwater General Permits

The upland properties listed below have been directed by Ecology to obtain coverage under the ISGP, obtain a CNE certificate, or Ecology has recommended that an evaluation be performed to determine if coverage under the ISGP is needed. Discharges to the storm drain from these facilities may contain sediment COCs.

Facility or Property Name	Address	Facility/ Site ID	Rationale
Non-Ferrous Metals	230 S Chicago Street 98108	66671686	Facility was previously issued a CNE certificate; however, a new evaluation is needed to determine if coverage under the ISGP is required or if the facility is eligible for a CNE certificate (Wright 2012).
North Star Ice Equipment	8151 Occidental Avenue S 98108	25963342	Ecology has indicated that the facility may need coverage under the ISGP or a CNE certificate may be required (Wright 2012).
Seattle Housing Authority	7500 Detroit Avenue SW 98106	2109	During a 2009 inspection, Ecology indicated that the facility needed to apply for coverage under the ISGP. The facility needs to be re-evaluated to determine if activities require coverage under an ISGP (Wright 2012).
Urban Hardwoods Sawmill	8427 1st Avenue S 98106	14193	During a 2009 inspection, Ecology indicated that the facility needed to apply for coverage under the ISGP. The facility needs to be re-evaluated to determine if activities require coverage under an ISGP (Wright 2012).
Vista Pro Automotive	7951 2nd Avenue S 98108	NA	Following a December 2010 inspection, SPU referred Vista Pro Automotive to Ecology to determine if coverage was needed under the ISGP.

All Facility/Site ID numbers associated with a facility/property are listed in the table.

3.2.3 Facilities/Properties with No Source Control Actions Identified

Source control actions were not identified for several facilities within the 1st Avenue S SD basin. These facilities have achieved compliance with applicable regulations and/or source control BMPs within the last four years. For three properties, no significant sources of sediment recontamination were identified in the Data Gaps Report (SAIC 2012).

The facilities listed below have been inspected by Ecology or SPU within the past four years (2008 or later). Ecology and SPU inspectors identified corrective actions for the facilities and verified that the facilities complied with the corrective actions during a follow-up inspection. For some of these facilities, no corrective actions related to source control were identified during the inspection.

Facility or Property Name	Current Operator	Address	Facility/ Site ID
Former Custom Roofing	Second Use Building Materials	8001 5th Avenue S, Seattle 98108	61231536
Demolition Man	Same	8129 Occidental Avenue S 98108	14413

Facility or Property Name	Current Operator	Address	Facility/ Site ID
Former Eastern Supply Company	W&O Supply	7745 1st Avenue S 98106 7746 Detroit Avenue SW 98106	2258
Former Formula Corp	TH Seafood	7901 2nd Avenue S 98108	44534539
International Construction Equipment	Same	8101 Occidental Avenue S 98108	99142846
MacDonald Miller Company	Same	7707 Detroit Avenue SW 98106 7717 Detroit Avenue SW 98106	36776588 21626
Standard Steel Fabricating	Same	8155 1st Avenue S 98106	42718345
Waste Management 1st Avenue S	Same	8101 1st Avenue S 98106 8105 1st Avenue S 98106 8111 1st Avenue S 98106	2536; 2537; 4709; 15161; 74491434; 79459683
Former West Coast Equipment	Contractors Equipment Company Walsh Construction	7777 Detroit Avenue SW 98106	2262
WG Clark Construction	Same	7958 Occidental Ave S 98108	64488657

All Facility/Site ID numbers associated with a facility/property are listed in the table.

The following properties were reviewed in the 1st Avenue S SD Data Gaps Report (SAIC 2012). No data gaps were identified for these properties due to the extremely low potential for sediment recontamination associated with the current and historical activities at these properties.

Facility or Property Name	Current Operator	Address	Facility/ Site ID
Former Myers Way Sand Pit	City of Seattle Department of Fleets and Facilities, which operates the Joint Training Facility	9400-9401 Myers Way S	12326
SR 509 & Greenbelt	Access road	Greenbelt near SR 509 and S Barton Street	4185778
West Seattle Reservoir	Water supply reservoir	9000 8th Avenue SW	26116543

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4.0 Monitoring

Monitoring efforts by SPU, Ecology, and King County will continue to assist in identifying and tracing ongoing sources of COCs present in LDW sediments or in upland media. This information will be used to focus source control efforts on specific problem areas within the 1st Avenue S SD source control area and to track the progress of the source control program. The following types of samples will be collected:

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

If monitoring data indicate the presence of additional sources that could result in recontamination of sediments associated with the 1st Avenue S SD source control area, then Ecology will identify source control activities as appropriate.

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

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5.0 Tracking and Reporting of Source Control Activities

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

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Tables

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Table 1
Facilities within the 1st Avenue S SD Source Control Area that are Listed in the Ecology Facility/Site Database

FSID	Facility Name	Alternate Names	Address	Source Control Inspection	Active EPA ID No.	Ecology CSCSL	Active NPDES Permit	KCIW Discharge Authorization or Permit	Ecology UST LIST	LUST	Ecology NFA Determi-nation
46918719	1st Kenyon Drum	None	1st Ave S & SW Kenyon St								
97913617	ABC Metal Finishing	None	501 S Elmgrove St								
17746	Arrowhead Senior Housing Assoc	None	9200 2nd Ave SW								
3329	Bus Yard Site Preparation CSWGP	Bus Yard Site Preparation	130 S Kenyon St								
15161	Can Do Services	Waste Management of Seattle	8101 1st Ave S	●							
2109	Chemical Processors Inc Detroit	Impact Property Services; Seattle Housing Authority	7500 Detroit Ave SW	●		●					●
61231536	Custom Roofing Inc	None	8001 5th Ave S						●		
14413	Demolition Man Inc	None	8129 Occidental Avenue S	●							
19521	Demolition Man Inc 8151	None	8151 Occidental Avenue S	●							
4504516	Dr Concrete Recycle	Healthcare Solutions Inc; Kenyon Street Property	149 SW Kenyon St	●		●					
2258	Eastern Supply Co	None	7745 1st Ave S			●					
91926231	Eastmont Transfer Station	Eastmont Development Inc	7155 W Marginal Way SW								
5542431	Exxon Co USA Div of Exxon Cor		7150 2nd Ave SW								
2201	First Ave Bridge Landfill	DOT Landfill	7700 Block of 2nd Ave SW			●					
90247719	First Student Seattle	First Student Inc Steilacoom; Ryder Student Transportation SEA	130 S Kenyon St		●						
1736255	Flamespray Northwest Inc	None	250 S Chicago St	●	●						
10791	Flying Fish Express	None	7937 2nd Ave S	●				●			
44534539	Formula Corp	Formula Corp 2nd Ave; T H Seafood	7901 2nd Ave S	●							
7130166	Greg Peterson Duwamish River	None	None Listed								
61437393	Hussmann Corp	Hussmann Corp First Ave	7272 1st Ave S								
99142846	International Construction Equipment	None	8101 Occidental Ave S								
97992431	International Lubricants Inc	None	7930 Occidental S		●		●				
94931167	Jones Washington Stevedoring Co UST2313	Icicle Seafoods	7245 W Marginal Way SW	●					●	●	
29892767	Kenyon Drum	None	Kenyon St S at Transfer Sta								
2320	Laidlaw	First Student Inc; First Student Inc 1st Ave S; Gazelle International; Laidlaw First Ave SEA; Laidlaw Transit; Laidlaw Transit Inc 1st Ave	7739 1st Ave S	●		●	●		●	●	
16981594	Lion Trucking Inc	1st Ave S Waste Oil; Iverson Property	8425 1st Ave S	●					●		

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21626	MacDonald Miller Co Inc	None	7717 Detroit Ave SW	●							
36776588	MacDonald Miller Service Inc	MacDonald Miller Company	7707 Detroit Ave SW						●		
46338473	Magnetic & Penetrant Services Co Inc	MAPSCO	8135 1st Ave S		●		●				
9677878	Metro Holden Marginal Way	None	W Marginal Way SW & S Holden St								
12326	Myers Way Sand Pit	City of Seattle Joint Training Facility	9400 Myers Way								
66671686	Non-Ferrous Metals Inc	Nonferrous Metals; Non Ferrous Metals	230 S Chicago St								
25963342	North Star Ice Equipment Inc	Ocean Terminals Inc Seattle; North Star Ice Equipment	8151 Occidental Ave S		●		●		●		
2536	Northwest Enviroservice 2	None	8105 1st Ave S			●					
74491434	NW Enviroservice 1st Ave Site	None	8105 1st Ave S								
2537	Northwest Enviroservice 2W	None	1st Ave SW & Marginal			●					
17445	Old Dominion Freight Line Inc	None	8425 1st Ave S	●							
72863999	Omnisource Inc	None	123 S Kenyon St								
85495122	Omnisource Inc 121	None	121 1/2 S Kenyon St								
82954349	Omnisource Inc 129	None	129 S Kenyon St								
79459683	Patent Construction Systems	None	8111 1st Ave S								
96897184	Proliance International Inc Seattle	VistaPro Automotive LLC; Daniel Radiator Corp; Go Dan Industries Seattle; Transpro	7951 2nd Ave S								
55695661	Recycle America	None	7901 1st Ave S Clean Up								
63293426	Ryder Student Transportation Services	First Student Inc.; Ryder Student Transportation Services I; Seattle Public Utilities Bus Yard; Starline Luxury Coaches	130 S Kenyon St			●			●	●	
15539	Samson Tug Maintenance Shop	None	7739 1st Avenue S	●							
21272	Samson Tug & Barge 2nd Ave SW	None	7600 2nd Avenue SW	●							
24041	Samson Tug & Barge Detroit Ave SW	None	7553 Detroit Ave SW				●				
4982711	Seaport Petroleum Detroit Ave	Collins Oil Co DBA Seaport Petroleum Co Detroit; Seaport Petroleum; Seaport Petroleum Co Detroit	7800 Detroit Ave SW	●	●		●		●		
84167493	Seattle City Eng Dept 2nd Ave SW	None	2nd Ave SW & W Marginal Way SW								

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77377391	Seattle Public Utilities W Seattle Res	SPU W Seattle Hypochlorination	8820 3rd Ave SW								
2175	Seattle S Transfer Sta	Oak Classics Co	8100 2nd Ave S			●					
3388037	South Kenyon Street	None	110, 130, 150, & 200 South Kenyon Street			●					
2180	South Park Landfill	Southpark Landfill; South Park Landfill Redevelopment	8200 2nd Ave S			●	●				
91256919	South Recycle & Disposal Station	Seattle City South Recycling & Dispos; Seattle Solid Waste Div Sts; South Recycle and Disposal Center; South Seattle HHW Facility	8100 2nd Ave S		●		●	●	●		
3665320	South Recycle & Disposal Station 5th Ave	None	8105 5th Ave S								
3453	South Transfer Station	South Transfer Station ISW; South Transfer Station Seattle	130 S Kenyon St				●				
4185778	SR 509 & Greenbelt	Greenbelt Myers Wy SR 509; Joint Training Facility; SR 509 & Greenbelt	SR 509 & Barton			●					
42718345	Standard Steel Fabricating Co Inc	None	8155 1st Ave S	●			●		●		
96838255	Tacoma Seattle Trailer Repair	None	150 S Kenyon St						●	●	
86979859	Tnemec Co Inc	None	7929 2nd Ave S								
39937726	Transfer Sta Barrel	None	8100 Occidental Ave S 033								
47666565	TW Express	None	7901 1st Avenue S								
14193	Urban Hardwoods Sawmill	Urban Hardwoods Inc	8427 1st Ave S	●							
9437672	Volvo Road Machinery Inc	None	7739 1st Ave S	●							
89337496	WA AGR King 2	None	8100B 2nd Ave S		●						
4709	Waste Management CNG Upgrades	None	149 SW Kenyon & 8111 1st Ave S								
2425	Waste Management of Seattle	Bayside Disposal Co; Eastmont Transfer Station; Sunset Disposal; Waste Management of Seattle Marg Wy	7201 West Marginal Way SW		●	●	●	●	●	●	

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FSID	Facility Name	Alternate Names	Address	Source Control Inspection	Active EPA ID No.	Ecology CSCSL	Active NPDES Permit	KCIW Discharge Authorization or Permit	Ecology UST LIST	LUST	Ecology NFA Determi-nation
95878752	Waste Management of Seattle 1st Ave	AVL Freight Svc; Intermountain Supply Inc; Recycle America; Waste Management First Ave; Waste Management of Seattle UST 10291; Waste Management SEA Recycle AM	7901 1st Ave S	●		●	●		●	●	
47374256	We Painters Inc	None	110 S Kenyon		●						
12494	West Coast Equipment 2	None	7746 Detroit Avenue SW			●					
2262	West Coast Equipment Inc	Contractors Equipment Co	7777 Detroit Ave SW	●		●					
26116543	West Seattle Reservoir	None	None Listed								
64488657	WG Clark Construction Occidental Ave	None	7958 Occidental Ave S	●							

EPA - Environmental Protection Agency
CSCSL - Confirmed or Suspected Contaminated Sites List
NPDES - National Pollutant Discharge Elimination System
KCIW - King County Industrial Waste
UST - Underground Storage Tank
LUST -Leaking Underground Storage Tank
NFA - No Further Action

Table 2
LDW Sediment Samples Collected Near RM 2.1 West

Event Name	Location Name	Date Collected	Collection Depth (feet)	Metals	SVOCs	PCBs	Dioxins/ Furans	Organo-tins	Pesticides	Source
EPA Site Investigation	DR135	8/13/1998	Surface	●	●	●				Weston 1999
LDW RI Phase 2 Round 1	B6a	8/15/2004	Surface	●	●	●		●	●	Windward 2005a
	C6	8/25/2004		●	●	●		●	●	
LDW RI Phase 2 Round 2	LDW-SSB6a	3/15/2005	Surface	●	●	●				Windward 2005b
LDW RI Phase 2 Round 3	LDW-SS331	10/2/2006	Surface	●	●	●				Windward 2007b
	LDW-SS332			●	●	●				
LDW Subsurface Sediment 2006	LDW-SC38a	2/20/2006	0 to 1	●	●	●				Windward 2007a
			1 to 2	●	●	●				
			2 to 3	●	●	●				
	LDW -SC38b	2/20/2006	3 to 3.3	●	●	●				
LDW Dioxin Sampling	LDW-SS523	12/15/2009	Surface				●			Windward 2010a
LDW Outfall Sampling	SS2505-A	3/7/2011	Surface	●	●	●				SAIC 2011b
	SS2506-A	3/7/2011		●	●	●				
	SS2506-D	3/7/2011								
	SS2512-A	3/7/2011		●	●	●				
	SS2512-U	3/7/2011		●	●	●				

SVOCs - semivolatile organic compound
PCBs - polychlorinated biphenyls

Table 3
Chemicals Detected Above Screening Levels in Sediment Samples
Near RM 2.1 West

Event Name	Sample Location	Date Collected	Sample Depth (feet)	Chemical	Concentration (mg/kg DW)	TOC %	Conc'n (mg/kg OC)	SQS*	CSL*	Units	SQS Exceedance Factor	CSL Exceedance Factor
Metals												
LDW Subsurface Sediment 2006	LDW-SC38a	2/20/2006	2 - 3	Mercury	0.45	1.5	30	0.41	0.59	mg/kg DW	1.1	<1
PAHs												
LDW Subsurface Sediment 2006	LDW-SC38a	2/20/2006	2 - 3	Acenaphthene	0.81 J	1.5	54	16	57	mg/kg OC	3.4	<1
LDW Subsurface Sediment 2006	LDW-SC38b	2/20/2006	3 - 3	Acenaphthene	0.21	1.3	16	16	57	mg/kg OC	1.0	<1
Phthalates												
LDW Outfall Sampling	LDW-SS2506-D	3/7/2011	Surface	Bis(2-ethylhexyl)phthalate	4.9	1.24	395	47	78	mg/kg OC	8.4	5.1
LDW Outfall Sampling	LDW-SS2506-A	3/7/2011	Surface	Bis(2-ethylhexyl)phthalate	2.5	1.95	128	47	78	mg/kg OC	2.7	1.6
LDW Outfall Sampling	LDW-SS2506-A	3/7/2011	Surface	Butyl benzyl phthalate	0.14	1.95	7.2	4.9	64	mg/kg OC	1.5	<1
LDW Outfall Sampling	LDW-SS2512-A	3/7/2011	Surface	Butyl benzyl phthalate	0.082	0.48	17	0.063	0.90	mg/kg DW	1.3	<1
Other SVOCs												
LDW Outfall Sampling	LDW-SS2506-D	3/7/2011	Surface	Benzyl alcohol	0.056	1.24		57	73	ug/kg DW	9.8	7.7
LDW Outfall Sampling	LDW-SS2506-A	3/7/2011	Surface	Benzyl alcohol	0.12	1.95		57	73	ug/kg DW	2.1	1.6
LDW Outfall Sampling	LDW-SS2506-A	3/7/2011	Surface	1,4-Dichlorobenzene	0.068	1.95	3.5	3.1	9.0	mg/kg OC	1.1	<1
LDW Subsurface Sediment 2006	LDW-SC38a	2/20/2006	2 - 3	Dibenzofuran	0.25 J	1.5	17	15	58	mg/kg OC	1.1	<1
PCBs												
LDW Subsurface Sediment 2006	LDW-SC38a	2/20/2006	2 - 3	PCBs (total calc'd)	3.4	1.5	227	12	65	mg/kg OC	19	3.5
LDW Subsurface Sediment 2006	LDW-SC38a	2/20/2006	1 - 2	PCBs (total calc'd)	0.71	1.37	52	12	65	mg/kg OC	4.3	<1
LDW RI Phase 2 Round 1	B6a	8/15/2004	Surface	PCBs (total calc'd)	0.3	0.89	34	12	65	mg/kg OC	2.8	<1
EPA Site Inspection	DR135	8/13/1998	Surface	PCBs (total calc'd)	0.26 J	2.04	13	12	65	mg/kg OC	1.1	<1
LDW RI Phase 2 Round 2	LDW-SSB6a	3/15/2005	Surface	PCBs (total calc'd)	0.15	1.26	12	12	65	mg/kg OC	1.0	<1
LDW Subsurface Sediment 2006	LDW-SC38a	2/20/2006	0 - 1	PCBs (total calc'd)	0.45	1.95	23	12	65	mg/kg OC	1.9	<1

mg/kg - milligram per kilogram
ug/kg - microgram per kilogram
DW - Dry weight
TOC - Total Organic Carbon
OC - Organic carbon normalized
SQS - SMS Sediment Quality Standard
PCB - Polychlorinated biphenyl
CSL - SMS Cleanup Screening Level
PAH - Polycyclic aromatic hydrocarbon
SMS - Sediment Management Standards
AET - Apparent Effects Threshold
Total HPAH - Total high molecular weight PAH
Total LPAH - Total low molecular weight PAH

J - Estimated value between the method detection limit and the laboratory reporting limit
SMS - Sediment Management Standard (Washington Administrative Code 173-204)

* Samples with TOC <0.5% were compared to dry weight SMS or AET criteria.

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

Table 4
Chemicals Detected Above Screening Levels in Storm Drain Samples
1st Avenue S SD Source Control Area

Sample Location	Date Collected	Sample Type	Chemical	Concentration (mg/kg DW)	TOC (%)	SQS/ LAET	CSL/ 2LAET	Units	SQS Exceedance Factor	CSL Exceedance Factor
Metals										
1st-ST5	9/16/2008	Inline	Mercury	0.6	11.2%	0.41	0.59	mg/kg DW	1.5	1.0
1st-ST5	8/2/2010	Inline	Mercury	0.49	9.9%	0.41	0.59	mg/kg DW	1.2	<1
1st-ST5	8/2/2010	Inline	Mercury	0.42	12.8%	0.41	0.59	mg/kg DW	1.0	<1
CB158	5/14/2010	CB	Zinc	3,770	6.3%	410	960	mg/kg DW	9.2	3.9
CB150	5/28/2009	CB	Zinc	2,140	6.3%	410	960	mg/kg DW	5.2	2.2
1st-ST5	9/16/2008	Inline	Zinc	1,480	11.2%	410	960	mg/kg DW	3.6	1.5
1st-ST5	8/2/2010	Inline	Zinc	924	12.8%	410	960	mg/kg DW	2.3	1.0
1st-ST5	8/2/2010	Inline	Zinc	852	9.9%	410	960	mg/kg DW	2.1	<1
1st-ST1	11/04/10	Trap	Zinc	793	7.9%	410	960	mg/kg DW	1.9	<1
1st-ST7	11/11/2010	Trap	Zinc	662	15.1%	410	960	mg/kg DW	1.6	<1
1st-ST1	03/06/09	Trap	Zinc	647	9.0%	410	960	mg/kg DW	1.6	<1
MH218	5/19/2009	Inline	Zinc	619	1.8%	410	960	mg/kg DW	1.5	<1
1st-ST2	3/6/2009	Trap	Zinc	579	NA	410	960	mg/kg DW	1.4	<1
RCB262	4/22/2011	Inline	Zinc	519 J	8.3%	410	960	mg/kg DW	1.3	<1
1st-ST1	09/05/08	Inline	Zinc	502	8.4%	410	960	mg/kg DW	1.2	<1
1st-ST2	11/4/2010	Trap	Zinc	466	5.5%	410	960	mg/kg DW	1.1	<1
PAHs										
1st-ST5	8/2/2010	Inline	Acenaphthene	0.55 J	12.8%	0.50	0.73	mg/kg DW	1.1	<1
1st-ST5	9/16/2008	Inline	Acenaphthene	0.58	11.2%	0.50	0.73	mg/kg DW	1.2	<1
RCB152	9/17/2008	RCB	Benzo(a)anthracene	1.6	15.3%	1.3	1.6	mg/kg DW	1.2	1.0
1st-ST7	11/11/2010	Trap	Benzo(a)pyrene	2.5	15.1%	1.6	3.0	mg/kg DW	1.6	<1
RCB152	9/17/2008	RCB	Benzo(a)pyrene	1.8	15.3%	1.6	3.0	mg/kg DW	1.1	<1
1st-ST7	11/11/2010	Trap	Benzo(g,h,i)perylene	4.8	15.1%	0.67	0.72	mg/kg DW	7.2	6.7
1st-ST1	11/04/10	Trap	Benzo(g,h,i)perylene	2.3	7.9%	0.67	0.72	mg/kg DW	3.4	3.2
1st-ST2	11/4/2010	Trap	Benzo(g,h,i)perylene	0.74	5.5%	0.67	0.72	mg/kg DW	1.1	1.0
RCB152	9/17/2008	RCB	Benzofluoranthenes	4.4	15.3%	3.2	3.6	mg/kg DW	1.4	1.2
1st-ST7	11/11/2010	Trap	Chrysene	3.1	15.1%	1.4	2.8	mg/kg DW	2.2	1.1
RCB152	9/17/2008	RCB	Chrysene	2.6	15.3%	1.4	2.8	mg/kg DW	1.9	<1
1st-ST1	11/04/10	Trap	Chrysene	1.6	7.9%	1.4	2.8	mg/kg DW	1.1	<1
1st-ST7	11/11/2010	Trap	Fluoranthene	6.1	15.1%	1.7	2.5	mg/kg DW	3.6	2.4
RCB152	9/17/2008	RCB	Fluoranthene	5.2	15.3%	1.7	2.5	mg/kg DW	3.1	2.1
1st-ST1	11/04/10	Trap	Fluoranthene	3.3	7.9%	1.7	2.5	mg/kg DW	1.9	1.3
MH218	5/19/2009	Inline	Fluoranthene	3.2	1.8%	1.7	2.5	mg/kg DW	1.9	1.3
1st-ST5	9/16/2008	Inline	Fluoranthene	2.2	11.2%	1.7	2.5	mg/kg DW	1.3	<1
1st-ST7	11/11/2010	Trap	Indeno(1,2,3-cd)pyrene	1.4	15.1%	0.60	0.69	mg/kg DW	2.3	2.0
RCB152	9/17/2008	RCB	Phenanthrene	2.7	15.3%	1.5	5.4	mg/kg DW	1.8	<1
1st-ST7	11/11/2010	Trap	Phenanthrene	2.4	15.1%	1.5	5.4	mg/kg DW	1.6	<1
1st-ST1	11/04/10	Trap	Phenanthrene	2	7.9%	1.5	5.4	mg/kg DW	1.3	<1
MH218	5/19/2009	Inline	Phenanthrene	1.9	1.8%	1.5	5.4	mg/kg DW	1.3	<1
1st-ST7	11/11/2010	Trap	Pyrene	3.9	15.1%	2.6	3.3	mg/kg DW	1.5	1.2
RCB152	9/17/2008	RCB	Pyrene	3.6	15.3%	2.6	3.3	mg/kg DW	1.4	1.1

Table 4
Chemicals Detected Above Screening Levels in Storm Drain Samples
1st Avenue S SD Source Control Area

Sample Location	Date Collected	Sample Type	Chemical	Concentration (mg/kg DW)	TOC (%)	SQS/ LAET	CSL/ 2LAET	Units	SQS Exceedance Factor	CSL Exceedance Factor
RCB152	9/17/2008	RCB	Total HPAH	25 J	15.3%	12	17	mg/kg DW	2.1	1.5
1st-ST7	11/11/2010	Trap	Total HPAH	25	15.1%	12	17	mg/kg DW	2.1	1.5
MH218	5/19/2009	Inline	Total HPAH	14	1.8%	12	17	mg/kg DW	1.2	<1
Phthalates										
CB150	05/28/09	CB	BBP	6.5	6.3%	0.063	0.90	mg/kg DW	103	7.2
1st-ST1	11/04/10	Trap	BBP	3.2	7.9%	0.063	0.90	mg/kg DW	51	3.6
CB158	5/14/2010	CB	BBP	0.61	6.3%	0.063	0.90	mg/kg DW	9.7	<1
MH218	5/19/2009	Inline	BBP	0.32	1.8%	0.063	0.90	mg/kg DW	5.1	<1
1st-ST1	03/06/09	Inline	BBP	0.3	6.0%	0.063	0.90	mg/kg DW	4.8	<1
1st-ST1	03/06/09	Trap	BBP	0.26	9.0%	0.063	0.90	mg/kg DW	4.1	<1
1st-ST2	11/4/2010	Trap	BBP	0.22	5.5%	0.063	0.90	mg/kg DW	3.5	<1
1st-ST1	09/05/08	Inline	BBP	0.21	8.4%	0.063	0.90	mg/kg DW	3.3	<1
MH216	5/19/2009	Inline	BBP	0.17	1.6%	0.063	0.90	mg/kg DW	2.7	<1
1st-ST1	11/04/10	Inline	BBP	0.090 J	7.6%	0.063	0.90	mg/kg DW	1.4	<1
1st-ST2	3/6/2009	Inline	BBP	0.077	2.1%	0.063	0.90	mg/kg DW	1.2	<1
1st-ST2	9/5/2008	Inline	BBP	0.064	0.9%	0.063	0.90	mg/kg DW	1.0	<1
1st-ST5	9/16/2008	Inline	BEHP	44	11.2%	1.3	1.9	mg/kg DW	34	23
1st-ST5	8/2/2010	Inline	BEHP	26	12.8%	1.3	1.9	mg/kg DW	20	14
RCB262	4/22/2011	Inline	BEHP	25 B	8.3%	1.3	1.9	mg/kg DW	19	13
1st-ST5	8/2/2010	Inline	BEHP	24	9.9%	1.3	1.9	mg/kg DW	18	13
CB150	5/28/2009	CB	BEHP	16	6.3%	1.3	1.9	mg/kg DW	12	8.4
MH218	5/19/2009	Inline	BEHP	14	1.8%	1.3	1.9	mg/kg DW	11	7.4
1st-ST1	03/06/09	Trap	BEHP	13	9.0%	1.3	1.9	mg/kg DW	10	6.8
CB158	5/14/2010	CB	BEHP	13	6.3%	1.3	1.9	mg/kg DW	10	6.8
1st-ST1	11/04/10	Trap	BEHP	11 B	7.9%	1.3	1.9	mg/kg DW	8.5	5.8
1st-ST7	11/11/2010	Trap	BEHP	11	15.1%	1.3	1.9	mg/kg DW	8.5	5.8
1st-ST1	03/06/09	Inline	BEHP	8.1	6.0%	1.3	1.9	mg/kg DW	6.2	4.3
1st-ST2	11/4/2010	Trap	BEHP	6.8 B	5.5%	1.3	1.9	mg/kg DW	5.2	3.6
1st-ST1	11/04/10	Inline	BEHP	4.5 B	7.6%	1.3	1.9	mg/kg DW	3.5	2.4
1st-ST7	3/17/2009	Trap	BEHP	3.2 B	4.5%	1.3	1.9	mg/kg DW	2.5	1.7
1st-ST2	3/6/2009	Inline	BEHP	3.2	2.1%	1.3	1.9	mg/kg DW	2.5	1.7
1st-ST1	09/05/08	Inline	BEHP	2.4	8.4%	1.3	1.9	mg/kg DW	1.8	1.3
RCB152	9/17/2008	RCB	BEHP	1.7	15.3%	1.3	1.9	mg/kg DW	1.3	<1
1st-ST1	03/06/09	Inline	Dimethylphthalate	0.12 J	6.0%	0.071	0.16	mg/kg DW	1.7	<1
1st-ST1	09/05/08	Inline	Dimethylphthalate	0.097	8.4%	0.071	0.16	mg/kg DW	1.4	<1
Other SVOCs										
RCB152	9/17/2008	RCB	4-Methylphenol	1.7	15.0%	0.67	0.67	mg/kg DW	2.5	2.5
1st-ST3	3/12/2009	Trap	4-Methylphenol	1.5	7.3%	0.67	0.67	mg/kg DW	2.2	2.2
1st-ST7	3/17/2009	Trap	4-Methylphenol	1.4	4.5%	0.67	0.67	mg/kg DW	2.1	2.1
1st-ST2	11/4/2010	Trap	Benzoic acid	0.75 J	5.5%	0.65	0.65	mg/kg DW	1.2	1.2
CB158	5/14/2010	CB	Benzoic acid	0.71 J	6.3%	0.65	0.65	mg/kg DW	1.1	1.1

Table 4
Chemicals Detected Above Screening Levels in Storm Drain Samples
1st Avenue S SD Source Control Area

Sample Location	Date Collected	Sample Type	Chemical	Concentration (mg/kg DW)	TOC (%)	SQS/ LAET	CSL/ 2LAET	Units	SQS Exceedance Factor	CSL Exceedance Factor
PCBs										
MH218	5/19/2009	Inline	Total PCBs	0.78	1.8%	0.13	1.0	mg/kg DW	6.0	<1
1st-ST7	11/11/2010	Trap	Total PCBs	0.77	15.1%	0.13	1.0	mg/kg DW	5.9	<1
1st-ST5	9/16/2008	Inline	Total PCBs	0.50	11.2%	0.13	1.0	mg/kg DW	3.8	<1
1st-ST5	8/2/2010	Inline	Total PCBs	0.27 J	9.9%	0.13	1.0	mg/kg DW	2.1	<1
1st-ST5	8/2/2010	Inline	Total PCBs	0.19 J	12.8%	0.13	1.0	mg/kg DW	1.5	<1
CB158	5/14/2010	CB	Total PCBs	0.18	6.3%	0.13	1.0	mg/kg DW	1.4	<1
Dioxins/Furans										
1st-ST1	11/04/10	Inline	Dioxin/Furan TEQ	12 J	7.6%	1.6		ng/kg DW	7.5	
Petroleum Hydrocarbons										
RCB262	4/22/2011	Inline	TPH-Diesel	2,900	8.3%	2,000		mg/kg DW	1.5	
1st-ST1	03/06/09	Trap	TPH-Diesel	2,400	9.0%	2,000		mg/kg DW	1.2	
RCB262	4/22/2011	Inline	TPH-Oil	16,000	8.3%	2,000		mg/kg DW	8.0	
1st-ST1	03/06/09	Trap	TPH-Oil	11,000	9.0%	2,000		mg/kg DW	5.5	
CB150	5/28/2009	CB	TPH-Oil	8,200	6.3%	2,000		mg/kg DW	4.1	
1st-ST1	11/04/10	Trap	TPH-Oil	5,900	7.9%	2,000		mg/kg DW	3.0	
1st-ST7	11/11/2010	Trap	TPH-Oil	5,500	15.1%	2,000		mg/kg DW	2.8	
CB158	5/14/2010	CB	TPH-Oil	4,400	6.3%	2,000		mg/kg DW	2.2	
1st-ST5	9/16/2008	Inline	TPH-Oil	3,800	11.2%	2,000		mg/kg DW	1.9	
1st-ST5	8/2/2010	Inline	TPH-Oil	3,600	12.8%	2,000		mg/kg DW	1.8	
MH218	5/19/2009	Inline	TPH-Oil	3,550	1.8%	2,000		mg/kg DW	1.8	
1st-ST1	03/06/09	Inline	TPH-Oil	3,300	6.0%	2,000		mg/kg DW	1.7	
1st-ST5	8/2/2010	Inline	TPH-Oil	3,300	9.9%	2,000		mg/kg DW	1.7	
1st-ST7	3/17/2009	Trap	TPH-Oil	2,600	4.5%	2,000		mg/kg DW	1.3	
1st-ST1	11/04/10	Inline	TPH-Oil	2,500	7.6%	2,000		mg/kg DW	1.3	

mg/kg - milligram per kilogram
ng/kg - nanogram per kilogram
DW - dry weight
TOC - total organic carbon
BEHP - bis(2-ethylhexyl)phthalate
BBP - butylbenzylphthalate
SQS - Sediment Quality Standard
CSL - Cleanup Screening Level
PCB - polychlorinated biphenyl
TPH - total petroleum hydrocarbons
PAH - polycyclic aromatic hydrocarbon
TEQ - toxic equivalence quotient
J - Estimated value between the method detection limit and the laboratory reporting limit
B - Analyte was detected in the associated method blank
LAET - lowest apparent effects threshold
2LAET - second lowest apparent effects threshold

Table presents chemicals that exceed a screening level in at least one sample.
Exceedance factors are the ratio fo the detected concentration to the SQS or CSL; exceedance factors are shown only if they are greater than 1.
Screening level for petroleum hydrocarbons is the MTCA soil cleanup level.
Screening level for dioxins/furans is the LDW background concentration.

Table 5
Properties, Facilities, and Parcel Numbers within the 1st Avenue S SD Source Control Area

Property Name	Facility Name	Current?	FSID	Address	Parcel Number	Taxpayer
Seattle Engineering Department 2nd Avenue SW	Seattle City Eng Dept 2nd Ave SW	●	84167493	2nd Avenue SW & West Marginal Way SW	7643400010	Seattle Department of Transportation
Waste Management Eastmont Transfer Station	Waste Management of Seattle	●	2425	7201 West Marginal Way SW	3024049167	Waste Management
	Eastmont Transfer Station	●	91926231	7155 West Marginal Way SW		
Jones Stevedoring	Jones Washington Stevedoring	●	94931167	7245 West Marginal Way SW	3024049176; 3024049159	Jones Washington Stevedoring; Jones Stevedoring Co.
	Nuprecon	●	NA	7245 West Marginal Way SW		
	Icicle Seafoods	●	NA	7245 West Marginal Way SW		
	MC Delivery	●	NA	7245 West Marginal Way SW		
	MDE Engineers, Inc.	●	NA	7245 West Marginal Way SW		
	Seafreeze	●	NA	7245 West Marginal Way SW		
	Sound Delivery Service	●	NA	7245 West Marginal Way SW		
	Specialty Storage Company	●	NA	7245 West Marginal Way SW		
	Western Crane	●	NA	7245 West Marginal Way SW		
Seattle Housing Authority	Chemical Processors Inc Detroit		2109	7500 Detroit Avenue SW	3024049073	Seattle Housing Authority
	Seattle Housing Authority	●	NA	7500 Detroit Avenue SW		
Burkheimer Family Property	Samson Tug & Barge Detroit Ave SW	●	24041	7553 Detroit Avenue SW	3024049174; 3024049018; 3024049153	Burkheimer Family LLC
	Samson Tug Maintenance Shop	●	15539	7739 1st Avenue S		
	Samson Tug & Barge 2nd Ave SW	●	21272	7600 2nd Avenue SW		
	Laidlaw/First Student	●	2320	7739 1st Avenue S		
	Volvo Road Machinery Inc		9437672	7739 1st Avenue S		
	Hussmann Corp		61437393	7272 1st Avenue S	Unknown	NA
Former Eastern Supply	Eastern Supply Co		2258	7745 1st Avenue S	3024049164	Fred Weinberg
Former First Avenue Bridge Landfill	First Ave Bridge Landfill		2201	7700 Block of 2nd Avenue SW	NA	NA
Seaport Petroleum	Seaport Petroleum Detroit Ave	●	4982711	7800 Detroit Avenue SW	3024049166	Seaport WE4ST LLC
	Seaport Food Mart	●	NA	7801 Detroit Avenue SW	3024049181	DJP Enterprise Inc
	West Coast Equipment 2		12494	7746 Detroit Avenue SW	3024049166	Seaport WE4ST LLC
Former West Coast Equipment	West Coast Equipment Inc		2262	7777 Detroit Avenue SW	3024049158	Thidwick Management Co

Table 5
Properties, Facilities, and Parcel Numbers within the 1st Avenue S SD Source Control Area

Property Name	Facility Name	Current?	FSID	Address	Parcel Number	Taxpayer
MacDonald Miller	MacDonald Miller Co Inc	●	21626	7717 Detroit Avenue SW	3024049026	F&V Investments LLC
	MacDonald Miller Service Inc	●	36776588	7707 Detroit Avenue SW	3024049075	
Kenyon Street Property	Dr Concrete Recycle		4504516	149 SW Kenyon Street	3124049004; 3124049009	Kenyon Street Partners
	Healthcare Solutions	●	NA	149 SW Kenyon Street		
Intermountain Supply/Former Recycle America	Waste Management of Seattle 1st Ave	●	95878752	7901 1st Avenue S	3124049001	LMN, LLC
	Recycle America		55695661			
	Intermountain Supply	●	NA			
	TW Express		47666565			
Waste Management 1st Avenue S	Can Do Services		15161	8101 1st Avenue S	3124049008	Oak Classics Company
	Waste Management Fueling Facility	●	NA	8105 1st Avenue S	3124049156; 3124049158	First Avenue Industries LLC
	NW Enviroservice 1st Ave Site		74491434	8105 1st Avenue S	3124049007	
	Northwest Enviroservice 2		2536	8105 1st Avenue S		
	Northwest Enviroservice 2W		2537	1st Avenue SW & Marginal	NA	
	Patent Construction Systems		79459683	8111 1st Avenue S	3124049151	Waste Management Inc.
	Waste Management CNG Upgrades		4709	149 SW Kenyon & 8111 1st Avenue S		
MAPSCO	Magnetic & Penetrant Services Co Inc	●	46338473	8135 1st Avenue S	3124049134	Promise Land Enterprise LLC
Standard Steel Fabricating	Standard Steel Fabricating Co Inc	●	42718345	8155 1st Avenue S	3124049160; 3124049157	Standard Steel Fabricating
Former Global Diving & Salvage	Global Diving & Salvage		None	8165 1st Avenue S	3124049157	IVMG LLC
Lion Trucking	Lion Trucking Inc	●	16981594	8425 1st Avenue S	3124049172; 3124049173; 3124049014	D&Z Lion Properties LLC
	Old Dominion Freight Line Inc	●	17445	8425 1st Avenue S		
Urban Hardwoods Sawmill	Urban Hardwoods Sawmill	●	14193	8427 1st Avenue S	3124049125	South Park 45 LLC
South Transfer Station/Former Kenyon Street Bus Yard	Bus Yard Site Preparation CSWGP		3329	130 S Kenyon Street	2924049006, 2924049099, 2924049104, 7328401175	City of Seattle
	First Student Seattle		90247719	130 S Kenyon Street		
	Ryder Student Transportation Services		63293426	130 S Kenyon Street		
	South Kenyon Street		3388037	110, 130, 150, & 200 South Kenyon Street		
	South Transfer Station	●	3453	130 S Kenyon Street		
	Tacoma Seattle Trailer Repair		96838255	150 S Kenyon St		
	We Painters Inc		47374256	110 S Kenyon		

Table 5
Properties, Facilities, and Parcel Numbers within the 1st Avenue S SD Source Control Area

Property Name	Facility Name	Current?	FSID	Address	Parcel Number	Taxpayer
Kenyon Business Park	Flying Fish Express	●	10791	7937 2nd Avenue S	3224049007	Harsch Investment Properties LLC
	International Lubricants Inc	●	97992431	7930 Occidental S		
	Omnisource Inc		72863999	123 S Kenyon St		
	Omnisource Inc 121		85495122	121 1/2 S Kenyon St		
	Omnisource Inc 129		82954349	129 S Kenyon St		
	Proliance International Inc Seattle		96897184	7951 2nd Avenue S		
	Second Use Building Materials		NA	7953 2nd Avenue S		
	Tnemec Co Inc	●	86979859	7929 2nd Avenue S		
	Vista Pro Automotive	●	NA	7951 2nd Avenue S		
Former Formula Corp	Formula Corp		44534539	7901 2nd Avenue S	3224049077	7901 2nd Ave S LLC
	T H Seafood	●	NA	7901 2nd Avenue S		
WG Clark Construction	WG Clark Construction Occidental Ave	●	64488657	7958 Occidental Avenue S	3224049068	W G Clark Construction
South Recycle & Disposal Station	Seattle S Transfer Sta	●	2175	8100 2nd Avenue S	7328400005	City of Seattle
	South Recycle & Disposal Station	●	91256919	8100 2nd Avenue S		
	South Recycle & Disposal Station 5th Ave	●	3665320	8105 5th Avenue S		
	WA AGR King 2	●	89337496	8100B 2nd Avenue S		
Former South Park Landfill	South Park Landfill		2180	8200 2nd Avenue S	3224049005	South Park Property Development LLC
International Construction Equipment	International Construction Equipment	●	99142846	8101 Occidental Avenue S	3224049008	International Construction Equipment
Demolition Man	Demolition Man	●	14413	8129 Occidental Avenue S	3224049102	John M. and Ginny M. McFarland
North Star Ice Equipment	North Star Ice Equipment Inc	●	25963342	8151 Occidental Avenue S	3224049010	Rainier Northwest JFK LLC
	Demolition Man Storage Yard	●	19521	8151 Occidental Avenue S		
Non-Ferrous Metals	Nonferrous Metals	●	66671686	230 S Chicago St	7328401427	McGee Properties Inc
Flamespray Northwest	Flamespray Northwest Inc	●	1736255	250 S Chicago St	7328401425	FSNW LLC
Former Custom Roofing	Custom Roofing Inc		61231536	8001 5th Avenue S	7328400445	Rick Larson Enterprises
	Second Use Building Materials		NA	8001 5th Avenue S		
ABC Metal Finishing*	ABC Metal Finishing		97913617	501 S Elmgrove St	7327900540	Bank of America TRE
	Flashlink TEC	●	NA	501 S Elmgrove St		
West Seattle Reservoir	West Seattle Reservoir	●	26116543	None Listed	7972603535	City of Seattle
	Seattle Public Utilities W Seattle Res	●	77377391	8820 3rd Avenue SW		

Table 5
Properties, Facilities, and Parcel Numbers within the 1st Avenue S SD Source Control Area

Property Name	Facility Name	Current?	FSID	Address	Parcel Number	Taxpayer
Arrowhead Senior Housing	Arrowhead Senior Housing Assoc	●	17746	9200 2nd Avenue SW	3124049205, 3124049216	Arrowhead Senior Housing Assoc
Former Myers Way Sand Pit	Myers Way Sand Pit		12326	9400 Myers Way	3124049024 (northern portion)	City of Seattle Dept. of Fleets and Facilities
	City of Seattle Joint Training Facility	●	NA	9400 Myers Way		
SR 509 & Greenbelt	SR 509 & Greenbelt		4185778	SR 509 & Barton	NA	NA

Not Listed: 1st Kenyon Drum (FSID 46918719), Greg Peterson Duwamish River (FSID 7130166), Kenyon Drum (FSID 29892767), Metro Holden Marginal Way (FSID 9677878), Transfer Sta Barrel (FSID 39937726); Exxon Co USA Div of Exxon Cor (FSID 5542431)

	Location shown on Figure 10
	Location shown on Figure 11
	Location shown on Figure 12
	Location shown on Figure 13
	Location shown on Figure 14

Table 6
Summary of Soil and/or Groundwater Contamination by Property/Facility within the 1st Avenue S SD Source Control Area

Property	Facility	Facility/ Site ID	Soil	Groundwater	Notes
Burkheimer Family Property	**Laidlaw**	**2320**	>MTCA: PCE, TCE, vinyl chloride	>MTCA: PCE, TCE, vinyl chloride	Age of Contaminants: 20+ years Ecology issued an NFA for soil remediation in 1999. Contaminants in soil and groundwater are not COCs for LDW sediment.
Former Eastern Supply Company	Same	**2258**	>MTCA: PCE, TCE	>MTCA: Arsenic, cadmium, chromium, iron, lead, cis-1,2-DCE, methylene chloride, PCE, TCE, vinyl chloride >GW-to-Sed SL: Cadmium, lead, mercury	Age of Contaminants: 20+ years An RI/FS was conducted from 1997 to 2000 under an Agreed Order with Ecology; a groundwater treatment system was installed and compliance monitoring is currently in progress.
Former First Avenue Bridge Landfill	Same	**2201**	>MTCA: Arsenic >Soil-to-Sed SL: Arsenic, copper, zinc	>MTCA & GW-to-Sed SL: Arsenic >MTCA: Vinyl chloride	Age of Contaminants: 20+ years The property was reportedly used as a construction waste landfill between 1969 and 1972.
Intermountain Supply/Former Recycle America	**Waste Management of Seattle 1st Ave**	**95878752**	>MTCA & Soil-to-Sed SL: Cadmium, lead >MTCA: Arsenic, benzene, ethylbenzene, toluene, xylenes, petroleum hydrocarbons	>MTCA & GW-to-Sed SL: Cadmium, lead, mercury >MTCA: Antimony, arsenic, benzene, TCE, petroleum hydrocarbons	Age of Contaminants: 15+ years CKD fill
Jones Stevedoring	Same	94931167	>MTCA: Petroleum hydrocarbons	None identified	Age of Contaminants: 20+ years Historical landfill site
Kenyon Business Park	Multiple	10791, 72863999, 82954349, 85495122, 86979859, 96897184, 97992431	>MTCA: TCE, methylene chloride, petroleum hydrocarbons	>MTCA & GW-to-Sed SL: Arsenic, cadmium, chromium, lead, silver, naphthalene >MTCA: cis-1,2-DCE, barium, benzene, chlorobenzene, methylene chloride, vinyl chloride, petroleum hydrocarbons	Age of Contaminants: 45+ years
Kenyon Street Property	**Dr. Concrete Recycle**	**4504516**	>MTCA & Soil-to-Sed SL: Cadmium, lead >MTCA: Arsenic >Soil-to-Sed SL: Silver	>MTCA & GW-to-Sed SL: Lead >MTCA: Arsenic, chromium	Age of Contaminants: 30+ years CKD fill This property was the site of an auto wrecking yard during the 1950s and 1960s. Wrecking yard activities may represent a source of petroleum hydrocarbons, PAHs, PCBs, volatile organics, and metals.
Seaport Petroleum	**West Coast Equipment 2**	**12494**	>MTCA & Soil-to-Sed SL: Arsenic, cadmium, chromium, lead >MTCA: Barium, petroleum hydrocarbons >Soil-to-Sed SL: Mercury, silver	>MTCA & GW-to-Sed SL: Lead >MTCA: Arsenic, chromium, benzene, petroleum hydrocarbons	Age of Contaminants: 40+ years CKD fill

Table 6
Summary of Soil and/or Groundwater Contamination by Property/Facility within the 1st Avenue S SD Source Control Area

Property	Facility	Facility/ Site ID	Soil	Groundwater	Notes
Seattle Housing Authority	**Former Chemical Processors Inc. Detroit**)	**2109**	None identified	>MTCA: PCE, TPH	Age of Contaminants: 20+ years Ecology issued an NFA in 1995. Contaminants in groundwater are not COCs for LDW sediment.
Former South Park Landfill	Same	**2180**	>MTCA: Metals, TPH, VOCs, SVOCs, and PCBs	>MTCA: Metals, TPH, VOCs, SVOCs, and PCBs	Age of Contaminants: 20+ years Contamination being addressed under Agreed Order No. 6709
South Recycle & Disposal Station	**Seattle S Transfer Sta**	**2175**	Suspected >MTCA: Conventional contaminants, organic and inorganic	Suspected >MTCA: Conventional contaminants, organic and inorganic	Information listed in ISIS, individual chemicals and concentrations were not available for review. Surface water contamination (same contaminants) also suspected.
South Transfer Station/Former S Kenyon Street Bus Yard	**Ryder Student Transportation Services, South Kenyon Street**	**3388037**, **63293426**	>MTCA: Petroleum hydrocarbons, MTBE, benzene, xylenes, methylene chloride, naphthalene, benzo(a)pyrene, cPAHs, arsenic, cadmium, chromium, lead	>MTCA: petroleum hydrocarbons, MTBE, benzene, toluene, xylenes, 1-methylnapthalene, benzo(a)anthracene, benzo(b)fluoranthene, chrysene, arsenic, lead, pesticides, herbicides	Age of Contaminants: 20+ years SPU excavated approximately 40,000 tons of contaminated soil at the property. Groundwater monitoring will be conducted. Ecology reviewed the Cleanup Action Plan and determined no further remedial action would be needed after cleanup is completed.
SR 509 & Greenbelt	Same	**4185778**	Suspected > MTCA: Metals, priority pollutant metals, petroleum products		Information listed in ISIS, individual chemicals and concentrations were not available for review. Surface water contamination (same contaminants) also suspected.
Waste Management Eastmont Transfer Station	Same	**2425**	>MTCA: Petroleum hydrocarbons	>GW-to-Sed SL: Cadmium	Age of Contaminants: 20+ years Petroleum hydrocarbon remained in place after remediation in the early 1990s.
Waste Management 1st Avenue S	**Northwest Enviroservice 2, Northwest Enviroservice 2W**	**2536, 2537**	>MTCA: Arsenic, 1,1,1-TCA, benzene, ethylbenzene, toluene, xylenes, petroleum hydrocarbons	None identified	Age of Contaminants: 15+ years
Former West Coast Equipment	Same	**2262**	>MTCA & Soil-to-Sed SL: Cadmium, lead >MTCA: Arsenic, barium, petroleum hydrocarbons >Soil-to-Sed SL: Chromium, mercury, silver, zinc	>MTCA & GW-to-Sed SL: Chromium, lead >MTCA: Arsenic, benzene, petroleum hydrocarbons	Age of Contaminants: 20+ years

CKD – cement kiln dust
cPAH – carcinogenic polycyclic aromatic hydrocarbon
DCE – dichloroethene
GW – groundwater
MTBE – methyl tertiary butyl ether
NFA – No Further Action
TCA – trichloroethane
TCE – trichloroethylene
PCE – tetrachloroethene
SL – Screening Level
Bold text indicates that the facility is listed on the CSCSL.

Table 7
Facilities with Active EPA ID Numbers within the 1st Avenue S SD Source Control Area

Property	Facility	FSID	EPA ID No.
South Transfer Station/Former Kenyon Street Bus Yard	First Student Seattle	90247719	WAD075124800
Flamespray Northwest Inc	Same	1736255	WAH000033142
Kenyon Business Park	International Lubricants Inc	97992431	WAR000004085
MAPSCO	Magnetic & Penetrant Services Co	46338473	WAD988482659
North Star Ice Equipment Inc	Same	25963342	WAD988492302
Seaport Petroleum	Seaport Petroleum Detroit Ave	4982711	WAH000003590
South Recycle & Disposal Station	Same	91256919	WAD980833826
South Recycle & Disposal Station	WA AGR King 2	89337496	WAH000012765
Waste Management Eastmont Transfer Station	Waste Management of Seattle	2425	WAD041333576
South Transfer Station/Former Kenyon Street Bus Yard	We Painters Inc	47374256	WAR000008755

Table 8
Facilities with Active NPDES Industrial Stormwater General Permits within the 1st Avenue S SD Source Control Area

Property	Facility	FSID	NPDES Permit Number
Burkheimer Family Property	Laidlaw/First Student	2320	WAR124991
	Samson Tug & Barge Detroit Ave	24041	WAR011800
Former South Park Landfill	South Park Landfill	2180	WAR125544
Intermountain Supply/Former Recycle America	Waste Management of Seattle 1st Ave	95878752	WAR000582
Kenyon Business Park	International Lubricants Inc	97992431	WAR126581
MAPSCO	Magnetic & Penetrant Services Co	46338473	WAR011078
Seaport Petroleum	Seaport Petroleum Detroit Ave	4982711	WAR125959
South Recycle & Disposal Station	South Recycle & Disposal Station	91256919	WAR000737
South Transfer Station/Former Kenyon Street Bus Yard	South Transfer Station	3453	WAR125583
Standard Steel Fabricating	Standard Steel Fabricating Co Inc	42718345	WAR000617
Waste Management Eastmont Transfer Station	Waste Management of Seattle	2425	WAR000581

Table 9
Facilities with Active King County Industrial Waste Discharge Permits within the 1st Avenue S SD Source Control Area

Property	Facility	FSID	KCIW Discharge No.
Kenyon Business Park	Flying Fish Express	10791	783-01
South Recycle & Disposal Station	Same	91256919	400-03
Waste Management Eastmont Transfer Station	Waste Management of Seattle	2425	322-03

Table 10
Facilities with Underground Storage Tanks and/or Leaking Underground Storage Tanks within the 1st Avenue S SD Source Control Area

Property	Facility	FSID	UST ID	LUST ID
Former Custom Roofing	Same	61231536	4900	
Jones Stevedoring	Same	94931167	2313	3728
Burkheimer Family Property	Laidlaw	2320	12778	4546
Lion Trucking Inc	Same	16981594	510118	
MacDonald Miller	Same	36776588	101253	
North Star Ice Equipment Inc	Same	25963342	3729	
South Transfer Station/Former Kenyon Street Bus Yard	Ryder Student Transportation Services	63293426	425723	4632
Seaport Petroleum	Same	4982711	424567	
South Recycle & Disposal Station	Same	91256919	97437	
Standard Steel Fabricating	Same	42718345	1527	
South Transfer Station/Former Kenyon Street Bus Yard	Tacoma Seattle Trailer Repair	96838255	6109	519164
Waste Management Eastmont Transfer Station	Waste Management of Seattle	2425	3446	2100
Intermountain Supply/Former Recycle America	Waste Management of Seattle 1st Ave	95878752	10291	4828

Table 11
Source Control Inspections at Current Properties/Facilities within the 1st Avenue S SD Source Control Area

Property Name	Facility Name	FSID	Address	Source Control Inspection (most recent)	Agency	Compliance Achieved	Notes	Source
Waste Management Eastmont Transfer Station	Waste Management of Seattle	2425	7201 West Marginal Way SW	9/15/2010	Ecology	N		SAIC 2012
	Eastmont Transfer Station	91926231	7155 West Marginal Way SW					
Jones Stevedoring	Jones Washington Stevedoring	94931167	7245 West Marginal Way SW	9/6/2012	SPU	Y		Ecology 2013, in preparation
	Nuprecon	NA	7245 West Marginal Way SW	10/2/2009	SPU	Y		SAIC 2012
	Icicle Seafoods	NA	7245 West Marginal Way SW	7/16/2009	SPU	Y		SAIC 2012
	MC Delivery	NA	7245 West Marginal Way SW	7/16/2009	SPU	Y		SAIC 2012
	MDE Engineers, Inc.	NA	7245 West Marginal Way SW	7/16/2009	SPU	Y		SAIC 2012
	Seafreeze	NA	7245 West Marginal Way SW	7/16/2009	SPU	Y		SAIC 2012
	Sound Delivery Service	NA	7245 West Marginal Way SW	7/16/2009	SPU	Y		SAIC 2012
	Specialty Storage Company	NA	7245 West Marginal Way SW	7/16/2009	SPU	Y		SAIC 2012
	Western Crane	NA	7245 West Marginal Way SW	7/16/2009	SPU	Y		SAIC 2012
Seattle Housing Authority	Seattle Housing Authority	NA	7500 Detroit Avenue SW	4/29/2010	Ecology	N		SAIC 2012
Burkheimer Family Property	Samson Tug & Barge Detroit Ave SW	24041	7553 Detroit Avenue SW	1/6/2011	SPU	Y	Samson Tug & Barge is not in compliance with the ISGP.	SAIC 2012; Ecology 2013, in preparation
	Samson Tug Maintenance Shop	15539	7739 1st Avenue S					
	Samson Tug & Barge 2nd Ave SW	21272	7600 2nd Avenue SW					
	Laidlaw/First Student	2320	7739 1st Avenue S	4/11/2011	SPU	Y		SAIC 2012
Seaport Petroleum	Seaport Petroleum Detroit Ave	4982711	7800 Detroit Avenue SW	4/24/2012	SPU	N	SPU and Seaport Petroleum have entered into a Voluntary Compliance Agreement (VCA).	SAIC 2012
	Seaport Food Mart	NA	7801 Detroit Avenue SW					
MacDonald Miller	MacDonald Miller Co Inc	21626	7717 Detroit Avenue SW	7/29/2010	SPU	Y		SAIC 2012
	MacDonald Miller Service Inc	36776588	7707 Detroit Avenue SW					
Kenyon Street Property	Healthcare Solutions	NA	149 SW Kenyon Street	9/20/2011	SPU	Y		SAIC 2012
Intermountain Supply/Former Recycle America	Intermountain Supply	NA	7901 1st Avenue S	7/13/2010	SPU	Y		SAIC 2012
	Waste Management of Seattle 1st Ave	95878752		9/28/2011	Ecology	Y		PARIS

Table 11
Source Control Inspections at Current Properties/Facilities within the 1st Avenue S SD Source Control Area

Property Name	Facility Name	FSID	Address	Source Control Inspection (most recent)	Agency	Compliance Achieved	Notes	Source
Waste Management 1st Avenue S	Waste Management Fueling Facility	NA	8105 1st Avenue S	9/28/2011	Ecology & SPU	Y		SAIC 2012
MAPSCO	Magnetic & Penetrant Services Co Inc	46338473	8135 1st Avenue S	8/12/2008	Ecology	Y		SAIC 2012
Standard Steel Fabricating	Standard Steel Fabricating Co Inc	42718345	8155 1st Avenue S	8/22/2009	Ecology	Y		SAIC 2012
Lion Trucking	Lion Trucking Inc	16981594	8425 1st Avenue S	10/11/2012	SPU	N	Final letter sent 1/9/13 requiring spill kits, cleaning onsite detention vault and catch basins, installing traps on catch basins.	Schmoyer 2013
	Old Dominion Freight Line Inc	17445	8425 1st Avenue S	10/19/2012	SPU	Y		Ecology 2013, in preparation
Urban Hardwoods Sawmill	Urban Hardwoods Sawmill	14193	8427 1st Avenue S	12/17/2012	SPU	Y		Ecology 2013, in preparation
Kenyon Business Park	Flying Fish Express	10791	7937 2nd Avenue S	2/22/2010	SPU	Y	Kenyon Business park drains to 3 private 30-inch SD lines, which tie into the 1st Avenue S SD system on S Kenyon Street.	Ecology 2011; SAIC 2012; Schmoyer 2013
	International Lubricants Inc	97992431	7930 Occidental S	5/4/2009	Ecology	Y		
	Tnemec Co Inc	86979859	7929 2nd Avenue S	10/19/2009	SPU	Y		
	VistaPro Automotive	NA	7951 2nd Avenue S	12/1/2010	SPU	Y		
Former Formula Corp	T H Seafood	NA	7901 2nd Avenue S	6/17/2010	SPU	Y		SAIC 2012
WG Clark Construction	WG Clark Construction Occidental Ave	64488657	7958 Occidental Avenue S	12/7/2009	SPU	Y		SAIC 2012
South Recycle & Disposal Station	Seattle S Transfer Sta	2175	8100 2nd Avenue S	11/8/2012	Ecology	N	Review source control practices and catch basin treatment, map tributaries to the sanitary sewer. Information on proposed handling of stormwater drainage during and after the 2013/2014 construction is needed. SPU will provide the drainage plans when site design is complete.	Ecology 2012b; Schmoyer 2013
	South Recycle & Disposal Station	91256919	8100 2nd Avenue S					
	South Recycle & Disposal Station 5th Ave	3665320	8105 5th Avenue S					
	WA AGR King 2	89337496	8100B 2nd Avenue S					

Table 11
Source Control Inspections at Current Properties/Facilities within the 1st Avenue S SD Source Control Area

Property Name	Facility Name	FSID	Address	Source Control Inspection (most recent)	Agency	Compliance Achieved	Notes	Source
International Construction Equipment	International Construction Equipment	99142846	8101 Occidental Avenue S	2/24/2012	SPU	Y		SAIC 2012
Demolition Man	Demolition Man	14413	8129 Occidental Avenue S	11/18/2011	SPU	Y		SAIC 2012
North Star Ice Equipment	North Star Ice Equipment Inc	25963342	8151 Occidental Avenue S	9/30/2010	Ecology	N		SAIC 2012
	Demolition Man Storage Yard	19521	8151 Occidental Avenue S	11/18/2011	SPU	Y		
Non-Ferrous Metals	Nonferrous Metals	66671686	230 S Chicago St	4/24/2012	SPU	Y		Ecology 2013, in preparation
Flamespray Northwest	Flamespray Northwest Inc	1736255	250 S Chicago St	11/17/2012	Ecology	N		Ecology 2013, in preparation
ABC Metal Finishing	Flashlink TEC	NA	501 S Elmgrove St	6/16/2011	SPU	Y		Ecology 2012a
Arrowhead Senior Housing	Arrowhead Senior Housing Assoc	17746	9200 2nd Avenue SW	6/22/2011	SPU	Y		Schmoyer 2013

	Location shown on Figure 10
	Location shown on Figure 11
	Location shown on Figure 12
	Location shown on Figure 13
	Location shown on Figure 14

Figures

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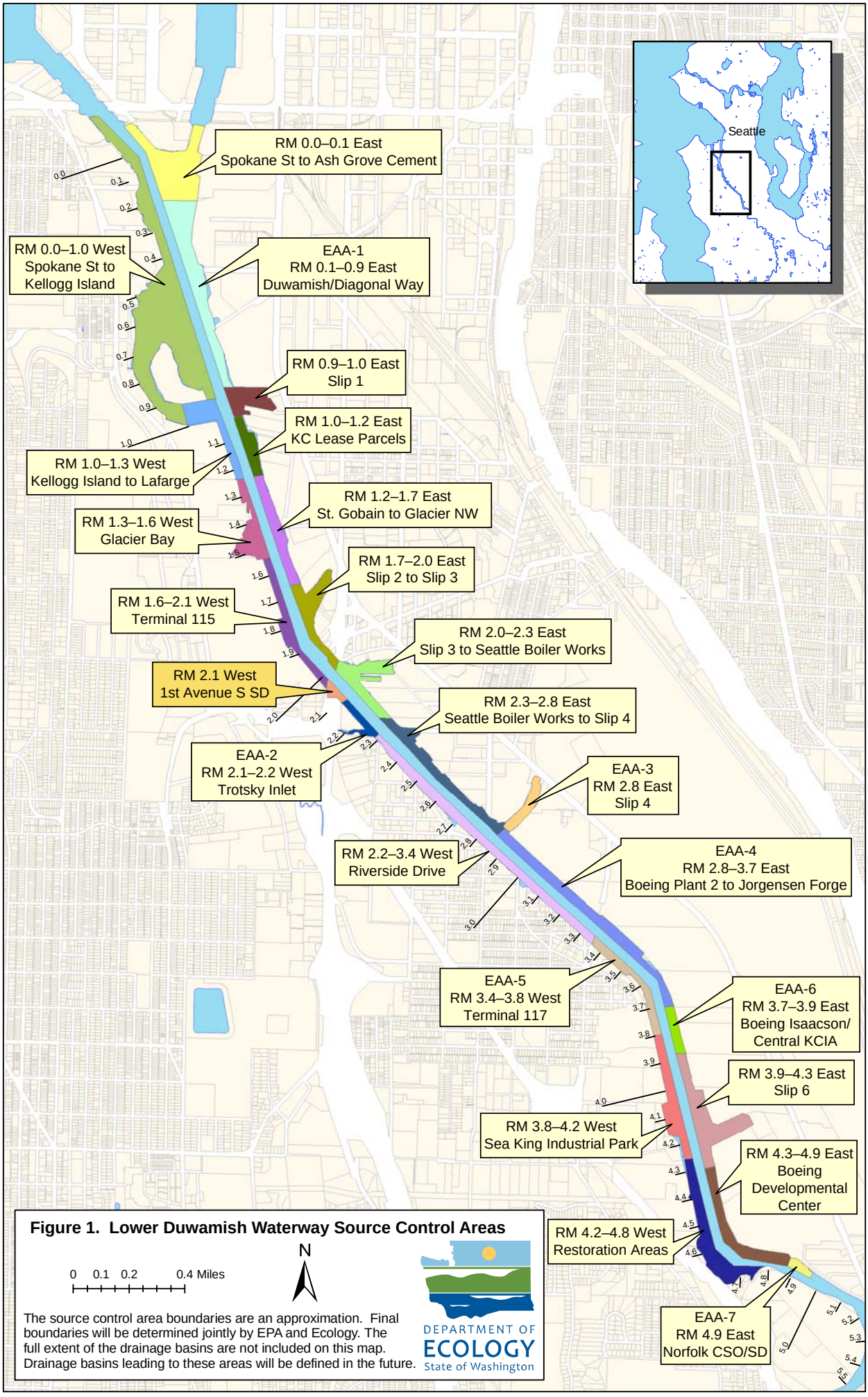
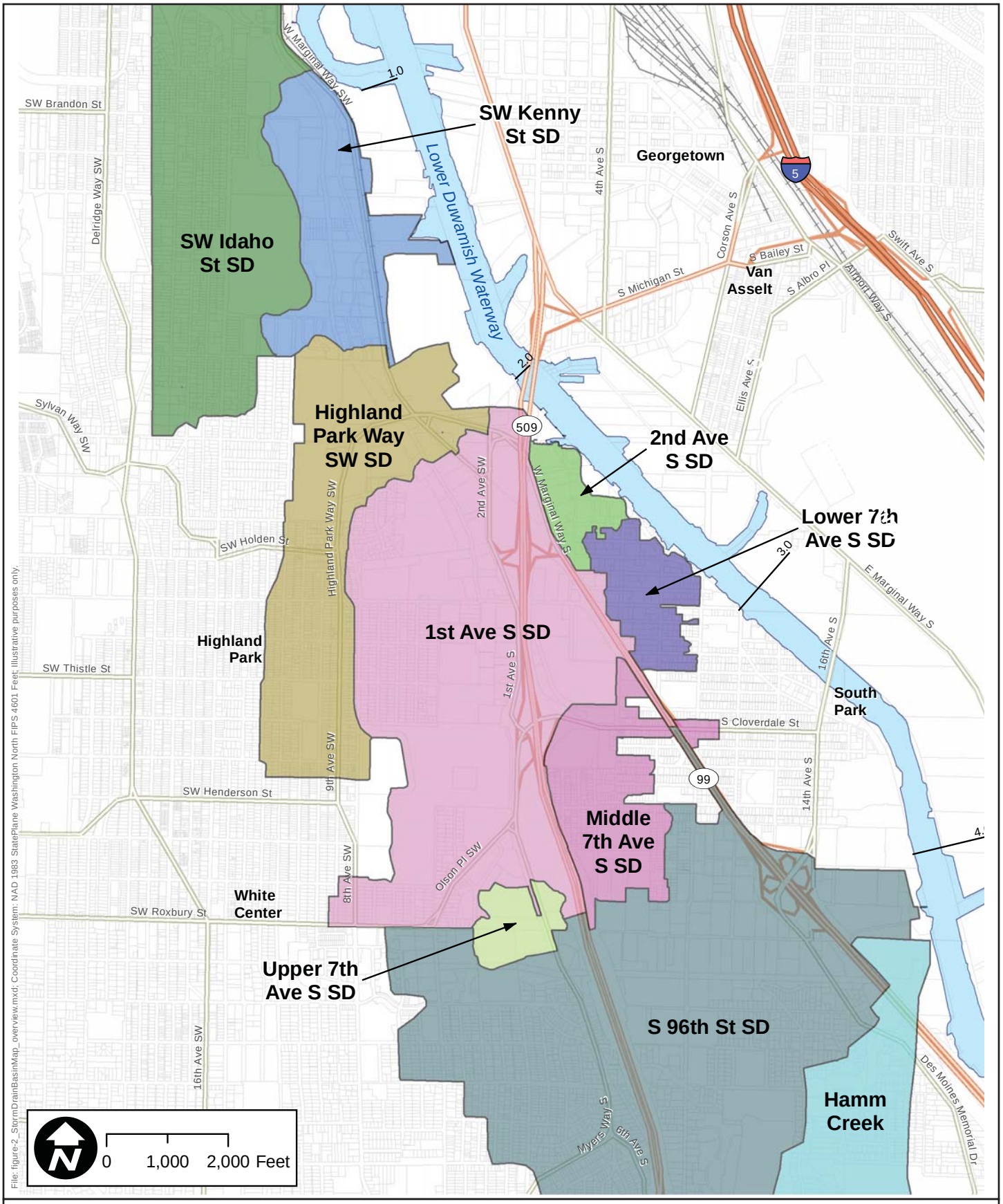


Figure 1. Lower Duwamish Waterway Source Control Areas

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



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State of Washington

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

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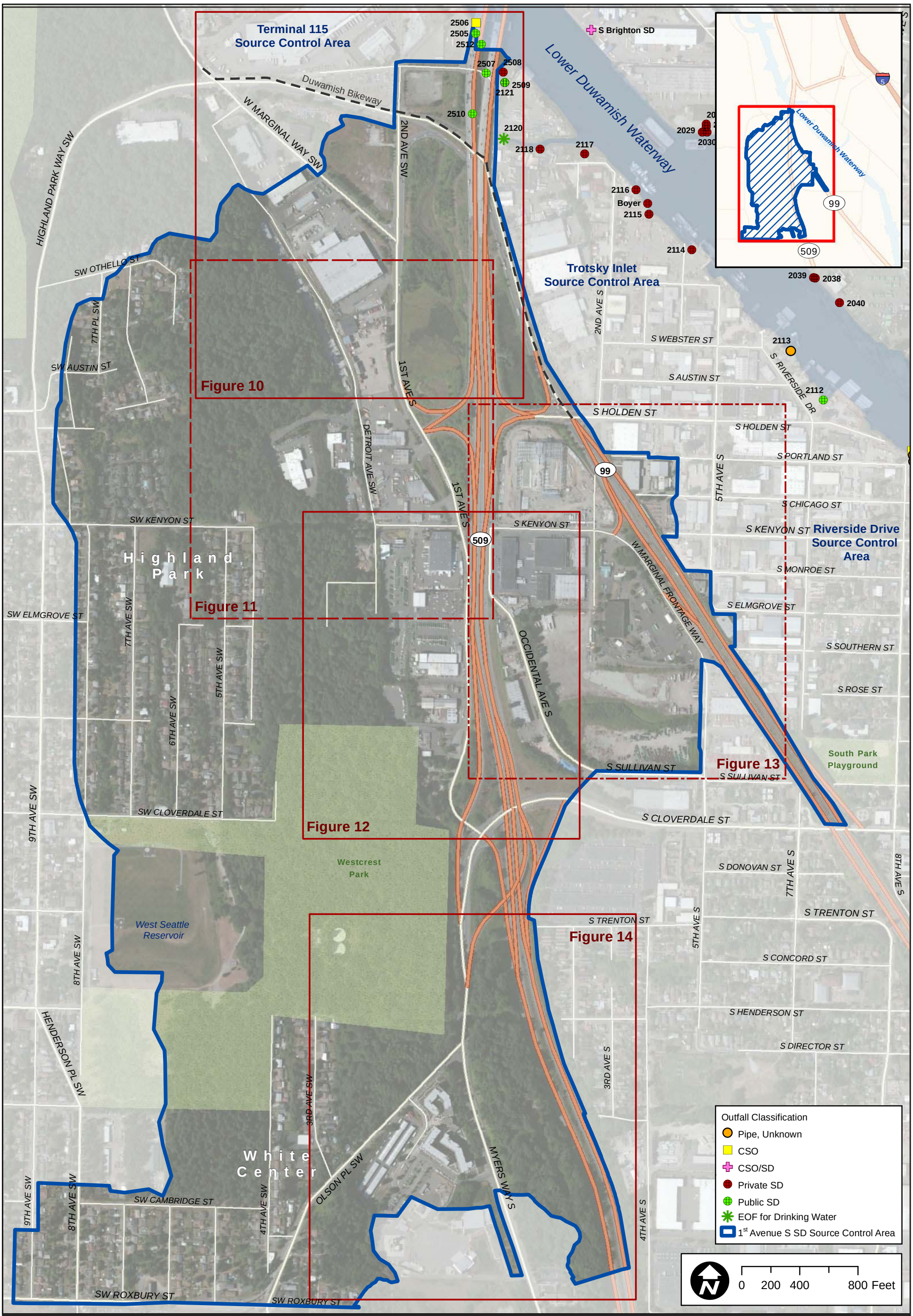

Figure 3. 1st Avenue S SD Source Control Area

Source: Washington State Coastal Atlas (https://fortress.wa.gov/ecy/coastalatlas/)

Source: Richard Thomas, Washington State Department of Ecology

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Figure 4. Shoreline Near 1st Avenue S SD

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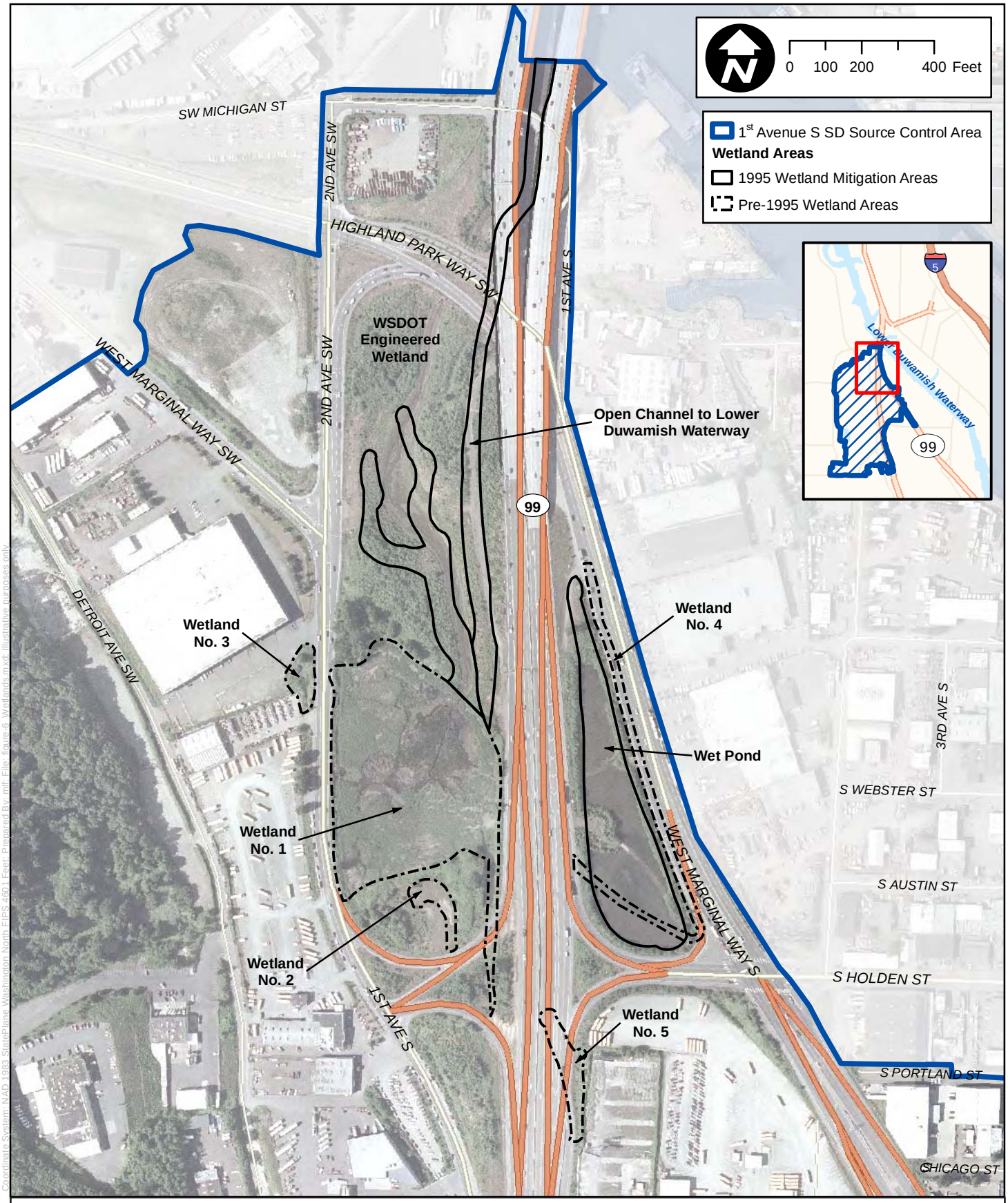

Coordinate System: NAD 1983 StatePlane Washington North FIPS 4601 Feet. Prepared By: mlf. File: figure 5_Wetlands.mxd. Illustrative purposes only.

Adapted from: WSDOT 1994a

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Figure 5. 1st Avenue S SD Central Wetland Areas

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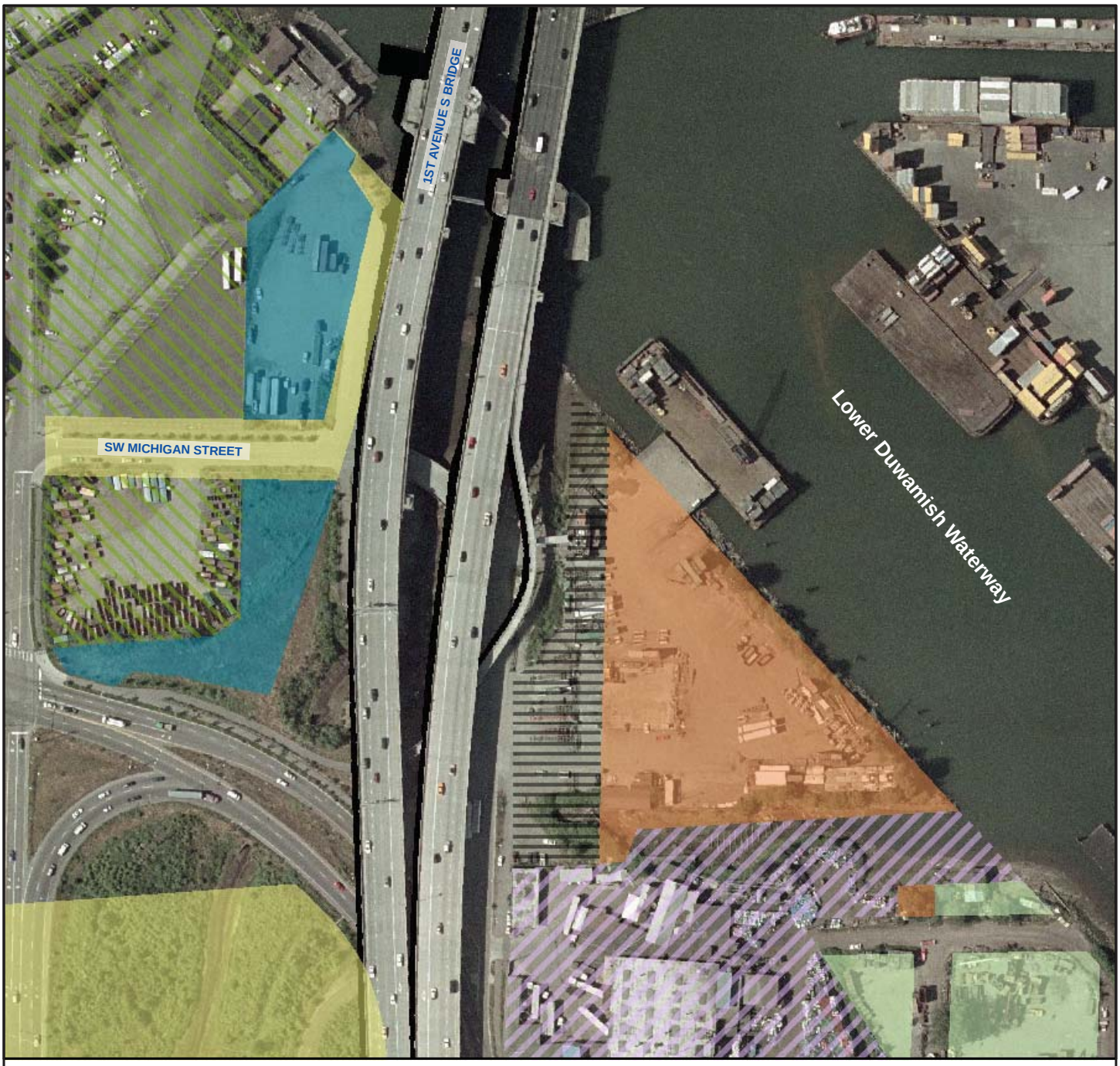

Parcel Ownership

- Douglas Management Company
- Seattle Department of Transportation
- State of Washington
- Boyer Towing
- Port of Seattle
- Trotsky, Herman & Jacqualine

Leased by Douglas Management Company From the State of Washington

Feet
0 62.5 125 250 375 500

WA State Plane North, NAD83

DEPARTMENT OF ECOLOGY State of Washington

Figure 6. Parcel Ownership in the Vicinity of the 1st Avenue S Bridge

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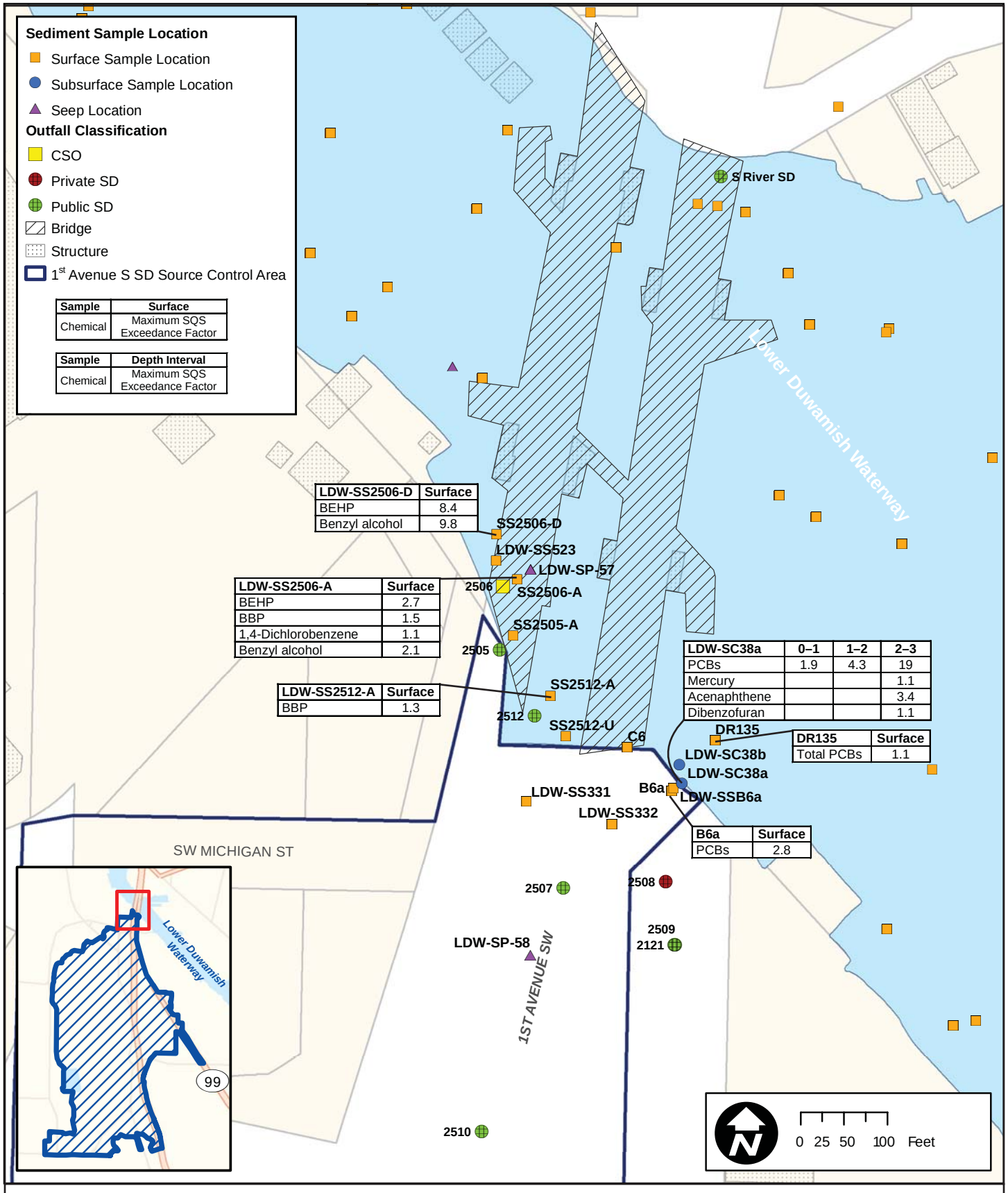

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Figure 7. Sediment Sample Locations Near the 1st Avenue S SD Source Control Area

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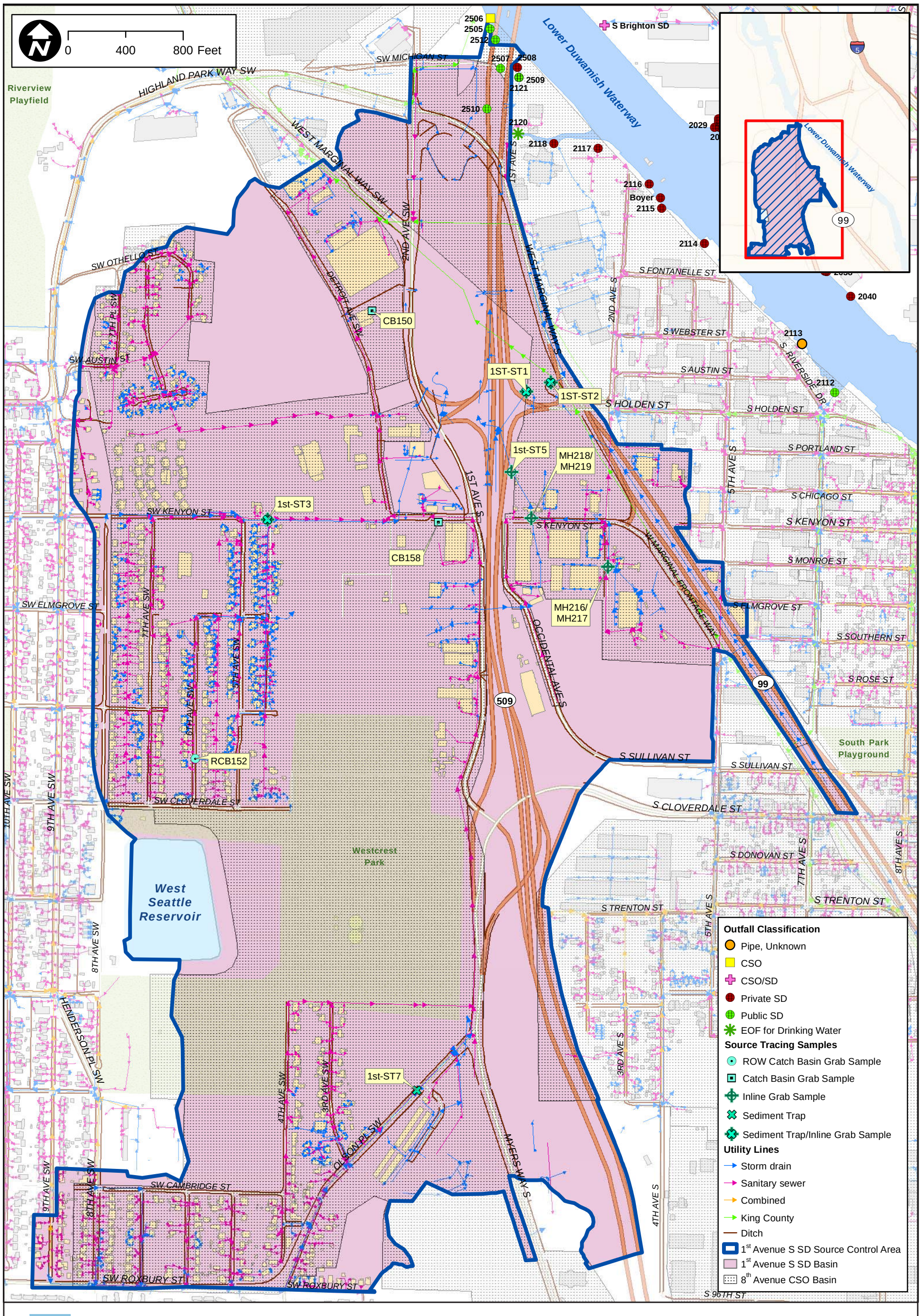

Figure 8. Storm Drain and Sanitary Sewer Lines in 1st Avenue S SD Source Control Area

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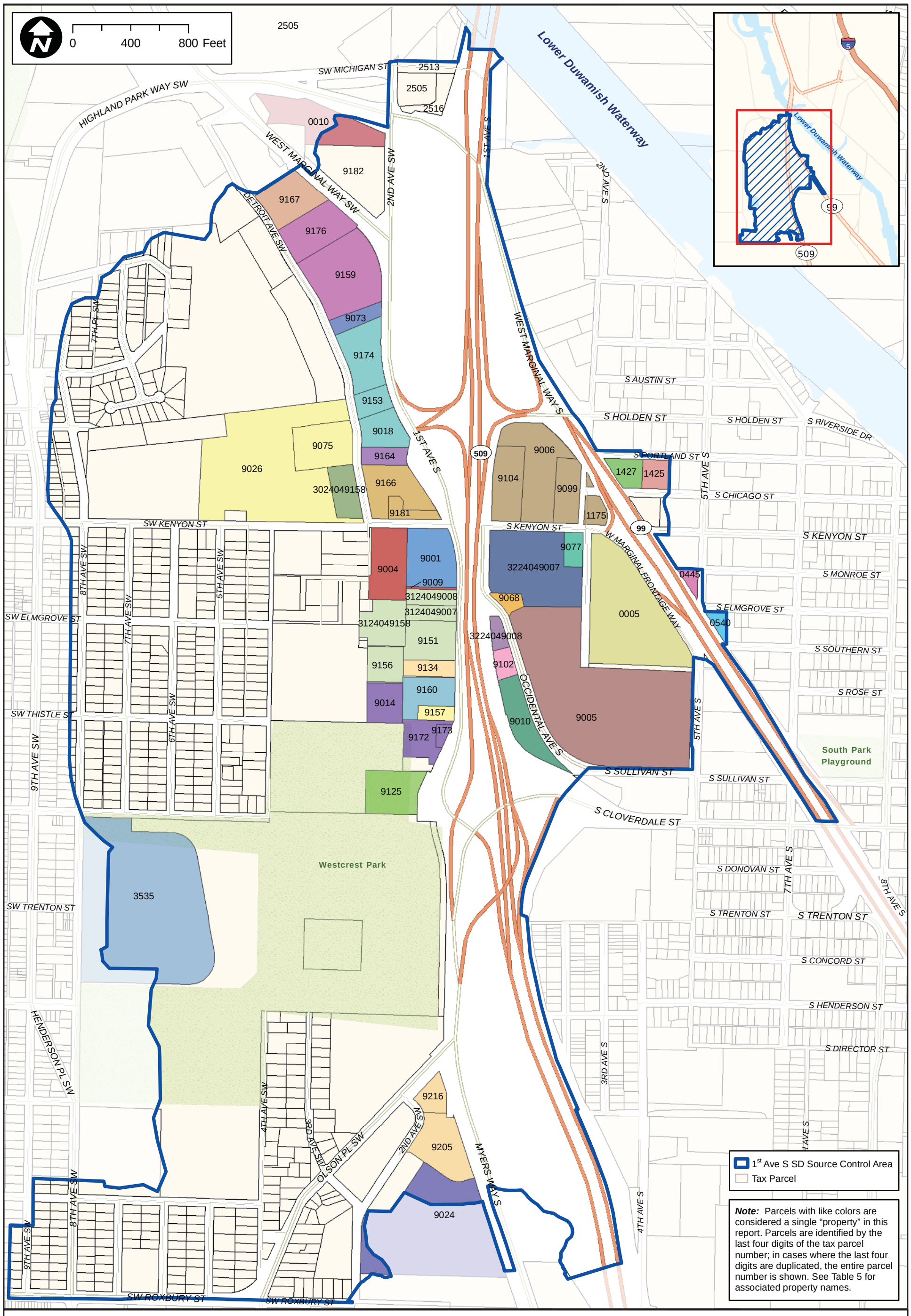

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Figure 9. Tax Parcels for Properties in the 1st Avenue S SD Source Control Area

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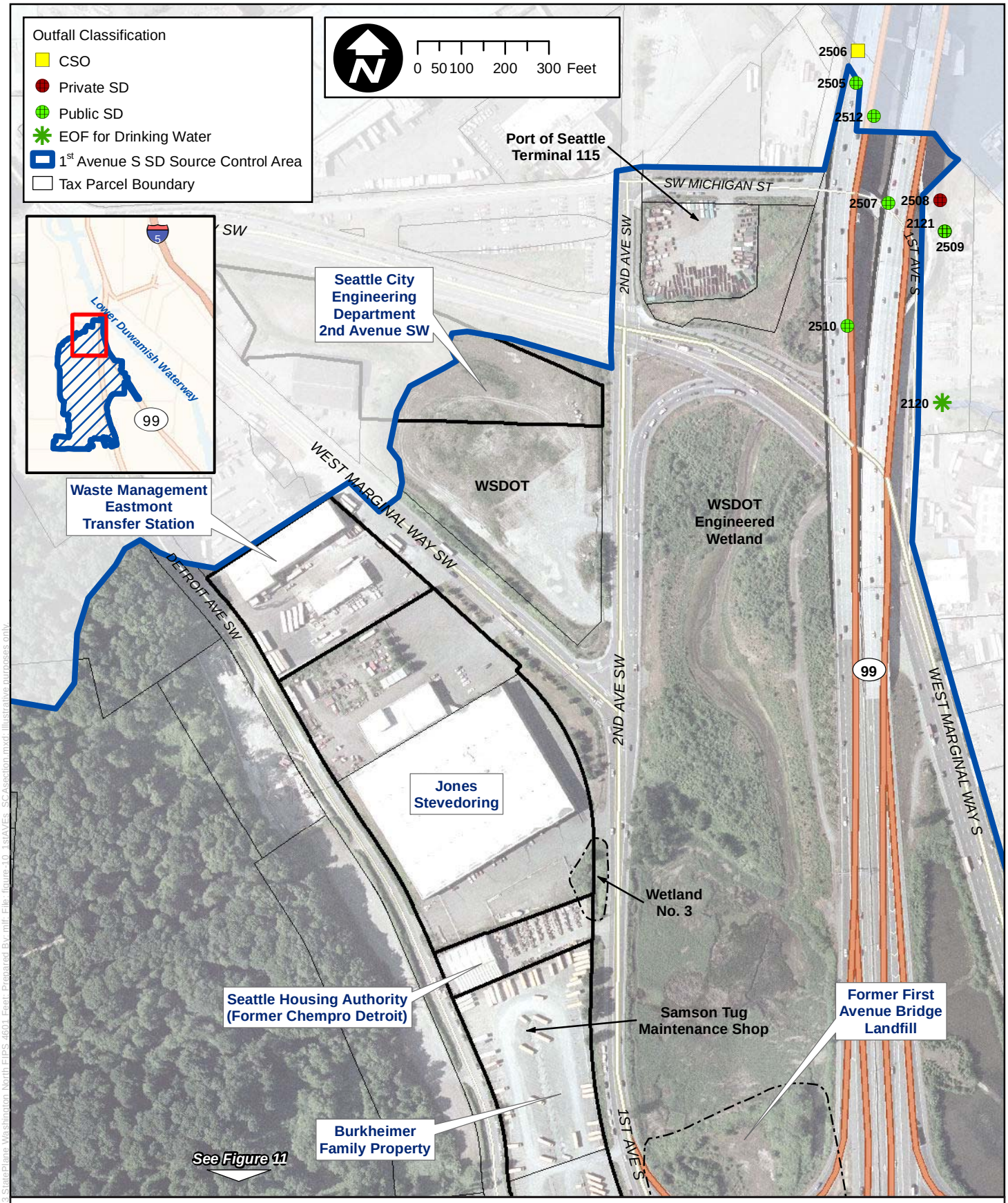

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Figure 10. 1st Avenue S SD Source Control Area (North Section)

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Coordinate System: NAD 1983 StatePlane Washington North FIPS 4601 Feet Prepared By mxd File: figure_10_1stAVES_SC_section.mxd Illustrative purposes only

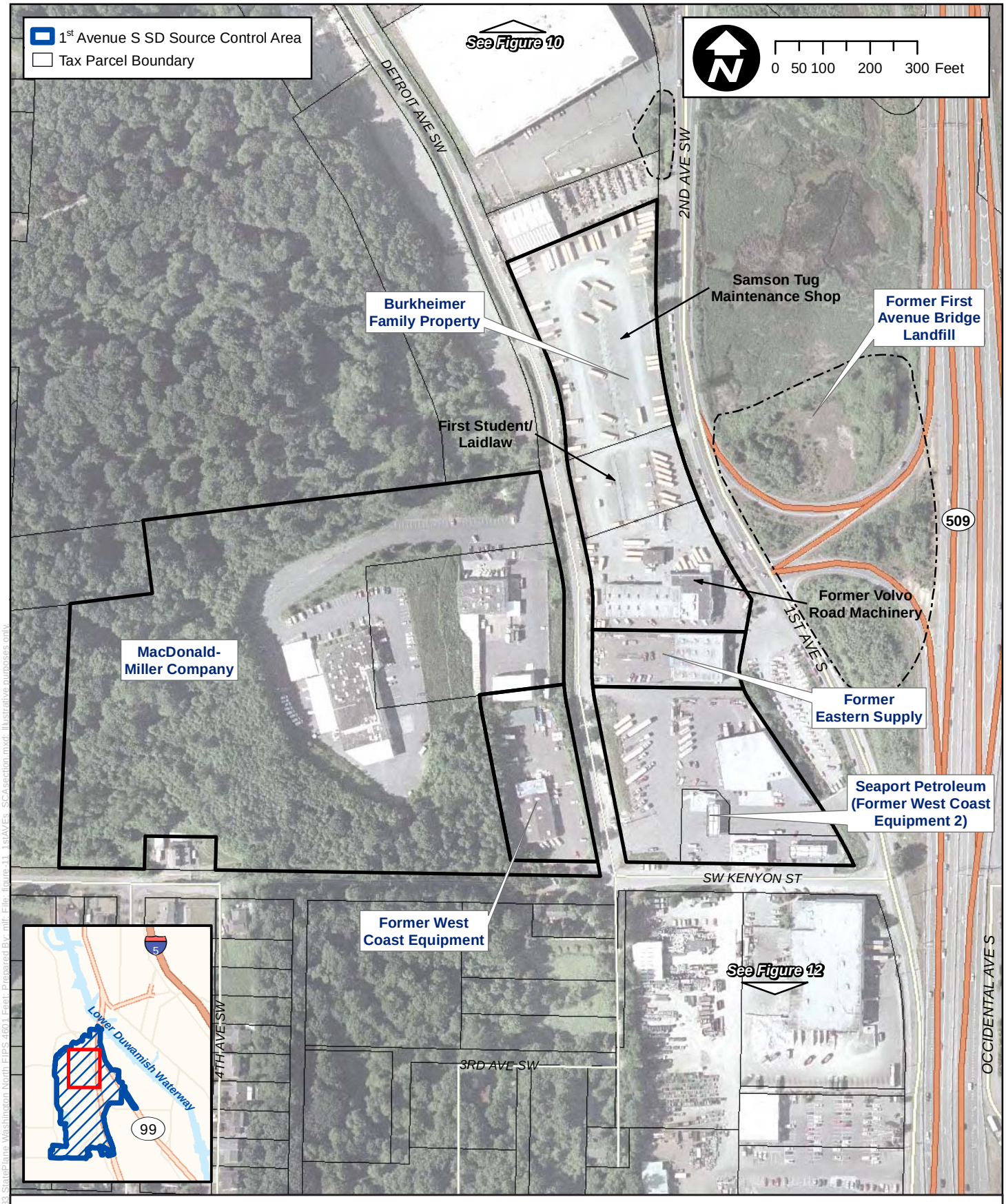

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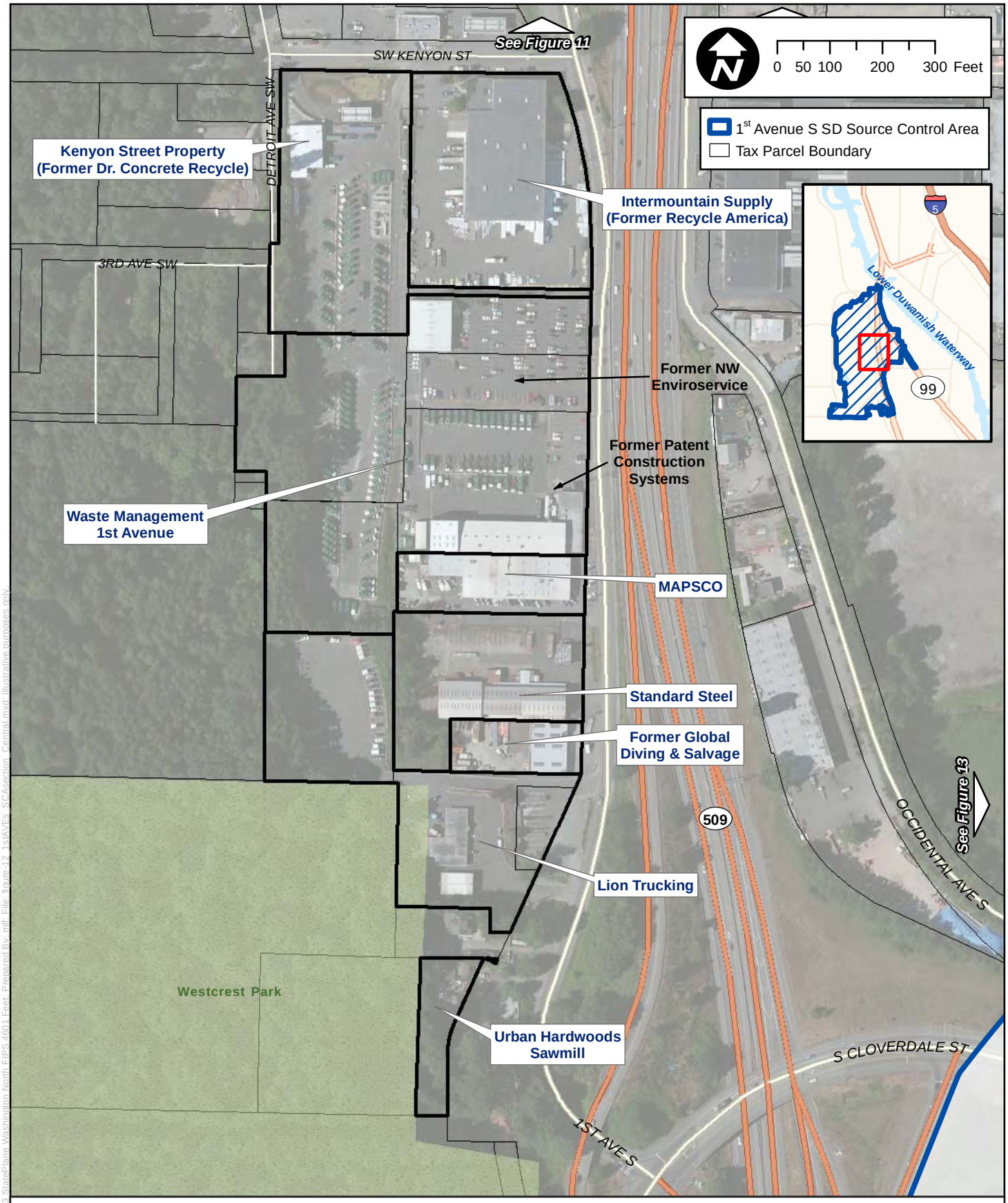
Figure 11. 1st Avenue S SD Source Control Area (West Section)

SAIC® From Science to Solutions

Coordinate System: NAD 1983 StatePlane Washington North FIPS 4601 Feet Prepared By: mlf File: figure 11_1stAVES_SCAsection.mxd Illustrative purposes only



Coordinate System: NAD 1983 StatePlane Washington North FIPS 4601 Feet Prepared by: mll File: figure-12_1stAVES_SCAsection_Central.mxd Illustrative purposes only

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Figure 12. 1st Avenue S SD Source Control Area (Central Section)

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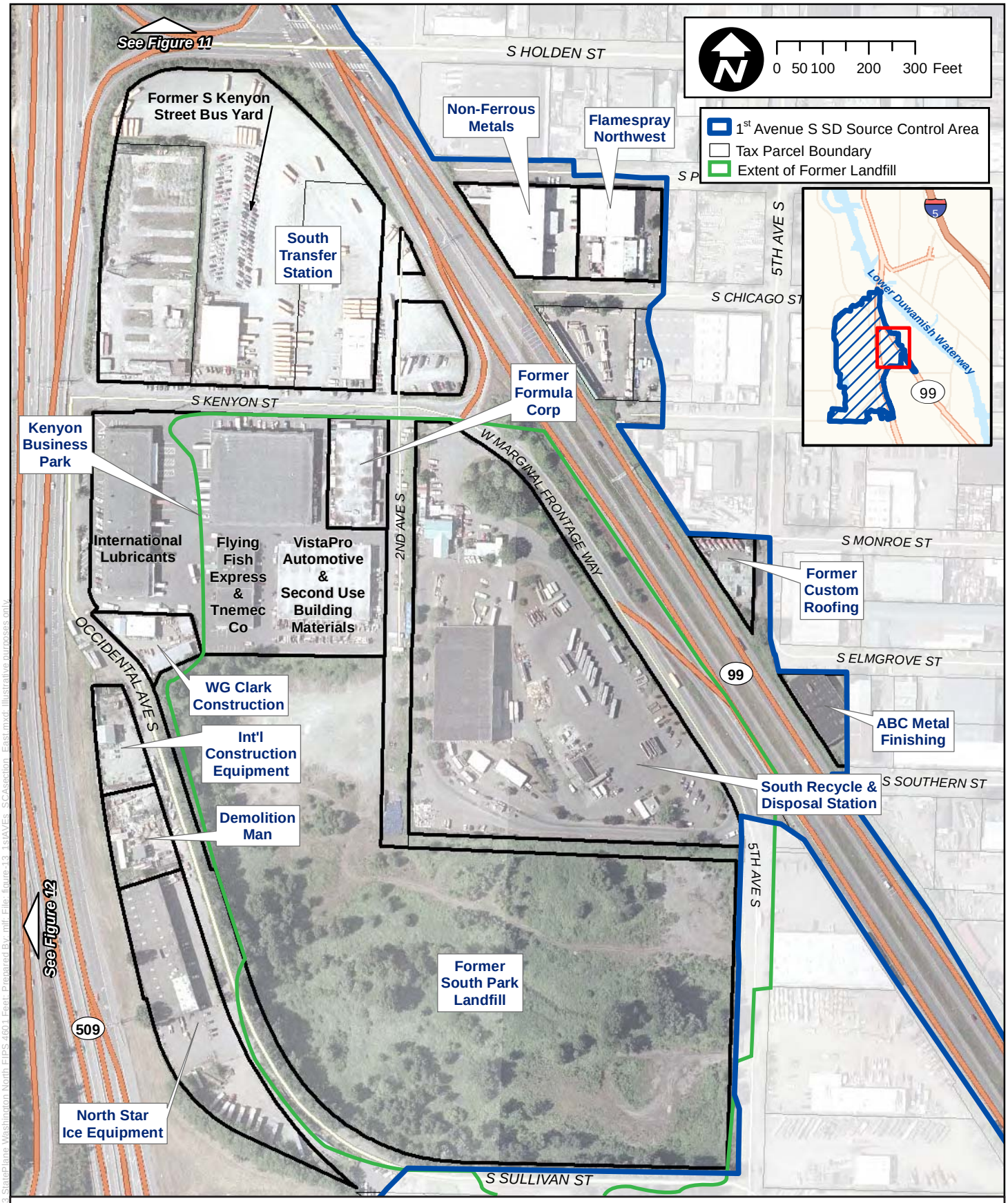

Coordinate System: NAD 1983 StatePlane Washington North FIPS 4601 Feet Prepared by: mll File: figure 13_1stAVES_SCAsection_East.mxd Illustrative purposes only

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Figure 13. 1st Avenue S SD Source Control Area (East Section)

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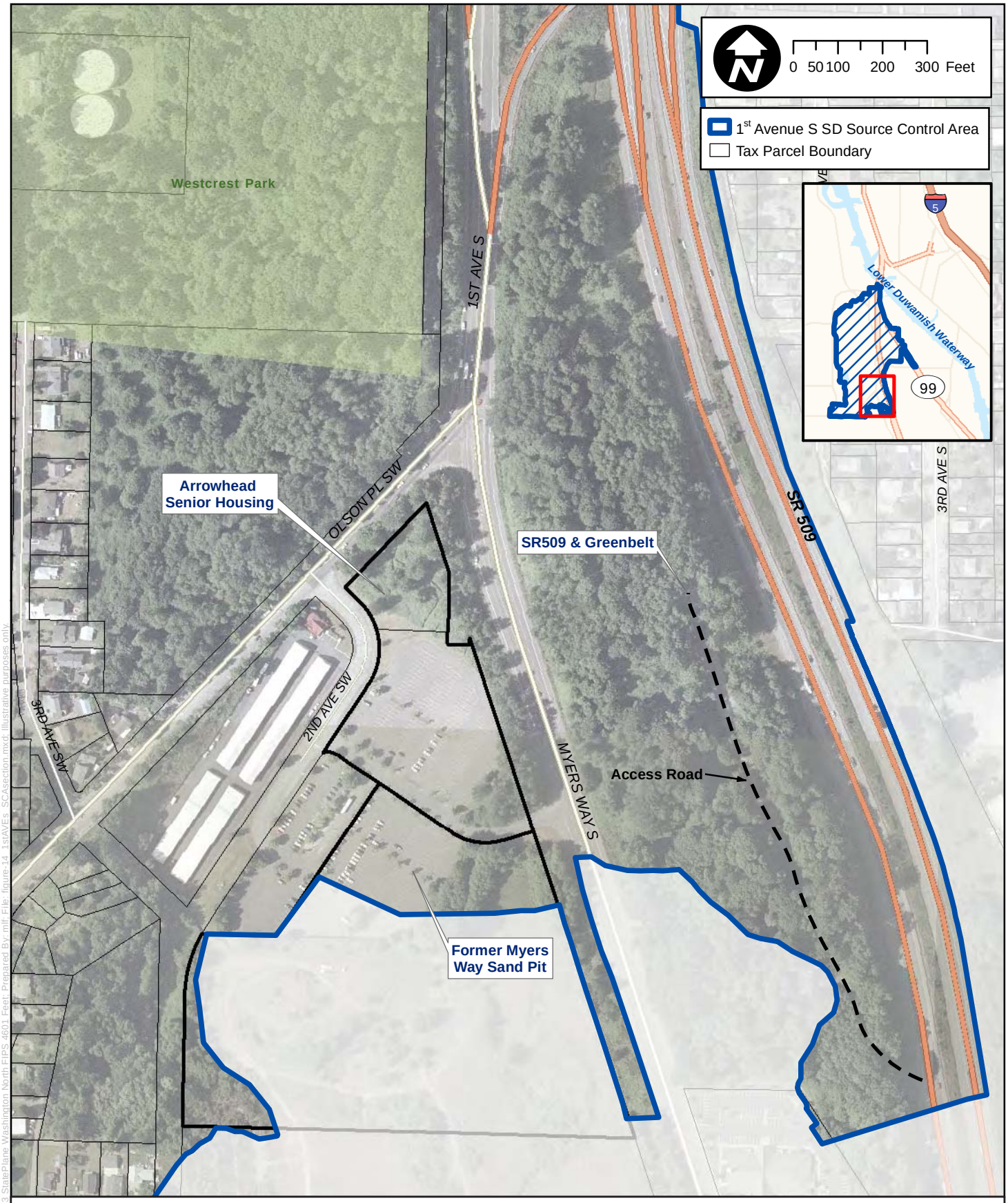

Coordinate System: NAD 1983 StatePlane Washington North FIPS 4601 Feet Prepared By mxd File: figure-14_1stAVEs_SCAsection.mxd Illustrative purposes only

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Figure 14. 1st Avenue S SD Source Control Area (South Section)

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