Lower Duwamish Waterway Source Control Status Report 2003 to June 2007

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Lower Duwamish Waterway Source Control Status Report 2003 to June 2007

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Executive Summary

This report summarizes source control activities conducted by the Lower Duwamish Waterway (LDW) Source Control Work Group between 2003 and June 2007. It provides an overview of the LDW site, the strategy for controlling sources of pollutants to the LDW, the process for developing Source Control Action Plans (SCAPs), the methods and process for implementing the SCAPs, issues associated with permitted discharges, and a summary of source control actions conducted since 2003.

Introduction

The Lower Duwamish Waterway is the downstream portion of the Duwamish River, extending 5.5 miles from the southern tip of Harbor Island to just south of the Norfolk Combined Sewer Overflow (CSO). Historical and current uses of the site and adjacent uplands include cargo handling, marine construction, paper and metals fabrication, food processing, marinas, and manufacturing of boats, concrete, and airplane parts.

The chemical contamination in the LDW has been recognized since the 1970s. The U.S. Environmental Protection Agency (EPA) added the LDW to its National Priorities List in September 2001. The Washington Department of Ecology (Ecology) added the site to the Washington State Hazardous Sites List in February 2002.

A Memorandum of Understanding (MOU) between EPA and Ecology divides responsibilities for the site. EPA is the lead agency for the sediment Remedial Investigation and Feasibility Study (RI/FS). Ecology is the lead agency for source control issues and works with the city of Seattle, King County, the Port of Seattle, the city of Tukwila, and EPA. These agencies form the LDW Source Control Work Group (SCWG).

Developing Source Control Action Plans

Source control is the process of finding and then stopping or reducing releases of pollution to the waterway. The goal of the LDW source control effort is to minimize the potential for contamination of sediments, and to reduce the chance of recontaminating sediments that have been cleaned up.

The LDW source control strategy relies on area-specific SCAPs. Each plan begins with an identified area of contaminated sediments that needs or may need cleanup. Potential sources of contamination are identified and evaluated. The SCAP outlines what additional information is needed and actions to be taken to control these sources.

The Phase 1 RI used existing information to identify seven areas for sediment cleanup. Using data collected during Phase 2 of the RI, Ecology and EPA identified eight more areas that may need cleanup. Ecology has published four SCAPs and expects to complete six more by June 2009.

Source Control Implementation

Source control activities are designed to address both on-going and future sources of pollution to the LDW. The three main LDW source control activities are business inspections, source tracing, and upland site assessment and cleanup.

> ***Business inspections*** ensure proper material handling and pollution prevention practices, and compliance with permits and municipal codes. Over 70 percent of the businesses inspected to date required actions to either control a discharge or to reduce the potential for future discharges to the LDW. Inspections are also used to help businesses find ways of reducing or eliminating hazardous materials from their operations. A program of recurring inspections is needed to ensure continued compliance. Ecology's Urban Waters Initiative will provide dedicated Ecology staff to pursue source control inspections in the LDW drainage basin. The initiative also provides funding for local governments to hire a source control specialist to assist in this effort. These new staff will integrate their efforts with the existing Seattle/King County inspection program.
>
> ***Source tracing*** involves the collection of solids samples from storm drains and catch basins. The analysis of these samples helps identify problems at a facility that cannot be seen during an inspection. Source tracing samples have identified sites with polychlorinated biphenyls (PCBs) in soils and building materials (such as paint and caulk). The number of source tracing samples collected will expand as business inspections begin in additional areas draining to the LDW. Ecology's Urban Waters Initiative includes funding for source tracing; this funding will supplement the efforts of the SCWG.
>
> ***Upland site assessment and cleanup*** identifies contaminated properties that are or may be a source of pollution to the LDW. Where there is evidence that a site is an actual or potential source, a legal order from Ecology or EPA is used to require characterization of the nature and extent of contamination and to develop a plan to clean up the site. The cleanup of contaminated properties typically requires significant time and resources.

Based on information gathered while developing SCAPs, Ecology prepared a long-term projection for implementing source control. The projection depends on a number of assumptions. A key assumption is that cleanup of contaminated upland sites is a limiting factor for river-wide source control. Another assumption is that releases to the sediments can be stopped or reduced through interim cleanup actions before each upland site is completely cleaned up. Assuming that source control is achieved using interim cleanup actions and with the funding and staff available as of May 2007, the projection shows that source control from all of the potentially contaminated upland sites could be completed by 2021.

The level of funding and number of Ecology staff dedicated to managing contaminated upland sites was changing as this document went to print. Expected increases in staff and funding will allow Ecology to work toward Governor Gregoire's goal of cleaning up Puget Sound by 2020. As staff and resources are added, source control at contaminated upland sites that affect the LDW will occur sooner than predicted in this report. Ecology will update this projection in the next status report.

While source control at all upland sites affecting the LDW may not be completed for many years, sediment cleanup can begin in areas where most sources have been controlled to the maximum extent practicable. Where and when sediment cleanups begin will depend on many factors. These include the location of the sediment cleanup area and upland sources, the nature of the sources, the nature of the contaminants, the ability of responsible parties to plan and implement cleanup, the method of sediment cleanup, and sediment transport considerations. Ecology and EPA will continue to coordinate source control and cleanup activities on the LDW.

Implementation Issues

In 2004, the city of Seattle conducted a comprehensive survey of outfall or outfall-like structures terminating in the LDW. The survey identified 211 active outfalls or structures. Of these there are 61 municipal outfalls, 111 private outfalls, and 39 listed as "unknown."

The municipal outfalls are owned by the city of Seattle, King County, the Port of Seattle, the Washington State Department of Transportation and the city of Tukwila. The Seattle, King County, Port of Seattle, and Washington State Department of Transportation outfalls are covered by the Phase 1 National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater Permit. The city of Tukwila is subject to the Phase 2 NPDES Municipal Stormwater Permit.

The city of Seattle has two combined sewer overflows (CSOs) in the LDW. The City is currently evaluating the status of its CSO projects and expects that these CSOs will be limited to an average of one untreated discharge per overflow structure per year by 2020.

King County has nine CSOs in the LDW. King County's CSO Control Program gives the highest priority to projects near bathing beaches with recreational uses such as swimming, where direct contact with the water occurs. The last of the CSO control projects along the Duwamish River will be completed by 2027.

The city of Seattle and King County formed a joint program to conduct business inspections throughout the 20,000 acres of the LDW drainage. The joint LDW city-county source control program initiated in 2003 is an aggressive effort to reduce the amount of pollution entering public storm drains and sanitary/combined sewer systems that discharge to the LDW. These efforts generally go beyond what is required under the NPDES program. In particular, the level of source tracing and characterization being conducted through the joint program far exceeds what is required by the NPDES program.

Despite the extensive inspections and sampling to trace sources of contaminants in some outfalls, only a few discrete sources of PCBs and no discrete, controllable sources of phthalates have been identified. Source tracing to find controllable areas of contamination continues throughout the greater LDW drainage.

The private outfalls generally carry flow from roof drains and stormwater to the river. As of July 2007, Ecology had issued 113 NPDES permits for businesses within the LDW drainage basin. While the permits limit and control the discharge of a number of pollutants, they do not typically address the contaminants of concern for LDW sediments, such as PCBs, phthalates, arsenic,

mercury and polycyclic aromatic hydrocarbons (PAHs). This issue is subject to a continuing dialogue within Ecology and with other agencies

The 39 "unknowns" are pipes where city inspectors observed some amount of flow. While some of the pipes may have been abandoned during redevelopment, others may be associated with facilities that do not need a discharge permit. Some of these may be potential sources from as-yet unidentified properties. These pipes will need to be evaluated as potential sources.

While significant progress has been made in identifying and controlling sources, there is much more that needs to be done. Business inspections, source tracing and upland site investigation and cleanup are all essential elements in identifying and controlling new and old sources of contamination. As each new SCAP is developed, the list of potential sources that must be addressed grows longer. The nature of these sources and the resources available to address them will govern the pace of source control.

Source Control Activities

Source control activities conducted between 2003 and June 2007 are described in detail in this report; key activities for each source control area are listed below.

- Early Action Area 1 (EAA-1): Duwamish/Diagonal
  - Ecology completed a SCAP in December 2004.
  - A total of 1,009 business inspections were conducted; by December 2006, all but seven sites had achieved compliance.
  - Seven rounds of sediment trap samples were collected.
  - Accumulated sediment was removed from 5,900 lineal feet of drain lines by Seattle Public Utilities (SPU).
  - Soil and groundwater investigations were conducted at Terminal 106 SE and Terminal 106 NE by the Port of Seattle.
  - Soil and groundwater at Terminal 108 were sampled by the Port of Seattle.
- EAA-2: Trotsky Property
  - Ecology completed a SCAP in June 2007.
  - SPU is currently conducting inspections at 16 businesses.
  - Two inline storm drain sediment samples were collected.
  - Ecology sampled soil, groundwater, sediment, and seeps at the Trotsky property to characterize current contaminant concentrations.
- EAA-3: Slip 4
  - Ecology prepared a SCAP in July 2006.
  - A total of 57 businesses were inspected; all but one has achieved compliance.
  - As of December 2006, four rounds of sediment trap samples have been collected from 10 locations.

- SPU investigated the Georgetown Flume to evaluate the condition of the flume and identify ongoing discharges to the flume; SPU is finalizing plans to demolish, fill, and/or slip-line the flume.
- Seattle City Light conducted a preliminary soil investigation at the Georgetown Steam Plant (GTSP) site.
- Seattle City Light conducted a limited cleanup at the GTSP to control erosion and offsite migration of PCB-contaminated soil near the former low-lying area.
- Boeing conducted extensive sampling of catch basin, oil/water separator, manhole, and in-line solids at North Boeing Field (NBF) and cleaned out over 1,700 feet of the north drain line (where the highest PCB concentrations have been detected).
- Boeing continues to collect samples, clean storm drain structures and lines, and replace drain lines in an effort to reduce PCB concentrations in the storm drain system.
- Boeing removed PCB-contaminated joint sealant material with concentrations above 50 mg/kg.
- Boeing conducted a soil investigation at NBF which included drilling of 38 soil borings in the northern portion of the site.
- Ecology prepared a report summarizing existing information about the GTSP and NBF, including identification of potential sources of contaminants and a summary of data gaps.
- Ecology prepared a report evaluating the potential for Slip 4 sediment recontamination via groundwater discharge from the adjacent Crowley and First South Properties.
- Ecology reviewed existing information and evaluated the potential for Slip 4 sediment contamination associated with seven upland sites.
- King County collected sediment samples from eight oil/water separators which drain to Slip 4 from the King County International Airport (KCIA).
- Ecology is negotiating an Agreed Order and scope of work with the city of Seattle, King County, and Boeing to investigate and control sources of PCBs and other contaminants to Slip 4.

- EAA-4: Boeing Plant 2/Jorgensen Forge
  - Ecology is currently preparing a SCAP.
  - Boeing conducted a stormwater survey, including sampling of storm drain solids in eight stormwater lines at Plant 2; based on the survey results, Boeing decommissioned drain lines X and Y and installed a new stormwater collection system and treatment vault.
  - Boeing also initiated a focused catch basin solids sampling program.
  - Boeing conducted an investigation of PCBs near a former Seattle City Light substation in the southwest corner of Plant 2, plugged manholes to prevent discharge of contaminated solids, and plans to excavate PCB-contaminated soil and remove storm drain lines in the area.
  - Ecology has negotiated a draft Agreed Order with Jorgensen Forge which requires Jorgensen to conduct a source control investigation.
- EAA-5: Terminal 117
  - Ecology completed a SCAP in July 2005.

- The city of Seattle removed PCB-contaminated gravel in the street shoulders along portions of Dallas Avenue S., graded and paved roads in the vicinity, and installed a temporary stormwater collection and treatment system to contain PCBs present in the road rights-of-way.
- The city of Seattle conducted cleanup at three additional properties and the west edge of 16th Avenue S., including removal of 790 tons of PCB-contaminated soil.
- The Port of Seattle removed an additional 3,100 tons of PCB-contaminated soil from the upland portions of the Terminal 117 property; excavated areas were lined with geotextile fabric, backfilled, and paved.
- At Basin Oil, located to the west of Terminal 117, a silt fence was installed along the east side of the property to trap sediment in runoff that flows off the site.
- In partnership with the city of Seattle and under agreement with EPA, the Port is developing plans to conduct an early action cleanup to address elevated PCB concentrations in adjacent sediment and bank areas of the LDW, as well as elevated PCB concentration in upland soil.
- Ecology prepared a report summarizing existing information and data gaps related to the former A&B Barrel Company, located at what is now South Park Marina. In addition, Ecology prepared a Site Reconnaissance Plan for sampling of soil and groundwater at the site.

- EAA-6: Boeing Isaacson/Central KCIA
  - Ecology will prepare a SCAP in 2007.
  - A total of 34 businesses on the portion of KCIA that drains to EAA-6 were inspected; by June 2005, all but one had achieved compliance.
  - One catch basin sediment sample was collected from airport property, and KCIA has been asked to clean out all catch basins.

- EAA-7: Norfolk CSO/Storm Drain (SD)
  - Ecology is currently preparing a SCAP for this area.
  - Approximately 40 businesses located in the Seattle portion of the Norfolk storm drain system were inspected; all are currently in compliance.
  - In-line sediment samples were collected at seven locations within the storm drain system.
  - King County completed construction of the Henderson/Norfolk CSO Treatment Facility to prevent the discharge of CSO to surface waters during all but the most severe storms.
  - SPU is developing a capital improvement project to correct drainage problems in the Norfolk-Martin Luther King, Jr. Way S. subbasin; accumulated sediment was removed from the piped section of the drainage system and 2,200 lineal feet of pipe was jetted and cleaned in 2005.
  - Boeing pressure-cleaned a portion of the south storm drain system at the Boeing Developmental Center, and installed a settling unit to help stop solids from reaching the LDW in 2003.
  - At the Boeing Military Flight Center, Boeing conducted an investigation to characterize the concrete expansion joint sealant; joint material that contained PCBs above 50 mg/kg was removed.

- Glacier Bay Source Control Area
  - Ecology is currently preparing a SCAP for this area.
  - As of December 2006, 21 business inspections had been conducted; all but one facility had achieved compliance.
  - Catch basin sediment samples were collected by SPU from three locations on West Marginal Way S.
  - Duwamish Shipyard, which ceased operations in April 2007, conducted a preliminary site investigation.
  - Ecology directed Duwamish Shipyard to clean out catch basins and storm drain lines, add additional groundwater monitoring wells, and conduct additional sampling and sediment evaluations.
  - Ecology is drafting an Agreed Order to require cleanup by Duwamish Shipyard. Negotiations are expected to begin in late Fall 2007.

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List of Acronyms

BDC	Boeing Developmental Center
BEHP	bis(2-ethylhexyl)phthalate
Bgs	below ground surface
BMP	best management practice
CB	catch basin
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
COC	chemical of concern
cPAH	carcinogenic polycyclic aromatic hydrocarbon
CSCSL	Confirmed and Suspected Contaminated Sites List
CSL	Cleanup Screening Level
CSO	combined sewer overflow
DSOA	Duwamish Sediment Other Area
DW	dry weight
EAA	Early Action Area
E&E	Ecology and Environment, Inc.
EBDRP	Elliot Bay/Duwamish Restoration Program
Ecology	Washington State Department of Ecology
EE/CA	Engineering Evaluation/Cost Analysis
EOF	emergency overflow
EPA	U.S. Environmental Protection Agency
FS	feasibility study
GTSP	Georgetown Steam Plant
GSA	General Services Administration
HPAH	high molecular weight polycyclic aromatic hydrocarbon
KCIA	King County International Airport
KCIW	King County Industrial Waste
LDW	Lower Duwamish Waterway
LDWG	Lower Duwamish Waterway Group
LUST	leaking underground storage tank
MFC	Military Flight Center
MH	manhole
MOU	Memorandum of Understanding
MTCA	Model Toxics Control Act
NBF	North Boeing Field
NFA	no further action
NPDES	National Pollutant Discharge Elimination System
OC	organic carbon
OWS	oil/water separator
PAH	polycyclic aromatic hydrocarbon
PCB	polychlorinated biphenyl
PCE	tetrachloroethylene
PLP	potentially liable party
PPA	potential priority area
PRG	Preliminary Remediation Goal

List of Acronyms (Continued)

PSCAA	Puget Sound Clean Air Agency
RCRA	Resource Conservation and Recovery Act
RCW	Revised Code of Washington
RI	Remedial Investigation
RI/FS	Remedial Investigation/Feasibility Study
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
SMC	Seattle Municipal Code
SMS	Sediment Management Standards
SPU	Seattle Public Utilities
SQS	Sediment Quality Standard
SVOC	semivolatile organic compound
SWPPP	Stormwater Pollution Prevention Plan
T2A	Tier 2 Area
TCE	trichloroethylene
TCLP	Toxicity Characteristic Leaching Procedure
TPH	total petroleum hydrocarbons
TOC	total organic carbon
TSCA	Toxic Substances Control Act
UST	underground storage tank
VOC	volatile organic compound

1.0 Introduction

The purpose of this document is to summarize the status of Lower Duwamish Waterway (LDW) source control efforts from 2003 to June 2007. The first section presents background information on the LDW site, the source control strategy that is being implemented, and the roles and responsibilities of the public agencies responsible for source control. Section 2 describes the process for developing Source Control Action Plans (SCAPs) for known or potential sediment cleanup areas. Section 3 describes source control methods and the process for implementing SCAPs, and provides an overview of source control activities being conducted for the entire LDW. Section 4 discusses implementation issues associated with permitted stormwater discharges to the waterway. Section 5 describes the Tier One source control areas, including a description of potential contaminant sources and a summary of source control actions that have been conducted since 2003. Sections 6 and 7 describe Tier Two and Three source control areas and the status of source control activities at these locations. Section 8 presents a list of references.

1.1 Lower Duwamish Waterway Site

The LDW is the downstream portion of the Duwamish River, which extends from the southern tip of Harbor Island to just south of the Norfolk Combined Sewer Overflow (CSO) (Figure 1). Beginning in 1913, the Duwamish River was straightened into the Duwamish Waterway to facilitate navigation and industrial development. The shoreline along most of the LDW has been developed for industrial and commercial operations and serves as a major shipping route for bulk and containerized cargo. Shoreline features include constructed bulkheads, piers, wharves, buildings extended over the water, and steeply sloped banks armored with riprap or other fill materials (Weston 1999). Most of the upland areas adjacent to the LDW have been heavily industrialized for many years. Historical and current commercial and industrial operations include cargo handling and storage, marine construction, boat manufacturing, marina operations, concrete manufacturing, paper and metals fabrication, food processing, and airplane parts manufacturing (Windward 2003a). 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 (Weston 1999).

The presence of chemical contamination in the LDW has been recognized since the 1970s (Windward 2003a). The U.S. Environmental Protection Agency (EPA) investigated sediments in the LDW in 1988 as part of the Elliott Bay Action Program, and identified a number of sampling stations that exhibited high levels of contamination. Problem chemicals included metals, polycyclic aromatic hydrocarbons (PAHs), polychlorinated biphenyls (PCBs), phthalates, and other organic compounds. In 1999, EPA completed a Superfund Site Assessment study of approximately 6 miles of the LDW. Chemicals of concern in the waterway included PCBs, PAHs, phthalates, mercury, and other metals. These chemicals may pose a threat to people, fish, and wildlife.

EPA and the Washington State Department of Ecology (Ecology) signed an agreement in December 2000 with King County, the Port of Seattle, the city of Seattle, and the Boeing Company, collectively identified as the Lower Duwamish Waterway Group, or LDWG. Under

the agreement, the LDWG is conducting a Remedial Investigation/Feasibility Study (RI/FS) to assess potential risks to human health and the environment and to evaluate cleanup alternatives.

EPA added the Lower Duwamish Waterway to its National Priorities List on September 13, 2001. 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.

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

The RI for the LDW site is being conducted in two phases. Results of Phase 1 were published in July 2003. The Phase 1 RI used existing data to provide an understanding of the nature and extent of chemical distributions in LDW sediments, develop preliminary risk estimates, and identify candidate sites for early cleanup action within the LDW.

The *Technical Memorandum: Data Analysis and Candidate Site Identification*, issued in June 2003 (Windward 2003b), described seven candidate sites for early sediment cleanup action (Windward 2003b). The sites, known as Early Action Areas (EAAs), are listed below[1]:

- Area 1: Duwamish/Diagonal CSO and storm drain (SD), east side of the waterway (River Mile [RM] 0.4 to 0.6)[2]
- Area 2: RM 2.2, west side of the waterway, just south of the First Avenue S. bridge
- Area 3: Slip 4 (RM 2.8)
- Area 4: South of Slip 4, on the east side of the waterway, just offshore of Boeing Plant 2 and Jorgensen Forge properties (RM 2.9 to 3.7)
- Area 5: Terminal 117/Malarkey, west side of the waterway (approximately RM 3.6)
- Area 6: RM 3.8, east side of the waterway, and
- Area 7: Norfolk CSO, east side of the waterway (RM 4.9 to 5.5)

EPA and Ecology selected four of these sites for early action cleanups: Duwamish/Diagonal (EAA-1), Terminal 117 (EAA-5), Slip 4 (EAA-3), and Boeing Plant 2/Jorgensen Forge (EAA-4). If work has not started on the remaining three areas before EPA publishes its Record of Decision (ROD), they will be included in the larger, waterway-wide sediment cleanup.

[1] In this report, the seven candidate sites are referred to by the following designations:
Area 1 – EAA-1 (Duwamish/Diagonal)
Area 2 – EAA-2 (Trotsky)
Area 3 – EAA-3 (Slip 4)
Area 4 – EAA-4 (Boeing Plant 2/Jorgensen Forge)
Area 5 – EAA-5 (Terminal 117)
Area 6 – EAA-6 (Boeing Isaacson/Central KCIA)
Area 7 – EAA-7 (Norfolk CSO/SD)

[2] River miles are measured from the southern tip of Harbor Island.

The Phase 2 sediment RI is designed to fill critical data gaps identified in Phase 1 and to complete human health and ecological risk assessments. The Phase 2 sediment RI may identify additional sites for long-term cleanup action. A feasibility study is being developed to address cleanup options in the LDW.

Further information about the LDW can be found at EPA's LDW website: http://yosemite.epa.gov/r10/cleanup.nsf/sites/lduwamish and the LDWG website: http://www.ldwg.org.

1.2 Lower Duwamish Waterway Source Control Strategy

The LDW Source Control Strategy (Ecology 2004) describes the process for identifying source control issues and implementing effective controls for the LDW. The basic plan is to identify and manage sources of potential recontamination in coordination with sediment cleanups. The goal of the strategy is to minimize the potential for recontamination to levels exceeding the LDW sediment cleanup goals and the Sediment Management Standards (SMS; WAC 173-204). This will be achieved by using existing administrative and legal authorities to perform inspections and require necessary source control actions.

The Source Control Strategy involves developing and implementing a series of detailed, area-specific SCAPs. Each SCAP starts with an identified area of sediment contamination, beginning with the early action areas. SCAPs have been developed for EAA-1 (Duwamish/Diagonal), EAA-2, EAA-3 (Slip 4), and EAA-5 (Terminal 117). SCAPs for EAA-4 (Boeing Plant 2/Jorgensen Forge), EAA-7 (Norfolk CSO/SD), and Glacier Bay (T2A-3,4,5) are in draft and will be published by the end of 2007. SCAPs document what is known about the area, potential sources of recontamination, and actions to address them. Each SCAP is unique to a specific sediment area because the scope of source control for each sediment area varies. The success of this strategy depends on the coordination and cooperation of all public agencies with responsibility for source control in the LDW area. It also requires adequate staffing and funding of those agencies and prompt compliance by the businesses and property owners who must make changes or implement cleanup.

The focus of the Source Control Strategy is to control contamination affecting LDW sediments. It is based primarily on the principles of source control for sediment sites described in EPA's *Principles for Managing Contaminated Sediment Risks at Hazardous Waste Sites* (EPA 2002), and Ecology's SMS (WAC 173-204). The first principle is to control sources early, starting with identifying all ongoing sources to the site. EPA's ROD for the site will require that sources of sediment contamination to the entire site be evaluated, investigated, and controlled as necessary. Organizing source control work into specific SCAPs and prioritizing them based on anticipated sediment cleanups addresses the guidance and regulations and will be consistent with the EPA ROD.

The Source Control Strategy identifies four prioritized tiers of work, organized to manage source control in parallel with anticipated sediment cleanups. The tiers are:

- Tier 1: Source control associated with Early Action sediment cleanups,
- Tier 2: Source control associated with EAAs identified in Phase 1 and cleanup areas identified in Phase 2 of the sediment RI and EPA's ROD,
- Tier 3: Source control necessary to prevent future sediment contamination from basins that may not drain directly to an identified sediment cleanup area, and
- Tier 4: Source control as necessary to address any recontamination identified by post-cleanup monitoring of sediment cleanups.

Within any drainage area, some businesses move to other locations while new businesses move into the area. This alters the nature of industrial and commercial operations, and consequently the types of chemicals which could pose a threat of recontamination. Due to the difficulty in identifying and completely controlling all possible sources, including illegal dumping, it is important to recognize that recontamination may occur even with an aggressive source control program (Ecology 2004).

Ecology has begun revising the Source Control Strategy to address needed updates, including source control processes, project planning, and documentation and reporting activities.

The source control strategy can be found at Ecology's website:
http://www.ecy.wa.gov/programs/tcp/sites/lower_duwamish/source_control/sc.html.

Further information about Lower Duwamish Waterway source control can be found at Ecology's Lower Duwamish Source Controls website:
http://www.ecy.wa.gov/programs/tcp/sites/lower_duwamish/lower_duwamish_hp.html

and at the King County/Seattle Public Utilities Joint Business Inspection website:
http://www.dnr.metrokc.gov/wlr/indwaste/duwamish.htm

1.3 Source Control Work Group

The primary public agencies responsible for source control for the LDW are Ecology, the city of Seattle, King County, Port of Seattle, the city of Tukwila, and the EPA. Together they are known as the LDW Source Control Work Group (SCWG).

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

The roles of the SCWG agencies are summarized below. Any additional roles that may be developed will be described in the area-specific SCAPs. Roles for other public agencies, such as the Washington Department of Transportation, Puget Sound Clean Air Agency, or Public Health

– Seattle & King County, may also be developed as information collection and source control proceeds.

1.3.1 Ecology

Ecology has broad roles and responsibilities under the Memorandum of Understanding and the Source Control Strategy. Ecology's overall role is to be lead agency for the waterway source control effort. In addition, Ecology will use its regulatory authorities in order to determine the extent of source control needed and to oversee or implement controls as necessary for:

- Properties and activities that discharge directly to the waterway (properties immediately adjacent to, or activities that occur on or in the waterway).
- Contaminated properties that may affect sediments through soil or groundwater pathways to the waterway.
- Contaminated properties that may affect sediments through soil or groundwater pathways into publicly owned storm drains or sewers that discharge to the waterway.

When necessary, Ecology will assist local agencies on specific source control issues, and carry out other source control activities as appropriate. Ecology's responsibilities in the source control effort also include:

- Develop and provide a Source Control Strategy and area-specific SCAPs.
- Summarize the status of source control throughout the waterway.
- Collect and track information from other SCWG members on the status of their source control activities.
- Prepare area-specific status reports.
- Report the status of source identification and control to EPA twice each year.
- Chair the SCWG.

1.3.2 City of Seattle

The city of Seattle owns and operates the municipal separated storm drain system that collects stormwater runoff from upland areas and discharges to the waterway. Under Seattle Municipal Code (SMC) 22.800, the city stormwater, grading, and drainage control code, Seattle Public Utilities (SPU) has authority to require properties discharging to the city-owned system to employ operational controls to reduce the amount of pollution discharged to the city system. Examples of this are spill prevention, regular inspection and maintenance, and employee training. In addition, for certain high risk generating activities, the City requires that structural source controls such as berms, containment, and covering be installed for all new facilities.

The City also owns and operates the sanitary and combined sewer collection system within the city. These smaller trunk lines collect domestic sewage, industrial wastewater, and stormwater from Seattle neighborhoods and discharge to the King County interceptor system, which conveys wastewater to the treatment plant at West Point. The City operates two emergency overflows (pump station overflows) and two CSOs in the waterway. Under its National Pollutant Discharge

Elimination System (NPDES) permit, the City is responsible for discharges or overflows into the waterway that come from the city-owned trunk system. King County regulates the amount of pollution discharged to the sanitary and combined systems in the King County area through the King County Industrial Waste Program (see below).

The city of Seattle's roles in the source control efforts are to:

- Participate in developing those portions of SCAPs dealing with controlling sources of pollution discharging to the city-owned storm drain system when discharges from the city system may recontaminate sediment cleanup sites.
- Exercise its authority to inspect commercial and industrial businesses and other entities in the areas draining to the city-owned storm drain system, in coordination with sediment cleanups.
- Require businesses and other entities to take actions to meet the City's regulatory requirements when sources of contaminants are found entering the city-owned storm drain system.
- Provide progress reports on source control activities to Ecology and the SCWG for use in reports to EPA.
- Conduct other source control activities as appropriate.

1.3.3 King County

King County owns and operates the interceptor system, which conveys wastewater to the treatment plant at West Point. Under the NPDES permit for the West Point Plant, the County is responsible for discharges or overflows that occur from the interceptor system. King County operates nine regulator and pump stations in the Duwamish drainage area and has eight combined sewer overflow points and two emergency overflows in the waterway. King County has delegated authority from the EPA to regulate the types and amount of pollutants discharged to the sanitary and combined sanitary storm drain systems from non-domestic dischargers in the King County service area. The County's authority comes from the federal pretreatment regulations in 40 CFR 403 and related federal effluent limitations. These federal regulations along with Title 28 of the King County Code gives the King County Industrial Waste Program authority to set limits on pollutants discharged, require best management practices and/or the installation of pollution treatment equipment, issue permits to dischargers, monitor, and enforce.

King County's roles in the source control efforts are to:

- Participate in developing those portions of SCAPs dealing with sources of pollution discharging to the sanitary or combined sanitary-storm drains tributary to sediment cleanup sites.
- Inspect industrial businesses and other entities in the areas discharging to the sanitary or combined sanitary-storm drain system which are tributary to King County CSOs.
- Require businesses and other entities to take actions to meet regulatory requirements when sources of contaminants to the sanitary or combined sanitary-storm drain are found. Take enforcement actions as needed.

- Provide progress reports on source control activities to Ecology and the SCWG for use in reports to EPA.
- Conduct other source control activities as appropriate.

Two agencies of the Local Hazardous Waste Management Plan, King County Hazardous Waste Program and the Environmental Hazards Group of Public Health – Seattle & King County, are also participating in source control efforts. The Local Hazardous Waste Management Program is a regional program focused on helping local residents, business owners and operators, and other institutions use fewer and/or less toxic materials, properly use and store hazardous materials, and properly dispose of hazardous wastes. The roles of these two agencies will be to provide technical assistance and environmental education to small businesses that are more effectively regulated through an outreach program than a discharge authorization mechanism.

1.3.4 Port of Seattle

The Port will cooperate with the other SCWG agencies in implementing the source control program to achieve the goals of this strategy for Port-owned properties, which are either operated by the Port or leased to tenants. The Port of Seattle's roles in the source control efforts are to:

- Take the lead on source control for Port properties that collect and discharge stormwater directly to the waterway.
- Accompany, cooperate, and provide support on source control conducted by the municipalities for Port properties that discharge stormwater to the municipal systems.
- Scope and inspect Port-owned properties for areas or activities that could affect sediments through stormwater discharges, eroding contaminated soils and/or groundwater contamination.
- Take needed actions to meet regulatory requirements when issues are found.
- Share relevant source control information and related environmental data with the SCWG.
- Conduct other source control activities as appropriate.

1.3.5 City of Tukwila

The city of Tukwila's roles in the source control efforts are to:

- Participate in developing those portions of SCAPs dealing with controlling sources of pollution discharging to the city-owned storm drain system when discharges from the city system may recontaminate sediment cleanup sites.
- Assist in the inspection of commercial and industrial businesses draining to the city-owned storm drain system, in coordination with sediment cleanups.
- Require businesses and other entities to take actions to meet the City's regulatory requirements when sources of contaminants are found entering the city-owned storm drain system.
- Conduct other source control activities as appropriate.

1.3.6 EPA

EPA has broad roles under the Memorandum of Understanding and the Source Control Strategy. EPA's roles in the source control efforts are to:

- Provide technical assistance to Ecology.
- Coordinate source control with EPA-lead site sediment investigation and cleanup(s), and as appropriate, require responsible parties to investigate and control sources.
- Coordinate source control with EPA-lead activities in the waterway area.
- Review and concur on the source control strategy and plans, status reports, proposed source control actions, and source control reports.
- Determine whether source control actions are sufficient to meet the goals of preventing or minimizing the recontamination of sediments.
- When necessary, EPA will assist other public agencies with source control tasks.

2.0 Developing Source Control Action Plans

2.1 Background

Ecology develops Source Control Action Plans (SCAPs) for areas of sediment contamination that will or may require cleanup. The SCAP for each of these sediment areas identifies potential contaminant sources and actions needed to control them, and evaluates whether ongoing sources are present that could recontaminate sediments after cleanup. In addition, the SCAPs describe source control actions that are planned or currently underway, and sampling and monitoring activities that will be conducted to identify additional sources.

Ecology works with consulting firms and other SCWG members to write the SCAPs. Members of the SCWG provide information needed to define the storm drain and CSO basins as well as to identify and evaluate NPDES permitted facilities and contaminated properties. This information is incorporated into the SCAPs.

Ecology and EPA worked together to develop an ordered list of areas along the LDW that will likely need SCAPs. The list starts with the seven Early Action Areas identified in the *Technical Memorandum: Data Analysis and Candidate Site Identification* (Windward 2003b). Additional areas were added based on a review of recent sediment data. Ecology and EPA also considered factors such as contaminant concentrations, size of the drainage basin, and general knowledge about facilities in the area. The additional areas are referred to below as Tier 2 Areas (T2As), and are discussed in more detail in Section 6.0.

2.2 SCAP Publication Schedule

SCAPs have been published for EAA-1 (Duwamish/Diagonal), EAA-2 (Trotsky), EAA-3 (Slip 4), and EAA-5 (Terminal 117). The scheduled publication of SCAPs for the balance of the sites is as follows:

Site	Planned Publication Date	Comment
EAA-7: Norfolk CSO/SD	July 2007	E&E under contract
EAA-4: Boeing Plant 2/Jorgensen Forge	September 2007	E&E under contract
T2A-3,4,5: Glacier Bay	October 2007	SAIC under contract
EAA-6 and T2-8: Boeing Isaacson/ Central KCIA	February 2008	SCAP to be completed in 07-09 biennium
T2A-9: Slip 6	March 2008	SCAP to be completed in 07-09 biennium
T2A-10: Slip 4 to Seattle Boiler Works	April 2008	SCAP to be completed in 07-09 biennium
T2A-11: Slip 3	March 2010	Delayed until 09-11 funding
T2A-12: Slip 3 to Slip 2	May 2010	Delayed until 09-11 funding
T2A-13: Glacier NW to St. Gobain	July 2010	Delayed until 09-11 funding
T2A-14: Slip 1	September 2010	Delayed until 09-11 funding
T2A-15: Ash Grove Cement	November 2010	Delayed until 09-11 funding

SCAPs for sites EAA-6, T2A-9, and T2A-10 are planned to start in August 2007 with starts staggered by one month. SCAPs for sites T2A-11 to T2A-15 are expected to be delayed due to the lack of funding in the 07-09 biennium. Work on SCAPs T2A-11 to T2A-15 are planned to start in August 2009, with starts staggered by one month, assuming funds are made available in the 2009-2011 biennium.

2.3 SCAP Implementation Schedule

The three main source control activities are business inspections, source tracing, and upland site assessment and cleanup.

For large drainage basins such as the Duwamish/Diagonal CSO/SD, business inspections and source tracing are long-term, ongoing efforts. As businesses and land use change, the potential sources change as well. The early stage of source control within a drainage basin, conducting business/industrial inspections and tracing sources, is an intensive effort and continues until apparent sources are controlled. While it may be possible to reduce the level of effort needed over time within a given drainage basin, inspections and source tracing must continue regularly over the longer term in order to identify and control new potential sources as they arise.

For discrete upland sources, such as facilities that require cleanup under the Model Toxics Control Act (MTCA) or federal cleanup laws, cleanup and control are also long-term efforts. Contaminated soil may be a source of sediment recontamination through several pathways. Contaminants in soil adjacent to the LDW can enter the waterway through erosion. Some soil contaminants migrate into groundwater or change the chemistry of the soil and cause other contaminants to become more mobile. Some groundwater contaminants accumulate as they come into contact with sediments. These sites may directly affect sediments in the river and, while identifying them and bringing them under control is possible, it often takes several years. Due to the time it takes to clean up a contaminated site, Ecology believes the time and available resources needed to complete upland site cleanups will be a limiting factor for achieving river-wide source control. This will affect the schedule for the cleanup of sediment areas identified in the ROD.

Ecology worked with Science Applications International Corporation (SAIC) to develop long-term projections for implementing source control in the Lower Duwamish. These projections were modeled using Microsoft Project.

The projected schedule is shown in Table 1, and is shown in more detail in Figure 2. The schedule uses Ecology's expected funding level for the 2007-2009 biennium and current Ecology staff available to manage upland site cleanups. For the purpose of developing the schedule, available staff consists of one full-time site manager and one site manager in training. Two part-time site managers are each working on one upland site in the LDW. Once they complete work on those sites, it is expected that they will be assigned to sites outside the Lower Duwamish.

The schedule is intended to project the timeline for source control of contaminated sites in the LDW using existing resources. The timeline will change as Ecology staff are added or reassigned, new information is developed, or priorities change. The assumptions used to develop the schedule are listed in Appendix C.

The schedule shows that at its current level of staff and funding, Ecology will probably not achieve source control at all of the potential upland sites before 2021. This does not mean that all sediment cleanups must be delayed until that time. Sediment cleanup may be started in some parts of the river before all of the upland sites have been cleaned up. The specific details of where and when sediment cleanups may begin will depend on variables such as location of the sediment cleanup area in relation to upland sources, the nature of the sediment source(s), the nature of the sediment cleanup, and sediment transport. Ecology will advise EPA as upland sources appear to be sufficiently controlled to proceed with sediment cleanup. Ecology and EPA will periodically review the status of source control and adjust the timeline for sediment cleanup actions.

Table 1. Projected SCAP Implementation Schedule

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Site Manager 1 (Full-time)															
EAA-3 (Slip 4)								Start 7/07 Finish 1/13							
T2A-3,4,5 (Glacier Bay)								Start 9/07 Finish 7/13							
EAA-2									Start 12/08 Finish 9/14						
EAA-6 (Boeing Isaacson/Central KCIA)									Start 2/09 Finish 12/14						
T2A-11 (Slip 3)													Start 1/13 Finish 11/18		
TTA-2 (Slip 3 to Slip 2)														Start 7/13 Finish 5/19	
TTA-15 (Ash Grove Cement)															Start 9/14 Finish 7/20
Site Manager 2 ("In Training")															
EAA-7 (Norfolk CSO/SD)										Start 6/09 Finish 3/15					
T2A-10 (Slip 4 to Seattle Boiler Works)										Start 11/09 Finish 9/15					
T2A-13 (Glacier NW to St. Gobain)															Start 3/15 Finish 1/21
T2A-14 (Slip 1)															Start 9/15 Finish 7/21
Site Manager 3 (Part-time)															
T2A-9 (Slip 6)								Start 3/08 Finish 1/14							
Site Manager 4 (Part-time)															
EAA-4 (Boeing Plant 2/Jorgensen Forge)								Start 8/07 Finish 5/13							
Other Agencies															
Port of Seattle: EAA-1 (Duwamish/Diagonal, Terminal 108) - Independent Cleanup				Start 12/04 Finish 10/09											
EPA Oversight: EAA-5 (Terminal 117)			Start 6/05 Finish 7/08												

3.0 Source Control Implementation

The three main types of source control activities are business inspections, source tracing, and upland site assessment and cleanup. These and other source control techniques that are being implemented for the LDW as a whole are described below. Activities associated with specific early action or Tier 2 sites are discussed in Sections 5.0 and 6.0, respectively.

3.1 Business Inspections

3.1.1 SPU/King County Business Inspection Program

In March 2003, King County and SPU began working with local businesses to reduce the amount of pollutants discharged to the LDW through storm drains and CSOs. The King County Industrial Waste Program and SPU co-led the joint King County-Seattle program to inspect businesses in areas that discharge to the LDW through either the city-owned storm drain system or the combined sanitary/storm sewer system. The goal of this effort was to complete the business inspections before sediment cleanup begins for the Lower Duwamish Waterway Superfund Site (King County and SPU 2005b).

In 2006, King County evaluated its role in the joint program and withdrew because none of the discovered sources fell within the scope of the County's regulations. Although the joint program expanded to other portions of the city and continues to function jointly, SPU conducts most of the inspections and investigations in the LDW and coordinates with King County when necessary.

King County operates the large interceptor pipes that convey municipal and industrial wastewater to the West Point treatment plan and the storm drain system in unincorporated King County. The city of Seattle operates the local sanitary/combined sewers that collect wastewater and route it to the King County interceptor system and the municipal storm drains within the city of Seattle. The sanitary/combined sewer and storm drains (including private storm drains) serve an area of about 19,800 and 9,300 acres, respectively.

King County and SPU have been inspecting local businesses in the Lower Duwamish service area to ensure that businesses are implementing appropriate pollution prevention practices and complying with local stormwater, industrial pretreatment, and hazardous waste regulations. Source areas for early action sediment sites are considered the highest priority. Within each early action site, inspections begin with the separated storm drain basin followed by the combined sewer service area. The goal is to complete the business inspections before sediment cleanup begins. Separated storm drain basins are considered a priority because storm drains discharge to the LDW every time it rains, whereas CSOs discharge much less frequently, typically only during large storm events. The following agencies are participating in this project:

- King County Industrial Waste (KCIW), Wastewater Treatment Division
- Seattle Public Utilities (SPU)
- King County Local Hazardous Waste Management, Water and Land Resources Division

- King County Local Hazardous Waste Management, Seattle-King County Public Health

Inspections are conducted under existing King County and Seattle code authorities. King County has primary authority in the industrial waste area and, with the exception of the stormwater discharges to the combined sewer, SPU has primary authority to regulate stormwater discharges. Code authority to regulate stormwater discharges to the combined sewer is shared by King County and Seattle. Information on the inspection process is provided in the June 2004, January 2005, and June 2005 progress reports (King County and SPU 2004, 2005a, 2005b).

The first round of source control inspections was completed in spring 2006 in the following early action areas: Area 1 (Duwamish/Diagonal CSO/SD), Area 3 (non-Boeing areas of Slip 4), Area 5 (Terminal 117), Area 6 (KCIA areas of Slip 5), and Area 7 (Norfolk CSO/SD). A total of 1,009 businesses were inspected between March 1, 2003 and December 31, 2006. This includes 286 screening inspections (quick inquiry and sometimes a tour of the facility – no polluting practices, no full inspection required), 723 full onsite inspections and 665 follow-up inspections to check compliance. Corrective action was required at 535 facilities. No significant sources of contaminants to the waterway were found during the business inspections. Instead, many small problems/corrective actions were identified at numerous businesses.

In 2007, source control business inspections are being conducted at Area 2 and several businesses in the Tukwila portion of Area 7 (Norfolk CSO/SD) under a Memorandum of Agreement with the city of Tukwila. A second round of inspections is underway at high priority sites in Area 1 (Duwamish/Diagonal CSO/SD).

Inspection locations are shown in Figure 3. A list of all sites inspected is provided in Appendix A and B for facilities that drain to storm drains and the combined sewer, respectively.

The following corrective actions were required:

Corrective Action	% of Facilities
Drainage facility needs cleaning	57%
Facility lacks proper spill prevention/cleanup plan/procedures	48%
Inadequate spill cleanup materials available on site	41%
Inadequate employee training on spill prevention/cleanup procedures	39%
Improper storage of hazardous products and waste materials	22%
Improper hazardous waste disposal	16%
Improper outdoor storage of non-hazardous materials/products	12%

3.1.2 Ecology NPDES Inspections

In 2004, Washington State House of Representatives Bill ESSB 6415 amended Revised Code of Washington (RCW) 90.48 to require that between January 2005 and June 2007, Ecology inspect all NPDES permittees with an industrial or general stormwater permit. As part of this mandate,

Ecology's Water Quality Program has been conducting inspections at NPDES-permitted facilities that discharge to the LDW. Currently there are 113 NPDES permits in the Lower Duwamish drainage. These include:

- 103 Industrial Stormwater General Permits – all have been inspected
- Two Boatyard General Permits – both have been inspected
- Four Sand & Gravel General Permits – one has been inspected
- Four individual Industrial Permits – three have been inspected.

A review of inspection reports from 40 facilities with Industrial Stormwater General Permits showed the following problems:

Corrective Action	% of Facilities
Inspector detected potential pollutant which could contaminate stormwater (e.g., oil sheens, leachates, dirty pavement, metal stored outside)	60%
Discharge monitoring report/sampling problems (e.g., missing Discharge Monitoring Reports, no sampling)	55%
Permittee did not initiate the required response when monitoring results were above permit benchmark/action level	33%
Improper storage of liquid products and wastes	13%
Stormwater conveyance system required maintenance	8%

Thirty-seven were given an inspection report listing the concerns which needed to be addressed. Seven (18 percent) of the 40 facilities were issued a formal warning letter.

This tally includes inspections conducted between January 1, 2005 and June 30, 2007. Appendix C provides a list of NPDES-permitted facilities that have been inspected to date.

3.2 Source Tracing

SPU and King County have been conducting source tracing and identification sampling activities since 2003 to support source control efforts (King County and SPU 2004, 2005a, 2005b). Source tracing sampling is designed to identify sources by strategically collecting samples at key locations within the drainage/combined sewer service areas. Source identification sampling focuses on product testing to determine whether specific products contain chemicals that are a concern for waterway sediments.

Source tracing samples have been collected at the following locations to identify sources of chemicals of concern (Figure 4):

- Key manholes in the combined/sanitary sewer
- In-line sediment traps installed in the storm drain system
- Onsite catch basins

- Catch basins in the public right-of-way

With the exception of key manhole samples, sediment rather than whole water samples are being collected. Sediment samples offer a number of advantages:

- Because sediment is the focus of cleanup in the waterway, analysis of sediment source material is key to understanding how pollutants are transported to the waterway.
- Sediment that accumulates in the drainage system provides a measure of pollutant concentrations over a longer time period, whereas water samples provide only a snapshot of a single storm event.
- Sediment samples, unlike whole water samples, generally do not present as many detection limit problems for the analytical laboratory.
- Sediment samples are generally easier and less expensive to collect than whole water samples.

Storm drain sediment data were compared to the Washington State Sediment Management Standards (SMS) to provide a rough indication of overall quality. The SMS include the Sediment Quality Standards (SQS), which identify surface sediments that have no adverse effects on biological resources, and Cleanup Screening Levels (CSL), which are used as an upper regulatory threshold for making decisions about source control and cleanup. It should be emphasized that the SQS and CSL values do not apply to storm drain sediments. 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. For organics, the measured dry weight concentrations were organic carbon (OC) normalized to allow comparison to the CSL/SQS.

3.2.1 Key Manhole Samples

King County regularly samples wastewater at key locations in the collection system to provide baseline data for comparisons when tracking down spills at the treatment plants. Twenty-four hour composite samples are collected over a 7-day period twice per year, once during the wet season and once during the dry season. Figure 4 shows the three key manhole sampling stations located within the combined sewer service area discharging to the LDW.

In 2003, King County began analyzing key manhole samples for phthalates as a possible tool to trace pollutant sources in the system.

Samples were collected in September 2003 (dry season), April 2004 (wet season), and September 2004 (dry season). Concentrations of bis(2-ethylhexyl)phthalate (BEHP) in the wet weather samples collected in April 2004 at the East Marginal and Duwamish pump stations (2 to 14 ug/L) are generally within the range of concentrations observed in stormwater samples (1 to 16 ug/L). However, BEHP concentrations in the West Marginal samples (13 to 52 ug/L) are greater than the stormwater samples and are similar to the concentrations measured in treatment plant influent (5 to 37 ug/L). The cause of the higher BEHP concentrations at the West Marginal station is unknown (King County and SPU 2004). Further investigation will be conducted as source tracing efforts expand into the west side of the Duwamish.

The dry weather samples collected at the East Marginal and Duwamish pump stations in September 2004 (5 to 40 ug/L) exhibit a broader range in BEHP concentrations than those collected in September 2003 (4 to 12 ug/L) and were also higher than the wet weather samples collected in April 2004 (2 to 14 ug/L). However, the average concentrations are fairly similar (6 to 15 ug/L in the dry weather samples versus 6 to 21 ug/L in the wet weather samples). In September 2003, one of the dry weather samples collected from the West Marginal pump station contained a significantly higher BEHP concentration (148 ug/L) than the other stations. However, this pattern was not observed in the samples collected in September 2004 (9 to 20 ug/L) (King County and SPU 2005a).

Phthalates other than BEHP that were detected in the key manhole samples include butylbenzyl phthalate (100 percent of samples), diethylphthalate (97 percent of samples), di-n-butylphthalate (25 percent of samples), and dimethylphthalate (1 percent of samples) (King County and SPU 2005a).

3.2.2 In-line Sediment Trap Samples

In-line sediment traps consist of a small bracket mounted inside the collection system pipe that holds a wide-mouth sample bottle. These in-line traps are installed for a period of 4 to 6 months to passively collect solids in the stormwater flow passing that location.

Traps have been installed at six sites in the Diagonal Avenue CSO/SD basin, and at 10 sites in the Slip 4 drainage basin (Figure 4). Station locations were selected to isolate individual subbasins within the larger storm drain system. Sediment trap sampling results are discussed in Section 5 for each geographic area.

It is anticipated that traps will continue to be installed over the next 2 to 3 years to track changes in suspended particulate quality that may occur as a result of source control activities.

3.2.3 Catch Basin Samples

Catch basin samples are grab samples of sediment that has accumulated in the catch basin sump. A catch basin is a storm drain structure that contains a sump to capture sediment and other debris before it can enter the collection system. Because many pollutants present in stormwater runoff tend to adhere to sediment, catch basins can also trap pollutants. The quality of sediment that accumulates in catch basins provides a measure of the quality of the stormwater runoff discharged to the drainage system since the catch basin was last cleaned. Catch basins must be cleaned on a regular basis to maintain their capacity to trap sediment and associated pollutants and prevent these materials from discharging to the downstream receiving water body.

As of December 2006, 92 onsite and 54 right-of-way catch basin samples have been collected in the LDW study area (Figure 4). In addition, sediment and soil samples were collected from the public right-of-way and adjacent properties near the Terminal 117 early action site. Samples included catch basin sediment, street dust, and soil samples from the public right-of-way and adjacent yards. Results are summarized in Section 5.5 (Early Action Area 5).

Onsite catch basin samples have been collected at sites of interest identified during the business inspections or simply at sites where sufficient sediment was available for chemical analysis. Approximately 80 percent of the onsite samples were collected from sites where contamination problems were suspected either due to the nature of the onsite activities or because specific problems were observed during the inspection. Results for all samples will be published in the upcoming King County and SPU source control progress report (King County and SPU 2007, in preparation). Key findings are summarized below:

- Arsenic was detected in about 51 percent of samples, but concentrations were all below SQS values.
- Copper and lead exceeded the SQS in 29 (35 percent) and 15 (17 percent) of the samples collected, respectively. Eleven (13 percent) of the samples also exceeded the CSL for lead.
- Mercury was detected in about 74 percent of the samples, but exceeded the SQS in only 16 of the samples (18 percent). Thirteen samples (15 percent) also exceeded the CSL.
- Zinc exceeded the SQS in 73 samples (87 percent) and exceeded the CSL in 34 samples (40 percent).
- Total petroleum hydrocarbon (TPH)-oil exceeded the MTCA Method A cleanup level in 63 percent of the samples. The highest TPH-oil concentrations were measured at a vehicle steam-cleaning pad (71,000 mg/kg) and an oil recycling facility (77,000 mg/kg). TPH-diesel concentrations were consistently lower than the oil levels and exceeded the MTCA cleanup level in about 28 percent of the samples.
- PAH compounds exceeded the SQS in only 14 of the onsite catch basin samples (16 percent). Elevated levels of PAHs were typically found in catch basins at heavy equipment maintenance facilities and gas stations.
- PCBs were detected in about 80 percent of the samples at concentrations ranging from 0.016 to 2,226 mg/kg dry weight (DW), but only 11 samples exceeded the SQS (12 percent) and five samples exceeded the CSL (6 percent). Of the 62 samples where PCBs were detected, 69 percent were less than 0.5 mg/kg DW and 81 percent were less than 1 mg/kg DW.
- BEHP exceeded the sediment standards in all but 15 of the 85 samples collected. Most samples exceeded the SQS and CSL; three samples exceeded only the SQS. The concentration of BEHP in most samples ranged from about 100 to 1,000 mg/kg OC.

Right-of-way samples were collected from catch basins located in a wide variety of roadways to evaluate whether contaminant levels are related to traffic density. Zinc, TPH-oil, and BEHP are the contaminants that most frequently exceeded the sediment standards (or MTCA Method A for TPH). Results for all samples will be published in the upcoming King County and SPU source control progress report (King County and SPU 2007, in preparation). Key findings for all samples collected to date are summarized below:

- With the exception of zinc, metals concentrations rarely exceeded the sediment standards. Only one sample exceeded the SQS for copper and lead, and two of the 54 samples collected to date exceeded the SQS for mercury. Mercury was detected in less than half of the samples. Arsenic was detected in 35 percent of samples, but did not exceed the SQS. Zinc exceeded the SQS in 16 samples (29 percent), but only one of the samples exceeded the CSL.

- TPH-oil exceeded the MTCA Method A cleanup level in about 50 percent of the samples. Only six samples exceeded the MTCA Method A cleanup level for TPH-diesel.
- PAH concentrations were generally low in the right-of-way catch basin samples. Only five samples exceeded an SQS for PAHs.
- PCBs were detected in about 77 percent of the samples and one sample exceeded the SQS. Concentrations generally ranged from 0.00002 to 0.3 mg/kg DW (0.2 to 6.7 mg/kg OC). One sample, located on S. Stevens Street east of Airport Way, exceeded the CSL for PCBs. This and adjacent catch basins were cleaned in June 2005. PCBs were traced to an adjacent property owner where exterior building paint contained up to 3,000 mg/kg PCBs. The building has been pressure washed and repainted. SPU is currently working with the property owner to clean and jet the onsite drainage system.
- Over 65 percent of the right-of-way samples exceeded either the CSL or the SQS for BEHP. The highest BEHP concentrations (460 and 502 mg/kg OC) occurred in two samples, one collected from an industrial roadway (RCB1) and one from a high traffic arterial (RCB36).

3.2.4 In-Line Sediment Samples

In-line sediment samples are grab samples collected from manholes located on the drainage mainline, and represent contributions from the entire drainage basin upstream of the sampling location. In-line sediment samples are usually collected prior to installing a sediment trap or prior to cleaning the drain to characterize the chemical quality of sediment in the storm drain system.

Between January 2002 and December 2006, SPU collected 69 in-line sediment samples from various locations in the Diagonal Avenue S. CSO/SD, Seventh Avenue S. storm drain in South Park, King County Airport SD#3/PS44 Emergency Overflow (EOF), I-5 storm drain, Georgetown flume, and the Norfolk-Martin Luther King, Jr. Way storm drain systems. Locations of samples are shown in Figure 4. Key findings are summarized below (King County and SPU 2007):

- With the exception of the Slip 4 drains, PCB concentrations were generally low (below the SQS) in most of the drainage systems that were sampled. However, the samples from the drains discharging to Slip 4 frequently exceeded the sediment standards for PCBs.
- BEHP concentrations exceeded the sediment standards in most drains, with concentrations ranging from 0.063 to 28 mg/kg DW. With the exception of the Norfolk system, BEHP concentrations were generally below 10 mg/kg DW. Samples from Slip 4 (0.14 to 3.8 mg/kg DW) were generally lower than in the other drainage systems sampled.
- Arsenic and copper concentrations were below the sediment standards in all samples.
- Lead concentrations exceeded the SQS in three samples and the CSL in two samples. Mercury exceeded the SQS in four samples and the CSL in three samples.
- Zinc exceedances of sediment standards occurred in all of the drains that were sampled, but were highest in the Norfolk-MLK Way and Slip 4 drains.

3.2.5 Source Sediment Comparisons

Source to source comparisons are complicated by the limited number of samples collected at any one site and possible biases introduced by the different sampling strategies employed for each source type. For example, onsite catch basin samples were collected primarily where problems were suspected. Data from onsite catch basin samples (collected where problems were suspected) are difficult to compare with data from in-line sediment traps meant to sample entire basins or subbasins. Given this kind of complexity, however, general observations and comparison from the most recent King County and SPU report (2007, in preparation) are provided below:

- Contaminant concentrations were generally higher in samples collected from onsite catch basins than from right-of-way samples. As shown below, onsite catch basin samples generally exhibit more frequent exceedances of SMS or MTCA Method A (TPH only):

	Exceedance in onsite catch basins	Exceedance in right-of-way catch basins
Copper	**29%**	**5%**
Lead	**13-15%**	**2%**
Mercury	**15-16%**	**3%**
Zinc	**40-87%**	**4-32%**
TPH-oil	**63%**	**53%**
PCBs	**6-12%**	**4-8%**
BEHP	**80-82%**	**48-64%**

Note: Ranges shows SQS and CSL exceedances.

- Arsenic concentrations did not exceed the SQS in any of the samples; this finding suggests that storm drains may not be a significant source of arsenic to the waterway sediment. Further testing with lower detection limits is needed to confirm whether storm drain discharges pose a potential threat for recontamination.
- Although TPH-oil frequently exceeded the MTCA Method A cleanup level for soil in the source sediment samples (30 to 81 percent), PAHs were found at relatively low concentrations. Individual PAH compounds generally ranged from <1 to 50 mg/kg OC. SQS exceedances occurred in only 3 to 22 percent of the source samples, with the greatest number of exceedances in the Slip 4 sediment trap samples (22 percent), followed by the onsite catch basin samples (17 percent). Samples collected at gas stations and heavy equipment maintenance facilities accounted for most of the exceedances in the onsite catch basins. PAH exceedances were less frequent in right-of-way samples (5 percent) and the Diagonal sediment trap samples (3 percent).
- PCBs were frequently detected (41 to 100 percent of samples) but rarely exceeded the SQS (in less than 10 percent of the onsite catch basin samples and right-of-way catch basin samples, and less than 5 percent of Diagonal sediment trap samples). Sediment collected from storm drains discharging to Slip 4 (Georgetown flume and KCIA storm drain) contained the highest PCB concentrations (57 to 71 percent exceeded the SQS).

- BEHP poses the most serious concern for recontamination in waterway sediment after cleanup. Concentrations frequently exceed the SQS in all types of sediment samples collected. BEHP concentrations are generally higher in the onsite catch basin samples (10 to 1,000 mg/kg OC) than in the right-of-way samples (12 to 300 mg/kg OC). Sediment trap samples also exhibit relatively high BEHP concentrations.

Comprehensive source sediment sampling data are provided in the King County and SPU Source Control Program Progress Reports (King County and SPU 2004, 2005a, 2005b, 2007).

3.3 Site Assessment and Cleanup

During SCAP development, Ecology and its contractors identify contaminated properties that may recontaminate a sediment cleanup area. The consultants review available information about each property and prepare an assessment of whether the site poses a threat to the sediment cleanup area. The detailed information on each property is reported in either a *Property Review* report (Duwamish/Diagonal, Terminal 117, Slip 4) or in a *Summary of Existing Information and Identification of Data Gaps* report (all other SCAPs). As of June 30, 2007, Ecology and its contractors had conducted assessments on 67 properties throughout the Lower Duwamish Basin (Table 2).

The property assessments evaluate the nature and extent of soil and groundwater contamination, potential contamination in surface runoff, and any cleanup actions that have occurred. Where there is inadequate information to make such an evaluation, the information needed is identified as a data gap and becomes an action item in the SCAP.

As staff and funds become available, the necessary information is collected to fill the data gaps. If the property is a known contaminated site, Ecology has the owner gather the information. This is generally done through an administrate order issued under MTCA. If the property is not a known contaminated site, Ecology hires a contractor to perform the necessary investigation.

The investigation or cleanup of a contaminated property may be performed before a SCAP is written. This may occur when an owner wants to expedite cleanup or Ecology considers it necessary for source control.

Site characterization or cleanup is in progress at eight facilities which are known or suspected threats to LDW sediments. Terminal 117, Rhone-Poulenc, and Boeing Plant 2, which includes part of Jorgensen Forge, are being managed by EPA. The upland portion of Jorgensen Forge and the PACCAR facility are being managed by Ecology with Agreed Orders under MTCA. Ecology is developing Agreed Orders for the North Boeing Field/Georgetown Steam Plant and Duwamish Shipyard sites. Ecology contractors have sampled the banks of Slip 4 and at Industrial Container Services (formerly Northwest Cooperage). Ecology plans to collect samples at South Park Marina and Douglas Management Company/Alaska Marine Lines Dock 2.

The number of sites which need to be assessed in the entire LDW storm drain and CSO basin has not been estimated at this time.

Table 2. Property Assessments Completed, 2003 to June 2007

Sediment Site	Property Assessed
EAA-1 (Duwamish/Diagonal)	Chevron USA Site No. 4097 (Chiyoda Property)
	Container-Care International, Inc. (Port of Seattle Terminal 106)
	Federal Center South
	Janco United (In progress)
	Transportation Services CFS (Port of Seattle Terminal 106W/106NW)
EAA-2 (Trotsky)	Alaska Washington Company
	Alki Construction Company
	ATC Distribution Group Inc./Automatic Transmission Parts
	Boyer Alaska Barge Lines
	Boyer Towing, Inc./Boyer Alaska Barge Lines/Boyer Logistics
	Cascade Mattress Factory
	Cunningham Manufacturing
	DaVinci Gourmet
	Douglas Management Company/Alaska Marine Lines Dock 2
	Ferguson Construction
	Fox Plumbing & Heating
	Hurlen Construction
	Industrial Battery Systems
	J & M Stamp & Form
	Northwest Building Tech Inc
	NW Center for the Retarded
	Pacific American Commercial (PACO)
	Pacific Northwest Fasteners
	Pacific Plumbing Supply
	PCT Construction
	Pioneer Human Services
	Trotsky Property (Industrial Container Services)
	Tucker-Weitzel Assoc.
	United Iron Works
	W.G. Wright and Associates
	Wells Trucking & Leasing
	WHECO
EAA-3 (Slip 4)	American Avionics
	ARCO #5218

Sediment Site	Property Assessed
EAA-3 (Slip 4), Continued	Aviation Fuel Storage/Shultz Distributing
	Crowley Marine
	First South Properties/Emerald Services
	Georgetown Steam Plant
	King County Airport Maintenance Shop
	Marine Vacuum Service
	North Boeing Field
	North Coast Chemical Company
EAA-4 (Boeing Plant 2/Jorgensen Forge)	Boeing Plant 2
	Jorgensen Forge
	King County Airport
EAA-5 (Terminal 117)	Basin Oil
	Boeing South Park
	South Park Marina
	Terminal 117
EAA-7 (Norfolk CSO/SD)	Affordable Auto Wrecking
	ARCO Gas Station
	Associated Grocers
	Boeing Developmental Center
	Boeing Military Flight Center
	King County Airport
	Northwest Auto Wrecking
T2A-3,4,5 (Glacier Bay)	Alaska Marine Lines (Parcel 1)
	Alaska Marine Lines (Parcel 2)
	Allen Property
	Chemithon
	City of Seattle Parks
	Duwamish Shipyard
	Glacier Northwest
	Klier-D.B. Property
	MRI Corp
	Sayler Property
	Wise Property

3.4 Phthalate Source Study

Phthalates, particularly BEHP, are contaminants of concern in the majority of the early action sites in the LDW. They are a class of industrial compounds commonly used as softeners in plastics, as solvents, as oil in vacuum pumps and electrical capacitors and transformers, and as carriers for fragrances and pesticides. Available literature indicates that phthalates are also a component of many consumer products. Phthalates can be released to the air and are likely contributing contaminants to stormwater and affecting sediments in the river.

3.4.1 Product Testing

In 2003, King County and SPU joined with the city of Tacoma to conduct joint testing of various products and materials to help identify potential sources of these chemicals. The following products were tested:

King County Environmental Lab	Tacoma Laboratory
Car wash soap (and liquid wax)	Atmospheric dust
Windshield washer fluid (and defoggers)	Tires
Dish soap (commercial and household)	Cigarette butts
Boat effluents (gray water or bilge)	Brake pad dust
Oils (new and used)	Plastic bottles
Armor-All (or equivalent)	Vehicle undercoating
Tire dressing (cleaner)	Asphalt binder
Inks and dyes (including printing inks)	Roofing tar
Asphalt sealer	Plastic wrap/packaging peanuts

Source: King County and SPU 2004

Samples were analyzed for phthalates and PAHs. The King County laboratory analyzed liquids while the Tacoma laboratory tested solids. The Tacoma laboratory also developed a method to measure atmospheric deposition by analyzing material collected from the roof of the Tacoma Dome. The Dome was then cleaned and resampled to determine whether phthalates are present in the rubberized vinyl roofing material. Sampling took place on May 13, 2003 (before cleaning) and July 3, 2003 (after cleaning). Results indicate that about 93 percent of the BEHP in the sample collected before cleaning (600 ug/sq.ft.) is a result of atmospheric deposition.

The testing found only low levels of phthalates in liquid products, but high levels of phthalates, particularly BEHP, in some solid products used in vehicles, including brake pads, serpentine belts, and tires. These solid products may be a source of phthalates to the waterway through either atmospheric deposition or direct deposition of worn product particles onto roadway surfaces and later wash-off in stormwater runoff (King County and SPU 2005b).

King County and SPU have set up a special work group to deal with phthalate issues. Members of the phthalate work group include staff from King County Industrial Waste, King County Hazardous Waste, King County Environmental Laboratory, and SPU.

3.4.2 Atmospheric Deposition Sampling

Because of high levels of phthalates in vehicle-related solid products, the phthalate source study continued with emphasis on evaluating whether atmospheric deposition contributes significant amount of phthalates to sediments in the LDW.

King County collected four rounds of samples from January 2005 through May 2005 at four sampling stations in the LDW drainage area, three stations in the Duwamish valley, and a fourth on Beacon Hill. The most significant finding is that BEHP concentrations were up to three times greater in the Duwamish valley stations than the Beacon Hill station. Results compared well with other studies conducted within the same airshed and within other regions. One outcome of this initial phase of sampling was that a redesign of the sampler was necessary.

After the passive air deposition sampler was modified, King County conducted a second phase of sampling from October 2005 to April 2007. A total of 16 sampling rounds were conducted at five sampling stations. The sampling stations were located at Beacon Hill, Duwamish Valley (East Marginal Way), Georgetown, King County International Airport (KCIA) Terminal, and South Park Community Center (Figure 5). A final air deposition monitoring report is expected to be available in Fall 2007; however, preliminary data are available for the 12 sampling rounds that occurred between October 2005 and December 2006. The following ranges of air deposition flux values were observed for BEHP (Tiffany 2007):

- Beacon Hill (original and relocated stations): 0.955 to 2.030 $\mu g/m^2$/day
- Duwamish Valley (original and relocated stations): 1.439 to 12.240 $\mu g/m^2$/day
- Georgetown: 0.402 to 3.654 $\mu g/m^2$/day
- KCIA Terminal: 0.268 to 2.275 $\mu g/m^2$/day
- South Park Community Center: 0.261 to 6.370 $\mu g/m^2$/day

There were detectable air deposition flux values for PCBs in some of the 12 sampling rounds. However, detected results were close to the detection limit of the technique. The detection limits were similar per Aroclor in a given sampling round and varied from a low of 0.011 $\mu g/m^2$/day to a high of 0.063 $\mu g/m^2$/day over the 12 sampling rounds. The highest detected Aroclor value was 0.045 $\mu g/m^2$/day (Aroclor 1254 at KCIA Terminal). The lowest detected Aroclor value was 0.011 $\mu g/m^2$/day (Aroclor 1254 at South Park Community Center). The highest total PCB value was 0.064 $\mu g/m^2$/day (Aroclors 1254 and 1260 at Georgetown) (Tiffany 2007).

3.5 Sediment Phthalate Work Group

In Fall 2006, the cities of Tacoma and Seattle, King County, Ecology, and EPA came together to form the Sediment Phthalates Work Group. The work group was formed to better understand how phthalates are reaching Puget Sound sediments and the related impacts to humans and animals. The Sediment Phthalates Work Group was voluntarily created with representatives

from each public agency. The work group recognizes the challenges that municipal governments face regarding phthalates in sediments at important cleanup sites such as the Thea Foss Waterway and Lower Duwamish Waterway. The work group also will study the occurrence of phthalates in other areas of Puget Sound.

The Sediment Phthalates Work Group is evaluating existing information regarding phthalate sediment concentrations and identifying data gaps, and will recommend possible short-term actions. They also will describe possible ways to address long-term issues such as:

- Defining phthalate concerns within current regulations.
- Placing sediment phthalate concerns in perspective with other sediment contamination risks and within the broader issue of phthalate risks from all exposure pathways.
- Documenting where phthalates occur and identifying potential sources.
- Identifying source control and treatment options.
- Examining data collected by work group members and providing recommendations on next steps.
- Sharing findings with the public.

In 2007, the work group intends to develop recommendations to address phthalate sediment contamination for regulatory agencies and the community to consider. However, any regulatory decisions will be made by state and federal agencies. Possible types of recommendations may include:

- Further study to fill any key information gaps.
- Source identification and control measures applicable to Puget Sound.
- How to address uncertainty and risks due to potential for phthalate contamination following cleanups.
- Policy and regulatory changes to address human health and environmental risks from sediment phthalate contamination.

Further information on the Sediment Phthalates Work Group can be found at Ecology's website (http://www.ecy.wa.gov/programs/tcp/smu/phthalates/phthlates_hp.htm).

Atmospheric deposition should be evaluated to assess whether it is a potential source of phthalates and other contaminants such as PCBs in stormwater runoff. However, at this time, there are no available resources to address this issue. Any future atmospheric deposition work to assess potential sources of phthalates and other contaminants will consider the findings and recommendations of the Sediment Phthalates Work Group.

3.6 Other City of Seattle and King County Activities

3.6.1 Seattle Street Sweeping Pilot

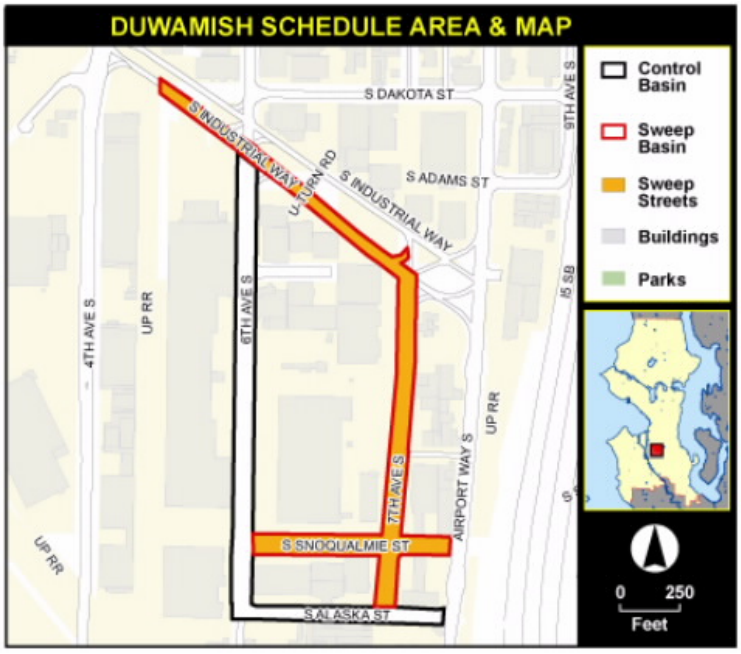
The city of Seattle implemented a pilot project to evaluate street sweeping as a tool to reduce the amount of pollutants discharged from city storm drains (SPU 2007). New high efficiency street

sweepers are being used to remove street dirt and debris from designated streets in two residential areas (West Seattle and Columbia City) and one industrial area (Duwamish/Diagonal). Unlike typical street sweepers, high efficiency sweepers can access the curb area where most of the dirt and debris accumulates.

Testing in the two residential areas began in June 2006 and concluded in June 2007. Testing in the Diagonal industrial area began in November 2006 and finished in June 2007. At each test site, a 10 to 25 block area has been divided into a control area and a sweep area. Both control and sweep areas were cleaned at the beginning of the pilot, establishing a baseline for analyzing whether street sweeping reduces pollutants and sediment.

The test area is swept every two weeks, but the control area is not swept. Catch basin sediment, sweeper waste, and street dirt accumulations are measured every month from the test and control areas to evaluate the quantity of material removed by the sweeping effort. Catch basin, sweeper waste, and street dirt samples are also collected every month. These samples are composited on a quarterly basis and analyzed for metals, SVOCs, PCBs, grain size, and total organic carbon (TOC) content.

SPU is analyzing the collected data and will present its findings to the City Council.



Street Sweeping Pilot Project Location in the Duwamish Industrial Area
(Source: SPU 2007)

3.6.2 Surface Water Quality Complaints

Between June 2003 and June 2007, SPU inspectors responded to about 174 surface water quality complaints in the LDW drainage basin (69 complaints in the storm drain basin and 105 complaints in the combined sewer service area). The most common complaint involved automobile related fluids such as gasoline, diesel, oil, and battery acid (76 complaints). The

remaining complaints involved a variety of materials including wash water, sediment, sewage, and other chemicals.

3.6.3 Spill Kit Incentive Program

As an incentive to improve onsite spill prevention and cleanup practices, in 2004 SPU began offering free spill kits to local businesses that make, store, use, or transport liquids onsite. The kits contain two absorbent booms, sorbent pads, and a drain cover, as well as personal protective equipment. The program is being administered by Resource Venture, a program of the Greater Seattle Chamber of Commerce and the Environmental Coalition of South Seattle. As of May 2007, over 270 spill kits have been delivered to businesses in the Lower Duwamish Waterway.

3.6.4 King County Business Outreach

King County developed source control posters to be distributed to businesses inspected as part of the LDW source control program. The posters, which contain information about best management practices (BMPs) to control pollutants discharged to the sanitary sewer and storm drain systems, were expected to be ready for distribution in late 2005 (King County and SPU 2005b). The purpose of the posters is to build on the work done during the business inspections and to serve as an ongoing reminder to businesses that their activities can affect the Duwamish Waterway.

3.6.5 Residential Outreach Project

During January through May 2005, planning began for a community outreach strategy to empower residents in the Lower Duwamish study area to do their part to help prevent recontamination of sediments in the LDW. Activities in the planning stage include natural yard care workshops, grant workshops, and distribution of car wash kits to charities (King County and SPU 2005b).

SPU and King County staff participated in the Duwamish River Festival in August 2005 and 2006 (see also Section 2.7.4 below). They provided posters and conducted demonstrations. King County source control outreach for this event included a Wheels to Water shuttle enhancing citywide transit access to the event, with a special focus on serving the South Park and Georgetown neighborhoods. Information about the Natural Yard Care and Grant Exchange programs was distributed, and a life-sized Bert the Salmon, symbolizing water quality and its link to salmon survival, was also present. The county handed out Bert the Salmon baseball cards describing the benefits of using charity car wash kits and other educational materials to the public.

3.7 Other Ecology Activities

3.7.1 Ecology Source Control Database Development

Ecology started work on a Lower Duwamish database in March 2005. The database will be a web-based application. Users will be able to track source control including evaluations of a site, chemicals of concern, location, actions taken, and parties responsible as well as create reports.

Work stopped in November 2005 for several reasons. A new programmer was assigned and work resumed in August 2006. The scope was modified to accommodate the needs of other users. User Acceptance Testing started in March 2007.

A publicly available version will be on Ecology's website once the database is completed and data entered. A contractor will be hired to load the database, update it and generate reports. The database is expected to be ready for data loading in August 2007. The reporting function is still in development and will be finished in the Fall of 2007.

3.7.2 Lower Duwamish Waterway Industrial Stormwater Monitoring Study

Ecology contracted with SAIC to collect and analyze samples of stormwater sediment from selected, representative industrial stormwater facilities. The goal is to assess the potential for these types of facilities to contaminate sediments and to estimate the loading contribution to sediments.

The project is the first step in determining if facilities covered under the Industrial Stormwater General Permit are potential sources of sediment recontamination.

A draft *Literature Review and Summary of Existing Information* report was submitted to Ecology in May 2007. This report includes a literature review of potential sediment sampling devices that would accomplish the study objectives; a review of industrial stormwater studies conducted by Ecology and others; and recommendations for potential monitoring sites.

Subsequent tasks include preparation of a sampling and analysis plan, installation of sampling devices at facilities that are representative of industry types and geographic locations within the LDW, collection of sediment samples, flow monitoring, and chemical analysis of samples. Sampling devices will be installed prior to the 2007 winter wet season.

3.7.3 Urban Waters Initiative

This is part of the Puget Sound Initiative. The Urban Waters Initiative proposes a comprehensive, multi-program approach to:

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

The initiative provides staff for Spokane River, Commencement Bay, and the Lower Duwamish Waterway. For the Lower Duwamish, it requires that Ecology's Water Quality and Hazardous Waste Programs each dedicate one existing full-time staff member to support this work.

The Water Quality Program has assigned a senior inspector to the project. The Hazardous Waste Program is working to create and fill the new staff position. The programs are jointly developing protocols for conducting this effort. Ecology staff and managers met with staff and managers from Seattle and King County on June 15, 2007 to begin coordinating inspections to avoid duplication of effort. Three work groups were formed to address inspection procedures and checklists, identify facilities already inspected, and determine the overall strategy for ongoing inspections and coordination in the Lower Duwamish basin.

The Urban Waters Initiative also includes $180,000 to contract with a local government for a local source control specialist. This position is in the Hazardous Waste Program's budget and will likely be involved with inspections and technical assistance. Work includes:

- Working with smaller businesses to assure appropriate disposal of their waste, and
- Response to issues covered by local ordinances and referrals to Ecology for investigation/action as appropriate.

Another element of the Puget Sound Initiative provides for additional source control specialists for King and other counties. The procedures for implementing these programs are being developed.

Ecology's Environmental Assessment Program will conduct sampling in Elliott Bay. The purpose and scope of sampling in Elliott Bay and its relationship to the Lower Duwamish is still being discussed.

3.7.4 Public Outreach

Source Control Communication Strategy

Representatives from Ecology, EPA, and King County have been working together to develop a communication strategy for the SCWG. This strategy will provide clear messages for various audiences and resources for members of the SCWG to use for presentations and other outreach opportunities.

Duwamish River Festival

Ecology collaborated with federal, state, and local agencies and community groups to develop the Duwamish River Festival. The first Duwamish River Festival was held in August 2005. The size of the event nearly doubled for the second festival in August 2006. Planning is underway for the third festival in August 2007. This outdoor event incorporates activities such as live local music, free food, homemade tamales, kids' activities, kayak tours, and a free water taxi, with relevant health and cleanup information on the Duwamish Waterway. This approach to a public update meeting was developed in direct response to community comments that they would like to interact with agency representatives in a less formal setting. It has been a good opportunity to reach the culturally and economically diverse population. In 2006, the SCWG had a large interagency source control booth where members of the SCWG answered questions and provided handouts and displays (and Spanish interpretation) related to source control. The SCWG will have a unified booth at the 2007 festival.

Source Control Fact Sheets

Ecology created a number of source control fact sheets with assistance from the SCWG. The fact sheets will continue to be updated and distributed annually.

Community Meetings

Ecology works together with EPA during community meetings to address the concerns and information related to the source control component of any public meeting. In addition, Ecology has held and will continue to hold public meetings related to source control at specific sites, as needed. Ecology will also coordinate source control update meetings for the entire LDW site.

4.0 Implementation Issues

In 2004, the city of Seattle conducted a comprehensive survey of outfall or outfall-like structures terminating in the LDW. The survey identified 211 active outfalls or structures:

- 61 publicly-owned outfalls (including storm drains owned by the city of Seattle, Port of Seattle, King County, city of Tukwila, and Washington Department of Transportation)
- 111 privately-owned outfalls
- 39 listed as "unknown."

Many of these discharges are permitted under the National Pollutant Discharge Elimination System (NPDES).

4.1 Municipal Stormwater

Stormwater runoff collected in municipal separate storm sewers and discharged to surface waters is required to have a NPDES permit under the federal Clean Water Act. The EPA stormwater regulations establish two phases (Phase I and Phase II) for the municipal stormwater permit program. Phase I of the municipal stormwater program went into effect in 1990 and applies to municipalities with populations of more than 100,000.

4.1.1 NPDES General Permit: Phase 1 Municipal Stormwater

The original Phase 1 permit was issued in 1995 and was eventually followed by a second issuance on January 17, 2007. The new permit represents a significant shift in approach to stormwater monitoring. Monitoring in the new permit is required for both whole water and in-line stormwater solids, to be collected during wet and dry seasons. Contaminants to be monitored include the State's SMS list, as well as toxicity testing for whole water effluent and receiving sediments. The permit requires all permittees to monitor one stormwater drainage/outfall representing one of each type of land use: residential, commercial, and industrial. Complete monitoring requirements are in Special Condition S.8 of the permit which is available on-line at: http://www.ecy.wa.gov/programs/wq/stormwater/municipal/phase_I_permit/ph_i-permit.html.

In addition to the expanded monitoring described above, the Phase 1 permit also contains more traditional requirements such as system maintenance, business inspections, education/outreach, BMPs, and the development of municipal stormwater regulations/code.

The recent Phase 1 permit only required municipalities to monitor three outfalls for different land use - residential, commercial, and industrial. Before this general permit was reissued and as the Superfund sediment RI process was beginning, the city of Seattle and King County formed a joint program to conduct the source control inspections process throughout the 20,000 acres of the LDW drainage. The City's source control authorities come from the City Stormwater, Grading, and Drainage Control Code (SMC 22.800), which was established in part to meet the requirements of its NPDES municipal stormwater permit. King County's source control

authorities stem from its authorized pretreatment program and attendant industrial and hazardous waste management programs as well as from the Phase 1 NPDES requirements.

The joint LDW city-county source control program initiated in 2003 is an aggressive effort to reduce the amount of pollution entering public storm drains and sanitary/combined sewer systems that discharge to the LDW. Lower Duwamish source control activities generally go beyond what is required under the NPDES program. In particular, the level of source tracing and characterization being conducted through the joint program far exceeds what is required by NPDES.

Despite the extensive inspections and sampling to trace sources of contaminants found at the Duwamish/Diagonal and other outfalls, only a few discrete sources of PCBs and no discrete, controllable sources of phthalates have been identified. Source tracing to find controllable areas of contamination continues throughout the greater LDW drainage.

4.1.2 NPDES General Permit – Phase 2 Municipal Stormwater

Approximately half of the Norfolk CSO/SD basin falls within the incorporated city limits of Tukwila, which is a Phase 2 permittee. The permit focuses on development of city-wide stormwater pollution prevention plans, from how to manage sidewalk wash-water to managing construction stormwater within the city. While the permit states that no pollutants or toxics should be added to stormwater so that water quality standards are protected, no monitoring or reporting is required. This permit was also issued on January 17, 2007, and may be found at: http://www.ecy.wa.gov/programs/wq/stormwater/municipal/phase_II_ww/ww_ph_ii-permit.html.

4.2 Combined Sewer Overflows (CSOs)

The city of Seattle and King County CSO systems are covered under individual NPDES permits. The permits require the permittee to implement and document nine minimum controls for CSOs. These are technology-based requirements to reduce the potential for releases from the CSOs that would cause adverse impacts to receiving waters. Dry weather overflows are prohibited. In addition, the permittee must monitor CSO outfalls to characterize CSO impacts and the efficacy of CSO controls. This includes collection of data to document existing baseline conditions, evaluate the efficacy of technology-based control, and determine the baseline conditions upon which a long-term control plan will be based. Additional water quality based requirements apply to controlled CSOs (such as the Norfolk CSO).

The city of Seattle has two CSOs in the Lower Duwamish. The City is currently evaluating the status of its CSO projects and expects that these CSOs will be limited to an average of one untreated discharge per overflow structure per year by 2020.

King County's CSO Control Program gives the highest priority to projects near bathing beaches with recreational uses such as swimming, where high direct contact with the water occurs. The County's CSO control priorities are:

- Priority 1, CSOs near Puget Sound Beaches. The current schedule calls for completion of the Barton, Murray, North Beach, and South Magnolia projects in 2012.
- Priority 2, The University/Montlake CSO. This CSO is located at the east end of the Ship Canal. The control project was given a high priority because of the high level of boating in that area, which could result in secondary contact with the water.
- Priority 3, CSOs Along the Duwamish River and in Elliot Bay. The last of the CSO control projects along the Duwamish River will be completed by 2027. These projects were given third priority because the 1998 *Combined Sewer Overflow Water Quality Assessment for the Duwamish River and Elliott Bay* indicated that the level of pollution originating upstream of CSOs was high enough to dwarf improvements by CSO control projects (King County 2006b).

4.3 NPDES Permits

Ecology issues NPDES permits for some businesses in the Lower Duwamish. While the permits limit and control the discharge of a number of pollutants, they do not necessarily control contaminants that pose a threat to the sediments, such as PCBs, phthalates, arsenic, mercury and PAHs. As of July 2007, Ecology has 113 NPDES permits on record, including four individual NPDES permits (Appendix B).

4.3.1 Industrial Stormwater General Permit

This permit currently covers 103 industries within the natural drainage basin of the LDW. Coverage under the Industrial Stormwater General Permit requires a facility to monitor its stormwater discharge for copper, zinc, oils, and total suspended solids.

4.3.2 Sand & Gravel General Permit

This permit provides coverage for discharges of process water, stormwater, and mine dewatering water associated with sand and gravel operations, rock quarries, and similar mining activities, including stockpiles of mined materials, concrete batch operations, and hot mix asphalt operations. There are four Sand & Gravel General Permit holders along the Lower Duwamish. The Sand & Gravel Permit generally requires a facility to monitor for pH, turbidity, total suspended solids, total dissolved solids, temperature, oils, and flow rate.

4.3.3 Boatyard General Permit

This permit covers a commercial business engaged in the construction, repair, and maintenance of small vessels, 85 percent of which are 65 feet or less in length, or revenues which constitute more than 85 percent of gross receipts. The Boatyard General Permit requires monitoring for copper, oils, and total suspended solids. These permits do not specifically require monitoring of the solids portion of stormwater flow. There are two remaining permitted boatyards in the LDW.

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5.0 Tier One Areas

Based on results of the RI Phase 1, seven early action candidate sites were proposed by the Lower Duwamish Waterway Group (Windward 2003b). These early action (Tier 1) areas are shown in Figure 6. Tier 2 areas are discussed in Section 6.0.

The potential for sediment recontamination associated with these EAAs and source control actions that have been conducted are summarized in the following sections. Some maps and figures from source documents have been reproduced in this document to help identify locations discussed in the text below. Other tables and figures are available in the referenced reports.

5.1 Early Action Area 1 (Duwamish/Diagonal)

The Duwamish/Diagonal area, located on the east side of the LDW approximately 0.4 to 0.6 miles from the southern tip of Harbor Island (Figure 6), was identified as a cleanup priority by the Elliott Bay/Duwamish Restoration Program (EBDRP) in the mid-1990s. This was based on concerns about contaminated sediments adjacent to storm drains and CSOs owned and operated by SPU, King County, and the Port of Seattle (Ecology 2004b). The Port also owns upland property adjacent to the cleanup site.

Studies conducted in 1994 and 1996 identified PCBs, mercury, BEHP, and butyl benzyl phthalate as the major chemicals of concern (COCs) in sediments. Modeling of sediment deposition off Duwamish/Diagonal CSO/SD in 1999 predicted that BEHP, lead, and chrysene may accumulate in sediments at concentrations above state standards (King County 2001).

A draft site assessment and cleanup study report were prepared by EBDRP (King County 2000, 2001). Partial cleanup at the Duwamish/Diagonal site began in November 2003 and was completed in March 2004. Cleanup consisted of dredging and removal of 66,000 cubic yards of contaminated sediments from the site, followed by the placement of an engineered sediment cap in order to isolate remaining sediment contamination.

Due to unacceptable levels of PCB contamination surrounding portions of the dredged area, a follow-up action was conducted in February 2005. A thin layer of sand was placed over the most contaminated area to reduce the exposure of marine organisms to contaminants and to accelerate natural recovery of the area.

5.1.1 Source Control Action Plan

A SCAP for EAA-1 was published on December 1, 2004 (Ecology 2004b). It identified the following potential contaminant sources: Diagonal Avenue S. CSO/SD, Nevada Street Storm Drain, private stormwater discharges from adjacent properties, and soil/groundwater contamination at adjacent or upland sites. Potential sources and source control actions that have been conducted are described below. Table 3 lists the action items identified in the SCAP.

In addition, 37 sites on Ecology's Confirmed or Suspected Contaminated Sites List (CSCSL) are located within the basins that drain to the Duwamish/Diagonal cleanup site. Of these 37 sites, 23

Table 3. Source Control Actions Identified in EAA-1 SCAP

Activity		Responsible Agency	Completion Date	Comments
Application	**Task Name**			
D/D EA	SPU Business Inspections	King Co./Seattle	2001 *Complete*	Inspections completed.
D/D EA only	Diagonal Storm Drain Cleaning	Seattle	Summer/Fall 2004	Project is complete as of 9/04
D/D EA only	Duwamish/Diagonal SD/CSO Joint Business, Hazardous, Industrial Waste Inspections	King Co./Seattle	July 2004	The first round of the King Co. /Seattle joint business inspection program was completed in July 2004. This includes problem referral to other agencies/programs for correction, technical or compliance assistance, education. Re-inspection of facilities will be done where necessary and will continue until compliance is achieved.
D/D EA only	Nevada Street SD	Seattle	Investigation – 2004 Further action – 2005 depending on nature and extent of work needed	Re-locate outfall, add to maintenance schedule for video. Determine further needs/actions pending results of maintenance inspections
D/D EA only	Diagonal Ave. South SD	Seattle	Investigation – 2004 Further action – TBD depending on nature and extent of work needed	Is on maintenance schedule, determine further needs/actions pending results of maintenance inspections
D/D EA only	Container Care stormwater inspection (T106 & T108)	Seattle/Ecology	Completed May 2003	T106 & T108: Poor BMPs and housekeeping at Container Care affected both Terminals. Resolved by city and state joint inspection.
D/D EA only	General Services Administration/ Federal Center South	Ecology	Initial inspection: June 2004 Final assessment: Fall 2005	Initial inspection complete. Assessment of discharges to surface water and soil & groundwater as potential sources of sediment contamination ongoing.
D/D EA only	T108 Assessment for Potential On-going Source (groundwater)	Port of Seattle	Spring 2005	Additional soil & groundwater sampling needed to determine if groundwater is contaminated (historic site use) and an on-going source of sediment contamination. Additional soil remediation (historic use) may be needed.

Table 3. Source Control Actions Identified in EAA-1 SCAP (Continued)

Activity		Responsible Agency	Completion Date	Comments
Application	Task Name			
D/D EA only	Union Pacific RR Diesel Spill (Argo St Rail Yard)	City/ Ecology	Summer 2005	Feb 1999 Diesel spill from locomotive refueling station was cleaned up but residual product remains in groundwater. City has observed & responded to oily sheens in LDW - suspect residual contamination follows stormwater utility corridor to LDW. Site is an independent cleanup under MTCA with no Ecology oversight. Review available data; refer to King County for Site Hazard Assessment. Determine if formal oversight is needed.
D/D EA only	Janco United site	Ecology	February 2005	Conduct initial investigation. Determine if wastes dumped on ground have been investigated and removed. Determine if site is ongoing source of phthalates.
D/D EA only	Upland Contaminated Sites	Ecology	March 2005	Review files for 37 identified sites. Determine potential as source of sediment contamination and need for additional action.
D/D EA only	LUST	Ecology	April 2005	Review files for identified LUST sites. Determine potential as source of sediment contamination and need for additional action.
throughout Lower Duwamish Waterway	UST	Ecology	January 2008	UST inspections occur every 7 years. Inspections in D/D EA are on an accelerated schedule.
throughout Lower Duwamish Waterway	Spills Emergency Response	All Agencies	Continuous	All agencies maintain emergency response preparedness, and respond as appropriate depending on the situation.
throughout Lower Duwamish Waterway	Phthalate Study	King Co./Seattle/Tacoma	Phase 1 complete, Phase 2 complete Phase 3 In progress	Phase 1= general land use relationship to phthalates, Phase 2 = source material sampling & analyses Phase 3 = Air pathway, additional source material sampling & analyses
throughout Lower Duwamish Waterway	Tenant Inspections at Port of Seattle Terminals	Port of Seattle	Continuous	Tenant compliance/SW protection programs

have had some form of site assessment conducted and require further investigation and cleanup, nine are in Ecology's Voluntary Cleanup Program with cleanup either in progress or reported as complete, and five sites have been cleaned up and have been issued "no further action" determinations by Ecology.

There are 105 leaking underground storage tank (LUST) sites listed in the basins that drain to the Duwamish/Diagonal Way cleanup site. The majority of these sites involve a release of petroleum products. There are approximately 196 underground storage tank (UST) sites in the Duwamish/Diagonal drainages. Some of these tanks may be unregulated (such as those used for heating oil) and therefore are not inspected by Ecology. Ecology conducts leak prevention inspections of regulated tanks on a 5-year cycle.

5.1.2 Business Inspections

A total of 1,009 businesses were inspected between 2003 and 2006. Of these, 286 were screening visits and 723 were full site inspections (Appendix A and B). Approximately two-thirds of the sites where full inspections were conducted required some type of corrective action. As of the end of 2006, all but seven sites where corrective actions were requested had achieved compliance.

Ten sites had illicit connections to the public storm drain system that allowed process water/wastewater that would normally discharge to the sanitary sewer to enter the stormwater system.

5.1.3 Source Tracing

SPU continues to monitor particulates using sediment traps in storm drains to identify sources of chemicals which may recontaminate sediments. Sediment traps have been installed at seven sites in the Diagonal Avenue CSO/SD system. As of September 2006, a total of seven rounds of sediment trap samples had been collected:

- Round 1: February 2003 – August 2003
- Round 2: August 2003 – February 2004
- Round 3: February 2004 – August 2004
- Round 4: August 2004 – March 2005
- Round 5: March 2005 – August 2005
- Round 6: August 2005 – March 2006
- Round 7: March 2006 – September 2006

Key findings are summarized below (King County and SPU 2007):

- PCBs are frequently detected (in 90 percent of the samples), but only one sample, collected from ST5 in Round 6 (3.25 mg/kg DW, 116 mg/kg OC) exceeded SQS values. PCB concentrations in the other samples generally ranged from about 0.1 to 0.5 mg/kg DW (<1 to 8 mg/kg OC).

- With the exception of zinc, metals concentrations are generally low. Zinc exceeded the SQS and CSL in about 58 percent and 9 percent of the samples, respectively. Copper and mercury exceeded the CSL in two samples and one sample, respectively.
- BEHP is the primary constituent of concern in the Diagonal Avenue S. CSO/SD. Approximately 84 percent of the 32 samples collected as of September 2007 exceeded the SQS and 66 percent exceeded the CSL.
- PAH concentrations are generally low. Only high molecular weight PAH compounds exceeded the SQS in 1 of 32 samples collected to date (station ST6).

5.1.4 Diagonal Avenue S. CSO/SD

The Diagonal Avenue S. CSO/SD discharges to the Lower Duwamish Waterway at approximately river mile 0.45. It is the largest storm drain system in Seattle, draining an area of approximately 2,600 acres. The drainage basin is comprised of a 3.6-mile stretch of I-5, portions of the Central District, the Duwamish industrial area, Rainier Valley, and Beacon Hill. Average annual stormwater discharge from the Diagonal drainage basin is estimated at 900 million gallons per year (King County and SPU 2007). In addition to collecting stormwater runoff, the Diagonal system receives discharges from nine CSOs, one operated by King County (Hanford #1, 4,900-acre service area) and eight operated by the city of Seattle (Diagonal 1A through 111H, 624-acre service area).

Source Control Actions

In 2002, SPU began removing accumulated sediment from the lower portion of the Diagonal Avenue S. CSO/SD system as part of an agreement with the EBDRP to eliminate a potential source of contamination to the Duwamish/Diagonal sediment cleanup area. An estimated 498 cubic yards of sediment had accumulated in the flat section of the main line and two of the major laterals located below Fourth Avenue S. SPU crews cleaned the two laterals (approximately 2,800 lineal feet) in 2002 (Ecology 2004b).

In 2003, approximately 2,500 lineal feet of the main drain from Fourth Avenue S. to Colorado Avenue S. and the S. Dakota Street lateral between Fifth Avenue S. and Second Avenue S. was cleaned, with 498 cubic yards of storm drain sediment transported to a nearby cement plant, where it was used in the cement manufacturing process. The remaining 600 feet in the S. Dakota lateral were cleaned during July through November 2004 (Ecology 2004b). SPU video-inspected the S. Dakota lateral in February 2005 to verify that sediment removal was complete. No further cleaning is needed (King County and SPU 2005b).

5.1.5 Nevada Street Storm Drain

The 24-inch Nevada Street storm drain outfall is located several hundred yards downstream (north) of the Duwamish/Diagonal cleanup area, and discharges to the LDW at the west end of S. Nevada Street. The drain serves a portion of the Port of Seattle Terminal 106 property that is used for warehousing and the northern portion of a shipping container repair facility (Container Care Inc.). Total drainage area is estimated at about 26 acres. Efforts to locate the outfall have been unsuccessful (Ecology 2004b).

Source Control Actions

SPU was scheduled to investigate this storm drain line in the Spring of 2005. Plans included using dye to locate the outfall, identifying connections, confirming drainage areas, and sampling sediments. In June 2005, SPU attempted to collect sediment samples from this storm drain, however all of the manholes in the right-of-way on South Nevada St. were clean and could not be sampled. The last manhole upstream of the outfall was covered by a container and could not be inspected.

5.1.6 Port of Seattle Terminal 106 / Container Care International

T-106 SW (Container Care International) stores, reconditions, and refurbishes shipping containers including refrigerated units. Container Care has been operating at this site since July 1990 (Ecology 2004b). Specific activities at the site include marine cargo container structural repair (no sandblasting), container chassis repair and painting, repair of refrigeration equipment on refrigerated containers, pressure washing of marine cargo containers, container/chassis storage, and transportation services (SAIC 2003). In the past, portions of this property drained directly into the LDW just north of the Oregon Street right-of-way. Currently, most of this property drains to the Diagonal Avenue S. CSO/SD.

Source Control Actions

In August 2002, representatives of SPU and Ecology conducted a joint inspection of the Container Care International facility. Numerous dangerous waste and surface water issues were identified, including improper labeling, segregation, storage, and waste manifesting. The facility was also found to be conducting pressure washing operations outside of a designated area. Other issues included general housekeeping, employee awareness training, spill readiness, and contingency planning. In January 2003, the facility was re-inspected and the majority of the discrepancies had been corrected. By May 2003, all discrepancies had been addressed.

Phase 1 Environmental Site Assessments and Phase 2 investigations were completed for T-106 SE (warehouse W-4) and T-106 NE (warehouse W-6) by the Port of Seattle (Pinnacle GeoSciences 2003a, 2003b, 2003c). The Phase 1 and 2 reports identified 14 potential areas of concern relative to soil and/or groundwater. The reports addressed historical uses of the Port property as well as neighboring and adjoining properties. A number of soil probes and borings were completed and 14 groundwater monitoring wells were installed. The investigations did not discover any concerns or ongoing contamination sources relative to stormwater or releases to the Duwamish/Diagonal outfalls. The contamination that was found was localized and determined not to be migrating to the Duwamish through stormwater (Pinnacle GeoSciences 2003a, 2003b, 2003c). The parcel containing Warehouse W-6 was sold by the Port in July 2005 to "AMB Partners II LP;" the Warehouse W-4 parcel was sold in August 2006 to "4746 Ohio Avenue South LP."

In April 2004, three underground storage tanks and associated contaminated soils at the Container Care site were excavated and disposed. All of the soil and groundwater samples were significantly below MTCA Method A cleanup levels.

5.1.7 Port of Seattle Terminal 108 / Former Chiyoda Property

Terminal 108 is located immediately north of Diagonal Ave. S (Figure 7). The Diagonal Ave. sewage treatment plant operated at this location from 1938 to 1969. In 1976, the U.S. Army Corps of Engineers disposed of PCB-contaminated dredge spoils on the Chiyoda property. The dredge spoils came from the 1974 transformer spill in Slip 1. The Corps excavated two lagoons along the northern edge of the property. These were used to treat approximately 10 million gallons of PCB-contaminated sediment dredged from near Slip 1. The PCB-contaminated sediment was deposited in the lagoon closest to the river. Water pumped from the disposal lagoons was treated by particulate, sand, and charcoal filters prior to discharge to the LDW. The PCBs in the lagoons were covered with soil from the excavations and sediment dredged from the shoreline in front of the old Diagonal treatment plant outfall.

The Port of Seattle acquired the Chiyoda property in 1980. The Port later sold part of the property to Chevron and retained the portion along the river. Soil contaminated with petroleum was stockpiled in the vicinity of the former disposal lagoons (Ecology 2004b). This soil was treated to meet the State of Washington TPH cleanup level of 200 mg/kg. The Port leased the southern part of the site to Lafarge Cement Company which occupied the site from 1989 to 1998 and loaded cement barges at the mooring pile dock (SAIC 2003). This site is currently the Port of Seattle's Terminal 108 expansion area and is used for container storage.

Source Control Actions

The Port of Seattle installed five groundwater monitoring wells and analyzed soil and groundwater samples in June 2006. Groundwater was sampled again in September 2006, January 2007, and May 2007 (Kuroiwa 2007). No PCBs, TPH, metals, solvents, or phthalates were found in the four rounds of groundwater samples collected.

Low levels of PCBs (0.5 to 3.0 mg/kg) were detected in shallow soils near the LDW bank. Higher concentrations have been detected farther inland and at depth on the property. The potential recontamination pathways for this site are soil erosion to the waterway and transport via Terminal 108 storm drains.

5.1.8 Union Pacific Railroad Argo Yard

The Union Pacific Railroad Argo Fueling Site is adjacent to Terminal 106E. An extensive diesel release and groundwater plume was discovered in 1999 that extended from the property onto the Port's Terminal 106 properties. An air sparging system was constructed in May 2001 to remediate groundwater at the site. Union Pacific constructed an interceptor trench downgradient of the fueling facility in July 2002, and began pumping operations to recover the diesel. A total of 21,300 gallons of pure product had been recovered by August 2002. The groundwater pumping system continued to operate until April 2004 and recovered 38,500 gallons of diesel. The air sparging system was shut off in May 2004 to correct electrical problems and to allow for an evaluation of natural attenuation of the site in the absence of air injection. Investigations in 2004 and 2005 by Union Pacific Railroad consultant Kennedy/Jenks discovered that the plume seems to be migrating in the backfill material of the storm drain along Oregon Street and Diagonal Way and is moving toward the Duwamish Waterway (Kennedy/Jenks 2005). Union

Pacific is conducting an independent cleanup of their property (Ecology 2004b) and is still recovering approximately 30 gallons of diesel fuel per year by hand bailing the product in the recovery wells.

Source Control Actions

King County staff collected water samples in both the Diagonal Ave S CSO/SD and the local sanitary sewer to determine if shutdown of the air sparging system had caused petroleum hydrocarbons to infiltrate into utilities in the area. Sample results were at background concentrations for stormwater and sanitary sewage. Although these results did not show infiltration when the samples were collected, changes in the configuration and flow of any diesel plume could cause different results in the future. Source control staff will remain vigilant for any evidence of infiltration in future sampling or inspection events.

5.1.9 Federal Center South

The General Services Administration (GSA) manages this property on behalf of the United States and leases space to various agencies of the federal government. Past or present tenants include the Army Corps of Engineers, the Federal Bureau of Investigation, Air Force Logistical Office, and the Bureau of Indian Affairs (Ecology 2004b).

A hazardous waste site inspection by Ecology in 1993 documented several potential sources of contamination to the river and sediments, including algaecides, biocides, fungicides, chemically-treated coolant from air conditioning units, and releases from the secondary containment of a drum holding area (Ecology 2004b). Five petroleum UST removals have been conducted at this site. In 2000, a gasoline plume was discovered in groundwater. Subsequent sampling indicated a decline in groundwater concentrations, however one well continues to show high levels of heavy hydrocarbons. This may represent a localized area of hydrocarbon contamination caused by historic site operations or the use of contaminated fill materials (Herrera 2003).

A 2001 site assessment contained several references to floor drains and drain lines; these may discharge through private outfalls directly to the LDW (Ecology 2004b). SPU and Ecology inspected this site on June 24, 2004 and found that the onsite drainage system was in need of cleaning and repair. In addition, other issues regarding storage, disposal, and labeling of waste materials were identified. As of December 2006, GSA had not corrected these problems (Schmoyer 2007).

5.1.10 Former JANCO-United Site

In 1986, two executives of JANCO-United Inc. a janitorial supply company, pleaded guilty to a charge of dumping industrial chemicals into the Duwamish River through an underground drain pipe (Seattle Post-Intelligencer 1986). The company installed a pipe which carried chemicals into a storm drain that emptied into the LDW via the Diagonal Avenue S. CSO/SD. Between September 1982 and November 1984, JANCO employees disposed of wastes, including degreasing compounds alleged to contain phthalates and chlorinated benzenes, through the pipe. Prior to installation of the pipe, the materials were dumped on the ground (Ecology 2004b). The plant, formerly in the 4400 block of Fourth Ave. S., moved to a different location in late 1984.

There is no record of any cleanup at this location and the fate of the pipe could not be determined at the time this report was written. Active Gear currently operates a distribution warehouse at this site.

5.1.11 Planned Source Control Activities

Business Inspections: A second cycle of inspections in the Duwamish/Diagonal basin, roughly 90 inspections, is scheduled to occur in 2007.

Source Tracing: Sediment trap sampling will continue at least through 2008.

Diagonal Avenue S. CSO/SD: The city of Seattle has hired a contractor to clean all of the catch basins located in the public right-of-way within the Diagonal Avenue S. CSO/SD drainage basin. Work is expected to be completed in 2007.

Nevada Street Storm Drain: SPU will attempt to collect a sample from the last manhole above the outfall in 2007.

Port of Seattle Terminal 108/Former Chiyoda Property: The Port of Seattle has proposed the following actions for source control at this property.

- Upgrade and maintain the existing stormwater collection system.
- Pave portions of the leased property and redirect stormwater away from the river and vegetated buffer zone.
- Enhance the existing vegetative buffer and berm running along the top of the bank adjacent to the river.
- Stabilize the eroding shoreline on the southern part of the property.

Former JANCO-United Site: Public Health – Seattle & King County is performing a Site Hazard Assessment; the assessment will be completed in August 2007.

5.2 Early Action Area 2 (Trotsky)

Early Action Area 2 (EAA-2) is located approximately 2.2 miles from the south end of Harbor Island, on the west bank of the LDW, just south of the First Avenue S. bridge in King County, Washington (Figure 6). It consists of a small inlet, approximately 80 feet wide at its mouth and tapering to a narrow stream at its head. The inlet is surrounded by property owned by the Douglas Management Company to the north and by Herman & Jacqualine Trotsky to the south (Figure 8). Boyer Towing, Inc. owns the land just east of the Trotsky property, extending from the mouth of the inlet along the LDW to the south. The inlet itself was formed when the area to the north was filled to create the triangular area that currently comprises the Douglas Management Company site.

Based on the results of sediment sampling conducted between 1991 and 2005, the following chemicals are considered to be contaminants of concern at EAA-2 with regard to potential sediment recontamination: PCBs, DDT, mercury, BEHP, dieldrin, lead, and zinc.

Potential sources of sediment recontamination and source control actions are described below.

5.2.1 Source Control Action Plan

SAIC prepared a *Summary of Existing Information and Identification of Data Gaps* report in February 2007 (SAIC 2007b). The following potential contaminant sources were identified: Second Avenue S. outfall, Industrial Container Services/Trotsky Property/Former Northwest Cooperage, Douglas Management Company/Alaska Marine Lines Dock 2, Boyer Towing, Inc., and other upland properties with stormwater drainage to the Second Avenue S. outfall.

The SCAP for EAA-2 was published on June 29, 2007 (Ecology 2007b). Table 4 lists the action items identified in the SCAP.

5.2.2 Business Inspections

SPU is currently conducting inspections at 16 businesses in this drainage basin. One business has been inspected as of December 2006.

5.2.3 Second Avenue S. Outfall

EAA-2 is located within the Second Avenue S. drainage area of the South Park Basin (SPU 2005). The EAA-2 area is served by separated storm and sanitary systems. In some areas, particularly along the river, there are no piped drainage or sewer systems.

The South Park Basin was identified in the 1995 SPU Comprehensive Drainage Plan update as having numerous drainage problems resulting from poor roadway grading, inadequate capacity of existing storm drain systems, lack of storm drainage infrastructure in some areas, and topographic constraints such as low elevation and tidal influence (SPU 2005). Tidal influence in the LDW causes gravity storm drain systems to back up and flood low-lying areas.

The Second Avenue S. subbasin covers the area between SR99 and the LDW, from about S. Austin Street to the EAA-2 inlet. It is served by a system of ditches and culverts, with a piped outfall to the river (known as the Second Avenue S. outfall) (SPU 2005). The main drainage ditch leading to this outfall runs along Second Avenue S., along the eastern boundary of the Trotsky property. In addition, SPU operates an overflow from the West Seattle reservoir that discharges excess water to the head of the inlet.

Source Control Actions

Inline sediment samples were collected on April 13, 2005 at two locations in a drainage ditch in the Second Avenue S. subbasin. Samples were analyzed for PCBs (as Aroclors), SVOCs, selected metals (arsenic, copper, lead, mercury, zinc), and petroleum hydrocarbons. Results are presented in the *Summary of Existing Information and Identification of Data Gaps* report (SAIC 2007b).

Storm drain sediment data were compared to SMS values to provide a rough indication of overall quality. Zinc, N-nitrosodiphenylamine, and di-n-butyl phthalate exceeded the SQS in sample RCB44, and BEHP exceeded the SQS in sample RCB45.

Table 4. Source Control Actions Identified in EAA-2 SCAP

Potential Sources	Action Items	Milestones and Parties Involved
Industrial Container Services / Trotsky Property		
Potential historic source: Data indicate that spills and releases of pollutants may have occurred during the 60+ years of barrel reconditioning operations at this site. Contaminants were present in soil and groundwater during the most recent sampling conducted in 1991. The presence of seeps along the banks of the EAA-2 inlet indicates that groundwater transport of contaminants to the inlet may be occurring.	Conduct additional site characterization to evaluate current concentrations of COCs in groundwater, bank and intertidal sediments, and seeps.	Ecology – August 2007 (In Progress)
	Identify additional data gaps based on sampling results, and determine means to fill them.	Ecology – 2007
	Conduct cleanup as needed to eliminate sources of contaminants to EAA-2.	Industrial Container Services/Trotsky – 2008
	Issue Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) 104(e) letter to facility/site/property owners to obtain additional information on historic sources of contamination.	EPA – October 2006 (Done)
	Review responses to CERCLA 104(e) letter.	EPA, Ecology - 2007
Potential ongoing source: Facility is authorized by King County to discharge stormwater to the combined sewer system. Stormwater is pretreated prior to discharge. Roof drains in the northwest corner of the property may drain to a pipe along First Avenue S.; it is not clear where this pipe discharges. A multimedia inspection was conducted in 2003; no significant concerns were identified. The facility is regulated by the Puget Sound Clean Air Agency (PSCAA) under Permit No. 11683.	Conduct periodic inspections to verify that facility complies with applicable regulations and best management practices (BMPs).	King County Industrial Waste (KCIW) – Ongoing
	Investigate destination of roof drainage from northwest corner of property.	King County, Ecology, Seattle Public Utilities (SPU), Industrial Container Services – 2007
	Evaluate the need for stormwater characterization (solids and whole water) from this facility if overflow occurs during heavy rainfall events.	Ecology-Water Quality (WQ), KCIW, SPU - 2007
	Conduct periodic air permit inspections to ensure compliance with permit conditions and BMPs.	PSCAA – Ongoing/As Needed
Alaska Marine Lines Dock 2 / Douglas Management Company		
Potential historic source: Past activities at the site include a sand and gravel batch plant, bus parking and maintenance, barge mooring, equipment storage, and marine cargo handling. Remediation was performed in the early 1990s for a leaking petroleum underground storage tank (LUST). The presence of contaminants in soil and groundwater beneath the site cannot be ruled out. The occurrence of seeps along the banks of the EAA-2 inlet indicates that groundwater transport of contaminants (if present) to the inlet may be occurring.	If granted access, conduct groundwater sampling along the southern portion of the property (adjacent to the EAA-2 inlet) to evaluate the potential for groundwater transport of contaminants from this site. Collect bank and seep samples as needed.	Ecology – Fall 2007 (In Progress)
	Identify additional data gaps based on sampling results, and determine means to fill them.	Ecology – 2007
	Conduct cleanup as needed to eliminate sources of contaminants to EAA-2.	Alaska Marine Lines/Douglas Management Company – 2008
	Issue CERCLA 104(e) letter to facility/site/property owners to obtain additional information on historic sources of contamination.	EPA – October 2006 (Done)
	Review responses to CERCLA 104(e) letter.	EPA, Ecology - 2007

Table 4. Source Control Actions Identified in EAA-2 SCAP (Continued)

Potential Sources	Action Items	Milestones and Parties Involved
Potential ongoing source: According to Alaska Marine Lines' Stormwater Pollution Prevention Plan (SWPPP) for this site, stormwater runoff flows from the site into a storm drain and directly to the Lower Duwamish Waterway through an outfall located along the northeastern side of the site. It is not clear whether stormwater on the southern portion of the site (near the EAA-2 inlet) drains to the EAA-2 inlet or to the storm drain.	Continue periodic inspections as needed to verify that site operations do not result in the release of contaminants to EAA-2. Verify storm drainage pathway on the southern portion of the site.	Ecology, SPU – Ongoing/As Needed
	If stormwater discharge to EAA-2 is confirmed, assess the need for stormwater characterization (solids and whole water). Collect stormwater samples as needed.	Ecology-WQ, SPU, Alaska Marine Lines/Douglas Management Company – 2007
Second Avenue S. Storm Drainage		
Potential ongoing source: A variety of industrial facilities discharge stormwater to the Second Avenue S. storm drain, which consists of ditches, culverts, and pipes. Contaminants in stormwater from upland facilities may be transported to EAA-2 via this storm drain. Inline sediment samples indicated the presence of arsenic, zinc, phthalates, PAHs, and other contaminants.	Collect storm drain outfall pipe sediment and water samples to evaluate whether contaminants are currently being transported to the EAA-2 inlet via this pathway.	Ecology – August 2007 (In Progress)
	Collect additional inline sediment samples to evaluate the levels of COCs with respect to sediment recontamination in this drainage.	SPU – 2007/2008
	If COCs are present in the storm drain line, conduct source tracing to identify sources of contaminants.	SPU – 2008
	Review and update National Pollutant Discharge Elimination System (NPDES) permits as needed.	Ecology-WQ – Ongoing
	Conduct source control inspections of upland sites as needed (see below)	SPU, Ecology
Boyer Towing / Boyer Alaska Barge Lines / Boyer Logistics		
Potential ongoing source: Boyer Towing owns or leases a large portion of the EAA-2 upland area. Little is known about historic or current operations at these parcels. EPA has recently issued CERCLA 104(e) letters to the property owners. Additional information is needed to assess whether activities at these parcels may pose a potential risk of sediment recontamination at EAA-2.	Issue CERCLA 104(e) letter to facility/site/property owners to obtain additional information on historic sources of contamination.	EPA – October 2006 (Done)
	Review responses to CERCLA 104(e) letter.	EPA, Ecology – 2007
	Continue source control inspections to verify that facility complies with applicable regulations and BMPs; verify storm drainage pathway on the southern portion of the site.	SPU – 2007
	If stormwater discharge to EAA-2 is confirmed, assess the need for stormwater characterization (solids and whole water) and conduct review of facility's SWPPP. Collect stormwater samples as needed.	Ecology-WQ, SPU, Boyer Towing – 2007
	Continue periodic inspections as needed to verify that site operations do not result in the release of contaminants to EAA-2.	Ecology, SPU – Ongoing/As needed

Table 4. Source Control Actions Identified in EAA-2 SCAP (Continued)

Potential Sources	Action Items	Milestones and Parties Involved
Other Upland Properties		
Potential ongoing sources: Several upland properties may contain COCs and are potential sources of sediment recontamination via the stormwater drainage system. These include: Pacific American Commercial (PACO), PCT Construction, WHECO, Cunningham Manufacturing, United Iron Works, Ferguson Construction, and Automatic Transmission Parts/ATC Distribution. Spills at adjacent and upland properties may result in transport of contaminants to EAA-2.	Conduct inspections/re-inspections to promote pollution prevention practices and conduct source control, as needed.	Ecology, SPU – 2007/2008
	Review facility SWPPPs as needed to ensure control of potential contaminant releases to EAA-2 sediments.	Ecology, SPU – 2007
	Monitor upland spills; depending on the nature of the spill, track origin of the spill and cleanup activities to identify any post-spill source control that may be needed.	Ecology, SPU, EPA – Ongoing/as needed
Atmospheric Deposition		
Localized or widely dispersed air pollutants may be deposited within the EAA-2 drainage basin and contribute to contaminant concentrations in stormwater that discharges to the EAA-2 inlet.	Evaluate atmospheric deposition to assess whether this pathway is a potential source of phthalates and other contaminants, such as PCBs, in stormwater runoff at EAA-2.	Not Scheduled

Stormwater discharges from the Second Avenue S. drainage basin may represent an ongoing source of COCs to the EAA-2 inlet.

5.2.4 Industrial Container Services / Trotsky Property / Former Northwest Cooperage

Industrial Container Services, LLC, is the current owner/operator of a steel drum reconditioning facility located at 7152 First Avenue S. in Seattle, adjacent to the EAA-2 inlet (Figure 8). The facility has been operating at this site (under several names) for over 60 years. The property is owned by Herman and Jacqualine Trotsky. The Trotsky family operated the facility at this site under the name Northwest Cooperage from 1953 through 1995.

Operations at the site include storage, cleaning, and repainting of empty used drums. Drums accepted by Industrial Container Services for reconditioning may have contained hazardous wastes, resins, solvents, petroleum products, paints, adhesives, or pesticides.

Northwest Cooperage is listed in Ecology's CSCSL as a site that has been ranked and is awaiting remedial action. Soil and groundwater underlying the former Northwest Cooperage facility is contaminated with volatile organic compounds (VOCs) and pesticides.

Contaminant concentrations detected in soil and groundwater at the Trotsky site were compared to screening levels and to MTCA Cleanup Levels to evaluate the potential for recontamination of EAA-2 slip sediments following cleanup. In soils, 19 chemicals that could potentially recontaminate slip sediments were identified, including metals, VOCs, SVOCs, and PCBs.

In groundwater, 18 chemicals that could potentially recontaminate EAA-2 slip sediments were identified. These include metals (arsenic, lead, zinc), VOCs (vinyl chloride, benzene), SVOCs (2,4-dimethylphenol, 1,2-dichlorobenzene), and pesticides (DDD, DDE, and DDT). DDT, lead, and zinc, which were detected in groundwater above the screening levels, are also contaminants of concern in sediment.

Data collected at the Trotsky Property are relatively old (1986 through 1991), and may not accurately reflect current conditions at the site. However, since no remediation has been performed at the site, previously detected contaminants are likely to still be present today. Therefore the potential for sediment recontamination due to contaminants in soil and groundwater at this site is believed to be high.

5.2.5 Douglas Management Company / Alaska Marine Lines

This site has been used for shipbuilding and salvage, handling of containerized marine freight, parking and light maintenance, equipment storage, and operation of a concrete batch plant (Seattle Ready Mix) which included a concrete waste disposal facility with settling and storage basins, a concrete pad and a conveyor belt. In 1990, widespread contamination was found in groundwater including benzene, toluene, xylene, and diesel above MTCA Method A Cleanup Levels. Underground storage tanks were removed in 1991. Between 1992 and 1995, operations at the site were covered by a baseline stormwater permit (SO3-0002471) for container storage. The permit was extended to November 2000 and again to 2005.

As part of the Phase 2 RI, Windward Environmental surveyed seeps along the LDW. Four seeps were identified in the EAA-2 inlet; Seep 55 was located near the head of the inlet, on the north (Douglas Management Company) side of the inlet. This seep has not been sampled. Because at least one seep enters the inlet from this property, and in the absence of other site characterization data, the site cannot be eliminated as a potential source for recontamination of EAA-2 sediments.

Source Control Actions

The facility operates under the Industrial Stormwater General Permit. It has not been inspected by SPU; however, Ecology conducted a stormwater compliance inspection in May 2006. It was observed at that time that wash water was draining to the storm drain system, that it was not known where the oil/water separator discharges to, and that the facility had not submitted Discharge Monitoring Reports as required by the stormwater permit (Ecology 2006). Ecology requested that the facility develop and implement a Stormwater Pollution Prevention Plan (SWPPP), submit a transfer of ownership and a revised Industrial Stormwater General Permit application, begin to collect and submit stormwater sampling results as required by the permit, and refrain from discharging wash water to the storm drains. No follow-up inspection has been conducted. The destination of stormwater on the southern portion of the site is not clear from the available documents.

5.2.6 Boyer Towing Inc.

Boyer Towing owns 13 parcels in the EAA-2 upland area; activities at these parcels include operation of a commercial fishing terminal, automotive and equipment repair, equipment and vehicle storage, and operation of warehouses and a machine shop. Some of these parcels are leased to tenant businesses, such as Wells Truck & Leasing, B&J Auto Wrecking, Alaska Washington Co., Alki Construction Co., and WHECO. At least two private outfalls discharge directly to the LDW from Boyer-owned parcels; these are not located within EAA-2.

Boyer Logistics operates a terminal that provides contract stevedoring and freight operations for the company's and outside customers' barges and cargo. Since 2002, they have been shipping and providing temporary storage for untreated cut lumber from Alaska.

Source Control Actions

A January 2003 SPU inspection found numerous issues associated with high-risk pollution-generating activities. Sediments from an oil/water separator at the site contained the following chemicals at concentrations above the SQS: phthalates, cadmium, and zinc. Runoff from the western and southern edges of the property was observed to flow toward the Second Avenue S. drainage system. Catch basins, sumps, and oil/water separators were subsequently cleaned.

On October 10, 2006, EPA notified Boyer Towing of their potential Superfund liability associated with releases of hazardous substances to the LDW.

Storm drains along the western and southern ends of the Boyer Towing properties discharge to the Second Avenue S. drainage system. Additional information is needed to assess whether activities at these parcels may pose a potential risk of sediment recontamination.

5.2.7 Other Upland Properties

Several upland properties in addition to Boyer Towing may generate COCs and are potential sources of sediment recontamination via the stormwater drainage system.

5.2.8 Planned Source Control Activities

Business Inspections: SPU is currently conducting inspections at 16 businesses in this drainage basin as part of its Cycle 2 business inspections.

Second Avenue S. Outfall:

- Ecology collected a sediment sample from the mouth of the Second Avenue S. outfall pipe in early May 2007 to evaluate whether contaminants are currently being transported to the EAA-2 inlet via this pathway. A whole water sample from the outfall was also collected. Results were not available at the time this Action Plan was prepared.
- SPU will collect additional inline sediment samples to evaluate the levels of COCs with respect to sediment recontamination in this drainage basin.
- If COCs are present in the storm drain line, SPU will conduct source tracing to identify sources of contaminants.
- SPU and Ecology will conduct source control inspections of upland sites as needed
- Ecology's Water Quality Program will continue to review and update NPDES permits as needed.

Industrial Container Services/Trotsky Property/Former Northwest Cooperage:

- Ecology is conducting additional site characterization to evaluate current concentrations of COCs in groundwater, bank soils, intertidal sediments, and seeps. SAIC installed three monitoring wells in April 2007; six subsurface soil samples were collected for chemical analysis. The three new wells and two existing wells were sampled in early May 2007. Results had not been received at the time this report was prepared.
- Based on the site characterization results, Ecology will identify additional data gaps and determine the subsequent actions necessary to fill them.
- Based on site characterization results, the property owner/operator may be required to conduct remediation as needed to eliminate sources of contaminants to EAA-2.
- EPA has issued a Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) 104(e) letter to the facility and property owners/operators to obtain additional information related to historic sources of contamination at this site.
- EPA and Ecology will review responses to the CERCLA 104(e) letter.
- King County will continue to oversee and inspect this site through the Industrial Waste Program.
- King County/SPU/Ecology will determine whether roof drains on the northwest corner of the property drain to the sanitary sewer or to an unidentified storm drain.

- Ecology's Water Quality program, along with King County and SPU, will evaluate the need for stormwater characterization from this facility due to runoff/overflow during heavy rainfall events.
- Puget Sound Clean Air Agency (PSCAA) will conduct periodic air permit inspections to ensure compliance with permit conditions and BMPs.

Douglas Management Company/Alaska Marine Lines Dock 2:

- If the property owner grants access, Ecology will conduct groundwater sampling in Fall 2007 along the southern portion of the property (adjacent to the EAA-2 inlet) to evaluate potential groundwater transport of contaminants from the site. Bank and seep samples will be collected as needed.
- Based on sampling results, Ecology will identify additional data gaps and determine the subsequent actions necessary to fill them.
- Based on site characterization results, the property owner/operator may be required to conduct remediation as needed to eliminate sources of contaminants to EAA-2.
- EPA has issued a CERCLA 104(e) letter to the facility and property owners/operators to obtain additional information related to historic sources of contamination at this site.
- EPA and Ecology will review the responses to the CERCLA 104(e) letter submitted by Douglas Management Company on December 11 and December 21, 2006.
- Ecology and SPU will verify the storm drainage pathway on the southern portion of the site; if stormwater discharge to EAA-2 is confirmed, Ecology's Water Quality Program and SPU will assess the need for stormwater characterization.
- Ecology and SPU will continue periodic inspections of this site as needed to verify that operations do not result in the release of contaminants to EAA-2.

Boyer Towing:

- EPA has issued a CERCLA 104(e) letter to the facility and property owners/operators to obtain additional information related to historic sources of contamination at this site.
- EPA and Ecology will review responses to the CERCLA 104(e) letter.
- SPU will conduct a source control inspection at this facility to verify that it complies with applicable regulations and BMPs and to verify the storm drainage pathway on the southern portion of the property.
- If stormwater discharge to EAA-2 is confirmed, Ecology and SPU will evaluate the need for stormwater characterization and will review Boyer Towing's SWPPP to ensure that contaminant releases to sediment from stormwater are controlled.
- Ecology and SPU will continue periodic inspections of this site as needed to verify that operations do not result in the release of contaminants to EAA-2.

Other Upland Properties:

- A recent basin reconnaissance indicated that some new businesses have begun operating in the basin in the past four to five years. Therefore, in 2007 SPU will re-inspect businesses in

the Second Avenue S. drainage basin to update information about business activities and to ensure that businesses are complying with City code requirements for stormwater pollution prevention. This second round of inspections is expected to be completed in 2007.

- Ecology and SPU will review SWPPPs as needed to ensure that releases of contaminants in stormwater to EAA-2 sediments are controlled.
- Ecology will conduct inspections of NPDES-permitted facilities as needed to ensure compliance with permit conditions.
- Upland spills will be monitored on an ongoing basis by Ecology, SPU, and EPA. Depending on the nature of the spill, the origin of the spill will be identified and cleanup activities will be evaluated to determine appropriate post-spill source control activities that may be required.

5.3 Early Action Area 3 (Slip 4)

Slip 4 is located on the east bank of the LDW, approximately 2.8 miles from the southern end of Harbor Island (Figure 9). The slip is approximately 1,400 feet long, with an average width of 200 feet, and encompasses about 6.4 acres. Properties immediately adjacent to Slip 4 are currently owned by: Crowley Marine Services, First South Properties, King County, and The Boeing Company. Crowley owns the majority of the submerged land within the Slip 4 EAA.

PCBs and BEHP are considered the contaminants of concern in Slip 4 sediments and are the primary focus of source control actions. Other chemicals that could result in sediment recontamination will be addressed as needed.

The city of Seattle and King County are planning a sediment removal action for early cleanup of contaminated sediments in the Slip 4 EAA. The proposed removal area identified in the Engineering Evaluation/Cost Analysis (EE/CA) for Slip 4 includes about 3.6 acres of the northern (inner) half of the slip (Integral 2006d). This includes all areas where surface sediments have chemical concentrations greater than the SQS except for one isolated station with minor SQS exceedances. Sediments outside the proposed removal area will continue to be evaluated by the LDWG, EPA, and Ecology pursuant to the Lower Duwamish Waterway RI/FS.

The combined sewer service area in the Slip 4 basin encompasses about 6,200 acres and the storm drain basin covers about 467 acres. There are currently no storm-related CSOs that discharge to Slip 4. The City and King County both maintain emergency overflows on pump stations that discharge to Slip 4, but overflows occur infrequently.

City and County source control activities focus on reducing the amount of chemicals discharged to publicly-owned storm drains and sanitary/combined sewers through business inspections and source identification/tracing activities. Because there are no CSOs discharging into Slip 4 and pump station emergency overflows occur infrequently, source control activities have focused on stormwater discharges.

The 60-inch KC Airport SD #3/PS44 EOF (formerly referred to as the Slip 4 SD) is owned by King County. This line drains the northern portion of the King County International Airport (KCIA) and encompasses 290 acres of the Slip 4 drainage area. The emergency overflow from

City pump station #44 is also now plumbed to this drain. City pump station #44 has not overflowed in the past 5 years, when the City started maintaining pump station records.

The 24-inch North Boeing Field SD (formerly referred to as the Slip 4 CSO/SD#117) used to serve a large portion of North Boeing Field and received emergency overflows from City pump station #44. However, most of these areas were directed to the King County Airport SD #3/PS44 EOF in the mid-1980s. As a result, the North Boeing Field SD now drains about 1 acre on the north end of North Boeing Field.

The E. Marginal Way EOF serves as an emergency overflow for King County's E. Marginal Way pump station. There has not been a recorded overflow from this pump station since recordkeeping began in the 1970s. The City outfall survey conducted in 2004 was unable to locate this outfall.

The I-5 storm drain collects runoff from approximately 150 acres, including 1.5 miles of I-5, approximately 44 acres of single-family residential property located east of I-5, and industrial properties along Airport Way S.

The 10 small private drains that discharge to Slip 4 also serve mostly industrial and commercial areas immediately adjacent to the slip (approximately 50 acres).

The Georgetown flume is discussed in Section 5.3.8 below.

5.3.1 Source Control Action Plan

A *Summary of Existing Information and Identification of Data Gaps* report was prepared by Striplin Environmental Associates for King County and the city of Seattle in January 2004 (SEA 2004). The SCAP for Slip 4 was published in July 2006 (Ecology 2006). Potential sources of sediment recontamination and source control actions are described below.

Table 5 presents a list of the action items identified during preparation of the SCAP, as updated in the *Lower Duwamish Waterway Slip 4 Technical Memorandum: Status of Slip 4 Source Control* (SAIC 2007d).

5.3.2 Business Inspections

SPU inspected 57 businesses in the Slip 4 basin between 2003 and 2006. Ecology conducted hazardous waste and stormwater NPDES compliance inspections in 2005. All of the airport tenants have been inspected. Seventy-two percent of the sites where SPU conducted full inspections required some type of corrective action. As of December 2006, all but one has made the requested changes.

Ecology conducted a Stormwater Compliance Inspection at North Boeing Field (NBF) on December 16, 2005 (Ecology 2006d). Concerns were noted regarding the presence of PCBs in the NBF catch basins, and concentrations of zinc at the NBF1 monitoring location, which had exceeded the benchmark permit value for the previous five quarters. Ecology recommended that Boeing continue to work to determine the source of PCBs in the catch basins, and to take appropriate actions with regard to zinc at NBF1.

Table 5. Source Control Actions Identified in Slip 4 SCAP, as Updated in February 2007

High Priority Source Control Actions[1]:

Source Control Action Item	Responsible Party	Contact	Status	Estimated Completion Date	Follow-On Actions	Follow-On Action Estimated Completion Date	Actions Needed Before Slip 4 Remediation
[H1] NBF: Remove PCB joint sealant.	Boeing	Bach, Power	Complete	NA	Characterize extent of PCBs in new joint sealant.	2007	None
[H2] NBF/KCIA/I-5: Distribute 2005/2006 in-line sediment trap data for winter wet season.	SPU	Schmoyer, Bach	Complete	NA	Continue monitoring of sediment trap data.	Ongoing	None
[H3] GTSP: Remove PCB contaminated soils; implement erosion or other source control as needed.	SCL	Goldberg	Complete	NA	Conduct site-wide site characterization.	2007	None
[H4] NBF: Complete source evaluation at north drain line and complete clean-out.	Boeing	Bach, Power	Complete	NA	Continue source tracing	2007	Identify source of PCBs in north drain line and/or eliminate transport of PCBs to Slip 4
[H5] NBF/KCIA/I-5: Conduct comprehensive analyses of sediment trap and catch basin data	Ecology	Cargill	Complete	NA	None	NA	None
[H6] NBF: Clean oil/water separator 640.	Boeing	Bach, Power	Complete	NA	None	NA	None
[H7] I-5/Residential Drainage: Complete source tracing.	SPU	Schmoyer	Complete	NA	Continue monitoring of sediment trap data.	Ongoing	None
[H8] KCIA: Sample seven oil/water separators.	KCIA	Renaud, Tiffany	Complete	NA	Continue source tracing at KCIA (see H9)	Ongoing	None
[H9] KCIA: Complete source tracing	KCIA	Renaud, Tiffany	In Progress	2007	None	Ongoing	None
[H10] NBF: Clean out catch basins.	Boeing	Bach, Power	Complete	NA	Continue source tracing in north drain line (see H4)	Ongoing	See H4
[H11] NBF/KCIA/I-5: Reinstall sediment traps.	SPU, Boeing	Schmoyer, Bach, Power	Complete	NA	Continue monitoring of sediment traps.	Ongoing	None

[1] High Priority: PCBs present or suspected, with potential for release to Slip 4

Table 5. Source Control Actions Identified in Slip 4 SCAP, as Updated in February 2007 (Continued)

Source Control Action Item	Responsible Party	Contact	Status	Estimated Completion Date	Follow-On Actions	Follow-On Action Estimated Completion Date	Actions Needed Before Slip 4 Remediation
[H12] KCIA: Test for PCB joint sealant (~1acre); remove as necessary.	KCIA	Renaud	Complete	NA	None	NA	None
[H13] KCIA: Clean out catch basins and lines (if required).	KCIA	Renaud	In Progress	May 2007	None	NA	None
[H14] I-5/Residential Drainage: Clean out catch basins and lines (pending results of sediment trap analysis round 3, due 9/2006).	Ecology, SPU, WSDOT	Cargill, Schmoyer	Planned	Summer 2007	NA	NA	None
[H15] Georgetown Flume: Investigate connection toward North Boeing Field as a possible source of PCBs.	SPU, Boeing	Schmoyer, Bach, Power	Complete	NA	NA	NA	None
[H16] Georgetown Flume: Close connections to flume, remove contaminated sediments.	SCL, SPU	Goldberg, Schmoyer	In Progress	October 2007	NA	NA	None

Medium Priority Source Control Actions[2]:

Source Control Action Item	Responsible Party	Contact	Status	Estimated Completion Date	Follow-On Actions	Follow-On Action Estimated Completion Date	Actions Needed Before Slip 4 Remediation
[M1] Crowley Marine/Alaska Logistics: Conduct physical site inspection confirming outfalls and what they drain(ed).	Ecology, SPU	Cargill, Schmoyer	Complete	NA	NA	NA	None

[2] Medium Priority: No PCBs present or suspected, but potential for release of other contaminants to Slip 4

Table 5. Source Control Actions Identified in Slip 4 SCAP, as Updated in February 2007 (Continued)

Source Control Action Item	Responsible Party	Contact	Status	Estimated Completion Date	Follow-On Actions	Follow-On Action Estimated Completion Date	Actions Needed Before Slip 4 Remediation
[M2] Crowley Marine/Alaska Logistics: Collect stormwater runoff and in-line solids to assess recontamination potential of current operations.	Ecology, SPU	Cargill, Schmoyer	Planned	Spring 2007	NA	NA	None
[M3] Crowley Marine/Alaska Logistics: Clean catch basins and drain lines.	Crowley	None	Planned	Summer 2007	NA	NA	None
[M4] First South Properties/Emerald Services: Collect stormwater runoff and in-line solids to assess sediment recontamination potential from any ongoing operations.	Ecology, SPU	Cargill, Stegman, Schmoyer	Complete	NA	None	NA	None
[M5] First South Properties/Emerald Services: Investigate two 4- to 6-inch outfalls located on the bank of First South Properties. Determine if the outfalls are still functioning and their drainage areas.	Ecology, SPU	Cargill, Schmoyer	Complete	NA	None	NA	None
[M6] First South Properties/Emerald Services: Clean catch basins and drain lines.	Emerald Services	Smith	Complete	NA	None	NA	None
[M7] First South Properties/Emerald Services: Reassess drainage swale for erosion and recontamination potential for phthalates.	Ecology	Cargill	Complete	NA	None	NA	None

Table 5. Source Control Actions Identified in Slip 4 SCAP, as Updated in February 2007 (Continued)

Source Control Action Item	Responsible Party	Contact	Status	Estimated Completion Date	Follow-On Actions	Follow-On Action Estimated Completion Date	Actions Needed Before Slip 4 Remediation
[M8] KCIA: Reinspect KC Surplus Storage, NE T-Hangars, and Schultz Distributing, Inc. as necessary to achieve compliance with BMPs.	SPU, Ecology	Schmoyer, Cargill	Complete	NA	See L7	NA	None
[M9] NBF: Review results of Ecology's TCP, Waste and Water programs, and King County/Hazardous Waste inspections of NBF (Nov–Dec 2005)	Ecology, EPA	Cargill, Flint	In Progress	Spring 2007	NA	NA	None
[M10] NBF: Revise Stormwater Management Plan; conduct additional inspections of the NBF facility as necessary.	Ecology Boeing	Stegman, Power	Planned	Summer 2007	NA	NA	None
[M11] GTSP: Conduct additional site characterization to assess need for additional soil removal.	SCL	Goldberg	Planned	2007	NA	NA	None
[M12] Boeing Plant 2: Inspect Bldg. 2-122 area, sample onsite storm drain solids.	Ecology	Cargill, Stegman	Planned	Spring 2007	NA	NA	None
[M13] Boeing Plant 2: Clean onsite storm drain system as necessary.	Boeing	Power	Planned	2007	NA	NA	None

Table 5. Source Control Actions Identified in Slip 4 SCAP, as Updated in February 2007 (Continued)

Low Priority Source Control Actions[3]:

Source Control Action Item	Responsible Party	Contact	Status	Estimated Completion Date	Follow-On Action	Follow-On Action Estimated Completion Date	Actions Needed Before Slip 4 Remediation
[L1] Crowley Marine/Alaska Logistics: Compile and evaluate historic groundwater quality data; complete historic use investigation to identify data gaps for recontamination potential (soil and groundwater).	Ecology, SAIC	Cargill	Complete	NA	See L2	NA	None
[L2] Crowley Marine/Alaska Logistics: Determine means to fill data gaps.	Ecology	Cargill	Complete	NA	See L3	See L3	None
[L3] Crowley Marine/Alaska Logistics: Conduct sampling if necessary and evaluate data.	Ecology	Cargill	Planned	Fall 2007	Ecology will conduct groundwater investigation to fill data gaps.	Fall 2007	None
[L4] First South Properties/Emerald Services: Compile and evaluate historic groundwater quality data; complete historic use investigation to identify data gaps for recontamination potential (soil and groundwater).	Ecology/SAIC	Cargill	Complete	NA	None	NA	None
[L5] First South Properties/Emerald Services: Determine means to fill data gaps.	Ecology	Cargill	No Action Required	NA	None	NA	None
[L6] First South Properties/Emerald Services: Conduct sampling if necessary and evaluate data.	Ecology	Cargill	No Action Required	NA	None	NA	None

[3] Low Priority: Release of contaminants possible but unlikely, based on location, current/past operations, or results of investigations

Table 5. Source Control Actions Identified in Slip 4 SCAP, as Updated in February 2007 (Continued)

Source Control Action Item	Responsible Party	Contact	Status	Estimated Completion Date	Follow-On Actions	Follow-On Action Estimated Completion Date	Actions Needed Before Slip 4 Remediation
[L7] KCIA: Conduct follow-up inspections at Shultz Distributing, Inc. until compliance achieved. Evaluate potential contaminants of concern and pathways.	SPU, Ecology	Schmoyer, Cargill	In Progress	Summer 2007	Re-inspections as necessary to ensure compliance.	2007	None
[L8] Boeing Plant 2: Assess existing groundwater data in the area.	Ecology, EPA	Cargill, Flint	Planned	2007	NA	NA	None
[L9] Other Upland Properties: Review data for contaminants of concern or pathways to Slip 4 for North Coast Chemical Company, Marine Vacuum Service, Inc. American Avionics/KC Airport, Arco Station #5218, KC Airport Maintenance, Aviation Fuel Storage/Schultz Distributing, and Rainier Ice & Cold Storage.	Ecology, SAIC	Cargill	Complete	NA	Reinspections as needed to ensure compliance.	2007	None
[L10] Review NPDES permits: Review permits for COCs found in sediments. This will include both municipal and industrial permits. Permittees affected for Slip 4 include Boeing (NBF), Boeing Plant 2, Emerald Services, Alaska Logistics, KCIA, WSDOT, and SPU.	Ecology, EPA	Cargill, Flint	Planned	2007	NA	NA	None

5.3.3 Source Tracing

In March 2005, SPU installed sediment traps at the following 10 locations in the Slip 4 drainage basin (Figure 10).

- **T1**: Downstream end of the north and central lateral storm drain lines, upstream of the King County lift station (KC Airport SD#3/PS44 EOF)
- **T2 and T2A**: Downstream and upstream, respectively, of the Boeing-leased property along the south lateral (KC Airport SD#3/PS44 EOF)
- **T3 and T3A**: Downstream and upstream, respectively, of the Boeing-leased property along central lateral #1 (KC Airport SD#3/PS44 /EOF)
- **T4 and T4A**: Downstream and upstream, respectively, of the Boeing-leased property along central lateral #2 (KC Airport SD#3/PS44 EOF)
- **T5 and T5A**: Downstream and upstream, respectively, of the Boeing-leased property along the north lateral (KC Airport SD#3/PS44 EOF)
- **T6**: Intersection of S. Hardy Street and Airport Way S. (I-5 Storm Drain)

Traps are installed for a 4- to 6-month period to passively collect samples of suspended sediment present in the stormwater runoff. Boeing is maintaining the seven traps located on Boeing-leased property, and SPU is maintaining the three remaining traps located in the public right-of-way and on the KCIA property. As of January 2007, four rounds of samples have been collected from the traps.

PCB concentrations frequently exceed the CSL at Stations T1 (10 to 260 mg/kg DW) and T5 (24 to 800 mg/kg DW). PCBs in samples collected from the other eight sediment traps ranged from 0.04 to 2.7 mg/kg DW (2 to 39 mg/kg OC). Trap T5 is located near the downstream end of the north lateral drain line, and T1 is located downstream of T5 and T4. The highest concentration (800 mg/kg DW) was observed at T5 during the third sampling round. The third round samples were collected after Boeing jetted and cleaned some of the storm drain lines in the north lateral. PCB concentrations declined in the fourth round, but were still well above the CSL (200 mg/kg DW, 4,200 mg/kg OC at T5, and 260 mg/kg DW, 7,500 mg/kg OC at T1).

Based on these data, it appears that PCB-contaminated sediment from the north drain line is being transported downstream to the King County lift station, and it is possible that contaminated sediments are continuing to enter Slip 4 through the KC SD#3/PS44 EOF outfall. This is considered an ongoing source of sediment recontamination and should be addressed prior to Slip 4 sediment cleanup.

At this time, it is unclear whether the elevated concentrations of PCBs in the north drain line are due to transport of contaminated soils or materials through inflow/infiltration, an unidentified new source, or the result of source control efforts in the drainage basin. The sediment traps may have collected residual sediment that was mobilized during cleaning of the storm lines in 2006. If this is the case, subsequent sediment trap sampling would be expected to show lower concentrations of PCBs. If sediment trap concentrations remain high, an ongoing source is likely. However, even if PCB concentrations in the north drain line decrease, the level of uncertainty

regarding the potential for Slip 4 sediment recontamination associated with PCB contamination in the storm drain system remains high.

Elevated concentrations of mercury were also found at station T1 (0.9 to 8.3 mg/kg DW) and T5 (1.1 to 5.1 mg/kg DW). All eight samples collected from these stations exceeded the CSL. Other CSL exceedances occurred at station T2 (0.6 mg/kg DW), T4 (0.6 mg/kg DW), and T5A (0.86 mg/kg DW). Stations T2 and T4 are located downstream of NBF on the south lateral and central lateral #1, respectively. Station T5 is located on the north lateral, downstream of KCIA and upstream of NBF.

Low to moderate exceedances of SQS values in sediment trap samples downstream of KCIA and upstream of NBF have been detected for copper (T5A), lead (T3A), zinc (T3A,T4A, T5A), phthalates (T2A, T4A, T5A) and PAHs (T2A). Moderate exceedances of SQS values have been detected in sediment trap samples downstream of NBF for copper (T5), zinc (T1, T2, T3, T4, T5), phthalates (T2, T3, T4, T5), and PAHs (T2). In addition, sediment trap samples from the I-5 storm drain (T6) have indicated low to moderate exceedances of the SQS for zinc, phthalates, and benzyl alcohol. These exceedances are not believed to pose an immediate threat of Slip 4 sediment recontamination.

Results from inline sediment samples are comparable to the sediment trap results. Inline samples were collected from four stations in the KC Airport SD #3/PS44 EOF and the Georgetown flume, wherever sufficient sediment was present for chemical analysis (MH100, MH221A, MH363, and MH229A). Sample splits were provided to Boeing. Sediment collected from the KC Airport SD #3/PS44 EOF frequently exceeded the SQS and CSL for PCBs. PCB concentrations ranged from 0.31 to 31 mg/kg DW (7.1 to 2,800 mg/kg OC). Only one sample did not exceed the CSL. Mercury (one station) and zinc (two stations) also exceeded the SQS in the King County Airport SD #3/PS44 EOF. BEHP concentrations (430 to 2,200 mg/kg DW, 25 to 76 mg/kg OC), although above the SQS, were generally lower than the concentrations found in other drains in the LDW.

5.3.4 Crowley Marine Services

This property is located along 8th Avenue South on the north side and head of Slip 4. The site has been used by Northland Services, Samson Tug, Pankrantz Lumber, Washington Excelsior and Mfg., Puget Timber, Washington Supply Mfg Co., Layrite Concrete Products, Hydraulic Supply Mfg., Port of Seattle (part of Terminal 118), Marine Power & Equipment, and Evergreen Marine Leasing.

A June 2004 joint Ecology/SPU inspection of the facility found minor problems with storage of oily materials and procedures for dealing with leaks from vehicles. SPU also collected a sample from one of the catch basins on this property. Zinc (1,220 mg/kg DW) exceeded the CSL and butylbenzyl phthalate (1.3 mg/kg DW, 27 mg/kg OC) exceeded the SQS.

Potential sediment recontamination from historic operations at this property is associated with PAHs in soil and groundwater in the southern portion of the property (Parcel D). This area has been dredged and therefore sediment samples may not reflect ongoing contaminant inputs from the property.

Source Control Actions

SAIC prepared a Technical Memorandum for Ecology in October 2006 to assess the potential for Slip 4 sediment recontamination via groundwater discharge from the Crowley and First South Properties (SAIC 2006a). The report concluded that the main potential for sediment recontamination is associated with PAHs in the southern portion of the Crowley property (Parcel D). PAHs in this area are widespread, occur at high concentrations relative to screening levels, and are present in both soil and groundwater. In addition, the downgradient extent of groundwater having significant exceedances of screening levels is poorly defined. SAIC recommends that a series of groundwater monitoring wells be installed along the Parcel D shoreline and sampled for chemicals of concern to allow better assessment of the recontamination potential.

Assessment of the recontamination potential from current operations is continuing; planned activities include the collection and analysis of stormwater runoff and in-line solids. No evidence of an ongoing source of contaminants of concern from current operations has been identified. However, because this site discharges directly to Slip 4, further assessment is warranted.

To support design of the Slip 4 sediment removal action, a pre-design investigation was conducted in June 2006 by Integral Consulting, Inc. for the city of Seattle. As part of this investigation, six seep samples were collected from five locations along the eastern bank of Slip 4. Two of these samples were along the banks of the Crowley property (SP-01 and SP-04). PCBs were detected at 0.1 ug/L (Aroclor 1254) and 0.02 ug/L (Aroclor 1248), respectively (Integral 2006c). (Note: the State marine chronic water quality standard for PCBs is 0.03 ug/L.)

5.3.5 First South Properties

This site is also known as Evergreen Marine Leasing Parcel E. Past uses include Washington Machinery & Storage, NW Precote, and Seattle Asphalt (batch plant). Current activities consist of storage of tanks and portable sanitary restrooms, offices, vactor truck parking and maintenance and vacant space.

In 1990, five USTs were removed, ranging from 1,000 to 12,500 gallons, the largest being a buried railroad car. The contents of the tanks included diesel, heavy oil/water sludge, mixed diesel/stove oil/water, water/diesel, and asphalt/water/sand. Contaminated soil and rubble was also removed. TPH was present in the residual soil, but the soil met the 200 mg/kg TPH MTCA standard. The likely source of this residual TPH is from dust control and road stabilization while the asphalt plant was in operation. Groundwater monitoring indicates the site groundwater meets drinking standards except for low TPH in one downgradient well.

Source Control Actions

SAIC (for Ecology) prepared a Technical Memorandum to assess the potential for Slip 4 sediment recontamination via groundwater discharge from the Crowley and First South Properties (SAIC 2006a). The report concluded that the potential for sediment recontamination associated with groundwater at the First South Properties site is low.

To support Slip 4 sediment removal action design, a pre-design investigation was conducted in June 2006 by Integral Consulting, Inc. for the city of Seattle. As part of this investigation, six seep samples were collected from five locations along the eastern bank of Slip 4 and were analyzed for PCBs. Three of these samples were along the banks of the Emerald Services site (SP-02, SP-03, and SP-05). PCBs were not detected (Integral 2006c).

A composite bank soil sample was collected from locations near the drainage swale and the southern boundary of the First South Properties site during the pre-design investigation (Integral 2006c). All detected analytes were below the SQS. PCBs were detected at 0.092 mg/kg (5.4 mg/kg OC). In addition, arsenic (14 mg/kg), cadmium (0.5 mg/kg), chromium (22.8 mg/kg), copper (62.3 mg/kg), lead (64 mg/kg), mercury (0.07 mg/kg), zinc (101 mg/kg), PAHs, diesel-range hydrocarbons (640 mg/kg), and motor oil (75 mg/kg) were detected.

The drainage swale area was excavated to a depth of 3 feet in September 2006. Approximately 5,000 pounds of soil was removed. Three samples were collected after the soil removal. Although the samples were not analyzed for phthalates, PCBs were not detected (Smith 2006). The area was paved in October 2006.

SPU collected sediment samples from catch basins at this site, and did some follow-up testing of materials (Personal communication, Beth Schmoyer to Dan Cargill, November 30, 2006 Slip 4 Source Control Meeting). Sampling results were not available. Emerald Services is currently constructing an office building on the property. In conjunction with the construction, the storm drainage system has been replaced; activities included installation of a new oil/water separator, excavation and paving of the former drainage swale; and abandonment of two previously identified discharge points (Goldberg 2006). All discharge now exits a single outfall.

This property does not pose a significant threat of sediment recontamination, and no additional source control actions have been identified.

5.3.6 Slip 4 Crowley Marine/First South Properties Bank

Sampling of the Slip 4 banks was conducted as part of the effort to establish a proposed sediment cleanup boundary. Bank sampling results indicated PCBs present in bank soils that could be a potential source of recontamination to the sediments. Ecology hired a contractor to sample and delineate the extent of the PCBs in bank soils. Sampling was completed in July 2005, and results indicate that PCB contamination is present in the bank surface and subsurface soil and sediment. However, the concentrations are relatively low, and are all below the CSLs. Ecology does not believe that any ongoing major upland PCB contamination source exists, and that at this time, no active upland cleanup action will be taken (Ecology 2005c).

5.3.7 Boeing Plant 2

The entire Boeing Plant 2 facility occupies 109 acres between E. Marginal Way S. and the Duwamish River on the southeastern side of Slip 4. The facility is used for storage as well as for the manufacturing of metal parts for airplanes. About 17.5 acres of this property drains to Slip 4.

Boeing is currently conducting a Resource Conservation and Recovery Act (RCRA) corrective action investigation at Plant 2. All of the RCRA corrective action investigation units are located south of Building 2-122 and do not include the redeveloped north end adjacent to Slip 4, since this north end area was extensively remediated as part of Building 2-122 construction. The corrective action includes sediments in the Duwamish Waterway west of Plant 2, known as the Duwamish Sediment Other Area (DSOA), but does not include sediments in Slip 4.

An NPDES compliance inspection was conducted at Building 2-122 on April 20, 2007. The inspection report was not available for review at the time this report was prepared.

5.3.8 Georgetown Steam Plant (GTSP)

The Seattle City Light GTSP property is located on the northwest corner of King County International Airport/Boeing Field. The property contains the old powerhouse, which currently houses the Georgetown Power Plant Museum. The condenser pit in the powerhouse is connected to the Georgetown flume and, until the 1960s, discharged cooling water from the steam plant to the flume.

Available soil data indicate that PCBs are present in soil at the GTSP at concentrations greater than MTCA Method A industrial soil cleanup levels. The property is unpaved and during high rainfall events stormwater may flow into catch basins on NBF.

Source Control Actions

Interim Remedial Action

SCL conducted an interim remedial action in May 2006 to control erosion and offsite migration of contaminated soil near the former low-lying area (Integral 2006a). The action involved excavation and replacement of contaminated soil behind the retaining wall and other measures to reduce potential ongoing erosion, as listed below:

- Removal of approximately 47 cubic yards of PCB-contaminated soil immediately behind the retaining wall located along the southwest boundary of the GTSP property, for a distance of approximately 125 feet and to a depth beneath the base of the ecology-block wall;
- Offsite disposal of excavated soil at an approved Toxic Substances Control Act (TSCA) landfill;
- Lining and backfilling of the excavation with clean imported fill material to prevent further loss of soil through the retaining wall joints;
- Installation of silt fencing along the south and southwest property boundary to filter stormwater that may be discharging from the site via overland flow during larger storm events.

During the remedial action, it was noted that voids located in joints between the concrete panels that make up the retaining wall could not be enclosed by the interim remedial design. On August 24, 2006, the contractor applied concrete grout to cover and seal the native soil in the voids at the base of the retaining wall joints (Integral 2006b), and thereby to reduce the potential for erosion of PCB-contaminated soil.

During the construction phase of the interim remedial action (May 2006), subsurface soil samples were collected and analyzed for PCBs. These data will be used to characterize the soil conditions at the base of the excavation for later consideration in developing a site-wide investigation plan. A total of 33 soil samples were collected at approximately 5-foot horizontal intervals at the bottom of the excavation (1 to 3.4 feet bgs). Samples from 19 locations were analyzed for PCBs; concentrations ranged from 0.077 to 3,800 mg/kg (almost exclusively Aroclor 1254) (Integral 2006a). This area was lined to prevent offsite transport of PCBs, and therefore does not pose an immediate threat of sediment recontamination.

Site Characterization

During July 27 to August 2, 2006 five soil borings were advanced at locations near the eastern, southern, and western property boundaries (Integral 2006c). Borehole depths ranged from 13.5 feet to 15 feet below ground surface (bgs). Soil samples were collected at approximately 2-foot intervals from each borehole; samples were analyzed for PCBs, SVOCs, cadmium, chromium, hexavalent chromium (Cr^{+6}), mercury, Skydrol components (a hydraulic oil), and TOC and total solids (if sufficient sample volumes were available). In addition, headspace screening was performed for each interval; selected samples were analyzed for VOCs, gasoline (TPH-G), and diesel- and oil-range hydrocarbons (TPH-Dx). Thirty-nine samples were collected; 29 were submitted for analysis and 10 were archived.

Soil sampling results were compared to MTCA Method A or B soil cleanup levels and to EPA soil screening levels for migration to groundwater (EPA Region 9 Preliminary Remediation Goals [PRGs]). Screening levels were exceeded for PCBs (2 locations), carcinogenic PAHs (cPAHs; 2 locations), and tributyl phosphate (1 location). PCBs were detected at concentrations from < 0.03 to 3.8 mg/kg; the screening level of 1.0 mg/kg was exceeded near the southern drainage ditch (0 to 3 feet bgs) and low-lying area (4 to 6 feet bgs).

Other exceedances of screening levels were found as follows:

- Boring GTSP-1 (northeast side of the Power House) – cPAHs
- Boring GTSP-2 (former fire training pit) -- tributyl phosphate
- Boring GTSP-3 (southern drainage ditch) -- cadmium, total chromium, cPAHs
- Boring GTSP-4 (along the western fenceline) – cPAHs
- Boring GTSP-5 (former low-lying area) -- total chromium, TPH-G

Groundwater monitoring wells were installed in each of the five boreholes to evaluate potential groundwater contamination at the GTSP. Groundwater will be monitored quarterly for 12 months. The first round of groundwater samples was collected on August 1-2, 2006. Samples were analyzed for PCBs, SVOCs, TPH-G, TPH-Dx, VOCs, total and dissolved metals (cadmium, chromium, mercury), dissolved Cr^{+6}, Skydrol, and TOC (Integral 2006c).

PCBs (Aroclor 1242) were detected only in well GTSP-5 (former low-lying area), at a concentration of 0.24 ug/L (which exceeds the MTCA Method B groundwater cleanup level of 0.044 ug/L). In addition, trichloroethylene (TCE) exceeded the screening level in well GTSP-1

(near the Power House); 12 analytes, including cPAHs, were not detected however detection limits exceeded the screening levels.

The second round of groundwater sampling was conducted in November 2006. Results show PCBs in GTSP-5 (former low-lying area) at 0.19 ug/L, slightly lower than in August. TCE in GTSP-1 was comparable to the first quarter result. No other analytes were detected. The third round of sampling was scheduled for late February 2007.

Other Source Control Activities

SAIC (for Ecology) prepared a *Summary of Existing Information and Data Gaps* report for NBF and the GTSP, using available information through early September 2006 (SAIC 2007d). The report summarizes historical information about potential contaminant sources at these two facilities and adjacent properties including KCIA.

Potential sources that may pose a risk of sediment recontamination were identified in the report. These include residual PCBs in soil and groundwater in the vicinity of the former low-lying area at GTSP. Additional site characterization is planned.

5.3.9 Georgetown Steam Plant Flume

The Georgetown flume, constructed in the early 1900s, originally discharged cooling water from the GTSP to the Duwamish Waterway. Cooling water discharges to the flume stopped in the 1960s when the steam plant was shut down. Prior to about 1985, numerous storm drains and pipes from adjacent properties were also plumbed to the flume. Seattle City Light plugged all pipes entering the flume in 1987, except one 15-inch pipe from a Boeing yard. This 15-inch pipe was diverted to the KC Airport SD #3/PS44 EOF sometime between 1985 and 1988 (SEA 2004). The flume now drains an estimated 6 acres.

Source Control Actions

In 2005, SPU initiated an investigation to evaluate the condition of the flume and identify ongoing discharges to the flume (Herrera 2005). The locations of all pipes (active and inactive) entering the flume were surveyed and mapped. The condition of the flume was inspected and evaluated, and sediment samples were collected at select locations along the flume.

During a 2005 inspection, six of the 25 pipes entering the flume appeared to be active; the rest had been capped or plugged (Herrera 2005). One illicit connection, a 3-inch ABS plastic pipe from a wash sink, floor drain, and laundry at an adjacent motel, was found during the inspection. The motel has stopped discharging to the flume.

Sediment samples were collected along the flume at roughly five equally spaced transects and in the vicinity of five pipes (four active and one plugged). Lead and zinc concentrations exceeded the SQS at station P3, near a 15-inch pipe entering the south side of the flume at the downstream end of the tunnel section (501 mg/kg and 766 mg/kg, respectively). This pipe is now plugged, but before 1985 it collected runoff from about 1.5 acres of industrial property in the northeast corner of KCIA.

PCB concentrations exceeded the SQS at multiple locations along the flume. The highest concentration (92 mg/kg DW or 1,700 mg/kg OC) was observed in the flume adjacent to the 15-inch pipe at station P3. The transect located about 650 feet downstream of this pipe (T3) also contained elevated concentrations of PCBs (3.9 mg/kg or 170 mg/kg OC). PCB concentrations below transect T3 were generally below 1 mg/kg.

SPU is finalizing an Engineering Design Report to demolish/fill/slip-line the existing flume. SPU will provide copies to EPA and Ecology for comments. The project is in design and will be completed in 2008.

SPU investigated and smoke tested connections to the flume in August 2006 (Schmoyer 2007c). They located a line near the head of the flume (where the flume leaves the GTSP and enters KCIA) on Boeing-leased property. Boeing planned to track the pipe to determine whether it was plugged. SPU will plug this line when the flume is replaced in summer of 2008.

An 8-inch line was located that connected to an active warehouse near Myrtle Street; this line drains a paved area. Several drain lines from the Aero Motel were identified; these also drain paved areas.

Two new connections were found to MH-100 (located at the downstream end of the Georgetown flume, prior to draining under East Marginal Way) (Schmoyer 2007c). One, an 18-inch wood stave pipe, was determined to be plugged with silt. Flow was observed in the other, a 24-inch concrete line. This line appears to connect to a single catch basin in a loading dock of the Boeing 7-21-1 building. Boeing will replumb the catch basin to another drain line. SPU will plug the line when the flume is replaced in the summer of 2008. The Georgetown flume is not considered to pose an immediate threat of sediment recontamination.

Final characterization and preliminary design for remediating and filling the flume is expected to be completed in September 2007. All PCB-contaminated material above 1 mg/kg will be removed and the flume will be filled with clean soil to match the surrounding grade by Fall 2008. A new piped storm water conveyance will likely be installed in the clean fill.

5.3.10 North Boeing Field

North Boeing Field (NBF) is leased by Boeing from KCIA with the exception of a few acres on either side of the GTSP flume which is leased from the city of Seattle, and the 3-390 building and an adjacent parcel used for parking which are owned by Boeing. Primary activities at the site include aircraft finishing and testing; research and development of Boeing military and commercial aircraft; and support services. Aircraft finishing activities involve wet sanding, cleaning, and painting of airplanes. Testing of airplane parts, both assembled and unassembled, occurs throughout the site.

Available soil and groundwater data from NBF indicate that PCBs are present in soil at concentrations above the MTCA Method A industrial cleanup level. However, the facility is almost entirely paved, making transport of subsurface contaminated soil into the storm drain system unlikely, except in the northeast corner where contaminated soil from the GTSP may be

entering catch basins at NBF (Ecology 2006b). Seattle City Light collected additional soil samples from this area in late January 2006 (see Georgetown Steam Plant).

PCBs are also present in residual joint sealant material at the facility. Residual material with PCB concentrations above 50 mg/kg has been removed.

Storm drain sediment traps and catch basin samples indicate the presence of PCBs in the storm drain system. Storm drains at the property are a likely future source of PCBs to the slip unless the origin of PCBs in the storm drains is identified and controlled.

Source Control Actions

Source Tracing in Storm Drain Lines

Boeing has been collecting catch basin, oil/water separator, manhole, and in-line filtration samples. Boeing also collected soil samples from 38 Geoprobes in the area around the north drain line. Ecology received the validated data for the catch basin, oil/water separator, manhole, and in-line filtration samples and the unvalidated data for the soil borings on April 20, 2007.

Elevated concentrations of PCBs continue to be detected in the storm drain lines in the northern portion of NBF despite repeated efforts to clean out lines and structures. Boeing has made considerable efforts to identify and eliminate potential sources of PCBs in this area.

In July 2006, samples of storm drain solid material were collected from catch basins, manholes, and oil/water separators throughout NBF that historically have detected over 10 mg/kg PCBs (Bach 2006a). Concentrations generally ranged between 1 and 10 mg/kg in most structures sampled. Higher concentrations of PCBs were detected in the following structures (Bach 2006b):

- OWS-186, which is located near the property line between GTSP and NBF (1,200 mg/kg)
- MH-193, which drains to OWS-186 (191 mg/kg);
- MH-179 (47 mg/kg)
- CB-372 (32.8 mg/kg) and CB-370 (28 mg/kg), in the central area of NBF
- CB-225 (27.9 mg/kg)
- CB-193, CB-194, CB-416, MH-226, MH-249, and OWS-226A (all between 10 and 20 mg/kg).

In addition, a sample collected from CB-113 on July 7 contained 31.7 mg/kg PCBs; a re-sample collected on July 25 did not detect PCBs. Additional information is provided in *Summary of Existing Information and Data Gaps* (SAIC 2007d)[3].

In August and October 2006, Boeing cleaned out over 1,700 feet of the north drain line as well as catch basins in various locations at NBF, including the following:

- South Drain Line: OWS-640

[3] This document is available on Ecology's website at:
http://www.ecy.wa.gov/programs/tcp/sites/lower_duwamish/sites/slip_4/slip_4.html

- Central Lateral #1: CB-415, CB-416, CB-418, CB-419, CB-420, CB-370
- Central Lateral #2: MH-249, CB-372, MH-226, MH-227
- North Drain Line: the north storm drain line from CB-173 to the King County lift station was cleaned out, including CB-113, CB-173, CB-174, CB-193, CB-194, CB-364A, MH-108, MH-130, MH-179, MH-179A, MH-187, MH-193, OWS-153, and OWS-186.

This clean-out included at least 20 feet of any side drain lines that connected to manholes along the north storm drain line (Bach 2006c), as well as drain lines associated with OWS-186 (Bach 2006d). Additional information, including a map showing storm drain cleanout locations, is provided in *Technical Memorandum: Status of Slip 4 Source Control* (SAIC 2007e). On December 8, storm drain solids were collected from 15 catch basins that had been cleaned, and PCBs were again detected, as described below.

Boeing planned to install new drain lines around the separator in 2007; the unit will then be sealed, filled, and abandoned. On November 17, soil samples were collected to characterize this area prior to construction of the new drain lines. A work plan dated November 14 indicates that six borings were to be installed to a depth of 6 feet bgs along the alignment of the planned storm drain line; samples were to be collected at three depth intervals (1-2 feet, 3-4 feet, and 5-6 feet bgs). All soil samples were to be analyzed for PCBs. One sample was to be analyzed for TPH and VOCs, and three samples were to be analyzed for toxicity characteristic leaching procedure (TCLP) metals. Preliminary sampling results indicate PCBs in the 200 mg/kg range in the 1-2 foot and 5-6 foot depth intervals.

Also on November 17, sediment samples were collected from two catch basins that drain to OWS-186 from the airfield side of the blast fence. CB-1 sediments contained 0.57 mg/kg PCBs; CB-188 sediments contained 0.39 mg/kg PCBs.

Another set of catch basin sediment samples were collected on December 8, 2006. Preliminary results indicate that PCB concentrations in these samples ranged from 1.2 to 107 mg/kg. The highest concentrations (107 mg/kg) were found in CB-363 (located at the downstream end of the north drain line, near the northeast corner of Building 3-380). PCBs were also high in MH-187 (64 mg/kg), which is downstream of OWS-186, and CB-194 (28 mg/kg). CB-173 was also re-sampled and contained 43.2 mg/kg PCBs.

Cleanout of OWS-640

OWS-640 was cleaned out in August 2006. The clean-out took about one week to complete. The separator holds approximately 20,000 gallons of water and has multiple sets of coalescing plates that needed to be pressure washed. Solids removed from this unit were combined with those from other catch basins and the north storm drain line which were cleaned at the same time, therefore no samples specific to OWS-640 were collected.

Removal of Joint Sealant Material

Boeing has been removing PCB-contaminated joint sealant material since 2002. Removal of the remaining joint sealant material with PCB concentrations above 50 mg/kg was completed by Boeing in 2006. However, recent testing at Boeing Everett after replacement of PCB-containing

joint sealant material found that the new material had been contaminated with PCBs. As a result, Boeing has collected samples at NBF of the joint sealant material that had been installed to replace the original PCB-containing caulk. Based on preliminary data, Boeing found that the new joint sealant material has been contaminated with PCBs at concentrations ranging from <1 mg/kg to 370 mg/kg. It is not clear whether the new sealant is being contaminated as a result of the incomplete removal of old sealant. Boeing is continuing its investigation of this issue.

While it is unclear whether PCBs in the new joint sealant material may be contributing to the storm drain concentrations, it is not anticipated to pose an immediate threat of sediment recontamination and therefore may be addressed concurrently with Slip 4 sediment cleanup actions.

North Boeing Field Soil Investigation

Between March 29 and April 3, 2007, 38 soil borings were drilled in the northern portion of NBF to investigate areas that may have been impacted by PCBs due to activities at the GTSP or historic activities on the NBF site (Landau 2007b). PCBs were detected in samples from 23 of the 38 boring locations, primarily in the 1- to 2-foot interval. At three locations, PCBs were also detected in the 5- to 6-foot interval. Detected concentrations ranged from 0.042 to 133 mg/kg; six samples contained total PCBs over 1 mg/kg. The highest concentration (133 mg/kg) was detected in the 5- to 6-foot interval in boring SB-36; this is the location of a PCB cleanup conducted in 1998 associated with Building 3-333. High concentrations of PCBs (17.6 to 25.9 mg/kg) were also detected in the 1- to 2-foot interval at borings SB-30 and SB-31, located near the GTSP property line near the former low-lying area (see Section 5.3.9 above).

Other Source Control Activities

SAIC (for Ecology) prepared a *Summary of Existing Information and Data Gaps* report for NBF and the GTSP, using available information through early September 2006 (SAIC 2007d). This report summarizes historical information about potential contaminant sources at these two facilities and adjacent properties including KCIA. Documented historic releases do not explain the recurring detection of PCBs in the storm drain system at NBF.

Potential sources that may pose a risk of sediment recontamination were identified in the report. These include residual PCBs in soil and groundwater in the UBF-55/UBF-27 area, and the recurring presence of high levels of PCBs in storm drain structures in various locations at NBF. Potential sources that pose a lower risk of sediment recontamination include: residual PCBs in soil and possibly groundwater in the vicinity of Building 3-333; residual joint material at NBF with PCB concentrations up to 50 mg/kg; and unidentified historic releases of PCBs in the northern portion of NBF.

5.3.11 King County International Airport

King County International Airport (KCIA) is a general aviation airport owned and operated by King County as a public utility. The site covers about 615 acres, of which 435 acres are impervious surface covered by buildings and paved areas. The remaining 180 acres consist of

grass and landscaped areas (King County 2003). Approximately 290 acres of the northern and central portion of KCIA drains to Slip 4; the remainder drains to the former Slip 5 and Slip 6.

As discussed above, elevated concentrations of PAHs, phthalates, and metals (zinc, mercury) have been detected in sediment trap samples downstream of KCIA and upstream of the Boeing-leased area.

Spills at KCIA may enter the storm drain system and be discharged to the slip. Activities that could potentially cause spills are controlled by the facility industrial stormwater permit and SWPPP. As of 2005, 25 of 28 airport tenants were in compliance with stormwater, industrial waste, and hazardous waste handling requirements. Efforts to bring the remaining three facilities into compliance are ongoing.

Source Control Actions

Source Tracing in Storm Drain Lines

On June 6-8, 2006, King County collected sediment samples from eight stormwater vaults (oil/water separators) which drain to Slip 4, located in the northern and central portions of KCIA. These vaults are configured to allow stormwater to flow through them under low-flow conditions, but allow higher flows to bypass via upgradient manhole overflow weirs. Samples were analyzed for PCBs, metals, SVOCs, TPH, TOC, and total solids (King County 2006a).

PCB concentrations ranged from < 0.04 to 2.1 mg/kg. Only Vault 1680 exceeded 1 mg/kg; this structure drains to Central Lateral #1, where January 2007 sediment trap data (sample T3A) indicated 0.18 mg/kg PCBs. BEHP concentrations ranged from 29.4 to 232 mg/kg; concentrations were generally higher toward the central portion of KCIA (Vaults 1680 to 1757) and lower at the northern portion of KCIA. Other detected chemicals included high molecular weight polycyclic aromatic hydrocarbons (HPAHs) which ranged from 37.4 to 629 mg/kg; copper at 240 to 1,550 mg/kg; lead from 190 to 744 mg/kg; zinc from 574 to 1,880 mg/kg; diesel-range TPH from non-detect to 16,000 mg/kg; motor oil-range TPH from 3,500 to 81,000 mg/kg; and coprostanol (a sterol used as a biomarker to indicate the presence of fecal contamination) from 25.7 to 34 mg/kg in two vaults at the north end of KCIA (King County 2006a).

Sampling results were compared to SQS and CSL values for marine sediment to evaluate potential impacts to Slip 4 sediments. SQS values were exceeded in all eight vaults for at least three chemicals. The concentration of PCBs in Vault 1680 exceeded the SQS value. In addition, SQS exceedances were present for copper, lead, zinc, phenanthrene, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(g,h,i)perylene, chrysene, dibenzo(a,h)anthracene, fluoranthene, indeno(1,2,3-cd)pyrene, pyrene, total HPAH, BEHP, and butylbenzylphthalate. PAHs were highest in Vaults 1756 and 1757 in the central area of KCIA (total HPAH of 10.5 and 7.6 mg/kg OC, respectively); the highest BEHP concentrations were also detected in these two vaults (1.1 to 2.8 mg/kg OC) (King County 2006a).

KCIA is continuing to track potential sources of metals, phthalates, and PAHs.

Testing of Joint Sealant Material

KCIA collected a caulk sample from the only exposed caulk at the KCIA site that is within the Slip 4 drainage basin. All caulk in this area was identical in appearance and was therefore assumed to be from the same application with the same materials. PCBs were not detected in this sample with a detection limit of 0.78 mg/kg (Renaud 2006). Joint sealant material at KCIA does not appear to pose a threat of Slip 4 sediment recontamination.

Cleanout of Catch Basins and Structures

KCIA reportedly has cleaned out all catch basins in the Slip 4 drainage basin and four of the nine oil/water separators (Renaud 2007). The remaining five oil/water separators will be cleaned out by May 2007.

5.3.12 North King County Airport/Georgetown Steam Plant Administrative Order

Potentially Liable Party (PLP) determination status letters were sent to King County, the city of Seattle, and The Boeing Company on April 20, 2007. An Administrative Order and scope of work are being drafted. Start of negotiations was delayed pending the assignment of a new Assistant Attorney General for the site.

5.3.13 Other Source Control Activities

A review of available information on contaminants of concern and pathways to Slip 4 has been conducted by SAIC for seven upland properties: American Avionics, ARCO #5218, Aviation Fuel Storage/Schultz Distributing, King County Airport Maintenance Shop, Marine Vacuum Service, North Coast Chemical, and Rainier Ice & Cold Storage. Due to the types of contaminants at these sites, the distance from Slip 4, and the absence of transport mechanisms and pathways for significant quantities of contaminants to reach Slip 4 sediments, no significant potential for Slip 4 sediment recontamination was identified. Additional information is available in SAIC 2006a through SAIC 2006g.

Two other facilities were identified in the SCAP as not in compliance with applicable requirements. King County Surplus Storage was inspected by SPU in February 2005, and corrective actions related to material storage and tracking were identified. A joint inspection by SPU and Ecology was conducted in October 2005; all deficiencies had been corrected and no further action was required (Schmoyer 2007b). NE T Hangars was incorrectly identified in the SCAP as not in compliance; records indicate that no discrepancies or further actions were identified during a joint SPU/King County inspection (Schmoyer 2007b).

The city of Seattle is planning to purchase the portion of Crowley property that is affected by the proposed Slip 4 sediment removal action (Integral 2006c). HWA Geosciences, Inc. (HWA) performed a Phase I and Phase II Environmental Site Assessment for Seattle City Light at the Slip 4 upland area to characterize upland soil and groundwater conditions within the City purchase area (HWA 2006a,b). HWA collected subsurface soil samples at the soil-groundwater interface (typically at 12 to 16 feet bgs) from seven borings near the head of Slip 4. A total of 10

soil samples and five groundwater samples were analyzed for chemical constituents. One of 10 soil samples analyzed contained petroleum hydrocarbon concentrations exceeding MTCA cleanup levels. Six soil samples contained total cPAHs exceeding the MTCA Method A cleanup levels. Two soil samples contained PCB concentrations exceeding MTCA cleanup levels. One soil sample contained arsenic at the cleanup level. Two groundwater samples contained lube-oil-range hydrocarbons above applicable cleanup levels. Additional investigations are continuing.

5.3.14 Planned Source Control Activities

Business Inspections: Ecology and SPU will conduct follow-up inspections at Schultz Distributing until compliance is achieved.

Source Tracing:

- Sediment traps have been reinstalled and sampling will continue during 2007.
- King County will continue source tracing at KCIA.

Crowley Marine Services:

- Ecology and SPU will collect stormwater runoff and inline solids to assess recontamination potential of current operations.
- Crowley Marine will clean catch basins and drain lines.
- Ecology is working on a plan for groundwater sampling to fill data gaps needed to evaluate sediment recontamination potential.

Boeing Plant 2:

- Ecology and EPA will evaluate existing groundwater data in the area.
- Ecology will sample onsite storm drain solids in the Building 2-122 area if this has not been done by Boeing as part of the Plant 2 RCRA work.
- Boeing will clean the onsite storm drain system as necessary.

Georgetown Steam Plant: As part of the North King County Airport/Georgetown Steam Plant Administrative Order, Seattle City Light will conduct site-wide site characterization and assess the need for additional soil removal.

Georgetown Steam Plant Flume: SPU and Seattle City Light will close connections to the flume, remove sediments, and remediate (in progress).

North Boeing Field:

- Boeing will characterize the extent of PCBs in new joint sealant.
- Boeing will continue source tracing in the north drain line (in progress).

North King County Airport/Georgetown Steam Plant Administrative Order: Ecology will negotiate an agreed order and scope of work with the city of Seattle, King County, and Boeing to investigate and control sources of PCBs and other contaminants to Slip 4.

5.4 Early Action Area 4 (Boeing Plant 2/Jorgensen Forge)

Early Action Area 4 (EAA-4) extends approximately 4,500 feet along the eastern bank of the LDW from Slip 4 to the south side of the Jorgensen Forge property (2.9 to 3.7 miles from the southern tip of Harbor Island) (E&E 2007). EAA-4 encompasses surface drainage for approximately 132 acres of commercial and industrial properties, as well as a portion of roadway in the LDW basin. Four properties drain into EAA-4: Boeing Plant 2, Jorgensen Forge, a portion of KCIA, and a small portion of East Marginal Way S., a four-lane arterial (Figure 11).

Contaminated soil and groundwater has been identified as a potential source of sediment recontamination in EAA-4. Boeing is investigating and cleaning up hazardous waste contamination at Plant 2 under RCRA. In 1994, EPA and Boeing signed an Administrative Order of Consent, which required Boeing to perform a corrective action at Plant 2. Ecology is in the final stages of negotiating a draft Agreed Order with Jorgensen Forge. This formal agreement will allow Jorgensen Forge and Ecology to develop a RI/FS to conduct source control activities on this site (E&E 2007). Bank and sediment cleanup at Jorgensen Forge will be conducted under a separate Administrative Order of Consent with EPA under CERCLA and will be coordinated with the EPA RCRA order for Plant 2.

Most of the drainage to this area is from Boeing Plant 2, a portion of 16th Avenue S and parts of Jorgenson Forge (Figure 11). Recent investigations by Boeing indicate that there are two drain lines running parallel to the Boeing Plant 2-Jorgenson Forge property line. The 15-inch line terminates approximately 600 feet east of the river. A video survey of the lines suggests that the 24-inch line extends to KCIA. Sediment samples collected from manholes and catch basins for both the 12-inch and 24-inch lines found concentrations of PCBs up to 10,000 mg/kg.

Sediment concentrations of PCBs, phthalates, PAHs, and metals at levels of concern have been identified at EAA-4 (Windward 2003b).

5.4.1 Source Control Action Plan

A revised draft *Summary of Existing Information and Data Gaps* report was prepared in April 2007 (E&E 2007). This report identified the following potential contaminant sources: Boeing Plant 2, Jorgensen Forge, a portion of KCIA, and a small portion of public storm drain system along East Marginal Way S.

A SCAP for EAA-4 is currently in preparation.

5.4.2 Stormwater Drainage

The EAA-4 drainage basin includes several point discharges to the LDW from three private stormwater drainage systems: Plant 2, Jorgensen Forge, and a portion of the KCIA. A small portion of the East Marginal Way South public storm drain system also drains to EAA-4.

The Boeing Plant 2 stormwater drainage system includes approximately 360 catch basins, 120 storm drain manholes, six oil/water separators, five shut-off valves, and three biofiltration swales (Boeing 2007a). There are 24 active outfalls draining to the LDW (E&E 2007).

Jorgensen Forge contains a stormwater conveyance system that consists of 19 catch basins and underground piping that discharges to the LDW through four active outfalls (Farallon and Anchor 2006). The stormwater conveyance system captures stormwater runoff from impermeable surfaces, including paved areas outside the existing buildings, and the building roof drains. Surface water within the interior of the buildings is not captured or delivered in the stormwater collection and conveyance system. Historically, nine outfalls, identified as outfalls 001 through 009, existed at the facility and discharged stormwater to the LDW. In the mid-1980s, outfalls 005 through 009 were plugged using concrete, and a dye tracer study was used to confirm complete enclosure of each outfall. Stormwater runoff from the facility currently discharges to the LDW through outfalls 001, 002, 003, and 004. Stormwater runoff from the eastern side of the facility discharges to the Metro stormwater system (Farallon and Anchor 2006).

Source Control Actions

As part of source control for EAA-4, the drainage basin boundaries will need to be verified and other potential sources of sediment recontamination in the basin will need to be identified. Inspections of the adjacent facilities are needed to determine if they are ongoing sources of contamination to the LDW. Potential sources that require further investigation are the 16th Avenue S. right-of-way and associated drainage and any city-owned or controlled storm drains crossing Plant 2.

5.4.3 Boeing Plant 2

Boeing Plant 2 is located between Slip 4 on the north and Jorgensen Forge on the south, along East Marginal Way S. The site is bisected by 16th Avenue S., and is a total of 116 acres. The site is covered by buildings and paved yards. Current operations at the facility are primarily limited to vehicle maintenance in Building 2-15, vehicle traffic between buildings, and operation/support of research and development activity. Current manufacturing operations are predominantly for research and development purposes. There are many small and large fuel tanks (diesel and jet fuel) on site ranging in capacity from 50 gallons to 600,000 gallons.

Historically, Plant 2 specialized in manufacturing aluminum alloy, steel alloy, and titanium alloy parts for airplanes.

The EPA Region 10 RCRA Corrective Action office is the lead at this site. There are 100 permitted RCRA units on site; however, only 20 of these units are an environmental concern to the Duwamish River.

Boeing is currently investigating and cleaning up hazardous waste contamination at Plant 2 under RCRA. In 1994, EPA and Boeing signed an Administrative Order of Consent, which required Boeing to perform corrective actions at Plant 2. Since then, over 2,600 soil samples from more than 950 locations have been collected and analyzed. In addition, over 3,200

groundwater samples from almost 750 locations, and 510 sediment samples from 271 locations in the LDW near Plant 2 have been collected and analyzed (E&E 2007). Chemicals detected in soil and groundwater included VOCs, SVOCs, PCBs, TPH, and metals. Plant 2 has been divided into seven "Corrective Measures Study Areas" to facilitate the development and screening of RCRA corrective measures. Groundwater monitoring along the Duwamish shoreline is ongoing.

Plant 2 is listed in Ecology's online CSCSL database, with confirmed groundwater, surface water, soil, air, and sediment contamination. The contaminants are listed as halogenated organic compounds, EPA priority pollutants—metals and cyanide, PCBs, petroleum products, non-halogenated solvents, and PAHs.

Source Control Actions

Upland Comprehensive Planning and Remedy Selection

Corrective action for the water side of the entire site is in development, and it will include sediment remediation (extent to be determined), remediation of the southwest bank area, and additional investigation of a PCB transformer release along the southern property line (see Section 5.4.4). Tetrachloroethylene (PCE) plumes are known to be reaching the waterway. Metals contamination on the southern portion of the site, including the waterway bank, includes lead, antimony, chromium, and copper. Interim measures taken so far include the installation of sheet pile walls to contain three TCE plumes and installation of a soil-vapor extraction and air stripping system to remove solvents from groundwater. Comprehensive planning and remedy selection documents are being prepared by Boeing.

PCB Investigation

In 2005, Boeing completed an investigation of PCBs found near Seattle City Light transformers in the southwest corner of Plant 2 (EPA 2004). The investigation indicated that PCBs are present in soil in the area near the transformer pad; PCBs also appear to have passed through the stormwater system directly to the LDW (EPA 2004). The sediments located along the southern portion of the southwest bank, the DSOA, and along the northern portion of Jorgensen Forge (to approximately Jorgensen Outfall 9) were studied as part of the transformer investigation. PCB migration did not reach the waterway via subsurface transport mechanisms; however, they are believed to have historically reached the waterway via the storm system that discharged through Boeing Outfalls 9/9A.

As part of this work, catch basin solids were sampled in the area along three separate stormwater lines draining Plant 2, Jorgensen Forge, and/or KCIA properties; PCBs were found in each line. Boeing plugged its manholes to eliminate the chance of contaminated solids being discharged to the LDW. In 2008, following EPA approval, Boeing intends to excavate PCB-contaminated soil in the substation area and remove Boeing's storm drain lines in that area (E&E 2007). Ecology and EPA are also working with other parties on non-Boeing sources in other storm drain lines.

Storm Drain Solids Sampling

Boeing recently conducted a video survey and associated storm drain solids sampling for PCBs and other parameters of the 12-inch and 24-inch storm drain lines that parallel the property line (Farallon and Anchor 2006). In addition to collecting samples for PCBs from each manhole sampled in the survey, Boeing has been testing sediments for PCBs in storm drain structures in the parking lot at KCIA (previously leased by Boeing) which drains to the 24-inch outfall. These samples were collected by Boeing in support of catch basin cleanout.

One of the pipes feeding into a sampled manhole is a 6-inch line that was traced and found to dead end on Jorgensen property. A sludge-like material was found within this line and was found to contain elevated levels of PCBs. Samples of the solids collected from manholes along the Jorgensen side of this line have very elevated PCB concentrations. The highest (10,000 mg/kg) was in a manhole directly down gradient of a plugged 12-inch diameter tie-in from Jorgensen. Sediments from catch basins on Boeing Plant 2 and KCIA property had concentrations of PCBs as high as 590 mg/kg and 213 mg/kg, respectively. Efforts to verify the extent of the drainage system are ongoing. While some of the PCBs may be traced to Boeing Plant 2 and Jorgenson Forge, some of this material may be related to the PCB joint caulking material that has and will be removed from KCIA. The SCWG, Boeing and KCIA will continue to pursue these issues.

Storm System Survey

A storm system survey was recently conducted to identify PCBs and metals in storm solids present in Plant 2 stormwater structures. The survey was conducted in two phases, from August through October 2005. Eight stormwater lines, draining most of the paved portions of Plant 2, were selected for the initial phase (Tier 1) of the survey, in which a sample of accumulated solids was collected from the furthest downgradient structure associated with each line.

At catch basins containing inserts (retrofitted traps for accumulation of solids), samples were collected from within the insert and at the bottom of the catch basin. Because samples were collected from the base of catchments specifically designed to retain particulates, they are not representative of the quality of suspended solids actually discharged to the LDW. However, these data were used as a screening tool to prioritize source control efforts; if PCBs were detected at a screening concentration exceeding 1 mg/kg in a Tier 1 sample, additional samples (Tier 2) were collected from upgradient catchments along the line in order to better identify the sources and extent of the contaminants (EPI and Golder Associates, 2006b).

In general, PCBs were detected well above 1 mg/kg in Line X (2,600 mg/kg) and Line Y (37 mg/kg), and slightly above 1 mg/kg in Line I (EPI and Golder Associates 2006b). Elevated concentrations of lead, chromium, and mercury were also detected in solids samples associated with these lines. Thus, Tier 2 sampling was subsequently conducted along lines X, Y, and I.

Results from the Tier 2 sampling indicated that storm drain solids in most upgradient catch basins along lines X and Y were impacted by PCBs. The PCB concentrations in Tier 2 samples associated with Line X ranged from 3.9 to 660 mg/kg, while concentrations in Line Y samples ranged from 8.8 to 134 mg/kg (EPI and Golder Associates 2006b). These PCBs were detected at concentrations between 0.5 and 1.5 mg/kg in Tier 2 samples associated with Line I. All catch

basins associated with lines X and Y were cleaned of solids in August and November (Tier 2 structures) of 2005. Cleanout of catch basins along Line I was completed in May 2006. The fact that PCBs were detected in the solids within the inserts (where present) indicates that an ongoing source of PCBs exists in the drainage area of lines X and Y, as the catch basins and inserts are cleaned periodically.

In the winter of 2006, lines X and Y were decommissioned and their stormwater drainages were diverted from lines X and Y to a new stormwater collection system and a treatment vault was plumbed to line Z which was designed to effectively remove solids. The *Interim Measure Work Plan for Stormwater Lines X & Y* (Golder Associates 2006b) describes the decommissioning, and presents the permanent removal and management approaches for lines X and Y.

Following the storm system survey, floor caulking and sealants in building slabs and roadways within the drainage areas of lines X and Y were tested to identify potential sources of PCBs to storm drain solids. Results indicated some PCB-containing products, applied as joint caulking and floor sealants, are present along sections of the floor slabs. Along Line X, PCB concentrations in joint material samples ranged from non-detect to 740 mg/kg, and concentrations in floor sealant samples ranged from non-detect to 350 mg/kg (EPI and Golder Associates 2006b). In Line Y samples, PCB concentrations in joint material ranged from non-detect to 40,500 mg/kg, and concentrations in floor sealant ranged from non-detect to 54 mg/kg (EPI and Golder Associates 2006b). The PCB-contaminated joint caulking and floor sealant in that part of Plant 2 will be removed as part of demolition and/or redevelopment actions. Further characterization of the caulk at Plant 2 is planned for the future.

Pollution Prevention and Source Control

A series of structural and non-structural measures have been adopted to control potential stormwater pollution at Plant 2 (Boeing 2007a). Work to remove 2-60s Area bulk coating products was expected to be completed in March 2007 (Boeing 2007b).

Shoreline Groundwater Monitoring

Quarterly groundwater monitoring of wells along the Lower Duwamish Waterway shoreline is ongoing (Boeing 2007b). A new well was installed and sampled during Summer 2006.

Sheetpile Mass Removal Interim Measure

During February 2007, 2.2 pounds of solvent were extracted from the subsurface adjacent to the sheet pile walls; since system startup in March 2004, 674.9 pounds of solvent have been physically removed from the Plant 2 environment (Boeing 2007b).

Monitoring of Storm Water Discharges

EPA has also recently approved a Work Plan to sample and evaluate suspended solids and actual storm water discharges (as opposed to the solids retained in catch basins) throughout Plant 2. This evaluation will identify the presence of any ongoing sources and associated risks to the LDW, and trigger actions to ensure the timely control of those sources (E&E 2007). Boeing has

an ongoing road and parking area street sweeping program to reduce the introduction of solids to the stormwater system.

All discharge pipes leading to the river have been identified, cleaned, and sealed if necessary. It will be necessary to document the correct sequence of investigations, results, and data, as well as to obtain an inventory of outfall pipes, check them against any permits, and check the permits for limits on COCs.

Catch Basin Sampling

As a follow-up to the Storm System Survey, Boeing has initiated a focused catch basin solids sampling program of limited duration. Sampling of solids in 11 catch basins will be conducted prior to the inspection and cleaning of catch basins for 2007 (Golder 2007). In addition, a sample will be collected from the recently installed treatment manhole that receives stormwater formerly routed to lines X and Y, and discharges to line Z. Solids samples will be submitted for PCB analysis. Following sampling, sampling locations (except the treatment manhole) will be inspected and cleaned as part of routine housekeeping procedures at Plant 2.

5.4.4 Jorgensen Forge

The Jorgensen Forge facility is located at 8531 East Marginal Way S. in Seattle. The site occupies approximately 21.6 acres between Slip 4 and Slip 6 on the east bank of the LDW (Figure 11). The site is bounded by Plant 2 to the north, East Marginal Way S. to the south, the KCIA to the east, and the LDW to the west. The facility manufactures specialized open die steel forgings and rolled aluminum rings. In addition to steel and aluminum, Jorgensen also processes nickel titanium and specialized alloys.

This property was developed in 1942, and operated from 1942 to 1965 as a fabricator of structural steel, and tractor and road equipment. Operations on the property included forging, heat-treating, and galvanizing by Isaacson Iron Works, which operated as a U.S. naval vessel manufacturer. From approximately 1953 to 1963, Bethlehem Steel operated a steel distribution center on the northwestern portion of the property. Bethlehem Steel operations consisted of cutting prefabricated steel rods to customers' specifications. From 1965 to 1992, this property was owned and operated by the Earle M. Jorgensen Company. In July 1992, the facility was purchased by a plant management group and became the Jorgensen Forge Corporation.

Site investigations have detected concentrations of PCBs, TPH, arsenic, cadmium, chromium, lead and nickel in soil exceeding applicable cleanup levels in various areas of the site. Concentrations of TPH and metals have also been detected in groundwater at the site exceeding cleanup levels (Ecology 2007c).

The Jorgensen Forge facility currently has an EPA Superfund Order (CERCLA Order No. 10-2003-0001) to address contamination in sediments of the LDW and shoreline bank area adjacent the facility (E&E 2007). In addition, Ecology has issued an Agreed Order (No. DE 4127) to address contamination within the upland portion of the Jorgensen Forge facility. These orders from EPA and Ecology are working concurrently.

Source Control Actions

Ecology and Jorgensen negotiated a draft Agreed Order. Public comment started April 26 and ended May 25, 2007. Under the order, Jorgensen will conduct a source control investigation to determine if the Jorgensen site is an ongoing source of contamination to sediments in the LDW.

EPA is the current lead for the bank and sediment portion of this site. EPA issued a CERCLA 106 order to Jorgensen to investigate the extent of contamination along their property fronting the river. Preliminary data from bank sampling shows PCBs and very high levels of metals (chromium, lead, zinc) in the bank area and upland, possibly indicating contamination in the storm drain system as well. Data is not yet final and any conclusions are tentative. Jorgenson's consultants met with EPA and Ecology to discuss the findings and next steps for further investigation of the northern portion of shoreline adjacent to Boeing Plant 2 property, the toe of Jorgensen's riverbank, and in the vicinity of an outfall on Jorgensen's property.

5.4.5 King County International Airport

KCIA, also known as Boeing Field, is located at 7277 Perimeter Road S., Seattle. KCIA is a general aviation airport, owned and operated by King County as a public utility. The site covers approximately 615 acres, 435 of which are impervious surface covered by buildings and paved areas. The remaining 180 acres consist of grass and landscape area. Twenty six acres of KCIA is located in the EAA-4 drainage basin. This area is located west of East Marginal Way S. and both north and south of the Federal Aviation Administration Air Traffic Control Tower. According to Ecology, the 26-acre area drains through the aforementioned 24-inch line located on the property boundary between the Jorgensen Forge facility and Plant 2.

Source Control Actions

Analytical results from a 2005 stormwater catch basin and joint caulk sampling event have shown elevated levels of PCBs in the stormwater sediments of Trench 2 and the joint caulk sample at concrete joint area location JC-3 (E&E 2007). However, this data has yet to be presented in a formal report with data validation, discussion, and source identification. The source and extent of PCB contamination at KCIA remains a data gap.

5.4.6 Planned Source Control Activities

SCAP: A draft Source Control Action Plan for EAA-4 is currently being developed, and is expected to be completed by September 2007. Stakeholder review is scheduled for late August 2007. The SCAP will identify additional source control actions to be conducted at EAA-4.

Jorgensen Forge: Under the negotiated Agreed Order, Jorgensen will begin work on a source control investigation to determine if the Jorgensen Forge site is an ongoing source of contamination to sediments in the LDW.

5.5 Early Action Area 5 (Terminal 117)

Terminal 117 is located on the west side of the LDW from approximately RM 3.5 to 3.7, as measured from the southern tip of Harbor Island (Figure 6). The Terminal covers approximately 2.9 acres including a 50-foot to 60-foot wide section of land adjacent to the shoreline, which is owned by the Port of Seattle. In 1999, the Port of Seattle acquired the additional inland parcels owned by the Malarkey Asphalt Company. These properties were consolidated to form the present-day Terminal 117 property (Ecology 2005a).

The Duwamish Manufacturing Company began asphalt manufacturing operations at the site around 1937 and continued until 1978. In 1978, the property was purchased by MCW, Inc. and roofing asphalt manufacturing continued. MCW, Inc. later changed its name to Malarkey Asphalt Company and continued asphalt manufacturing operations until 1993.

In the 1950s and again in the 1970s, the U.S. Army Corps of Engineers may have used the Terminal 117 shoreline area to deposit dredge material generated from the LDW. In the early 1970s, Duwamish Manufacturing used waste oil that contained PCBs. Sampling results from past site inspections indicated high levels of PCBs in soil, groundwater and sediments.

Adjacent properties include the Basin Oil Company to the west, the Boeing Company to the south, and the South Park Marina to the north/northwest (Figure 12).

Runoff from about a 5-acre area (including the Terminal 117 facility) previously discharged to EAA-5. Because there was no public storm drainage system in this area and because the streets were in poor condition, runoff typically ponded in the right-of-way or ran off onto adjacent properties. The primary route to the waterway was across the south end of the Terminal 117 facility. Runoff from the adjacent streets either sheet flowed across the driveway entrance or was picked up in a catch basin near the south entry to Terminal 117 that discharged to the LDW (Ecology 2005a).

5.5.1 Source Control Action Plan

A *Summary of Existing Information and Data Gaps Analysis Report* was prepared by Windward Environmental LLC for the Port of Seattle in September 2003 (Windward 2003c).

Ecology prepared a SCAP for the Terminal 117 Early Action Area in July 2005 (Ecology 2005a). Potential sources of sediment recontamination and source control actions are described below. Table 6 lists the action items identified during preparation of the SCAP. The chemicals of concern at Terminal 117 include PCBs, phenol, phthalates, and DDT (Ecology 2005a).

5.5.2 Business Inspections

One King County and SPU source control business inspection has been conducted in this drainage basin. An initial site visit of Basin Oil Company was conducted on August 19, 2004. Ecology conducted a stormwater permit compliance inspection at Boeing South Park on April 13, 2007. Discharge is parking lot and roof runoff.

Table 6. Source Control Actions Identified in EAA-5 SCAP

Task Name	Responsible Agency	Completion Date	Comments
Dallas Ave S PCBs in street soils - Interim Action	City of Seattle	Dec-04 (completed)	Streets are paved, shoulders are excavated and re-graveled, and stormwater and catch basin sediments are being monitored.
Dallas Ave S PCBs in residential yards	City of Seattle	June-05 (completed)	Contaminated soils at 8601 and 8609 17th Avenue South as removed and the yards restored.
Dallas Ave S PCBs in street soils - Cleanup Action	City of Seattle	June-07	Contaminated soils will be removed, new storm drainage will be installed, and the roads will be restored. Permanent stormwater control will be implemented based on monitoring of Interim Action.
Inspect South Park Marina	Ecology	Dec-05	1) Review waste management practices, compliance with permit; 2) investigate sewer connections and discharge locations of storm drains and catch basins; 3) investigate location and fate of A & B Barrel waste lagoon; 4) sample soils adjacent to fence between Terminal 117 and South Park Marina due to contamination observed in borings at Terminal 117; 4) sample catch basins for metals and phthalates.
Basin Oil	Ecology	Dec-05	1) Monitor facility demolition; 2) refer for Site Hazard Assessment; 3) work with owner to ensure site is adequately characterized for soils and groundwater contamination, including on-site septic system..
Basin Oil	Ecology	May-05 (completed)	Joint EPA/Ecology compliance inspection.
Inspect Boeing South Park	Ecology	Dec-05	1) Review drainage system and stormwater pollution prevention practices; 2) check status of hydraulic oil recovery; Look for other potential sources of sediment recontamination.
Terminal 117 Site	Port of Seattle, Ecology	June-06	1) Verify placement of institutional controls and write and adopt restrictive covenants that will prevent sediment recontamination by any future property owners in lieu of further characterization or cleanup action; 2) check soil cover/barrier across site for industrial use based on suspected residual contamination (sub-surface); 3) Continue discussions between the Port, the City, EPA and Ecology regarding the how to further assess the potential presence of subsurface contamination in the portions of the site formerly occupied by the Malarkey plant. Based on these discussions, complete any needed assessments in cooperation with EPA or Ecology; 4) inspect current tenants in coordination with the Port of Seattle to determine if they are potential sources of recontamination; 5) discuss condition and maintenance of on-site septic system with the Port..

5.5.3 Terminal 117

The former Malarkey Asphalt Company and its predecessors manufactured roofing asphalt and operated at this location from approximately 1937 until 1993. In the 1950s, dredged materials believed to contain heavy metals and other contaminants may have been deposited along the riverbank on the site (Ecology 2005a). In the early 1970s, Malarkey used waste oil that contained PCBs. Sampling results from past site inspections indicated high levels of PCBs in soil, groundwater, and sediments.

In 1999, the Port of Seattle conducted a CERCLA Removal Action. The Port removed and contained PCB-contaminated soil in the upland portion of Terminal 117 in the fall of 1999. The work included the removal and treatment of impounded stormwater, excavation and disposal of over 2,000 tons of PCB-contaminated soil, backfilling the excavation, installation of storm drain improvements, and paving the site. The completion of this work resulted in the present-day configuration of the property. The 1999 CERCLA removal action included these measures to protect stormwater quality at Terminal 117:

- Interception of surface runoff into catch basins designed to retain solids,
- Paving of exposed soil areas to prevent erosion,
- Installation of filter fabric and filter socks in catch basin inlets to retain sediment and periodic maintenance, and
- Inspection of tenant activities and outdoor storage practices to make sure materials are not a source of potential contaminants to stormwater runoff.

Source Control Actions

In 2006, the Port of Seattle conducted a time-critical removal action to remove additional PCB-contaminated soil in the upland portion of Terminal 117, which includes the entire area of the upland property (EPA 2006). PCB-contaminated soil was removed from all parts of the upland area with concentrations above 10 mg/kg total PCBs in the top 2 feet, and above 25 mg/kg total PCBs below 2 feet. The work included excavation and disposal of over 3,100 tons of PCB-contaminated soil from four areas of the site. Excavated areas were lined with geotextile fabric, backfilled, and paved. The Port implemented the following measures to prevent offsite transport of material via stormwater during the construction activities:

- Installed asphalt berms to fully contain and collect onsite stormwater and construction-related water. Approximately 95,000 gallons of stormwater and other construction-related water were collected and transported offsite for treatment and disposal.
- Cleaned onsite catch basins before construction and temporarily plugged storm drain lines to prevent construction area runoff from reaching the Duwamish Waterway.
- Converted selected catch basins to temporary sumps to collect onsite runoff.
- Conducted daily temporary erosion and sediment control inspections.
- Cleaned and restored onsite drainage system at the completion of the removal action.

TPH-contaminated soil was removed from all parts of the upland area to an action level of 4,000 mg/kg.

5.5.4 Basin Oil

Basin Oil Company occupies the triangular property bounded by 17th Avenue S. on the west, Dallas Avenue S. on the east, and Donovan Street S. on the south. The company collected, transported, and marketed used oil. Beginning in 1987, Basin Oil leased the property from Malarkey Asphalt then purchased the property in the August 2000. The industrial operations of Basin Oil shared the site with its subsidiaries, Northwest Antifreeze Service and Basin Tank and Environmental Service. Basin Tank and Environmental Service closed in January 2002. Tank work was still done under Basin Oil's name until 2004. The business was sold to Emerald Services Inc. in 2004; the property still belongs to the owner of Basin Oil. Basin Oil is in the process of demolishing the facility.

Source Control Actions

During an August 2004 inspection by Ecology and SPU, sludge samples were collected and analyzed from the oil/water separator and one catch basin. Besides high concentrations of petroleum and PAHs (183 to 4,300 mg/kg DW), the sludge was found to contain arsenic (98 and 248 mg/kg DW), zinc (711 and 830 mg/kg DW), BEHP (41 and 84 mg/kg DW), as well as low levels of PCBs (0.14 and 0.35 mg/kg DW). An EPA TSCA inspection was conducted in May 2005. No issues of concern to TSCA (which regulates PCBs over 50 mg/kg) were found.

Basin Oil has placed gravel in the disturbed areas at the south end of the property and installed a silt fence along the east side of the property to trap sediment in runoff that sheet flows off the site.

As part of the city of Seattle's interim action at Dallas Ave to address PCBs in the street (see Section 5.5.6 below), the City installed a temporary stormwater collection and treatment system to serve the newly paved roadways. Initially, the stormwater system collected runoff from the public right-of-way and the adjacent Basin Oil property and routed it to a temporary treatment system located on the south side of South Donovan Street. Because the existing combined sewer is over capacity, the runoff is stored in five 18,000-gallon storage tanks to allow runoff to be released to the sewer at a controlled rate. Effluent from the system has been sampled and tested and PCBs have not been detected (at 0.1 μg/L) in any of the samples, including those from Basin Oil.

Ecology coordinated a multi-agency inspection of Basin Oil on March 14, 2007. The inspection included Ecology Hazardous Waste and Toxics Cleanup programs, Seattle Department of Development & Planning, Seattle Public Utilities, King County Water & Land Resources Division, and Public Health Seattle & King County. Ecology sent a letter to Basin Oil on April 17 listing the concerns and requirements of the agencies involved, as well as a comment from EPA. EPA is considering action to remove the drums.

5.5.5 South Park Marina

South Park Marina is located at 8604 Dallas Ave. S., Seattle, just north of Terminal 117. It is a small boat marina and do-it-yourself boat maintenance and repair facility. Since 1970, marina activities have included offices, boat repair, cleaning facilities, upland boat storage, boat haul-out services, a boat-launch ramp, and moorage slips in the waterway.

South Park Marina is covered under the NPDES Boatyard General Permit (WAG030045) for discharges to the Lower Duwamish Waterway. A surface ditch and corrugated pipe are located along the property line with Terminal 117 (southeast of South Park Marina); this ditch discharges to the LDW.

Past site uses include barrel and drum reconditioning and painting (A&B Barrel Company), a mobile home park, and a boat building business. Liquid waste, including oils, grease and sodium hydroxide, were discharged to a small pond on the site, and the pond discharged to the LDW.

Source Control Actions

SPU and Ecology conducted a joint inspection at South Park Marina on June 7, 2005 (Ecology 2005b). Several issues were identified:

- No tarps were being used with upland boatyard activities; all upland boatyard activities require use of tarps to contain solids and prevent releases to surface waters.
- The inspector was concerned about the close proximity of the catch basin to the wash pad sump and to surface water; the catch basin is reportedly covered when the wash pad is in use. At the time of the inspection, paint residuals were observed around the edge of the catch basin, and the potential for discharge of paint residuals to surface water was judged to be "great."
- There were visible oil spills under the crane used to lift boats out of the water; the spills were on bare ground and should have been cleaned up immediately. The crane should be repaired and proper containment provided under the crane to limit any future spill.
- Paints and solvents were not properly stored; they should be stored in a covered area and on a durable impervious bermed surface.

No follow-up inspection has been conducted.

SAIC (for Ecology) prepared a *Summary of Existing Information and Identification of Data Gaps* report for South Park Marina to determine the precise location of the old A&B Barrel waste lagoon in June 2007 (SAIC 2007c). In addition, SAIC prepared a *Site Reconnaissance Plan* to provide recommendations on soil and bank sampling (SAIC 2007f).

5.5.6 Dallas Avenue S. Interim PCB Cleanup

In December 2004, the city of Seattle completed an interim cleanup action to contain PCBs present in the road rights-of-way. PCBs were originally discovered in August 2004, as part of routine source sampling efforts conducted to identify potential sources to the Terminal 117 Early Action Area. Concentrations in street dirt were as high as 9.2 mg/kg DW PCBs (found in a catch

basin located on 17th Avenue S.). Soil beneath the roadway contained as much as 66 mg/kg DW PCBs and soil collected from the public right-of-way immediately adjacent to the roadway contained up to 93 mg/kg DW PCBs. (The cleanup level in soil for unrestricted use under MTCA is 1 mg/kg DW PCBs.) Cleanup actions were conducted to protect public health by containing or removing PCBs in the public right-of-way, and included the following[4]:

- Removing PCB-contaminated gravel in the street shoulders along portions of Dallas Avenue S. and replacing with clean gravel.
- Grading and paving the roads along South Donovan Street, Dallas Avenue S., and 17th Avenue S.
- Installing a temporary stormwater collection and treatment system. The treatment system was removed in April 2005 because PCBs were not detected in any of the monthly stormwater samples collected following cleanup. Runoff from most of the adjacent roadways and the Basin Oil property (about 1.8 acres) is now collected, conveyed to storage tanks, and discharged at a controlled rate to the City combined sewer system on South Donovan Street. SPU continues to collect monthly stormwater samples as required under its discharge authorization with King County. Since April 2005, no PCBs have been detected in any of the stormwater samples.

In March 2005, SPU collected sediment samples from three of the five new catch basins installed in the roadway during the December 2004 interim cleanup, where there was sufficient sediment to analyze (two catch basins located at the northeast end of 17th Avenue S. and one on Dallas Avenue S. across from the south entrance to the Basin Oil property). All three sample contained PCBs (Aroclor 1260), at concentrations from 3.9 to 23 mg/kg DW. It is not clear whether the PCB-contaminated soil entered the catch basins during the December 2004 cleanup/construction activities or resulted from adjacent soils that were not capped or removed during the interim cleanup project. SPU cleaned all of the new catch basins in June 2005 and resampled in March 2007. Only one catch basin contained sufficient sediment to sample. PCBs were low (0.31 mg/kg DW).

In June 2005, additional cleanup was completed on properties at 8601 and 8609 17th Avenue S. and 8603 Dallas Avenue S., as well as along the west edge of 16th Avenue S. between Dallas Avenue S. and S. Cloverdale Street. A total of 790 tons (approximately 525 cu.yds.) of PCB-contaminated soil was removed from the properties and areas were backfilled with clean fill or gravel. Sod was placed in yard areas. Cleanup along 16th Avenue S. was conducted because PCBs were found in street dust along the edge of the pavement in March 2005 as part of additional site characterization work conducted by SPU.

In January 2006, SPU swept and pressure washed S. Cloverdale Street between 14th Avenue S. and 16th Avenue S., and the north side of Donovan Street between 17th Avenue S. and 16th Avenue S. to remove PCB-contaminated material found during sampling conducted in October 2005.

[4] Site maps showing sampling and cleanup action locations are available from SPU's website at: http://www.seattle.gov/util/About_SPU/Drainage_&_Sewer_System/Projects/South_Park_Soil_Project/index.asp

The EAA-5 cleanup, which includes removal of contaminated bank material and the redesign of the bank, may include a new stormwater discharge to the LDW in the vicinity of Terminal 117.

5.5.7 Planned Source Control Activities

Terminal 117: In partnership with the City of Seattle and under agreement with EPA, the Port is currently developing plans to conduct a cleanup under CERCLA to address elevated PCB concentrations in adjacent sediment and bank areas of the river, as well as elevated PCB concentrations remaining in the upland soil following the time critical removal action. This action is anticipated to address potential source material detected in the intertidal shoreline and upland bank area through a combination of removal and placement of an isolating cap structure. The work will also remove or isolate historical asphalt waste materials deposited in the shoreline during the Malarkey plant era, and will likely be conducted beginning the summer of 2008.

Basin Oil: Ecology's Hazardous Waste Program is following up on compliance issues at Basin Oil. The last of the tank contents – oil and collected stormwater – were removed by Aarcom of Tacoma in June. Basin Oil obtained a demolition permit in early June. The last tanks and drums will be removed by the end of July.

South Park Marina: Ecology will conduct sampling after July 2007, if funds are available, to characterize potential residual contamination from the A&B Barrel Company, formerly located at this site.

Dallas Avenue S. Interim PCB Cleanup:

- The temporary stormwater collection system will remain in place until the final cleanup is completed.
- Cleanup of the public right-of-way will now be included in the overall EE/CA for the Terminal 117 Early Action Area. The final cleanup of the street rights-of-way is anticipated to begin in 2010, following cleanup of the bank/sediments and upland portions of the Early Action Area.

5.6 Early Action Area 6 (Boeing Isaacson/Central KCIA)

Sediments adjacent to the Isaacson and Thompson properties owned by Boeing and just offshore of a municipal outfall exceed sediment standards for PAHs and BEHP (Windward 2003b). This area is also known as the former Slip 5.

The middle portion of KCIA (237 acres) drains to the former Slip 5 via a 48-inch diameter storm drain. This outfall also serves as the emergency overflow for pump station 45 on the City's sanitary sewer system. Pump station 45 has not overflowed in the last 5 years, since the City started maintaining pump station records. Because of the PCBs in catch basin sediments associated with the removal of PCB-containing concrete joint material from KCIA, as well as the elevated levels of PCBs in two catch basins on the airport property, there is a potential that PCBs could be transported through the 48-inch storm drain to the LDW.

5.6.1 Source Control Action Plan

A SCAP has not been prepared for this early action area.

5.6.2 Business Inspections

Between 2004 and 2006, the King County/city of Seattle Joint Business Inspection Program inspected 34 businesses at KCIA that drain to the former Slip 5 (EAA-6). Of these, two were screening visits and 32 were full site inspections. Forty-one percent of the sites where full inspections were conducted required some type of corrective action. By June 2005, 12 sites where corrective actions were requested had achieved compliance. Most of the problems found in Slip 5 were related to spill prevention and cleanup. Lack of onsite materials for controlling and cleaning up spills was the most common problem found during this reporting period.

5.6.3 Source Tracing

One sediment sample was collected from a catch basin in the area draining to the former Slip 5 (CB 40). Sample results are generally comparable to samples collected from other onsite catch basins: Mercury (0.61 mg/kg), BEHP (185 mg/kg OC), and PCBs (6.6 mg/kg DW, 154 mg/kg OC) exceeded the CSL in CB40. The concentration of TPH-heavy oil exceeded the MTCA Method A cleanup level for soil. KCIA has been requested to clean these catch basins. As of June 2005, they had not been cleaned (King County and SPU 2005b).

5.6.4 Illicit Connections and Discharges

Inspectors discovered three illicit connections at tenant facilities in the portion of KCIA that drains to EAA-6. Two involve interior catch basins located on drainage mainlines that run under buildings and cannot be fully sealed. The first tenant had already covered the catch basin with a steel plate. The second tenant discharges process water to the catch basin about twice a year. The discharge consists of about 1,500 gallons of a dilute solution of Immunol (an anti-corrosive agent). The tenant was advised to stop discharging and to cover the catch basin to prevent material from entering the drainage system. The third illicit connection is at a catch basin located off the mainline in an area of the building that is no longer being used, so the risk of material inadvertently entering the catch basin is low. The tenant was advised to seal the catch basin by filling it with concrete.

One illicit discharge (washwater from an airplane wash area) was discovered by SPU in 2005. KCIA has asked the facility to stop washing airplanes at this location and the business has covered the catch basin with a steel plate.

5.6.5 Boeing Thompson/Isaacson

Boeing Thompson/Isaacson is located at 8625 E Marginal Way South. North of Slip 5 was the historical Mineralized Cell Preserving Company, which treated wood with a solution of arsenic and sulfated copper and zinc and disposed of waste solutions and sludges to the ground. This property is the present day Boeing Isaacson site. The Bisbell Lumber Company occupied the property south of the slip. This is the present day Boeing Thompson property.

In 1941, the U.S. Navy began building a steel melting, forging and fabrication facility on the site of the present day Jorgenson Forge property. Isaacson Steel acquired the Navy facility in the 1950s and enlarged the plant to the south, including the Mineralized Cell Preserving Company property, during the 1950s and 1960s. As industrial operations expanded, Slip 5 was filled with dredge spoils as well as significant amounts of slag, firebrick and various construction materials. Earl M. Jorgenson purchased the steel mill in 1965.

Site investigations in 1983 revealed elevated arsenic concentrations in soils and groundwater. Isaacson removed 500 cubic yards of contaminated material in 1983. Boeing monitored groundwater between 1985 and 1987. Boeing purchased the Isaacson property in 1984 as part of a plan to expand their Thompson Building.

In 1988, Landau Associates conducted an investigation of soil and groundwater conditions prior to demolition of the Isaacson building and new Boeing construction. After finding arsenic in soils at concentrations of 1,000 mg/kg, 4,300 cubic yards of soil was removed. Over 3,000 cubic yards, with concentrations between 200 and 5,000 mg/kg arsenic, were disposed of in the Arlington, Oregon Hazardous Waste Landfill.

In 1991, Boeing excavated 35,000 tons of contaminated soil, treated it on site using a chemical and physical stabilization process and placed the material back in the ground beneath a polyethylene cap and asphalt cover. Confirmation sampling after the removal found arsenic concentrations in the north wall of the excavation up to 2,000 mg/kg. The soil could not be removed because it would have compromised the integrity of the existing storm drain line. The extent of the arsenic concentrations in the soil beyond the storm drain is unknown. Boeing entered Ecology's Voluntary Cleanup Program seeking a No Further Action (NFA) determination for this property in 2000. For a number of reasons, Ecology would not issue an NFA. Information is needed on current groundwater conditions as well as the northern extent of the arsenic contamination in soil.

Source Control Actions

None to date.

5.6.6 Central King County International Airport

Boeing has been removing concrete joint caulking material containing up to 79,000 mg/kg PCBs from areas of North KCIA since 2002. Further south, sampling in 2000 by Boeing found catch basins sediments containing 213 mg/kg PCBs. Finally, a sample collected by SPU in 2004 on the airport (CB40) had 6.6 mg/kg PCBs. Based on this data, the KCIA should be investigated as a potential source of sediment recontamination by PCBs.

5.6.7 Planned Source Control Activities

SCAP: A SCAP will be prepared for this Early Action Area beginning in late 2007.

5.7 Early Action Area 7 (Norfolk CSO/SD)

The Norfolk CSO/SD is located near the south end of KCIA on the Duwamish River (Figure 13). It functions as a CSO for the county wastewater system and also conveys stormwater runoff from an approximately 800-acre area in Seattle and Tukwila.

The Norfolk CSO area was identified as a cleanup priority by the EBDRP in the mid-1990s as a result of concerns associated with contaminated sediments adjacent to the outfall (Windward 2003b). King County completed a partial sediment cleanup for this area. Site remediation began in February 1999 and was completed in March 1999. Activities consisted of dredging approximately 2 acres of contaminated sediment and backfilling the dredged area to original grade with clean sediment. Contaminated sediments were removed from the site by mechanical dredge and dewatered onshore in a containment area.

Sediments with a PCB concentration greater than 45 mg/kg were transported to a Subtitle C landfill for disposal. Sediments with a PCB concentration less than 45 mg/kg were transported to a Subtitle D landfill for disposal. A total of 5,190 cubic yards of sediment was removed during the dredging; approximately 1,900 cubic yards were transported to a Subtitle C landfill as hazardous waste. Sediment was generally removed to a depth of three feet. The project was monitored for a period of five years to evaluate possible recontamination of the backfill sediment because of continuing CSO discharges.

In 2003, in response to monitoring data indicating increased PCB levels on one edge of the Norfolk cap, The Boeing Company removed approximately 100 cubic yards of sediment using a specialized vacuum excavator.

Remaining sediment contamination in the Norfolk CSO vicinity led to the EAA designation.

5.7.1 Source Control Action Plan

E&E is preparing a *Summary of Existing Information and Data Gaps Report* for Ecology; a draft was submitted in April 2007 (E&E 2007b).

A draft SCAP has been prepared and was submitted to Ecology on May 1, 2007 (E&E 2007c). Source control action items are currently being developed.

5.7.2 Business Inspections

Approximately 40 businesses located in the Seattle portion of the Norfolk storm drain system have been inspected as part of King County and SPU's source control inspection program. All are currently in compliance.

5.7.3 Source Tracing

Sediments near the Norfolk CSO outfall contain elevated levels of contaminants, primarily PCBs, mercury, 1,4-dichlorobenzene, and BEHP. In an effort to help identify potential sources of Norfolk CSO sediment recontamination, in-line sediment samples were collected from seven locations within the storm drain system. Several of the locations were sampled twice, once in

2003 and again in 2005 when SPU jetted and cleaned the mainline in the Martin Luther King, Jr. (MLK) Way S. subbasin downstream of S. Norfolk Street and between MLK Way S. and I-5.

For comparison purposes, in-line sediment concentrations were compared to CSL and SQS values for marine sediments. Eight of the 12 samples (from stations MH1, MH3, MH4, MH6, and Norfolk 20) exceeded the SQS for zinc, and four exceeded the CSL. Several HPAH compounds also exceeded the SQS in the 2005 sample from station MH4. BEHP exceeded the CSL in six of 10 samples, and two samples (from stations MH4 and MH5) exceeded the SQS for butylbenzyl phthalate. N-nitrosodiphenylamine exceeded the CSL at station MH5.

Samples contained zinc, BEHP, butylbenzyl phthalate, PAHs and n-nitrosodiphenylamine above SQS and/or CSL values. TPH-diesel and TPH-oil were also detected. The in-line sediment sampling results characterize contaminant levels in the largest and most heavily industrialized part of the Norfolk SD drainage basin.

5.7.4 Drainage System

In addition to the Norfolk CSO, five private outfalls from Boeing Developmental Center (BDC) are located in this area. A sixth private stormwater discharge owned by Boeing connects to the Norfolk CSO a short distance upstream of the Norfolk CSO outfall into the LDW (E&E 2007c).

Source Control Actions

Henderson/Norfolk CSO Treatment Facility

In the spring of 2005 the King County Wastewater Treatment Division completed the construction of the Henderson/Norfolk CSO Treatment Facility to eliminate CSOs into Lake Washington. This system also provides treatment for CSOs to the LDW via the Norfolk outfall. It consists of an inlet regulator; a 14-foot 8-inch inside diameter, 3,100-foot long 42nd Avenue Storage and Treatment Tunnel; an outlet regulator; several junction manholes; and auxiliary equipment. The system is located between South Henderson Street and South Norfolk Street just west of Martin Luther King Jr. Way. These facilities provide storage and treatment of potential CSO during peak storm events. The diversion of wastewater into the tunnel prevents the discharge of CSO to surface waters during all but the most severe storms. CSOs that are discharged receive primary treatment by settling, screening, disinfection, and dechlorination. If the tunnel fills before the peak event is over, it will overflow the tunnel at the outlet regulator. The overflow is dechlorinated with sodium bisulfite, and passed through fine screens to remove floatable debris (King County Department of Natural Resources 2006).

The Henderson/Norfolk CSO Control facility began operating in May 2005. During the annual reporting period of 2005-2006, the treatment tunnel did not need to operate, and there were no discharge events from any of the facilities controlled by this control facility. One-hundred percent of the volumes that previously discharged untreated at those CSOs was captured and received full secondary treatment and disinfection. The King County Wastewater Treatment Division concluded that, although it appears the project was successful, it will require a more normal rain pattern to fully assess effectiveness (King County 2006c).

Drainage Improvements

In early 2005, SPU began developing a capital improvement project to correct drainage problems in the drainage system in the Norfolk-Martin Luther King, Jr. Way S. subbasin (Norfolk-MLK Way). The Norfolk-MLK Way system serves approximately 224 acres of mixed residential, commercial, and industrial property on the southeast end of the LDW surface drainage basin. The project is currently in design.

As part of this project, accumulated sediment was removed from the piped section of the drainage system and samples were collected to evaluate disposal options. In July 2005, SPU jetted and cleaned about 2,200 lineal feet of pipe in the Norfolk-MLK Way subbasin to restore system capacity. Approximately 633 tons of sediment was removed.

5.7.5 Boeing Developmental Center (BDC)

BDC is located at 9725 E Marginal Way South. There is mixed ownership of the property and leasing of some sections by Boeing. The site has been used as a meat packing facility in the 1930s; a horse riding and training track; railroad tracks under various owner/lease agreements; and Pankrantz Lumber Company was on portions of the site from 1943-50. Boeing leases/ownership began on various parcels in the mid-1950s.

A mid-1990s subsurface investigation at Building 9-70, a RCRA Treatment, Storage and Disposal facility, discovered approximately 1,100 cubic yards of PCB-contaminated soil at levels greater than 0.035 mg/kg beneath the building. In 1995, Ecology agreed that the PCBs came from other sources, possibly from historical backfills from river dredging. It was agreed that soils contaminated greater than 1 mg/kg would be removed and disposed. The RCRA closures for Buildings 9-50, 9-60, and 9-69/70 were completed in 1997. Contaminated soils and concrete were excavated and disposed. PCB contamination outside of the buildings was not pursued. Cleanup was started for soil and groundwater.

Other records indicate a sump was used from 1956 to 1984 by Building 9-101, associated with aboveground storage tanks and a degreaser (PCE and TCE use possible). The sump was steam cleaned, filled, compacted and capped with concrete. Surface investigations of Building 9-101 in 1989 showed groundwater and soil contaminated with PCE, TCE, and TPH. Independent cleanup records list contamination as suspected for metals in soils, and petroleum products and halogenated and non-halogenated organic solvents confirmed in soils. Groundwater is suspected of having metals contamination. Groundwater is confirmed for having petroleum products, halogenated and non-halogenated solvents contamination.

Under its RCRA corrective action authority, EPA conducted a RCRA Facility Assessment in 1994, and identified 157 Solid Waste Management Units and five Areas of Concern at the BDC. Subsequent investigation determined most of these do not pose a threat to human health or the environment. RCRA corrective actions were taken at several units, all located north of the area that drains into the EAA-7 area of interest. These RCRA corrective action areas are described further in E&E 2007b.

Source Control Actions

Sampling for PCBs was conducted at oil/water separators during August and September of 2002. Total PCBs were detected above the detection limit in all 10 sediment/sludge samples (ranging from 0.34 mg/kg to 16.7 mg/kg) and in six of the 10 aqueous samples (ranging from 0.4 µg/L to 4.4 µg/L) (E&E 2007c).

Also in 2002, Boeing completed pressure cleaning of a segment of the south storm drain system located on the south side of the 9-101 Building in order to remove PCBs from the interior of the south storm drain line. Approximately 500 feet of 24-inch diameter concrete pipe was cleaned. Following completion of the cleanout work, a video camera was run through the drain line for visual inspection. The video inspection indicated that the line cleaning was effective in removing the side-wall scum and solids adhered to the pipe side walls, and the concrete pipe appeared clean.

In 2003, Boeing installed a Vortechnics 9000 unit upstream of Manhole 2 to help stop solids from reaching the Duwamish Waterway by settling out the solids from the stormwater that flows through the south storm drain line. This unit is cleaned annually.

In September 2003, removal activities were conducted by Project Performance Corporation for Boeing, in the Duwamish River in the area immediately offshore of the south storm drain outfall. This work was conducted under Ecology's Voluntary Cleanup Program. A prior sediment removal action was completed in the adjacent areas in 1999 by King County. The 2003 removal was implemented to address inshore sediments near the Boeing storm drain outfall that were not addressed in the 1999 sediment removal and capping action conducted by King County near the Norfolk CSO. The data from the storm drain sampling suggests that further source control measures are needed to minimize PCB inputs into the storm drain. Based on the results of the effluent solids sampling, Boeing indicated its intent to evaluate the feasibility and expected efficiency of additional source control measures for the south storm drain system.

5.7.6 Boeing Military Flight Center

The Boeing Military Flight Center (MFC) is located at 10002 East Marginal Way S., Seattle. It is situated approximately 1200 feet northeast of the LDW eastern bank. The site consists of 24.6 acres of land owned by Boeing. Major facilities at the site support the flight line and consist of aircraft storage, preparation for flight, general servicing, and maintenance and repair. Processes conducted at the MFC include: coating, conversion coating, cold solvent cleaning, machining, sealing, bonding, adhesion, automotive and equipment maintenance, airplane washing, laboratory operation, photographic/graphic processing, and airplane hydraulic/fuel testing (E&E 2007c).

Source Control Actions

In March, April, and July of 2005, Boeing conducted an investigation to characterize the material filling concrete expansion joints at the MFC. The results indicated that five of the nine types of material contained PCBs at concentrations ranging from 3.9 to 99,000 mg/kg. Joint material that

contained total PCBs above 50 mg/kg was removed. A total of 14,300 linear feet of types Q, R, S, and V material were removed from May through July of 2005 (Boeing 2006).

Additional removal activities were conducted from May through September of 2006. A total of 11,250 linear ft of PCB containing joint material was removed during these activities. A total of 25,550 linear ft of PCB joint material has been removed from the MFC (Landau 2007).

The 2007 Removal Report states that all planned primary and residual concrete expansion joint material containing PCB concentrations greater than 50 mg/kg at the MFC has been completed. Some Type Q, R, S, and V, primary and residual joint material may be present in concrete expansion joints beneath the buildings or structures (Landau 2007).

5.7.7 Southern King County International Airport

The southern portion of this facility is located within the Norfolk CSO drainage basin. There are no buildings, USTs, or known areas of groundwater or soil contamination on this portion of the site. Investigations are needed to determine whether PCBs are present in joint sealant material at the southern portion of KCIA that is located in the Norfolk CSO drainage basin.

5.7.8 Associated Grocers, Inc.

Associated Grocers, Inc., is located at 3301 South Norfolk Street, Seattle. The company is a wholesaler providing food, general merchandise, and retail services to stores throughout Washington, Alaska, Oregon, Hawaii, Guam, and the Pacific Rim. A truck maintenance shop was located at this site at one time. According to Ecology's online UST database, Associated Grocers has two operational USTs. These 20,000 gallon tanks were installed in January 1979 and contain diesel fuel. The database also shows 12 tanks have been removed from the site and one tank was closed in place.

In April 1995, two USTs (450-gallon and a 300-gallon) were removed from the southern end of the maintenance shop. It is suspected that the maintenance shop was formerly a dry cleaning facility and the USTs were abandoned cleaning solvent tanks. VOCs were detected in soil. There is no information in the site files regarding groundwater sampling.

Ongoing groundwater monitoring has been performed at the former truck shop area since at least June 2002. The latest round of groundwater sampling took place in June 2006. The following compounds were detected at concentrations greater than the MTCA Method A groundwater cleanup levels: benzene, TPH-diesel, and TPH-gasoline. Free product consisting of a mixture of gasoline and diesel fuel has been found in four of the wells.

SPU inspected Associated Grocers in October 2005 and noted problems with spill response procedures and general housekeeping practices. In addition, the onsite drainage system needed repairs. Corrections were confirmed during a December 2005 follow-up inspection (Schmoyer 2007).

Associated Grocers' storm drain system appears to drain areas of known groundwater and/or soil contamination, and ties into the Norfolk CSO/SD; it is therefore is a potential source of sediment recontamination of the LDW.

5.7.9 Northwest Auto Wrecking

Northwest Auto Wrecking is located at 10230 East Marginal Way South, Tukwila. According to Ecology's CSCSL online database, the facility (Facility Site ID No. 2287) has confirmed soil and sediment contamination, and suspected groundwater, surface water, and air contamination. The confirmed and suspected contaminants are halogenated organic compounds, EPA priority pollutant metals, and cyanide, metals, PCBs, petroleum products, and non-halogenated solvents.

No information regarding the storm drain system at Northwest Auto Wrecking was available. Thus, it is not possible to assess whether the storm drain system serving the Northwest Auto Wrecking facility could facilitate the migration of contaminants to the LDW at EAA-7.

5.7.10 Affordable Auto Wrecking

Affordable Auto Wrecking is located at 9802 Martin Luther King Jr. Way South, Seattle. This facility salvages and sells miscellaneous vehicle parts, then crushes and sells the remaining vehicle components in bulk to local metal salvage businesses.

Ecology's online CSCSL database lists Affordable Auto Wrecking as having suspected groundwater contamination and confirmed surface water and soil contamination. The contaminants are listed as EPA priority pollutants metals and cyanide, petroleum products, non-halogenated solvents, and PAHs. In July 2006, the site was added to the Hazardous Sites List with a rank of 5 (from 1 to 5). The site is awaiting remedial action.

5.7.11 Former ARCO Gas Station

The reported address of the former Arco Gas Station facility on Ecology's UST and LUST databases is 9830 Martin Luther King Way S., Seattle. The facility is listed on Ecology's online CSCSL database as a contaminated site, with groundwater contamination determined to be below the cleanup level and soil contamination that has been remediated. The facility owner is pursuing a NFA determination by Ecology under the Voluntary Cleanup Program (E&E 2007c).

According to Ecology's online UST and LUST databases, 26 USTs have been removed from the facility, and the site is awaiting soil cleanup. There are no USTs remaining on site. The USTs were removed in 1991 and 1992, and a verbal notice of release was later given to Ecology in 1994 (E&E 2007c). No soil sampling data associated with the tank removal have been submitted to Ecology, and Ecology is not aware of any other soil characterization data for the site.

5.7.12 Planned Source Control Activities

SCAP: Stakeholder review for the draft SCAP will be May 30 to June 13; the SCAP is scheduled to be published by July 30.

Business Inspections: In 2007, SPU will inspect five businesses in the Tukwila portion of the Norfolk basin under a Memorandum of Agreement with Tukwila, including Northwest Auto Wrecking.

Drainage System: SPU intends to install sediment traps at key locations in the storm drain system in 2007.

6.0 Tier Two Areas

Source control at Tier 2 Areas consists of activities associated with any final, long-term sediment cleanup actions identified through the Phase 2 RI and the EPA ROD. Action plans will be developed and implemented for each long-term cleanup.

Some of the Tier 2 Areas coincide with Potential Priority Areas (PPAs) as defined in the *Draft Preliminary Screening of Alternatives for the Lower Duwamish Waterway Superfund Site* (RETEC 2006). The draft technical memorandum, dated September 27, 2006, identified potentially actionable areas within the LDW for which remedial alternatives were to be developed. The identification of potentially actionable areas will be further refined as part of the FS process once all of the surface and subsurface data are compiled and analyzed, the risk assessments are completed, and remedial action objectives are identified (RETEC 2006).

Tentative Tier 2 Areas (T2As) are shown in Figure 14.

As of the date of this report, it is not possible to determine where additional sediment cleanups beyond the Early Action Areas will occur. Based on existing knowledge of the sites or available sediment data, it is possible that source control work may be needed in the following areas.

6.1 T2A-3, 4, & 5 (Glacier Bay)

The Glacier Bay Source Control Area is located along the western side of the Lower Duwamish Waterway Superfund Site between 1.2 and 1.6 miles from the southern end of Harbor Island (Figure 14). The main properties of interest in this area include: Alaska Marine Lines, Duwamish Shipyard, Glacier Northwest, and Former MRI Corporation/Terminal 115 (Figure 15). The Glacier Bay Source Control Area encompasses PPAs 3, 4, and 5, as described in the *Draft Preliminary Screening of Alternatives for the Lower Duwamish Waterway Superfund Site* (RETEC 2006).

Contaminants of concern were identified based on the results of sediment sampling conducted between 1991 and 2007. Chemicals that exceeded the SQS in at least one surface or subsurface sediment sample offshore of the Glacier Bay Source Control Area are considered contaminants of concern. In addition, although no sediment quality standards have been promulgated, dioxins and furans are considered to be COCs at Glacier Bay due to their presence in high concentrations, particularly within the Glacier Bay triangle (offshore of Glacier Northwest). In addition, the presence of tin at various locations, particularly offshore of Alaska Marine Lines and Duwamish Shipyard, warrants its inclusion as a COC.

The following chemicals are considered to be COCs at Glacier Bay with regard to potential sediment recontamination: arsenic, mercury, zinc, copper, lead, antimony, tin, dioxins/furans, PCBs, phthalates, PAHs, 1,2-dichlorobenzene, pentachlorophenol, and benzyl alcohol.

6.1.1 Glacier Bay Source Control Action Plan

SAIC submitted a *Summary of Existing Information and Identification of Data Gaps* report in June 2007 (SAIC 2007a). Development of the SCAP is in progress.

6.1.2 Business Inspections

As of December 2006, 21 source control inspections had been conducted in this drainage basin by SPU. All but one facility (Sea Pac Transport Services) had achieved compliance.

6.1.3 Piped Outfalls

A 48-inch city of Seattle storm drain discharges at the southeast corner of the Glacier Bay triangle. Lateral storm drain lines connect several of the surrounding facilities to the City storm drain. The drainage basin has not been fully delineated, but appears to include about 150 to 200 acres, including approximately 1 mile of West Marginal Way S., the steep hillside west of West Marginal Way S., and portions of the industrial properties along the east side of West Marginal Way S. (e.g., north end of Terminal 115, Glacier Northwest). The Duwamish Shipyard and the Alaska Marine Lines graving dock are served by private storm drains. A 2005 survey conducted by SPU identified two 15-inch private storm drain outfalls discharging to the Glacier Bay triangle (Herrera 2005).

SPU collected sediment samples from three catch basins on West Marginal Way S. in March 2006. One sample (RCB53) contained zinc (635 mg/kg DW) at concentrations exceeding the SQS. No other metals exceeded the SMS. BEHP (0.9 to 3.8 mg/kg DW, 49 to 73 mg/kg OC) and butylbenzyl phthalate (0.14 to 1.1 mg/kg DW, 9.8 to 49.3 mg/kg OC) exceeded the SQS at all three stations.

Source Control Actions

None to date.

6.1.4 Alaska Marine Lines

The main operations at this facility are loading barges and transportation and storage of containerized freight cargo. Additionally, site facilities include an onsite fueling station, truck scales, vehicle washing and steam cleaning area, and dry and liquid cargo storage, including dangerous and hazardous wastes. In 1999, Alaska Marine Lines expanded the property by purchasing the northwest portion of the adjacent Duwamish Shipyard property (SAIC 2007a).

Sediment samples collected in the LDW near the Alaska Marine Lines site in 2005 contained arsenic, copper, zinc, BEHP, and PCBs at concentrations above the SQS. In addition, high levels of butyltins were detected in sediment near the site.

Past practices at this facility resulted in soil and groundwater contamination. Although petroleum-contaminated soils were excavated in 1993, PAHs and dibenzofuran remained in the soil at levels of potential concern subsequent to the cleanup. The most recent soil and groundwater data were collected from this site in 1994. Additional data needs to be collected from this site to determine whether residual historical contamination poses a risk of sediment recontamination via groundwater transport.

Decommissioning of the graving dock and elimination of vessel repair activities should significantly reduce the potential for future releases of hazardous and toxic materials to the environment from this site.

The facility currently operates under an NPDES general industrial stormwater permit. Operations at this facility should be monitored to ensure compliance with permit requirements and stormwater BMPs to prevent release of contaminants to the Lower Duwamish Waterway.

Source Control Actions

None to date.

6.1.5 Duwamish Shipyard

Duwamish Shipyard operated a shipyard at this site from 1941 until April 1, 2007. The company specialized in repair and maintenance of floating vessels and equipment (SIC code 3731). Services included machine and electrical work, carpentry, steel fabrication, pipe-fitting, sandblasting, pressure washing, and painting. The most recent facilities included two dry docks and a graving dock. The graving dock was leased from Alaska Marine Lines. Alaska Marine Lines has recently completed filling in the graving dock area in order to expand their freight terminal operations.

The site is listed on Ecology's CSCSL. Sediment contamination at Duwamish Shipyard was identified through the NPDES monitoring program. Contaminants reported in sediment included metals and phthalates. Soil, sediment, and groundwater contamination have been confirmed and surface water contamination is suspected at the site.

A variety of contaminants have recently been detected in soil and groundwater at this facility as a result of historical and current operations, including arsenic, cadmium, copper, mercury, lead, and PAHs. Additional groundwater data are needed to assess the potential for sediment recontamination via this pathway.

Duwamish Shipyard closed on April 1, 2007. The NPDES permit has been cancelled. Although operations have ceased at the site, decommissioning operations and residual soil and groundwater contamination at the site may continue to pose a risk of sediment recontamination. Potential pathways for discharge from this site include groundwater transport and stormwater discharges. Groundwater beneath the site is contaminated with arsenic, chromium, lead, benzo(a)pyrene, benzene, and vinyl chloride; therefore, the groundwater to sediment pathway is of greatest concern at this site.

Source Control Actions

Preliminary Site Investigation

In 2006, Anchor Environmental conducted a preliminary site investigation for Duwamish Shipyard. They advanced 12 soil borings and collected 24 soil samples (two from each boring) and 12 groundwater samples (one from each boring). Anchor redeveloped two existing groundwater monitoring wells and collected two groundwater samples (one from each well).

Anchor also collected solids samples from the 10 stormwater catch basins and the stormwater system sump.

Contaminants reported above MTCA cleanup levels in soil were gasoline- and diesel-range hydrocarbons, benzene, total arsenic, cadmium, lead, and benzo(a)pyrene. Contaminants reported above MTCA cleanup levels in groundwater were benzene, total arsenic, lead, vinyl chloride, and benzo(a)pyrene.

Analytical results for the soil samples were compared to SQS and CSL values in the Data Report. Mercury and PAHs were detected in one surface soil sample above the SQS and CSL values. Cadmium, copper, lead, zinc, and PAHs were reported in at least one subsurface soil sample above the SQS and CSL values (Anchor 2006).

Copper, mercury, zinc, PAHs (acenaphthene), and phthalates (BEHP and butyl benzyl phthalate) were reported above the SQS and CSL values in the catch basin sample. Exceedance factors were less than 10 in the catch basin solids sample.

Arsenic, chromium, lead, benzo(a)pyrene, benzene, and vinyl chloride concentrations reported in groundwater exceeded MTCA cleanup levels. No marine surface water criteria exceedances were noted for the nearshore groundwater samples.

Ecology reviewed the preliminary report and directed Duwamish Shipyard to clean out catch basins and lines and sample the solids contained therein, add three monitoring wells, and prepare work plans for additional sampling and sediment evaluation. Ecology also directed Duwamish Shipyard to include analysis for tributyltin (SAIC 2007a).

Notice of Potential Liability

A Notice of Potential Liability was sent to Duwamish Shipyard on March 15, 2007. Duwamish Shipyard responded and suggested Ecology name another PLP as well. Ecology has no information about the other company. Duwamish Shipyard has provided additional information the proposed additional PLP. This information is awaiting legal review prior to a final decision. Ecology sent a determination of PLP status to Duwamish Shipyard on May 10, 2007.

6.1.6 Glacier Northwest, Inc.

Glacier Northwest, Inc. is the current owner/operator of a cement terminal located at 5900 West Marginal Way SW in Seattle. The site has been historically referred to by Glacier Northwest as the West Marginal Way Plant and Marginal Way Truck Stop. The property has had many previous owners and tenants, including Carlisle Lumber Company, the U.S. Army, Reichhold Chemical Company, the Port of Seattle, Kaiser Cement Company, Lone Star Northwest, Inc., and Ash Grove Cement West, Inc.

Sediment samples collected in the Lower Duwamish Waterway near the Glacier Northwest site in 2005 and 2007 contained arsenic, zinc, phthalates (butylbenzyl phthalate), and PCBs at concentrations above the SQS. High levels of dioxins and furans were also detected in this area. In addition, a seep sample collected in 2004 contained arsenic above the marine chronic WQS.

A variety of contaminants have been detected in soil and groundwater at this site as a result of historical operations. These include metals, pentachlorophenol, and 2,4-dichlorophenol. The most recent soil and groundwater data for this site were collected in 1990. Current soil and groundwater concentrations are unknown. In addition, high levels of dioxins have been detected in sediments directly offshore of this facility.

Because groundwater at the site is shallow and the area reportedly has a high seepage level, the potential for sediment recontamination via groundwater from this site is of significant concern. Additional data on contaminant concentrations in soil and groundwater are needed in order to evaluate the potential for groundwater from this site to recontaminate Glacier Bay sediments.

This facility does not have a stormwater discharge permit, and little information about current activities at the site was available. A site inspection is needed to identify current activities at the site and to determine whether the facility is discharging to the Lower Duwamish Waterway. If so, the facility should be permitted.

Source Control Actions

None to date.

6.1.7 Former MRI Corporation

This site was used for tin reclamation processes beginning in 1963. Tin was reclaimed from scrap steel and recycled tin cans. From 1991 to 1997, MRI generated an average of 2,200 tons of de-tinned steel and metal ingot per month (SAIC 2007a). Beginning in 1997 or 1998, Schnitzer Steel Industries initiated closure of the tin reclamation and recycling operations at the site. The most recent recycling operation involved stripping steel cans and glass sludge (dross) of tin. Reclaimed tin was smelted and sold as ingots.

Past operations at this site, including the presence of unlined lagoons, indicate a potential for contamination of soils and groundwater with metals including tin and zinc; however, very little environmental sampling data are available. Three soil samples collected in 1997 indicated elevated levels of tin and zinc. Additional groundwater data are needed in order to assess the potential for sediment recontamination via this pathway.

No information was available regarding current activities at this site. A site inspection is needed to evaluate current activities and to determine whether the facility is discharging stormwater to the LDW.

Source Control Actions

None to date.

6.1.8 Upland Properties

A number of upland properties are located within the Glacier Bay drainage basin, including the Chemithon Corporation, Alaska Marine Lines parcels, Lock Rite Metals, Kleen Environmental, city of Seattle Parks Department, and several vacant properties.

Chemithon manufactures chemical process equipment for the production of anionic detergents, process equipment for the power generation industry, and other chemical process equipment. In addition, Chemithon operates a research pilot plant facility for the testing of new products and equipment.

In October 2006, the King County Wastewater Treatment Division directed Chemithon to stop discharging stormwater runoff to the sanitary sewer. Catch basin samples collected by SPU found several chemicals exceeded screening criteria including PCBs, methylphenolic compounds, phthalates, PAHs, copper, lead, mercury, zinc, and diesel- and motor-range hydrocarbons.

Chemithon has an NPDES stormwater permit but has not been discharging to the Duwamish River. Chemithon plans to collect four samples of the water for three months to characterize water quality including pH, turbidity, zinc, oil and grease, and TOC. Chemithon cleaned out the catch basins prior to sampling. Chemithon is discussing the sampling results with the King County Wastewater Treatment Division and Ecology prior to modifying the stormwater drainage system. Results of follow-up inspections and sampling are needed to allow an assessment of the potential for sediment recontamination from this facility.

Other upland sites may be discharging stormwater to the Glacier Bay Source Control Area. Upland sites that may be discharging stormwater to this area should be inspected to provide information needed to assess the potential for sediment recontamination associated with these upland sites.

6.1.9 Planned Source Control Activities

SCAP: A SCAP for this source control area is scheduled to be published in early October. Stakeholder review is scheduled for mid-September. Source control action items will be identified in this document.

Duwamish Shipyard: Ecology is drafting an Agreed Order and Duwamish Shipyard's consultant is preparing a draft scope of work for an RI/FS. Negotiations are expected to start in late Fall 2007 after the newly assigned Assistant Attorney General completes work on other projects.

6.2 T2A-9 (Slip 6)

The Slip 6 Source Control Area is located from 3.9 to 4.4 river miles from the southern tip of Harbor Island, along the east side of the LDW (Figure 14). The main properties of interest in this area include Kenworth Truck/PACCAR, Rhone-Poulenc, and Boeing Developmental Center North.

6.2.1 Business Inspections

Two businesses were inspected by the King County/city of Seattle Joint Business Inspection Program in the Slip 6 basin between June 1, 2004 and December 31, 2004. Both were full site

inspections and corrective measures were required at one of the businesses. The site where corrective actions were requested achieved compliance within 30 days.

6.2.2 Source Tracing

One sediment sample was collected from a catch basin in the area draining to Slip 6 (CB41b). Sample results are generally comparable to samples collected from other onsite catch basins. The sample from CB41b exceeded the SQS for zinc (740 mg/kg) and the concentration of TPH heavy oil exceeded the MTCA Method A cleanup level. The sample also exceeded the soil cleanup for diesel. KCIA has been requested to clean the catch basin.

6.2.3 Kenworth Truck/PACCAR

The current lessee (Insurance Auto Auctions) stores damaged vehicles at the site for weekly auction and shipment. Surface contamination from the wrecked vehicles and leakage of petroleum, battery acid, metals, phthalates, and other COCs are a potential source for sediment recontamination. During World War 2, this property was used to produce trucks and airplane assemblies. In 1946, PACCAR purchased the property and Kenworth Motor Truck Company continued truck manufacturing on this property until 2002. The site was sold in 2004; the current tenant is Insurance Auto Auctions.

Contamination in the upland portion of this site is attributed to heavy industrial use since the 1920s. Soil and/or groundwater on the upland portions of the site are contaminated with petroleum hydrocarbons, PAHs, VOCs, PCBs, and metals (primarily arsenic, lead, and copper) (Ecology 2006c).

In 1986, both petroleum contamination in the soils and VOCs in groundwater were discovered. Numerous investigations took place between 1986 and 2006 including monitoring for VOCs in groundwater from 1986 to 2002. From 1993 through 1995, groundwater was extracted in the source area. In 2003 and 2004, oxygen-releasing compound was applied in the areas of petroleum contamination. In 2004, PACCAR installed a treatment system for the VOCs in groundwater. In addition, PACCAR performed site-wide storm drain cleaning in 2004 (Ecology 2006c).

Source Control Actions

NPDES Permit

Ecology is working on drafting an individual NPDES permit for the lessee to address both surface discharge and water quality issues, including sediment.

Stormwater Inspections

TCP and WQ conducted a stormwater permit inspection in March. A joint Ecology/city of Tukwila inspection is planned for May 9 to discuss an individual stormwater permit and stormwater facility upgrades including some form of treatment.

Sediment Evaluation

Ecology and PACCAR negotiated an Agreed Order to develop an Ecology-approved Sediment Evaluation Work Plan. A preliminary review of results shows sediment exceedances of the SQS criteria for some chemicals. PCBs exceed the SQS at 11 locations, butylbenzyl phthalate at 6 locations, and mercury, phenanthrene, and dibenzo(a,h)anthracene each exceed at one location. Sediment results for mercury exceed the CSL at one location. Stormwater solids show cadmium, zinc, dimethylphthalate, butylbenzyl phthalate, and BEHP all exceed the SQS and CSL at one or two locations.

Ecology met with PACCAR in May 2007 to discuss additional sediment sampling and a schedule to negotiate an RI/FS for the site.

Upland Cleanup

Ecology and PACCAR continue to work together for the upland cleanup and source control; this work will be conducted under a Consent Decree and Cleanup Action Plan. For the Cleanup Action Plan, PACCAR has agreed to implement two rounds of comprehensive groundwater monitoring. The wet season monitoring was completed in February 2006 and the dry season monitoring was conducted in August 2006. Results indicate elevated levels of BEHP in several wells, plus hits of PCBs and VOCs.

These results will form the basis for drafting the Cleanup Action Plan and if additional investigation tasks are required, they will be added. The neighboring site to the north, Boeing Thompson-Isaacson, agreed to split groundwater monitoring with PACCAR and Ecology at two wells located northwest of the PACCAR site and these analyses are for priority pollutant metals. The proposed Consent Decree will incorporate the sediment evaluation and groundwater results for calculating the upland cleanup levels in order to be protective for the waterway and sediments and source control.

PACCAR submitted the wet and dry season groundwater monitoring results. Elevated levels of BEHP were detected in several wells as well as detections of PCBs and VOCs.

6.2.4 Rhone-Poulenc

Most recently operated by Rhone-Poulenc and now owned by McLaughlin Thomas, this facility manufactured and processed a wide variety of industrial chemicals until it closed in April 1991. The site has a long history of above- and below-ground releases of contaminants such as toluene, arsenic, cadmium, copper, mineral oil, sulfuric acid and other pollutants. Sampling has detected contaminated groundwater flowing into the LDW. EPA is overseeing the RCRA Corrective Action cleanup under a 1993 consent order.

6.2.5 Planned Source Control Activities

Kenworth Truck/PACCAR:

- Under the MTCA Agreed Order, PACCAR has been directed to resample one of the areas where they collected surface sediment and to collect three sediment core samples.

- PACCAR is developing a Cleanup Action Plan for the upland portion of the site.

Insurance Auto Auctions (IAA):

- IAA plans to upgrade the stormwater collection and treatment system for the site in September or October 2007.
- IAA will also collect stormwater and stormwater solids samples over the next year. The samples will be analyzed for metals, SVOCs, TPH, and PCBs.

6.3 T2A-10 (Slip 4 to Seattle Boiler Works)

No source identification or control activities have been conducted to date.

6.4 T2A-11 (Slip 3)

No source identification or control activities have been conducted to date.

6.5 T2A-12 (Slip 3 to Slip 2)

No source identification or control activities have been conducted to date.

6.6 T2A-13 (Glacier NW to St. Gobain)

No source identification or control activities have been conducted to date.

6.7 T2A-14 (Slip 1)

No source identification or control activities have been conducted to date.

6.8 T2A-15 (Ash Grove Cement)

No source identification or control activities have been conducted to date.

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7.0 Tier Three Areas

No Tier Three areas have been identified at this time.

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Appendix A:

King County and SPU
Source Control Business Inspections

March 2003 to December 2006

Appendix A: SPU/King County Business Inspections (2003-2006)

Facility	Address	Inspection Type	Date Inspected	Basin	Subbasin
Afro Mini Store	166 19th Ave	Screening	2/27/2004	Diagonal CSO	Diagonal CSO
Ames & Holzer	2118 E Olive St	Onsite	3/15/2004	Diagonal CSO	Diagonal CSO
Anita Johnson Connell, M.D., P.S.	1001 Broadway, #301	Screening	4/5/2004	Diagonal CSO	Diagonal CSO
Anthony's Beauty School	1237 S Jackson St	Onsite	4/19/2004	Diagonal CSO	Diagonal CSO
Arco am/pm #81706	427 12th Ave	Onsite	3/31/2004	Diagonal CSO	Diagonal CSO
Arco AM/PM on 23rd Avenue	665 23rd Ave	Onsite	4/1/2004	Diagonal CSO	Diagonal CSO
Associates in Behaviorial	818 12th Ave	Screening	3/8/2004	Diagonal CSO	Diagonal CSO
AT Systems	1401 E Yesler St	Onsite	3/4/2004	Diagonal CSO	Diagonal CSO
Aurora Medical Services	1001 Broadway, #320	Screening	4/5/2004	Diagonal CSO	Diagonal CSO
Banh Cuon Tan Dinh Deli	1212 S Main St	Screening	3/16/2004	Diagonal CSO	Diagonal CSO
Bank of America	4825 Rainier Ave S	Onsite	1/28/2004	Diagonal CSO	Diagonal CSO
Banner Bank	1420 Madison St	Screening	4/9/2004	Diagonal CSO	Diagonal CSO
Beacon Hill Dry Cleaners	4850 Beacon Ave S	Onsite	2/2/2004	Diagonal CSO	Diagonal CSO
Blue Nile Store	173 16th Ave	Screening	2/25/2004	Diagonal CSO	Diagonal CSO
Bonnie's 5 Point Cleaners	1000 E Madison St	Screening	3/10/2004	Diagonal CSO	Diagonal CSO
Broadway Denture Clinic	1001 Broadway, #306	Screening	3/31/2004	Diagonal CSO	Diagonal CSO
Broadway Sports & Internal Medicine	600 Broadway, #270	Onsite	3/31/2004	Diagonal CSO	Diagonal CSO
BYG Maintenance	74 S Hudson St	Onsite	11/24/2003	Diagonal CSO	Diagonal CSO
Campus Shell Service Station	700 12th Ave	Onsite	3/11/2004	Diagonal CSO	Diagonal CSO
Catholic Church of Holy Martyrs of Vietnam	1230 E Fir St	Onsite	3/8/2004	Diagonal CSO	Diagonal CSO
Causey Learning Center	527 23rd Ave	Onsite	4/19/2004	Diagonal CSO	Diagonal CSO
Center For Prosthetics Orthotics, Inc.	441 12th Ave	Screening	3/24/2004	Diagonal CSO	Diagonal CSO
Central Area Development Association	500 30th Ave S	Onsite	3/9/2004	Diagonal CSO	Diagonal CSO
Central Area Motivation Program	722 18th Ave	Screening	5/10/2004	Diagonal CSO	Diagonal CSO
Choice Medical Supplies, Inc.	1215 E Union St	Screening	3/18/2004	Diagonal CSO	Diagonal CSO
Church of Christ	1708 E Fir St	Onsite	3/8/2004	Diagonal CSO	Diagonal CSO
City of Seattle	815 S Dearborn St	Onsite	8/24/2004	Diagonal CSO	Diagonal CSO
City of Seattle	805 S Charles St	Onsite	8/24/2004	Diagonal CSO	Diagonal CSO
City of Seattle	805 S Dearborn St	Onsite	9/3/2004	Diagonal CSO	Diagonal CSO
City of Seattle	801 S Plummer St	Onsite	9/1/2004	Diagonal CSO	Diagonal CSO
City of Seattle	814 8th Ave S	Onsite	8/26/2004	Diagonal CSO	Diagonal CSO
Coffee Animals	550 12th Ave	Screening	3/31/2004	Diagonal CSO	Diagonal CSO
Columbia City Chiropractic	4739 Rainier Ave S	Onsite	2/12/2004	Diagonal CSO	Diagonal CSO
Columbia Funeral Home	4567 Rainier Ave S	Onsite	1/29/2004	Diagonal CSO	Diagonal CSO
Columbia Pharmacy	4741 Rainier Ave S	Screening	2/10/2004	Diagonal CSO	Diagonal CSO

Appendix A: SPU/King County Business Inspections (2003-2006)

Facility	Address	Inspection Type	Date Inspected	Basin	Subbasin
Columbia Plaza	4801 Rainier Ave S	Onsite	1/29/2004	Diagonal CSO	Diagonal CSO
Community Svc Ctr for the Deaf & Hard of Hearing	1609 19th Ave	Screening	3/11/2004	Diagonal CSO	Diagonal CSO
Compton Lumber & Hardware	3847 1st Ave S	Onsite	2/13/2004	Diagonal CSO	Diagonal CSO
Daniel S. Frank, MD	1001 Broadway, #309	Screening	4/9/2004	Diagonal CSO	Diagonal CSO
Davis Door Inc.	2021 S Grand St	Onsite	1/5/2004	Diagonal CSO	Diagonal CSO
Deeny Construction Co. Inc.	2545 Rainier Ave S	Onsite	10/22/2003	Diagonal CSO	Diagonal CSO
Don's Quality Automotive	1117 12th Ave	Onsite	3/31/2004	Diagonal CSO	Diagonal CSO
Downtown Mini Warehouse LLC	1111 E Madison St	Screening	3/31/2004	Diagonal CSO	Diagonal CSO
DSHS	2809 26th Ave S	Screening	6/15/2004	Diagonal CSO	Diagonal CSO
Dynacare Laboratories	1229 Madison St, #500	Onsite	4/8/2004	Diagonal CSO	Diagonal CSO
Ebenezer American Zion Church	1716 23rd Ave	Onsite	3/23/2004	Diagonal CSO	Diagonal CSO
Edifice Construction Company Inc.	1417 31st Ave S	Screening	3/10/2004	Diagonal CSO	Diagonal CSO
EL Gallito	1700 20th Ave	Onsite	3/17/2004	Diagonal CSO	Diagonal CSO
Election Distribution Center	1215 E Fir St	Onsite	2/25/2004	Diagonal CSO	Diagonal CSO
Elliott Bay Behavioral Healthcare	1001 Broadway, #313	Screening	4/5/2004	Diagonal CSO	Diagonal CSO
Emerald Paving, Inc.	2547 Rainier Ave S	Onsite	10/22/2003	Diagonal CSO	Diagonal CSO
Evergreen Chiropractic Clinic	1032 S Jackson St, #200	Onsite	4/19/2004	Diagonal CSO	Diagonal CSO
Eye Concept Signs	1218 E Cherry St, #102	Screening	3/9/2004	Diagonal CSO	Diagonal CSO
Farmers Insurance Group	3601 S Alaska St	Screening	2/10/2004	Diagonal CSO	Diagonal CSO
Garfield High School	400 23rd Ave	Onsite	3/15/2004	Diagonal CSO	Diagonal CSO
Genesee Oil	3616 S Genesee St	Onsite	2/3/2004	Diagonal CSO	Diagonal CSO
Girlie Press	1658 21ST AVE	Onsite	3/17/2004	Diagonal CSO	Diagonal CSO
Goodwill Missionary Baptist Church	126 15th Ave S	Onsite	3/4/2004	Diagonal CSO	Diagonal CSO
Grace United Church of Christ	722 30th Ave S	Onsite	4/1/2004	Diagonal CSO	Diagonal CSO
H&I Automotive Inc.	317 12th Ave	Screening	3/30/2004	Diagonal CSO	Diagonal CSO
Han Han Market	412 12th Ave S	Onsite	3/16/2004	Diagonal CSO	Diagonal CSO
Harborview Medical Center	325 9th Ave	Onsite	4/27/2004	Diagonal CSO	Diagonal CSO
HealthSouth	600 Broadway, #100	Screening	3/24/2004	Diagonal CSO	Diagonal CSO
Hearing,, Speach & Deafness Ctr	1625 19th Ave	Screening	3/11/2004	Diagonal CSO	Diagonal CSO
Hoa's Beauty School	1220 S Jackson St	Onsite	3/16/2004	Diagonal CSO	Diagonal CSO
Hospital Central Services Association	1300 E Columbia St	Onsite	3/16/2004	Diagonal CSO	Diagonal CSO
Immaculate Conception	820 18th Ave	Onsite	4/16/2004	Diagonal CSO	Diagonal CSO
Institute of Complementary Medicine, P.L.L.C.	726 Broadway, #301	Onsite	3/25/2004	Diagonal CSO	Diagonal CSO
Interior Environments Inc.	5035 1st Ave S	Onsite	11/24/2003	Diagonal CSO	Diagonal CSO
Irena M. Baker DDS	4704 Rainier Ave SE	Onsite	1/30/2004	Diagonal CSO	Diagonal CSO

Appendix A: SPU/King County Business Inspections (2003-2006)

Facility	Address	Inspection Type	Date Inspected	Basin	Subbasin
Jack M. Reiter, M.D., P.S.	726 Broadway, #303	Screening	3/26/2004	Diagonal CSO	Diagonal CSO
Jackson Inc.	303 12th Ave S, #A	Onsite	3/26/2004	Diagonal CSO	Diagonal CSO
Jackson Medical Clinic	1200 S Jackson St, #27	Onsite	4/7/2004	Diagonal CSO	Diagonal CSO
James Nowak, Inc.	550 12th Ave	Screening	3/31/2004	Diagonal CSO	Diagonal CSO
JoJo Salon	200 12th Ave S	Screening	3/17/2004	Diagonal CSO	Diagonal CSO
Joslin Diabetes Center	910 Boylston Ave	Onsite	4/14/2004	Diagonal CSO	Diagonal CSO
Kaizuka Restaurant	1306 S King St	Screening	3/16/2004	Diagonal CSO	Diagonal CSO
Kelly Ross Pharmacy	1120 Harvard St	Screening	6/29/2004	Diagonal CSO	Diagonal CSO
Kevin C. Elliott, MD	1001 Broadway, #316	Screening	4/9/2004	Diagonal CSO	Diagonal CSO
Kidney Centers	700 Broadway	Onsite	4/6/2004	Diagonal CSO	Diagonal CSO
King's Barbecue house	303 12th Ave S, #D	Screening	3/15/2004	Diagonal CSO	Diagonal CSO
Kusakabe Professional Corp.	1414 E Yesler Wy	Onsite	3/9/2004	Diagonal CSO	Diagonal CSO
Laney Surgical Arts	600 Broadway, #460	Onsite	3/30/2004	Diagonal CSO	Diagonal CSO
Longs Drugs	3820 Rainier Ave S	Onsite	2/27/2004	Diagonal CSO	Diagonal CSO
Loomis Fargo	5200 E Marginal Wy S	Onsite	10/30/2003	Diagonal CSO	Diagonal CSO
Loomis Fargo	5200 E Marginal Wy S	Onsite	12/1/2005	Diagonal CSO	Diagonal CSO
Madison Park Church of Christ	1115 19th Ave	Onsite	4/1/2004	Diagonal CSO	Diagonal CSO
Magee's Specialty Food	1801 E Marion St	Screening	5/10/2004	Diagonal CSO	Diagonal CSO
Magic Dragon	3820 Rainier Ave S	Screening	2/27/2004	Diagonal CSO	Diagonal CSO
Malay Satay Hut	212 12th Ave S	Onsite	3/16/2004	Diagonal CSO	Diagonal CSO
Mary Catherine's and Daughters	901 Broadway	Onsite	3/31/2004	Diagonal CSO	Diagonal CSO
Materials/Geotechnical Lab	707 S Plummer St	Screening	8/20/2004	Diagonal CSO	Diagonal CSO
Medina Children's Services	123 6th Ave	Onsite	2/2/2004	Diagonal CSO	Diagonal CSO
Minh Tam's Market	1040 S Jackson St	Onsite	4/15/2004	Diagonal CSO	Diagonal CSO
Money Tree	1400 Madison St	Onsite	4/14/2004	Diagonal CSO	Diagonal CSO
Moss Alley Motors, Inc.	932 12th Ave	Onsite	3/9/2004	Diagonal CSO	Diagonal CSO
Mount Zion Baptist Church	1634 19th Ave	Onsite	3/24/2004	Diagonal CSO	Diagonal CSO
New Saigon Deli	1034 S Jackson St	Onsite	4/15/2004	Diagonal CSO	Diagonal CSO
Ngoc Huong Restaurant	1200 S Jackson St, #8	Onsite	3/16/2004	Diagonal CSO	Diagonal CSO
Nicola Nylander, M.D.	600 Broadway, #600	Onsite	3/17/2004	Diagonal CSO	Diagonal CSO
NiNi's Beauty School	303 12th Ave S, #E	Screening	3/15/2004	Diagonal CSO	Diagonal CSO
No Sunguk	4800 Beacon Ave S	Onsite	2/17/2004	Diagonal CSO	Diagonal CSO
Northwest Kidney Center	600 Broadway, #640	Screening	3/24/2004	Diagonal CSO	Diagonal CSO
Northwest Prosthetic & Orthotic Clinic	600 Broadway, #190	Screening	3/31/2004	Diagonal CSO	Diagonal CSO
NOVA Alternative School	2410 E Cherry St	Onsite	3/10/2004	Diagonal CSO	Diagonal CSO

Appendix A: SPU/King County Business Inspections (2003-2006)

Facility	Address	Inspection Type	Date Inspected	Basin	Subbasin
Occuhealth	726 Broadway, #201	Onsite	3/26/2004	Diagonal CSO	Diagonal CSO
Pacific Psychological	1001 Broadway, #315	Screening	4/5/2004	Diagonal CSO	Diagonal CSO
Pacific Sleep Center	726 Broadway, #305	Screening	6/29/2004	Diagonal CSO	Diagonal CSO
Paine Electronics	2203 23rd Ave S	Onsite	1/23/2004	Diagonal CSO	Diagonal CSO
Paine Electronics	2401 S Bayview St	Onsite	10/22/2003	Diagonal CSO	Diagonal CSO
PC International Inc.	5044 Wilson Ave S	Screening	2/18/2004	Diagonal CSO	Diagonal CSO
Photographic Center Northwest	900 12th Ave	Onsite	3/11/2004	Diagonal CSO	Diagonal CSO
Phu's Bakery & Deli	1221 S Main St, #104	Screening	3/16/2004	Diagonal CSO	Diagonal CSO
Planned Parenthood of Western Washington	2001 E Madison St	Screening	4/26/2004	Diagonal CSO	Diagonal CSO
Plasteel Frames	824 12th Ave	Screening	3/8/2004	Diagonal CSO	Diagonal CSO
Porbug	820 S Charlestown St	Onsite	12/29/2003	Diagonal CSO	Diagonal CSO
Prosthetics Outreach Foundation	726 Broadway	Screening	3/26/2004	Diagonal CSO	Diagonal CSO
Puget Sound Foot & Ankle Center	600 Broadway, #220	Onsite	3/30/2004	Diagonal CSO	Diagonal CSO
QFC	2707 Rainier Ave S	Onsite	10/21/2003	Diagonal CSO	Diagonal CSO
Qwest	1313 E Columbia St	Onsite	3/16/2004	Diagonal CSO	Diagonal CSO
Rabanco	54 S Dawson St	Onsite	12/11/2003	Diagonal CSO	Diagonal CSO
Rainier Community Center	4600 38th Ave S	Screening	2/4/2004	Diagonal CSO	Diagonal CSO
Rainier Pacific Management	4714 Rainier Ave S	Onsite	3/31/2004	Diagonal CSO	Diagonal CSO
Rainier Valley Chiropractic P.S.	4236 36th Ave S	Onsite	3/10/2004	Diagonal CSO	Diagonal CSO
Rainier Valley Cultural Center	3515 S Alaska St	Onsite	2/10/2004	Diagonal CSO	Diagonal CSO
Rhodes Architectural Stone	2011 E Olive St	Screening	3/26/2004	Diagonal CSO	Diagonal CSO
Richardson Annabelle	3107 S Day St	Screening	3/10/2004	Diagonal CSO	Diagonal CSO
Richlen's Mini-Mart/76 Gas Station	2220 E Union St	Onsite	3/10/2004	Diagonal CSO	Diagonal CSO
Robert Grenley, M.D.	600 Broadway Ave, #320	Onsite	4/2/2004	Diagonal CSO	Diagonal CSO
Roe Milton R	5717 Rainier Ave S	Screening	1/21/2004	Diagonal CSO	Diagonal CSO
Rotary Boys and Girl Club	201 19th Ave	Onsite	3/12/2004	Diagonal CSO	Diagonal CSO
Royal Esquire Club	5016 Rainier Ave S	Onsite	2/4/2004	Diagonal CSO	Diagonal CSO
Saba Ethiopian Restaurant	110 12th Ave	Screening	2/27/2004	Diagonal CSO	Diagonal CSO
Safeway	3820 Rainier Ave S	Onsite	3/1/2004	Diagonal CSO	Diagonal CSO
Saigon Bistro	1032 S Jackson St, #202	Onsite	4/15/2004	Diagonal CSO	Diagonal CSO
Saigon Deli	1237 S Jackson St, #4	Onsite	3/16/2004	Diagonal CSO	Diagonal CSO
Saigon Viet Nam Deli	1200 S Jackson St, #7	Onsite	3/16/2004	Diagonal CSO	Diagonal CSO
Screenmakers Northwest	3925 Martin Luther King Jr Wy S	Onsite	2/3/2004	Diagonal CSO	Diagonal CSO
Seahawks Academy	810 18th Ave	Screening	4/12/2004	Diagonal CSO	Diagonal CSO
Seattle Academy	1201 E Union St	Screening	3/18/2004	Diagonal CSO	Diagonal CSO

Appendix A: SPU/King County Business Inspections (2003-2006)

Facility	Address	Inspection Type	Date Inspected	Basin	Subbasin
Seattle Automotive Distributing, Inc.	1264 S King St	Onsite	3/15/2004	Diagonal CSO	Diagonal CSO
Seattle Central Chiropractic	1204 E Columbia St	Onsite	3/8/2004	Diagonal CSO	Diagonal CSO
Seattle Collision Center	1752 Rainier Ave S	Screening	11/6/2003	Diagonal CSO	Diagonal CSO
Seattle Curtain	104 12th Ave	Onsite	3/1/2004	Diagonal CSO	Diagonal CSO
Seattle Fire Department	3224 4th Ave S	Onsite	5/16/2003	Diagonal CSO	Diagonal CSO
Seattle Koyasan Church	1518 S Washington St	Screening	3/23/2004	Diagonal CSO	Diagonal CSO
Seattle Radiologists	600 Broadway, #170	Screening	4/20/2004	Diagonal CSO	Diagonal CSO
Seattle University	550 14th Ave	Screening	3/11/2004	Diagonal CSO	Diagonal CSO
Seattle University	914 E Jefferson St	Screening	3/11/2004	Diagonal CSO	Diagonal CSO
Seattle University	901 12th Ave	Onsite	3/11/2004	Diagonal CSO	Diagonal CSO
Seattle University	817 11th Ave	Onsite	3/11/2004	Diagonal CSO	Diagonal CSO
Seattle University	1215 E Columbia St	Onsite	3/11/2004	Diagonal CSO	Diagonal CSO
Seattle University	900 Broadway	Onsite	4/5/2004	Diagonal CSO	Diagonal CSO
Seattle University Engineering Building	900 Broadway	Onsite	3/11/2004	Diagonal CSO	Diagonal CSO
Servpro	1915 21st Ave S	Onsite	1/21/2004	Diagonal CSO	Diagonal CSO
Shell Gas Station	2015 E Union St	Onsite	3/10/2004	Diagonal CSO	Diagonal CSO
Shell Mini Mart	3611 SE Genesee St	Onsite	2/12/2004	Diagonal CSO	Diagonal CSO
Shiomi and Chinn Investments LLC	1032 S Jackson St	Onsite	4/15/2004	Diagonal CSO	Diagonal CSO
Shulman Enterprises	1709 23rd Ave	Screening	3/11/2004	Diagonal CSO	Diagonal CSO
Skeeter's Auto Rebuild, Inc.	2104 S Plum St	Onsite	2/3/2004	Diagonal CSO	Diagonal CSO
Sons of Haiti	153 14th Ave	Onsite	3/12/2004	Diagonal CSO	Diagonal CSO
SoundWinds/Air Arts	1400 31st Ave S	Screening	3/10/2004	Diagonal CSO	Diagonal CSO
Spencer Technologies	701 16th Ave	Onsite	3/16/2004	Diagonal CSO	Diagonal CSO
St. Joseph's Baby Corner, Inc.	900 Bolyston Ave, #1	Screening	3/31/2004	Diagonal CSO	Diagonal CSO
Star Laundry	160 12th Ave	Onsite	2/27/2004	Diagonal CSO	Diagonal CSO
Statscript Parmacy Chronimed	1001 Broadway, #101	Screening	3/31/2004	Diagonal CSO	Diagonal CSO
Swedish Family Medicine	1401 Madison St	Onsite	6/4/2004	Diagonal CSO	Diagonal CSO
Swedish Medical Center	801 Broadway	Onsite	4/8/2004	Diagonal CSO	Diagonal CSO
Swedish Neuroscience Institute	600 Broadway, #200	Screening	3/31/2004	Diagonal CSO	Diagonal CSO
Thanh Son Tofu	118 12th Ave	Onsite	3/8/2004	Diagonal CSO	Diagonal CSO
Thao Thanh Vuong, M.D.	1200 S Jackson St, #24	Onsite	3/16/2004	Diagonal CSO	Diagonal CSO
That's Amore	1425 31st Ave S	Screening	3/10/2004	Diagonal CSO	Diagonal CSO
The Buzz Shop	1122 E Madison St	Screening	3/10/2004	Diagonal CSO	Diagonal CSO
The Color Store, Inc.	1122 E Madison St	Onsite	3/10/2004	Diagonal CSO	Diagonal CSO
The Larrabee Center	600 Broadway, #280	Screening	3/25/2004	Diagonal CSO	Diagonal CSO

Appendix A: SPU/King County Business Inspections (2003-2006)

Facility	Address	Inspection Type	Date Inspected	Basin	Subbasin
The Lemongrass	514 12th Ave	Screening	3/31/2004	Diagonal CSO	Diagonal CSO
The Polyclinic Sleep Center	1001 Broadway, #215	Screening	4/5/2004	Diagonal CSO	Diagonal CSO
The Silver Fork	3800 Rainier Ave SE	Screening	2/27/2004	Diagonal CSO	Diagonal CSO
Therese Law, M.D., P.S.	600 Broadway, #230	Onsite	3/17/2004	Diagonal CSO	Diagonal CSO
Thuy Tien Deli	1228 S Jackson St	Screening	3/17/2004	Diagonal CSO	Diagonal CSO
Trac Associates	1001 Broadway, #217	Screening	4/1/2004	Diagonal CSO	Diagonal CSO
Transitions	514 12th Ave, #B	Screening	4/7/2004	Diagonal CSO	Diagonal CSO
U-Haul of Western WA	2515 Rainier Ave S	Onsite	10/22/2003	Diagonal CSO	Diagonal CSO
United Doctors Medical	2535 Beacon Ave S	Screening	3/3/2004	Diagonal CSO	Diagonal CSO
University of Washington	600 Broadway, #400	Screening	4/2/2004	Diagonal CSO	Diagonal CSO
University of Washington Consolidated Laundry	2901 27th Ave S	Onsite	3/23/2004	Diagonal CSO	Diagonal CSO
Urban League of Metropolitan Seattle	105 14th Ave	Onsite	2/24/2004	Diagonal CSO	Diagonal CSO
US Postal Service	3727 S Alaska St	Onsite	2/11/2004	Diagonal CSO	Diagonal CSO
Viet Wah Supermarket	1032 S Jackson St	Onsite	3/15/2004	Diagonal CSO	Diagonal CSO
Vietnam House	1038 S Jackson St	Onsite	4/19/2004	Diagonal CSO	Diagonal CSO
Vy Da	1200 S Jackson St, #8	Onsite	7/7/2004	Diagonal CSO	Diagonal CSO
Washington Alarm	1253 S Jackson St	Onsite	3/15/2004	Diagonal CSO	Diagonal CSO
Washington State Department of Social and Health S	1700 E Cherry St	Onsite	4/7/2004	Diagonal CSO	Diagonal CSO
Wholesale Transmissions	4527 Rainier Ave S	Onsite	2/12/2004	Diagonal CSO	Diagonal CSO
Work Source	2531 Rainier Ave S	Onsite	6/17/2004	Diagonal CSO	Diagonal CSO
Young Men's Christian Association	1700 23rd Ave E	Onsite	3/15/2004	Diagonal CSO	Diagonal CSO
A & A Restaurant	4860 Beacon Ave S	Screening	2/12/2004	Diagonal CSO	Lake Washington South
A.E. Raketley, Co.	5716 Rainier Ave S	Screening	2/5/2004	Diagonal CSO	Lake Washington South
Ayan Internet Coffee Shop	5400 Rainier Ave S	Screening	1/26/2004	Diagonal CSO	Lake Washington South
B&H Quality Auto Parts	5508 Rainier Ave S	Onsite	2/3/2004	Diagonal CSO	Lake Washington South
Banadir Restaurant	5212 Rainier Ave S	Onsite	2/3/2004	Diagonal CSO	Lake Washington South
Best Beauty Supply	3820 Rainier Ave S	Screening	2/27/2004	Diagonal CSO	Lake Washington South
Best Cleaning Concepts	4531 Rainier Ave S	Screening	2/10/2004	Diagonal CSO	Lake Washington South
Billiard Hoang	3220 S Hudson St	Screening	2/10/2004	Diagonal CSO	Lake Washington South
Books 4 Cars	4850 37th Ave S	Screening	1/29/2004	Diagonal CSO	Lake Washington South
Both Ways Bakery Cafe & Catering	4922 S Genesee St	Screening	1/14/2004	Diagonal CSO	Lake Washington South
Burdick's Security	4728 Rainier Ave S	Onsite	1/29/2004	Diagonal CSO	Lake Washington South
Busy Bee Mini Mart	5015 Rainier Ave S	Screening	1/27/2004	Diagonal CSO	Lake Washington South
Christien Church Rainier	4620 S Findlay St	Screening	1/21/2004	Diagonal CSO	Lake Washington South
Clayton VW Repair	4709 Martin Luther King Jr Wy S	Onsite	3/3/2004	Diagonal CSO	Lake Washington South

Appendix A: SPU/King County Business Inspections (2003-2006)

Facility	Address	Inspection Type	Date Inspected	Basin	Subbasin
Columbia City Beauty Salon	4901 Rainier Ave S	Screening	1/27/2004	Diagonal CSO	Lake Washington South
Consejo Counseling & Referral Service	3808 S Angeline St	Screening	2/4/2004	Diagonal CSO	Lake Washington South
Custom Steel Fabricators, Inc.	3530 Rainier Ave S	Onsite	2/23/2004	Diagonal CSO	Lake Washington South
Dalsan Mini Mart	3925 Martin Luther King Jr Wy S	Screening	2/5/2004	Diagonal CSO	Lake Washington South
Damascus Church	5261 Rainier Ave S	Onsite	1/27/2004	Diagonal CSO	Lake Washington South
Damascus Pre-School & CCC	5237 Rainier Ave S	Screening	1/27/2004	Diagonal CSO	Lake Washington South
Dayspring - Fitch & Sons	5503 Rainier Ave S	Onsite	3/3/2004	Diagonal CSO	Lake Washington South
Dong Khanh	5300 Rainier Ave S	Onsite	2/5/2004	Diagonal CSO	Lake Washington South
Dubb City	5022 Rainier Ave S	Screening	1/27/2004	Diagonal CSO	Lake Washington South
Dubb City	5022 Rainier Ave S	Onsite	2/12/2004	Diagonal CSO	Lake Washington South
EM Beacon BBQ	4856 Beacon Ave S	Screening	2/12/2004	Diagonal CSO	Lake Washington South
Enterprise Rent-A-Car	3711 Rainier Ave S	Onsite	2/9/2004	Diagonal CSO	Lake Washington South
Fashion Nail & Hair	4851 Rainier Ave S	Screening	1/27/2004	Diagonal CSO	Lake Washington South
Fineline Auto Design	3757 Rainier Ave S	Onsite	2/11/2004	Diagonal CSO	Lake Washington South
First A.M.E. Child and Family Center	4436 Rainier Ave S	Screening	3/8/2004	Diagonal CSO	Lake Washington South
Foulee Market	2050 S Columbian Wy	Onsite	2/20/2004	Diagonal CSO	Lake Washington South
Game Crazy	3820 Rainier Ave S	Screening	2/27/2004	Diagonal CSO	Lake Washington South
Garde Rail Gallery	4860 Rainier Ave S	Screening	1/22/2004	Diagonal CSO	Lake Washington South
Genesee Plaza	4400 Rainier Ave S	Onsite	4/22/2004	Diagonal CSO	Lake Washington South
Glant Textiles Corporation	3031 S Walden St	Onsite	2/23/2004	Diagonal CSO	Lake Washington South
Group Health Cooperative	5316 Rainier Ave S	Onsite	1/30/2004	Diagonal CSO	Lake Washington South
Halai Meat	4419 S Brandon St	Onsite	1/26/2004	Diagonal CSO	Lake Washington South
Haramain Mini-Market	5020 Rainier Ave S	Screening	1/21/2004	Diagonal CSO	Lake Washington South
Hollywood Video	3820 Rainier Ave S	Screening	2/27/2004	Diagonal CSO	Lake Washington South
Home Sight	5117 Rainier Ave S	Screening	1/21/2004	Diagonal CSO	Lake Washington South
Hong's Garage	3518 Rainier Ave S	Onsite	2/23/2004	Diagonal CSO	Lake Washington South
Image Star Shots	4801 Rainier Ave S	Onsite	2/5/2004	Diagonal CSO	Lake Washington South
Import Auto Sales	5203 Rainier Ave S	Onsite	3/31/2003	Diagonal CSO	Lake Washington South
In Sync Giftware	5100 Rainier Ave S	Screening	1/21/2004	Diagonal CSO	Lake Washington South
Isaacs Chiropractic Clinic	5200 Rainier Ave S	Onsite	2/4/2004	Diagonal CSO	Lake Washington South
Javi's Auto	3757 Rainier Ave S	Onsite	2/11/2004	Diagonal CSO	Lake Washington South
Jobs Plus	3107 S Oregon St	Screening	2/10/2004	Diagonal CSO	Lake Washington South
John Muir Elementary School	3301 S Horton St	Onsite	2/23/2004	Diagonal CSO	Lake Washington South
Jones Barbeque	5060 Martin Luther King Jr Wy S	Screening	2/10/2004	Diagonal CSO	Lake Washington South
Jone's Clavier Academy of Music, Inc.	3847 Rainier Ave S	Onsite	3/3/2004	Diagonal CSO	Lake Washington South

Appendix A: SPU/King County Business Inspections (2003-2006)

Facility	Address	Inspection Type	Date Inspected	Basin	Subbasin
K-1 Auto Body Shop	5223 Rainier Ave S	Onsite	2/25/2003	Diagonal CSO	Lake Washington South
K-1 Auto Body Shop	5223 Rainier Ave S	Onsite	4/22/2004	Diagonal CSO	Lake Washington South
Ky Van Tran, M.D.	4203 Rainier Ave S, #C	Onsite	3/2/2004	Diagonal CSO	Lake Washington South
Laundromat	3820 Rainier Ave S	Screening	2/27/2004	Diagonal CSO	Lake Washington South
Matthiesen's Flowers	4873 Rainier Ave S	Screening	1/27/2004	Diagonal CSO	Lake Washington South
Mekong Rainier Market & Gift	3400 Rainier Ave S	Onsite	2/23/2004	Diagonal CSO	Lake Washington South
Mexican Shop	5041 Rainier Ave S	Screening	1/21/2004	Diagonal CSO	Lake Washington South
New Freeway Hall	5018 Rainier Ave S	Screening	2/11/2004	Diagonal CSO	Lake Washington South
New york Nails & Waxing	5614 Rainier Ave S	Screening	1/26/2004	Diagonal CSO	Lake Washington South
Pac Staff	5102 Rainier Ave S	Screening	1/21/2004	Diagonal CSO	Lake Washington South
Paul Luu Plastic Surgen	5420 Rainier Ave S	Onsite	2/18/2004	Diagonal CSO	Lake Washington South
PCC Natural Markets	5041 Wilson Ave S	Onsite	2/9/2004	Diagonal CSO	Lake Washington South
Pet Elegance	4863 Rainier Ave S	Screening	1/27/2004	Diagonal CSO	Lake Washington South
Pho Hoa	4732 Rainier Ave S	Onsite	1/29/2004	Diagonal CSO	Lake Washington South
Phoi's Auto Co.	3501 Rainier Ave S	Onsite	2/9/2004	Diagonal CSO	Lake Washington South
Puget Sound License Agency	3820 Rainier Ave S, #C	Screening	2/27/2004	Diagonal CSO	Lake Washington South
Q.C. Cleaners	5000 S Genesee St	Screening	2/18/2004	Diagonal CSO	Lake Washington South
Quan P. Le, M.D.	4069 Rainier Ave S, #A	Onsite	2/4/2004	Diagonal CSO	Lake Washington South
Radio Hart's	5303 Rainier Ave S	Onsite	1/27/2004	Diagonal CSO	Lake Washington South
RadioShack	3820 Rainier Ave S	Screening	2/27/2004	Diagonal CSO	Lake Washington South
Rainier Auto	3300 4th Ave S	Onsite	7/11/2003	Diagonal CSO	Lake Washington South
Rainier Pharmacy	5415 Rainier Ave S	Onsite	2/11/2004	Diagonal CSO	Lake Washington South
Rainier Vista Leader	3107 S Oregon St	Screening	2/10/2004	Diagonal CSO	Lake Washington South
Revival Lighting	4860 Rainier Ave S	Screening	1/27/2004	Diagonal CSO	Lake Washington South
Rex's Service	5059 Wilson Ave S	Onsite	2/9/2004	Diagonal CSO	Lake Washington South
Ruan Transportation	4058 Rainier Ave S	Onsite	2/18/2004	Diagonal CSO	Lake Washington South
Saint Gobain	3711 S Hudson St	Onsite	5/25/2004	Diagonal CSO	Lake Washington South
Sayers Fuel	3809 Rainier Ave S	Onsite	2/11/2004	Diagonal CSO	Lake Washington South
Seattle Foods Center	4801 Beacon Ave SE	Onsite	3/9/2004	Diagonal CSO	Lake Washington South
Seed	5117 Rainier Ave S	Screening	1/21/2004	Diagonal CSO	Lake Washington South
Seward Park Chiropractic	5370 Wilson Ave S	Screening	2/18/2004	Diagonal CSO	Lake Washington South
Shola Grocery Deli	3810 S Edmunds St	Screening	2/4/2004	Diagonal CSO	Lake Washington South
Soreano's Hatfield Plumbing & Heating Co., Inc.	3704 S Ferdinand	Onsite	1/12/2004	Diagonal CSO	Lake Washington South
Speedy Auto Glass	4243 Rainier Ave S	Onsite	2/4/2004	Diagonal CSO	Lake Washington South
Starbucks	3820 Rainier Ave S	Screening	3/1/2004	Diagonal CSO	Lake Washington South

Appendix A: SPU/King County Business Inspections (2003-2006)

Facility	Address	Inspection Type	Date Inspected	Basin	Subbasin
Starbucks Coffee	4824 Rainier Ave S	Screening	2/4/2004	Diagonal CSO	Lake Washington South
Super Saver Furniture	4208 Rainier Ave S	Onsite	2/12/2004	Diagonal CSO	Lake Washington South
Suzy Meyers	3830 S Ferdinand St	Screening	1/27/2004	Diagonal CSO	Lake Washington South
Sweet Pea's	4820 Rainier Ave S	Screening	2/4/2004	Diagonal CSO	Lake Washington South
Taco Bell	3820 Rainier Ave S	Screening	2/25/2004	Diagonal CSO	Lake Washington South
Tacos El Asadero	3513 Rainier Ave S	Onsite	2/9/2004	Diagonal CSO	Lake Washington South
Tan Tuu Quan	4864 Beacon Ave SE	Screening	2/12/2004	Diagonal CSO	Lake Washington South
The Mustard Seed	4811 Rainier Ave S	Screening	2/4/2004	Diagonal CSO	Lake Washington South
Tiet Hoa L	4203 Rainier Ave S	Onsite	2/4/2004	Diagonal CSO	Lake Washington South
Time - 4 - Nails	5731 S Rainier Ave	Screening	1/26/2004	Diagonal CSO	Lake Washington South
TrueNorth	3605 34th Ave S	Onsite	2/23/2004	Diagonal CSO	Lake Washington South
Tully's #1038	4400 Rainier Ave S	Screening	3/8/2004	Diagonal CSO	Lake Washington South
Twardus	5269 Rainier Ave S	Onsite	2/9/2004	Diagonal CSO	Lake Washington South
Walgreens Drug Store	4412 Rainier Ave S	Onsite	2/12/2004	Diagonal CSO	Lake Washington South
Washington Mutual	3820 Rainier Ave S	Screening	3/1/2004	Diagonal CSO	Lake Washington South
Wash's Auto Reair	5021 Rainier Ave S	Onsite	2/5/2004	Diagonal CSO	Lake Washington South
Wash's Auto Reair	5021 Rainier Ave S	Onsite	4/22/2004	Diagonal CSO	Lake Washington South
WestCoast Auto Body	3815 Rainier Ave S	Onsite	1/22/2004	Diagonal CSO	Lake Washington South
WestFarm Foods	4058 Rainier Ave S	Onsite	2/18/2004	Diagonal CSO	Lake Washington South
Wheeler & Wheeler	4730 32nd Ave S	Screening	2/10/2004	Diagonal CSO	Lake Washington South
Wilson Distributing	3151 Rainier Ave S	Onsite	3/2/2004	Diagonal CSO	Lake Washington South
Zion Prep Academy	4730 32nd Ave S	Onsite	2/12/2004	Diagonal CSO	Lake Washington South
Bank of America	2555 Beacon Ave S	Onsite	2/17/2004	Diagonal CSO	Lander
Beacon 76	2415 Beacon Ave S	Onsite	12/20/2004	Diagonal CSO	Lander
Hilltop Red Apple	2701 Beacon Ave S	Onsite	2/17/2004	Diagonal CSO	Lander
Lioe's Automotive Service	2400 Beacon Ave S	Onsite	12/8/2004	Diagonal CSO	Lander
Westview Apartments	2525 14th Ave S	Onsite	12/15/2004	Diagonal CSO	Lander
Lifelong Aids Alliance	1002 E Seneca St	Screening	3/10/2004	Diagonal CSO	
1594 Club	2204 S Jackson St	Screening	9/16/2003	Duwamish	Diagonal SD
2100 Building	2100 24th Ave S	Screening	10/16/2003	Duwamish	Diagonal SD
2212 S. Jackson Partnership	2212 S Jackson St	Onsite	9/16/2003	Duwamish	Diagonal SD
3 Brothers Cleaners	3210 Beacon Ave S	Screening	6/27/2003	Duwamish	Diagonal SD
3A Industries, Inc.	3101 Martin Luther King Jr Wy	Screening	10/10/2003	Duwamish	Diagonal SD
4800 Denver Avenue Facility	4800 Denver Ave S	Onsite	7/21/2005	Duwamish	Diagonal SD
A-1 Auto Repair & Towing, Inc.	1821 Rainier Ave S	Onsite	1/20/2004	Duwamish	Diagonal SD

Appendix A: SPU/King County Business Inspections (2003-2006)

Facility	Address	Inspection Type	Date Inspected	Basin	Subbasin
ABC Towing	710 S Dakota St	Onsite	5/15/2003	Duwamish	Diagonal SD
Acme Construction Supply Co., Inc.	4747 1st Ave S	Onsite	3/24/2003	Duwamish	Diagonal SD
Action Communications, Inc.	4000 Airport Wy S	Onsite	5/13/2003	Duwamish	Diagonal SD
Active Gear	600 S Dakota St	Screening	5/14/2003	Duwamish	Diagonal SD
Active Gear	4412 4th Ave S	Onsite	3/20/2003	Duwamish	Diagonal SD
Adhesa Plate	4000 7th Ave S	Onsite	5/15/2003	Duwamish	Diagonal SD
Advantage Sanitary Supply	4581 Rainier Ave S	Screening	1/29/2004	Duwamish	Diagonal SD
Agbar Technologies, Inc.	3820 6th Ave S	Onsite	7/25/2003	Duwamish	Diagonal SD
Airgas	4401 Airport Wy S	Onsite	5/20/2003	Duwamish	Diagonal SD
Alaska Silk Pie	3429 Airport Wy S	Screening	7/28/2003	Duwamish	Diagonal SD
Alaskan Copper & Brass	628 S Hanford St	Onsite	6/5/2003	Duwamish	Diagonal SD
Alaskan Copper & Brass	3400 6th Ave S	Onsite	6/5/2003	Duwamish	Diagonal SD
Alaskan Copper & Brass	3300 6th Ave S	Onsite	6/5/2003	Duwamish	Diagonal SD
Alaskan Copper & Brass	2958 6th Ave S	Onsite	6/5/2003	Duwamish	Diagonal SD
Alaskan Copper & Brass	3200 6th Ave S	Onsite	6/5/2003	Duwamish	Diagonal SD
Alaskan Copper & Brass	3223 6th Ave S	Onsite	6/5/2003	Duwamish	Diagonal SD
Alaskan Copper & Brass	3301 6th Ave S	Onsite	6/5/2003	Duwamish	Diagonal SD
Alaskan Copper & Brass	3317 6th Ave S	Onsite	6/5/2003	Duwamish	Diagonal SD
Alaskan Copper & Brass	3405 6th Ave S	Onsite	6/5/2003	Duwamish	Diagonal SD
All City Fence Co.	2345 Rainier Ave S	Onsite	10/21/2003	Duwamish	Diagonal SD
All Ports Trading Co. LLC	3429 Airport Wy S	Onsite	8/5/2003	Duwamish	Diagonal SD
Amazon.com	1200 12th Ave S	Onsite	10/30/2003	Duwamish	Diagonal SD
Amazon.com	2646 Rainier Ave S	Onsite	10/30/2003	Duwamish	Diagonal SD
American Red Cross	1900 25th Ave S	Onsite	10/23/2003	Duwamish	Diagonal SD
Amy Yee Tennis Center	2000 Martin Luther King Jr Wy S	Screening	9/16/2003	Duwamish	Diagonal SD
ANICA, Inc.	4634 E Marginal Wy S, #200	Onsite	3/21/2003	Duwamish	Diagonal SD
Applied Industrial Technologies	4021 6th Ave S	Onsite	8/20/2003	Duwamish	Diagonal SD
Arco Rainier	3005 Rainier Ave S	Onsite	11/5/2003	Duwamish	Diagonal SD
Arctic Ice Cream Novelties	1901 23rd Ave S	Onsite	10/16/2003	Duwamish	Diagonal SD
ASA Mercer Middle School	1600 Columbia Wy	Onsite	6/20/2003	Duwamish	Diagonal SD
Atlantic Place View Condominiums	1111 S Atlantic St	Onsite	6/17/2003	Duwamish	Diagonal SD
Atlas Supply	611 S Charlestown St	Onsite	6/24/2003	Duwamish	Diagonal SD
Auto Depot	3500 Rainier Ave S	Screening	3/29/2004	Duwamish	Diagonal SD
Auto Quest	4115 4th Ave S	Onsite	3/17/2003	Duwamish	Diagonal SD
Auto Quest	4115 4th Ave S	Onsite	5/3/2006	Duwamish	Diagonal SD

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Facility	Address	Inspection Type	Date Inspected	Basin	Subbasin
Auto-Chlor System	4315 7th Ave S	Onsite	6/23/2003	Duwamish	Diagonal SD
Automotive Brakes & Service	308 14th Ave S	Onsite	9/10/2003	Duwamish	Diagonal SD
AV-Pro	825 S Dakota St	Onsite	6/11/2003	Duwamish	Diagonal SD
B & J Restoration Ltd.	4222 6th Ave S	Onsite	5/30/2003	Duwamish	Diagonal SD
Bader & Olson	4143 1st Ave S	Onsite	9/29/2003	Duwamish	Diagonal SD
Bailey Gazert Elementary	1301 E Yesler Wy	Onsite	10/15/2003	Duwamish	Diagonal SD
Balzer Pacific Equipment Co.	5047 Colorado Ave S	Onsite	12/4/2003	Duwamish	Diagonal SD
Bamboohardwoods	510 S Industrial Wy	Onsite	8/14/2003	Duwamish	Diagonal SD
Bank of America	2301 S Jackson St, #100	Screening	8/5/2003	Duwamish	Diagonal SD
Barr Transmission	3913 Airport Wy S	Onsite	7/2/2003	Duwamish	Diagonal SD
Beacon Hill Driving School	2341 15th Ave S	Screening	10/14/2003	Duwamish	Diagonal SD
Beacon Hill Foods	4347 15th Ave S	Screening	6/25/2003	Duwamish	Diagonal SD
Beacon Market	2500 Beacon Ave S	Onsite	10/14/2003	Duwamish	Diagonal SD
Bella Vista Apartments	1115 S Atlantic	Screening	6/17/2003	Duwamish	Diagonal SD
Bendokas Painting Company, Inc.	805 Rainier Ave S	Onsite	9/4/2003	Duwamish	Diagonal SD
Benjamin Moore, Inc.	1213 S King St	Onsite	9/11/2003	Duwamish	Diagonal SD
Betty Merken Studios	3063 Beacon Ave S	Screening	5/28/2003	Duwamish	Diagonal SD
Beverly Nails	306 23rd Ave S, #105	Screening	9/12/2003	Duwamish	Diagonal SD
Big Top Studio	3429 Airport Wy S, #11A	Onsite	8/5/2003	Duwamish	Diagonal SD
Bill Hatch Sports	4202 6th Ave S	Onsite	6/25/2003	Duwamish	Diagonal SD
Blaine Memorial United Methodist Church	3001 24th Ave S	Onsite	2/18/2004	Duwamish	Diagonal SD
Blanchard Auto Electric/Automotive Service Co.	640 S Spokane St	Onsite	7/28/2003	Duwamish	Diagonal SD
Bloch Steel Industries	4580 Colorado Ave S	Onsite	3/20/2003	Duwamish	Diagonal SD
BMP Painting Contractors, Inc.	1922 Airport Wy S	Onsite	6/19/2003	Duwamish	Diagonal SD
Boy Boy's Salon	1400 S Jackson St, #1	Onsite	9/16/2003	Duwamish	Diagonal SD
Brooklyn Beaute Salon	306 23rd Ave S	Screening	9/12/2003	Duwamish	Diagonal SD
Browne Production Group	3429 Airport Wy S	Screening	8/5/2003	Duwamish	Diagonal SD
Buck & Buck Designs	3111 27th Ave S	Onsite	10/10/2003	Duwamish	Diagonal SD
Budget Batteries	2006 Rainier Ave S	Onsite	10/16/2003	Duwamish	Diagonal SD
Budget Batteries	2006 Rainier Ave S	Onsite	12/5/2005	Duwamish	Diagonal SD
BUD's Muffler City Inc.	1801 Rainier Ave S	Onsite	2/3/2004	Duwamish	Diagonal SD
Bush Woodcraft	841 Rainier Ave S	Onsite	8/18/2003	Duwamish	Diagonal SD
Business Park	3828 4th Ave S	Onsite	9/29/2003	Duwamish	Diagonal SD
BYG Taxi Co-op	74 S Hudson St	Onsite	8/12/2003	Duwamish	Diagonal SD
Byrne Specialty Gases, Inc.	601 S Andover St	Onsite	6/5/2003	Duwamish	Diagonal SD

Appendix A: SPU/King County Business Inspections (2003-2006)

Facility	Address	Inspection Type	Date Inspected	Basin	Subbasin
C.C. Filson Co.	3851 1st Ave S	Onsite	2/19/2004	Duwamish	Diagonal SD
Canton Noodle House	506 12th Ave S	Onsite	9/11/2003	Duwamish	Diagonal SD
Ca-Rem #1 Oriental Ice Cream	1529 Rainier Ave S	Screening	10/21/2003	Duwamish	Diagonal SD
Carlson Audio Systems	3801 Airport Wy S, #A	Onsite	7/24/2003	Duwamish	Diagonal SD
Carpet Liquidators Inc.	3434 4th Ave S	Onsite	8/14/2003	Duwamish	Diagonal SD
Carpet Liquidators Inc.	4400 4th Ave S	Onsite	10/22/2003	Duwamish	Diagonal SD
Cascade Designs	4000 1st Ave S	Onsite	3/13/2003	Duwamish	Diagonal SD
Cascade Designs	3800 1st Ave S	Onsite	3/13/2003	Duwamish	Diagonal SD
Cascade Designs	130 S Dakota St	Onsite	3/13/2003	Duwamish	Diagonal SD
Cascade Designs	4225 2nd Ave S	Onsite	3/13/2003	Duwamish	Diagonal SD
Cascade Designs	3857 2nd Ave S	Onsite	3/13/2003	Duwamish	Diagonal SD
Cascade Designs	4225 2nd Ave S	Onsite	11/3/2006	Duwamish	Diagonal SD
Cascade Machinery & Electric, Inc.	4600 E Marginal Wy S	Onsite	3/14/2003	Duwamish	Diagonal SD
Cascade Oil Company	925 Hiawatha Pl S	Onsite	8/6/2003	Duwamish	Diagonal SD
Castle Cafe	1715 E Yesler Wy	Onsite	9/24/2003	Duwamish	Diagonal SD
Catalan Custom Metal	4740 Airport Wy S	Onsite	5/27/2003	Duwamish	Diagonal SD
Catholic Community Services of King County	100 23rd Ave S	Onsite	9/18/2003	Duwamish	Diagonal SD
Cedrus Technologies Inc.	3922 6th Ave S	Onsite	8/13/2003	Duwamish	Diagonal SD
Center For Career Alternatives	901 Rainier Ave S	Onsite	8/13/2003	Duwamish	Diagonal SD
Centerpointe Apartments	1311 12th Ave S	Screening	6/10/2003	Duwamish	Diagonal SD
Charlie's Produce	5047 Colorado Ave S	Onsite	6/6/2006	Duwamish	Diagonal SD
Charter Construction	1900 Airport Wy S	Screening	6/12/2003	Duwamish	Diagonal SD
Chevron Station	2802 Rainier Ave S	Onsite	10/10/2003	Duwamish	Diagonal SD
Choung Mei Corp.	801 Rainier Ave S	Screening	8/14/2003	Duwamish	Diagonal SD
City of Seattle	2700 Airport Wy S	Onsite	10/6/2003	Duwamish	Diagonal SD
City of Seattle	805 S Dearborn ST	Onsite	7/28/2004	Duwamish	Diagonal SD
CL Auto Repair	2901 17th Ave S	Onsite	5/21/2003	Duwamish	Diagonal SD
CL Auto Repair	2901 17th Ave S	Onsite	12/15/2004	Duwamish	Diagonal SD
Clear Channel Outdoor	3601 6th Ave S	Onsite	6/27/2003	Duwamish	Diagonal SD
Cleveland High School	5511 15th Ave S	Onsite	11/19/2003	Duwamish	Diagonal SD
Coastwide Laboratories	3800 1st Ave S	Onsite	3/11/2003	Duwamish	Diagonal SD
Color Graphics	1421 S Dean St	Onsite	9/4/2003	Duwamish	Diagonal SD
Commercial Plastics Corp.	3414 4th Ave S	Onsite	8/14/2003	Duwamish	Diagonal SD
Commercial Warehouse Co., Inc.	3623 6th Ave S	Onsite	6/18/2003	Duwamish	Diagonal SD
Community Transit	3400 Airport Wy S	Onsite	5/5/2004	Duwamish	Diagonal SD

Appendix A: SPU/King County Business Inspections (2003-2006)

Facility	Address	Inspection Type	Date Inspected	Basin	Subbasin
Concepts in Wood	1915 Rainier Ave S	Screening	10/14/2003	Duwamish	Diagonal SD
Consolidated Press	600 S Spokane St	Onsite	8/19/2003	Duwamish	Diagonal SD
Container Care Inc.	1S Idaho St	Onsite	3/28/2003	Duwamish	Diagonal SD
Continental Western Corporation	3925 9th Ave S	Screening	6/5/2003	Duwamish	Diagonal SD
Contract Furnishings Mart	500 S Brandon St	Screening	5/21/2003	Duwamish	Diagonal SD
Control Contractors	1128 Poplar Pl S	Onsite	8/27/2003	Duwamish	Diagonal SD
COSTCO Wholesale	4401 4th Ave S	Onsite	3/20/2003	Duwamish	Diagonal SD
COSTCO Wholesale	4401 4th Ave S	Onsite	11/18/2005	Duwamish	Diagonal SD
Courier One	3623 6th Ave S	Screening	6/18/2003	Duwamish	Diagonal SD
Cramer Inspection Services	2411 S Walker St	Onsite	10/9/2003	Duwamish	Diagonal SD
Crosscut Hardwoods	4100 1st Ave S	Onsite	11/18/2003	Duwamish	Diagonal SD
Daniel Smith	4150 1st Ave S	Onsite	11/12/2003	Duwamish	Diagonal SD
David Huchthausen Studio	3911 Airport Wy S	Screening	8/14/2003	Duwamish	Diagonal SD
Davis Sign	4025 7th Ave S	Onsite	5/20/2003	Duwamish	Diagonal SD
Day Moon Press	3320 Beacon Ave S	Screening	6/27/2003	Duwamish	Diagonal SD
Delite Bakery	3211 Beacon Ave S	Screening	6/27/2003	Duwamish	Diagonal SD
Dere Auto	1818 Rainier St	Onsite	2/24/2006	Duwamish	Diagonal SD
Design Engineering	800 23rd Ave S	Screening	8/26/2003	Duwamish	Diagonal SD
Details Custom Car Care	2420 Airport Wy S	Onsite	5/21/2003	Duwamish	Diagonal SD
DeWalt	2100 Airport Wy S	Onsite	6/5/2003	Duwamish	Diagonal SD
Diagonal Storage Yard	400 S Spokane St	Screening	5/8/2006	Duwamish	Diagonal SD
Dilettante	2021 22nd Ave S	Screening	11/14/2003	Duwamish	Diagonal SD
Down Products	4011 6th Ave S	Onsite	8/7/2003	Duwamish	Diagonal SD
Eagle Bar & Restaurant Supply	2001 S Plum St	Onsite	11/14/2003	Duwamish	Diagonal SD
Eco Waterborne Coatings	420 S Hinds St	Onsite	5/19/2003	Duwamish	Diagonal SD
Ed Wyse & Company Inc.	3701 7th Ave S	Onsite	12/1/2003	Duwamish	Diagonal SD
El Centro de la Raza	2524 16th Ave S	Onsite	10/23/2003	Duwamish	Diagonal SD
Electro Mechanical Company	411 S Dawson St	Onsite	11/14/2005	Duwamish	Diagonal SD
Emerald City Bindery	4809 Airport Wy S	Onsite	6/17/2003	Duwamish	Diagonal SD
Emerald City Cleaners	850 Rainier Ave S	Onsite	9/3/2003	Duwamish	Diagonal SD
Emerald Services	1500 Airport Wy S	Onsite	7/26/2004	Duwamish	Diagonal SD
Emmanuel's Inc.	1105 Rainier Ave S	Onsite	8/13/2003	Duwamish	Diagonal SD
Entrees Inc.	3922 6th Ave S	Onsite	8/13/2003	Duwamish	Diagonal SD
Eskimo Pie Distribution Company	4606 4th Ave S	Onsite	10/22/2003	Duwamish	Diagonal SD
Essential Foods	1440 S Jackson St	Onsite	9/4/2003	Duwamish	Diagonal SD

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Facility	Address	Inspection Type	Date Inspected	Basin	Subbasin
Evergreen Marketing Inc.	3429 Airport Wy S	Screening	7/28/2003	Duwamish	Diagonal SD
Evergreen Treatment Services	1740 Airport Wy S	Screening	7/28/2003	Duwamish	Diagonal SD
Expo Hair Design	2534 15th Ave S	Screening	2/17/2004	Duwamish	Diagonal SD
Ezell's Famous Chicken	501 23rd Ave S	Onsite	8/5/2003	Duwamish	Diagonal SD
F.D. Thomas	3655 E Marginal Wy S	Onsite	11/25/2003	Duwamish	Diagonal SD
Fabriform Plastics Inc.	3300 Airport Wy S	Onsite	5/30/2003	Duwamish	Diagonal SD
Family Affair Style Center	3604 S Genesee St	Screening	2/12/2004	Duwamish	Diagonal SD
Family Chiropractic Health Clinic, Inc. P.S.	4346 15th Ave S	Onsite	5/19/2003	Duwamish	Diagonal SD
Fatou Braider	2202 S Jackson St	Screening	9/16/2003	Duwamish	Diagonal SD
FedEx	651 S Alaska St	Onsite	6/3/2003	Duwamish	Diagonal SD
Fidelity Accounting Tax Service	2356 15th Ave S, #101	Screening	10/9/2003	Duwamish	Diagonal SD
Firestone	2915 Rainier Ave S	Onsite	10/28/2003	Duwamish	Diagonal SD
FleetPride	600 S Dakota St	Onsite	5/14/2003	Duwamish	Diagonal SD
Fleshtone Media LLC	3909 Airport Wy S	Screening	8/14/2003	Duwamish	Diagonal SD
Flexi-Van Leasing Inc.	1S Idaho St	Onsite	3/28/2003	Duwamish	Diagonal SD
Flynn's Restaurant	3923 Airport Wy S	Onsite	7/24/2003	Duwamish	Diagonal SD
FMG LLC	3433 Airport Wy SE	Onsite	1/12/2004	Duwamish	Diagonal SD
Fryer Knowles, Inc	205 S Dawson St	Onsite	12/2/2003	Duwamish	Diagonal SD
FSI	4601 6th Ave S	Onsite	7/14/2003	Duwamish	Diagonal SD
Galaxy Specialty Co.	2329 Rainier Ave S	Onsite	10/23/2003	Duwamish	Diagonal SD
GB Distribution LLC	4727 Denver Ave S	Onsite	3/18/2003	Duwamish	Diagonal SD
GB Distribution LLC	4711 Denver Ave S	Onsite	3/18/2003	Duwamish	Diagonal SD
General Services Administration	4735 E Marginal Wy S	Onsite	6/25/2004	Duwamish	Diagonal SD
Glacier Northwest	5975 E Marginal Wy S	Onsite	5/25/2006	Duwamish	Diagonal SD
Glassworks	927 Rainier Ave S	Onsite	8/13/2003	Duwamish	Diagonal SD
Global Imports LTD	4226 6th Ave S	Onsite	5/28/2003	Duwamish	Diagonal SD
Golden Pheasant Foods, LLC	1222 S Weller St	Onsite	8/13/2003	Duwamish	Diagonal SD
Goldie's Inc.	3924 Airport Wy S	Onsite	8/20/2003	Duwamish	Diagonal SD
Grand Central Baking Company	4634 E Marginal Wy, #C110	Onsite	3/12/2003	Duwamish	Diagonal SD
Great Sun Corp	1421 S Dearborn St	Screening	9/25/2003	Duwamish	Diagonal SD
Great Sun Restaurant Equipment & Supplies	812 Rainier Ave S	Onsite	9/4/2003	Duwamish	Diagonal SD
Gull Industries, Inc.	3404 4th Ave S	Screening	8/14/2003	Duwamish	Diagonal SD
Haaland Associates	2326 Airport Wy S	Screening	5/28/2003	Duwamish	Diagonal SD
Hadco Supply	2500 Airport Wy S	Onsite	6/12/2003	Duwamish	Diagonal SD
Hair Salon	2603 S Mc Clellan St	Screening	10/22/2003	Duwamish	Diagonal SD

Appendix A: SPU/King County Business Inspections (2003-2006)

Facility	Address	Inspection Type	Date Inspected	Basin	Subbasin
Heath Northwest	1762 Airport Wy S	Onsite	6/12/2003	Duwamish	Diagonal SD
Hen Sen Herb Inc.	3013 Beacon Ave S	Screening	5/28/2003	Duwamish	Diagonal SD
Hien Van Nguyen Chiropractic Clinic	1200 S Jackson St, #22	Screening	3/18/2004	Duwamish	Diagonal SD
High Winds, Inc.	4202 6th Ave S, #A	Onsite	6/25/2003	Duwamish	Diagonal SD
High-Rise Cabinets Inc.	2755 Airport Wy S	Onsite	5/28/2003	Duwamish	Diagonal SD
Hollywood Lights	660 S Dakota St	Screening	6/5/2003	Duwamish	Diagonal SD
Hong Yi Gift Shop	807 Rainier Ave S	Screening	8/27/2003	Duwamish	Diagonal SD
Honolulu Freight Service	2326 Airport Wy S	Onsite	5/28/2003	Duwamish	Diagonal SD
Housing Management Services	3623 6th Ave S	Screening	6/18/2003	Duwamish	Diagonal SD
HQ Building Supply	1423 S Dearborn St	Onsite	9/5/2006	Duwamish	Diagonal SD
Hudson Bay Insulation	220 S Dawson St	Onsite	11/20/2003	Duwamish	Diagonal SD
IBEW Local No. 77	1432 S Jackson St	Screening	9/4/2003	Duwamish	Diagonal SD
Inkwell Printers	3651 E Marginal Wy S	Onsite	11/25/2003	Duwamish	Diagonal SD
Intermountain Supply, Inc.	3700 6th Ave S	Onsite	7/18/2003	Duwamish	Diagonal SD
International Truck Leasing & Rental	3801 7th Ave S	Onsite	5/27/2003	Duwamish	Diagonal SD
International Video	3207 Beacon Ave S	Screening	6/27/2003	Duwamish	Diagonal SD
INX International Ink	4029 1st Ave S	Onsite	3/21/2003	Duwamish	Diagonal SD
Iridio	5050 1st Ave S	Onsite	10/31/2003	Duwamish	Diagonal SD
Ishimitsu & Sons Inc.	2304 Rainier Ave S	Onsite	10/27/2003	Duwamish	Diagonal SD
Island Detail	308 14th Ave S	Onsite	9/4/2003	Duwamish	Diagonal SD
J.H. Carr & Sons	37 S Hudson St	Onsite	3/19/2003	Duwamish	Diagonal SD
J.R. Abbott Construction	3512 Airport Wy S	Onsite	8/11/2003	Duwamish	Diagonal SD
Jacks Inc.	24 S Idaho St	Onsite	3/20/2003	Duwamish	Diagonal SD
Jackson Motors, Inc.	401 Rainier Ave S	Onsite	7/29/2004	Duwamish	Diagonal SD
JAE Awards	1775 15th Ave S	Screening	10/13/2003	Duwamish	Diagonal SD
Jefferson Park Community Center	3801 Beacon Ave S	Onsite	8/7/2003	Duwamish	Diagonal SD
Jefferson Park Family Medicine	2902 Beacon Ave S	Onsite	10/30/2003	Duwamish	Diagonal SD
Jefferson Park Golf Course	4051 Beacon Ave S	Screening	5/1/2006	Duwamish	Diagonal SD
Jefferson Park Golf Course Clubhouse	4101 Beacon Ave S	Onsite	6/25/2003	Duwamish	Diagonal SD
Jefferson Park Golf Course Restaurant	4101 Beacon Ave S	Screening	7/16/2003	Duwamish	Diagonal SD
Jefferson Park Golf Maintenance Building	4101 Beacon Ave S	Onsite	7/16/2003	Duwamish	Diagonal SD
Jefferson Park Horticulture	4101 Beacon Ave S	Screening	5/1/2006	Duwamish	Diagonal SD
JEMCO, Inc.	901 S Hinds St	Onsite	8/11/2003	Duwamish	Diagonal SD
John Perine Co.	820 S Adams St	Onsite	5/28/2003	Duwamish	Diagonal SD
JSH Properties Inc.	2601 S Mc Clellan St	Onsite	10/22/2003	Duwamish	Diagonal SD

Appendix A: SPU/King County Business Inspections (2003-2006)

Facility	Address	Inspection Type	Date Inspected	Basin	Subbasin
Kawabe Memorial House	221 18th Ave S	Onsite	9/24/2003	Duwamish	Diagonal SD
KDL Hardware Supply	850 Poplar Ave S	Onsite	8/12/2003	Duwamish	Diagonal SD
Kellan's Motor Works	1501 S Dearborn St	Onsite	8/27/2003	Duwamish	Diagonal SD
Kevin Tran's Tailoring	2520 Beacon Ave S	Screening	10/9/2003	Duwamish	Diagonal SD
Key Bank	4323 7th Ave S	Screening	5/20/2003	Duwamish	Diagonal SD
KFC	2822 Rainier Ave S	Onsite	10/10/2003	Duwamish	Diagonal SD
King County Records and Elections	3901 1st Ave S	Screening	9/28/2003	Duwamish	Diagonal SD
King County Sheriff	4623 7th Ave S	Onsite	5/19/2003	Duwamish	Diagonal SD
King Way Food Mart	804 Martin Luther King Jr Wy S	Screening	8/27/2003	Duwamish	Diagonal SD
King's BBQ House	2710 Beacon Ave S	Screening	10/20/2003	Duwamish	Diagonal SD
King's Oriental Foods Co. Ltd	1238 S Weller St	Onsite	11/4/2003	Duwamish	Diagonal SD
KP Corporation	2001 22nd Ave S	Screening	11/14/2003	Duwamish	Diagonal SD
Krispy Kreme Doughnuts	2822 S Mc Clellan St	Onsite	10/10/2003	Duwamish	Diagonal SD
Kumon Math & Reading Service	2531 16th Ave S	Screening	10/9/2003	Duwamish	Diagonal SD
Kusak Cut Glass Works, Inc.	1911 22nd Ave S	Screening	10/14/2003	Duwamish	Diagonal SD
Kustom Foods	651 S Industrial Wy	Onsite	5/30/2003	Duwamish	Diagonal SD
L.N. Curtis & Sons	629 S Industrial Wy	Onsite	6/4/2003	Duwamish	Diagonal SD
La Bodeguita	2528 Beacon Ave S, #A	Screening	10/9/2003	Duwamish	Diagonal SD
La Cabana Restaurant	2532 Beacon Ave S	Screening	10/9/2003	Duwamish	Diagonal SD
La Spaziale	2418 Airport Wy S, #B5	Screening	5/21/2003	Duwamish	Diagonal SD
Lacy & Par	660 S Industrial Wy	Onsite	6/18/2003	Duwamish	Diagonal SD
Laird Plastics	650 S Industrial Wy	Onsite	6/19/2003	Duwamish	Diagonal SD
Lam Seafood	1221 S King St	Onsite	9/11/2003	Duwamish	Diagonal SD
Landreth Studios	2020 Airport Wy S	Screening	6/12/2003	Duwamish	Diagonal SD
Langston Hughes Performing Arts Center	104 17th Ave S	Screening	10/15/2003	Duwamish	Diagonal SD
LC Jergens Painting Co.	417 18th Ave S	Onsite	9/24/2003	Duwamish	Diagonal SD
Leduc Packaging, Inc.	4424 4th Ave S	Screening	10/8/2003	Duwamish	Diagonal SD
Lee & Eastes Tank Lines	2418 Airport Wy S	Onsite	5/21/2003	Duwamish	Diagonal SD
Lee & Eastes Tank Lines	2418 Airport Wy S	Onsite	6/2/2006	Duwamish	Diagonal SD
Lee Sang H & You K	3002 Beacon Ave S	Onsite	5/23/2003	Duwamish	Diagonal SD
Lee's Hair Salon	2356 15th Ave S, #103	Screening	10/9/2003	Duwamish	Diagonal SD
Liberty Sidecars	2310 Rainier Ave S	Onsite	10/9/2003	Duwamish	Diagonal SD
Life Style Landscape	4101 4th Ave S	Onsite	10/22/2003	Duwamish	Diagonal SD
Linh Beauty Salon	808 Rainier Ave S	Onsite	9/4/2003	Duwamish	Diagonal SD
Liquor Control Board	4401 E Marginal Wy S	Onsite	9/29/2003	Duwamish	Diagonal SD

Appendix A: SPU/King County Business Inspections (2003-2006)

Facility	Address	Inspection Type	Date Inspected	Basin	Subbasin
Loudeye	1130 Rainier Ave S	Onsite	8/6/2003	Duwamish	Diagonal SD
Lowe's Home Improvement Warehouse	2700 Rainier Ave S	Onsite	10/14/2003	Duwamish	Diagonal SD
Lucky 1 International Trading Inc.	2105 S Grand St	Screening	10/22/2003	Duwamish	Diagonal SD
Lucky Money	2528 Beacon Ave S, #B	Screening	10/9/2003	Duwamish	Diagonal SD
Lucky Seafood	3217 Beacon Ave S	Screening	6/27/2003	Duwamish	Diagonal SD
Lyn Hair Salon	1042 S Jackson St	Screening	3/18/2004	Duwamish	Diagonal SD
M&R Equipment, Inc.	3626 Airport Wy S	Onsite	7/15/2003	Duwamish	Diagonal SD
MacDonald Meat Company, LLC	2709 Airport Wy S	Onsite	6/12/2003	Duwamish	Diagonal SD
Machenrys Provisioners Llc	3922 6th Ave S, #B	Screening	8/20/2003	Duwamish	Diagonal SD
MacMillan Piper Inc.	655 S Edmunds St	Onsite	6/4/2003	Duwamish	Diagonal SD
Magic Dragon Chinese	306 23rd Ave S, #102	Screening	9/12/2003	Duwamish	Diagonal SD
Mail Movers	4500 4th Ave S	Onsite	3/19/2003	Duwamish	Diagonal SD
Mailhandlers	4005 6th Ave S	Onsite	8/14/2003	Duwamish	Diagonal SD
Maland Communications	2400 Airport Wy S, #100	Screening	5/21/2003	Duwamish	Diagonal SD
Mallory & Church	633 S Snoqualmie St	Onsite	5/20/2003	Duwamish	Diagonal SD
Mallory Church Corp.	676 S Industrial Wy	Onsite	6/4/2003	Duwamish	Diagonal SD
Mandarin Apartments	1701 12th Ave S	Onsite	6/10/2003	Duwamish	Diagonal SD
Manila Video	3019 Beacon Ave S	Screening	5/28/2003	Duwamish	Diagonal SD
Manson Construction	5209 E Marginal Wy S	Onsite	11/20/2003	Duwamish	Diagonal SD
Mar Properties	1225 S Weller St	Onsite	8/18/2003	Duwamish	Diagonal SD
Masons Supply Co.	5004 2nd Ave S	Onsite	3/19/2003	Duwamish	Diagonal SD
Maurer Supply	843 Rainier Ave S	Onsite	8/11/2003	Duwamish	Diagonal SD
McDonald's #435	2336 25th Ave S	Onsite	10/30/2003	Duwamish	Diagonal SD
McKinstry Company	5005 3rd Ave S	Onsite	3/28/2003	Duwamish	Diagonal SD
MDE Engineers, Inc.	700 S Industrial Wy	Onsite	7/9/2003	Duwamish	Diagonal SD
Medgar Evers Pool/Seattle Parks and Recreation	500 23rd Ave	Onsite	11/4/2003	Duwamish	Diagonal SD
Merlino & Associates Inc.	5200 Denver Ave S	Onsite	5/29/2003	Duwamish	Diagonal SD
Mi La Cay	718 Rainier Ave S	Onsite	8/29/2003	Duwamish	Diagonal SD
Mi So 1	1400 S Jackson St	Onsite	9/16/2003	Duwamish	Diagonal SD
Milton Lew Insurance Agency	2356 15th Ave S	Screening	10/9/2003	Duwamish	Diagonal SD
Mobile Equipment Systems	2120 Airport Wy S	Onsite	5/28/2003	Duwamish	Diagonal SD
MochaLand Espresso	2400 Airport Wy S	Screening	5/21/2003	Duwamish	Diagonal SD
Modelwerks	655 S Andover	Onsite	5/21/2003	Duwamish	Diagonal SD
Modine Aftermarket Holdings, Inc.	115 S Dawson St	Onsite	12/8/2003	Duwamish	Diagonal SD
Motorsports Ltd.	920 S Bayview St	Screening	5/21/2003	Duwamish	Diagonal SD

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Facility	Address	Inspection Type	Date Inspected	Basin	Subbasin
Mount Baker Cleaners	2864 S Mc Clellan St	Onsite	10/30/2003	Duwamish	Diagonal SD
Mr. Detail	401 Rainier Ave S	Onsite	7/29/2004	Duwamish	Diagonal SD
Mutual Fish Co.	2335 Rainier Ave S	Onsite	10/23/2003	Duwamish	Diagonal SD
My Favorite Deli	4005 Airport Wy S	Screening	5/15/2003	Duwamish	Diagonal SD
National Food Processors Association	1600 S Jackson St	Onsite	9/24/2003	Duwamish	Diagonal SD
NetVersant	3849 1st Ave S	Onsite	12/11/2003	Duwamish	Diagonal SD
New City Theater	2110 Airport Wy S	Screening	6/24/2003	Duwamish	Diagonal SD
Ngoc Viet Jewelry	1236 S Jackson St, #B	Onsite	9/16/2003	Duwamish	Diagonal SD
Nguyen Chiropractic	502 Rainier Ave S	Screening	8/28/2003	Duwamish	Diagonal SD
Nicholson Machine & Technology Co.	3670 E Marginal Wy S	Onsite	11/21/2003	Duwamish	Diagonal SD
Night Star Beauty	1901 Tokul Ave S	Screening	10/14/2003	Duwamish	Diagonal SD
Noble Wines	818 S Dakota St	Screening	5/20/2003	Duwamish	Diagonal SD
NorStar Specialty Foods Inc.	3901 7th Ave S, #100	Onsite	5/27/2003	Duwamish	Diagonal SD
North Star Casteel	3901 9th Ave S	Onsite	5/22/2003	Duwamish	Diagonal SD
North Star Casteel	3901 9th Ave S	Onsite	5/5/2004	Duwamish	Diagonal SD
Northcoast Refrigeration	5021 Colorado Ave S	Onsite	12/2/2003	Duwamish	Diagonal SD
Northwave	5000 1st Ave S	Onsite	10/30/2003	Duwamish	Diagonal SD
Northwest DyeWorks	4505 Airport Wy S	Onsite	6/4/2003	Duwamish	Diagonal SD
Northwest Manufacturing & Supply Inc.	4045 7th Ave S	Screening	7/17/2003	Duwamish	Diagonal SD
Northwest Publishing Center	1710 S Norman St	Onsite	9/4/2003	Duwamish	Diagonal SD
Northwest Pump & Equipment	601 S Snoqualmie St	Onsite	5/20/2003	Duwamish	Diagonal SD
NW Container Services Inc.	635 S Edmunds St	Onsite	6/25/2003	Duwamish	Diagonal SD
NW Office Furniture Recycle Inc.	3841 1st Ave S	Onsite	10/15/2003	Duwamish	Diagonal SD
Oberto Sausage Company	2000 Airport Wy S	Onsite	6/24/2003	Duwamish	Diagonal SD
Oberto Sausage Company	1715 Rainier Ave S	Screening	10/21/2003	Duwamish	Diagonal SD
Olympic Foundry	5200 Airport Wy S	Onsite	8/2/2006	Duwamish	Diagonal SD
Ontario Hotel	4003 Airport Wy S	Screening	5/15/2003	Duwamish	Diagonal SD
Operation Nightwatch	302 14th Ave S	Onsite	11/14/2003	Duwamish	Diagonal SD
Opportunities Industrialization Center of WA	2611 S Dearborn St	Onsite	8/26/2003	Duwamish	Diagonal SD
Oriental Meats	2001 21st Ave S	Screening	11/14/2003	Duwamish	Diagonal SD
Outrageous Sports	4130 1st Ave S	Screening	10/28/2003	Duwamish	Diagonal SD
Oversea Casing Company	601 S Nevada	Onsite	6/23/2003	Duwamish	Diagonal SD
Owl Transfer & Storage Co., Inc.	3623 6th Ave S	Onsite	6/18/2003	Duwamish	Diagonal SD
Pacer Global Logistics	655 S Edmunds St	Onsite	6/3/2003	Duwamish	Diagonal SD
Pacer Stacktrain	4750 Denver Ave S	Screening	3/26/2003	Duwamish	Diagonal SD

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Facility	Address	Inspection Type	Date Inspected	Basin	Subbasin
Pacific Coastal Sales, Inc.	4020 Airport Wy S	Screening	7/17/2003	Duwamish	Diagonal SD
Pacific Fish & Chips	3019 Martin Luther King Jr Wy S	Onsite	10/14/2003	Duwamish	Diagonal SD
Pacific Industrial Supply	3200 4th Ave S	Onsite	5/16/2003	Duwamish	Diagonal SD
Pacific Industrial Supply	2960 4th Ave S	Onsite	5/16/2003	Duwamish	Diagonal SD
Pacific Northwest Orthodontics	2815 S Mc Clellan St	Onsite	2/11/2004	Duwamish	Diagonal SD
Pacific Northwest Theatre Associates, Inc.	615 S Alaska St	Onsite	5/20/2003	Duwamish	Diagonal SD
Pacific Publishing Co.	636 S Alaska St	Onsite	5/19/2003	Duwamish	Diagonal SD
Pacific Rim Import Co.	600 S Brandon St	Screening	6/2/2003	Duwamish	Diagonal SD
PacMed Clinics	1200 12th Ave S	Onsite	10/30/2003	Duwamish	Diagonal SD
Papa Murphy's	306 23rd Ave SE, #101	Screening	9/12/2003	Duwamish	Diagonal SD
Papa Teriyaki	2200 S Jackson St	Screening	9/16/2003	Duwamish	Diagonal SD
Paradise Studio	2607 S Mc Clellan St	Onsite	10/22/2003	Duwamish	Diagonal SD
Paratex	423 S Horton St	Screening	5/28/2003	Duwamish	Diagonal SD
Parnely Mini Mart	722 23rd Ave S	Screening	8/26/2003	Duwamish	Diagonal SD
Payless Shoe Source	2326 Rainier Ave S	Onsite	10/9/2003	Duwamish	Diagonal SD
Pedersen's	4604 4th Ave S	Onsite	10/8/2003	Duwamish	Diagonal SD
People of Color Against Aids Network	2200 Rainier Ave S	Screening	10/9/2003	Duwamish	Diagonal SD
Pete's Small Engine Repair	4553 11th Ave S	Onsite	5/14/2003	Duwamish	Diagonal SD
Pham Nien	1314 S Jackson St	Onsite	9/17/2003	Duwamish	Diagonal SD
Pham Nien	1240 S Jackson St	Onsite	9/17/2003	Duwamish	Diagonal SD
Phelps Tire	3922 7th Ave S	Onsite	8/28/2003	Duwamish	Diagonal SD
Phelps Tire	2520 Airport Wy S	Onsite	5/19/2003	Duwamish	Diagonal SD
Phelps Tire	2520 Airport Wy S	Onsite	5/10/2006	Duwamish	Diagonal SD
Phelps Tire	3922 7th Ave S	Onsite	5/24/2006	Duwamish	Diagonal SD
Philippine Remittance Services	2544 Beacon Ave S	Screening	10/9/2003	Duwamish	Diagonal SD
Pho Nuong	2826 Martin Luther King Jr Wy S	Onsite	11/12/2003	Duwamish	Diagonal SD
Pho-Banh Mi Sai Gon	810 Rainier Ave S	Screening	9/4/2003	Duwamish	Diagonal SD
Pierre Espresso Repair	2418 Airport Wy S, #B5	Screening	5/21/2003	Duwamish	Diagonal SD
Pizza Hut	2601 S Mc Clellan St	Onsite	10/22/2003	Duwamish	Diagonal SD
Plantscapes Horticultural Services	1127 Poplar Pl S	Onsite	8/26/2003	Duwamish	Diagonal SD
Plastics for Lighting, Inc.	4069 1st Ave S	Onsite	4/2/2003	Duwamish	Diagonal SD
Plymouth Poultry	4500 7th Ave S	Onsite	6/4/2003	Duwamish	Diagonal SD
Power Distributing, Inc.	4813 Airport Wy S	Screening	5/22/2003	Duwamish	Diagonal SD
Presbytery of Seattle	1625 S Columbia Wy	Onsite	5/19/2003	Duwamish	Diagonal SD
Priya's Auto Center	2705 S Winthrop St	Onsite	5/30/2006	Duwamish	Diagonal SD

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Facility	Address	Inspection Type	Date Inspected	Basin	Subbasin
Pro Express Inc.	4800 Denver Ave S	Onsite	3/18/2003	Duwamish	Diagonal SD
Professional Marketing Group	912 Rainier Ave S	Onsite	8/6/2003	Duwamish	Diagonal SD
Promenade 23 Associates	306 23rd Ave S	Onsite	8/8/2003	Duwamish	Diagonal SD
Promenade 23 Shopping Center	2301 S Jackson St, #101A	Onsite	8/27/2003	Duwamish	Diagonal SD
Promenade Red Apple Market	2301 S Jackson St	Onsite	8/27/2003	Duwamish	Diagonal SD
Puget Sound Blood Center	924 Poplar Pl S	Onsite	9/3/2003	Duwamish	Diagonal SD
Puget Sound Dispatch	74 S Hudson St	Screening	11/24/2003	Duwamish	Diagonal SD
Puget Sound Industry Services	4429 Airport Wy S	Onsite	7/23/2003	Duwamish	Diagonal SD
Puget Sound Industry Services	4429 Airport Wy S	Onsite	11/22/2005	Duwamish	Diagonal SD
Puget Sound Truck Lines, Inc.	3720 Airport Wy S	Onsite	7/15/2003	Duwamish	Diagonal SD
R&K Foods, Inc.	1440 S Jackson St	Onsite	9/10/2003	Duwamish	Diagonal SD
R&R Vending & Coffee Service	628 S Brandon St	Screening	5/21/2003	Duwamish	Diagonal SD
Rainier Commons LLC / Tullys	3100 Airport Wy S	Onsite	10/12/2005	Duwamish	Diagonal SD
Rainier Corner Deli & Teriyaki	1265 14th Ave S, #102	Screening	9/4/2003	Duwamish	Diagonal SD
Rainier Grocery Outlet	2901 27th Ave S, #C	Onsite	10/27/2003	Duwamish	Diagonal SD
Rainier Occupational Medical Center	1400 S Jackson St	Onsite	9/9/2003	Duwamish	Diagonal SD
Rainier Pacific	1600 S Lane St	Screening	8/29/2003	Duwamish	Diagonal SD
Rainier Veterinary Hospital	815 Rainier Ave S	Onsite	8/27/2003	Duwamish	Diagonal SD
Ralph's Concrete Pumping	1511 Rainier Ave S	Onsite	12/12/2003	Duwamish	Diagonal SD
Ralph's Concrete Pumping	816 Poplar Pl S	Onsite	8/12/2003	Duwamish	Diagonal SD
Recycling Depot	851 Rainier Ave S	Onsite	8/14/2003	Duwamish	Diagonal SD
Refrigeration Supplies Distributor Total Control	625 S Industrial Wy	Onsite	5/30/2003	Duwamish	Diagonal SD
Reliance Fire Protection	3706 Airport Wy S	Onsite	7/30/2003	Duwamish	Diagonal SD
Remo Borracchini's	2307 Rainier Ave S	Onsite	10/23/2003	Duwamish	Diagonal SD
Renaissance	5212 6th Ave S	Onsite	5/15/2003	Duwamish	Diagonal SD
Rent-A-Center	2301 S Jackson St, #202	Onsite	8/5/2003	Duwamish	Diagonal SD
Rever Salon Inc.	3005 Beacon Ave S	Screening	5/28/2003	Duwamish	Diagonal SD
Rite Aid of Washington Inc	2707 Rainier Ave S	Onsite	10/20/2003	Duwamish	Diagonal SD
Robin's Hair Salon or Philippine Video Plaza	2544 Beacon Ave S	Screening	10/9/2003	Duwamish	Diagonal SD
Rodda Paint	3838 4th Ave S	Onsite	3/20/2003	Duwamish	Diagonal SD
Romio's Pizza & Seattle Pizza Dough Co.	4101 Airport Wy S	Onsite	6/4/2003	Duwamish	Diagonal SD
Royal Glass Co., Inc.	1216 S Weller St	Onsite	8/19/2003	Duwamish	Diagonal SD
RREEF	3849 1st Ave S	Onsite	5/8/2003	Duwamish	Diagonal SD
RS Auto Rebuild	1265 S King St	Onsite	9/11/2003	Duwamish	Diagonal SD
Rust Pattern & Woodworking, Inc.	812 S Adams St	Onsite	6/11/2003	Duwamish	Diagonal SD

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Facility	Address	Inspection Type	Date Inspected	Basin	Subbasin
Safeco	306 23rd Ave S, #200	Screening	8/8/2003	Duwamish	Diagonal SD
Safelite Glass Corp.	665 S Dakota St	Onsite	6/23/2003	Duwamish	Diagonal SD
Saigon Billiard	2205 Rainier Ave S	Screening	10/23/2003	Duwamish	Diagonal SD
Salon Lulize	1265 S Main St, #108	Onsite	9/16/2003	Duwamish	Diagonal SD
Saltaire Construction	1132 Poplar Pl S	Screening	8/6/2003	Duwamish	Diagonal SD
Sanderson Safety Supply	2600 Airport Wy S	Onsite	5/19/2003	Duwamish	Diagonal SD
Sanft & Sanft	4716 Airport Wy S	Onsite	6/3/2003	Duwamish	Diagonal SD
Sanft & Sanft	4716 Airport Wy S	Onsite	8/2/2006	Duwamish	Diagonal SD
Schuck's Auto Supply	2805 Rainier Ave S	Onsite	10/27/2003	Duwamish	Diagonal SD
Scientific Supply & Equipment, Inc.	926 Poplar Pl S	Onsite	8/7/2003	Duwamish	Diagonal SD
Sealant Specialists	4621 Airport Wy S	Onsite	5/20/2003	Duwamish	Diagonal SD
Sears Service Center	4786 1st Ave S	Onsite	3/21/2003	Duwamish	Diagonal SD
Seattle Barrel Company	4520 7th Ave S	Onsite	6/30/2003	Duwamish	Diagonal SD
Seattle Central Community College - Wood Technolo	2310 S Lane St	Onsite	10/27/2003	Duwamish	Diagonal SD
Seattle City Light	3613 4th Ave S	Onsite	5/7/2003	Duwamish	Diagonal SD
Seattle Credit Union	2030 Airport Wy S	Onsite	7/10/2003	Duwamish	Diagonal SD
Seattle DOT - Sunny Jim	4200 Airport Wy S	Onsite	5/30/2003	Duwamish	Diagonal SD
Seattle Fire Department	3601 Beacon Ave S	Onsite	7/16/2003	Duwamish	Diagonal SD
Seattle Goodwill	1400 S Lane St	Onsite	8/15/2003	Duwamish	Diagonal SD
Seattle Housing Authority - MLK Household Facility C	810 Martin Luther King Jr Wy S	Onsite	9/9/2003	Duwamish	Diagonal SD
Seattle Indian Health Board	606 12th Ave S	Screening	8/15/2003	Duwamish	Diagonal SD
Seattle Injector Company	1410 Airport Wy S	Onsite	6/16/2003	Duwamish	Diagonal SD
Seattle Keiro	1601 E Yesler Wy	Onsite	10/29/2003	Duwamish	Diagonal SD
Seattle Lighthouse-The Lighthouse for the Blind, Inc.	2501 S Plum St	Onsite	10/24/2003	Duwamish	Diagonal SD
Seattle Lighting Fixture Co. - Distribution Center	3800 1st Ave S	Onsite	3/20/2003	Duwamish	Diagonal SD
Seattle Parks - Citywide Horticulture Center	1600 S Dakota St	Onsite	6/30/2003	Duwamish	Diagonal SD
Seattle Public Utilities - Paint Shop	3641 2nd Ave S	Onsite	3/14/2003	Duwamish	Diagonal SD
Seattle Self Storage	1100 Poplar Pl S	Onsite	8/7/2003	Duwamish	Diagonal SD
Seattle's Central Bark	838 S Poplar Pl	Onsite	8/11/2003	Duwamish	Diagonal SD
Senior Services - Minor Home Repair	620 S Spokane St	Onsite	8/21/2003	Duwamish	Diagonal SD
Service Welding and Machine	1435 SE Jackson St	Screening	9/22/2003	Duwamish	Diagonal SD
Sharp's Automotive, Inc.	2102 Airport Wy S	Onsite	6/5/2003	Duwamish	Diagonal SD
Shell	852 Rainier Ave S	Onsite	9/5/2003	Duwamish	Diagonal SD
Signsmith	2108 Airport Wy S	Onsite	6/25/2003	Duwamish	Diagonal SD
Sinh Sinh Dong Medicare	200 12th Ave S	Screening	4/7/2004	Duwamish	Diagonal SD

Appendix A: SPU/King County Business Inspections (2003-2006)

Facility	Address	Inspection Type	Date Inspected	Basin	Subbasin
Skanska USA Building Inc.	900 Poplar Pl S	Screening	8/7/2003	Duwamish	Diagonal SD
Skyline Electric & MFG. Company	3619 7th Ave S	Onsite	12/1/2003	Duwamish	Diagonal SD
Skyline Pacific Northwest	3605 Airport Wy S	Onsite	6/4/2003	Duwamish	Diagonal SD
SME Electrical Contractors	828 S Poplar Pl	Onsite	8/11/2003	Duwamish	Diagonal SD
Snopac Products Inc.	5053 E Marginal Wy S	Onsite	11/17/2003	Duwamish	Diagonal SD
Snorkel Stove Company	4216 6th Ave S	Onsite	6/23/2003	Duwamish	Diagonal SD
Soleil Hair Studio	3067 Beacon Ave S	Screening	5/28/2003	Duwamish	Diagonal SD
South China Restaurant	2714 Beacon Ave S	Screening	10/20/2003	Duwamish	Diagonal SD
Spicers Paper	4811 Airport Wy S	Screening	5/29/2003	Duwamish	Diagonal SD
Sprague Company	1136 Poplar Pl S	Onsite	8/27/2003	Duwamish	Diagonal SD
St. Edward Parish	4250 S Mead St	Onsite	2/19/2004	Duwamish	Diagonal SD
St. Vincent de Paul #8	2825 Rainier Ave S	Onsite	10/22/2003	Duwamish	Diagonal SD
Stan's Hamburgers	828 Rainier Ave S	Onsite	9/3/2003	Duwamish	Diagonal SD
Starbucks Coffee Company	2300 S Jackson St	Screening	9/12/2003	Duwamish	Diagonal SD
Starbucks Coffee Company	2921 Martin Luther King Jr Wy	Onsite	10/13/2003	Duwamish	Diagonal SD
Starving Students	620 Spokane St	Screening	8/11/2003	Duwamish	Diagonal SD
Stewart Industries	16 S Idaho St	Onsite	3/26/2003	Duwamish	Diagonal SD
Stewart Lumber Co.	1761 Rainier Ave S	Onsite	12/23/2003	Duwamish	Diagonal SD
Stone Fly Design	4660 E Marginal Wy S	Onsite	3/19/2003	Duwamish	Diagonal SD
Stove Depot USA	3429 Airport Wy S	Screening	8/18/2003	Duwamish	Diagonal SD
Stusser Electric Co.	660 S Andover St	Onsite	7/2/2003	Duwamish	Diagonal SD
Subway	2338 Rainier Ave S	Screening	10/9/2003	Duwamish	Diagonal SD
Summit Radiology	861 Poplar Pl S	Onsite	8/20/2003	Duwamish	Diagonal SD
Sun Deli Mart	2701 Airport Wy S	Onsite	6/12/2003	Duwamish	Diagonal SD
Sun Food Trading Co.	4715 6th Ave S	Onsite	5/19/2003	Duwamish	Diagonal SD
Sun Luck	4601 6th Ave S	Onsite	7/14/2003	Duwamish	Diagonal SD
Sun Sun Oriental Food Co.	1328 S Weller St	Onsite	8/19/2003	Duwamish	Diagonal SD
Sysco	654 S Industrial Wy	Screening	6/18/2003	Duwamish	Diagonal SD
Tachyon Technology Corp.	4101 1st Ave S	Onsite	9/29/2003	Duwamish	Diagonal SD
Taco Time	2212 Rainier Ave S	Onsite	10/9/2003	Duwamish	Diagonal SD
Takisaki Inc.	1312 S Weller St	Onsite	8/13/2003	Duwamish	Diagonal SD
Taqueria Los Primos	3002 Beacon Ave S	Onsite	10/21/2003	Duwamish	Diagonal SD
TCP Painting	1900 Airport Wy S	Onsite	4/21/2004	Duwamish	Diagonal SD
Teriaki Plus	4001 Airport Wy S	Screening	5/15/2003	Duwamish	Diagonal SD
Teshome Tedros	1622 Yesler Wy	Onsite	9/24/2003	Duwamish	Diagonal SD

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Facility	Address	Inspection Type	Date Inspected	Basin	Subbasin
Thai Hung Auto Repair	509 Rainier Ave S	Onsite	11/4/2003	Duwamish	Diagonal SD
The Amaranth Inn	1451 S Main St	Screening	9/24/2003	Duwamish	Diagonal SD
The Anywear Shoe Co., Inc.	14 S Idaho St	Onsite	3/26/2003	Duwamish	Diagonal SD
The Beacon Pub	3057 Beacon Ave S	Screening	5/28/2003	Duwamish	Diagonal SD
The Bentley Co.	4109 Airport Wy S	Onsite	6/4/2003	Duwamish	Diagonal SD
The Boiler Room	3828 4th Ave S	Onsite	3/31/2003	Duwamish	Diagonal SD
The Chop House	2552 Beacon Ave S	Screening	10/14/2003	Duwamish	Diagonal SD
The Color Group	1407 S Dearborn St	Onsite	8/14/2003	Duwamish	Diagonal SD
The Corporate Image	4001 1st Ave S	Onsite	9/29/2003	Duwamish	Diagonal SD
The Original Philly's	3019 Martin Luther King Jr Wy S	Onsite	3/16/2006	Duwamish	Diagonal SD
The Painters, Inc.	4501 Airport Wy S	Onsite	6/4/2003	Duwamish	Diagonal SD
The Pepsi Bottling Group	5300 Denver Ave S	Onsite	5/22/2003	Duwamish	Diagonal SD
The Pepsi Bottling Group	2300 26th Ave S	Onsite	10/21/2003	Duwamish	Diagonal SD
The Pepsi Bottling Group	2300 26th Ave S	Onsite	1/23/2005	Duwamish	Diagonal SD
The Seattle Indian Services Commission	606 12th Ave S	Onsite	8/15/2003	Duwamish	Diagonal SD
Total Reclaim	4400 4th Ave S	Onsite	3/26/2003	Duwamish	Diagonal SD
Trade-Marx Sign & Display Corp.	3614 6th Ave S	Onsite	7/30/2003	Duwamish	Diagonal SD
Trig Electric Service, Inc.	1121 Rainier Ave S	Onsite	8/27/2003	Duwamish	Diagonal SD
Triple B. Corp. Co.	3844 1st Ave S, #B	Onsite	3/14/2003	Duwamish	Diagonal SD
Triple B. Corp. Co.	4103 2nd Ave S	Onsite	3/14/2003	Duwamish	Diagonal SD
Triple B. Corp. Co.	4103 2nd Ave S	Onsite	10/7/2004	Duwamish	Diagonal SD
Triple B. Corp. Co.	3844 1st Ave S, #B	Onsite	12/1/2005	Duwamish	Diagonal SD
Triple B. Corp. Co.	4103 2nd Ave S	Onsite	12/12/2005	Duwamish	Diagonal SD
Triple F Granite and Marble	4660 E Marginal Wy S, #16	Onsite	4/2/2003	Duwamish	Diagonal SD
Truescents LLC	550 S Brandon St	Screening	5/21/2003	Duwamish	Diagonal SD
Tru-Line Frame & Wheel	312 Boren Ave S	Onsite	9/4/2003	Duwamish	Diagonal SD
Tully's Coffee	3100 Airport Wy S	Onsite	6/15/2003	Duwamish	Diagonal SD
Union Pacific Railroad	402 S Dawson St	Onsite	6/19/2003	Duwamish	Diagonal SD
Unique Art Framing	3429 Airport Wy S	Onsite	8/5/2003	Duwamish	Diagonal SD
Unique Sign & Design	700 Rainier Ave S	Onsite	8/29/2003	Duwamish	Diagonal SD
United Ocean Seafood Inc.	2209 Rainier Ave S	Onsite	11/5/2003	Duwamish	Diagonal SD
United Parcel Service	4329 7th Ave S	Onsite	5/28/2003	Duwamish	Diagonal SD
United Parcel Service	4455 7th Ave S	Onsite	5/28/2003	Duwamish	Diagonal SD
United Parcel Service	4455 7th Ave S	Onsite	7/31/2006	Duwamish	Diagonal SD
United Parts Corporation	4126 Airport Wy S	Onsite	6/18/2003	Duwamish	Diagonal SD

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Facility	Address	Inspection Type	Date Inspected	Basin	Subbasin
United States Bakery, Inc.	2006 S Weller St	Onsite	8/26/2003	Duwamish	Diagonal SD
Universal Cuts	3019 Martin Luther King Jr Wy S	Onsite	6/15/2006	Duwamish	Diagonal SD
Universal Nonlinear Design	3828 4th Ave S	Screening	9/4/2003	Duwamish	Diagonal SD
Upgrade Auto Service	520 12th Ave S	Onsite	8/15/2003	Duwamish	Diagonal SD
US Bank	2910 Rainier Ave S	Screening	10/9/2003	Duwamish	Diagonal SD
US Club House Home & Garden	3810 Airport Wy S	Onsite	8/28/2003	Duwamish	Diagonal SD
US Filter	1910 21st Ave S	Screening	10/10/2003	Duwamish	Diagonal SD
Utility Inc.	3931 1st Ave S	Screening	9/29/2003	Duwamish	Diagonal SD
Utility Inc.	3931 1st Ave S	Onsite	9/8/2004	Duwamish	Diagonal SD
Utility, Inc.	4100 1st Ave S	Screening	9/29/2003	Duwamish	Diagonal SD
Uwajimaya	4601 6th Ave S	Onsite	7/14/2003	Duwamish	Diagonal SD
Valley Gear & Transmission, Inc.	1543 Rainier Ave S	Onsite	10/29/2003	Duwamish	Diagonal SD
Verity Credit Union	1660 S Columbia Wy, #35	Screening	5/19/2003	Duwamish	Diagonal SD
Veterans Administration Medical Center	1660 S Columbia Wy	Onsite	6/16/2003	Duwamish	Diagonal SD
Vieng Thong	2820 Martin Luther King Jr Wy S	Screening	11/12/2003	Duwamish	Diagonal SD
Vietnam's Pearl	708 Rainier Ave S	Onsite	8/28/2003	Duwamish	Diagonal SD
Votivo, Ltd.	3450 4th Ave S	Onsite	8/14/2003	Duwamish	Diagonal SD
Vu's Automotive	2800 Martin Luther King Jr Wy S	Onsite	10/14/2003	Duwamish	Diagonal SD
W.W. Grainger, Inc.	4930 3rd Ave	Onsite	4/17/2003	Duwamish	Diagonal SD
Washington Belt & Drive Systems	4201 Airport Wy S	Onsite	6/16/2003	Duwamish	Diagonal SD
Washington Middle School	2101 S Jackson St	Onsite	9/4/2003	Duwamish	Diagonal SD
Washington State Department of Corrections	851 Poplar Pl S	Screening	8/21/2003	Duwamish	Diagonal SD
Washington State Department of Transportation - Gas	3700 9th Ave S	Onsite	12/4/2003	Duwamish	Diagonal SD
Washington State Department of Transportation - Sig	3700 9th Ave S	Onsite	12/4/2003	Duwamish	Diagonal SD
WatchGuard Technologies, Inc.	4321 7th Ave S	Screening	6/23/2003	Duwamish	Diagonal SD
Watermark Press	1407 S Dearborn St	Onsite	8/14/2003	Duwamish	Diagonal SD
Wendy's	2543 Rainier Ave S	Onsite	6/17/2004	Duwamish	Diagonal SD
West Coast Printing	622 Rainier Ave S	Onsite	8/28/2003	Duwamish	Diagonal SD
West Coast Trucking	3433 Airport Wy S	Screening	7/28/2003	Duwamish	Diagonal SD
Western Fleet Supply	620 S Dakota St	Screening	6/5/2003	Duwamish	Diagonal SD
Western Peterbilt Inc.	3801 Airport Wy S	Onsite	7/17/2003	Duwamish	Diagonal SD
Western Washington Beverage	4201 6th Ave S	Onsite	6/10/2003	Duwamish	Diagonal SD
Westfire Coastal, Inc.	3710 Airport Wy S	Screening	7/15/2003	Duwamish	Diagonal SD
WGM Jeweler Company	301 23rd Ave S	Onsite	9/16/2003	Duwamish	Diagonal SD
Widget Works	3834 4th Ave SE	Onsite	4/5/2004	Duwamish	Diagonal SD

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Facility	Address	Inspection Type	Date Inspected	Basin	Subbasin
Wilcor Grounding Systems	4045 7th Ave S	Onsite	5/21/2003	Duwamish	Diagonal SD
Wright Runstad & Company	1200 12th Ave S	Screening	10/30/2003	Duwamish	Diagonal SD
D&J Equipment Sales	3413 4th Ave S	Onsite	9/16/2005	Duwamish	Duwamish (NEC) CSO
Rainier Billiards	5101 Rainier Ave S	Screening	1/21/2004	Duwamish	Duwamish (NEC) CSO
T & T Truck and Trailer Repair	5300 1st Ave S	Onsite	6/10/2005	Duwamish	Duwamish (NEC) CSO
Ahmed Syed	720 S Orchard St	Onsite	11/14/2005	Duwamish	Duwamish (NEC) SD
Sam Perkins	720 S Orchard St	Onsite	11/14/2005	Duwamish	Duwamish (NEC) SD
Sam Perkins	720 S Orchard St	Onsite	1/31/2006	Duwamish	Duwamish (NEC) SD
Seaport Steel	3660 E Marginal Wy S	Onsite	6/2/2005	Duwamish	Duwamish (NEC) SD
SPU South Transfer Station	8100 2nd Ave S	Onsite	6/10/2005	Duwamish	Duwamish (NEC) SD
V.Van Dyke, Inc.	150 S River St	Onsite	12/1/2006	Duwamish	Duwamish (NEC) SD
Aluminum & Bronze Fabrication	6301 W Marginal Wy SW	Onsite	3/24/2006	Duwamish	Glacier Bay
Auburn West Enterprices, LLC	7201 E Marginal Wy S	Onsite	3/30/2006	Duwamish	Glacier Bay
B & B Electric Motors Inc	6000 W Marginal Wy SW	Onsite	6/23/2006	Duwamish	Glacier Bay
Bellacure	6327 W Marginal Wy SW, #bldg 2	Screening	3/13/2006	Duwamish	Glacier Bay
Catholic Printery Inc.	6327 W Marginal Wy SW	Onsite	3/13/2006	Duwamish	Glacier Bay
Chelan MFG Co. Inc	5901 W Marginal Wy SW	Onsite	7/1/2006	Duwamish	Glacier Bay
Chemithon	5430 W Marginal Wy SW	Onsite	4/28/2006	Duwamish	Glacier Bay
Douglas Management	7100 1st Ave SW	Onsite	5/11/2006	Duwamish	Glacier Bay
Emswiler Construction	6045 W Marginal Wy SW	Onsite	4/28/2006	Duwamish	Glacier Bay
Gene Summy Lumber	6000 W Marginal Wy SW	Onsite	6/23/2006	Duwamish	Glacier Bay
Glacier Northwest	4002 E Marginal Wy SW	Onsite	6/2/2006	Duwamish	Glacier Bay
Glacier Northwest	5900 W Marginal Wy S	Onsite	6/2/2006	Duwamish	Glacier Bay
Glacier Northwest	5902 W Marginal Wy SW	Onsite	6/2/2006	Duwamish	Glacier Bay
Kleen Environmental Technologies	5955 W Marginal Wy SW	Onsite	3/13/2006	Duwamish	Glacier Bay
LaFarge Corp	5400 W Marginal Wy SW	Onsite	5/25/2006	Duwamish	Glacier Bay
MSI - Marine Services International	6000 W Marginal Wy SW	Onsite	6/23/2006	Duwamish	Glacier Bay
Northland Services Marine Transportation	6700 W Marginal Wy SW	Onsite	5/22/2006	Duwamish	Glacier Bay
Polar Supply Sub Lease Area	6000 W Marginal Wy SW	Onsite	6/23/2006	Duwamish	Glacier Bay
Sea Pac Transport Services LLC	3544 W Marginal Wy SW	Onsite	10/5/2006	Duwamish	Glacier Bay
SGM- Strategic Global Mobility	6000 W Marginal Wy SW	Onsite	6/23/2006	Duwamish	Glacier Bay
Taras Trucking	6000 W Marginal Wy S	Onsite	7/24/2006	Duwamish	Glacier Bay
Affordable Auto Wrecking	9802 Martin Luther King Jr Wy S	Onsite	8/3/2004	Duwamish	Norfolk SD
Affordable Auto Wrecking	9802 Martin Luther King Jr Wy S	Onsite	10/26/2005	Duwamish	Norfolk SD
African American Academy	8311 Beacon Ave S	Onsite	10/31/2005	Duwamish	Norfolk SD
Associated Grocers, Inc.	3301 S Norfolk St	Onsite	10/20/2005	Duwamish	Norfolk SD

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Facility	Address	Inspection Type	Date Inspected	Basin	Subbasin
Bake Mark	9833 40th Ave S	Onsite	11/2/2005	Duwamish	Norfolk SD
Beacon United Methodist Church	7301 Beacon Ave S	Onsite	11/2/2005	Duwamish	Norfolk SD
Cascade Engine Center	9800 40th Ave S	Onsite	9/19/2005	Duwamish	Norfolk SD
Cascade Motor Inc.	9650 Martin Luther King Jr Wy S	Onsite	12/1/2005	Duwamish	Norfolk SD
Fairn and Swanson	9875 40th Ave S	Onsite	9/29/2005	Duwamish	Norfolk SD
Frank Coluccio Construction	9600 Martin Luther King Jr Wy S	Onsite	11/8/2005	Duwamish	Norfolk SD
Frank Coluccio Construction Co.	9850 Martin Luther King Jr Wy S	Onsite	11/8/2005	Duwamish	Norfolk SD
Front Porch	3701 S Norfolk St	Screening	10/19/2005	Duwamish	Norfolk SD
GE Equipment Management - TIR	9801 Martin Luther King Jr Wy S	Onsite	10/25/2005	Duwamish	Norfolk SD
GRQ, Inc.	8300 Military Rd S	Onsite	12/1/2005	Duwamish	Norfolk SD
Hughes Supply Inc.	10013 Martin Luther King Jr Wy S	Onsite	9/16/2005	Duwamish	Norfolk SD
International Drop-In Center	7301 Beacon Ave S	Screening	10/31/2005	Duwamish	Norfolk SD
Jacks Payless Auto Parts	9423 Martin Luther King Jr Wy S	Onsite	12/13/2005	Duwamish	Norfolk SD
MacDonald-Miller	9833 40th Ave S	Onsite	10/18/2005	Duwamish	Norfolk SD
Martin Smith Inc.	3701 S Norfolk ST	Onsite	10/19/2005	Duwamish	Norfolk SD
Masins	3701 S Norfolk St	Screening	10/19/2005	Duwamish	Norfolk SD
MRG	9877 40th Ave S	Onsite	10/13/2005	Duwamish	Norfolk SD
Nelson Trucking	9747 M L King Jr WY S	Onsite	11/21/2005	Duwamish	Norfolk SD
Noble Wines	9860 40th Ave S	Onsite	9/29/2005	Duwamish	Norfolk SD
NW Kidney Center	9700 M L King Jr WY S	Onsite	11/23/2005	Duwamish	Norfolk SD
Ohno Construction Company	9416 Martin Luther King Jr Wy S	Onsite	2/22/2006	Duwamish	Norfolk SD
Pacific Coatings Inc.	9243 Martin Luther King Jr Wy S	Onsite	12/1/2005	Duwamish	Norfolk SD
Pape Material Handling	9892 40th Ave S	Onsite	9/30/2005	Duwamish	Norfolk SD
Penske	3301 S Norfolk St	Onsite	10/25/2005	Duwamish	Norfolk SD
Property on 9650 MLK Jr. Way S.	9650 Martin Luther King Jr Wy S	Onsite	12/1/2005	Duwamish	Norfolk SD
Public Storage - MLK WY S	10020 M L King JR WY S	Onsite	10/31/2005	Duwamish	Norfolk SD
Rosen-Harbottle Commercial Real Estate	8300 Military Rd S, #A	Onsite	11/7/2005	Duwamish	Norfolk SD
San Gennaro Foods	9620 Martin Luther King Jr Wy S	Onsite	11/17/2005	Duwamish	Norfolk SD
Security Service Northwest, Inc	9640 Martin Luther King Jr Wy S	Onsite	12/22/2005	Duwamish	Norfolk SD
Steeler Inc	10023 Martin Luther King Jr Wy S	Onsite	9/30/2005	Duwamish	Norfolk SD
Swan Net, LLC	8300 Military Rd S, #A	Onsite	10/28/2005	Duwamish	Norfolk SD
The January Company	9844 40TH Ave S	Onsite	10/13/2005	Duwamish	Norfolk SD
Wall & Ceiling	9830 40th Ave S	Onsite	9/16/2005	Duwamish	Norfolk SD
Westward Mobile Park	9685 Martin Luther King Jr Wy S	Onsite	11/18/2005	Duwamish	Norfolk SD
Win Lee Motors Inc	9637 Martin Luther King Jr Wy S	Onsite	12/16/2005	Duwamish	Norfolk SD

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Facility	Address	Inspection Type	Date Inspected	Basin	Subbasin
Wright Way Truck Repair	9688 Martin Luther King Jr Wy S	Onsite	11/18/2005	Duwamish	Norfolk SD
Aero Motel Inn	7240 E Marginal Wy S	Onsite	4/25/2005	Duwamish	Slip 4
Air Lift Northwest	6987 Perimeter Rd S	Onsite	9/20/2004	Duwamish	Slip 4
Airpac Airlines	7001 Perimeter Rd S	Onsite	9/20/2004	Duwamish	Slip 4
Alaska Logistics	7400 8th Ave S	Onsite	6/22/2004	Duwamish	Slip 4
American Avionics, Inc.	7023 Perimeter Rd S	Screening	8/27/2004	Duwamish	Slip 4
Arco Marginal Way	7200 E Marginal Wy S	Onsite	10/12/2004	Duwamish	Slip 4
AV Factory	1900 S Corgiat Dr	Onsite	5/19/2004	Duwamish	Slip 4
Cacallori Marble	1535 S Albro St	Onsite	6/16/2004	Duwamish	Slip 4
Chinese Baptist Church	5801 Beacon Ave S	Onsite	7/26/2004	Duwamish	Slip 4
Classic Helicopters	6505 Perimeter Rd S	Onsite	8/5/2004	Duwamish	Slip 4
Emerald Services	7343 E Marginal Wy S	Onsite	10/28/2005	Duwamish	Slip 4
Envelope Converting Service	6603 Ursula Ave S	Onsite	5/19/2004	Duwamish	Slip 4
Federal Aviation Administration	6526 Ellis Ave S	Onsite	8/5/2004	Duwamish	Slip 4
Ferguson Property	1915 Ursula Pl S	Onsite	6/9/2004	Duwamish	Slip 4
Fire Station # 27	1000 S Myrtle St	Onsite	8/20/2004	Duwamish	Slip 4
Galvin Flying Service, Inc.	7001 Perimeter Rd S	Onsite	8/11/2004	Duwamish	Slip 4
Galvin Flying Service, Inc.	7023 Perimeter Rd S	Onsite	8/11/2004	Duwamish	Slip 4
Galvin Flying Service, Inc.	7149 Perimeter Rd S	Onsite	8/11/2004	Duwamish	Slip 4
Galvin Flying Service, Inc.	7201 Perimeter Rd S	Onsite	8/11/2004	Duwamish	Slip 4
Galvin Flying Service, Inc.	6987 Perimeter Rd S	Onsite	8/11/2004	Duwamish	Slip 4
Garlatz/Seattle Air Corp	1115 S Elizabeth St	Onsite	10/6/2004	Duwamish	Slip 4
Georgetown Management	6801 Perimeter Rd S, #A	Onsite	8/17/2004	Duwamish	Slip 4
Georgetown Powerplant Museum	6605 13th Ave S	Onsite	11/4/2004	Duwamish	Slip 4
Great Western Soil	6640 Ellis Ave S	Onsite	8/20/2004	Duwamish	Slip 4
Helijet	7277 Perimeter Rd S	Screening	9/27/2004	Duwamish	Slip 4
Jensen Family LTD Partners	1001 S Myrtle St	Onsite	9/29/2004	Duwamish	Slip 4
Kenmore Air	7277 Perimeter Rd S	Screening	8/12/2004	Duwamish	Slip 4
King County Airport - NE T-Hangars	6300 Perimeter Rd S	Onsite	10/8/2004	Duwamish	Slip 4
King County Maintenance Facility	6518 Ellis Ave	Onsite	12/22/2004	Duwamish	Slip 4
King County Public Health - Asthma	7300 Perimeter Rd, #128	Screening	9/22/2004	Duwamish	Slip 4
King County Sheriff's Office - Special Operations	7300 Perimeter Rd S, #134	Screening	8/3/2004	Duwamish	Slip 4
King County Surplus Storage	6530 Ellis Ave S	Onsite	1/27/2005	Duwamish	Slip 4
Kohl & Madden	1017 S Myrtle St	Onsite	9/30/2004	Duwamish	Slip 4
Larry's Market	1001 S Myrtle St	Onsite	11/3/2004	Duwamish	Slip 4

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Facility	Address	Inspection Type	Date Inspected	Basin	Subbasin
Marine Vacuum Service	1516 S Graham St	Onsite	1/26/2005	Duwamish	Slip 4
Markey	7266 8th Ave S	Onsite	3/17/2006	Duwamish	Slip 4
Mente LLC	6771 Perimeter Rd S, #B	Onsite	8/25/2004	Duwamish	Slip 4
National Aviation	7170 Perimeter Rd S	Onsite	8/25/2004	Duwamish	Slip 4
Neon Sign Systems	6606 Ursula Pl S	Onsite	6/9/2004	Duwamish	Slip 4
Nichols Jon E	6311 Corgiat Dr S	Onsite	6/16/2004	Duwamish	Slip 4
NW Truck Transmission Inc.	6327 18th Ave S	Onsite	6/9/2004	Duwamish	Slip 4
Office of Emergency Management	7300 Perimeter Rd S, #129	Screening	9/29/2004	Duwamish	Slip 4
Olde Thyme Aviation	6505 Perimeter Rd S	Onsite	7/30/2004	Duwamish	Slip 4
Opportunity Skyway	6524 Ellis Ave S	Screening	1/27/2005	Duwamish	Slip 4
Pacific Multiforms Co., Inc.	6600 Ursula PL S	Onsite	5/19/2004	Duwamish	Slip 4
Perspective Image	6309 Corgiat Dr S	Screening	6/17/2004	Duwamish	Slip 4
Pioneer Human Services	102 21st Ave E	Onsite	12/17/2004	Duwamish	Slip 4
Puget Sound Energy	6500 Ursula Ave S	Onsite	5/27/2004	Duwamish	Slip 4
San Juan Airlines	7277 Perimeter Rd S	Screening	9/24/2004	Duwamish	Slip 4
Show Quality Metal Finishing	1115 S Elizabeth St	Onsite	10/6/2004	Duwamish	Slip 4
Shultz Distributing Inc.	1495 S Hardy St	Onsite	3/15/2005	Duwamish	Slip 4
Starbucks Coffee Company - Corporate Aviation	6771 Perimeter Rd S, #A	Onsite	8/17/2004	Duwamish	Slip 4
Tenrikyo High Seattle	2007 S Orcas St	Onsite	7/26/2004	Duwamish	Slip 4
Troll Motors	1115 S Elizabeth St	Onsite	10/6/2004	Duwamish	Slip 4
UltraBlock Inc.	6300 17th Ave S	Onsite	6/16/2004	Duwamish	Slip 4
WA Air National Guard	6736 Ellis Ave S	Onsite	7/29/2004	Duwamish	Slip 4
Washington Square Fruit & Produce	1622 S Graham ST	Onsite	11/29/2004	Duwamish	Slip 4
Aeroflight	8555 Perimeter Rd S	Onsite	8/12/2004	Duwamish	Slip 5
Airtech Instrument Co., Inc.	8490 Perimeter Rd S	Onsite	9/22/2004	Duwamish	Slip 5
Airwest Repair Services	8167 Perimeter Rd S	Onsite	8/5/2004	Duwamish	Slip 5
Ameriflight	7575 Perimeter Rd S	Onsite	6/4/2004	Duwamish	Slip 5
ARFF - King County Airport	8190 E Marginal Wy S	Onsite	9/24/2004	Duwamish	Slip 5
BAX Global	8201 Perimeter Rd S	Onsite	8/12/2004	Duwamish	Slip 5
Caliber Inspection	7500 Perimeter Rd S	Onsite	8/18/2004	Duwamish	Slip 5
Cascade AirFrame Repair Inc.	8500 Perimeter Rd S, #A4	Onsite	11/2/2004	Duwamish	Slip 5
Civil Air Patrol	7827 Perimeter Rd S	Screening	9/20/2004	Duwamish	Slip 5
Clay Lacy Aviation	8285 Perimeter Rd S	Onsite	8/4/2004	Duwamish	Slip 5
Corporate Jets, Inc	8167 Perimeter Rd S	Onsite	8/5/2004	Duwamish	Slip 5
DHL/ABX Air	8075 Perimeter Rd S	Onsite	8/6/2004	Duwamish	Slip 5

Appendix A: SPU/King County Business Inspections (2003-2006)

Facility	Address	Inspection Type	Date Inspected	Basin	Subbasin
FAA ATCT Control Tower	8200 E Marginal Wy S	Onsite	9/29/2004	Duwamish	Slip 5
Federal Drug Enforcement	8700 E Marginal Wy S, #B	Screening	7/29/2004	Duwamish	Slip 5
Galvin Flying Service, Inc.	7777 Perimeter Rd S	Onsite	8/11/2004	Duwamish	Slip 5
GBA	8167 Perimeter Rd S	Onsite	8/5/2004	Duwamish	Slip 5
GSM Inc.	7575 Perimeter Rd S	Onsite	8/19/2004	Duwamish	Slip 5
Helicopters Northwest, Inc.	8500 Perimeter Rd S, #2	Onsite	9/29/2004	Duwamish	Slip 5
Midfield Airpark T-Hangars - King County Airport	8700 E Marginal Wy S	Onsite	9/24/2004	Duwamish	Slip 5
MJL Partners	7827 Perimeter Rd S	Onsite	9/20/2004	Duwamish	Slip 5
Nordstrom	7979 Perimeter Rd	Onsite	10/29/2004	Duwamish	Slip 5
Puget Sound Aviators	8167 Perimeter Rd S	Onsite	8/5/2004	Duwamish	Slip 5
Reed Aviation	8490 Perimeter Rd S, #a2	Onsite	10/4/2004	Duwamish	Slip 5
Southwest Airpark - King County Airport	9230 E Marginal Wy S	Onsite	9/10/2004	Duwamish	Slip 5
SSCC - Aviation Department Hangar	8900 E Marginal Wy S	Onsite	8/11/2004	Duwamish	Slip 5
Startube	8900 E Marginal Wy S	Onsite	8/11/2004	Duwamish	Slip 5
United Postal Service	7575 S Perimeter Rd	Onsite	8/4/2004	Duwamish	Slip 5
Vulcan	7675 Perimeter Rd S	Onsite	10/8/2004	Duwamish	Slip 5
Washington Avionics	8525 Perimeter Rd S	Onsite	9/15/2004	Duwamish	Slip 5
Western Metal Products, Inc	7696 Perimeter Rd S	Onsite	3/29/2006	Duwamish	Slip 5
Wings Aloft	8467 Perimeter Rd SE	Onsite	9/13/2004	Duwamish	Slip 5
King County Airport Office Building	9010 E Marginal Wy S	Onsite	1/27/2005	Duwamish	Slip 6
King County Sheriff	8600 Perimeter Rd S	Onsite	8/3/2004	Duwamish	Slip 6
The Museum of Flight	9404 E Marginal Wy S	Onsite	10/14/2004	Duwamish	Slip 6
Da Vinci Gourmet	7224 1st Ave S	Onsite	8/16/2004	Duwamish	South Park
Independent Metals, Inc.	703 S Monroe St	Onsite	8/13/2003	Duwamish	South Park
Modern Coach/Modern Pattern	7601 5TH Ave S	Onsite	3/14/2003	Duwamish	South Park
Northwind Marine	605 S Riverside Dr	Screening	4/11/2003	Duwamish	South Park
Vacant	8219 7th Ave S	Screening	4/11/2003	Duwamish	South Park
Basin Oil	8661 Dallas Ave S	Onsite	8/19/2004	Duwamish	T117

Appendix B:

Ecology Inspections of NPDES-Permitted Facilities

Through June 30, 2007

Appendix B: NPDES-Permitted Facilities and Ecology Inspections Conducted through June 30, 2007

NPDES Permit ID	Facility	Address	City	Type of Permit	Date Inspected
SO3004602	Abx Air, Inc - Seattle	8075 PERIMETER ROAD S	Seattle	General Stormwater Industrial	May 24, 2006
SO3000154	Ace Galvanizing Inc 96th	429 S 96TH ST	Seattle	General Stormwater Industrial	August 10, 2006
SO3000843	Affordable Auto Wrecking	9802 MARTIN LUTHER KING JR WAY S	Seattle	General Stormwater Industrial	August 18, 2006
SO3001219	Airco Gases Div Of Boc Seattle	7700 14TH AVE S	Seattle	General Stormwater Industrial	December 1, 2006
SO3001365	Alaska Marine Lines Seattle Termina	5502 + 5658 W MARGINAL WAY	Seattle	General Stormwater Industrial	January 30, 2006
SO3004605	Alaska Street Reload & Recycling	70 SOUTH ALASKA STREET	Seattle	General Stormwater Industrial	February 6, 2007
SO3000139	Alaskan Copper Works	3200 6TH AVE S	Seattle	General Stormwater Industrial	April 13, 2007
SO3002830	Ameriflight Inc Hangar 5	7585 PERIMETER RD S	Seattle	General Stormwater Industrial	October 25, 2006
SO3003235	Amtrak Railroad King St Maintenance	187 HOLGATE STREET S	Seattle	General Stormwater Industrial	December 14, 2006
SO3000089	Asahipen America Inc	1128 SW SPOKANE ST	Seattle	General Stormwater Industrial	January 24, 2007
SO3002040	Associated Grocers 3301 Norfolk	3301 S NORFOLK ST	Seattle	General Stormwater Industrial	January 29, 2007
SO3000392	Becker Truck Terminal	12677 E MARGINAL WAY S	Seattle	General Stormwater Industrial	October 31, 2005
SO3002612	Becker Trucking, Inc	6350 S 143RD ST	Seattle	General Stormwater Industrial	April 16, 2007
SO3000146	Boeing Developmental Center	9725 E MARGINAL WAY S	Tukwila	General Stormwater Industrial	March 17, 2006
SO3000150	Boeing Military Flight Center	10002 E MARGINAL WAY S	Seattle	General Stormwater Industrial	March 17, 2006
SO3000482	Boeing Plant 2	7755 E MARGINAL WAY S	Seattle	General Stormwater Industrial	April 20, 2007
SO3001009	Boeing South Park Facility	1420 S TRENTON STSOUTH PARK PLANT	Kent	General Stormwater Industrial	April 6, 2007
SO3000148	Boeing Thompson Site	8770 EAST MARGINAL WAY S	Tukwila	General Stormwater Industrial	April 6, 2007
SO3005598	Boyer Logistics Inc	7318 FOURTH AVENUE SOUTH	Seattle	General Stormwater Industrial	February 28, 2007
SO3005603	Bp Seattle Terminal	1652 SW LANDER ST	Seattle	General Stormwater Industrial	November 29, 2006
SO3002153	Building Busters Inc	13001 MARTIN LUTHER KING JR WAY	Seattle	General Stormwater Industrial	December 14, 2006
WAG503337B	Cadman Seattle	5225 E MARGINAL WAY S	Seattle	Sand and Gravel	
SO3002274	CB Finishing	9585 8TH AVE S	Seattle	General Stormwater Industrial	April 24, 2007
SO3002641	Cedar Grove Compost Webster Yard	7343 E MARGINAL WAY S	Seattle	General Stormwater Industrial	October 28, 2005
SO3002285	Chas A Lasater Co Seattle	515 S 96TH ST	Seattle	General Stormwater Industrial	October 26, 2006
SO3005619	Colorado St Facility Rainier Petro	40 S SPOKANE ST	Seattle	General Stormwater Industrial	May 4, 2005
WA0001945E	ConocoPhillips Co Renton Terminal	2423 LIND AVE SW	Renton	Individual Industrial	March 26, 2007
SO3000040	Custom Gear Inc	10834 E. MARGINAL WAY S.	Seattle	General Stormwater Industrial	November 2, 2005
SO3000500	Darigold Rainier Ave Plant	4058 RAINIER AVE. S.	Seattle	General Stormwater Industrial	February 6, 2007
WAG030091C	Delta Marine Industries Inc	1608 S 96TH ST	Seattle	Boatyard	January 25, 2007
SO3005621	Dr Concrete Recycle	149 SW KENYON	Seattle	General Stormwater Industrial	May 2, 2007
WA0030937C	Duwamish Shipyard	5658 W MARGINAL WAY SW	Seattle	Individual Industrial	June 25, 2007
SO3000464	Eagle Marine Services Ltd Term 5	3200 W MARGINAL WAY SW	Seattle	General Stormwater Industrial	June 25, 2007
SO3002198	Engstrom Machine Works Inc	6400 S 143RD PL	Tukwila	General Stormwater Industrial	May 10, 2007
SO3002966	Evergreen Trails Inc	4500 W MARGINAL WAY SW	Seattle	General Stormwater Industrial	February 7, 2006
SO3000863	Farwest Paint Mfg Co	4522 S. 133RD ST.	Tukwila	General Stormwater Industrial	August 7, 2006
SO3003598	Fibres International Inc 4th Av	9208 4TH AVE S	Seattle	General Stormwater Industrial	February 13, 2007
SO3002329	First Student Inc Steilacoom	130 S KENYON ST	Seattle	General Stormwater Industrial	April 26, 2007
SO3001953	Fmh Material Handling Solutions	1313 S 96TH ST	Seattle	General Stormwater Industrial	October 25, 2006
SO3000475	Fog Tite Inc.	4819 W. MARGINAL WAY S.W.	Seattle	General Stormwater Industrial	November 1, 2005
SO3002292	Franz Seattle	2901 6TH AVE S	Seattle	General Stormwater Industrial	May 11, 2005
SO3000607	Galvin Flying Service Inc	7149 PERIMETER RD S	Seattle	General Stormwater Industrial	May 25, 2006

Appendix B: NPDES-Permitted Facilities and Ecology Inspections Conducted through June 30, 2007

NPDES Permit ID	Facility	Address	City	Type of Permit	Date Inspected
SO3002341	General Recycling Of Washington Llc	TERMINAL 105 4260 W MARGINAL WAY SW	Seattle	General Stormwater Industrial	January 30, 2007
SO3002227	Glacier Northwest Inc	3838 W MARGINAL WAY SW	Seattle	General Stormwater Industrial	June 7, 2006
WAG503191C	Glacier Northwest Inc	5975 E MARGINAL WAY S	Seattle	Sand and Gravel	November 16, 2006
SO3000801	Grundfos Cbs Inc.	3215 S 116TH ST	Seattle	General Stormwater Industrial	May 2, 2007
SO3000054	Harbor Island Machine Works Inc	3431 11TH AVE SW	Seattle	General Stormwater Industrial	April 22, 2005
WAG503282C	Icon Materials Seattle Asphalt	1115 S 96TH ST	Seattle	Sand and Gravel	
SO3001949	Industrial Automation Inc	1421 S 93RD ST	Seattle	General Stormwater Industrial	May 10, 2007
SO3008681	Insurance Auto Auctions Tukwila	8801 E MARIGINAL WAY S	Seattle	General Stormwater Industrial	February 28, 2007
SO3004509	Island Tug And Barge Terminal 7c	3546 W MARGINAL WAY SW	Seattle	General Stormwater Industrial	January 30, 2007
WAG503082C	JA Jack & Sons Inc	5407 OHIO AVE S	Seattle	Sand and Gravel	
SO3000056	James Hardie Gypsum	5931 E MARGINAL WAY S	Seattle	General Stormwater Industrial	April 25, 2006
SO3003231	Jorgensen Forge Corp	8531 E MARGINAL WAY S	Seattle	General Stormwater Industrial	January 13, 2006
SO3005569	King Co Transit South Base Annex	11911 E MARGINAL WAY S	Tukwila	General Stormwater Industrial	April 23, 2007
SO3000343	King County Int Airport Maint Shop	6518 ELLIS AVE. S.	Seattle	General Stormwater Industrial	November 30, 2006
WA0002232E	LaFarge Corporation	5400 W MARGINAL WAY SW	Seattle	Individual Industrial	2006
SO3004614	Lee & Eastes Tank Lines Inc	2418 AIRPORT WAY SOUTH	Seattle	General Stormwater Industrial	June 2, 2006
SO3000206	Longview Fibre Seattle	5901 E MARGINAL WAY S	Seattle	General Stormwater Industrial	December 22, 2005
SO3003252	Macmillan Piper Mass Shop	637 S MASSACHUSETTS	Seattle	General Stormwater Industrial	November 29, 2006
SO3000639	Meltec Division Of Young Corp	3444 13TH AVE SW	Seattle	General Stormwater Industrial	February 28, 2007
SO3000417	Metro South Operating Base	12100 E MARGINAL WAY S	Seattle	General Stormwater Industrial	October 31, 2005
SO3000868	Millwork Supply Co	2225 1ST AVE S	Seattle	General Stormwater Industrial	April 18, 2007
SO3000226	North Boeing Field	7700 E MARGINAL WAY S	Seattle	General Stormwater Industrial	December 16, 2005
SO3000471	Northland Services Inc. Seattle	6700 W. MARGINAL WAY S.W.	Seattle	General Stormwater Industrial	May 22, 2006
SO3000961	Northwest Auto + Truck Wrecking Inc	10230 E MARGINAL WAY S	Tukwila	General Stormwater Industrial	May 22, 2007
SO3003779	Northwest Container Services Inc	6110 W MARGINAL WAY SW TERM 115	Seattle	General Stormwater Industrial	February 22, 2007
SO3001918	Northwest Grating Products	9230 4TH AVE S	Seattle	General Stormwater Industrial	April 26, 2007
SO3000804	Oberto Sausage Co Airport Way Plant	2005 AIRPORT WAY S	Seattle	General Stormwater Industrial	March 22, 2007
SO3002835	Overnite Transportation Co 9/3/96	11231 E MARGINAL WAY S	Tukwila	General Stormwater Industrial	April 23, 2007
SO3000484	Pac Rail	44 S HANFORD ST	Seattle	General Stormwater Industrial	June 20, 2007
SO3005562	Pacific Rail Serv+Bnsf So Seattle	12400 - 51ST PLACE SO	Seattle	General Stormwater Industrial	May 25, 2007
SO3001901	Pacific Utility Equipment Co	1303 S 96TH ST	Seattle	General Stormwater Industrial	June 20, 2007
SO3001817	Pendleton Mills LLC	3235 16TH AVE SW	Seattle	General Stormwater Industrial	March 2, 2005
SO3008720	Pepsi Bottling Group Seattle Plant	2300 26TH AVE S	Seattle	General Stormwater Industrial	April 17, 2007
SO3001897	Pioneer Industries	7000 HIGHLAND PKWY SW	Seattle	General Stormwater Industrial	March 22, 2007
SO3002517	Port of Seattle Marine Maint Shop	25 S HORTON ST	Seattle	General Stormwater Industrial	April 22, 2005
SO3000264	Psf Mechanical Inc	9322 14TH AVE. S.	Seattle	General Stormwater Industrial	July 31, 2006
SO3002142	Puget Sound Coatings	9220 8TH AVE S	Seattle	General Stormwater Industrial	July 31, 2006
SO3000949	Puget Sound Truck Lines Inc Sea	7303 8TH AVE. S.	Seattle	General Stormwater Industrial	June 9, 2005
SO3002721	Rainier Petroleum P 15	1711 13TH AVE SW	Seattle	General Stormwater Industrial	April 17, 2007
SO3000015	Recycling Depot Inc	851 RAINIER AVE S	Seattle	General Stormwater Industrial	April 26, 2007
SO3002149	Regional Disposal Black River Trans	501 MONSTER RD SW	Renton	General Stormwater Industrial	December 2, 2005
SO3004620	Roadway Express Inc (T870)	600 S 96TH ST	Seattle	General Stormwater Industrial	April 26, 2007

Appendix B: NPDES-Permitted Facilities and Ecology Inspections Conducted through June 30, 2007

NPDES Permit ID	Facility	Address	City	Type of Permit	Date Inspected
SO3001134	Saint Gobain Containers Llc	5801 E MARGINAL WAY S	Seattle	General Stormwater Industrial	December 28, 2005
SO3005565	Scs Refrigerated Services - Seattle	303 SOUTH RIVER	Seattle	General Stormwater Industrial	May 30, 2007
SO3000962	Seatac Marine Services Llc	6701 FOX AVE S	Seattle	General Stormwater Industrial	June 27, 2007
SO3002208	Seattle Boilerworks Inc Myrtle St	500 S MYRTLE ST	Seattle	General Stormwater Industrial	June 26, 2007
SO3003645	Seattle Iron + Metals Corp	600 SOUTH GARDEN ST	Seattle	General Stormwater Industrial	March 29, 2006
SO3001958	Seattle Refrigeration + Mfg Aka Avj	1057 S DIRECTOR ST	Seattle	General Stormwater Industrial	March 27, 2007
SO3000650	Selland Auto Transport	615 S 96TH ST	Seattle	General Stormwater Industrial	April 23, 2007
WA0001791D	Shell Oil Product Seattle Terminal	2555 13TH AVE SW	Seattle	Individual Industrial	
SO3002346	Shultz Distributing Inc Sea	6851 E MARGINAL WAY S	Seattle	General Stormwater Industrial	January 27, 2006
SO3000930	Skyline Electric and Mfg Co Inc.	3619 7TH AVE S	Seattle	General Stormwater Industrial	April 23, 2007
WAG030045C	South Park Marina	8604 DALLAS AVE S	Seattle	Boatyard	June 7, 2005
SO3000737	South Recycle And Disposal Station	8100 2ND AVE. S.	Seattle	General Stormwater Industrial	June 10, 2005
SO3000617	Standard Steel Fabricating Co Inc	8155 1ST AVE S	Seattle	General Stormwater Industrial	April 26, 2007
SO3000467	Stevedoring Services Terminal 18	2400 11TH AVE. S.W.	Seattle	General Stormwater Industrial	July 12, 2005
SO3002471	Swan Bay Holdings Dock	7100 2ND AVE SW	Seattle	General Stormwater Industrial	May 11, 2006
SO3000430	System Transfer and Storage Co.	2400 6TH AVE S	Seattle	General Stormwater Industrial	May 10, 2007
SO3000033	The Chemithon Corp	5430 W. MARGINAL WAY S.W.	Seattle	General Stormwater Industrial	April 28, 2006
SO3000763	The Gear Works Seattle Inc	500 S PORTLAND ST	Seattle	General Stormwater Industrial	March 22, 2007
SO3000253	Tierney Elec Mfg Co	7901 7TH AVE S	Seattle	General Stormwater Industrial	March 22, 2007
SO3001155	Union Pacific Railroad Co Dawson St	402 S DAWSON ST	Seattle	General Stormwater Industrial	December 5, 2006
SO3002137	United Iron Works	7421 5TH AVE S	Seattle	General Stormwater Industrial	February 6, 2007
SO3000434	United Parcel Service Waboe	7575 PERIMETER RD S	Seattle	General Stormwater Industrial	January 11, 2006
SO3000443	United Parcel Service Wasau	4329 7TH AVE S	Seattle	General Stormwater Industrial	August 3, 2005
SO3000444	United Parcel Service Wasea	4455 7TH AVE S	Seattle	General Stormwater Industrial	August 3, 2005
SO3000453	V Van Dyke Inc	150 S. RIVER ST.	Seattle	General Stormwater Industrial	December 1, 2006
SO3000581	Waste Management Of Seattle Marg Wy	7201 W MARGINAL WAY SW	Seattle	General Stormwater Industrial	December 2, 2005
SO3000582	Waste Management Sea Recycle Am	7901 1ST AVE S	Seattle	General Stormwater Industrial	June 28, 2007
SO3002111	West Coast Wire + Rope Rigging Inc	7777 7TH AVE S	Seattle	General Stormwater Industrial	May 31, 2007
SO3004526	Westway Feed Products Co Inc	1002 SW SPOKANE STREET	Seattle	General Stormwater Industrial	April 20, 2005

Appendix C

Basic Assumptions for Creating Schedule and Timeline

Appendix C
Basic Assumptions for Creating Schedule and Timeline

A set of basic assumptions was used to model the scenario for those tasks yet to be started or completed. For sites where work has already begun, actual dates were used wherever possible.

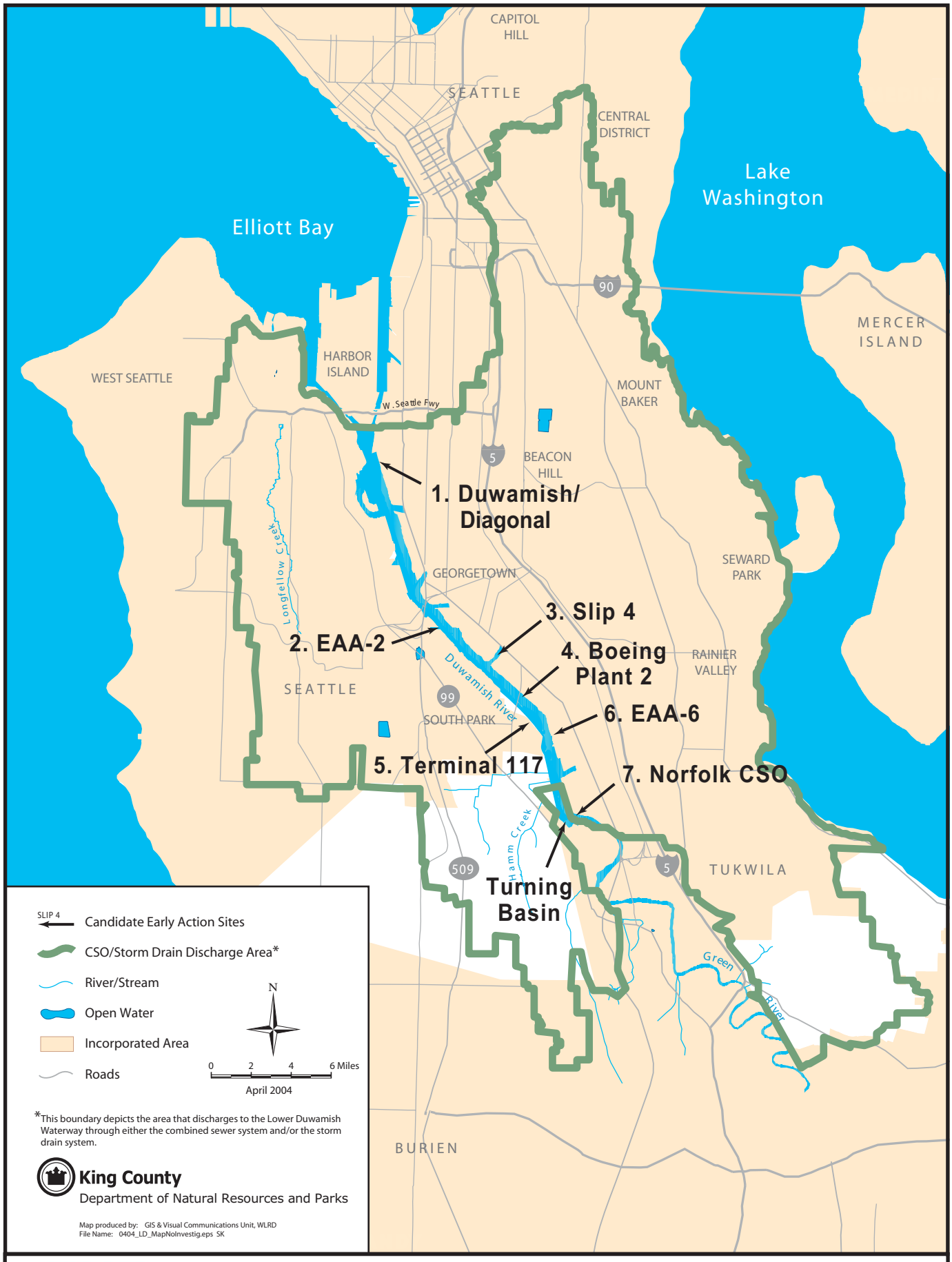
The following process assumptions were made:

- Each Source Control Action Plan (SCAP) yields one source control cleanup site.
- The Agreed Order negotiations take 10 months to complete, as follows:
    - Credible evidence exists to support issuing a preliminary Potentially Liable Party (PLP) Notice letter to the owner/operator within three weeks of publication of the SCAP.
    - Owner/operator does not respond to preliminary PLP letter until the last day of the 30-day response period.
    - No new potential PLPs are identified who must be notified and included in negotiations.
    - PLP determination letter is sent two weeks after receiving the owner/operator response.
    - Negotiations for an Agreed Order begin 30 days after Ecology sends the PLP determination letter.
    - Negotiations are complete within six months of start of negotiations. This includes the 30-day public comment period.
- Remedial Investigation/Feasibility Study (RI/FS) takes 37 months. This includes sampling plans, field work, and draft and final RI/FS reports.
- Interim action requires completion of the RI/FS.
- The interim action does not require in-water work.
- Interim action to stop the release of contaminants is completed 12 months after acceptance of the RI/FS. This includes scoping, review and approval of design and monitoring plans, field work, and Ecology acceptance of the final action reports.
- Monitoring of the Interim Action starts one month after completion of field work.
- Monitoring of the Interim Action continues for 12 months (assume quarterly monitoring).
- Ecology accepts final Compliance Monitoring report four months after the end of the 12-month monitoring period. Ecology determines the source is controlled.

The following staffing assumptions were made:

- A site manager and Assistant Attorney General will be available to start work on the identified site on the date of publication of the SCAP.
- A full-time site manager can handle a total of four sites.

- A full-time site manager, with no existing workload, can initially handle two sites, starting six months apart.
- Eighteen months after starting the first two sites, a full-time site manager can take on two new sites, six months apart.
- Work at EAA-1 (Duwamish/Diagonal) is underway. The work at EAA-1 is being done by the Port of Seattle at Terminal 108 as an independent action. The Port is working with Ecology.
- Work at EAA-5 (Terminal 117) is underway. Terminal 117 is an EPA-lead site.
- Work at T2A-9 (Slip 6) and EEA-4 (Boeing Plant 2/Jorgensen Forge) has started or will start soon. Site managers for these sites are not dedicated to work on the Lower Duwamish Waterway, therefore they are not included in the projected schedule for future sites.
- The staffing scenario is based on known or anticipated assignments as of May 2007.



SAIC From Science to Solutions

Figure 1. Lower Duwamish Waterway Site

ID	Task Name	Duration	Start	Finish	Successors	Predecessors
1	**Early Action Area 1- Duwamish Diagonal**	**87 mons**	**Mon 2/3/03**	**Fri 10/2/09**		
2	**SCAP**	**24 mons**	**Mon 2/3/03**	**Fri 12/3/04**		
3	Contract process	1 mon	Mon 2/3/03	Fri 2/28/03	4	
4	Property reports	12 mons	Mon 3/3/03	Fri 1/30/04	5	3
5	Write SCAP and Review	11 mons	Mon 2/2/04	Fri 12/3/04	6	4
6	SCAP published	0 mons	Fri 12/3/04	Fri 12/3/04	8,9	5
7	**SC implementation**	**63 mons**	**Mon 12/6/04**	**Fri 10/2/09**		
8	SC inspections	18 mons	Mon 12/6/04	Fri 4/21/06		6
9	T-108 Investigation and SC	60 mons	Mon 12/6/04	Fri 7/10/09	10	6
10	Source Control Determination	3 mons	Mon 7/13/09	Fri 10/2/09		9
11	**Early Action Area 5- Terminal 117**	**72 mons**	**Wed 1/1/03**	**Tue 7/8/08**		
12	**SCAP**	**17 mons**	**Thu 4/1/04**	**Wed 7/20/05**		
13	Contract process	1 mon	Thu 4/1/04	Wed 4/28/04	14	
14	Property Reports	5 mons	Thu 4/29/04	Wed 9/15/04	15	13
15	Write SCAP and Review	11 mons	Thu 9/16/04	Wed 7/20/05	16	14
16	SCAP published	0 mons	Wed 7/20/05	Wed 7/20/05	18	15
17	**SC implementation**	**72 mons**	**Wed 1/1/03**	**Tue 7/8/08**		
18	SC inspections	25 mons	Thu 7/21/05	Wed 6/20/07		16
19	EPA removal action	72 mons	Wed 1/1/03	Tue 7/8/08		
20	**Early Action Area 3- Slip 4**	**113.75 mons**	**Mon 5/3/04**	**Fri 1/18/13**		
21	**SCAP**	**29 mons**	**Mon 5/3/04**	**Fri 7/21/06**		
22	Contract process	1 mon	Mon 5/3/04	Fri 5/28/04	23	
23	Property Reports	14 mons	Mon 5/31/04	Fri 6/24/05	24	22
24	Write SCAP and Review	14 mons	Mon 6/27/05	Fri 7/21/06	25	23
25	SCAP published	0 mons	Fri 7/21/06	Fri 7/21/06	27	24
26	**SC implementation**	**84.75 mons**	**Mon 7/24/06**	**Fri 1/18/13**		
27	SC inspections	18 mons	Mon 7/24/06	Fri 12/7/07		25
28	NKCIA GTSP AO negotiations	6 mons	Mon 7/16/07	Fri 12/28/07	29,42SS+18	
29	Complete RI/FS	37 mons	Mon 12/31/07	Fri 10/29/10	30	28
30	Design and Implement Interim Action	12 mons	Mon 11/1/10	Fri 9/30/11	31FS+1 mon	29
31	Compliance Monitoring	12 mons	Mon 10/31/11	Fri 9/28/12	32	30FS+1 mon
32	Source Control Determination	4 mons	Mon 10/1/12	Fri 1/18/13	176	31
33	**Early Action Area 2- Trotsky**	**108.6 mons**	**Thu 6/1/06**	**Fri 9/26/14**		
34	**SCAP**	**10.7 mons**	**Fri 9/1/06**	**Wed 6/27/07**		
35	Contract process	0.5 mons	Fri 9/1/06	Thu 9/14/06	36	
36	Summary of Existing Information and Da	5.5 mons	Fri 9/15/06	Thu 2/15/07	37	35
37	Write SCAP and Review	4.7 mons	Fri 2/16/07	Wed 6/27/07	38	36
38	SCAP published	0 mons	Wed 6/27/07	Wed 6/27/07	42	37
39	**SC implementation**	**108.6 mons**	**Thu 6/1/06**	**Fri 9/26/14**		
40	SC inspections	18 mons	Thu 6/1/06	Wed 10/17/07		
41	**AO negotiations**	**10 mons**	**Mon 12/1/08**	**Fri 9/4/09**		
42	Preliminary PLP letter Issued	1 mon	Mon 12/1/08	Fri 12/26/08	43FS+1 mon	28SS+18 mons,38
43	Owner Operator Response Receive	0 mons	Fri 1/23/09	Fri 1/23/09		42FS+1 mon
44	Search for other PLPs	1 mon	Mon 12/29/08	Fri 1/23/09	45FS+1 mon	42
45	PLP Determination Letter Sent	0 mons	Fri 2/20/09	Fri 2/20/09	46FS+1 mon	44FS+1 mon
46	AO Negotiations	6 mons	Mon 3/23/09	Fri 9/4/09	47	45FS+1 mon

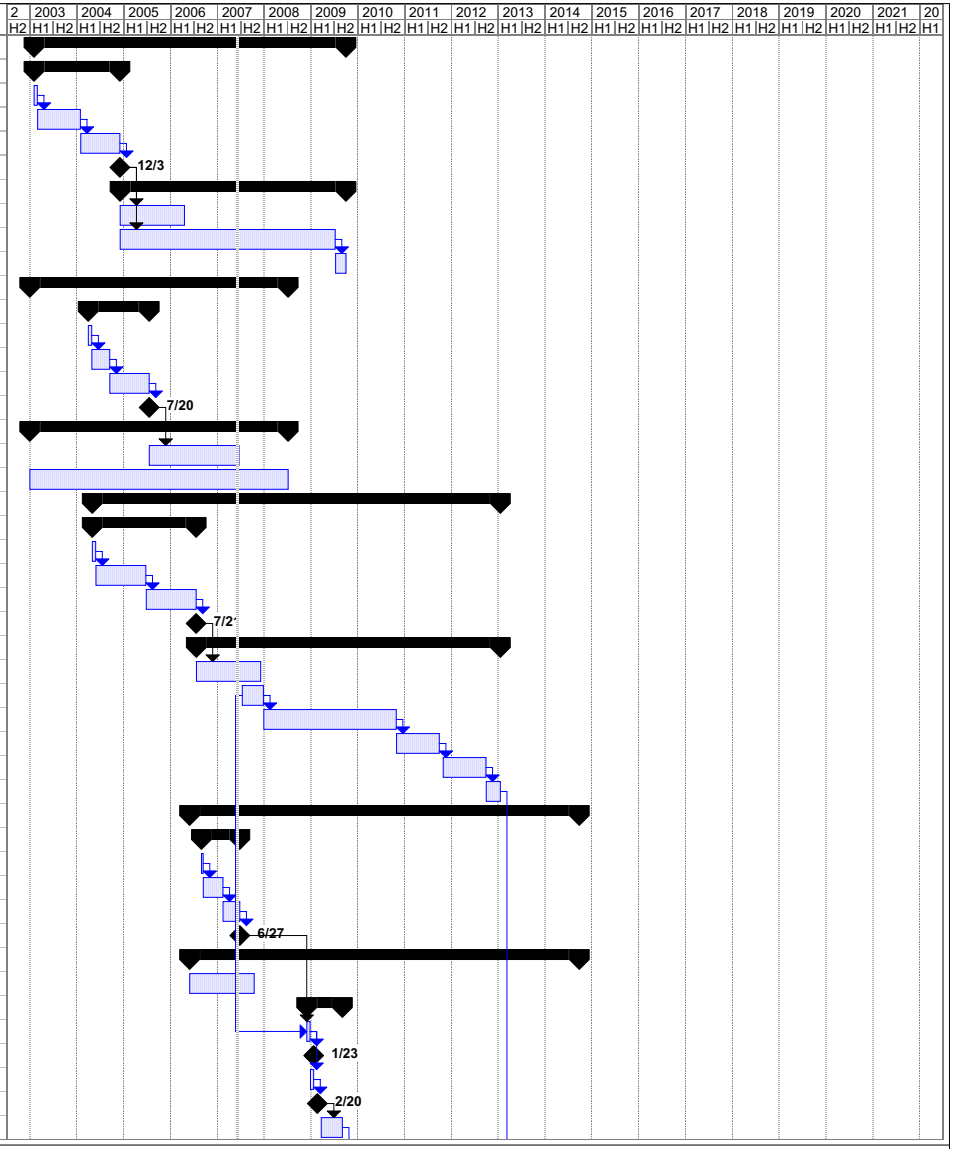


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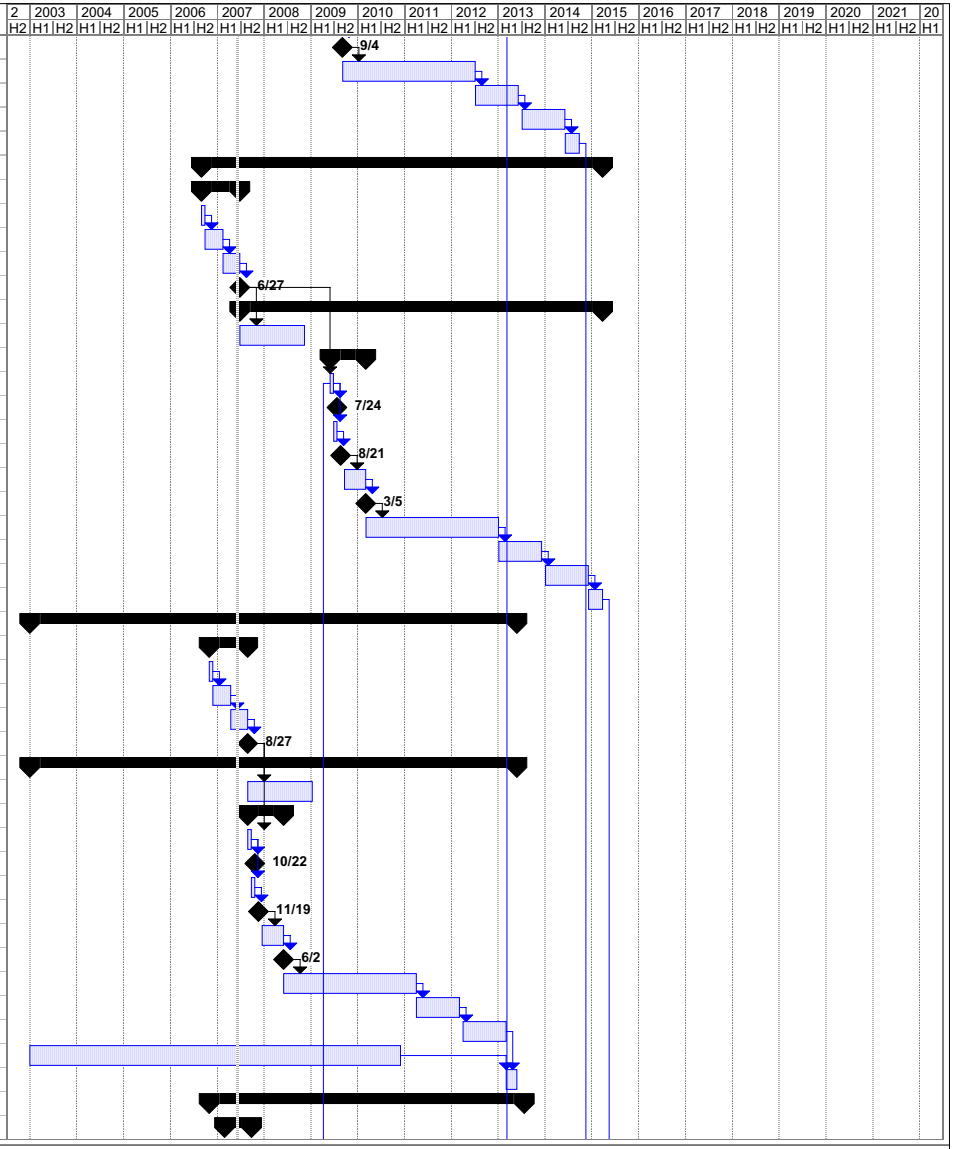
Figure 2. Lower Duwamish Waterway Projected Source Control Schedule

ID	Task Name	Duration	Start	Finish	Successors	Predecessors
47	AO Negotiations Complete	0 mons	Fri 9/4/09	Fri 9/4/09	48	46
48	Complete RI/FS	37 mons	Mon 9/7/09	Fri 7/6/12	49	47
49	Design and Implement Interim Action	12 mons	Mon 7/9/12	Fri 6/7/13	50FS+1 mon	48
50	Compliance Monitoring	12 mons	Mon 7/8/13	Fri 6/6/14	51	49FS+1 mon
51	Source Control Determination	4 mons	Mon 6/9/14	Fri 9/26/14	252	50
52	**Early Action Area 7- Norfolk**	**111.8 mons**	**Fri 9/1/06**	**Fri 3/27/15**		
53	**SCAP**	**10.7 mons**	**Fri 9/1/06**	**Wed 6/27/07**		
54	Contract process	1 mon	Fri 9/1/06	Thu 9/28/06	55	
55	Summary of Existing Information and Da	5 mons	Fri 9/29/06	Thu 2/15/07	56	54
56	Write SCAP and Review	4.7 mons	Fri 2/16/07	Wed 6/27/07	57	55
57	SCAP published	0 mons	Wed 6/27/07	Wed 6/27/07	59,61	56
58	**SC implementation**	**101.1 mons**	**Thu 6/28/07**	**Fri 3/27/15**		
59	SC inspections	18 mons	Thu 6/28/07	Wed 11/12/08		57
60	**AO negotiations**	**10 mons**	**Mon 6/1/09**	**Fri 3/5/10**		
61	Preliminary PLP letter Issued	1 mon	Mon 6/1/09	Fri 6/26/09	62FS+1 mon	57
62	Owner Operator Response Receive	0 mons	Fri 7/24/09	Fri 7/24/09		61FS+1 mon
63	Search for other PLPs	1 mon	Mon 6/29/09	Fri 7/24/09	64FS+1 mon	61
64	PLP Determination Letter Sent	0 mons	Fri 8/21/09	Fri 8/21/09	65FS+1 mon	63FS+1 mon
65	AO Negotiations	6 mons	Mon 9/21/09	Fri 3/5/10	66	64FS+1 mon
66	AO Negotiations Complete	0 mons	Fri 3/5/10	Fri 3/5/10	67	65
67	Complete RI/FS	37 mons	Mon 3/8/10	Fri 1/4/13	68	66
68	Design and Implement Interim Action	12 mons	Mon 1/7/13	Fri 12/6/13	69FS+1 mon	67
69	Compliance Monitoring	12 mons	Mon 1/6/14	Fri 12/5/14	70	68FS+1 mon
70	Source Control Determination	4 mons	Mon 12/8/14	Fri 3/27/15	214	69
71	**Early Action Area 4- Plant 2, Jorgensen**	**135.7 mons**	**Wed 1/1/03**	**Mon 5/27/13**		
72	**SCAP**	**10.7 mons**	**Wed 11/1/06**	**Mon 8/27/07**		
73	Contract process	1 mon	Wed 11/1/06	Tue 11/28/06	74	
74	Summary of Existing Information and Da	5 mons	Wed 11/29/06	Tue 4/17/07	75	73
75	Write SCAP and Review	4.7 mons	Wed 4/18/07	Mon 8/27/07	76	74
76	SCAP published	0 mons	Mon 8/27/07	Mon 8/27/07	78,80	75
77	**SC implementation**	**135.7 mons**	**Wed 1/1/03**	**Mon 5/27/13**		
78	SC inspections	18 mons	Tue 8/28/07	Mon 1/12/09		76
79	**AO negotiations**	**10 mons**	**Tue 8/28/07**	**Mon 6/2/08**		
80	Preliminary PLP letter Issued	1 mon	Tue 8/28/07	Mon 9/24/07	81FS+1 mon	76
81	Owner Operator Response Receive	0 mons	Mon 10/22/07	Mon 10/22/07		80FS+1 mon
82	Search for other PLPs	1 mon	Tue 9/25/07	Mon 10/22/07	83FS+1 mon	80
83	PLP Determination Letter Sent	0 mons	Mon 11/19/07	Mon 11/19/07	84FS+1 mon	82FS+1 mon
84	AO Negotiations	6 mons	Tue 12/18/07	Mon 6/2/08	85	83FS+1 mon
85	AO Negotiations Complete	0 mons	Mon 6/2/08	Mon 6/2/08	86	84
86	Complete RI/FS	37 mons	Tue 6/3/08	Mon 4/4/11	87	85
87	Design and Implement Interim Action	12 mons	Tue 4/5/11	Mon 3/5/12	88FS+1 mon	86
88	Compliance Monitoring	12 mons	Tue 4/3/12	Mon 3/4/13	90	87FS+1 mon
89	Plant 2 RCRA corrective measure	103.3 mons	Wed 1/1/03	Wed 12/1/10	90	
90	Source Control Determination	3 mons	Tue 3/5/13	Mon 5/27/13		89,88
91	**Glacier Bay**	**87.8 mons**	**Wed 11/1/06**	**Wed 7/24/13**		
92	**SCAP**	**7.5 mons**	**Thu 3/1/07**	**Wed 9/26/07**		



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Task | Progress | Summary | External Tasks | Deadline
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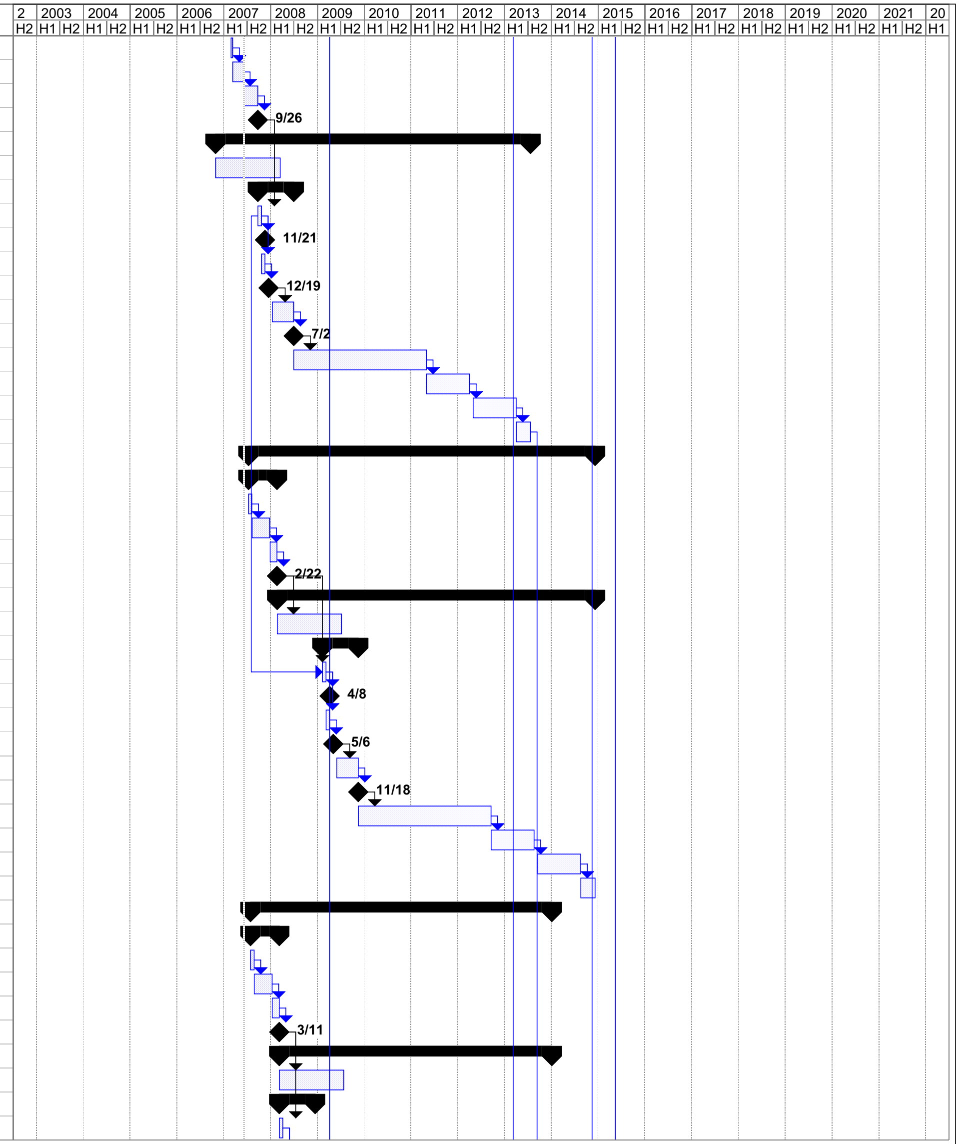
Figure 2. Lower Duwamish Waterway Projected Source Control Schedule

ID		Task Name	Duration	Start	Finish	Successors	Predecessors
93		Contract process	0.5 mons	Thu 3/1/07	Wed 3/14/07	94	
94		Summary of Existing Information and Da	3 mons	Thu 3/15/07	Wed 6/6/07	95	93
95		Write SCAP and Review	4 mons	Thu 6/7/07	Wed 9/26/07	96	94
96		SCAP published	0 mons	Wed 9/26/07	Wed 9/26/07	100	95
97		**SC implementation**	**87.8 mons**	**Wed 11/1/06**	**Wed 7/24/13**		
98		SC inspections	18 mons	Wed 11/1/06	Tue 3/18/08		
99		**AO negotiations**	**10 mons**	**Thu 9/27/07**	**Wed 7/2/08**		
100		Preliminary PLP letter Issued	1 mon	Thu 9/27/07	Wed 10/24/07	101FS+1 mo	96
101		Owner Operator Response Receive	0 mons	Wed 11/21/07	Wed 11/21/07		100FS+1 mon
102		Search for other PLPs	1 mon	Thu 10/25/07	Wed 11/21/07	103FS+1 mo	100
103		PLP Determination Letter Sent	0 mons	Wed 12/19/07	Wed 12/19/07	104FS+1 mo	102FS+1 mon
104		AO Negotiations	6 mons	Thu 1/17/08	Wed 7/2/08	105	103FS+1 mon
105		AO Negotiations Complete	0 mons	Wed 7/2/08	Wed 7/2/08	106	104
106		Complete RI/FS	37 mons	Thu 7/3/08	Wed 5/4/11	107	105
107		Design and Implement Interim Action	12 mons	Thu 5/5/11	Wed 4/4/12	108FS+1 mo	106
108		Compliance Monitoring	12 mons	Thu 5/3/12	Wed 4/3/13	109	107FS+1 mon
109		Source Control Determination	4 mons	Thu 4/4/13	Wed 7/24/13	195	108
110		**Boeing Isaacson/Thompson**	**96.65 mons**	**Mon 7/16/07**	**Wed 12/10/14**		
111		**SCAP**	**8 mons**	**Mon 7/16/07**	**Fri 2/22/08**		
112		Contract process	1 mon	Mon 7/16/07	Fri 8/10/07	113	
113		Summary of Existing Information and Da	5 mons	Mon 8/13/07	Fri 12/28/07	114	112
114		Write SCAP and Review	2 mons	Mon 12/31/07	Fri 2/22/08	115	113
115		SCAP published	0 mons	Fri 2/22/08	Fri 2/22/08	117,119	114
116		**SC implementation**	**88.65 mons**	**Mon 2/25/08**	**Wed 12/10/14**		
117		SC inspections	18 mons	Mon 2/25/08	Fri 7/10/09		115
118		**AO negotiations**	**10 mons**	**Thu 2/12/09**	**Wed 11/18/09**		
119		Preliminary PLP letter Issued	1 mon	Thu 2/12/09	Wed 3/11/09	120FS+1 mo	100SS+18 mons,115
120		Owner Operator Response Receive	0 mons	Wed 4/8/09	Wed 4/8/09		119FS+1 mon
121		Search for other PLPs	1 mon	Thu 3/12/09	Wed 4/8/09	122FS+1 mo	119
122		PLP Determination Letter Sent	0 mons	Wed 5/6/09	Wed 5/6/09	123FS+1 mo	121FS+1 mon
123		AO Negotiations	6 mons	Thu 6/4/09	Wed 11/18/09	124	122FS+1 mon
124		AO Negotiations Complete	0 mons	Wed 11/18/09	Wed 11/18/09	125	123
125		Complete RI/FS	37 mons	Thu 11/19/09	Wed 9/19/12	126	124
126		Design and Implement Interim Action	12 mons	Thu 9/20/12	Wed 8/21/13	127FS+1 mo	125
127		Compliance Monitoring	12 mons	Thu 9/19/13	Wed 8/20/14	128	126FS+1 mon
128		Source Control Determination	4 mons	Thu 8/21/14	Wed 12/10/14		127
129		**Slip 6/Paccar/Rhone Poulenc**	**84 mons**	**Wed 8/1/07**	**Tue 1/7/14**		
130		**SCAP**	**8 mons**	**Wed 8/1/07**	**Tue 3/11/08**		
131		Contract process	1 mon	Wed 8/1/07	Tue 8/28/07	132	
132		Summary of Existing Information and Da	5 mons	Wed 8/29/07	Tue 1/15/08	133	131
133		Write SCAP and Review	2 mons	Wed 1/16/08	Tue 3/11/08	134	132
134		SCAP published	0 mons	Tue 3/11/08	Tue 3/11/08	136,138	133
135		**SC implementation**	**76 mons**	**Wed 3/12/08**	**Tue 1/7/14**		
136		SC inspections	18 mons	Wed 3/12/08	Tue 7/28/09		134
137		**AO negotiations**	**10 mons**	**Wed 3/12/08**	**Tue 12/16/08**		
138		Preliminary PLP letter Issued	1 mon	Wed 3/12/08	Tue 4/8/08	139FS+1 mo	134



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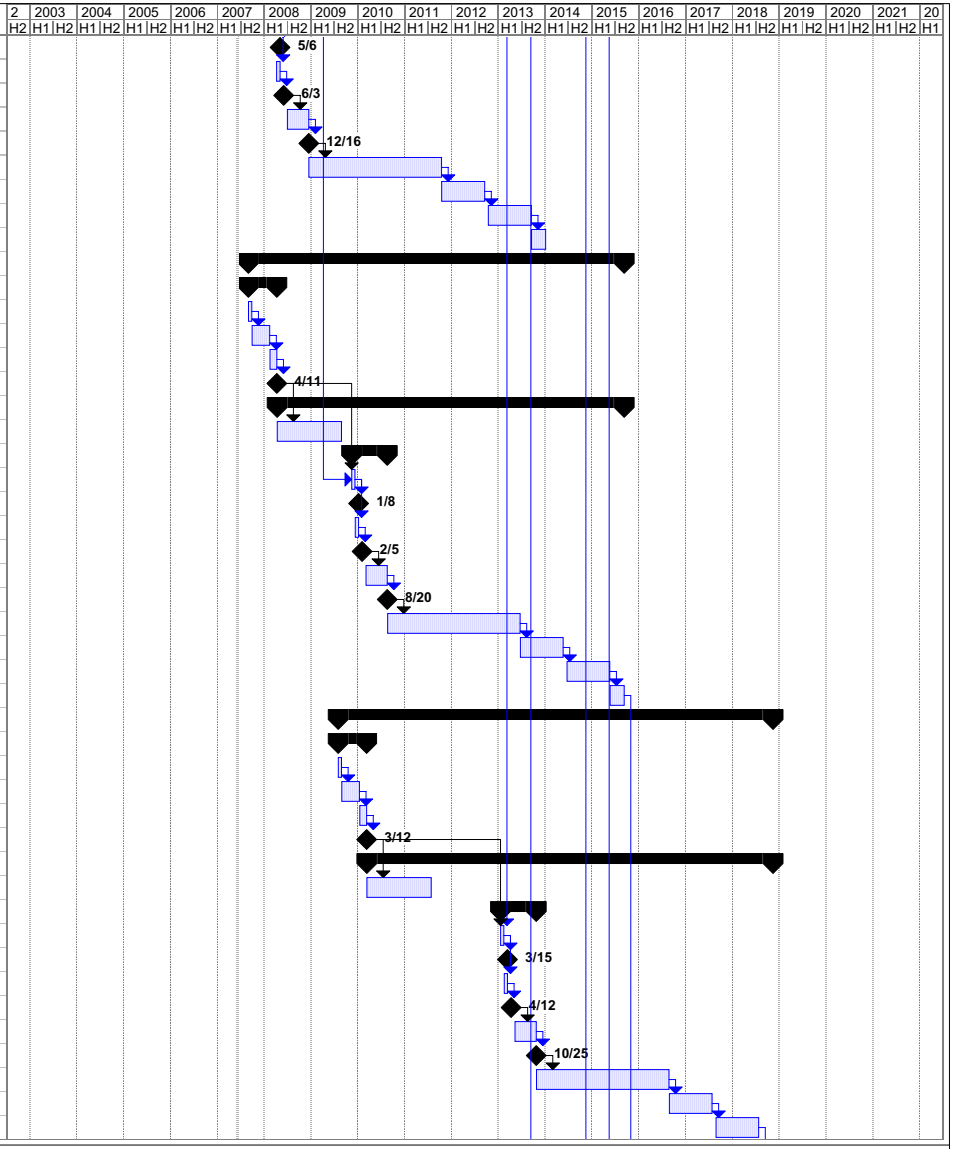
Task | Split | Progress | Milestone | Summary | Project Summary | External Tasks | External Milestone | Deadline

Figure 2. Lower Duwamish Waterway Projected Source Control Schedule

ID	Task Name	Duration	Start	Finish	Successors	Predecessors
139	Owner Operator Response Receive	0 mons	Tue 5/6/08	Tue 5/6/08		138FS+1 mon
140	Search for other PLPs	1 mon	Wed 4/9/08	Tue 5/6/08	141FS+1 mo	138
141	PLP Determination Letter Sent	0 mons	Tue 6/3/08	Tue 6/3/08	142FS+1 mo	140FS+1 mon
142	AO Negotiations	6 mons	Wed 7/2/08	Tue 12/16/08	143	141FS+1 mon
143	AO Negotiations Complete	0 mons	Tue 12/16/08	Tue 12/16/08	144	142
144	Complete RI/FS	37 mons	Wed 12/17/08	Tue 10/18/11	145	143
145	Design and Implement Interim Action	12 mons	Wed 10/19/11	Tue 9/18/12	146FS+1 mo	144
146	Compliance Monitoring	12 mons	Wed 10/17/12	Tue 9/17/13	147	145FS+1 mon
147	Source Control Determination	4 mons	Wed 9/18/13	Tue 1/7/14		146
148	**RM 2.8-2.4 Slip 4 to Seattle Boiler Works**	**104.75 mons**	**Mon 9/3/07**	**Fri 9/11/15**		
149	**SCAP**	**8 mons**	**Mon 9/3/07**	**Fri 4/11/08**		
150	Contract process	1 mon	Mon 9/3/07	Fri 9/28/07	151	
151	Summary of Existing Information and Da	5 mons	Mon 10/1/07	Fri 2/15/08	152	150
152	Write SCAP and Review	2 mons	Mon 2/18/08	Fri 4/11/08	153	151
153	SCAP published	0 mons	Fri 4/11/08	Fri 4/11/08	155,157	152
154	**SC implementation**	**96.75 mons**	**Mon 4/14/08**	**Fri 9/11/15**		
155	SC inspections	18 mons	Mon 4/14/08	Fri 8/28/09		153
156	**AO negotiations**	**10 mons**	**Mon 11/16/09**	**Fri 8/20/10**		
157	Preliminary PLP letter Issued	1 mon	Mon 11/16/09	Fri 12/11/09	158FS+1 mo	153,61SS+6 mons
158	Owner Operator Response Receive	0 mons	Fri 1/8/10	Fri 1/8/10		157FS+1 mon
159	Search for other PLPs	1 mon	Mon 12/14/09	Fri 1/8/10	160FS+1 mo	157
160	PLP Determination Letter Sent	0 mons	Fri 2/5/10	Fri 2/5/10	161FS+1 mo	159FS+1 mon
161	AO Negotiations	6 mons	Mon 3/8/10	Fri 8/20/10	162	160FS+1 mon
162	AO Negotiations Complete	0 mons	Fri 8/20/10	Fri 8/20/10	163	161
163	Complete RI/FS	37 mons	Mon 8/23/10	Fri 6/21/13	164	162
164	Design and Implement Interim Action	12 mons	Mon 6/24/13	Fri 5/23/14	165FS+1 mo	163
165	Compliance Monitoring	12 mons	Mon 6/23/14	Fri 5/22/15	166	164FS+1 mon
166	Source Control Determination	4 mons	Mon 5/25/15	Fri 9/11/15	233	165
167	**Slip 3**	**121.25 mons**	**Mon 8/3/09**	**Fri 11/16/18**		
168	**SCAP**	**8 mons**	**Mon 8/3/09**	**Fri 3/12/10**		
169	Contract process	1 mon	Mon 8/3/09	Fri 8/28/09	170	
170	Summary of Existing Information and Da	5 mons	Mon 8/31/09	Fri 1/15/10	171	169
171	Write SCAP and Review	2 mons	Mon 1/18/10	Fri 3/12/10	172	170
172	SCAP published	0 mons	Fri 3/12/10	Fri 3/12/10	174,176	171
173	**SC implementation**	**113.25 mons**	**Mon 3/15/10**	**Fri 11/16/18**		
174	SC inspections	18 mons	Mon 3/15/10	Fri 7/29/11		172
175	**AO negotiations**	**10 mons**	**Mon 1/21/13**	**Fri 10/25/13**		
176	Preliminary PLP letter Issued	1 mon	Mon 1/21/13	Fri 2/15/13	177FS+1 mo	32,172
177	Owner Operator Response Receive	0 mons	Fri 3/15/13	Fri 3/15/13		176FS+1 mon
178	Search for other PLPs	1 mon	Mon 2/18/13	Fri 3/15/13	179FS+1 mo	176
179	PLP Determination Letter Sent	0 mons	Fri 4/12/13	Fri 4/12/13	180FS+1 mo	178FS+1 mon
180	AO Negotiations	6 mons	Mon 5/13/13	Fri 10/25/13	181	179FS+1 mon
181	AO Negotiations Complete	0 mons	Fri 10/25/13	Fri 10/25/13	182	180
182	Complete RI/FS	37 mons	Mon 10/28/13	Fri 8/26/16	183	181
183	Design and Implement Interim Action	12 mons	Mon 8/29/16	Fri 7/28/17	184FS+1 mo	182
184	Compliance Monitoring	12 mons	Mon 8/28/17	Fri 7/27/18	185	183FS+1 mon



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Task | Progress | Summary | External Tasks | Deadline
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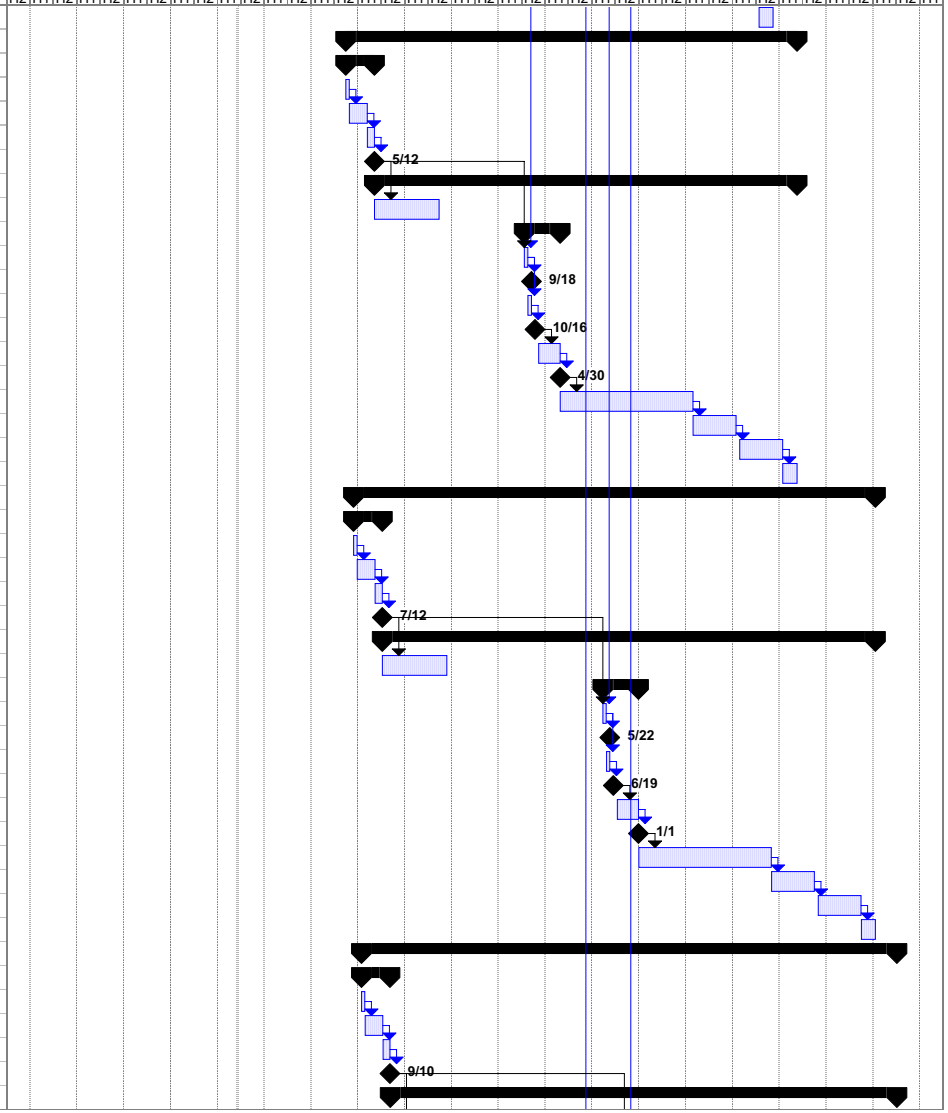
Figure 2. Lower Duwamish Waterway Projected Source Control Schedule

ID	Task Name	Duration	Start	Finish	Successors	Predecessors
185	Source Control Determination	4 mons	Mon 7/30/18	Fri 11/16/18		184
186	**RM 2.0-1.8: Slip 3-Slip 2**	**125.75 mons**	**Thu 10/1/09**	**Wed 5/22/19**		
187	**SCAP**	**8 mons**	**Thu 10/1/09**	**Wed 5/12/10**		
188	Contract process	1 mon	Thu 10/1/09	Wed 10/28/09	189	
189	Summary of Existing Information and Da	5 mons	Thu 10/29/09	Wed 3/17/10	190	188
190	Write SCAP and Review	2 mons	Thu 3/18/10	Wed 5/12/10	191	189
191	SCAP published	0 mons	Wed 5/12/10	Wed 5/12/10	193,195	190
192	**SC implementation**	**117.75 mons**	**Thu 5/13/10**	**Wed 5/22/19**		
193	SC inspections	18 mons	Thu 5/13/10	Wed 9/28/11		191
194	**AO negotiations**	**10 mons**	**Thu 7/25/13**	**Wed 4/30/14**		
195	Preliminary PLP letter Issued	1 mon	Thu 7/25/13	Wed 8/21/13	196FS+1 mo	109,191
196	Owner Operator Response Receive	0 mons	Wed 9/18/13	Wed 9/18/13		195FS+1 mon
197	Search for other PLPs	1 mon	Thu 8/22/13	Wed 9/18/13	198FS+1 mo	195
198	PLP Determination Letter Sent	0 mons	Wed 10/16/13	Wed 10/16/13	199FS+1 mo	197FS+1 mon
199	AO Negotiations	6 mons	Thu 11/14/13	Wed 4/30/14	200	198FS+1 mon
200	AO Negotiations Complete	0 mons	Wed 4/30/14	Wed 4/30/14	201	199
201	Complete RI/FS	37 mons	Thu 5/1/14	Wed 3/1/17	202	200
202	Design and Implement Interim Action	12 mons	Thu 3/2/17	Wed 1/31/18	203FS+1 mo	201
203	Compliance Monitoring	12 mons	Thu 3/1/18	Wed 1/30/19	204	202FS+1 mon
204	Source Control Determination	4 mons	Thu 1/31/19	Wed 5/22/19		203
205	**RM 1.7-1.3 Glacier NW**	**145.45 mons**	**Tue 12/1/09**	**Fri 1/22/21**		
206	**SCAP**	**8 mons**	**Tue 12/1/09**	**Mon 7/12/10**		
207	Contract process	1 mon	Tue 12/1/09	Mon 12/28/09	208	
208	Summary of Existing Information and Da	5 mons	Tue 12/29/09	Mon 5/17/10	209	207
209	Write SCAP and Review	2 mons	Tue 5/18/10	Mon 7/12/10	210	208
210	SCAP published	0 mons	Mon 7/12/10	Mon 7/12/10	212,214	209
211	**SC implementation**	**137.45 mons**	**Tue 7/13/10**	**Fri 1/22/21**		
212	SC inspections	18 mons	Tue 7/13/10	Mon 11/28/11		210
213	**AO negotiations**	**10 mons**	**Mon 3/30/15**	**Fri 1/1/16**		
214	Preliminary PLP letter Issued	1 mon	Mon 3/30/15	Fri 4/24/15	215FS+1 mo	210,70
215	Owner Operator Response Receive	0 mons	Fri 5/22/15	Fri 5/22/15		214FS+1 mon
216	Search for other PLPs	1 mon	Mon 4/27/15	Fri 5/22/15	217FS+1 mo	214
217	PLP Determination Letter Sent	0 mons	Fri 6/19/15	Fri 6/19/15	218FS+1 mo	216FS+1 mon
218	AO Negotiations	6 mons	Mon 7/20/15	Fri 1/1/16	219	217FS+1 mon
219	AO Negotiations Complete	0 mons	Fri 1/1/16	Fri 1/1/16	220	218
220	Complete RI/FS	37 mons	Mon 1/4/16	Fri 11/2/18	221	219
221	Design and Implement Interim Action	12 mons	Mon 11/5/18	Fri 10/4/19	222FS+1 mo	220
222	Compliance Monitoring	12 mons	Mon 11/4/19	Fri 10/2/20	223	221FS+1 mon
223	Source Control Determination	4 mons	Mon 10/5/20	Fri 1/22/21		222
224	**Slip 1/Manson**	**149.25 mons**	**Mon 2/1/10**	**Fri 7/9/21**		
225	**SCAP**	**8 mons**	**Mon 2/1/10**	**Fri 9/10/10**		
226	Contract process	1 mon	Mon 2/1/10	Fri 2/26/10	227	
227	Summary of Existing Information and Da	5 mons	Mon 3/1/10	Fri 7/16/10	228	226
228	Write SCAP and Review	2 mons	Mon 7/19/10	Fri 9/10/10	229	227
229	SCAP published	0 mons	Fri 9/10/10	Fri 9/10/10	231,233	228
230	**SC implementation**	**141.25 mons**	**Mon 9/13/10**	**Fri 7/9/21**		



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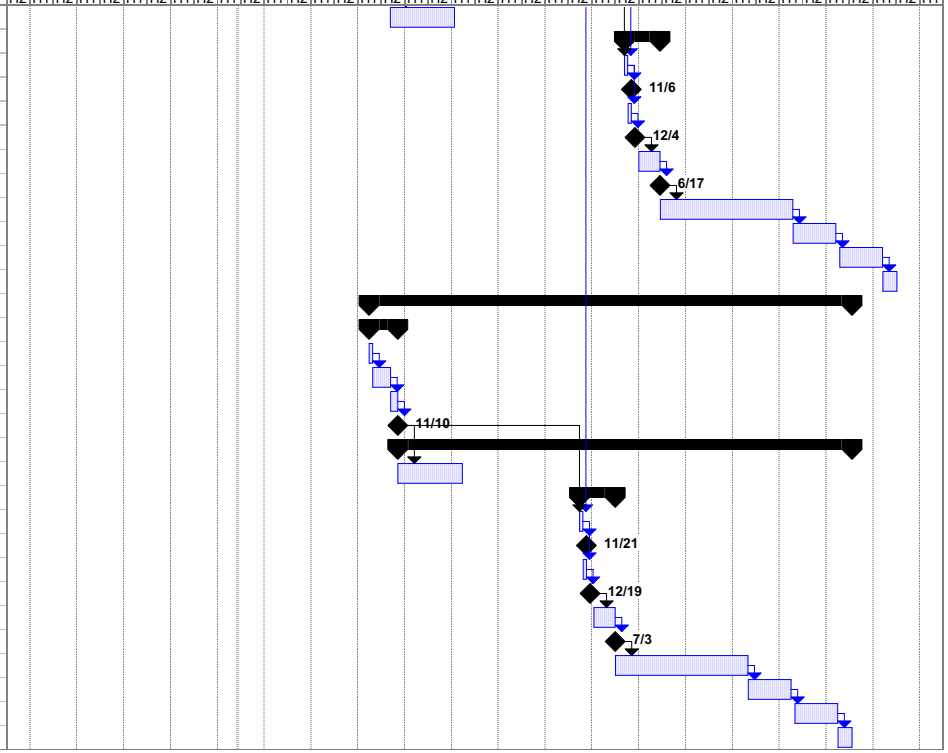
Task | Split | Progress | Milestone | Summary | Project Summary | External Tasks | External Milestone | Deadline

Figure 2. Lower Duwamish Waterway Projected Source Control Schedule

ID	Task Name	Duration	Start	Finish	Successors	Predecessors
231	SC inspections	18 mons	Mon 9/13/10	Fri 1/27/12		229
232	**AO negotiations**	**10 mons**	**Mon 9/14/15**	**Fri 6/17/16**		
233	Preliminary PLP letter Issued	1 mon	Mon 9/14/15	Fri 10/9/15	234FS+1 mo	166,229
234	Owner Operator Response Receive	0 mons	Fri 11/6/15	Fri 11/6/15		233FS+1 mon
235	Search for other PLPs	1 mon	Mon 10/12/15	Fri 11/6/15	236FS+1 mo	233
236	PLP Determination Letter Sent	0 mons	Fri 12/4/15	Fri 12/4/15	237FS+1 mo	235FS+1 mon
237	AO Negotiations	6 mons	Mon 1/4/16	Fri 6/17/16	238	236FS+1 mon
238	AO Negotiations Complete	0 mons	Fri 6/17/16	Fri 6/17/16	239	237
239	Complete RI/FS	37 mons	Mon 6/20/16	Fri 4/19/19	240	238
240	Design and Implement Interim Action	12 mons	Mon 4/22/19	Fri 3/20/20	241FS+1 mo	239
241	Compliance Monitoring	12 mons	Mon 4/20/20	Fri 3/19/21	242	240FS+1 mon
242	Source Control Determination	4 mons	Mon 3/22/21	Fri 7/9/21		241
243	**Ash Grove Cement**	**134.6 mons**	**Thu 4/1/10**	**Fri 7/24/20**		
244	**SCAP**	**8 mons**	**Thu 4/1/10**	**Wed 11/10/10**		
245	Contract process	1 mon	Thu 4/1/10	Wed 4/28/10	246	
246	Summary of Existing Information and Da	5 mons	Thu 4/29/10	Wed 9/15/10	247	245
247	Write SCAP and Review	2 mons	Thu 9/16/10	Wed 11/10/10	248	246
248	SCAP published	0 mons	Wed 11/10/10	Wed 11/10/10	250,252	247
249	**SC implementation**	**126.6 mons**	**Thu 11/11/10**	**Fri 7/24/20**		
250	SC inspections	18 mons	Thu 11/11/10	Wed 3/28/12		248
251	**AO negotiations**	**10 mons**	**Mon 9/29/14**	**Fri 7/3/15**		
252	Preliminary PLP letter Issued	1 mon	Mon 9/29/14	Fri 10/24/14	253FS+1 mo	51,248
253	Owner Operator Response Receive	0 mons	Fri 11/21/14	Fri 11/21/14		252FS+1 mon
254	Search for other PLPs	1 mon	Mon 10/27/14	Fri 11/21/14	255FS+1 mo	252
255	PLP Determination Letter Sent	0 mons	Fri 12/19/14	Fri 12/19/14	256FS+1 mo	254FS+1 mon
256	AO Negotiations	6 mons	Mon 1/19/15	Fri 7/3/15	257	255FS+1 mon
257	AO Negotiations Complete	0 mons	Fri 7/3/15	Fri 7/3/15	258	256
258	Complete RI/FS	37 mons	Mon 7/6/15	Fri 5/4/18	259	257
259	Design and Implement Interim Action	12 mons	Mon 5/7/18	Fri 4/5/19	260FS+1 mo	258
260	Compliance Monitoring	12 mons	Mon 5/6/19	Fri 4/3/20	261	259FS+1 mon
261	Source Control Determination	4 mons	Mon 4/6/20	Fri 7/24/20		260



Project: Project0 in Untitled
Date: Mon 6/4/07

Task | Progress | Summary | External Tasks | Deadline
Split | Milestone | Project Summary | External Milestone

Figure 2. Lower Duwamish Waterway Projected Source Control Schedule

Lower Duwamish Waterway

Figure 3
Businesses Inspected
March 2003 - December 2006

Legend

Streams
Culvert
Open channel

Combined sewer service area
Slip 4 drainage basin
Slip 5
Slip 6

Diagonal/Duwamish source area
Lower Duwamish surface drainage basin

Screening visit
Full inspection
Follow-up inspection (Mar 2003 - June 2005)
Follow-up inspection (July 2005 - June 2006)

Note: Locations where dots and solid colors overlap are in the partially separated drainage/sewer system.

0.2 0 0.2 0.4 0.6 0.8 1 Miles

Produced by the City of Seattle

Elliott Bay
Harbor Island
Lake Washington
Puget Sound
Turning Basin
E MADISON ST
E CHERRY ST
S JACKSON ST
E MARGINAL WY S
1ST AV S
4TH AV S
6TH AV S
15TH AV S
M L KING JR WY S
BEACON AV S
50TH AV S
RAINIER AV S
AIRPORT WY S
PACIFIC HY S
35TH AV SW
W MARGINAL WY SW
DELRIDGE WY SW
16TH AV SW
9TH AV SW
S 112TH ST
SW 116TH ST
SW 128TH ST

Figure 3. King County and SPU Source Control Business Inspections

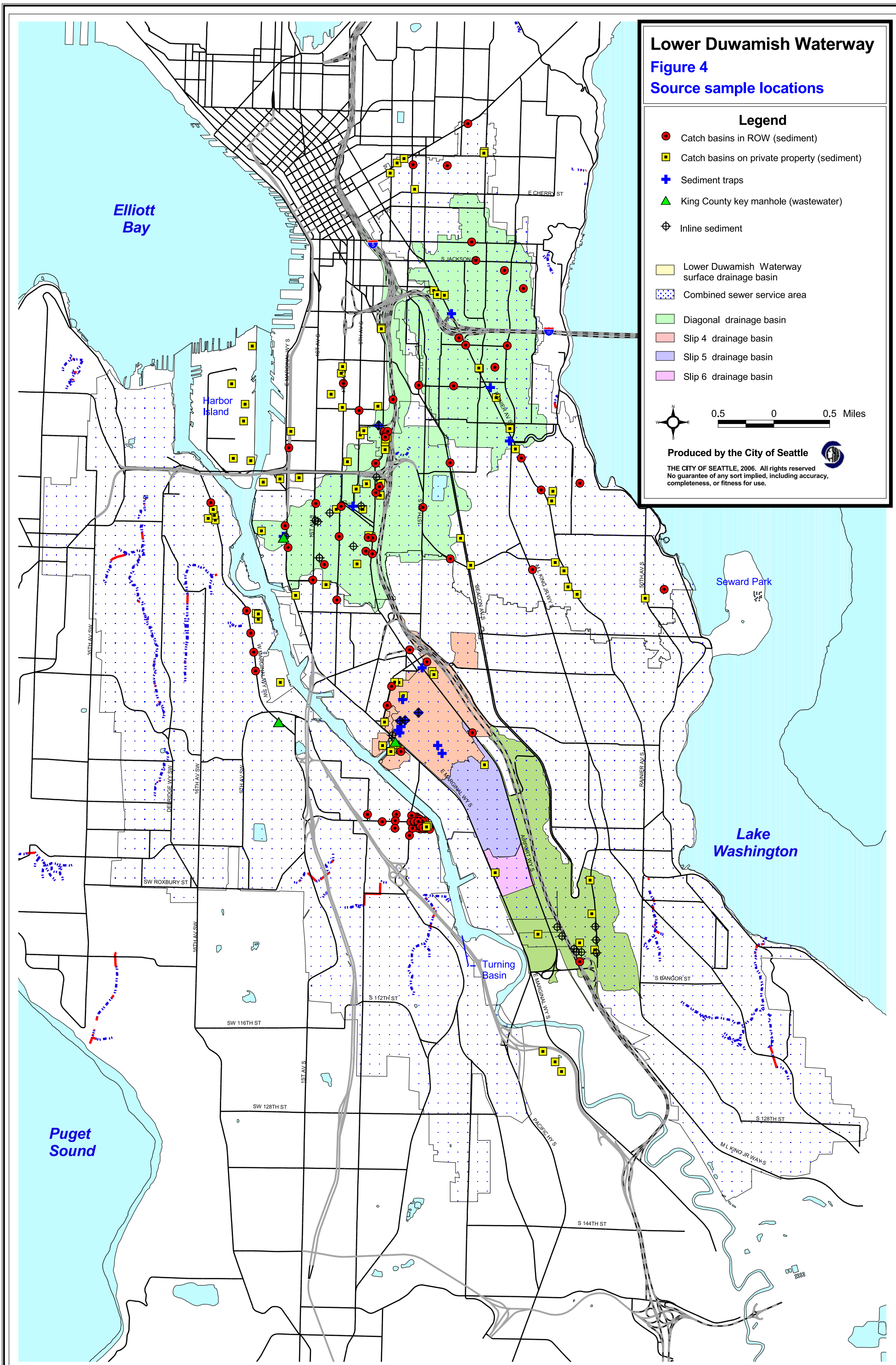


Figure 4. Source Tracing Sample Locations

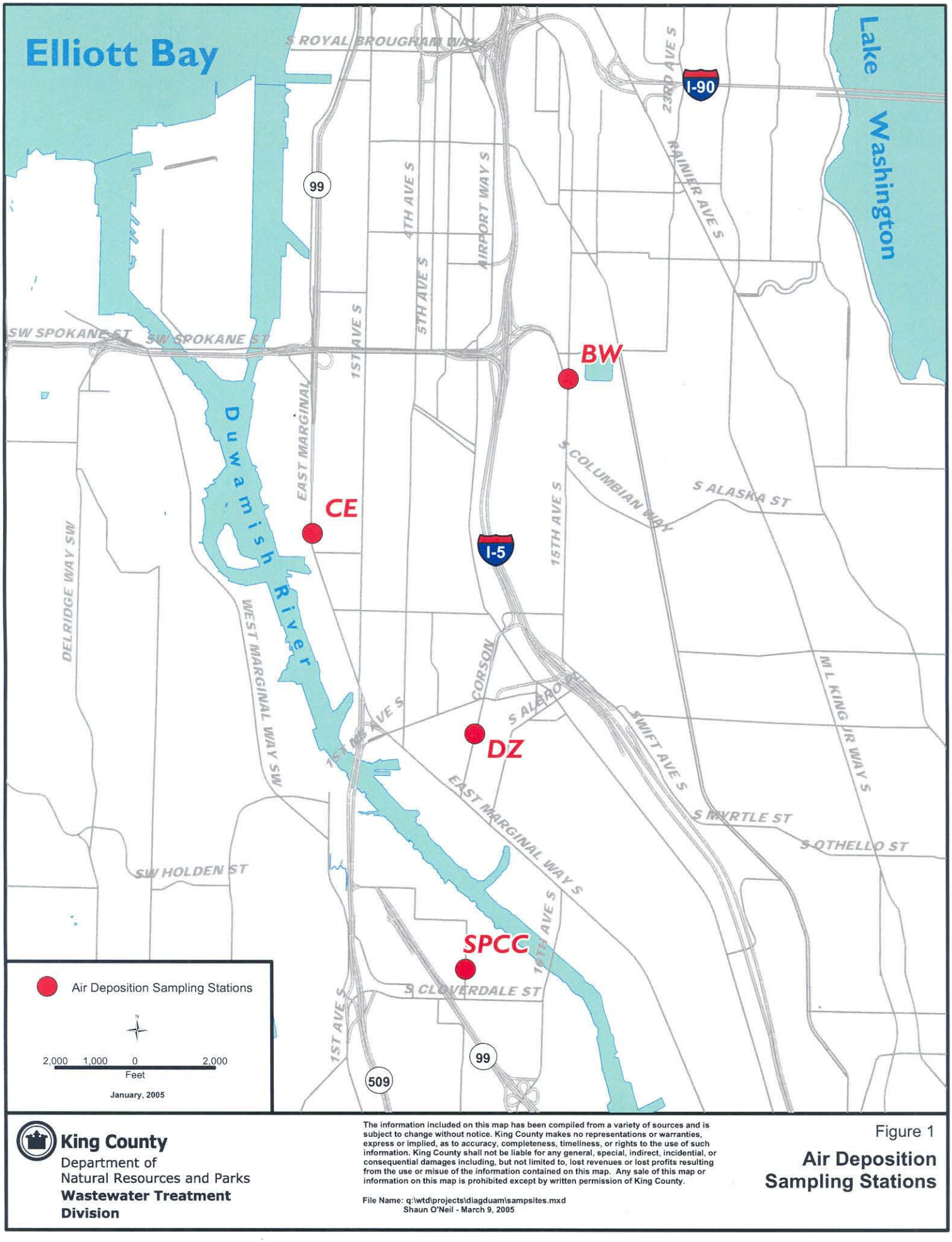


Figure 5. Air Deposition Sampling Locations

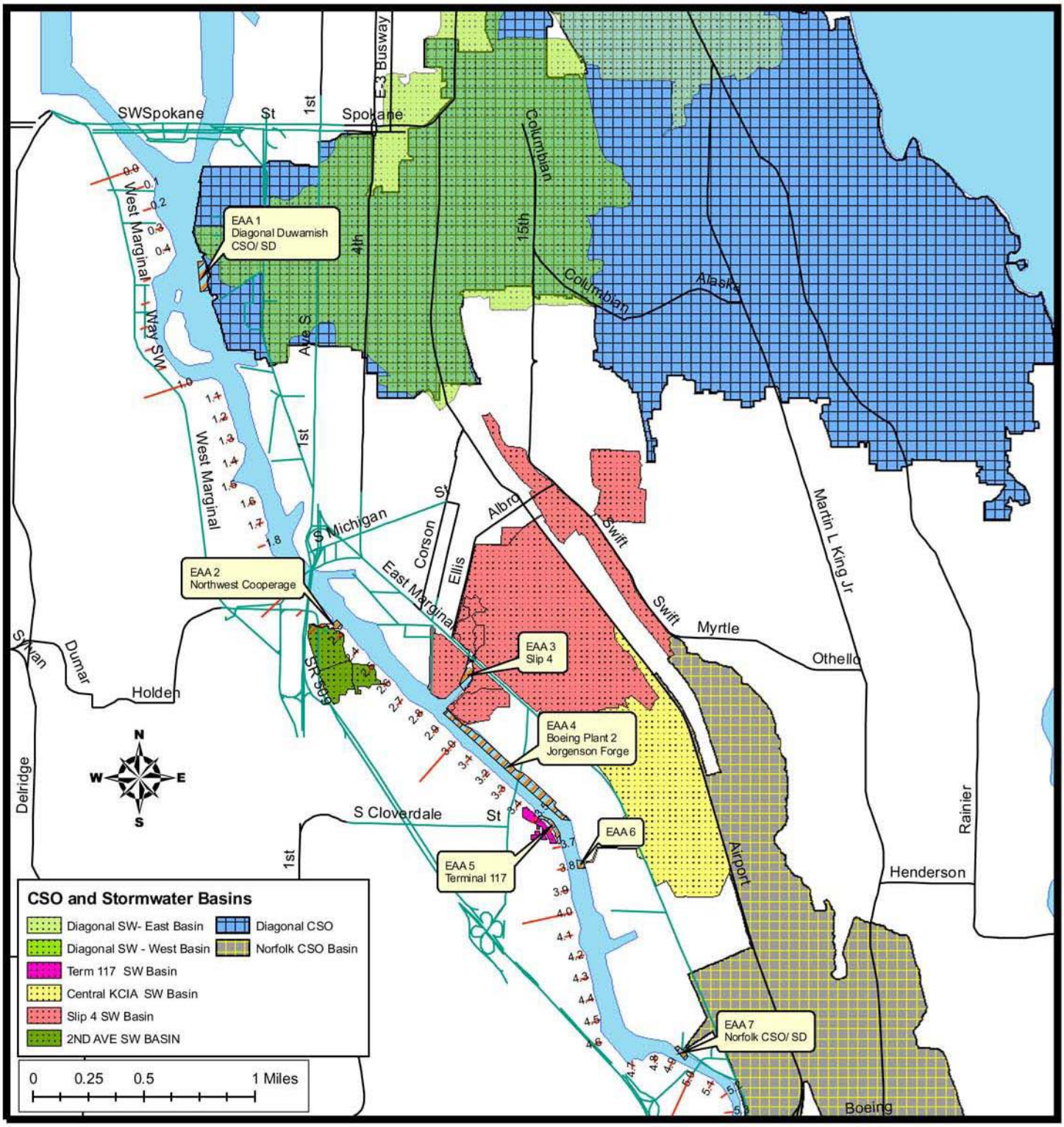
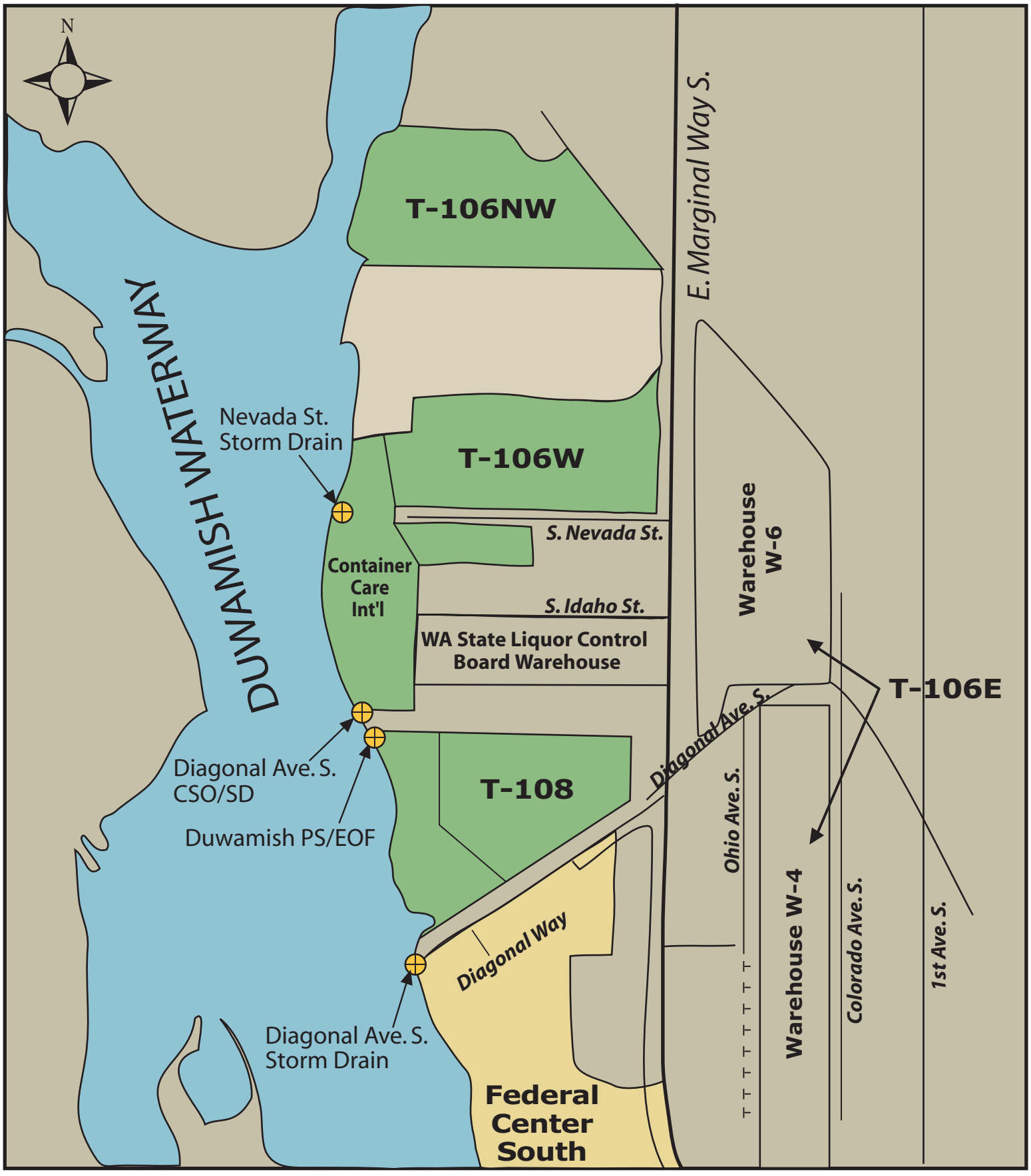


Figure 6. Lower Duwamish Waterway Early Action Areas



LEGEND

- Publicly-owned storm drain or CSO
- Port of Seattle
- Federal Ctr South

NOT TO SCALE

Figure 7. Upland Property Locations, Duwamish/Diagonal

SAIC® An Employee-Owned Company

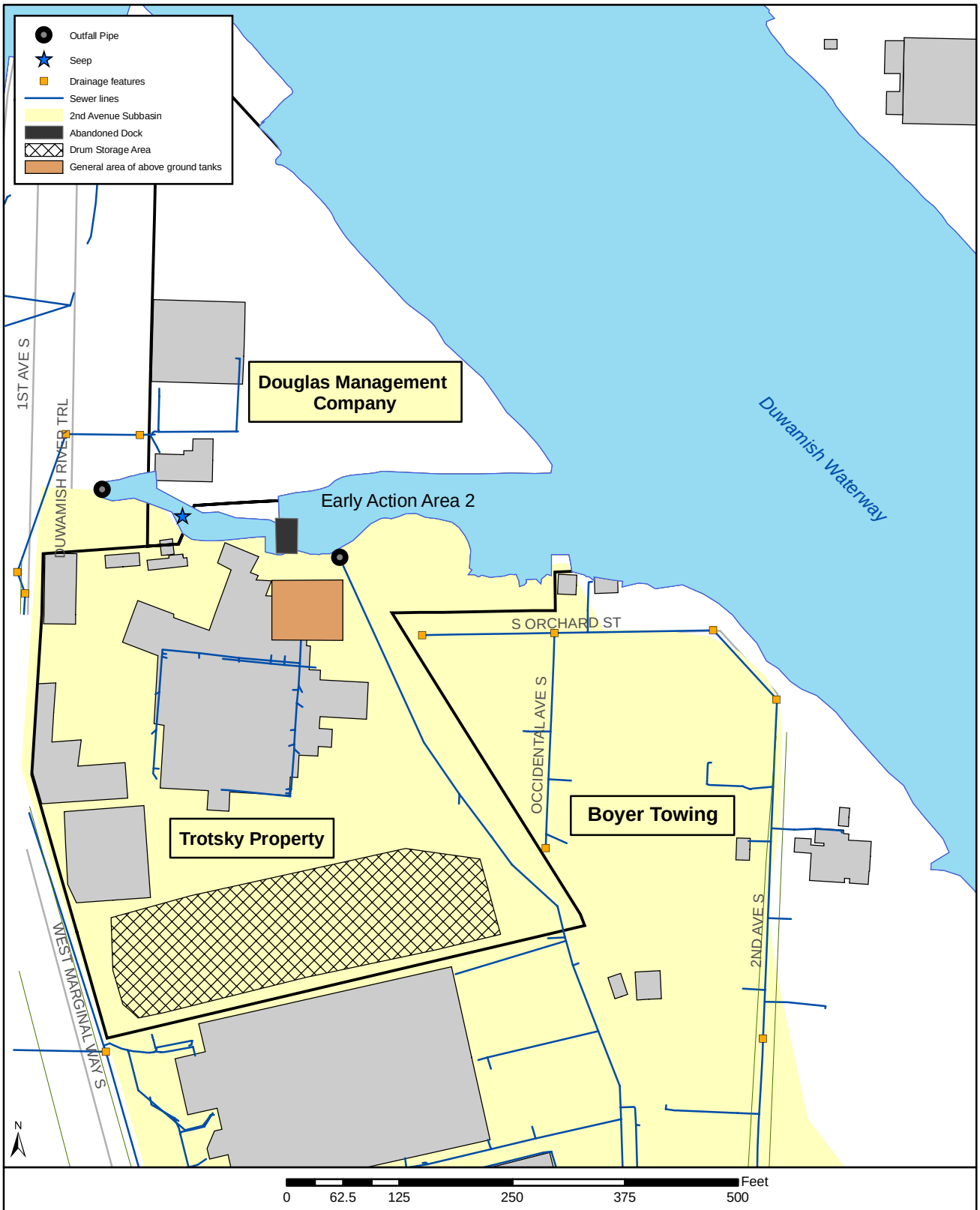


Figure 8. Adjacent Properties — Early Action Area 2

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Figure 9. Slip 4 Adjacent and Upland Properties

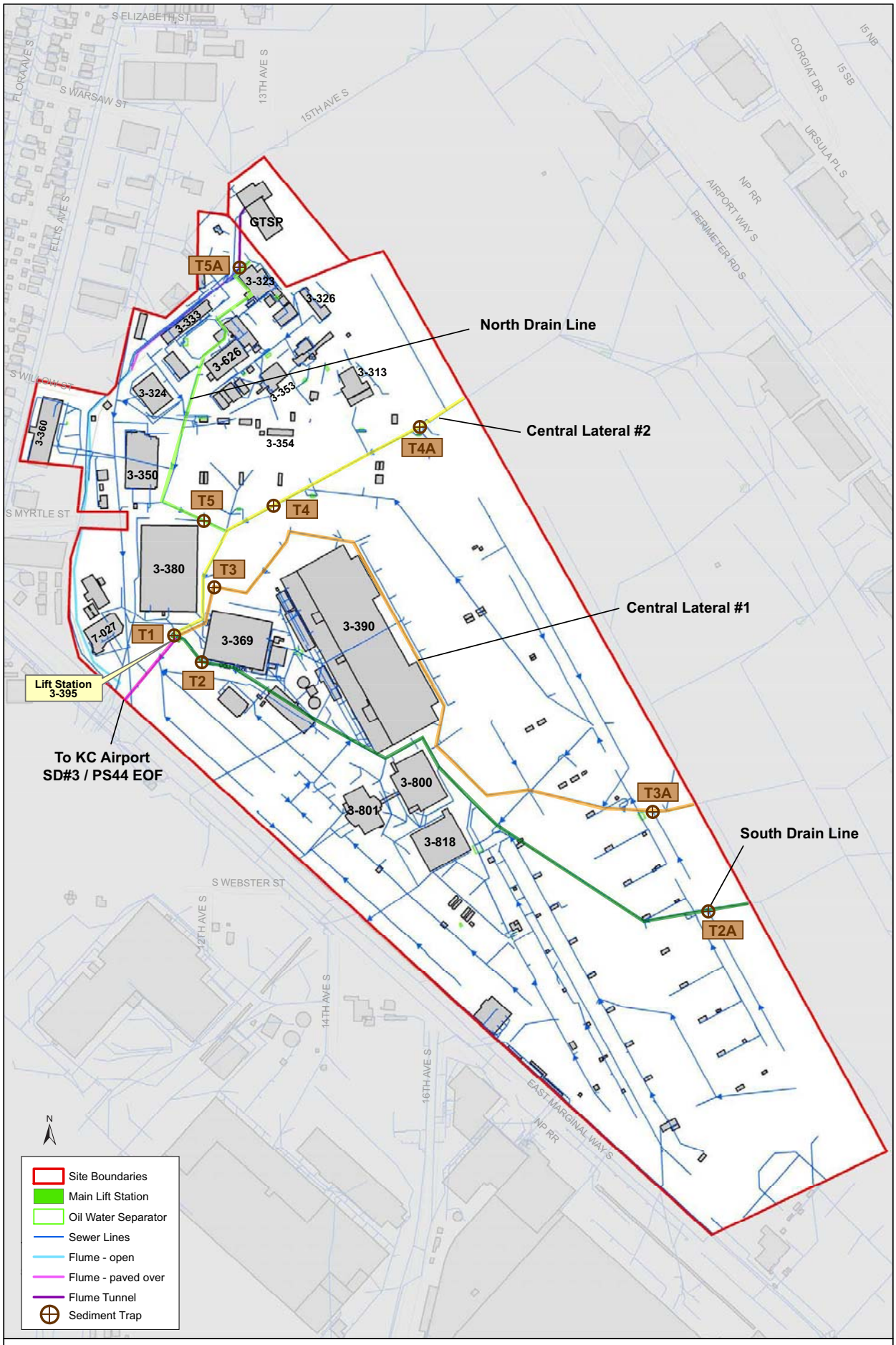
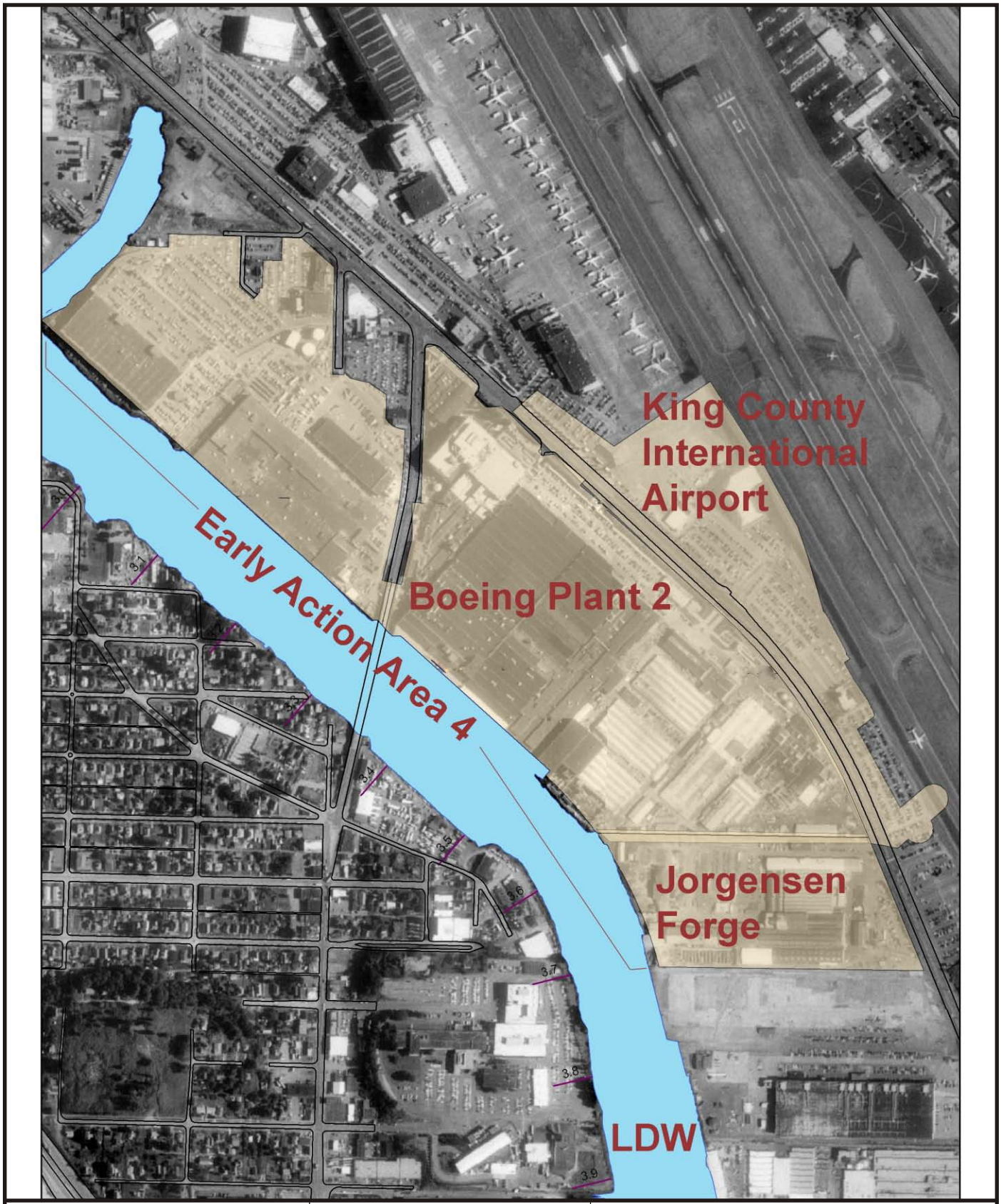


Figure 10. Slip 4 Sediment Trap Locations



ecology and environment, inc.
International Specialists in the Environment
Seattle, Washington

LOWER DUWAMISH WATERWAY
EARLY ACTION AREA 4
Seattle, Washington

Figure 2
EAA 4 DRAINAGE BASIN AND
POTENTIAL SOURCES OF CONTAMINATION

Base Map Reference: ?

Date: 4-13-07 | Drawn by: AES | 10:002330WD0702\fig 2

Figure 11. Early Action Area 4 Drainage Basin

X:\duwamish\sitemap_052004.mxd May 20, 2004

LEGEND

- Parcel Boundary
- T-117 Property Boundary

0 200 400 800 1,200 Feet

0 50 100 200 300 Meters

N

Figure 12. Terminal 117 Site Vicinity

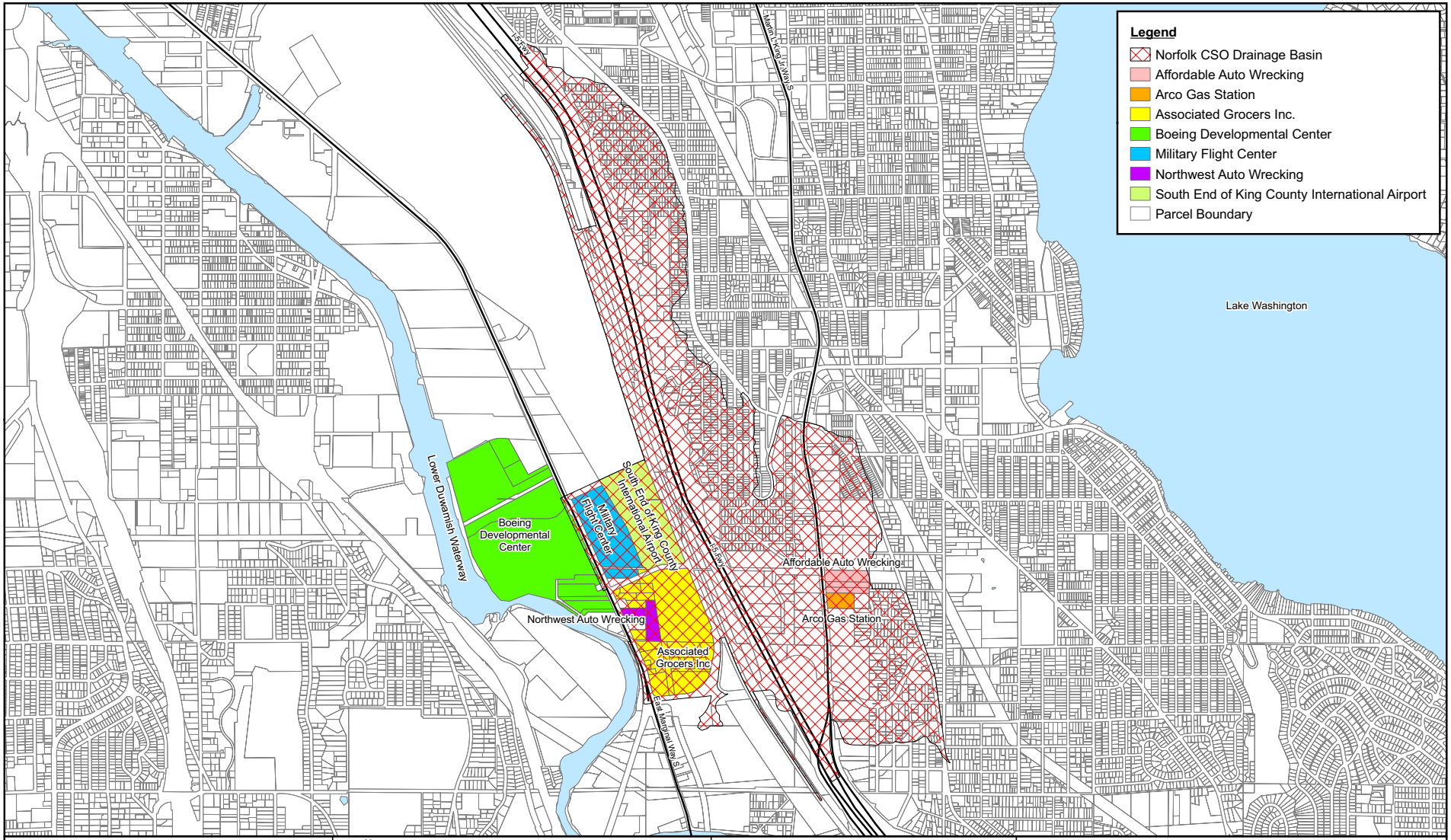


Figure 13. Early Action Area 7

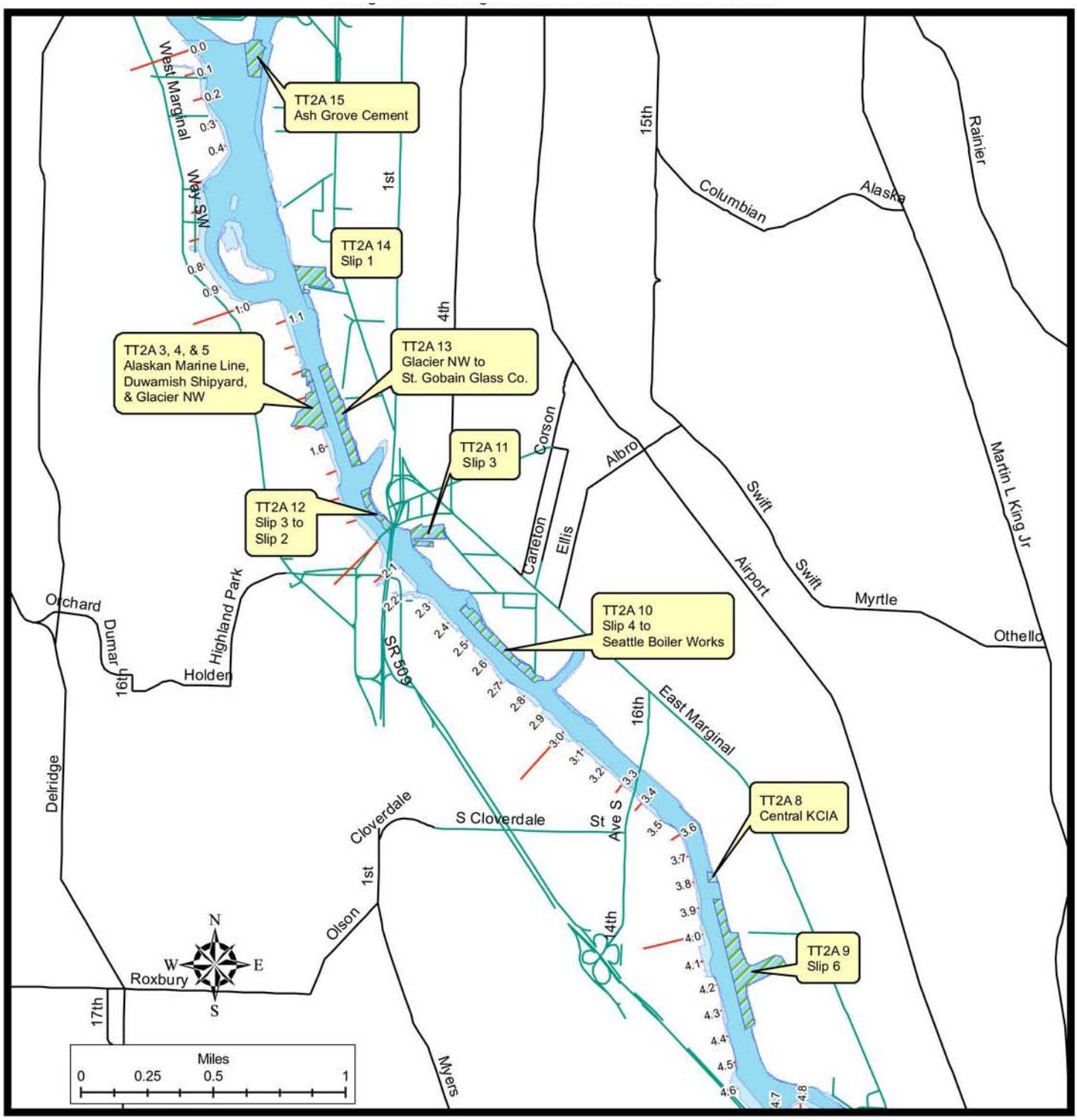


Figure 14. Tentative Tier 2 Areas

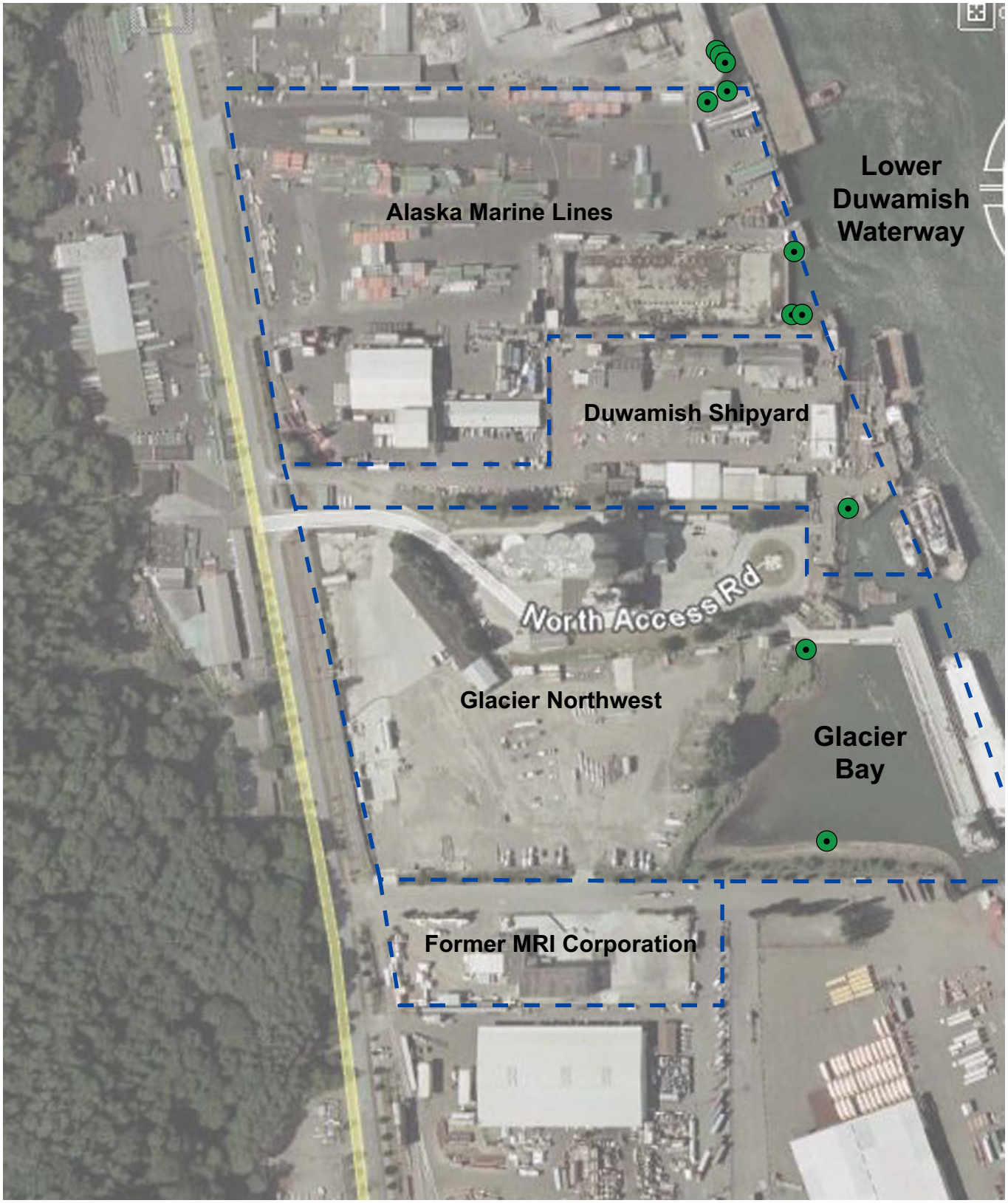


Figure 15. Glacier Bay Source Control Area