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# FINAL

# INVESTIGATION DATA SUMMARY REPORT

**JORGENSEN FORGE FACILITY**
**8531 EAST MARGINAL WAY SOUTH**
**SEATTLE, WASHINGTON**
**U.S. EPA DOCKET NO. CERCLA 10-2003-0111**

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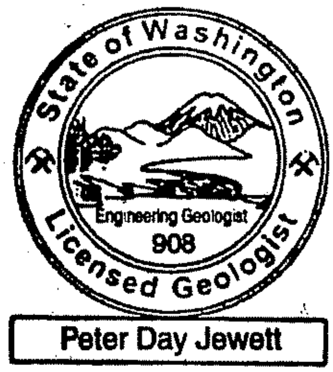


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## ACRONYMS AND ABBREVIATIONS

| | |
|---|---|
| ACOE | U.S. Army Corps of Engineers |
| Anchor | Anchor Environmental, L.L.C. |
| AOC | Administrative Order on Consent (for this Investigation Data Summary Report the AOC refers to the U.S. Environmental Protection Agency Docket No. CERCLA 10-2003-0111) |
| APS | Applied Professional Services of North Bend, Washington |
| Baseline Permit | National Pollutant Discharge Elimination System Industrial Stormwater General Permit No. SO3-001196 |
| bgs | below ground surface |
| BMPs | best management practices |
| Boeing | The Boeing Company |
| cm | centimeter |
| CSL | Cleanup Screening Level |
| Ecology | Washington State Department of Ecology |
| EMJ | Earle M. Jorgensen Company |
| EPA | U.S. Environmental Protection Agency |
| Farallon | Farallon Consulting, L.L.C. |
| FSP | Field Sampling Plan |
| Jorgensen Forge | Jorgensen Forge Corporation |
| KCIA | King County International Airport |
| LDW | Lower Duwamish Waterway |
| LDWG | Lower Duwamish Waterway Group |
| LAET | lowest apparent effect threshold |
| 2LAET | upper lowest apparent effect threshold |
| LNAPL | light nonaqueous-phase liquid |
| metals | arsenic, cadmium, chromium, copper, lead, mercury, nickel, silver, and zinc |
| mg/kg | milligrams per kilogram |
| MHHW | mean higher high water |
| MLLW | mean lower low water |
| MTCA | Washington State Department of Ecology (Ecology) Model Toxics Control Act Cleanup Regulation |
| NPDES | National Pollutant Discharge Elimination System |

| | |
|---|---|
| OC | organic carbon |
| PCBs | polychlorinated biphenyls |
| PQL | practical quantitation limit |
| QAPP | Quality Assurance Project Plan |
| QA/QC | quality assurance/quality control |
| Report | Investigation Data Summary Report |
| RI | Remedial Investigation |
| Site | Jorgensen Forge Facility, 8531 East Marginal Way South, Seattle, Washington |
| SMS | Sediment Management Standards |
| SQS | Sediment Quality Standards |
| STL | Severn Trent Laboratories |
| TOC | total organic carbon |
| TS | total solids |
| Weston | Weston Solutions, Inc. |
| Windward | Windward Environmental, L.L.C. |
| Work Plan | Environmental Sampling Work Plan |
| Work Plan Addendum | Environmental Sampling Work Plan Addendum |

# 1.0 INTRODUCTION

This Final Investigation Data Summary Report (Report) has been prepared on behalf of Earle M. Jorgensen Company (EMJ) by Farallon Consulting, L.L.C. (Farallon) and Anchor Environmental, L.L.C. (Anchor). The Report provides a summary of the results of the investigation completed at the Jorgensen Forge Facility located at 8531 East Marginal Way South in Seattle, Washington (herein referred to as the Site) (Figure 1). The Site currently is owned by Jorgensen Forge Corporation (Jorgensen Forge) and formerly was owned by EMJ and by others. The investigation was conducted in accordance with the requirements of the Statement of Work attached to the Administrative Order on Consent U.S. EPA Docket No. CERCLA 10-2003-0111 (AOC) entered into by and between the U.S. Environmental Protection Agency (EPA) and EMJ (EPA 2003b).

The Draft Investigation Data Summary Report was submitted to EPA on October 10, 2005 in accordance with the requirements of the AOC. EPA reviewed the Draft Investigation Data Summary Report and provided comments in the letter regarding *Jorgensen Forge Facility, Administrative Order on Consent, U.S. EPA Docket No CERCLA 10-2003-01111, Draft Investigation Data Summary Report*, dated January 18, 2006. A copy of the letter is included in Appendix A. A Technical Memorandum prepared by Farallon and Anchor regarding *Response to EPA Comments Dated January 18, 2006, Jorgensen Forge Facility, Administrative Order on Consent, U.S. EPA Docket No CERCLA 10-2003-01111*, dated February 13, 2006, provided responses to the comments provided by EPA on the Draft Investigation Data Summary Report. A copy of the Technical Memorandum is included in Appendix A.

## 1.1 PURPOSE

The AOC directs EMJ to determine whether the current and/or former operations on the Site are or have been a source of polychlorinated biphenyls (PCBs) and metals to the sediment in the Lower Duwamish Waterway (LDW); to determine the nature and extent of hazardous substances that may have been released at or from the Site; and to determine the threat to public health, welfare, or the environment from any such release or threatened release of hazardous substances at or from the Site. This Report presents the results of several phases of Site investigation activities that were completed to make these determinations.

## 1.2 SCOPE OF WORK

The scope of work for the Site investigation was developed in accordance with the requirements of the AOC-related Statement of Work, and was conducted in three phases. The first phase included review, evaluation, and compilation of available Site information to identify potential sources of PCBs from current or historical operations at the Site to define potential contaminant pathways from the Site to sediments in the adjacent LDW, and to define data gaps in the information necessary to determine whether migration of contaminants from the Site has resulted in adverse impacts to sediment quality in the LDW adjacent to the Site. The results of the first phase of the investigation did not identify any evidence that PCBs have been, or are, used on the

Site except for dielectric fluid in electric transformers. The results also yielded insufficient data to determine whether erosion of historical fill on the shoreline bank or stormwater discharge from the Site was a source of contamination to sediments. The Second Draft Environmental Sampling Work Plan (Work Plan) summarized the results of the first phase of the investigation and included a scope of work for investigating the data gaps (Farallon 2004). The Work Plan was reviewed and approved by EPA (EPA 2004a).

The second phase of the Site investigation was conducted in accordance with the scope of work presented in the approved Work Plan. It also included a modification by EPA that the environmental sampling analysis include arsenic, cadmium, chromium, copper, lead, mercury, nickel, silver, and zinc (collectively referred to herein as metals) and that debris piles located at the toe of the bank adjacent to the Site be sampled (EPA 2004b). The second phase included collection and analysis of samples of shoreline debris piles, shoreline bank-face fill, soil/fill from borings located near the top of the shoreline bank, and solids in the stormwater catch basins. The analytical results detected concentrations of PCBs and metals above the screening levels defined in the Work Plan in the fill located along the shoreline, and in solids collected from four catch basins located on the western, central, and eastern portions of the Site. To further evaluate the source of the PCBs and metals detected in the fill and in the solids in the catch basins, additional sampling and analysis was necessary to meet the requirements of the AOC.

The results of the second phase of the Site investigation, and of sediment investigations in the LDW adjacent to the Site conducted in 2004 on behalf of The Boeing Company (Boeing) and the EPA/U.S. Army Corps of Engineers (ACOE) (unpublished) were reviewed with EPA to develop the scope of work for the third phase of the Site investigation. The scope of work for the third phase was provided in the Second Draft Environmental Sampling Work Plan Addendum (Work Plan Addendum), which was reviewed and approved by EPA (Anchor 2005). The third phase of the investigation included collection and analysis of nearshore surface and subsurface sediment samples in the LDW adjacent to the Site for analysis for PCBs and metals. The preliminary results of the third phase of the investigation have been discussed with EPA and the Washington State Department of Ecology (Ecology); the final validated results and discussion of the results are presented herein.

## 1.3 ORGANIZATION OF INVESTIGATION DATA SUMMARY REPORT

This Report provides a summary of the investigation completed at the Site to meet the requirements of the AOC-related Statement of Work. It is divided into the following sections:

**Section 2** – Section 2 provides a description of the Site and Site development; a summary of Site operations; a discussion of physical conditions, including topography, geology, hydrogeology; and a discussion of the on-Site stormwater conveyance system;

**Section 3** – Section 3 provides a summary of the first phase of the investigation;

**Section 4** – Section 4 provides a summary of the second phase of the investigation;

**Section 5** – Section 5 provides a summary of the third phase of the investigation;

**Section 6** – Section 6 provides an evaluation of the Site conceptual model, and PCB and metals migration pathways;

**Section 7** – Section 7 confirms that the objectives of the AOC were fulfilled through the various Site investigation activities; and

**Section 8** – Section 8 presents the references cited in the text.

# 2.0 SITE INFORMATION

The information provided in Section 2 was compiled during the first phase of the investigation, and is described in detail in the Work Plan. The following subsections provide an overview of the Site description, Site development, Site operations, on-Site stormwater conveyance system, topography, geology, hydrogeology, groundwater analytical data, and LDW characteristics.

## 2.1 SITE DESCRIPTION

The Site occupies approximately 20 upland acres between Slip 4 and Slip 6 on the east bank of the LDW at approximately LDW River Mile marker 3.6, at 8531 East Marginal Way South in Seattle, Washington (Figure 1). The Site is located in Section 42, Township 24 North, Range 4 East, Willamette Meridian in King County, Washington.

The Site is developed and includes a 124,128-square foot building of prefabricated steel, slab-on-grade construction that houses a machine shop area, forge shop area, and melt shop area (Figure 2). An aluminum heat treating area, a former power house, and a rectifier room are located on the southeastern corner of the Site. A wood-frame office building is located on the northeastern side of the Site. The central portion of the Site is covered with concrete, and is used for storage of finished product, unused equipment, and materials. A wood-frame laboratory building is located in this area (Figure 2).

A scrap metal storage area is located on the southern side of the Site in an area that is paved with asphalt or concrete. Recycled scrap metal is stored in ecology-block bins pending use in the manufacturing process. The majority of the Site is covered with impermeable surfaces that consist of asphalt, concrete paving, and buildings. Portions of the ground surface along the western and northwestern areas of the Site are covered with gravel.

## 2.2 SITE DEVELOPMENT

Decades ago, fill was placed in a large embayment that was located on the western portion of the Site (Figure B-1, Appendix B). At the time the Work Plan was prepared, the exact year the embayment was filled could not be determined with precision, but was estimated based on a historical review to have occurred sometime between 1936 and 1946 (Farallon 2004). Subsequent to preparation of the Work Plan, the report *Aerial Photographic Analysis of Jorgensen Forge Corporation/Duwamish Waterway* was reviewed. The report indicated that the embayment had been filled between May 1942 and 1946 (EPA 2003a). The source of the fill may be the result historical hydraulic dredging conducted in the LDW by the ACOE or unknown upland sources. Aerial photograph review showed a similar inlet to the south along the current Boeing (former Isaacson/Thompson) property and in the vicinity of the Boeing Isaacson combined sewer overflow.

## 2.3 SITE OPERATIONS

The Site was developed in 1942, and operated from 1942 to 1965 as a fabricator of structural steel, and tractor and road equipment. On-Site operations included forging, heat-treating, and galvanizing by Isaacson Iron Works, which operated as a U.S. naval vessel manufacturer. Bethlehem Steel operated a steel distribution center on the northwestern portion of the Site from approximately 1951 to 1963. Bethlehem Steel operations consisted of cutting prefabricated steel rods to customers' specifications. From 1965 to 1992, the Site was owned and operated by EMJ. From 1992 to the present, the Site has been owned and operated by Jorgensen Forge.

Jorgensen Forge currently manufactures (and EMJ formerly manufactured) precision-machined forgings from material grades, including carbon and low-alloy steels, duplex stainless grades, aluminum alloys, titanium alloys, and nickel-base alloys for the commercial aircraft, aerospace, energy (i.e., oil exploration), power generation, automotive, and shipbuilding industries. Smelting activities did not and do not occur at the Site. Nor was raw metal previously or currently stored on-Site. Plant operations are housed in one large building, which contains melting, forging, heat-treating, and machining operations.

## 2.4 ON-SITE STORMWATER CONVEYANCE SYSTEM

Stormwater runoff from the Site discharges to the LDW under Ecology's National Pollutant Discharge Elimination System (NPDES) Industrial Stormwater General Permit (No. SO3-001196; prior permit #WA 003078-3) (Baseline Permit). Discharge under this Baseline Permit is in compliance with the provisions of the State of Washington Water Pollution Control Law, Chapter 90.48 of the Revised Code of Washington, and the Clean Water Act, Title 33 of the U.S. Code, Section 1251, et seq. In compliance with the requirements of the Baseline Permit, Jorgensen Forge implemented a Stormwater Pollution Prevention Plan, with periodic updates (Anchor 2001) and has conducted quarterly monitoring of stormwater discharges since April 2003 in accordance with the Baseline Permit. The Baseline Permit does not provide water quality benchmarks for PCBs and therefore quarterly monitoring does not include PCB analyses. However, quarterly monitoring for metals (i.e., copper, lead and zinc) is conducted to evaluate compliance with the associated benchmark criteria. The Site maintained an Industrial NPDES Permit from 1985 to 1996 for the currently permitted outfalls. Jorgensen Forge formally terminated the Industrial NPDES Permit in May 1998, through written notification to Ecology documenting that the industrial discharges at the Site had been eliminated.

The Site contains a stormwater conveyance system that consists of 19 catch basins and underground piping that historically discharged and currently discharges to the LDW through permitted outfalls (Figure 3). 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 on the Site and discharged stormwater to the LDW (Figure 3). Stormwater runoff from the eastern side of the Site discharges to the King County Metro stormwater system (Figure 3).

In the mid-1980s, Outfalls 005 to 009 were plugged using concrete, and a dye tracer study was used to confirm complete enclosure of each outfall (Linne 2003). These outfalls are no longer active. The origins of stormwater that discharged through each of these historical outfalls have not been determined. Attempts to trace the stormwater lines from the outfalls to identify their origin have been unsuccessful.

Stormwater runoff from the Site currently discharges to the LDW through Outfalls 001, 002, 003, or 004 (Figure 3). A summary description of each of these active outfalls is summarized below:

- Outfall 001 is an active outfall located on the south side of the Site. It consists of a 12-inch-diameter pipe discharging stormwater from impermeable surfaces and roof drains on the southern portion of the Site (Figures 3). Groundwater that accumulates in the vacuum degasser pit and the railroad scale sumps discharges to Outfall 001. The pipe is below the MHHW elevation, at an elevation of 12.42 feet MLLW, and is exposed through a concrete panel in the concrete bulkhead wall.
- Outfall 002 is an active outfall located on the south side of the Site. It consists of a 12-inch-diameter corrugated metal pipe discharging stormwater from impermeable surfaces, including roof drains on the southern portion of the Site (Figure 3). Groundwater that accumulates in the electric furnace pit and the argon-oxygen-decarbonization scale sumps discharge to Outfall 002. The outfall pipe is located below the MHHW elevation, at an elevation of 9.04 feet MLLW and is exposed through the sheet pile bulkhead wall.
- Outfall 003 is an active outfall located on the south side of the Site. It consists of an 18-inch-diameter reinforced concrete pipe discharging stormwater collected from impermeable surfaces, including roof drains, from the majority of the Site. The outfall pipe is located below the MHHW elevation, at an elevation of 8.91 feet MLLW, and is exposed through the sheet pile bulkhead wall.
- Outfall 004 is an active outfall that is only used on rare occasions (i.e., when the cooling-tower pump station malfunctions or a pipe breaks leading to flooding in the cooling-tower pump station subgrade basin). The outfall consists of a 12-inch-diameter ductile iron pipe located below the MHHW elevation, at an elevation of 6.99 feet MLLW, and is exposed through riprap rock on the bank face.

## 2.5 TOPOGRAPHY

The Site is located at an elevation of approximately 16 feet above mean sea level, and is relatively flat, with the ground surface sloping gently toward the LDW. Most of the Site is covered with impermeable surfaces, including asphalt or concrete paving and buildings (Figure 3).

The eastern bank of the LDW shoreline (located on the west side of the Site) is relatively steep, sloping from an elevation of approximately 19 to 20 feet mean lower low water (MLLW) (Figure 2). The toe of the bank slope extends into the LDW beyond the MLLW elevation.

Approximately 3 to 4 vertical feet of the bank adjacent to the Site lies above the mean higher high water (MHHW) elevation.

The northern portion of the bank consists of fill covered with riprap and woody debris. The middle portion of the bank consists of remnants of a structure supported by timber piles, with heavy vegetation along the upper elevations of the bank. A gravel surface extends to the top of the bank along the majority of this portion of the shoreline, with the exception of a portion that is paved with asphalt. The southern portion of the bank consists of a vertical steel sheet pile/concrete panel bulkhead. The western edge of the main manufacturing building extends up to the edge of the concrete panel bulkhead. The scrap metal storage area and ecology-block storage bins are located just south of the manufacturing building, adjacent to the concrete panel bulkhead. An approximately 10-foot high concrete wall separates the area from the top of the bank slope (Figure 3). The surface immediately east of the sheet pile/concrete panel bulkhead is covered with gravel. The surface to the west of the Melt Shop along the sheet pile/concrete panel bulkhead to the property line is heavily vegetated.

## 2.6 GEOLOGY

As discussed in the Work Plan, a western portion of the Site is underlain by fill that consists of gray and brown sand that ranges from very fine to coarse sub-rounded grains. The sand is well to poorly graded, and ranges from moderately dense to loose. The fill appears to extend to a depth of 2 to 10 feet below ground surface (bgs). Boring logs identify a pervasive silt layer between 8 and 10 feet bgs that represents the uppermost native soil. Organic material also is present in this layer. A silt layer that ranges from 0.5 foot to 2 feet thick is present at depths of 2 to 7 feet bgs. The uppermost native soil generally consists of a 1- to 3-foot thick, organic-rich, dark gray silt to clayey silt layer. The majority of the shoreline along the western portion of the Site is composed of riprap, fill, and wooden bulkheads. The shoreline along the southwestern portion of the Site (i.e., adjacent to the main building) is composed of a sheet pile/concrete panel bulkhead.

The geology of the eastern portion of the Site consists of alluvial silts and sands. Except as described above, fill material is laterally discontinuous, consists of sandy gravel, and ranges in thickness from 4 inches to 2 feet. The uppermost native material consists of sand and silty sand with thinly-laminated layers of interbedded alluvial silt and buried paleosols that indicate historical soil horizons. A layer of silt that contains degrading plant material and woody debris is encountered across the Site at depths of 10 to 12 feet bgs and ranges in thickness from 2 to 5 feet. Underlying the silt, poorly-graded sands grade to silty sands from east to west and extend to the total depth explored in most areas of the Site. The deepest soil boring at the Site was completed for monitoring well PL2-JF01C in the northwest portion of the Site (Figure 2). Soil boring PL2-JF01C was completed to a depth of 81.5 feet bgs and indicates that poorly-graded sand with interbedded silt is present to a depth of 51 feet bgs, with layers of sandy silt, sand, and silty sand present to 81.5 feet bgs.

## 2.7 HYDROGEOLOGY

As discussed in the Work Plan, groundwater in the Duwamish Valley occurs in unconfined conditions in a shallow aquifer, and under confined conditions in some areas within a deeper aquifer. Recharge to the water table aquifer is primarily by direct infiltration of precipitation and periodic contributions from streams during high-stage periods. Regional groundwater flow in the unconfined aquifer is typically to the south or southwest, toward the Duwamish Waterway.

The Site is underlain by lenses and layers of silt and clay. There are no identified discrete zones, and only a few units can be correlated within the Site monitoring wells. The Site hydro-stratigraphy is further complicated by placement of fill atop the pre-development topography, including placement of fill between 1942 and 1946 into the previously existing embayment. Clay lenses occur throughout the Site, and perched and locally confined groundwater has been observed at several locations. For purposes of this discussion, the entire unconfined shallow water-bearing zone beneath the Site is considered a single aquifer system, and occurs between 9 and 13 feet bgs.

A summary of groundwater elevation data across the Site is provided on Table C-5 (Appendix C). A map depicting the groundwater flow direction and gradient, as observed during the December 2005 groundwater monitoring and sampling event, is included in Appendix C (Figure C-1). The observed groundwater conditions during December 2005 are consistent with previous monitoring events and indicate that the groundwater flow direction is to the southwest on the eastern half of the Site with the gradient increasing and the flow direction becoming more westerly near the LDW, where tidal effects are prevalent. Tidal influences have been identified in monitoring wells MW-5 and MW-6, located on the western portion of the Site (Figure 2). The depth to groundwater on the eastern portion of the Site shows seasonal response, with water levels 1 foot to 2 feet higher during the rainy season (Farallon 2004).

### 2.7.1 Summary of Site Groundwater Data

A summary of the Site groundwater data was presented in Section 3.2.1.2 of the Work Plan. A brief summary of the PCB and metals groundwater analytical results is being provided herein for reference. Tables showing all of the historical analytical results for PCB and metals in groundwater and figures showing the sample locations are attached in Appendix C. The analytical results of groundwater samples collected from monitoring wells located throughout the Site from 1993 to 2003 did not detect concentrations of PCBs above the laboratory practical quantitation limit (PQL) and/or Ecology's Model Toxics Control Act Cleanup Regulation (MTCA) Method A cleanup level (as established in Chapter 173-340 of the Washington Administrative Code [WAC 173-340], as amended February 12, 2001), with the exception of one detection in groundwater collected from monitoring well MW-6 in June 2003 (Table C-1). The groundwater samples collected from monitoring wells located throughout the Site included monitoring wells located down-gradient of the Seattle City Light transformer on the southeastern portion the Site (Figure 2). A comprehensive summary of the groundwater analytical results for PCBs is presented in Table C-1 (Appendix C).

As discussed in the Work Plan, the analytical results for three light nonaqueous-phase liquid (LNAPL) samples collected from monitoring wells MW-19, MW-20, and MW-21 in 1993, one LNAPL sample collected from the return trough of the Niles Lathe in 1993, and LNAPL samples collected from monitoring wells MW-19 and MW-33 in 2003 did not detect concentrations of PCBs above the screening level defined in the Work Plan or the laboratory PQLs in accordance with EPA Method 8082.

The results of groundwater samples collected in 1990 and 1992 analyzed for total metals from monitoring wells MW-1, MW-9, and MW-23 at the Site detected concentrations of total arsenic, barium, cadmium, chromium, copper, iron, manganese, mercury, selenium, and zinc above the laboratory PQLs (Table B-2A and B-2B). However, only cadmium was detected at a concentration (6 micrograms per liter [µg/l]) above the MTCA Method A cleanup level (5 µg/l) from monitoring well MW-1.

To monitor groundwater quality down-gradient of documented releases of metals and chlorinated solvents from the Boeing Plant 2 Facility, Boeing installed four monitoring wells along the northwestern portion of the Site (Figure 2). The analytical results of groundwater samples collected from the four monitoring wells detected concentrations of total and/or dissolved arsenic exceeding the MTCA Method A cleanup level (5 µg/l). The highest concentration of arsenic was 10 µg/l, which was detected in October 2001 in the groundwater sample collected from monitoring well PL2-JF01C (Figure 2). There were no other metals detected in groundwater samples collected from the monitoring wells exceeding the applicable MTCA Method A cleanup levels. A summary of these total and dissolved metals groundwater analytical results is provided in Tables B-2A and B-2B in Appendix B.

## 2.8 LOWER DUWAMISH WATERWAY

The LDW is a well-stratified, salt wedge-type estuary influenced by freshwater flow and tidal effects. The relative influence of each is highly seasonally dependent. Typical of salt-wedge estuaries, the LDW has a sharp interface between the freshwater outflow at the surface and the saltwater inflow at depth. The 25 parts per thousand salinity layer near the river mouth occupies most of the water depth, but tapers toward the upriver portion of the estuary. Freshwater inflow exerts a strong influence on the relative thicknesses of the two layers. The thickness of the freshwater layer increases with increasing river flow rates throughout the LDW. Saltwater enters the LDW principally through the lower water column of the West Waterway (Farallon 2004).

### 2.8.1 Sediment Characteristics

Bottom sediment composition is variable throughout the LDW, ranging from sands to mud, depending on the sediment source and current velocity. The sediment typically consists of slightly sandy silt with varying amounts of organic detritus. Coarser sediments are present in nearshore areas adjacent to outfalls and storm drain discharges (Weston Solutions, Inc. [Weston] 1999). Finer-grained sediments typically are located in remnant mudflats, along channel sideslopes, and within portions of the navigation channel. Sediment composition in the nearshore areas adjacent to the Site has been observed to be very coarse (e.g., coarse sand, cobble, riprap) and armored (Farallon 2004). A mudflat area was observed adjacent to the sheet pile/concrete panel bulkhead wall located on the southwestern corner of the Site.

### 2.8.2 Sediment Transport and Deposition

Sediment transport characteristics within the LDW are described in detail in the Work Plan. Sediment stability was evaluated as part of the LDW Group (LDWG) Phase I Remedial Investigation (RI). The RI indicated that the navigational channel and the majority of the transitional zones and intertidal benches in the vicinity of the Site are subject to erosional events, but exhibit a net accumulation of sediments over time (Windward Environmental, L.L.C. [Windward] 2003). Estuarine processes and preliminary modeling results also show that sediment sources (and associated chemicals) can migrate in an upstream direction due to tidal forcing during flood tide conditions (Farallon 2004). Current velocities measured within the LDW indicate that bottom water velocity in the vicinity of the Site facilitates sediment deposition during particular times of the year (Farallon 2004). Erosional areas were identified in portions of the transitional zones and in the intertidal areas adjacent to the Boeing Plant 2 Facility and Terminal 117 property (formerly owned by Malarkey Asphalt) (Figure 1). Long-term studies of sediment mobility along the LDW indicate that approximately 99 percent of the total sediment load entering the LDW can be attributed to the Green River (Harper-Owes Company 1983). The remaining 1 percent was contributed by local sources along the LDW (e.g., upland runoff, a variety of discharges). The study conducted by Harper-Owes Company (1983) determined that the majority of the sediment input to the LDW occurred during peak flow events.

Following completion of the RI and concurrent with this third phase of investigation activities, the LDWG conducted additional studies to further evaluate sediment fate and transport processes in the LDW. The results of the studies are described in the Data Report prepared by Windward (2005a). This report only presents an overview of the findings and does not provide an estimate of the sedimentation rates adjacent to the Site. The Data Report will be finalized pending resolution of several issues. Currently, the following information is known regarding sedimentation adjacent to the Site, as identified by EPA (see Appendix A – Comment 25, Part D) "Current data indicate that the bench area adjacent to the navigation channel is an area of deposition over time, although the patterns of deposition and erosion in this particular reach have not yet been determined. Nearshore sedimentation rates, closer to the bank, are also undefined."

# 3.0 FIRST PHASE INVESTIGATION SUMMARY

The first phase of the investigation included researching and compiling available information pertaining to the Site to:

- Identify potential sources of PCBs from current or historical operations at the Site;
- Define potential contaminant pathways from the Site to the adjacent LDW; and
- Identify data gaps in the information necessary to determine whether contaminant pathways have resulted in adverse impacts to sediment quality adjacent to the Site.

The results of the first phase identified the source of the fill on the bank-face, and evaluation of the stormwater conveyance system as data gaps that required sampling and analysis. The scope of work to investigate the data gaps, and the results of the first phase are summarized in the Work Plan. A brief summary of the results of the first phase of the investigation are provided below and in Section 2, Site Information.

## 3.1 POTENTIAL SOURCES

The results of the first phase of the investigation did not identify any evidence that PCBs have been or are used on the Site, with the exception of dielectric fluid contained in some of the transformers that are owned and operated by Seattle City Light. The use of PCBs was not identified in chemical inventories of process chemicals from 1994 and 2002. Material safety data sheets for hydraulic oil, cutting oil, and metal working fluid indicate that these oils do not contain PCBs. Prior to 1994 there is limited information available regarding the use of PCB containing materials. However, Mr. Lee Linne, former Environmental Manager of Jorgensen Forge, and Jorgensen Forge employee for approximately 30 years, confirmed that to his recollection chemicals containing PCBs were not used during his tenure at the Site (Linne 2003).

The only identified potential source of PCBs used on the Site is in dielectric fluids in some of the Seattle City Light transformers; however, there is no evidence that a release of dielectric fluid has ever occurred at the Site. Results of the EPA Toxic Substances Control Act inspection confirmed that there was no evidence of a release from any of the Site transformers (Farallon 2004). EPA noted that all of the Site transformers appeared to be in good condition, and there was no evidence of leaks. EPA stated that no other sources of PCBs were identified on the Site, and no additional inspections were required to further evaluate the presence of PCB sources on the Site (EPA 2002). The majority of the transformers are not located in close proximity to any catch basin or stormwater conveyance system.

Fill that was placed on the Site between 1942 and 1946 to fill in the former embayment was identified as one potential source of PCB and metals contamination. The source of the fill may have been historical hydraulic dredging conducted in the LDW by the ACOE or from unknown upland sources.

There are numerous potential off-Site sources of PCBs to the LDW in close proximity to the Site. These include: documented releases of PCBs to soil, groundwater, and surface water at the

Boeing Plant 2 Facility; outfall discharges in the vicinity of the Site that include 12- and 24-inch diameter property line outfalls (Figure B-1); upstream Boeing/Isaacson combined sewer overflow; and potential transport and deposition of sediment with elevated concentrations of PCBs and/or metals from other properties in the LDW (Farallon 2004).

## 3.2 POTENTIAL CONTAMINANT PATHWAYS

The first phase of the investigation identified the following potential pathways for migration of contaminants to the adjacent sediments in the LDW:

- Erosion of the bank material containing PCB and/or metals concentrations to the LDW sediments;
- Discharge of stormwater with PCBs and/or metals to the LDW sediments; and
- Sediment transport from adjacent facilities.

The first phase of the investigation did not identify sufficient information to evaluate erosion of the bank material as a potential migration pathway to the LDW. Erosion was identified as a potential pathway that required additional investigation.

Stormwater discharge from the Site was also identified as a potential migration pathway for contamination to enter the LDW. EPA indicated that additional evaluation of the stormwater conveyance system was necessary to determine whether this was a historical or existing migration pathway.

Several studies of the LDW have identified sediment deposition and resuspension areas in the vicinity of the Site. These studies focused on LDW velocities, sediment sources, estuarine and tidal features, and sediment deposition and resuspension processes. The results of these studies indicate that the bottom water velocity in the vicinity of the Site facilitates sediment deposition during particular times of the year. These studies also indicate that the sources of sediment and the concentrations of PCBs and/or metals detected in sediments in the reach of the LDW in the vicinity of the Site can originate from both upstream and downstream locations due to variations in tidal conditions. Following completion of the first phase of the investigation, additional sedimentation studies within the LDW were conducted by LDWG as part of the Phase 2 RI, as discussed in Section 2.8.2.

## 3.3 DATA GAPS

There were insufficient data to confirm whether potential erosion of fill on the shoreline bank to sediment is or is not a potential source of contamination to the sediments. There were also insufficient data to confirm whether the stormwater conveyance system historically acted or currently acts as a pathway for undocumented releases of PCB and/or metals-containing materials. The Work Plan presented a scope of work to evaluate these data gaps, which is summarized in Section 4, Second Phase Environmental Sampling Summary.

# 4.0 SECOND PHASE ENVIRONMENTAL SAMPLING SUMMARY

The second phase of the investigation included implementing the scope of work defined in the Work Plan to investigate the identified data gaps in the available information for the Site. A modification by EPA required the second phase of the investigation to include laboratory analysis for metals and sampling debris piles located at the toe of the bank adjacent to the LDW. The field sampling for the second phase of the investigation was completed at the Site in August 2004. The scope of work for the second phase of the investigation included the collection and analysis of samples of subsurface fill, shoreline bank-face fill, debris piles located at the toe of the shoreline bank, and solids in stormwater catch basins.

The scope of work also included a video survey of outfalls 006, 007, and 008; an outfall reconnaissance survey to identify the locations and sizes of all existing visible outfalls directly adjacent to the Site; and a comprehensive stormwater drainage survey. Sampling was conducted in accordance with the EPA-approved Environmental Sampling and Analysis Plan (attached as Appendix B to the Work Plan, which includes the Environmental Sampling Field Sampling Plan (FSP) and Environmental Sampling Quality Assurance Project Plan (QAPP). The results of the second phase of the investigation are provided in the Work Plan Addendum, and are summarized below.

The Work Plan defined screening levels for comparison of the analytical results of fill and solids samples. The screening levels for PCBs at the Site were selected to determine whether the concentrations in the shoreline fill and/or solids could potentially result in exceedances of the lowest apparent effect threshold (LAET) and Upper LAET (2LAET) screening levels if deposited in sediments in the LDW adjacent to the Site. The screening levels were later modified by EPA to include Ecology's Sediment Management Standards (SMS) Sediment Quality Standards (SQS) and the Cleanup Screening Levels (CSL) for metals. The screening levels applicable to the Site investigation are summarized in Table 1. The screening levels were derived based on the sediment concentration of various chemicals above which adverse biological effects are expected upon direct exposure to sediments. Given the concentrations of the fill and solids samples are not within the marine environment and organisms are not directly exposed to the identified concentrations, use of these screening levels as a comparison endpoint for potential adverse effects is considered conservative. EPA has not determined Site-specific cleanup levels for any compounds.

## 4.1 ENVIRONMENTAL MEDIA SAMPLING

The second phase investigation included collecting samples of subsurface fill, fill from the shoreline bank-face, debris piles located at the toe of the shoreline bank, and solids from the stormwater conveyance system catch basins. The samples were collected by Farallon from August 26 to 31, 2004 in accordance with the scope of work in the Work Plan. The documentation for the environmental sampling, including figures, tables, and soil boring logs, is provided in Appendix B of this Report.

### 4.1.1 Subsurface Fill Sampling

Subsurface fill samples were collected on August 26 and 27, 2004 from seven direct-push soil borings (SB1 through SB7) located along the top of the bank on the upland portion of the Site (Figure B-1, Appendix B). The sampling objectives, sample locations and frequency, sample designation, sampling equipment and procedures, and sample handling and laboratory analysis for the environmental sampling activities are described in detail in the Work Plan.

The soil borings were located approximately 60 to 160 linear feet apart at distances of approximately 5 feet landward from the top of the bank. The soil borings were advanced through the subsurface fill to native soil, which was encountered in borings SB1 and SB6 at depths ranging from 12 to 16 feet bgs. Soil boring SB1 was advanced to a total depth of 12 feet bgs. Soil borings SB2, SB4, SB5, SB6, and SB7 were advanced to a total depth of 16 feet bgs. Refusal was met in soil boring SB3 at depths of 8 to 10 feet bgs, and four attempts to relocate this soil boring were not successful in reaching depths greater than 10 feet bgs. Soil samples were collected continuously from each boring in 2-foot intervals from the ground surface to the total depth of the boring. Soil boring logs are included in Appendix B.

The soil encountered in the soil borings consisted of fill from the surface to depths ranging from 9.5 feet bgs (soil boring SB1) to 15.5 feet bgs (soil boring SB6). The fill consisted of brown to orange-brown gravel and sand with varying amounts of silt and brick, wood, and metal debris. Creosote and/or petroleum odors were noted in soil boring SB4 between 11.5 and 16 feet bgs, and soil collected from 14 to 16 feet bgs in soil boring SB4 showed blue-grey staining. The native soil encountered in soil boring SB1 consisted of grey silt. The native soil encountered in soil boring SB6 consisted of grey fine sand with trace silt. Groundwater was encountered in the soil borings at depths ranging from 11.5 to 14 feet bgs.

### 4.1.2 Shoreline Bank-Face Fill Sampling

The shoreline bank-face fill sampling was conducted on August 30 and 31, 2004 in accordance with the Work Plan. This sampling included collection of eight fill samples (SS1 through SS8) from the face of the shoreline bank along the LDW directly adjacent to the Site (Figure B-1, Appendix B). The sampling objectives, sample locations and frequency, sample designation, sampling equipment and procedures, and sample handling and laboratory analysis for the environmental sampling activities are described in detail in the Work Plan.

The fill samples were collected along the face of the bank from locations approximately midway between the MHHW elevation of the LDW, and the elevation of the top of the slope east of each sample location. The fill samples were collected approximately 40 to 100 linear feet apart, and averaged 2 feet in depth below the surface of the slope face. The bank-face fill is comprised of brown silty sand with variable percentages of gravel. The fill samples were submitted to Severn Trent Laboratories of Fife, Washington (STL) for laboratory analysis of PCBs, metals, total organic carbon (TOC), and grain size.

### 4.1.3 Debris Pile Sampling

Two debris piles (identified as the North Debris Pile and the South Debris Pile) are located at the toe of the bank, slightly north of the sheet pile wall area near Outfall 004, and are depicted on

Figure B-1, Appendix B. The debris piles are composed of black solid asphalt-like material containing nails and other miscellaneous metal debris. Six grab samples (solids and any sediment entrained in the debris) from each debris pile were collected on August 31, 2004, and were composited and placed in sample jars for laboratory analysis. The samples were submitted to STL for analysis of PCBs and metals.

### 4.1.4 Catch Basin Solids Sampling

Solids were collected from stormwater catch basins CB1 through CB4, located on the western, central, and eastern portions of the Site on August 31, 2004 (Figure B-1, Appendix B). The solids samples were submitted to STL for analysis of PCBs and metals.

## 4.2 ANALYTICAL RESULTS

The laboratory analytical results of subsurface fill, fill from the shoreline bank-face, debris piles, and catch basin solids samples are summarized below. The analytical results were compared with the selected screening levels to determine whether the concentrations of PCBs and/or metals could result in exceedances of the LAET or 2LAET in the sediments in the LDW adjacent to the Site. The laboratory analytical results are summarized in Tables B-3 and B-4 (Appendix B), and are depicted on Figures B-2 through B-11 (Appendix B). Electronic or paper copies of the laboratory analytical reports can be provided upon request.

### 4.2.1 Subsurface Fill

The subsurface fill samples collected from the soil borings were submitted to STL for analysis of PCBs, metals, TOC, and grain size, in accordance with the analytical methods defined in the Work Plan. The laboratory analytical results are summarized in Tables B-3 and B-4 (Appendix B), and are depicted on Figures B-2 through B-11 (Appendix B).

#### 4.2.1.1 Polychlorinated Biphenyls

Concentrations of PCBs exceeding the screening level were detected in fill samples collected from various depths in all seven of the soil borings (Table B-3). The laboratory analytical results detected concentrations of PCBs exceeding the LAET in soil collected from soil borings SB1, SB2, SB5, and SB6. The results also detected concentrations of PCBs exceeding both the LAET and the 2LAET in soil collected from soil borings SB3, SB4, and SB7 (Table B-3, Appendix B) located on the shoreline.

The detected concentrations of PCBs in soil borings SB1 and SB2, located on the northern portion of the Site, ranged from 0.003 to 0.668 milligrams per kilogram (mg/kg), with concentrations of PCBs exceeding the LAET at depths of 0 to 2 feet bgs in soil borings SB1 and SB2, and at a depth of 10 to 12 feet bgs in soil boring SB2 (Table B-3). Concentrations of PCBs exceeding the LAET were detected also in soil boring SB5 at depths of 8 to 10 feet bgs and 14 to 16 feet bgs, and in soil boring SB6 from the ground surface to a depth of 14 feet bgs (Figure B-2). The laboratory analytical results of soil samples collected from soil boring SB3 detected concentrations of PCBs exceeding the 2LAET at 17.77 mg/kg in the fill sample collected from 0 to 2 feet bgs, and concentrations of PCBs exceeding the LAET from 2 to 10 feet bgs. Concentrations of

PCBs exceeding the 2LAET were detected also in the fill samples collected from 0 to 6 feet and 12 to 16 feet bgs in soil boring SB4. The laboratory analytical results of the fill samples collected from soil boring SB7 detected concentrations of PCBs exceeding the LAET from 2 to 16 feet bgs, and exceeding the 2LAET from 4 to 6 feet bgs (Table B-3).

#### 4.2.1.2 Metals

The laboratory analytical results detected concentrations of arsenic exceeding the SQS, and concentrations of chromium, copper, lead, mercury, and zinc exceeding the SQS and the CSL in fill samples collected and analyzed from the soil borings (Table B-4). Concentrations of cadmium and silver were not detected above the Sediment Management Standards (SMS) or the CSL in fill samples collected from the borings. Concentrations of nickel were detected between 61 and 5,560 mg/kg; however, nickel does not have a promulgated SMS screening level (Figure 9).

Arsenic was detected in fill samples collected from soil borings SB3 and SB6 at concentrations of 61.7 and 62.7 mg/kg, respectively, both of which exceeded the SQS of 57 mg/kg for arsenic in sediment, but are below the CSL of 93 mg/kg (Table B-4). Concentrations of arsenic below the SMS were detected also in the fill sample collected and analyzed from soil borings SB1, SB2, SB4, SB5, and SB7, ranging from 3.47 to 25.7 mg/kg (Figure B-3).

Chromium at concentrations exceeding the SQS and CSL was detected in all of the fill samples collected from all of the soil borings, with the exception of the fill sample collected from 2 to 4 feet bgs in soil boring SB1, which contained a concentration of chromium below the SQS and CSL (Table B-4). The detected concentrations of chromium exceeding the SQS and CSL ranged from 282 to 1,950 mg/kg (Figure B-5).

The laboratory analytical results detected concentrations of copper exceeding the SQS and CSL in fill samples collected from soil borings SB3 and SB6 (Table B-4). The concentrations of copper exceeding the SQS and CSL criterion of 390 mg/kg ranged from 541 to 955 mg/kg (Figure B-6).

Lead was detected at concentrations exceeding the SQS and CSL in fill samples collected from soil borings SB3, SB4, and SB7 (Table B-4). The concentrations of lead exceeding the SQS criterion of 450 mg/kg and the CSL criterion of 530 mg/kg ranged from 543 to 1,530 mg/kg (Figure B-7).

The laboratory analytical results detected mercury at a concentration of 0.694 mg/kg in the fill sample collected from soil boring SB4 at a depth of 0 to 2 feet bgs, which is above both the SQS and CSL values of 0.41 mg/kg and 0.59 mg/kg, respectively (Figure B-8).

Zinc exceeding the SQS was detected in one fill sample collected from soil boring SB3, and exceeding the SQS and the CSL from fill samples collected from soil borings SB1 and SB7 (Table B-4). The detected concentrations of zinc exceeding the SQS criterion of 410 mg/kg and the CSL criterion of 960 mg/kg were 1,320 mg/kg for the fill sample collected from soil boring SB1 at a depth of 0 to 2 feet bgs, and 1,380 mg/kg for the fill sample collected from soil boring SB7 at a depth of 4 to 6 feet bgs (Figure B-11).

### 4.2.2 Shoreline Bank-Face Fill

The laboratory analytical results of fill samples collected from the shoreline bank-face are summarized below, along with an evaluation of the results in comparison to the screening levels. The laboratory analytical results are summarized in Tables B-3 and B-4 (Appendix B), and are depicted on Figures B-2 through B-11 (Appendix B).

#### 4.2.2.1 Polychlorinated Biphenyls

The laboratory analytical results of fill samples collected from the shoreline bank-face detected concentrations of PCBs ranging from 0.0255 to 4.54 mg/kg (Table B-3). The laboratory analytical results for bank-face fill samples collected from sample locations SS1, SS5, and SS8 exceeded the LAET of 0.130 mg/kg with detected concentrations of 0.3230, 0.1967, and 0.1696 mg/kg, respectively (Figure B-2). The concentrations of PCBs in soil samples collected from sample locations SS2, SS3, SS6, and SS7 exceeded the 2LAET of 1 mg/kg with detected concentrations of 1.443 mg/kg (sample location SS3) and 4.54 mg/kg (sample location SS6). The concentration of PCBs detected from the bank-face fill sample collected from sample location SS4 did not exceed the LAET (Table B-3).

#### 4.2.2.2 Metals

Arsenic was detected in the shoreline bank-face fill samples at concentrations ranging from 9.95 (sample location SS4) to 64.9 mg/kg (sample location SS7) (Table B-4). The concentration of arsenic detected in sample location SS7 exceeded the SQS, but did not exceed the CSL. The detected concentrations of arsenic in other sample locations did not exceed the SQS (Figure B-3).

The laboratory analytical results detected concentrations of cadmium exceeding the SQS and the CSL in the bank-face fill samples collected from sample locations SS1 and SS7 (Figure B-4).

Concentrations of chromium exceeding the SQS and the CSL were detected in the shoreline bank-face fill samples collected from sample locations SS1 at 350 mg/kg and SS4 at 386 mg/kg (Table B-4). The laboratory analytical results of the bank-face fill samples collected from sample locations SS2, SS3, SS5, SS6, SS7, and SS8 detected concentrations of chromium below the SQS and CSL (Figure B-5).

The laboratory analytical results detected concentrations of copper in the shoreline bank-face fill samples ranging from 72.4 to 561 mg/kg, with the only exceedance of the SQS and the CSL identified in the soil sample collected from sample location SS7 (Table B-4).

Concentrations of lead exceeding the SQS and the CSL were detected in the shoreline bank-face fill samples collected from sample locations SS1, SS2, SS6, and SS7, with concentrations ranging from 1,010 to 5,450 mg/kg (Figure B-7). The laboratory analytical results of the shoreline bank-face fill samples collected from sample locations SS3, SS4, SS5, and SS8 detected concentrations of lead below the SQS and the CSL (Table B-4).

The laboratory analytical results detected concentrations of mercury exceeding the SQS in the shoreline bank-face fill sample collected from sample location SS7 at 0.502 mg/kg, and exceeding the SQS and the CSL in the sample collected from sample location SS2 at 0.958 mg/kg (Figure B-8). Concentrations of mercury above the SQS and the CSL were not detected in the other bank-face fill samples.

Silver was detected in the shoreline bank-face fill sample collected from sample location SS7 at a concentration of 8.73 mg/kg, which exceeded the SQS and CSL criterion of 6.1 mg/kg (Figure B-10). The laboratory analytical report indicated that concentrations of silver were detected in the associated method blank, but denoted that the concentration in the sample collected from sample location SS7 was significantly higher than that identified in the method blank. However, it is possible that the actual concentration of silver in the shoreline bank-face fill sample collected from sample location SS7 is less than the SQS and CSL criteria.

The laboratory analytical results detected concentrations of zinc exceeding the SQS and the CSL in the shoreline bank-face fill samples collected from sample locations SS1, SS2, SS6, SS7, and SS8 (Figure B-11). The detected concentrations of zinc above the SQS and the CSL ranged from 986 to 5,430 mg/kg (Table B-4).

### 4.2.3 Debris Piles

The laboratory analytical results of samples collected from the North and South Debris Piles are summarized below, along with an evaluation of the results in comparison to the screening levels. The laboratory analytical results are summarized in Tables B-3 and B-4, and are depicted on Figures B-2 through B-11, which are included in Appendix B.

#### 4.2.3.1 Polychlorinated Biphenyls

The laboratory analytical results of samples collected from the North Debris Pile and the South Debris Pile detected concentrations of PCBs at 2.34 and 2.06 mg/kg, respectively, both of which exceeded the LAET of 0.13 mg/kg (Table B-3).

#### 4.2.3.2 Metals

The laboratory analytical results detected concentrations of copper and lead exceeding the SQS and the CSL in the samples collected from the debris piles (Table B-4). Concentrations of chromium and zinc exceeding the SQS and the CSL also were detected in the sample collected from the North Debris Pile (Table B-4). The laboratory analytical results also identified the presence of arsenic, mercury, and nickel in the samples collected from the debris piles, with concentrations below the SQS and the CSL.

### 4.2.4 Catch Basin Solids

The laboratory analytical results of the solids samples collected from the stormwater conveyance system catch basins are summarized below, along with an evaluation of the results in comparison to the screening levels. The laboratory analytical results are summarized in Tables B-3 and B-4, and are depicted on Figures B-2 through B-11, which are included as Appendix B.

#### 4.2.4.1 Polychlorinated Biphenyls

The concentrations of PCBs detected in the solids samples collected from the catch basins ranged from 0.129 mg/kg (catch basin CB4) to 0.302 mg/kg (catch basin CB2) (Figure B-2). The concentrations of PCBs detected in the solids samples collected from catch basins CB1, CB2, and CB3 exceeded the LAET criterion of 0.13 mg/kg (Table B-3).

#### 4.2.4.2 Metals

The laboratory analytical results of the solids samples collected from the catch basins detected concentrations of chromium, copper, and zinc exceeding the SQS and the CSL (Table B-4). Chromium was detected in all four of the catch basin samples, at concentrations ranging from 3,110 mg/kg (catch basin CB4) to 10,100 mg/kg (catch basin CB2), all of which exceeded the SQS of 260 mg/kg and the CSL of 270 mg/kg (Figure B-5). Concentrations of copper ranging from 1,060 mg/kg (catch basin CB3) to 2,090 mg/kg (catch basin CB1) exceeded the SQS and CSL criterion of 390 mg/kg in all four samples collected (Figure B-6). Zinc exceeding the SQS and the CSL was detected in the samples collected from catch basins CB1, CB2, and CB3 at concentrations ranging from 1,030 mg/kg (catch basin CB2) to 1,090 mg/kg (catch basin CB1) (Figure B-11). The SQS and the CSL for zinc are 410 and 960 mg/kg, respectively. The laboratory analytical results also detected concentrations of arsenic, cadmium, lead, mercury, and silver below the SQS in one or more of the samples collected (Table B-4). Concentrations of nickel were detected in the four catch basin samples, ranging from 1,770 mg/kg (catch basin CB1) to 3,620 mg/kg (catch basin CB2) (Figure B-9). There are no SMS criteria for nickel.

## 4.3 OUTFALL VIDEO SURVEY

A video survey and underground stormwater conveyance line location was conducted by Applied Professional Services of North Bend, Washington (APS) on August 26, 2004 for Outfalls 006, 007, and 008. The stormwater piping for Outfalls 006, 007, and 008 were blocked approximately 10 linear feet eastward from the face of the bank. APS attempted to locate each of the stormwater lines from the upland portion of the Site; however, as discussed in the Work Plan, the outfalls had been plugged with concrete in the mid-1980s. The stormwater piping for Outfalls 006, 007, and 008 could not be located.

## 4.4 OUTFALL RECONNAISSANCE SURVEY AND SITE STORMWATER DRAINAGE SURVEY

An outfall reconnaissance survey of the Site had been performed in May 2003 to identify the locations and sizes of all existing visible outfalls located on the shoreline directly adjacent to the Site. In addition, outfall locations on the southern portion of the Boeing Plant 2 Facility were identified. A photograph of each outfall and specific physical information for each of Outfalls 001 through 009 are provided on Figure 4 in the Work Plan. The elevation of each of the outfalls was surveyed in July 2003. Outfalls 001, 002, 003, and 004 are the only active outfalls, and are permitted under the Baseline Permit (Figure 3).

A comprehensive stormwater drainage survey was conducted on the Site on October 13 through 15, 2004. The drainage survey was conducted to obtain additional information on stormwater discharge to surface water and the sediment pathway. Using historical as-built drawings of the stormwater drainage system, a series of dye studies were performed to document the drainage pathways throughout the Site (Figure 3). The stormwater drainage survey confirmed that surface water drainage from the Site discharges through active permitted Outfalls 001, 002, and 003, and that no discharges currently occur through inactive Outfalls 005 to 009. Based on discussions with Jorgensen Forge personnel, it was determined that Outfall 004 was designed to discharge non-contact cooling water from the cooling tower concrete basin in the event that the cooling tower pump system malfunctioned, or a pipe break resulted in water accumulation in this area. Outfall 004 does not appear to be affected by precipitation events.

The 19 catch basins located on the Site were inspected to assess the integrity of the structures and the general construction design. The catch basins were constructed with concrete basins of variable depths, and function as spill-control separators to decrease the discharge of solids and/or sheen from the catch basins. The concrete in each of the catch basins was intact, with minimal visible cracks.

## 4.5 IDENTIFICATION OF DATA GAPS

The results of the second phase of the investigation and the existing sediment quality data collected in the vicinity of the Site were evaluated in cooperation with EPA to determine whether the data gaps identified in the Work Plan had been adequately addressed. This evaluation identified the following remaining data gaps that require additional investigation:

- The potential relationship between concentrations of PCBs and metals detected in sediments in the LDW in the nearshore zone adjacent to the Site and fill located on the shoreline adjacent to the LDW;
- The potential relationship between the location of historical Site outfall discharges and concentrations of PCBs and/or metals in sediments in the nearshore zone adjacent to the Site;

- Whether the permitted Site stormwater outfalls are or are not an ongoing source of PCBs and/or metals to LDW sediments in the nearshore zone adjacent to the Site; and
- The lateral and vertical extent of concentrations of PCBs and metals above the screening levels in sediments in the nearshore zone adjacent to the Site.

# 5.0 THIRD PHASE ENVIRONMENTAL SAMPLING SUMMARY

The third phase of the investigation included conducting the scope of work defined in the Work Plan Addendum to characterize the data gaps identified after completion of the second phase of the investigation. The scope of the third phase of the investigation included collecting surface and subsurface sediment samples, solids residing in the stormwater catch basins, and water samples from outfall discharges from active Outfalls 001, 002, and 003. This scope of work was approved by EPA. The completion of this phase of work fulfilled the objectives of the AOC. A detailed description of the sampling and analysis, quality assurance/quality control (QA/QC) protocols, and data quality objectives is presented in the EPA-approved FSP (Appendix C-1) and the Quality Assurance Project Plan (Appendix C-2) of the Work Plan Addendum.

## 5.1 ENVIRONMENTAL MEDIA SAMPLING

The third phase of the investigation included collecting surface and subsurface sediment samples, additional solids samples from the stormwater conveyance catch basins, and water samples from the active outfalls. These activities are discussed in further detail below.

### 5.1.1 Surface Sediment Sampling

Eleven surface sediment samples (sample stations AJF-01 to AJF-11) were collected in the locations defined in the Work Plan Addendum and are depicted on Figure 4. All of the sample stations were located above the 0 feet MLLW elevation, with the exception of sample station AJF-07, which was located closer to the navigation channel (Figure 4). A summary of the sample collection information is presented in Table 2.

Sampling at stations AJF-01 to AJF-10 was conducted from within the interstitial spaces of the shoreline debris (Figure 4). Due to the limited amount of sediments within the interstitial spaces at these stations, the penetration depth was limited to 0 to 3 centimeters (cm), rather than the 0 to 10 cm proposed in the Work Plan Addendum. The limited amount of substrate in the interstitial spaces indicates that this portion of the shoreline is in a relatively high-energy environment (i.e., tidal and/or river currents and vessel wakes). This also indicates that this portion of the shoreline experiences relatively low deposition and/or that the sediment bed is in dynamic equilibrium. The shoreline debris is composed of a combination of riprap, fragments of concrete and pavement, bricks, woody debris, dilapidated pilings, and vegetation near the upper portion of the bank. North of Site Outfall 005, the entire shoreline above approximately the 0 feet MLLW elevation is composed of dense contiguous debris. Debris is present also along the shoreline adjacent to Site Outfalls 004 and 005, and to a lesser extent the sheet pile wall adjacent to Outfalls 002 and 003, illustrated on photographs included on Figure 4. There was no debris at station AJF-11, which allowed collection of samples to the depth of 0 to 10 cm proposed in the Work Plan Addendum.

### 5.1.2 Subsurface Sediment Sampling

In May 2005, seven subsurface sediment cores (sample stations AJF-07, and AJF-11 to AJF-16) were collected to depths ranging from approximately 5 to 7 feet below mudline using a vibracore deployed from a sampling vessel (Figure 5). Due to the contiguous debris located along the majority of the inner shoreline north of the sheet pile wall and above the 0 feet MLLW elevation, coring was not possible in several areas. Following refusal at several proposed stations, probing of the sediment mudline was conducted using a long stainless-steel rod to assess the stiffness of the substrate along the entire shoreline. Several areas further offshore from the proposed stations (i.e., elevations less than 0 feet MLLW) were composed of softer substrate. Additional coring targeted the softer areas where no historical subsurface cores had been collected. Each of the cores was pushed to refusal, and sampling was conducted at approximately 1-foot intervals. The samples were submitted to STL for analysis of TOC, Total Solids (TS), Atterberg limits, grain size, PCBs (by aroclor), and metals, in accordance with the analytical methods defined in the FSP (Anchor 2005). A summary of the sample collection information is presented in Table 3; the coring logs are provided in Appendix D.

### 5.1.3 Catch Basin Solids Sampling

As part of the second phase of the investigation, solids were collected from four stormwater catch basins (CB1 through CB4), located on the western, central, and eastern portions of the Site (Figure 16 of the Work Plan). As discussed in Work Plan Addendum, following collection of the catch basin samples, drainage investigation activities determined that the previous catch basin cleanouts had not removed a residual layer of sediments in the bottom of the sampled catch basins. Therefore, the analytical results obtained during the second phase of the investigation were indicative of solids that had accumulated in the catch basins over an unknown period of time. Following the catch basin sampling in August 2004, all of the Site stormwater catch basins were thoroughly cleaned to remove all residual solids. Additional sampling in these four catch basins was proposed as part of the third phase of the investigation to assess ongoing PCB- and metals-loading into the stormwater drainage system from solids recently deposited into the catch basins.

As part of the third phase of the investigation, sampling of the catch basins was attempted on May 12, 2005. During the attempt, each of the catch basins had insufficient (i.e., less than 1 cm of solids on the catch basin floor) solids accumulation; therefore, no sampling was performed. Review of the catch basin cleanout schedule conducted frequently as part of the Site stormwater best management practices (BMPs), indicated that the most recent cleanout prior to the attempted catch basin sampling occurred on November 12, 2004. Therefore, approximately 6 months of potential accumulation occurred prior to the third phase catch basin sampling, including the months with historically the most rainfall which would facilitate the highest potential for solids infiltration into the catch basins.

### 5.1.4 Outfall Discharge Water Sampling Activities

Grab water samples were to be collected from Outfalls 001, 002, and 003 during a sufficient rainfall event. As discussed in the Work Plan Addendum, Outfall 004 appears to be unaffected by precipitation events, so no sampling was proposed for this outfall.

Sampling was performed on May 19, 2005 during a rainfall event of sufficient intensity to produce surface water runoff. LDW surface water elevations at the time of sampling were low enough to facilitate visual inspection of the discharge from each of the outfalls. However, insufficient discharge from Outfalls 001 and 004 occurred during the rainfall event, so no samples were collected from these outfalls.

Monitoring of discharges from Outfalls 001 and 004 was conducted during multiple rainfall events after May 19, 2005. To date, sampling has been precluded by an insufficient discharge from these outfalls. The samples collected from Outfalls 002 and 003 were submitted to STL for laboratory analysis of pH, total suspended solids, total PCBs and total and dissolved metals.

## 5.2 SEDIMENT SAMPLING ANALYTICAL RESULTS AND EVALUATION

A brief description of the surface and subsurface physical and chemical results are provided below. A summary of the surface and subsurface sediment analytical results are provided in Tables 4 and 5. A comprehensive summary of the LDW river-wide sediment analytical results, including all of the sediment analytical results compiled in the LDWG database, the recent Boeing Upriver Area I Sediment Characterization (Floyd Snider McCarthy 2004), the cooperative Boeing, EPA and ACOE Lower Duwamish Triad Sampling (report pending), the LDWG Phase 2 Round 1 and 2 RI surface sediment sampling (Windward, 2005b) and the AOC-related sediment sampling are provided in Appendix E. The results of the third phase of the investigation showed trends very similar to the concentrations of contaminants in sediments summarized in the Work Plan Addendum. The additional data more exactly defines the extent of PCB and metals concentrations in sediment adjacent to the Site.

### 5.2.1 Surface Sediment Samples

Surface sediment samples were collected and submitted to STL for analysis of TOC, TS, Atterberg limits, grain size, PCBs (by aroclor), and metals, in accordance with the analytical methods defined in the Work Plan Addendum.

#### 5.2.1.1 Physical Results

The third phase investigation surface sediment TOC concentrations and percent fines adjacent to the shoreline ranged from 1.16 (AJF-11) to 2.62 (AJF-03) and 5.2 percent (AJF-08) to 77.0 percent (AJF-07), respectively (Table 4).

The combined third phase investigation and historically available (as available in the LDWG riverwide sediment database) surface sediment TOC concentrations adjacent to the shoreline ranged from 1.16 to 3.4 percent (Figure 6). TOC concentrations were relatively higher near the northwestern corner adjacent to the Site and in scattered areas in the vicinity of the northern portion of the sheet pile wall, and Site Outfalls 004 and 005. The surface sediment percent fines adjacent to the Site were less than 20 percent along the shoreline above the 0 feet MLLW elevation, ranged between 60 and 80 percent along the northwestern corner of shoreline, and ranged between 20 and 60 percent along the middle/southern portion of the Site (Figure 7). The fines content increases with distance from the shoreline bank, indicating a lack of accretion along the mid-upper shoreline bank.

#### 5.2.1.2 Polychlorinated Biphenyls

The third phase investigation surface sediment total PCB concentrations ranged from 23 mg/kg OC (AJF-11) to 1252 mg/kg OC (AJF-02). The results were organic carbon- (OC-) normalized to facilitate comparison with the SMS criteria. Exceedances of the SMS CSL criteria (65 mg/kg OC) were identified along the northwest corner of the Site (AJF-01 and AJF-02) and just north of the sheet pile wall along the southeastern portion of the Site (AJF-06, AJF-08, and AJF-09). The remainder of the sampling stations contained total PCB concentrations ranging between the SMS SQS (12 mg/kg OC) and CSL criteria. The results are summarized in Table 4.

The combined third phase investigation and historically available (as available in the LDWG riverwide sediment database) surface sediment total PCBs analytical results are presented on Figure 8 in the form of concentration contours, which were calculated using an inverse distance-weighting technique. The compiled third phase surface sediment and historically available PCB concentrations are summarized in Table 4 and Appendix E, respectively. The results were organic carbon- (OC-) normalized to facilitate comparison with the SMS criteria. The PCB concentration contours for surface sediments showed that the majority of the surface sediment PCB concentrations in the reach of the LDW (i.e., shoreward of the federal navigation channel) near the Site were above the SQS criterion of 12 mg/kg OC. As shown on Figure 8, surface sediment total PCBs concentrations were greater than two times the CSL criterion in three general areas in the vicinity of the Site: adjacent to the cluster of Boeing outfalls with documented historical and potentially on-going releases (Farallon 2004), adjacent to the northwestern corner of the Site, and just north of the sheet pile wall along the southeastern portion of the Site. An evaluation of the potential historical and current migration pathways and sources of PCBs to the surface sediments is presented in Section 6, Site Conceptual Model.

#### 5.2.1.3 Metals

The third phase investigation surface sediment total arsenic (ranged from 9.10 mg/kg at AJF-10 to 32.5 mg/kg at AJF-08), cadmium (0.0569 mg/kg at AJF-07 to 28.4 mg/kg at AJF-02), chromium (23.6 mg/kg at AJF-01 to 32.5 mg/kg at AJF-08), copper (43.9 mg/kg at AJF-07 to 2820 mg/kg at AJF-06), lead (99.0 mg/kg at AJF-11 to 64,900 mg/kg at AJF-06), mercury (0.0253 mg/kg at AJF-01 to 0.104 mg/kg at AJF-07), nickel (26.6 mg/kg at AJF-01 to 496.0 mg/kg at AJF-08), silver (0.214 mg/kg at AJF-05 to 2.47 mg/kg at AJF-09), and zinc concentrations (148,000 mg/kg at AJF-01 to 117 mg/kg at AJF-11) are summarized in Table 4.

The combined third phase investigation and historically available (as available in the LDWG riverwide sediment database) surface sediment metals concentrations are presented on Figures 9 through 17 in the form of concentration contours, which were calculated using an inverse distance-weighting technique. The compiled third phase surface sediment and historically available metals concentrations are summarized in Table 4 and Appendix E, respectively. No SQS exceedances for arsenic, cadmium, or silver were detected in the surface sediments adjacent to the Site. Cadmium, chromium, lead, mercury, nickel, silver, and zinc concentrations in the upper bank area near the cluster of Boeing outfalls were greater than two times the CSL criteria (Figures 10, 11, 13, 14, 15, 16, and 17). The zinc concentrations detected in surface sediments adjacent to the northwestern corner of the Site were greater than two times the CSL concentration. Concentrations of chromium, lead, and zinc detected in surface sediment samples in the vicinity of the northern boundary of the sheet pile wall also were detected at concentrations greater than two times the CSL criteria. An evaluation of the potential historical and current migration pathways and sources of PCBs to these areas is discussed in Section 6, Site Conceptual Model.

### 5.2.2 Subsurface Sediment Sampling

Subsurface sediment samples were collected from approximately 5 to 7 feet below mudline, and were submitted for laboratory analysis. The subsurface samples were submitted to STL for analysis of TOC, TS, Atterberg limits, grain size, PCBs (by aroclor), and metals in accordance with the analytical methods defined in the Work Plan Addendum.

#### 5.2.2.1 Physical Results

The third phase investigation subsurface sediment TOC variations exhibited no discernible trends with depth across all sample stations. TOC ranged from 0.065 to 3.6 percent across all cores, and varied by a factor of 1 to 10 in several cores. In accordance with SMS protocols, TOC concentrations below 0.5 percent were not TOC-normalized when compared to total PCBs, or the SQS or CSL criteria. In these cases, the total PCB concentrations were compared against the LAET and 2LAET criteria (dry weight basis). The TS concentrations were relatively uniform, generally varying by 15 to 25 percent in each core. As expected, samples with a higher TS contained lower TOC concentrations. As shown in Table 5, all cores except AJF-07SD showed a distinct gradation to a fine to medium dark gray sand (likely the native alluvium) toward the bottom of the core.

#### 5.2.2.2 Polychlorinated Biphenyls

The third phase investigation subsurface sediment total PCB concentrations ranged from 23 mg/kg OC (AJF-11) to 1252 mg/kg OC (AJF-02). The results were organic carbon-(OC-) normalized to facilitate comparison with the SMS criteria. Exceedances of the SMS CSL criteria (65 mg/kg OC) were identified at station AJF-12 (from 0 to 3 ft), AJF-14 (1 to 4 ft), and AJF-16 (2 to 3 ft). Exceedances of the SMS SQS criteria were identified at stations AJF-07 (0 to 1 ft, 2 to 4 ft, 6 to 6.65 ft), AJF-12 (3 to 4 ft), AJF-13 (0 to 1 ft), AJF-14 (0 to 1 ft), AJF-14 (0 to 1 ft), AJF-15 (0 to 1 ft and 2 to 3 ft), and AJF-16 (1 to 2 ft). The results are summarized in Table 5.

The combined third phase investigation and historically available (as available in the LDWG riverwide sediment database) subsurface sediment total PCB concentrations are presented on Figure 18, and are summarized in Table 5 and Appendix E, respectively. These data provide a comprehensive picture of PCB concentrations with depth over time in the vicinity of the Site. Similar to the surface sediment PCB concentrations (Section 5.1.1, Surface Sediment Sampling), the subsurface sediment PCB concentrations exceeded twice the CSL concentration centered around the Boeing cluster of outfalls adjacent to the northwestern corner of the Site near Site Outfall 009, and just north of the sheet pile wall adjacent to the southeastern portion of the Site. The PCB concentrations in subsurface sediments located along the remainder of the Site shoreline exhibit PCB concentrations similar to the average riverwide PCB concentrations (i.e., between the SQS and CSL criteria). An evaluation of the potential historical and current migration pathways and sources of PCBs to the subsurface sediments is presented in Section 6, Site Conceptual Model.

#### 5.2.2.3 Metals

The third phase investigation subsurface sediment metals concentrations at each sampling station and depth were below the SMS SQS criteria except for arsenic at station AJF-07 (3 to 4 ft and 6 to 6.5 ft) which was above the SMS SQS criteria (57 mg/kg) but below the SMS CSL criteria (93 mg/kg). The results are summarized in Table 5.

The combined third phase investigation and historically available (as available in the LDWG riverwide sediment database) subsurface sediment metals concentrations are presented on Figures 19 through 27, and are summarized in Table 5 and Appendix E, respectively. The subsurface sediment metals concentrations in the LDW in the vicinity of the Site are well below the SQS criteria. Concentrations of cadmium, copper, mercury, silver, and zinc in subsurface sediment samples collected near the cluster of Boeing outfalls exceeded twice the CSL criteria. Two isolated subsurface sediment samples collected at station AJF-07 (at 3 to 4, and 6 to 6.65 feet below mudline), which is located channelward of Outfalls 004 and 005 detected concentrations of arsenic between the SQS and CSL criteria. An SQS level exceedance of zinc also was identified 2 to 3 feet below mudline at station AJF-12. An evaluation of the potential historical and current migration pathways and sources of metals to the surface sediments is presented in Section 6, Site Conceptual Model.

## 5.3 CATCH BASIN SOLIDS SAMPLING ANALYTICAL RESULTS AND EVALUATION

The lack of accumulated solids in the targeted catch basins following catch basin cleanout indicates that the Site stormwater BMPs have successfully limited the amount of solids entering the Site catch basins since the last catch basin cleanout (duration of approximately 6 months from November 2004 through May 2005). Those BMPs include regularly scheduled comprehensive sweeping and/or vacuuming of all paved surfaces, as well as installation and regular replacement of filter fabric in each of the 19 Site catch basins. In addition, the lack of solids indicates that the solids identified during the second phase investigation likely were due to years of accumulation.

## 5.4 OUTFALL DISCHARGE SAMPLING ANALYTICAL RESULTS AND EVALUATION

As discussed in the Work Plan Addendum, the outfall discharge concentrations were evaluated to determine whether the stormwater discharge to sediments pathway was contributing elevated levels of PCBs and/or metals to sediments adjacent to active Site Outfalls 001, 002, and 003. The initial stage of the evaluation was undertaken to determine whether SMS exceedances were detected in surface sediment sampling stations AJF-09, AJF-10, and/or AJF-11, which are located directly channelward of Outfalls 003, 002, and 001, respectively (Figure 3). If no SMS exceedances were detected, no further evaluation was necessary. Alternatively, if SQS exceedances were identified, the observed outfall discharge concentrations would be compared to the appropriate water quality criteria to determine whether the observed SMS exceedances potentially could be due to historical and/or current discharges. The appropriate water quality criteria include WAC 173-201A chronic surface water criteria (Ecology 2003), EPA National Recommended Water Quality Criteria (EPA 2005), and Ecology Action Levels defined in the Industrial Stormwater General Permit (Ecology 2004). As discussed in the LDWG Phase I RI, salt water infiltration into the LDW from the downstream Elliot Bay extends well upstream of the Site. Therefore, the results were compared to marine criteria (Table 6).

Surface SMS exceedances were detected at stations AJF-09 (total PCBs and zinc) and AJF-10 (total PCBs, chromium, and zinc) (Table 4). Due to these exceedances, the stormwater discharge concentrations from Outfall 003 and 002 were compared to the water quality criteria (Table 6). As shown in Table 6, the chromium and zinc concentrations were below the water quality criteria. The identified PCB aroclor concentrations were at non-detectable concentrations but matrix interferences elevated the laboratory MRL (0.19 µg/L) above the applicable water quality criteria (0.03 µg/L) prohibiting direct comparison to the criteria. Assuming a simplified screening approach, concentrations less than the water quality criteria, as was identified for the chromium and zinc concentrations, may indicate that the stormwater discharge has a limited potential to affect sediment quality. However, certain additional facts beyond a simple comparison to water quality criteria must also be considered for the purposes of determining effluent impacts on sediment quality and serving the conceptual model of source control, primarily, chemical partitioning and equilibrium at the interfaces between the discharge and the water column and between soils/sediments and the water column may have a greater effect on sediments than is indicated by chemical concentrations in effluent grab samples."

## 5.5 DEVIATIONS FROM THE APPROVED WORK PLAN ADDENDUM

The following deviations from the EPA-approved Work Plan Addendum occurred during the third phase of investigation activities:

- Due to the rocky nature of the shoreline area, cores were collected at 7 stations rather than 11, as proposed). Five of the seven cores were relocated from their proposed target station to facilitate greater penetration and recovery;
- No samples were collected from the four proposed Site catch basins due to the lack of solids in the bottom of each catch basin; and

- No stormwater grab sample was collected from Outfall 001 due to the lack of sufficient runoff from this outfall between May and September 2005.

These deviations did not affect the data quality or the objectives of the third phase of the investigation.

## 5.6 THIRD PHASE DATA VALIDATION

In accordance with the Work Plan Addendum QAPP (Appendix C-2, Anchor 2005), the third phase sampling analytical results were validated to ensure that the data quality objectives specified in the QAPP were achieved. Data validation included signed entries on field data sheets and laboratory datasheets by the field and laboratory technicians, respectively; review for completeness and accuracy by the Field Coordinator and Laboratory Manager; review by the Data Manager for outliers and omissions; and use of QC criteria to accept or reject specific data. All data were entered into the EQuIS database, and a raw data file was printed. A second data manager or designee performed one hundred percent verification of the database raw data file. Any errors found were corrected on the raw data printout. Following review of the raw data, the top sheet was marked with the date the review was completed, and the initials of the person conducting the review. Any errors found in the raw data file were corrected, and the database was established. Data packages were checked for completeness immediately upon receipt from the laboratory to ensure that the requested data and QA/QC information were present. Data quality was assessed by a reviewer using current functional guidelines data validation requirements (EPA 1999, 2004c). A copy of the data validation report is provided in Appendix F, and is briefly summarized below.

Anchor collected sediment, solids, and liquid samples at the Site on May 2, 5, 6, and 19, 2005. A total of 20 sediment samples, 37 solids samples and 4 liquids samples were submitted to STL for analysis. STL received the samples on May 4, 6, 9, and 20, 2005. The temperatures in the coolers were within the designated range of 4°±2° Celsius. The sample receipt forms indicated that STL received the samples in good condition. STL analyzed the samples using the following parameters and methods:

- PCBs by EPA Method 8082;
- Total metals by EPA Methods 6020 and 7471;
- TS in percent by EPA Method 160.3 (modified for sediments);
- TOC by EPA Method 9060;
- Atterburg limits by American Society for Testing and Materials Method D4318; and
- Grain size by Puget Sound Estuary Program methodologies.

Overall, the data were judged to be acceptable for their intended use, as qualified. The data achieved precision, accuracy, and completeness goals. All laboratory data not meeting the data quality objectives defined in the Work Plan Addendum QAPP were flagged appropriately, as shown in Tables 2 through 5 of Appendix F.

## 5.7 PROPERTY LINE STORMWATER OUTFALL SAMPLING AND ANALYTICAL RESULTS

Boeing conducted an investigation of stormwater structures in accordance with the EPA-approved Phase II Transformer Investigation Work Plan (Floyd Snider McCarthy 2004). The investigation included collecting and analyzing solids material within the 12- and 24-inch diameter stormwater outfalls located in the easement on the northern portion of the Site that convey stormwater runoff from the Boeing Plant 2 Facility and the King County International Airport (KCIA) (Floyd Snider and Weston Solutions, Inc. 2005). Solids samples were collected from the manholes located along the 12- and 24-inch stormwater outfalls in May 2005. A video survey of the stormwater outfall conveyance pipes conducted at the same time identified two drainage lines connected to the 24-inch stormwater outfall, including a 15-inch diameter pipe extending from the Boeing Plant 2 Facility, and a 12-inch diameter pipe extending from the Site. No cross-connections were identified in the video survey of the 15-inch diameter storm drain line. The locations of the 12- and 24-inch diameter stormwater outfalls are shown on Figure 28.

Solids samples were collected from three manhole locations (MN 37-2, SDMH-24B, and SDMH-24A) along the 24-inch diameter pipe, a manhole location on the previously unidentified Boeing 15-inch diameter pipe (MH37-7), and two manhole locations along the 12-inch diameter pipe (SDMH-15B and SDMH-15A). The solids sampled from the 12-inch diameter pipe consisted of several inches of silty sand and/or gravel overlying approximately 0.5-inch of oily sludge in SDMH-15B to a bottom layer of silty sand sludge with a grey-black, oily appearance and a hydrocarbon odor in SDMH-15A. The solids sampled from the 24-inch diameter pipe consisted of several inches of silty sand and/or gravel overlying approximately 0.5-inch of oily sludge in MN 37-2, MN 37-7, and SDMH-24B, to very little accumulated granular material and the presence of oily sludge along the bottom surface in SDMH-24A.

The concentrations of PCBs detected in the granular samples collected by Boeing from the 24-inch diameter stormwater outfall (samples SD004 and SD001), upstream from the 12-inch diameter stormwater outfall that extends from the Site, ranged up to 2,600 mg/kg. The analytical results of a sample collected from the 12-inch diameter stormwater pipe connecting the Boeing Plant 2 Facility to the 24-inch diameter stormwater outfall, upstream of the cross-connection of the 12-inch diameter pipe from the Site, detected a concentration of PCBs of 731 mg/kg. A concentration of PCBs of 10,000 mg/kg was detected in the sample of oily sludge collected downstream of the connection with the 12-inch diameter pipe extending from the Site. The analytical results of the solids samples are illustrated on Figure 28.

Farallon collected a sample of solids material in the 12-inch diameter pipe that extends from the Site to the 24-inch diameter stormwater outfall at a distance of approximately 6 inches from the junction. The 12-inch diameter pipe was traced by Farallon as far as possible onto the Site, and a sample of solids material was collected at a distance of approximately 40 feet from the junction by excavating vertically, cutting the pipe, and collecting an undisturbed sample of the black silty sand. The concentration of PCBs detected in the solids sample collected from the 12-inch diameter pipe was 1,100 mg/kg in the sample collected at 6 inches. The concentration of PCBs detected in the sample collected at a distance of 40 feet from the junction of the 12- and 24-inch diameter pipes was 6.5 mg/kg. The solids sample collected 6 inches from the junction of the 12- and 24-inch diameter pipes was at an elevation that is tidally influenced. The concentrations of PCBs detected in the 12-inch diameter pipe are likely attributable to the backflushing of PCB-laden water and solids within the pipe during high tide, and/or rainfall events.

The results of the stormwater drainage investigation indicated that the 12-inch diameter pipe that extends from the Site is not the source of PCBs detected in the solids sample collected in the 24-inch diameter stormwater outfall. A more detailed discussion of the stormwater drainage investigation was provided to EPA in the Technical Memorandum Regarding Storm Drain Line Data Summary (Farallon 2005b).

## 5.8 SEDIMENT TRANSPORT CHARACTERIZATION

As discussed in the Work Plan, several studies have evaluated sediment transport in the LDW. The LDWG Phase I RI summarizes the results of these studies and an evaluation of the historical data. Following completion of the Phase I RI and concurrent with this third phase investigation activities, the LDWG conducted additional studies to further evaluate sediment fate and transport processes in the LDW. The results of the studies are described in the Data Report prepared by Windward (2005a). This report only presents an overview of the findings and does not provide an estimate of the sedimentation rates adjacent to the Site. The Data Report will be finalized pending resolution of several issues. Currently, the following information is known regarding sedimentation adjacent to the Site, as identified by EPA (see Appendix A – Comment 25, Part D) "Current data indicate that the bench area adjacent to the navigation channel is an area of deposition over time, although the patterns of deposition and erosion in this particular reach have not yet been determined. Nearshore sedimentation rates, closer to the bank, are also undefined."

## 5.9 SUMMARY OF LDW MAINTENANCE DREDGING ACTIVITIES

The steady accumulation of sediment in the LDW has required the ACOE to perform regular maintenance dredging since 1916 to maintain the appropriate depths in the federal navigation channel for commercial vessel traffic (Weston 1999). The maintained depths range from approximately minus 15 to minus 30 feet MLLW elevation extending from just upstream of Turning Basin 3 to the southern tip of Harbor Island (Weston 1999). Adjacent to the Site, the ACOE has maintained the dredged channel at approximately minus 15.1 feet MLLW, with the most recent dredging event occurring circa 1999 (Windward 2003). These dredging events have maintained an approximately rectangular channel configuration, with steep slope transition zones adjacent to the navigation channel, and shallow intertidal benches in some areas on either side of the transition zones.

# 6.0 SITE CONCEPTUAL MODEL

A preliminary site conceptual model that developed potential source(s) and migration pathways to determine whether operations at the Site are or have been a source of contamination to sediments in the adjacent LDW was presented in the Work Plan. The Work Plan identified data gaps that were evaluated in the second and third phases of the investigation. The results of the AOC-related investigation have been compiled and evaluated to develop a site conceptual model that defines the current physical conditions, types of hazardous substances, sources, nature and extent, and migration pathways for PCBs and metals that have resulted in or could potentially result in impacts to sediments in the LDW adjacent to the Site. The site conceptual model is presented below.

## 6.1 PHYSICAL CONDITIONS

The Site consists of approximately 20 upland acres located on the east bank of the LDW. The Site is covered by impermeable surfaces with the exception of limited areas along the bank on the western portion. The Site is at an elevation of approximately 16 feet above mean sea level, and is relatively flat, with the ground surface sloping gently toward the LDW. The Site was first developed in 1942, and has operated as a steel fabrication and distribution facility since that time.

The majority of the shoreline along the western portion of the Site is composed of a steep bank (pile supported) covered with riprap, woody debris, fill, and wooden bulkheads. The shoreline along the southwestern portion of the Site (adjacent to the main building) is composed of a vertical sheet pile bulkhead, with heavy vegetation along the upper elevations.

Surface water runoff from impermeable surfaces at the Site is captured in a stormwater conveyance system that discharges directly to the LDW under the Baseline Permit. Stormwater runoff from the eastern side of the Site discharges to the King County Metro stormwater system.

### 6.1.1 Geology

The western portion of the Site, adjacent to the LDW, consists of fill along the bank and in a large embayment located on the western portion of the Site sometime between May 1942 and 1946. The source of the fill may be a result of hydraulic dredging conducted in the LDW by ACOE or imported from unknown upland sources. The fill extends to total depths of 2 to 16 feet bgs on the western portion of the Site, and consists of brown to orange-brown gravel and sand with varying amounts of silt and brick, wood, and metal debris. The native soil encountered underlying the fill consists of grey silt to fine sand.

The geology of the eastern portion of the Site consists of alluvial sand and silty sand with buried paleosols overlying silt with degraded plant material and woody debris overlying approximately 30 feet of poorly-graded sand that grades to silty sand from east to west. Alluvial sand and silt are present to the total depth explored at the Site of 81.5 feet bgs.

### 6.1.2 Hydrogeology

Groundwater at the Site was encountered at depths of 9 to 15 feet bgs on the western portion of the Site, and at depths of 11 to 21 feet bgs on the eastern portion of the Site (Table C-5). The direction of shallow groundwater flow beneath the Site is consistently observed to be toward the southwest on the eastern portion of the Site with flow direction becoming more westerly near the LDW with an average gradient of 0.0167 feet/foot (Farallon 2004). Tidal influences have been identified in monitoring wells located on the western portion of the Site.

### 6.1.3 Lower Duwamish Waterway

The LDW has been a depositional environment during all river flow conditions from 1960 to 1980, retaining an average of approximately 90 percent of the total incoming sediment load (Harper-Owes Company 1983). Sediments deposited in the LDW either have contributed to steady accretion of the bed or have been removed from the system through routine channel maintenance dredging operations. As identified by EPA (see Appendix A – Comment 25, Part D) "Current data indicate that the bench area adjacent to the navigation channel is an area of deposition over time, although the patterns of deposition and erosion in this particular reach have not yet been determined." This indicates that the sediment-to-sediment pathway is viable in the reach of the LDW adjacent to the Site.

## 6.2 TYPES OF HAZARDOUS SUBSTANCES

The hazardous substances that have been identified in sediments in the LDW adjacent to the Site at concentrations exceeding the SQS and CSL are:

- Polychlorinated biphenyls (surface and subsurface sediments); and
- Metals, including cadmium, chromium, copper, lead, silver, and zinc (surface sediments).

The analytical results for the environmental media samples collected as part of AOC-related Site investigations detected concentrations of these hazardous substances in subsurface fill, shoreline bank fill, debris piles, and/or catch basin solids exceeding the screening levels defined in the Work Plan.

## 6.3 SOURCES OF HAZARDOUS SUBSTANCES

The results of the investigation completed to meet the requirements of the AOC identified known and potential sources of hazardous substances on the Site that may have resulted in impacts to sediment in the LDW adjacent to the Site. Historical records that clearly define past uses of chemicals at the Site provided limited information.

### 6.3.1 Sources of Polychlorinated Biphenyls

Known uses or releases of PCBs have not been identified at the Site. As discussed in Section 3.1, Potential Sources, the results of the AOC-related investigation have defined the following potential on-Site sources of PCBs:

- While the possibility that PCB-containing materials were used as part of former Isaacson Iron Works and Bethlehem Steel operations at the Site cannot be ruled out, these former operations are not well documented, and there is no indication that PCBs were ever used.
- Hydraulic fill from historical dredging of the LDW or imported from upland source areas that may have contained concentrations of PCBs above the screening levels defined in the Work Plan.
- Electric transformers were identified as potential sources of PCBs to the Site. However, no known or suspected releases of dielectric fluids from the transformers have occurred on the Site (Section 3 of the Work Plan).
- Windblown soil and waste particulates containing low level concentrations of PCBs that have been deposited on the Site and transported through the stormwater conveyance system.

Off-Site sources of PCBs to the sediment in the LDW adjacent to the Site include PCB-containing stormwater runoff from the Boeing Plant 2 Facility, KCIA, and other facilities that discharge stormwater runoff through the 12- and 24-inch diameter storm drain pipes that are located in the easement of the northern portion of the Site. The distribution of high concentrations of PCBs detected in the solids samples collected from these drain pipes supports this interpretation. In addition, PCB concentrations identified at depth in sediments in the LDW adjacent to the Site are potentially due to deposition during placement of fill material with elevated PCB concentrations (e.g., dredging by the ACOE or placement of fill by other entities), erosion and failure of bank fill with elevated levels of PCBs, admixing of sediments to depth by physical disturbance (e.g., prop wash and dredging), and sediment transport and subsequent sedimentation (including upstream migration from Boeing outfalls with document historical discharges of PCBs).

### 6.3.2 Sources of Metals

The results of the AOC-related investigation have defined the following potential on-Site sources of metals:

- Hydraulic fill from historical dredging of the LDW or imported from unknown up land source areas that may have contained concentrations of metals above the screening levels defined in the Work Plan; and
- Releases via the stormwater system stemming from metal fabrication operations at the Site.

## 6.4 NATURE AND EXTENT

The nature and extent of PCBs and metals in the fill on or near the Site shoreline, in solids in the Site stormwater conveyance system catch basins, and in sediment in the LDW adjacent to the Site were identified based on the analytical results of environmental media samples collected from this and prior investigations. Concentrations of PCBs above the screening levels or the PQLs have not been detected in groundwater or LNAPL samples collected at the Site. The nature and extent of PCBs and metals identified at the Site and LDW sediments adjacent to the Site is presented below.

### 6.4.1 Polychlorinated Biphenyls

Concentrations of PCBs above the screening levels defined in the Work Plan have been detected in fill located along the shoreline of the LDW, Site stormwater conveyance system catch basins solids and in LDW sediments adjacent to the Site. The nature and extent of PCBs in the uplands portion of the Site is not consistent with surface releases. The distribution of PCBs in the fill is entirely consistent with the placement of fill that contained PCBs as a result of historical dredging of the LDW by the ACOE.

#### 6.4.1.1 Uplands

The upland media include native soil, LNAPL, fill, debris piles, solids in the stormwater catch basins, and groundwater. The nature and extent of PCBs in each of these media is discussed below.

**Native Soil**
Concentrations of PCBs have not been detected in any native soil samples collected from the eastern portion of the Site or from native soil samples collected from below the fill on the western portion of the Site.

**Light Nonaqueous-Phase Liquid**
Measurable LNAPL from releases of cutting oil are present on groundwater on the eastern portion of the Site, and based on years of monitoring data, the LNAPL is not moving toward the LDW. Concentrations of PCBs have not been detected in the samples of LNAPL collected from monitoring wells located on the eastern portion of the Site in Area 1 (Figure 2).

**Fill**
Concentrations of PCBs exceeding the screening levels defined in the Work Plan were detected in samples of fill collected from soil borings located along the western shoreline of the Site, and from the shoreline bank-face. The concentrations of PCBs above the screening levels were distributed heterogeneously throughout the fill with no apparent trends in lateral or vertical distribution. Concentrations of PCBs were detected in the fill overlying native soils to a depth of 16 feet bgs.

Analytical results of subsurface fill samples collected from borings located adjacent to the shoreline on the northwestern portion of the Site did not detect concentrations of PCBs exceeding the screening levels and/or the laboratory PQL (Figure B-2).

**Debris Piles**

The analytical results of samples collected from the debris piles located between shoreline bank-face fill sample locations SS1 and SS2 detected concentrations of PCBs above the screening level (Figure B-2). The origin of the debris piles is unknown; however, discussions with Site employees indicated they have been present for decades. It also is unknown whether the concentrations of PCBs detected in sediment in the LDW have adversely affected the debris piles, which have been in direct contact with contaminated sediment for an unknown length of time, or whether erosion of the debris piles is a source of PCBs to sediment in the LDW.

**Solids in Stormwater Catch Basins**

Concentrations of PCBs above the screening level defined in the Work Plan were detected in samples of accumulated solids collected from four catch basins on the Site.

**Groundwater**

Concentrations of PCBs have not been detected in groundwater samples collected from monitoring wells located on the Site. In addition, Boeing collected groundwater samples from monitoring wells located near or within the vicinity of release(s) of PCBs from the former Seattle City Light transformer. PCBs were not identified in a dissolved phase in groundwater, and have not migrated via the groundwater pathway (Floyd Snider and Weston Solutions, Inc. 2005).

#### 6.4.1.2 Sediments

The distribution of concentrations of PCBs exceeding the SQS and/or the CSL in the LDW adjacent to the Site is depicted on Figure 8 (surface sediments) and Figure 18 (subsurface sediments). Analytical results are summarized on Tables 4 and 5.

The analytical results of the sediment samples collected for the third phase of the investigation are similar to the analytical results of sediment samples collected by others which are summarized in the Work Plan and the Work Plan Addendum. The analytical data show that the majority of the surface sediment PCB concentrations in the reach of the LDW (i.e., shoreward of the federal navigation channel) near the Site detected concentrations above the SQS.

Concentrations of PCBs exceeding the CSL have been detected in surface sediments located between Outfalls 003 and 007 extending distances of 40 to 90 feet channelward of the shoreline. PCBs also have been detected at concentrations above the CSL in one surface sediment sample collected further channelward near the eastern edge of the navigation channel between Outfalls 003 and 004. PCB concentrations exceeding the CSL have also been detected in surface sediment samples collected adjacent to the northern portion of the Site between shoreline bank-face fill sample location SS6 and the northern property line, and extend 80 to 100 feet channelward of the shoreline. Just downstream from the northern property line adjacent to the cluster of Boeing Outfalls, PCB concentrations exceeding the CSL have also been detected. The laboratory analytical results of the subsurface sediment samples collected for the third phase of the investigation detected concentrations of PCBs exceeding the CSL to a depth of 3 feet below mudline. Subsurface sediment samples collected from depths of 3 to 7 feet below mudline detected concentrations of PCBs above the SQS but below the CSL.

Concentrations of PCBs exceeding the CSL in subsurface sediment samples are centered around the Boeing cluster of outfalls and the upstream area adjacent to the northwestern corner of the Site. The subsurface sediment PCB concentrations in these areas are elevated throughout the collected depth. Subsurface sediment PCB concentrations located farther upstream of the northwestern corner of the Site exhibit lower PCB concentrations, and the PCB concentrations generally decrease with depth.

### 6.4.2 Metals

The analytical results for metals, including cadmium, chromium, copper, lead, silver, and zinc, for fill samples collected for the second phase of the investigation are depicted on Figures B-4, B-5, B-6, B-7, B-10, and B-11 and in Table B-4 included in Appendix B. The surface sediment metals analytical data are presented on Figures 9 through 17. The subsurface sediment metals analytical data are presented on Figures 19 through 27. The laboratory analytical results for metals in surface and subsurface sediment are summarized in Tables 4 and 5, respectively.

**Cadmium**

Cadmium was detected at concentrations exceeding the SQS or the CSL in subsurface fill, shoreline bank-face fill samples, and catch basin solids. Cadmium was not detected above the laboratory PQL in the samples collected from the debris piles. Concentrations of cadmium exceeding the SQS have not been detected in surface sediment in the LDW, except adjacent to the northernmost portion of the Site.

**Chromium**

Concentrations of chromium exceeding the screening level are widespread in the various media sampled at the Site. The concentrations of chromium exceeding the screening level in fill at the Site were detected from the ground surface to the total depth explored in all of the soil borings. Elevated concentrations of chromium were detected in the solids samples collected from the catch basins during the second phase of the Site investigation. The concentrations of chromium detected in the shoreline bank-face fill samples are significantly lower than those detected in subsurface fill. Concentrations of chromium above the screening level were detected in the sample collected from the North Debris Pile. However, the concentrations of chromium detected in the sample collected from the South Debris Pile, located upstream of Outfall 004, did not exceed the screening level. Concentrations of chromium above the CSL were detected in surface sediment samples collected from two areas of the LDW, near the locations of Outfalls 002 and 004.

**Copper**

The distribution of copper at concentrations exceeding the screening level in subsurface fill at the Site is limited to depths of 2 to 6 feet bgs in soil borings. The results of shoreline bank-face fill sampling detected concentrations of copper exceeding the screening level. Elevated concentrations of copper were detected in the solids samples collected from the catch basins during the second phase of the Site investigation. The analytical results of the debris piles samples detected concentrations of copper exceeding the screening level. The shoreline bank-face fill samples collected on either side of the debris piles did not contain concentrations of copper exceeding the screening level. The analytical results of surface sediment samples collected from the LDW detected concentrations of copper exceeding the CSL at a single sampling station just north of the sheetpile wall, and adjacent to the northernmost portion of the Site.

**Lead**

Concentrations of lead exceeding the screening level were detected in subsurface fill samples collected at depths ranging from the ground surface to 8 feet bgs. Concentrations of lead exceeding the screening level were detected in the shoreline bank-face fill samples and in the samples collected from the two debris piles. Concentrations of lead detected in the solids collected from the Site catch basins did not exceed the screening level. The analytical results of surface sediment sampling adjacent to the Site detected concentrations of lead exceeding the CSL near Outfalls 004 and 005, a single sampling station between Outfalls 006 and 007, and adjacent to the northernmost portion of the Site.

**Silver**

The only detection of silver exceeding the screening level was in the shoreline bank-face fill sample collected at sample location SS7. The results of surface sediment sampling in the LDW have not detected concentrations of silver exceeding the SQS or the CSL, except adjacent to the northernmost portion of the Site.

**Zinc**

Concentrations of zinc exceeding the screening level were detected in subsurface fill samples collected from soil borings SB1, SB3, and SB7; in shoreline bank-face fill collected from five of the seven sample locations; in solids collected from three of the catch basins; and in the sample collected from the North Debris Pile. The results of surface sediment samples adjacent to the Site detected concentrations of zinc exceeding the SQS and the CSL near Outfall 004 and 005, between Outfalls 008 and 009, and adjacent to the northernmost portion of the Site.

All of the metals concentrations in the subsurface sediment samples in the LDW in the vicinity of the Site are well below the SQS criteria; however, concentrations of cadmium, copper, silver, and zinc exceeding the CSL are present in subsurface sediment near the cluster of Boeing outfalls. The only CSL exceedance for metals adjacent to the Site occurred at sampling station

AJF-12SD for zinc at a depth of 2 to 3 feet below mudline. Sample station AJF-12 is located near the North Debris Pile, which also contained a concentration of zinc above the SQS and the CSL. With this one exception, the subsurface sediment analytical results for samples collected adjacent to the Site did not detect concentrations of cadmium, chromium, copper, lead, silver, or zinc exceeding the SQS.

## 6.5 MIGRATION PATHWAYS

The migration pathways for potential transport of PCBs and/or metals from the Site to sediment in the LDW adjacent to the Site that were evaluated for this investigation include:

- Direct migration of groundwater to surface water or sediment;
- Stormwater discharge to surface water and sediment;
- Erosion of shoreline fill to sediment; and
- Transport and deposition of sediments to areas adjacent to the Site.

Of these, direct migration of groundwater to sediment has been eliminated as a pathway. A detailed summary of the migration pathways is provided below.

### 6.5.1 Direct Migration of Groundwater to Surface Water and Sediment

The results of groundwater monitoring and sampling at the Site were summarized in the Technical Memorandum Regarding Groundwater Data Summary dated June 28, 2005, prepared by Farallon for EPA on behalf of Jorgensen Forge (Farallon 2005a. Appendix A). The analytical results of groundwater samples collected at the Site have not detected concentrations of PCBs exceeding the laboratory PQLs or the screening levels provided in the Work Plan. In addition, to further evaluate the migration of groundwater to sediment pathway, the highly conservative equilibrium-partitioning (Eq-P) based argument was conducted to compute a conservative groundwater PCB screening level protective of sediment quality. Using the Eq-P approach (Attachment A, EPA Comment 32), the SMS SQS PCB criteria (i.e., 12 mg/kg OC) was converted to a conservative groundwater PCB screening level (assuming equilibrium partitioning from groundwater to sediments). The conservative PCB screening level is 0.039 µg/L. This conservative PCB screening level is nearly an order of magnitude lower than most of the PCB PQLs (ranged from 0.02 to 1 µg/L) obtained for facility data prohibiting comparison of the data to the conservative PCB screening level. As discussed in the Draft Data Summary Report, of the 40 PCB samples collected from the 30 monitoring wells on the facility (from 1994 to 2003), only one sample collected by Weston Solutions, Inc. (Boeing's consultant) in June 2003 was detected above the PQL in MW-6 (0.41 µg/L). However, the PCB concentration in the same well only 2 months prior was non-detect (0.0478 µg/L) for PCBs. Therefore, this isolated detection of PCBs is likely a false detection. As identified in the Draft Data Summary Report, the groundwater to sediment pathway for PCBs is not complete and is therefore screened out of the pathway analysis. The groundwater to surface water/sediment migration pathway for PCBs is incomplete because of the absence of PCBs in Site groundwater. Nonetheless, the groundwater to sediment pathway will be an important element during the design of the future remedy for the sediment and adjacent bank areas.

The low concentrations of metals detected in groundwater collected from Site monitoring wells and Boeing monitoring wells do not indicate that the concentrations of metals detected in sediment in the LDW are originating from upland sources and being transported by groundwater migration. Direct migration of groundwater to sediment was, therefore, eliminated as a pathway.

### 6.5.2 Stormwater Discharge to Surface Water and Sediment

Existing Site outfall information gathered for the investigation, together with information presented in the Boeing Plant 2 Transformer PCB Investigation Report, has been compiled and evaluated to determine whether this migration pathway currently exists or historically existed for elevated concentrations of PCBs and/or metals to enter the LDW through stormwater discharge from the Site (Floyd Snider and Weston Solutions, Inc. 2005; Weston 1999). This evaluation included an assessment of the drainage pathways for each of the Site outfalls and the potential for PCBs and/or metals to enter the drainage pipes, an assessment of existing water quality and solids data for each outfall, and an assessment of the sediment quality adjacent to each outfall.

#### 6.5.2.1 Historical Site Stormwater Discharges

Evaluation of Site files provided very little information pertaining to historical Outfalls 005 to 009 (Figure 3). Therefore, the drainage pathways for these outfalls have not been identified. Outfalls 005 to 009 reportedly were plugged using concrete in the mid-1980s, which indicates that any potential migration from these outfalls would have been limited to the period prior to the mid-1980s. Discussions with Site employees, and the discharge locations for these outfalls indicate that these outfalls may have served the historical Bethlehem Steel operations, which operated from 1951 to 1963 along the northwestern portion of the Site (Figure 9 of the Work Plan).

Elevated concentrations of PCBs, cadmium, lead, and zinc were detected in sediments in the northwestern corner of the Site in the vicinity of Outfall 009, the 24-inch property line stormwater outfall, and the 12-inch Boeing property line stormwater outfall. The PCB exceedances in each of these areas were not co-located with metals exceedances, indicating that the source(s) of these analytes is different. Site Outfall 009 is a 2.5-inch diameter pipe that is located approximately 2 feet below the top of bank ground surface. It is thought to have historically discharged stormwater runoff from a roof drain, which is a highly unlikely source of PCBs to the LDW. Because no metals data for the stormwater discharge from Outfall 009 exist, it is not possible to determine whether this roof drain was a potential source of metals to this area. The sources of the elevated PCB concentrations adjacent to this portion of the Site are due to documented releases from the Boeing cluster of outfalls located slightly downstream, and the 12- and 24-inch property line stormwater outfalls, as discussed below. Concentrations of cadmium and lead exceeding the CSL were detected in surface sediment samples surrounding Outfall 009. The outfall was plugged in the 1980s, and the detected concentrations of cadmium and lead are present only in surface sediment. Thus, the likely source of cadmium and lead to the LDW is the Boeing cluster of outfalls and the 12- and 24-inch property line stormwater outfalls.

Concentrations of PCBs were detected in solids at several points along the 12-inch Boeing property line stormwater outfall and the 24-inch property line stormwater outfall. Any contribution of PCBs from the 12-inch Boeing property line stormwater outfall is due to historical Boeing operations. Potential sources of PCBs to the 24-inch property line stormwater outfall include up-gradient releases from Boeing, off-Site sources (e.g., KCIA), and backflushing of elevated PCB concentrations up the 24-inch property line stormwater outfall during tidal exchanges within the LDW. The drainage for the 24-inch property line stormwater outfall extends up-gradient onto KCIA property. KCIA has documented elevated PCB concentrations in caulking used to repair pavement, and concentrations of PCBs have been documented in catch basins up-gradient of the Site that discharge into the 24-inch property line stormwater outfall. It is unlikely that the previously unidentified Site 12-inch connection into the 24-inch property line stormwater outfall (which may have served historical Bethlehem Steel operations) was a historical source of PCBs. This conclusion is supported by the fact that there are no historical documented uses of PCBs or releases at the Site; and that the variation in detected concentrations in the 12-inch connection are indicative of backflushing from the 24-inch property line stormwater outfall during high tidal events.

Elevated concentrations of PCBs, cadmium, lead, and zinc were detected in sediment samples located channelward of historical Site Outfall 005. The PCB exceedances were detected in both surface and subsurface sediments, whereas the elevated metals concentrations were limited to the surface sediments. Given that Outfall 005 was plugged in the mid-1980s, it likely is not the source of the metals. There are no data to indicate that this historical outfall is the source of PCBs to the adjacent sediments, given the lack of documented historical uses or releases of PCBs at the Site.

#### 6.5.2.2 Existing Site Stormwater Discharges

Site Outfalls 001, 002, and 003 currently discharge all collected stormwater runoff from the Site to the LDW during rainfall events (Figure 2). Outfall 004 does not appear to be affected or influenced by precipitation events. Site research produced no evidence that PCBs have been or are used on the Site, with the exception of dielectric fluid contained in some of the transformers on the Site. Surface water in the interior of the current buildings is not captured and/or delivered to the stormwater collection and conveyance system. The relatively low concentrations of PCBs detected in the samples of solids collected from the catch basins on Site may be the result of PCB-containing windblown soil and waste particulates that accumulated in the catch basins. The catch basins have recently been cleaned out, and have been protected from further sedimentation through the implementation of BMPs. These conditions indicate that Site Outfalls 001, 002, and 003 are not an ongoing source of PCBs to the LDW.

Metals are used on the Site in manufacturing processes that are limited to the interior of buildings. Surface water in the interior of the buildings is not captured and/or delivered to the stormwater collection and conveyance system. This limits the potential for metals migration from manufacturing processes into the LDW. Large metal scraps used during manufacturing processes are stored outside the building on pavement. Inspection of this pavement indicated that the pavement is in good condition (i.e., few visible cracks), which limits direct migration to groundwater. Stormwater that comes into contact with this stored metal is conveyed to the 19 Site catch basins. The design of the catch basins, which were constructed to facilitate settling of particulates, and implementation of stormwater BMPs (e.g., Site sweeping and use of filter fabric to limit solids infiltration into the catch basins) limit potential suspended metals that migrate to the catch basins. An evaluation of the potential for metals migration through the stormwater conveyance system, prior to and following the implementation of BMPs, is presented below.

The evaluation conducted during the third phase investigation concluded that metals concentrations of stormwater discharges from Outfalls 002 and 003 collected during a single rainfall were not above the applicable water quality screening levels. This indicates that the implementation of BMPs has successfully limited the introduction of solids into the stormwater conveyance system.

The elevated concentrations of chromium, copper, and zinc in the solids samples collected from the catch basins indicate that the discharge of water through the stormwater conveyance system potentially resulted in the deposition of solids into the LDW containing concentrations of chromium, copper, and zinc exceeding the SQS and the CSL. To evaluate this potential pathway, the catch basin solids metals concentrations were compared to the surface sediment concentrations identified in the vicinity of the outfall discharge locations, as discussed below.

The concentrations of chromium, copper, and zinc detected in surface sediment adjacent to the Site surrounding Outfalls 003, 004, and 005 are similar to the concentrations detected in the solids samples collected from the catch basins. Outfall 003 consists of an 18-inch diameter ductile iron pipe that extends through the sheetpile wall at an elevation of 8.91 feet MLLW. The surface of the bank beneath Outfall 003 is composed of armored rock. Stormwater discharged through Outfall 003 during low tides is expected to flow across the bank with little to no erosion of bank material and little to no deposition of solids. Any suspended solids in the stormwater stream, including any metals, could be deposited on top of surface sediment when the velocity of the stormwater discharge decreases upon entering the LDW. This material could then be transported to the surrounding sediments during tidal fluctuations. Given the similarity in metals concentrations identified in sediments in the vicinity of this outfall and the catch basin solids (CB1, CB2, and CB3) conveyed through this outfall, Outfall 003 was, prior to implementation of BMPs, a likely source of metals to the LDW.

Outfall 004 is an active outfall that on rare occasions discharges non-contact cooling water from the cooling tower system. Discussions with Site personnel indicate that the last discharge from this outfall occurred more than 10 years ago. Similarly, Outfall 005 is a historical outfall that has not discharged for at least 20 years. Given these outfalls have been inactive for many years it is unlikely that they are the source of elevated surface sediment metals concentrations identified adjacent to their outfall discharge locations.

The analytical results of the solids samples collected from catch basin CB4 detected concentrations of chromium and copper exceeding the SQS and the CSL (Figure B-1, Appendix B). The water and solids captured by catch basin CB4 are discharged through the stormwater conveyance system to Outfall 002. The results of surface sediment samples collected near Outfall 002 detected concentrations of chromium exceeding the SQS and CSL in surface sediment, indicating that discharge of stormwater through Outfall 002 was, prior to implementation of BMPs, a likely source of metals to the LDW.

### 6.5.3 Erosion of Fill to Sediment

Concentrations of PCBs exceeding the screening levels have been detected in subsurface fill located on the Site, and exceeding the CSL in surface and subsurface sediment in the LDW. Based on the physical conditions of the bank, significant erosion of shoreline bank fill is currently not occurring. However, historical erosion of the bank or erosion during placement of the fill may have resulted in deposition of fill in the LDW containing PCBs.

Concentrations of copper, lead, and zinc exceeding the screening levels have been detected in subsurface fill and shoreline bank-face fill that likely were present in the fill that was placed in the former river embayment. Surface sediment chromium, copper, lead, and zinc concentrations in exceedance of the SQS and/or CSL indicate recent deposition; subsurface sediment lead and zinc exceedances of the SQS and/or CSL indicate historical sources. The current physical condition of the bank indicates that erosion of bank fill is not a significant source of metals to the LDW, although it is likely that historical erosion and deposition of fill and/or sediment from the shoreline bank resulted in concentrations of metals to sediment in the LDW.

### 6.5.4 Transport and Deposition of Sediments to Areas Adjacent to the Site

Figures 4 and 5 show that a high density of surface and subsurface sediment sampling density exists in the vicinity of the Site, from the eastern edge of the federal navigation channel to the 0 foot MLLW elevation. This high degree of coverage enables an accurate evaluation of the lateral and vertical variability of surface and subsurface sediment quality in the vicinity of the Site. Along the northwestern corner of the Site, the high density of subsurface sediment data in the vicinity of the Boeing outfalls clearly shows that high subsurface sediment total PCB concentrations migrate upstream from sediments adjacent to the cluster of Boeing outfalls toward the sediments adjacent to the northwestern corner of the Site. Releases of elevated PCB concentrations occurred from the Boeing outfalls. The elevated PCB concentrations likely were transported upstream during flood-tide conditions, and were deposited adjacent to the Site under the appropriate hydraulic and tidal conditions. This upstream sediment transport mechanism also contained elevated concentrations of PCBs that were discharged from the 12-inch and/or the 24-inch property line outfall. As identified by EPA (see Appendix A – Comment 25, Part D) "Current data indicate that the bench area adjacent to the navigation channel is an area of deposition over time, although the patterns of deposition and erosion in this particular reach have not yet been determined."

## 6.6 SITE CONCEPTUAL MODEL SUMMARY

### 6.6.1 Polychlorinated Biphenyls

Concentrations of PCBs were detected in subsurface fill, shoreline bank-face fill, debris piles, and catch basin solids collected at the Site. Concentrations of PCBs were detected in surface and subsurface sediments in the LDW adjacent to the Site. The concentrations of PCBs detected in the subsurface fill and the shoreline bank-face fill samples at the Site may be due to imported fill placed on the Site by historical dredging of the LDW or from unknown upland sources. The PCBs may have been deposited in the LDW during the fill placement and/or through historical erosion of the bank by flooding, surface water runoff, and/or wind erosion. Significant erosion of the shoreline bank is no longer currently occurring, as evidenced by the high degree of shoreline armor. Erosion, suspension, and lateral transport of sediment occur in the channel of the LDW during tidal flooding, and result in the localized re-deposition of PCBs both upstream and downstream of the source area(s).

Evaluation of total PCB concentrations in surface sediment indicates that the contamination adjacent to the northwestern portion of the Site is likely due to recent and on-going stormwater discharges from the 24-inch property line outfall and recent discharges from the 12-inch Boeing property line outfall that has migrated upstream during tidal fluctuations. Elevated concentrations of PCBs detected in surface sediment samples collected from the area located north of the sheet pile wall adjacent to the southeastern portion of the Site are likely due to localized sediment transport within the LDW. The only evidence of PCB releases via the stormwater from the Site is the relatively low concentrations of PCBs found in catch basin solids sampling.

Subsurface sediment PCB concentrations are similar to PCB concentrations detected in subsurface sediment samples collected throughout the LDW with the exception of the areas located on the northwest portion of the Site, near the 24-inch property line outfall and the 12-inch Boeing property line outfall, and north of the sheet pile wall on the southeastern portion of the Site, slightly downstream of active Site Outfall 004. Concentrations of PCBs detected in the subsurface sediment in the area located on the northwest portion of the Site are likely due to historic releases and on-going of stormwater discharges from the 24-inch property line outfall and the 12-inch Boeing property line outfall and stormwater discharged from the Boeing outfalls that migrated upstream during tidal fluctuations. Concentrations of PCBs detected in subsurface sediment samples collected upstream adjacent to the central portion of the Site are likely the result of historic erosion of fill and localized sediment transport within the LDW. There is no evidence of the use of PCBs in historic Site operations.

### 6.6.2 Metals

Concentrations of cadmium exceeding the screening level were detected in the shoreline bank-face fill and in solids samples collected from the catch basins. Concentrations of cadmium detected in the surface sediment may be attributable to transport through the stormwater conveyance system and deposition in the LDW near the outfalls. Implementation of BMPs to reduce solids accumulating in the catch basins, combined with periodic cleaning of the catch basins, has eliminated this pathway. The concentrations of cadmium detected in bank-face fill may be attributable to historical releases from the stormwater conveyance system, or to historical deposition of cadmium in the shoreline sediments. However, concentrations of cadmium exceeding the SQS were not detected in surface or subsurface sediment located adjacent to the Site outfalls, with the exception of Outfall 009.

Concentrations of chromium in surface sediment likely are attributable to transport of accumulated solids in the catch basins by stormwater. Implementation of BMPs to reduce solids accumulating in the catch basins, combined with periodic cleaning of the catch basins, has eliminated this pathway. The concentrations of chromium detected in the bank-face fill samples are significantly lower than those detected in the subsurface fill samples indicating that ongoing erosion of subsurface fill containing concentrations of chromium exceeding the screening level is not occurring. The lower concentrations of chromium detected in the debris piles than those detected in surrounding surface sediment indicate that erosion of the debris piles is not a source of chromium to the LDW. The concentrations of chromium detected in solids collected from Site catch basins (CB1, CB2, CB3, and CB4), and the distribution of chromium in surface sediment (centered around Outfalls 002 and 004) indicate that discharge of solids through the stormwater conveyance system likely was the source of chromium to surface sediment in the LDW. Subsurface sediment adjacent to the Site does not contain concentrations exceeding the SQS, indicating that there is no historical source of chromium from the Site to sediments.

Concentrations of copper exceeding the screening level detected in subsurface fill at the Site likely were present in the imported fill. The concentrations of copper detected in solids collected from Site catch basin CB3, and the distribution of copper in surface sediment (centered between Outfall 003 and 004) indicate that copper potentially was transported through the stormwater conveyance system and was deposited in the LDW adjacent to this outfall. Subsurface sediment adjacent to the Site does not contain concentrations exceeding the SQS, indicating that there is no historical source of copper from the Site to sediments. The concentrations of lead in subsurface fill at the Site and shoreline bank-face fill likely were present in the imported fill. The concentrations of lead exceeding the CSL detected in surface sediment are located adjacent to the subsurface fill and shoreline bank-face fill sample locations containing elevated lead concentrations. Given the high degree of armoring along the bank, it is unlikely that erosion of the shoreline fill is a significant source of lead to surface sediments. In addition, the relatively low concentrations of lead detected in the solids collected from the catch basins and sediments adjacent to Outfalls 001, 002, and 003 indicate that the stormwater conveyance system likely is not a source of lead at concentrations above the CSL to the LDW. The source of the elevated lead concentrations in surface sediment adjacent to the Site is likely a result of transport and re-deposition of sediment from up-gradient and/or down-gradient sources within the LDW. Subsurface sediment adjacent to the Site does not contain concentrations exceeding the SQS, indicating that there is no historical source of lead from the Site to sediments.

The concentrations of zinc detected in subsurface fill, shoreline bank-face fill, catch basin solids, and surface sediment likely are attributable to both the presence of zinc in the imported fill and releases from the Site stormwater conveyance system. The elevated concentrations of zinc in surface sediment adjacent to the northwestern portion of the Site may be due to releases from the cluster of Boeing outfalls and/or the property line outfalls. The concentrations of zinc detected in the solids samples collected from the catch basins, and the concentrations of zinc exceeding the SQS in surface sediment adjacent to Outfalls 002, 003, and 004 along the shoreline indicate that transport through the stormwater conveyance system likely was the source of zinc to surface sediment in the LDW. The identified zinc exceedances in subsurface sediment in the vicinity of Outfalls 004 and 005 indicate that this area may have also been affected by historical sources of zinc.

Silver detected in shoreline bank-face fill likely is a result of historical Site operations. However, the laboratory analytical results indicate that only very low concentrations of silver are present in soil and sediment at the Site and in the adjacent LDW.

# 7.0 SUMMARY

A thorough evaluation of potential sources and pathways of contamination to sediment in the LDW adjacent to the Site was conducted in accordance with the requirements of the AOC. This Report presents the results of the evaluation, data review, and site conceptual model to provide sufficient information to determine whether current or former operations at the Site are or have been a source of contamination to sediments in the adjacent LDW. The requirements of the Statement of Work attached to the AOC entered into by and between EPA and EMJ (EPA 2003b) have been completed. Approval of this document by EPA will fulfill the requirements of the AOC.

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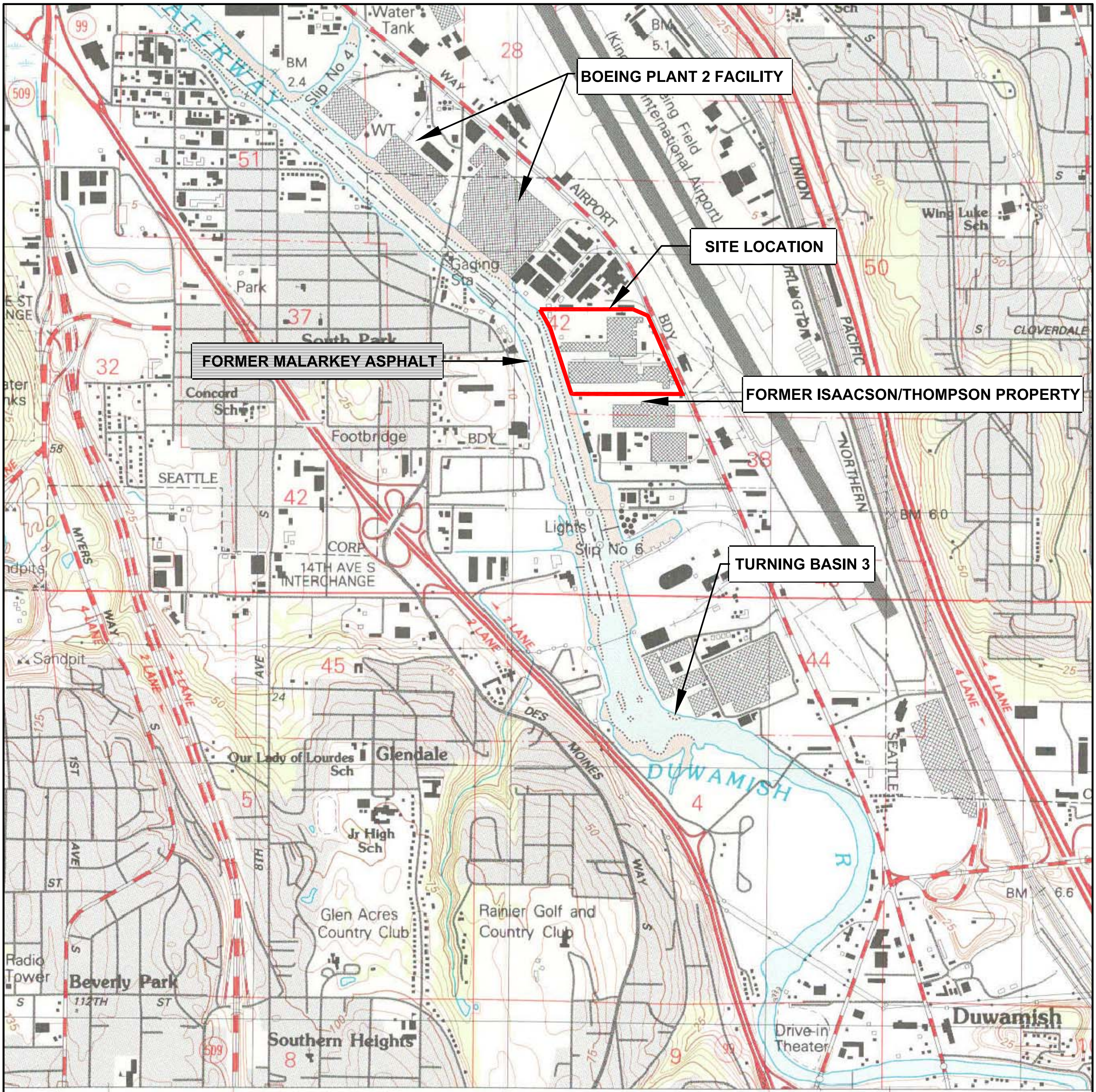
# FIGURES

FINAL INVESTIGATION DATA SUMMARY REPORT
Jorgensen Forge Facility
8531 East Marginal Way South
Seattle, Washington
U.S. EPA Docket No. CERCLA 10-2003-0111

Farallon PN: 831-003




REFERENCE: 7.5 MINUTE USGS QUADRANGLE SEATTLE SOUTH, WASHINGTON, DATED 1983.



FARALLON CONSULTING, L.L.C.

ANCHOR ENVIRONMENTAL, L.L.C.

FIGURE 1

SITE LOCATION MAP
JORGENSEN FORGE FACILITY
8531 EAST MARGINAL WAY SOUTH
SEATTLE, WASHINGTON

FARALLON PN: 831-003

| Drawn By: DEW | Checked By: AED | Date: 5/8/03 | Disk Reference: 831003 |
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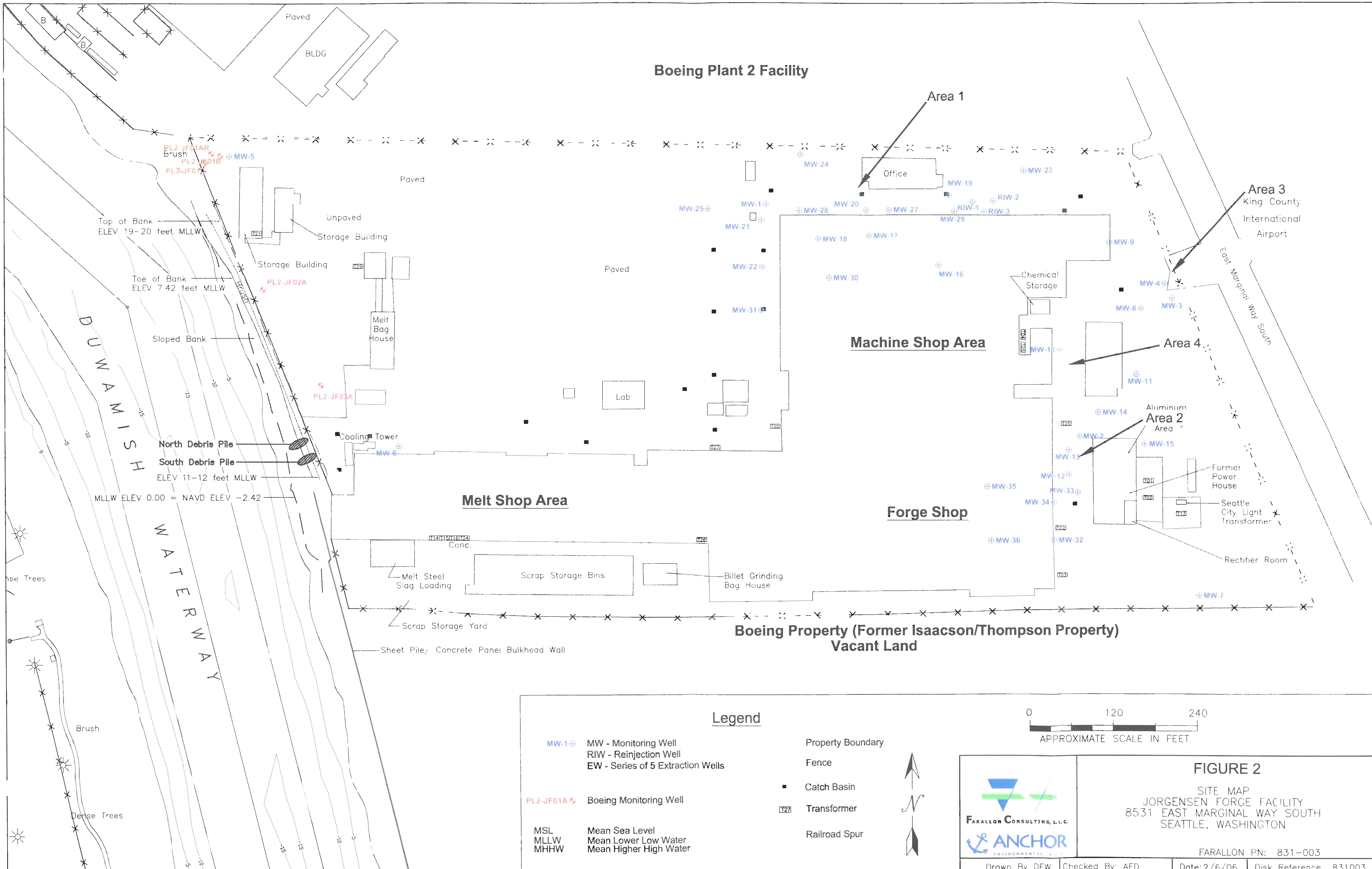


Boeing Plant 2 Facility
Paved
BLDG
Area 1
Area 3
King County International Airport
East Marginal Way South
Office
Paved
Unpaved
Storage Building
Storage Building
Top of Bank ELEV 19-20 feet MLLW
Toe of Bank ELEV 7.42 feet MLLW
Brush
Sloped Bank
Melt Bag House
Paved
Lab
Cooling Tower
Chemical Storage
Machine Shop Area
Area 4
Aluminum Area
Area 2
Former Power House
Seattle City Light Transformer
Rectifier Room
North Debris Pile
South Debris Pile
ELEV 11-12 feet MLLW
MLLW ELEV 0.00 = NAVD ELEV -2.42
DUWAMISH WATERWAY
Melt Shop Area
Forge Shop
Conc.
Melt Steel Slag Loading
Scrap Storage Bins
Billet Grinding Bag House
Scrap Storage Yard
Sheet Pile/ Concrete Panel Bulkhead Wall
Boeing Property (Former Isaacson/Thompson Property)
Vacant Land
Dense Trees
Brush
Dense Trees
MW-1 through MW-36
RIW-1
RIW-2
RIW-3
PL2-JF01A
PL2-JF01AR
PL2-JF01B
PL2-JF02A
PL2-JF03A
Legend
MW - Monitoring Well
RIW - Reinjection Well
EW - Series of 5 Extraction Wells
Boeing Monitoring Well
MSL Mean Sea Level
MLLW Mean Lower Low Water
MHHW Mean Higher High Water
Property Boundary
Fence
Catch Basin
Transformer
Railroad Spur
0
120
240
APPROXIMATE SCALE IN FEET
N
FARALLON CONSULTING, L.L.C.
ANCHOR ENVIRONMENTAL, L.L.C.
FIGURE 2
SITE MAP
JORGENSEN FORGE FACILITY
8531 EAST MARGINAL WAY SOUTH
SEATTLE, WASHINGTON
FARALLON PN: 831-003
Drawn By: DEW
Checked By: AED
Date: 2/6/06
Disk Reference: 831003

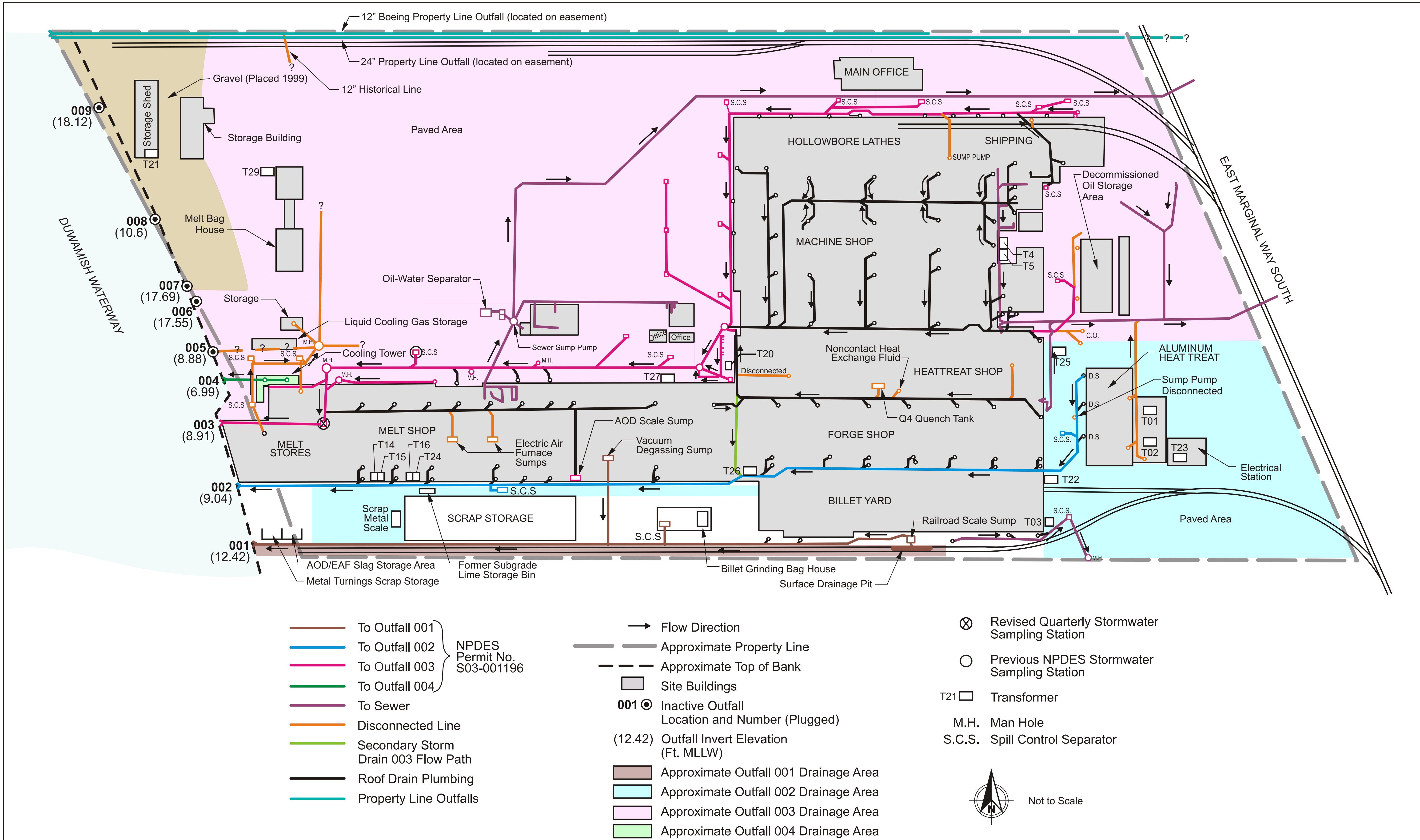
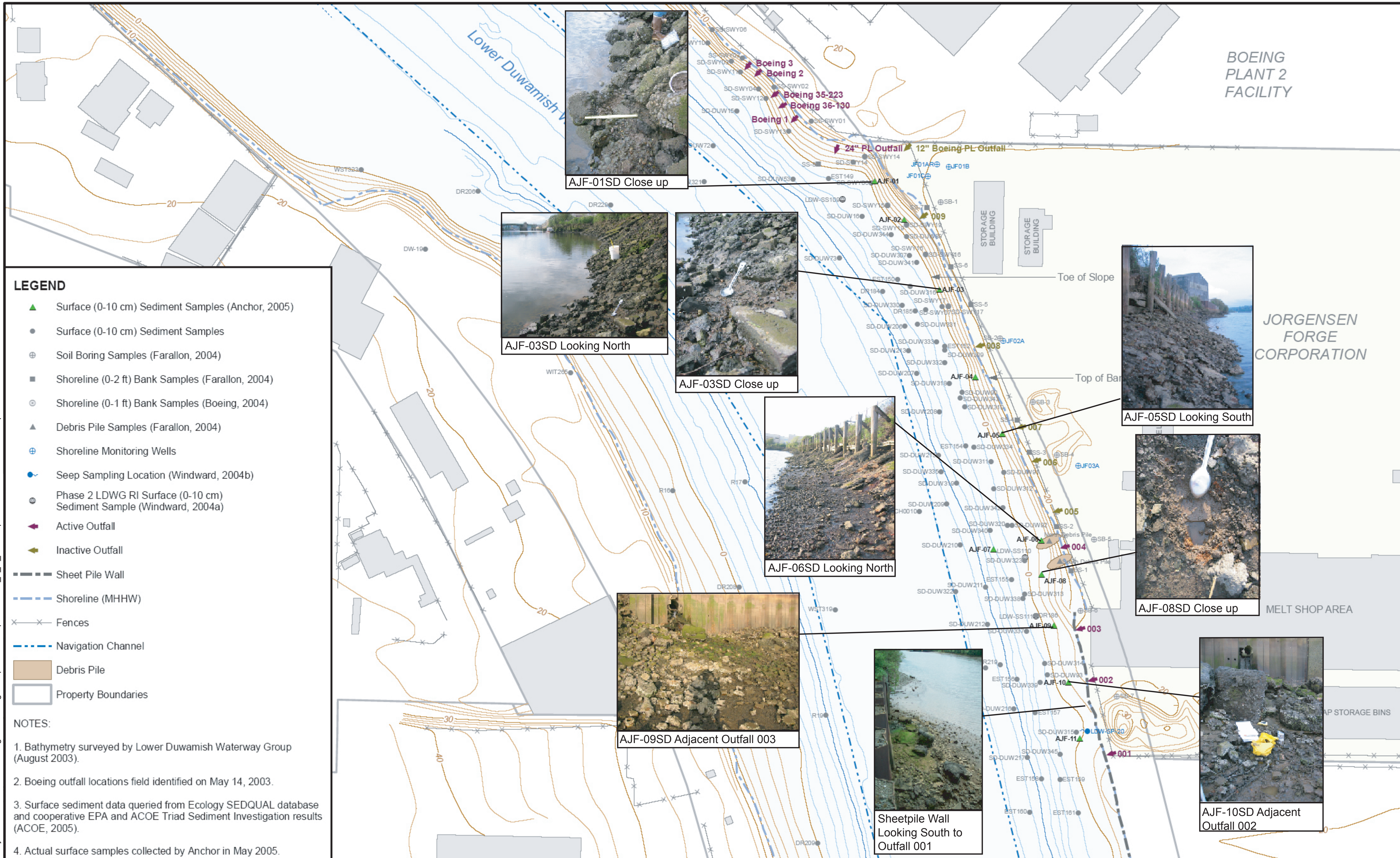



**Figure 3**
Current Site Stormwater Drainage Plan
Jorgensen Forge Facility
8531 East Marginal Way South
Seattle, Washington

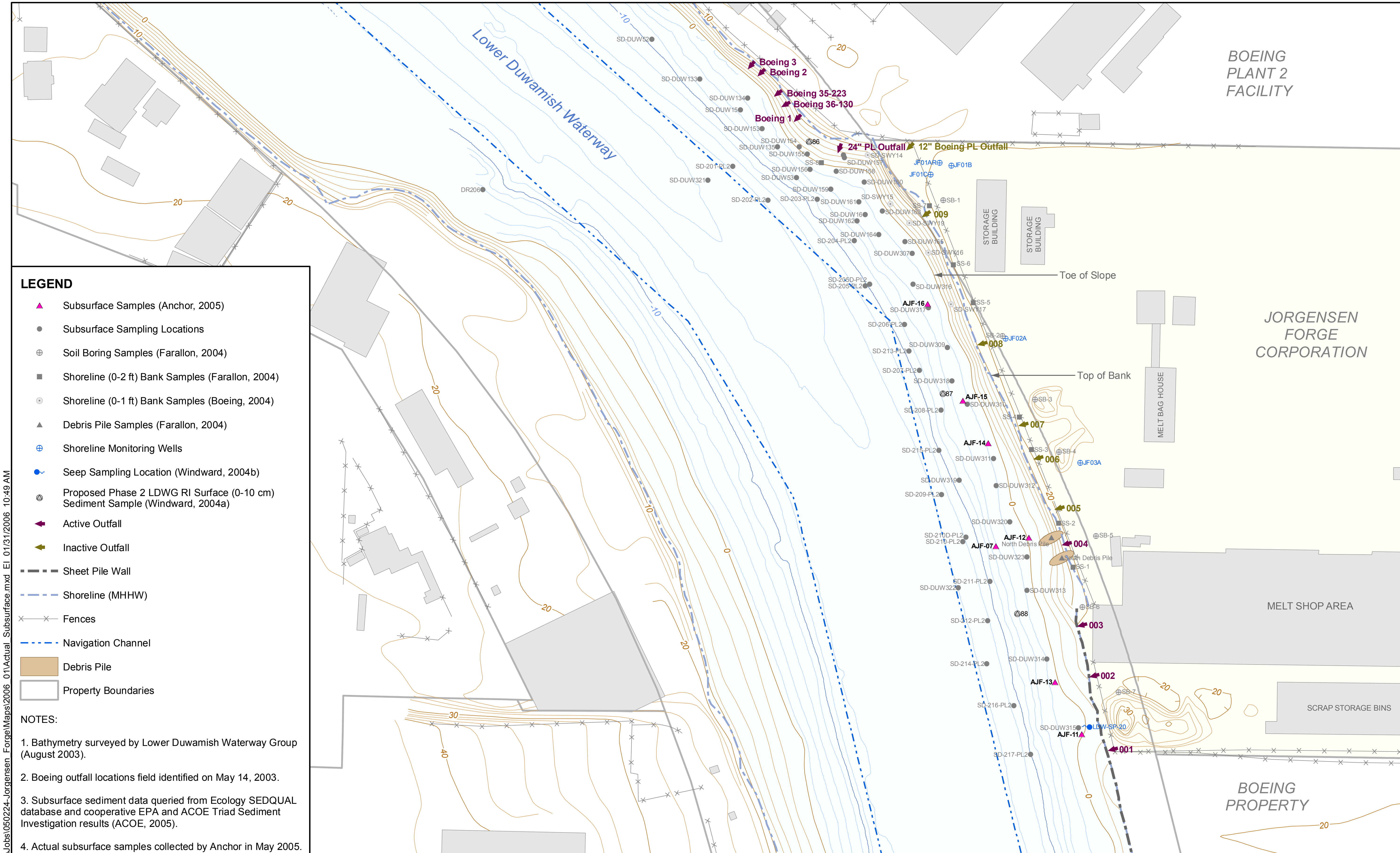
ANCHOR ENVIRONMENTAL, L.L.C.




I:\Projects\Duwamish River\Jorgensen Forge Corporation\Maps\FIGURE_4_w_Photos.pdf BY 02/03/2006 1:44 p.m.

ANCHOR ENVIRONMENTAL, L.L.C.

**FIGURE 4**
Surface Sediment Sample Locations
Jorgensen Forge Facility
8531 East Marginal Way South
Seattle, Washington




NOTES:

1. Bathymetry surveyed by Lower Duwamish Waterway Group (August 2003).

2. Boeing outfall locations field identified on May 14, 2003.

3. Subsurface sediment data queried from Ecology SEDQUAL database and cooperative EPA and ACOE Triad Sediment Investigation results (ACOE, 2005).

4. Actual subsurface samples collected by Anchor in May 2005.

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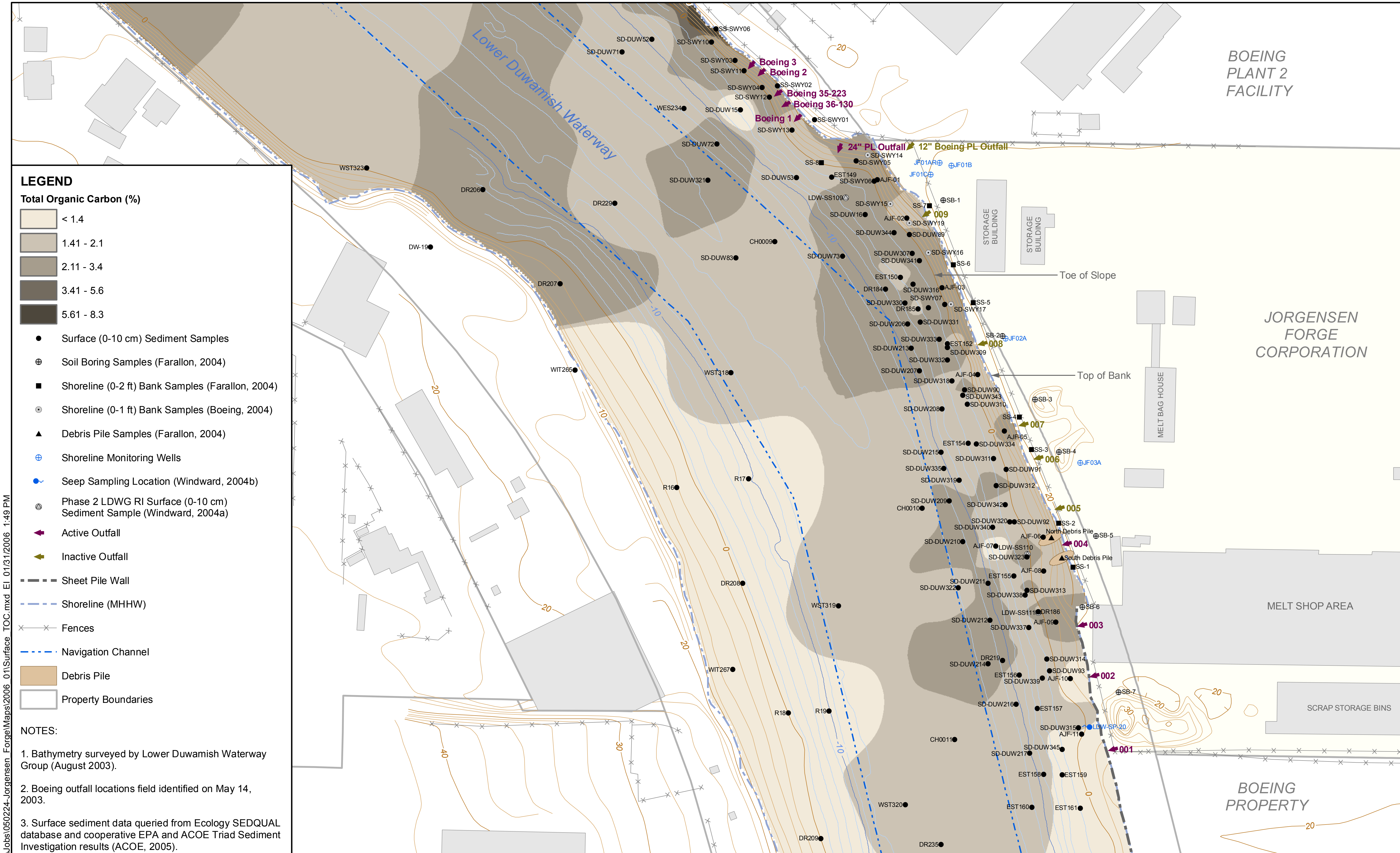
ANCHOR ENVIRONMENTAL, L.L.C.

0 50 100 200
Scale in Feet

N

**Figure 5**
Subsurface Sediment Sample Locations
Jorgensen Forge Facility
8531 East Marginal Way South
Seattle, Washington



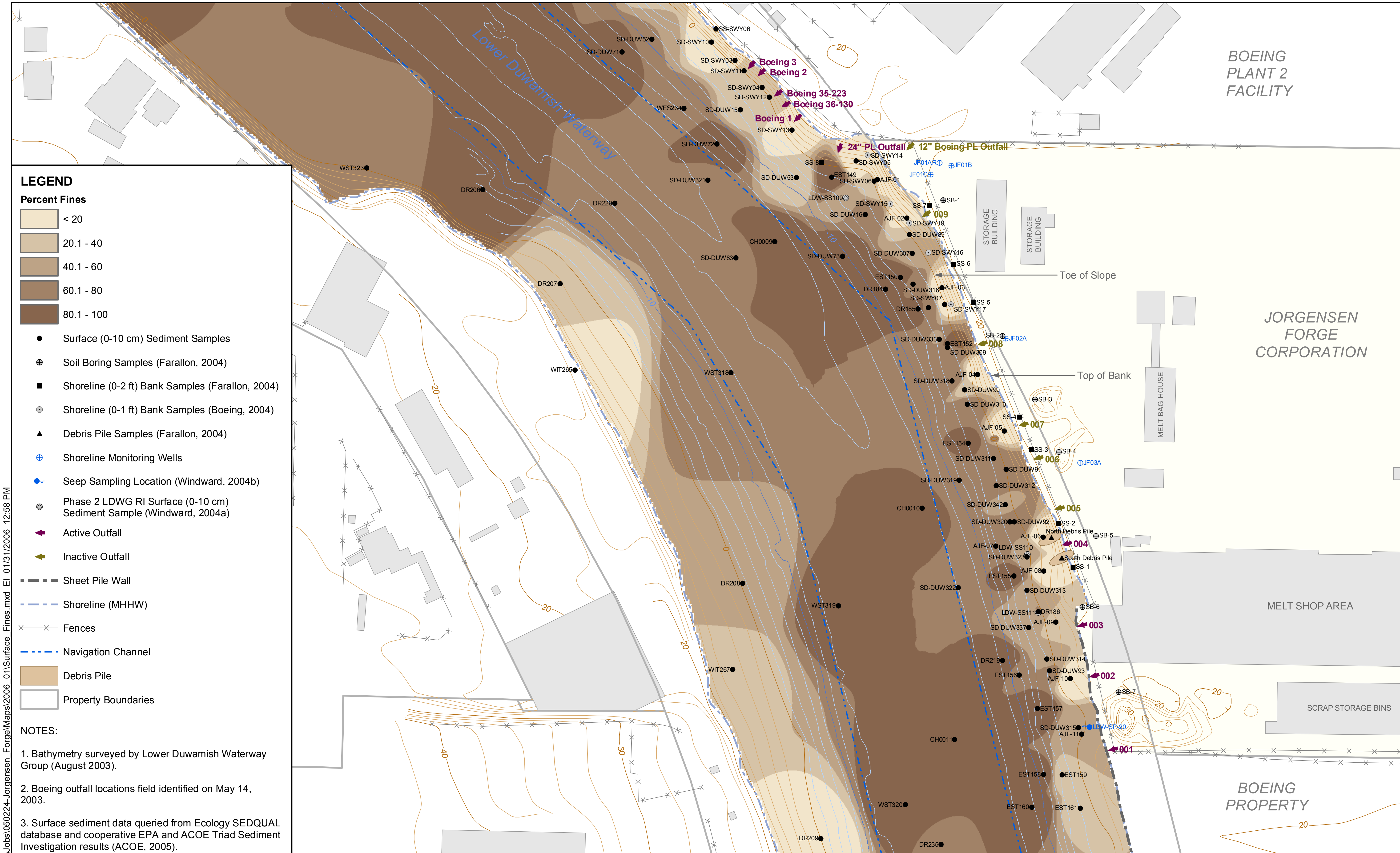



ANCHOR ENVIRONMENTAL, L.L.C.

0 50 100 200
Scale in Feet

N

**Figure 6**
Surface Sediment Total Organic Carbon Concentrations
Jorgensen Forge Facility
8531 East Marginal Way South
Seattle, Washington




ANCHOR ENVIRONMENTAL, L.L.C.

0 50 100 200
Scale in Feet

N

**Figure 7**
Surface Sediment Grain Size Percent Fines
Jorgensen Forge Facility
8531 East Marginal Way South
Seattle, Washington

## LEGEND

**Total PCBs[1]**

- < 0.5x SQS
- 0.5x SQS - SQS
- SQS - CSL
- CSL - 2x CSL
- > 2x CSL
- Surface (0-10 cm) Sediment Samples
- Soil & Shoreline (0-2 ft) Sampling Locations (Farallon, 2004)
- Shoreline (0-1 ft) Bank Samples (Boeing, 2004)
- Shoreline Monitoring Wells
- Seep Sampling Location (Windward, 2004b)
- Phase 2 LDWG RI Surface (0-10 cm) Sediment Sample (Windward, 2004a)
- Active Outfall
- Inactive Outfall
- Sheet Pile Wall
- Shoreline (MHHW)
- Fences
- Navigation Channel
- Debris Pile
- Property Boundaries

NOTES:

1. Sediment samples were OC-normalized and compared to SQS and CSL Total PCBs criteria. Upland soil and shoreline samples (Farallon, 2004) were compared to LAET and 2LAET Total PCBs critera.

2. Bathymetry surveyed by Lower Duwamish Waterway Group (August 2003).

3. Boeing outfall locations field identified on May 14, 2003.

4. Surface sediment data queried from Ecology SEDQUAL database and cooperative EPA and ACOE Triad Sediment Investigation results (ACOE, 2005).

5. Sediment Quality Standard (SQS) = 12 mg/kg-OC

6. Lower Apparent Effects Threshold (LAET) = 0.13 mg/kg

7. Cleanup Screening Level (CSL) = 65 mg/kg-OC

8. Second Lower Apparent Effects Threshold (2LAET) = 1 mg/kg

9. Contours created using Inverse Distance Weighting.

10. Contours extending into the Navigation Channel were not modified to account for past maintenance dredging in the Channel.

11. Shoreline sample locations SD-SWY14 to SD-SWY19 have a depth interval of 0-1 feet. Total PCB results for these locations were included in contouring.

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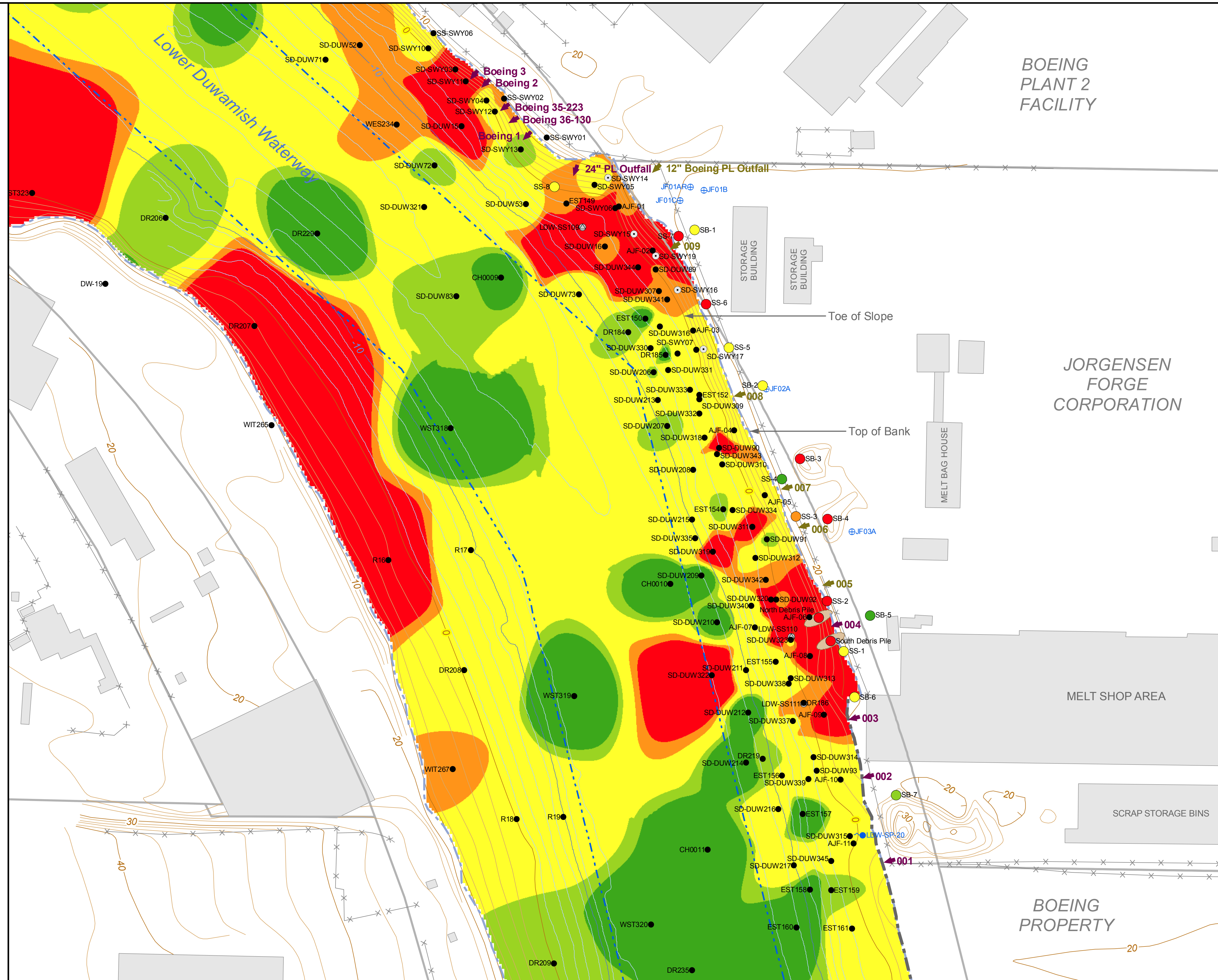
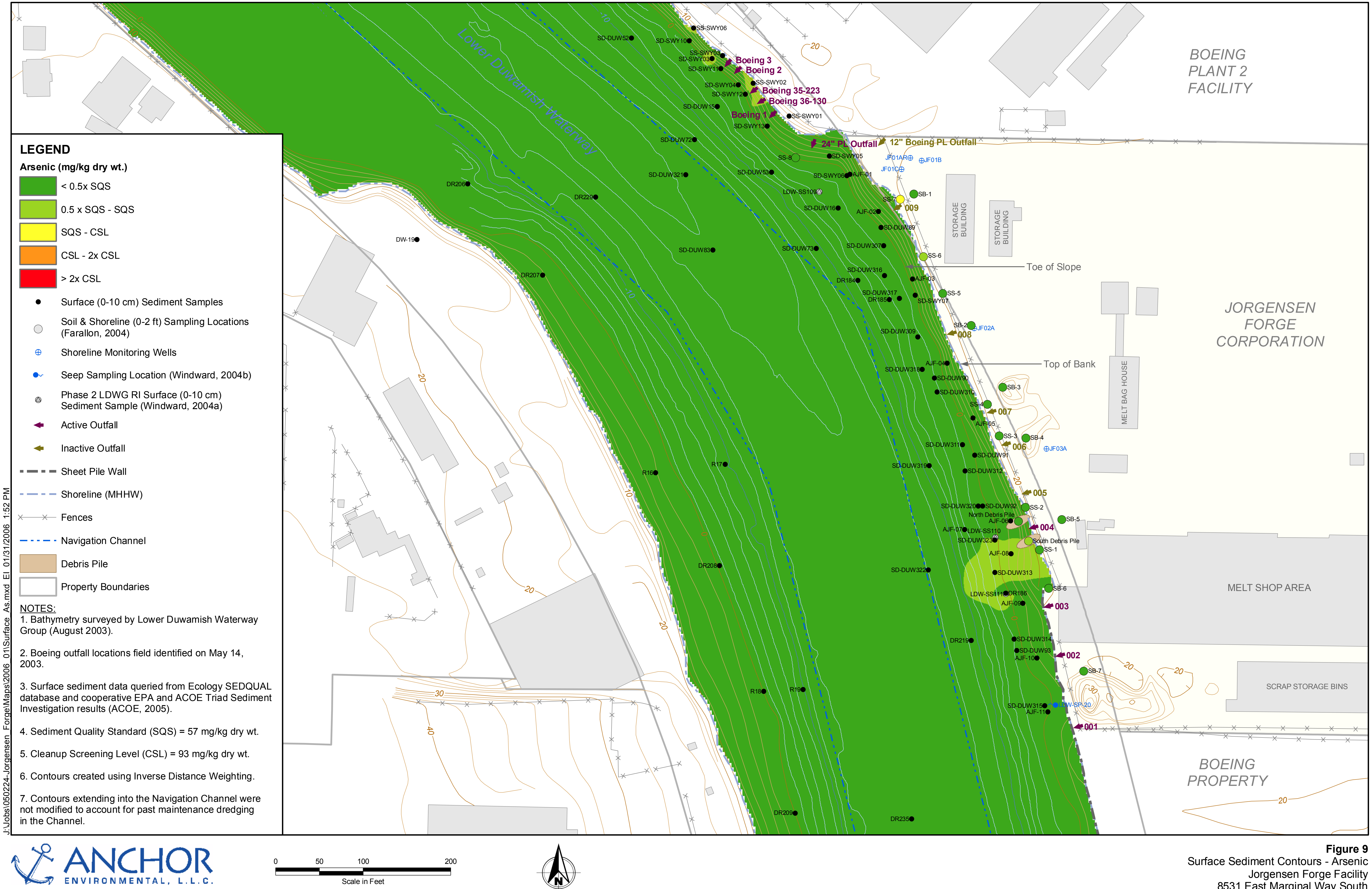



ANCHOR ENVIRONMENTAL, L.L.C.

0 50 100 200
Scale in Feet

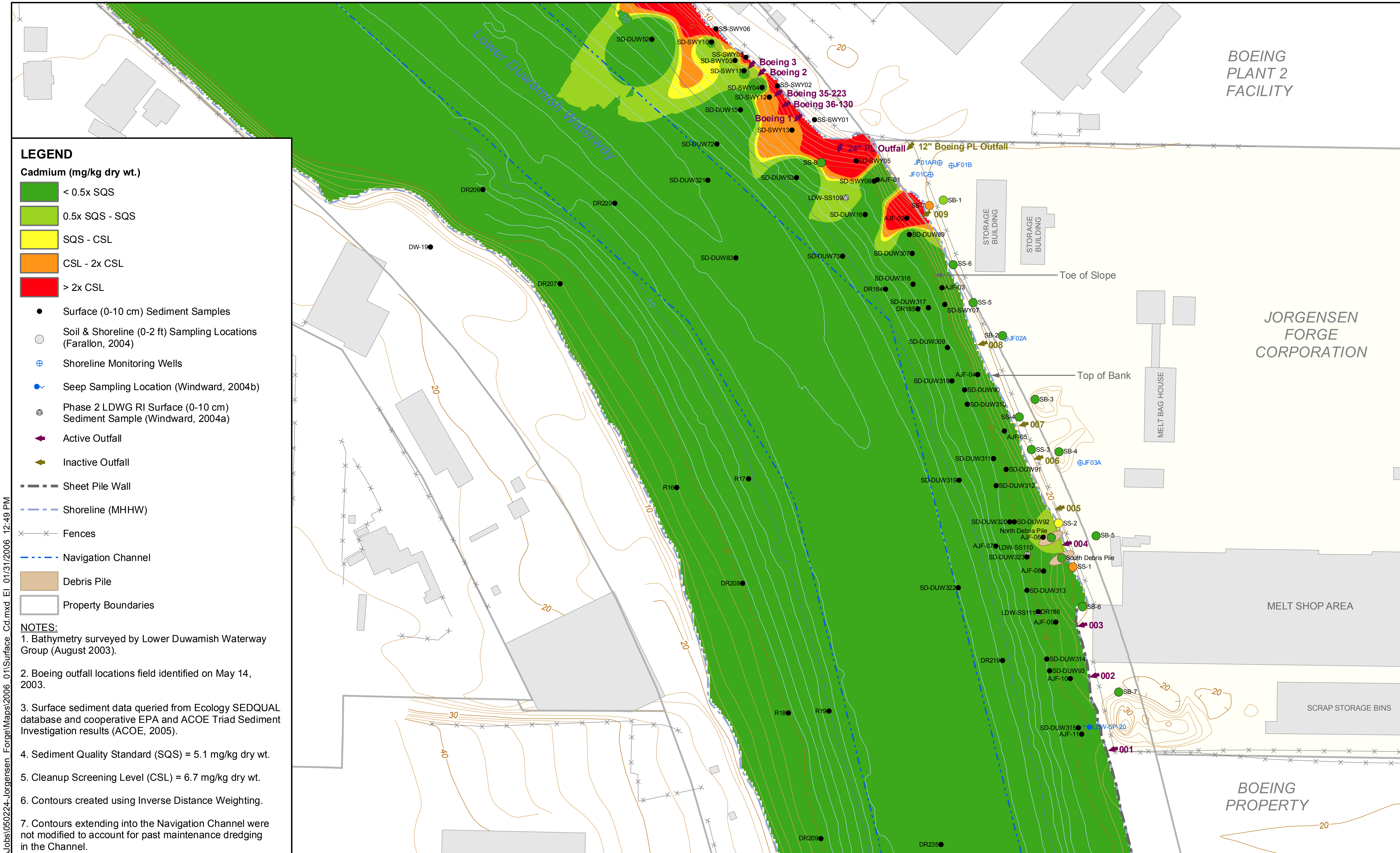
N

**Figure 8**
Surface Sediment Contours - Total PCBs
Jorgensen Forge Facility
8531 East Marginal Way South
Seattle, Washington




ANCHOR ENVIRONMENTAL, L.L.C.

**Figure 9**
Surface Sediment Contours - Arsenic
Jorgensen Forge Facility
8531 East Marginal Way South
Seattle, Washington




**LEGEND**

**Cadmium (mg/kg dry wt.)**

- < 0.5x SQS
- 0.5x SQS - SQS
- SQS - CSL
- CSL - 2x CSL
- > 2x CSL
- Surface (0-10 cm) Sediment Samples
- Soil & Shoreline (0-2 ft) Sampling Locations (Farallon, 2004)
- Shoreline Monitoring Wells
- Seep Sampling Location (Windward, 2004b)
- Phase 2 LDWG RI Surface (0-10 cm) Sediment Sample (Windward, 2004a)
- Active Outfall
- Inactive Outfall
- Sheet Pile Wall
- Shoreline (MHHW)
- Fences
- Navigation Channel
- Debris Pile
- Property Boundaries

NOTES:

1. Bathymetry surveyed by Lower Duwamish Waterway Group (August 2003).
2. Boeing outfall locations field identified on May 14, 2003.
3. Surface sediment data queried from Ecology SEDQUAL database and cooperative EPA and ACOE Triad Sediment Investigation results (ACOE, 2005).
4. Sediment Quality Standard (SQS) = 5.1 mg/kg dry wt.
5. Cleanup Screening Level (CSL) = 6.7 mg/kg dry wt.
6. Contours created using Inverse Distance Weighting.
7. Contours extending into the Navigation Channel were not modified to account for past maintenance dredging in the Channel.

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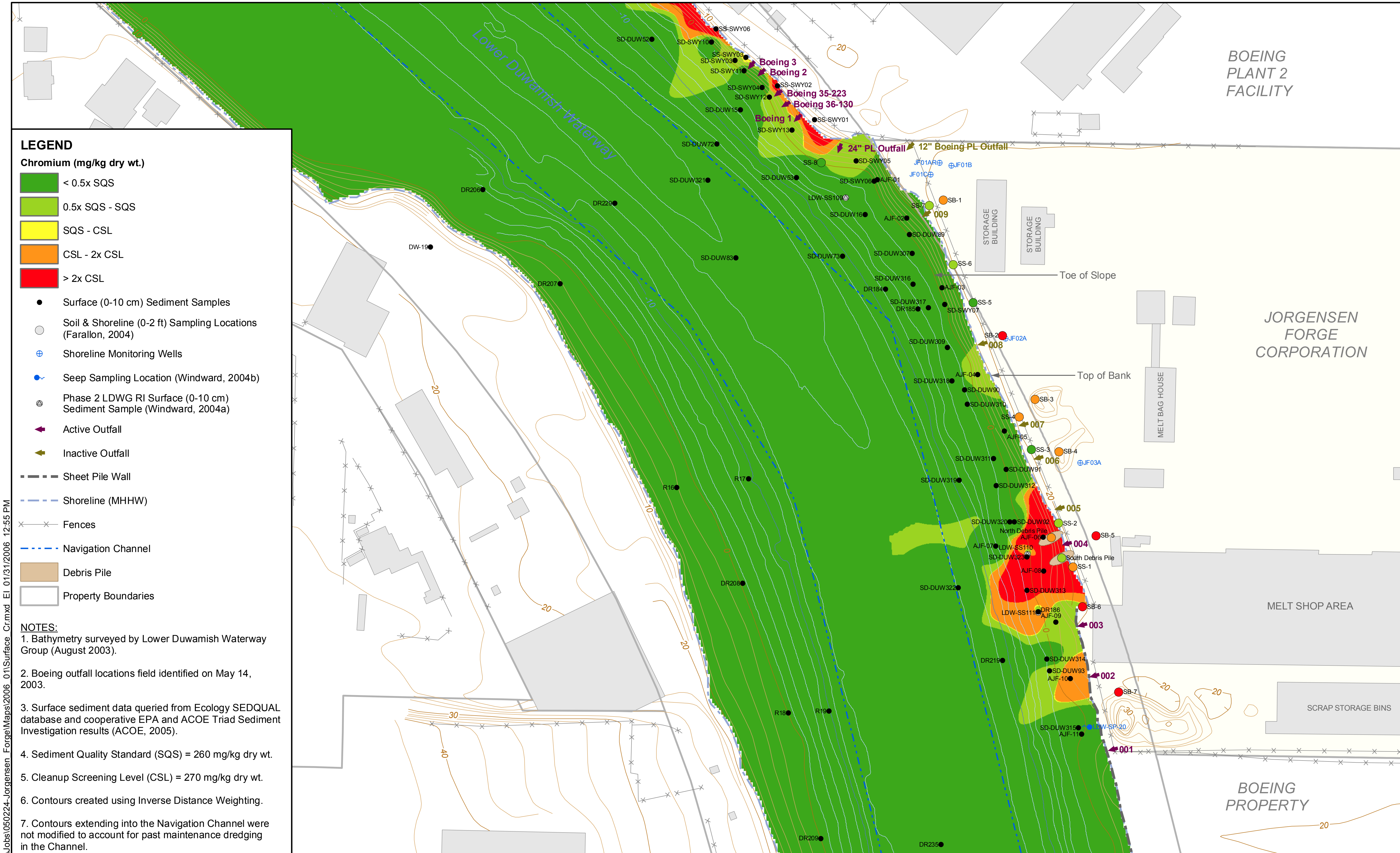
ANCHOR ENVIRONMENTAL, L.L.C.

0 50 100 200
Scale in Feet

**Figure 10**
Surface Sediment Contours - Cadmium
Jorgensen Forge Facility
8531 East Marginal Way South
Seattle, Washington




NOTES:
1. Bathymetry surveyed by Lower Duwamish Waterway Group (August 2003).
2. Boeing outfall locations field identified on May 14, 2003.
3. Surface sediment data queried from Ecology SEDQUAL database and cooperative EPA and ACOE Triad Sediment Investigation results (ACOE, 2005).
4. Sediment Quality Standard (SQS) = 260 mg/kg dry wt.
5. Cleanup Screening Level (CSL) = 270 mg/kg dry wt.
6. Contours created using Inverse Distance Weighting.
7. Contours extending into the Navigation Channel were not modified to account for past maintenance dredging in the Channel.

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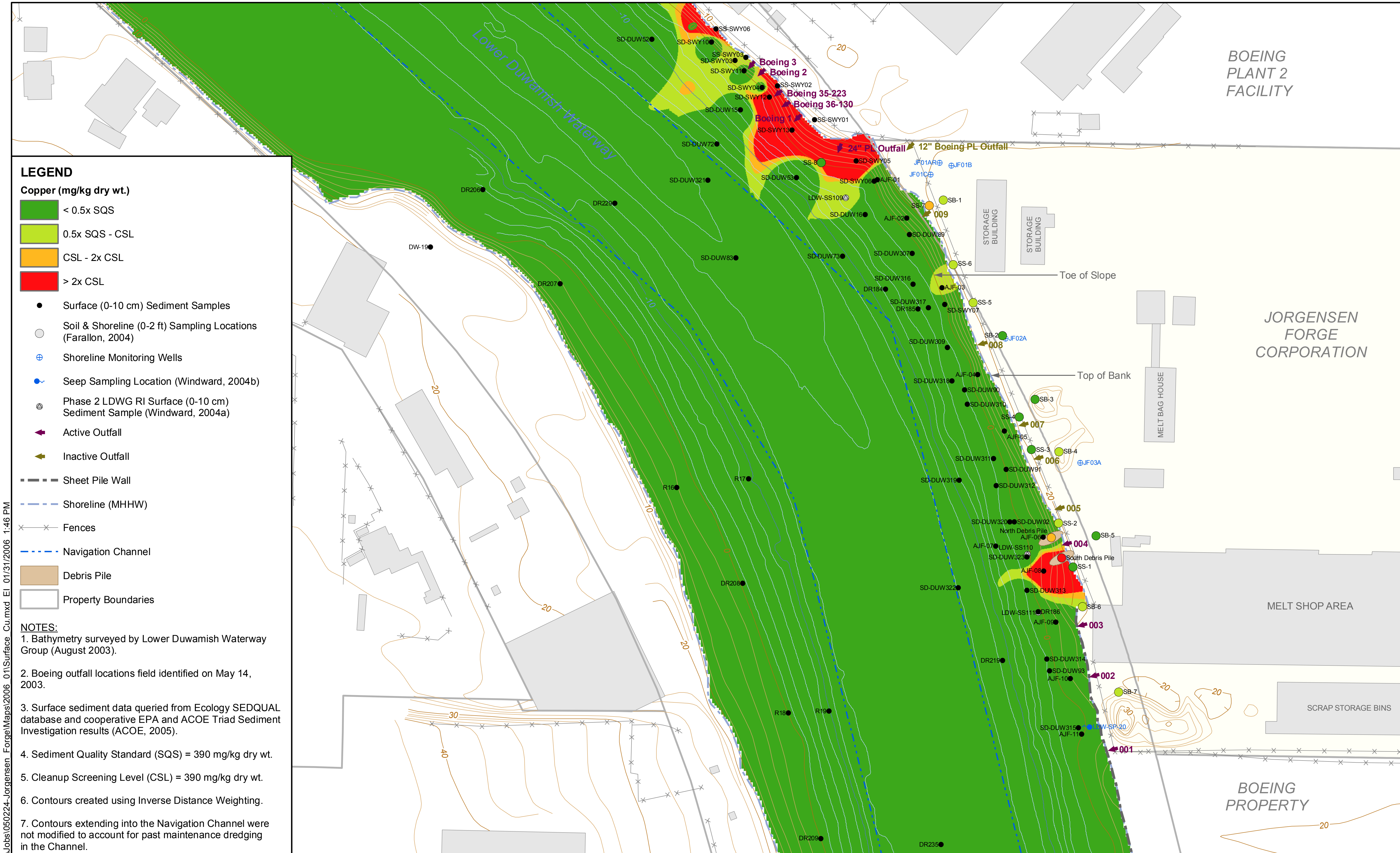
ANCHOR ENVIRONMENTAL, L.L.C.

0 50 100 200
Scale in Feet

**Figure 11**
Surface Sediment Contours - Chromium
Jorgensen Forge Facility
8531 East Marginal Way South
Seattle, Washington




## LEGEND

**Copper (mg/kg dry wt.)**

- < 0.5x SQS
- 0.5x SQS - CSL
- CSL - 2x CSL
- > 2x CSL
- Surface (0-10 cm) Sediment Samples
- Soil & Shoreline (0-2 ft) Sampling Locations (Farallon, 2004)
- Shoreline Monitoring Wells
- Seep Sampling Location (Windward, 2004b)
- Phase 2 LDWG RI Surface (0-10 cm) Sediment Sample (Windward, 2004a)
- Active Outfall
- Inactive Outfall
- Sheet Pile Wall
- Shoreline (MHHW)
- Fences
- Navigation Channel
- Debris Pile
- Property Boundaries

NOTES:
1. Bathymetry surveyed by Lower Duwamish Waterway Group (August 2003).

2. Boeing outfall locations field identified on May 14, 2003.

3. Surface sediment data queried from Ecology SEDQUAL database and cooperative EPA and ACOE Triad Sediment Investigation results (ACOE, 2005).

4. Sediment Quality Standard (SQS) = 390 mg/kg dry wt.

5. Cleanup Screening Level (CSL) = 390 mg/kg dry wt.

6. Contours created using Inverse Distance Weighting.

7. Contours extending into the Navigation Channel were not modified to account for past maintenance dredging in the Channel.

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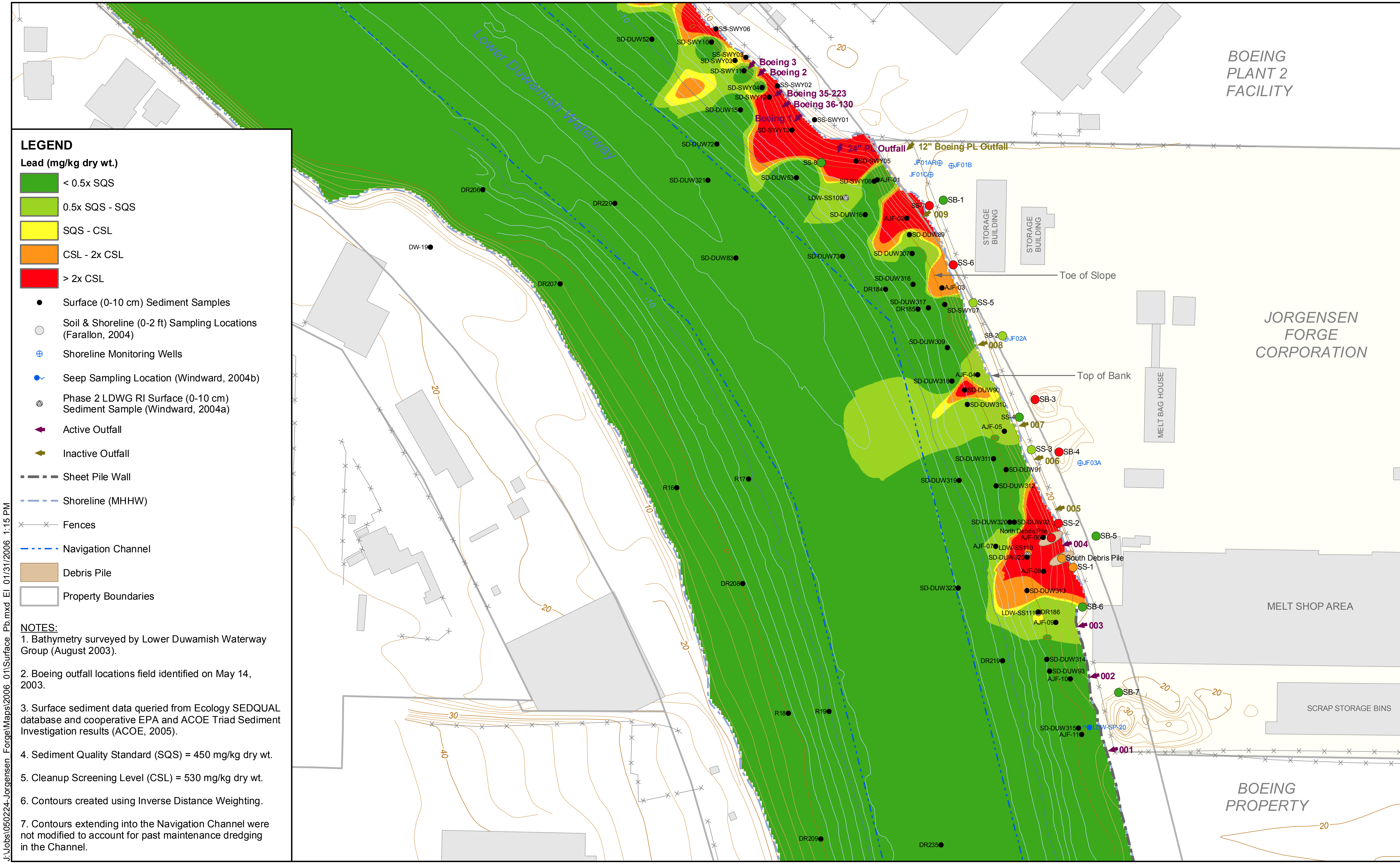
ANCHOR ENVIRONMENTAL, L.L.C.

0 50 100 200
Scale in Feet

N

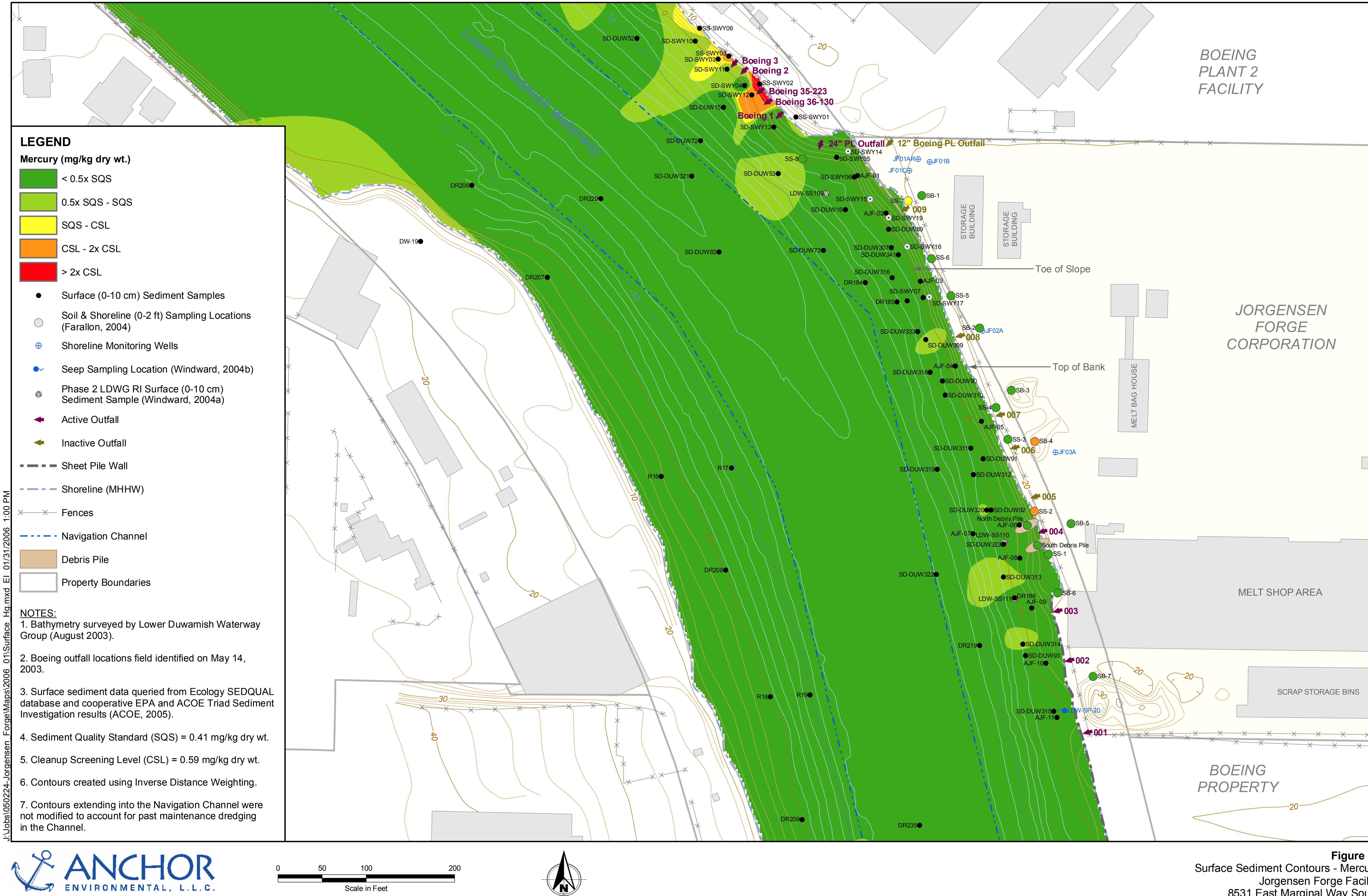
**Figure 12**
Surface Sediment Contours - Copper
Jorgensen Forge Facility
8531 East Marginal Way South
Seattle, Washington




ANCHOR ENVIRONMENTAL, L.L.C.

0 50 100 200
Scale in Feet

**Figure 13**
Surface Sediment Contours - Lead
Jorgensen Forge Facility
8531 East Marginal Way South
Seattle, Washington

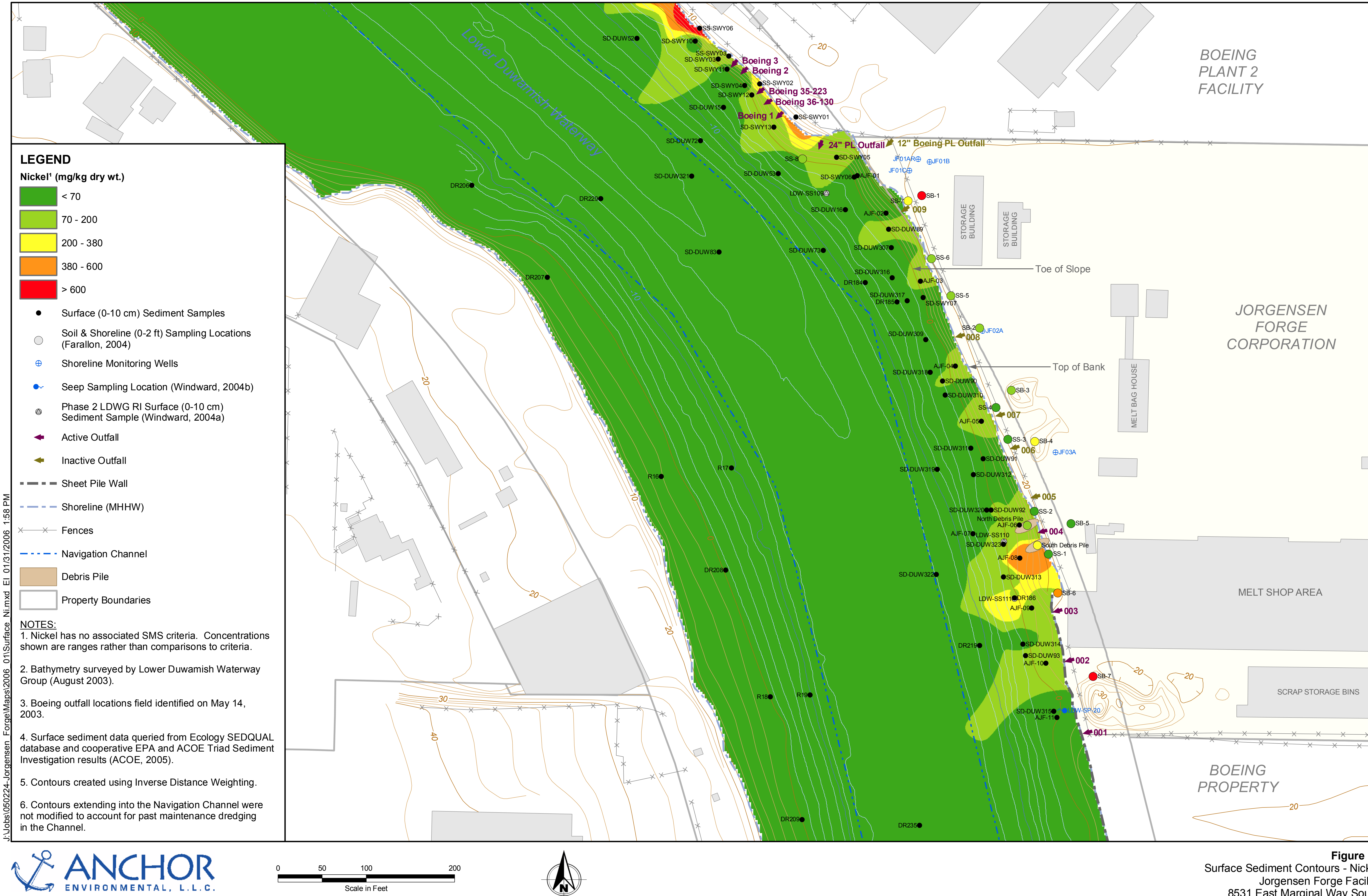



NOTES:

1. Bathymetry surveyed by Lower Duwamish Waterway Group (August 2003).
2. Boeing outfall locations field identified on May 14, 2003.
3. Surface sediment data queried from Ecology SEDQUAL database and cooperative EPA and ACOE Triad Sediment Investigation results (ACOE, 2005).
4. Sediment Quality Standard (SQS) = 0.41 mg/kg dry wt.
5. Cleanup Screening Level (CSL) = 0.59 mg/kg dry wt.
6. Contours created using Inverse Distance Weighting.
7. Contours extending into the Navigation Channel were not modified to account for past maintenance dredging in the Channel.

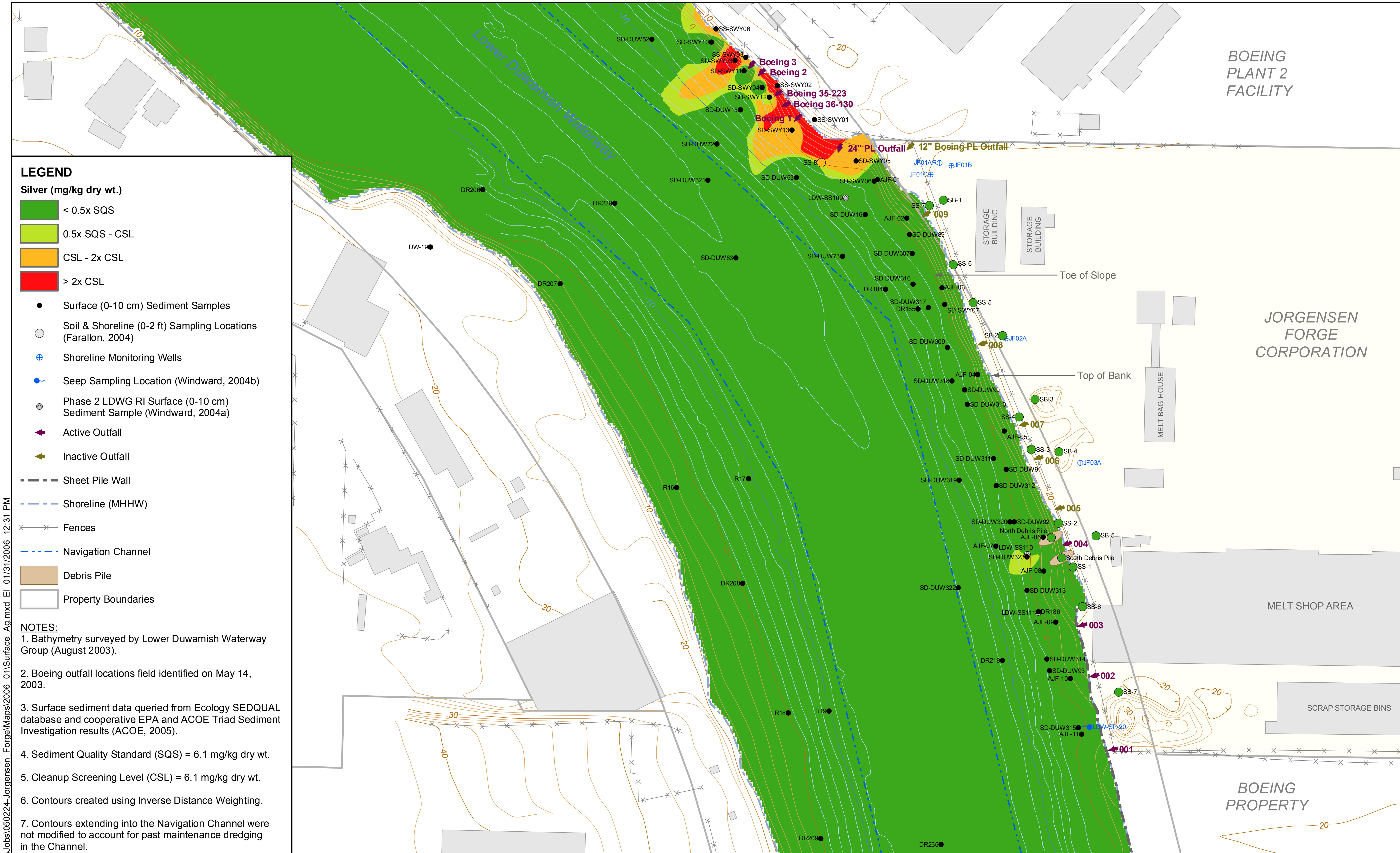
ANCHOR ENVIRONMENTAL, L.L.C.

**Figure 14**
Surface Sediment Contours - Mercury
Jorgensen Forge Facility
8531 East Marginal Way South
Seattle, Washington




ANCHOR ENVIRONMENTAL, L.L.C.

**Figure 15**
Surface Sediment Contours - Nickel
Jorgensen Forge Facility
8531 East Marginal Way South
Seattle, Washington

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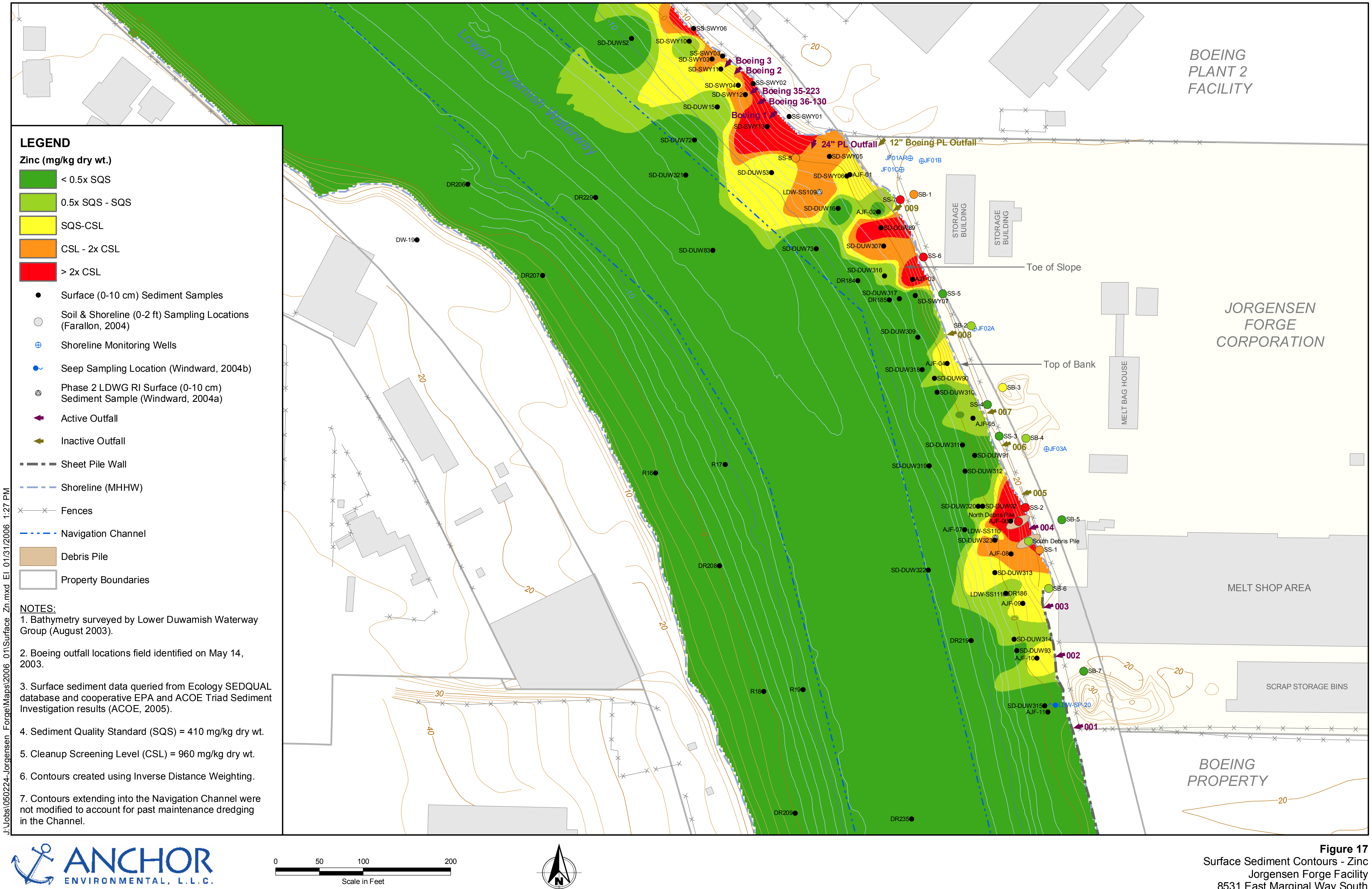
ANCHOR ENVIRONMENTAL, L.L.C.

0 50 100 200
Scale in Feet

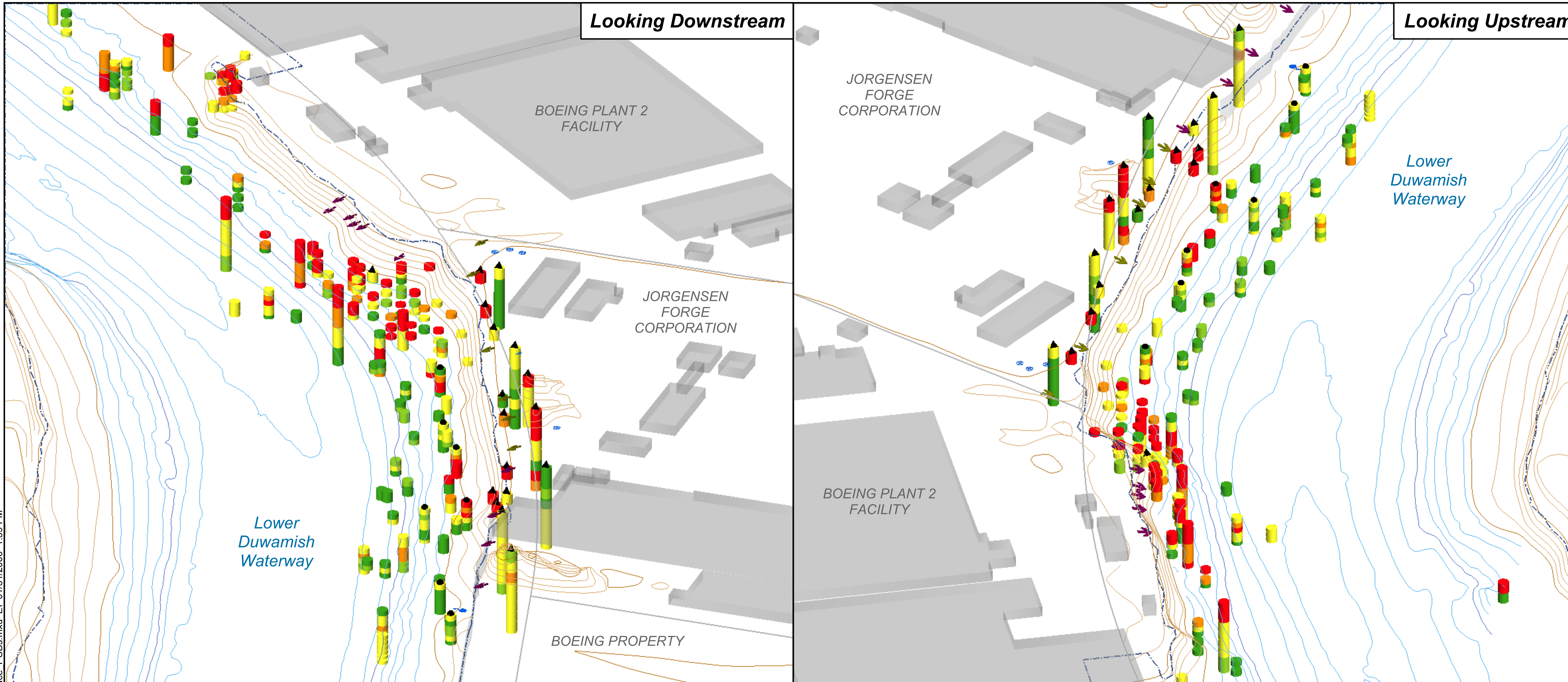
N

**Figure 16**
Surface Sediment Contours - Silver
Jorgensen Forge Facility
8531 East Marginal Way South
Seattle, Washington




ANCHOR ENVIRONMENTAL, L.L.C.

**Figure 17**
Surface Sediment Contours - Zinc
Jorgensen Forge Facility
8531 East Marginal Way South
Seattle, Washington




**LEGEND**

**Total PCBs[1]**

- < 0.5x SQS/LAET
- 0.5x SQS/LAET - SQS/LAET
- SQS/LAET - CSL/2LAET
- CSL/2LAET - 2x CSL/2LAET
- > 2x CSL/2LAET

- Anchor Sampling Locations (2005)
- Soil & Shoreline Sampling Locations (Farallon, 2004)
- Shoreline Monitoring Wells
- Seep Sampling Location (Windward, 2004)
- Active Outfall
- Inactive Outfall

- Property Boundaries
- Buildings
- Shoreline (MHHW)

NOTES:

1. Sediment samples were OC-normalized and compared to SQS and CSL Total PCBs criteria. Upland soil and shoreline samples (Farallon, 2004) were compared to LAET and 2LAET Total PCBs criteria.
2. Bathymetry surveyed by Lower Duwamish Waterway Group (August 2003).
3. Boeing outfall locations field identified on May 14, 2003.
4. Subsurface sediment data queried from Ecology SEDQUAL database and cooperative EPA and ACOE Triad Sediment Investigation results (ACOE, 2005).
5. Sediment Quality Standard (SQS) = 12 mg/kg-OC
6. Lower Apparent Effects Threshold (LAET) = 0.13 mg/kg
7. Cleanup Screening Level (CSL) = 65 mg/kg-OC
8. Second Lower Apparent Effects Threshold (2LAET) = 1 mg/kg
9. Sampling station location denoted by top of core position.

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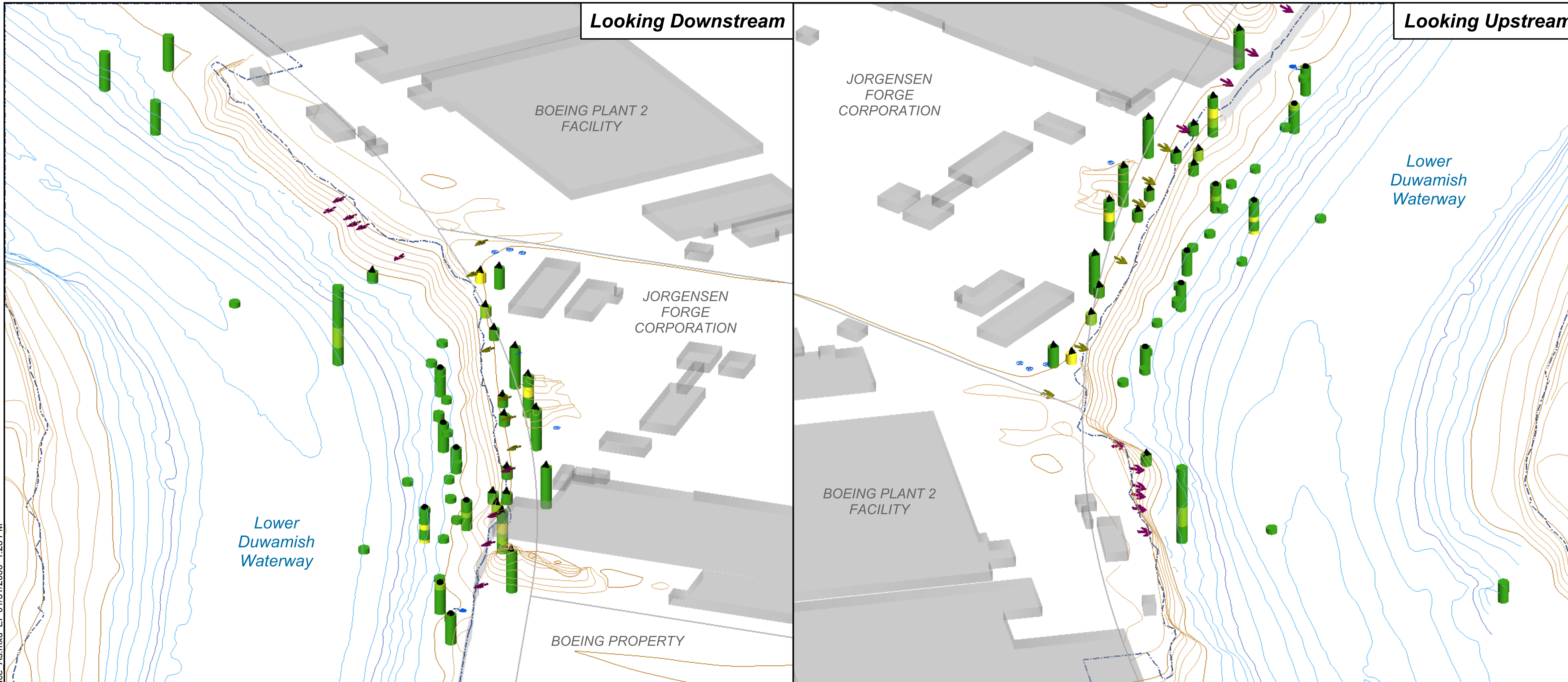
ANCHOR ENVIRONMENTAL, L.L.C.

**Figure 18**
Subsurface Sediment Concentrations - Total PCBs
Jorgensen Forge Facility
8531 East Marginal Way South
Seattle, Washington




**LEGEND**

**Arsenic (mg/kg dry wt.)**

- < 0.5x SQS
- 0.5x SQS - SQS
- SQS - CSL
- CSL - 2x CSL
- > 2x CSL

- Anchor Sampling Locations (2005)
- Soil & Shoreline Sampling Locations (Farallon, 2004)
- Shoreline Monitoring Wells
- Seep Sampling Location (Windward, 2004)
- Active Outfall
- Inactive Outfall

- Property Boundaries
- Buildings
- Shoreline (MHHW)

NOTES:
1. Bathymetry surveyed by Lower Duwamish Waterway Group (August 2003).
2. Boeing outfall locations field identified on May 14, 2003.
3. Subsurface sediment data queried from Ecology SEDQUAL database and cooperative EPA and ACOE Triad Sediment Investigation results (ACOE, 2005).
4. Sediment Quality Standard (SQS) = 57 mg/kg dry wt.
5. Cleanup Screening Level (CSL) = 93 mg/kg dry wt.

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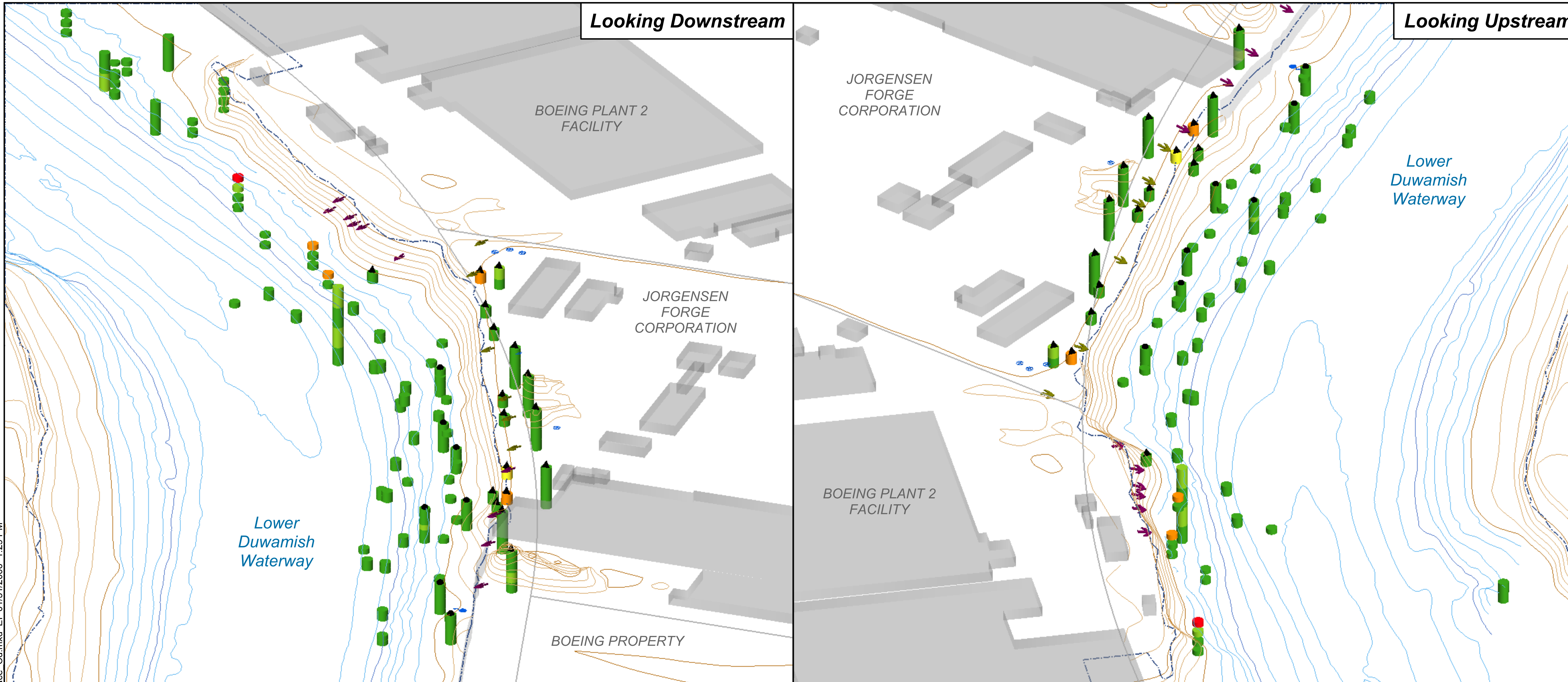
ANCHOR ENVIRONMENTAL, L.L.C.

**Figure 19**
Subsurface Sediment Concentrations - Arsenic
Jorgensen Forge Facility
8531 East Marginal Way South
Seattle, Washington




**LEGEND**

**Cadmium (mg/kg dry wt.)**

- < 0.5x SQS
- 0.5x SQS - SQS
- SQS - CSL
- CSL - 2x CSL
- > 2x CSL

- Anchor Sampling Locations (2005)
- Soil & Shoreline Sampling Locations (Farallon, 2004)
- Shoreline Monitoring Wells
- Seep Sampling Location (Windward, 2004)
- Active Outfall
- Inactive Outfall
- Property Boundaries
- Buildings
- Shoreline (MHHW)

NOTES:
1. Bathymetry surveyed by Lower Duwamish Waterway Group (August 2003).
2. Boeing outfall locations field identified on May 14, 2003.
3. Subsurface sediment data queried from Ecology SEDQUAL database and cooperative EPA and ACOE Triad Sediment Investigation results (ACOE, 2005).
4. Sediment Quality Standard (SQS) = 5.1 mg/kg dry wt.
5. Cleanup Screening Level (CSL) = 6.7 mg/kg dry wt.

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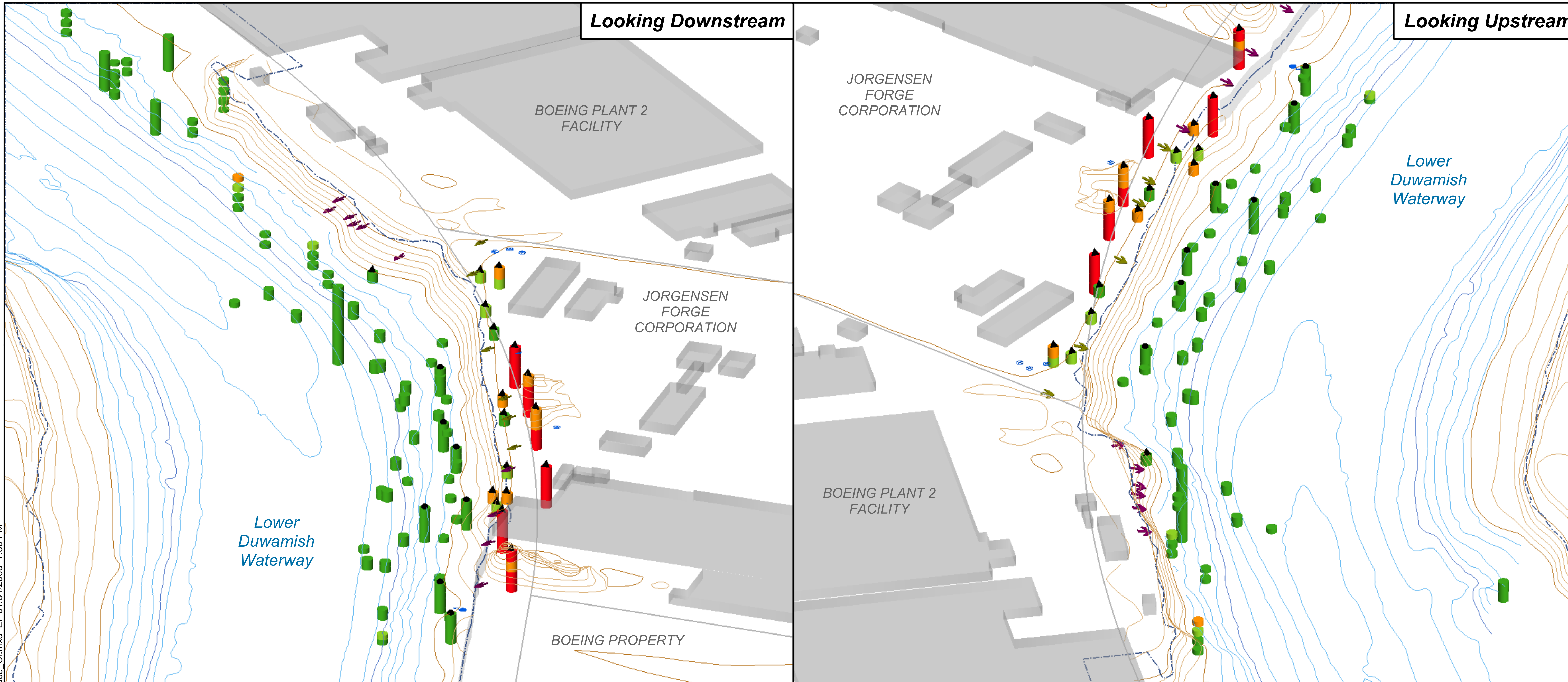
ANCHOR ENVIRONMENTAL, L.L.C.

**Figure 20**
Subsurface Sediment Concentrations - Cadmium
Jorgensen Forge Facility
8531 East Marginal Way South
Seattle, Washington




**LEGEND**

**Chromium (mg/kg dry wt.)**

- < 0.5x SQS
- 0.5x SQS - SQS
- SQS - CSL
- CSL - 2x CSL
- > 2x CSL

- Anchor Sampling Locations (2005)
- Soil & Shoreline Sampling Locations (Farallon, 2004)
- Shoreline Monitoring Wells
- Seep Sampling Location (Windward, 2004)
- Active Outfall
- Inactive Outfall

- Property Boundaries
- Buildings
- Shoreline (MHHW)

NOTES:
1. Bathymetry surveyed by Lower Duwamish Waterway Group (August 2003).
2. Boeing outfall locations field identified on May 14, 2003.
3. Subsurface sediment data queried from Ecology SEDQUAL database and cooperative EPA and ACOE Triad Sediment Investigation results (ACOE, 2005).
4. Sediment Quality Standard (SQS) = 260 mg/kg dry wt.
5. Cleanup Screening Level (CSL) = 270 mg/kg dry wt.

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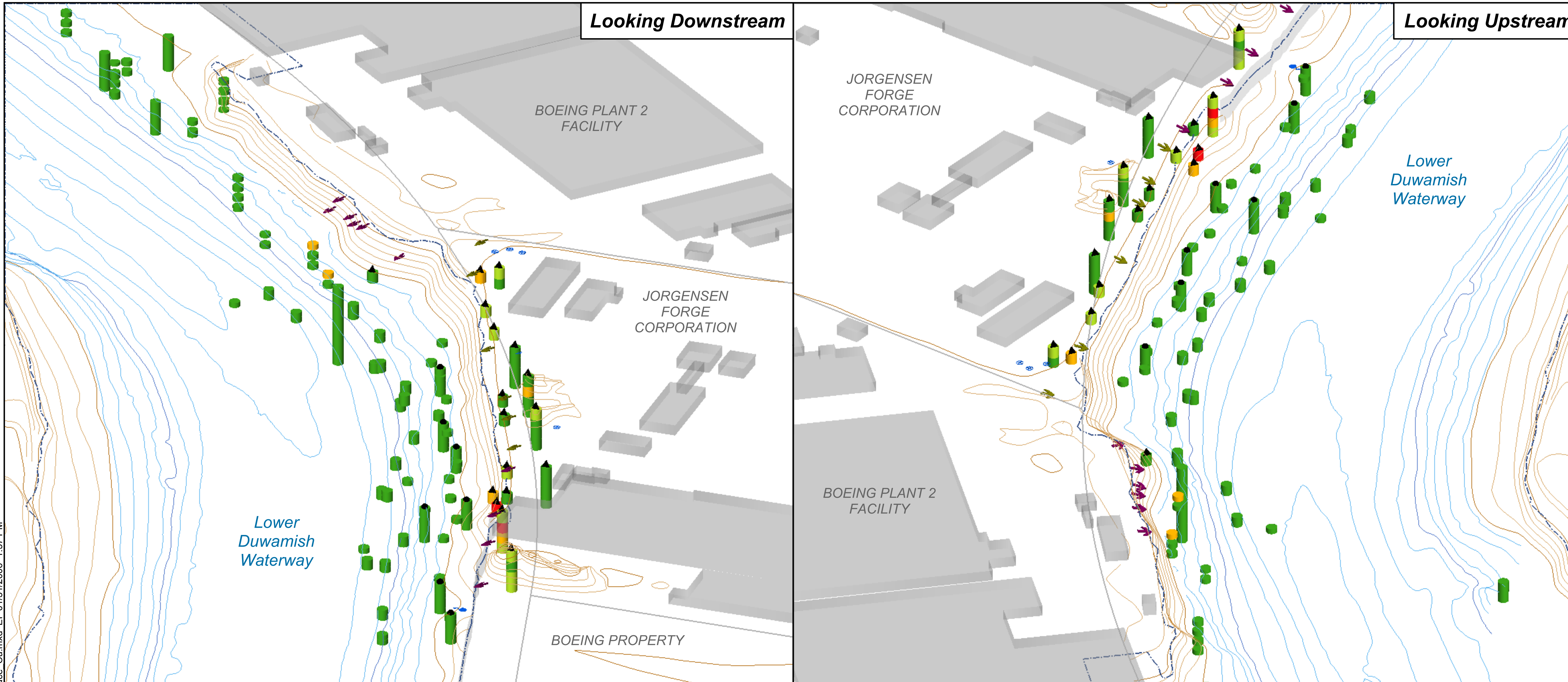
ANCHOR ENVIRONMENTAL, L.L.C.

**Figure 21**
Subsurface Sediment Concentrations - Chromium
Jorgensen Forge Facility
8531 East Marginal Way South
Seattle, Washington




**LEGEND**

**Copper (mg/kg dry wt.)**

- < 0.5x SQS
- 0.5x SQS - CSL
- CSL - 2x CSL
- > 2x CSL

- Anchor Sampling Locations (2005)
- Soil & Shoreline Sampling Locations (Farallon, 2004)
- Shoreline Monitoring Wells
- Seep Sampling Location (Windward, 2004)
- Active Outfall
- Inactive Outfall

- Property Boundaries
- Buildings
- Shoreline (MHHW)

NOTES:

1. Bathymetry surveyed by Lower Duwamish Waterway Group (August 2003).
2. Boeing outfall locations field identified on May 14, 2003.
3. Subsurface sediment data queried from Ecology SEDQUAL database and cooperative EPA and ACOE Triad Sediment Investigation results (ACOE, 2005).
4. Sediment Quality Standard (SQS) = 390 mg/kg dry wt.
5. Cleanup Screening Level (CSL) = 390 mg/kg dry wt.

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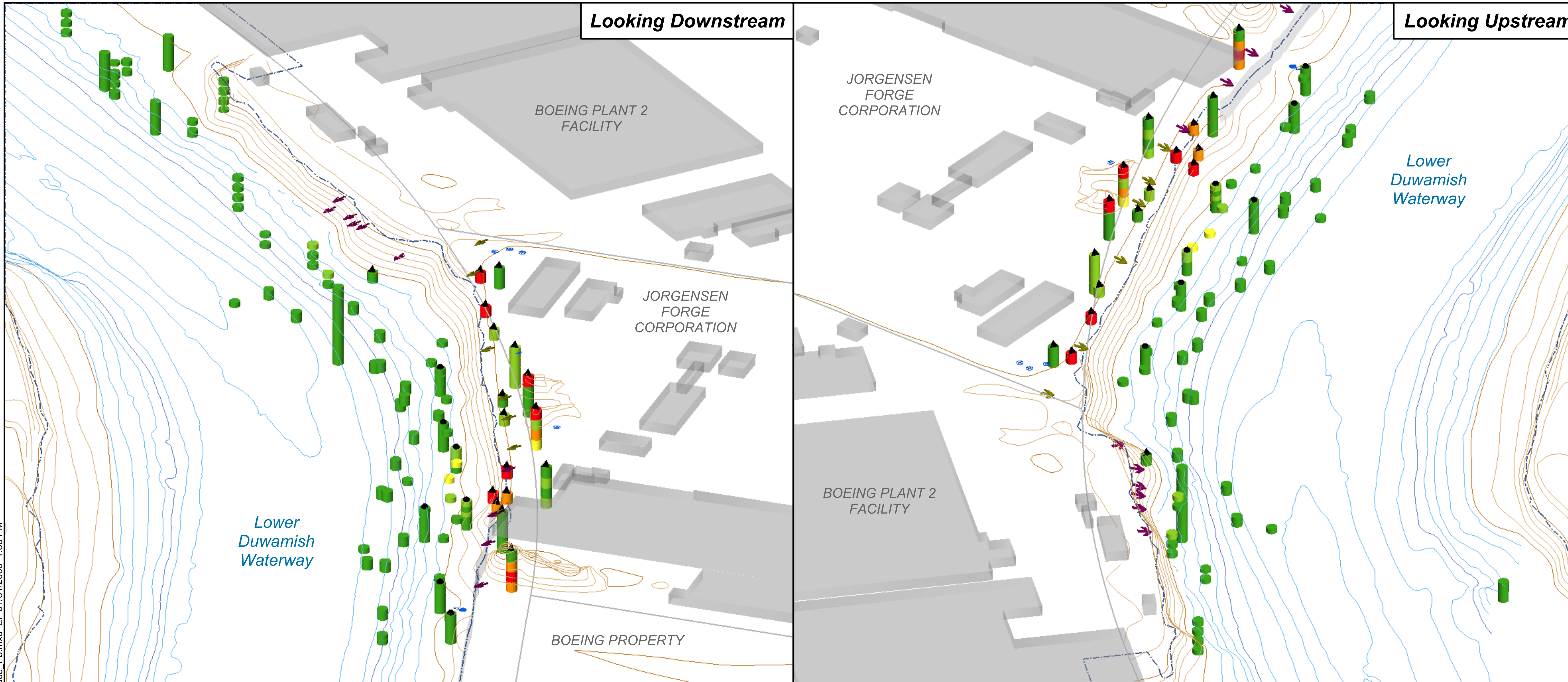
ANCHOR ENVIRONMENTAL, L.L.C.

**Figure 22**
Subsurface Sediment Concentrations - Copper
Jorgensen Forge Facility
8531 East Marginal Way South
Seattle, Washington

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**LEGEND**

**Lead (mg/kg dry wt.)**

- < 0.5x SQS
- 0.5x SQS - SQS
- SQS - CSL
- CSL - 2x CSL
- > 2x CSL

- Anchor Sampling Locations (2005)
- Soil & Shoreline Sampling Locations (Farallon, 2004)
- Shoreline Monitoring Wells
- Seep Sampling Location (Windward, 2004)
- Active Outfall
- Inactive Outfall

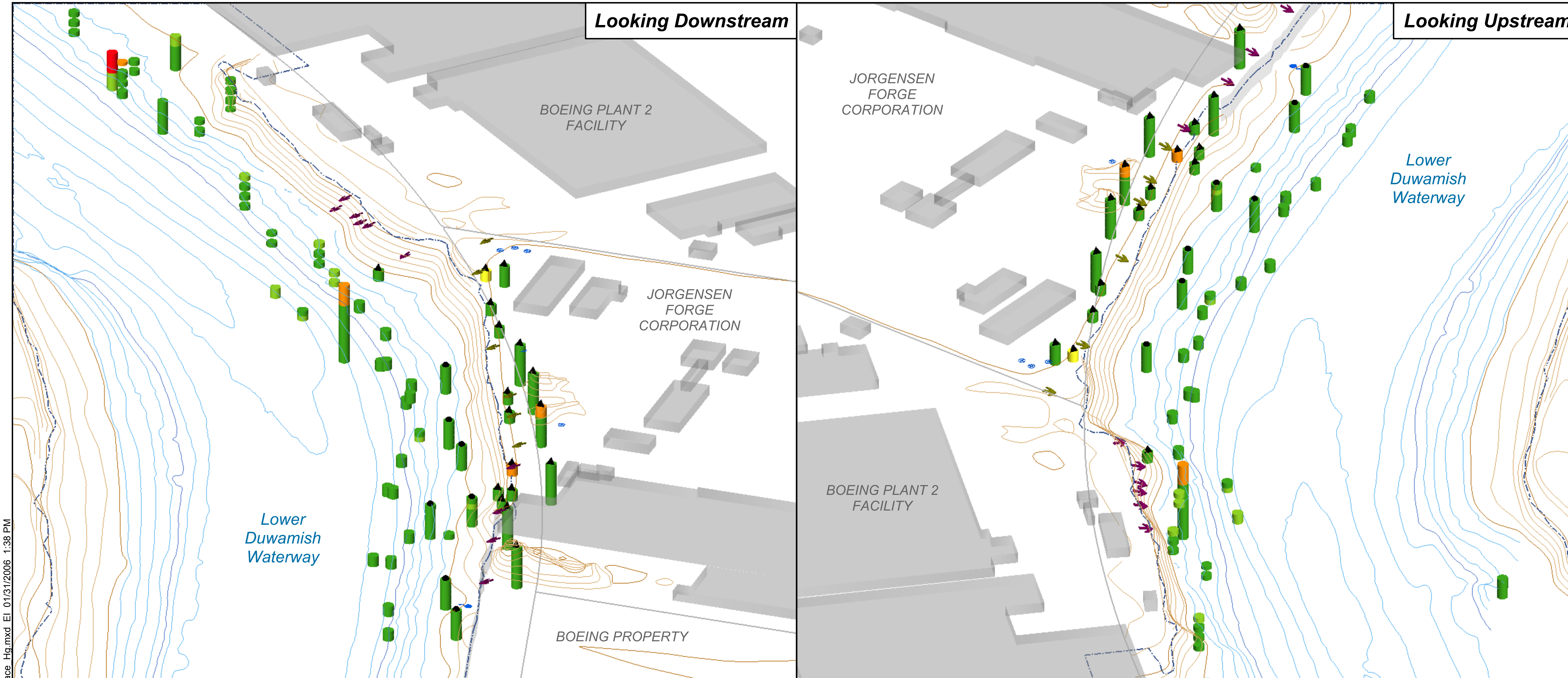
- Property Boundaries
- Buildings
- Shoreline (MHHW)

NOTES:

1. Bathymetry surveyed by Lower Duwamish Waterway Group (August 2003).
2. Boeing outfall locations field identified on May 14, 2003.
3. Subsurface sediment data queried from Ecology SEDQUAL database and cooperative EPA and ACOE Triad Sediment Investigation results (ACOE, 2005).
4. Sediment Quality Standard (SQS) = 450 mg/kg dry wt.
5. Cleanup Screening Level (CSL) = 530 mg/kg dry wt.

ANCHOR ENVIRONMENTAL, L.L.C.

**Figure 23**
Subsurface Sediment Concentrations - Lead
Jorgensen Forge Facility
8531 East Marginal Way South
Seattle, Washington




**LEGEND**

**Mercury (mg/kg dry wt.)**
- < 0.5x SQS
- 0.5x SQS - SQS
- SQS - CSL
- CSL - 2x CSL
- > 2x CSL

- Anchor Sampling Locations (2005)
- Soil & Shoreline Sampling Locations (Farallon, 2004)
- Shoreline Monitoring Wells
- Seep Sampling Location (Windward, 2004)
- Active Outfall
- Inactive Outfall
- Property Boundaries
- Buildings
- Shoreline (MHHW)

NOTES:
1. Bathymetry surveyed by Lower Duwamish Waterway Group (August 2003).

2. Boeing outfall locations field identified on May 14, 2003.

3. Subsurface sediment data queried from Ecology SEDQUAL database and cooperative EPA and ACOE Triad Sediment Investigation results (ACOE, 2005).

4. Sediment Quality Standard (SQS) = 0.41 mg/kg dry wt.

5. Cleanup Screening Level (CSL) = 0.59 mg/kg dry wt.

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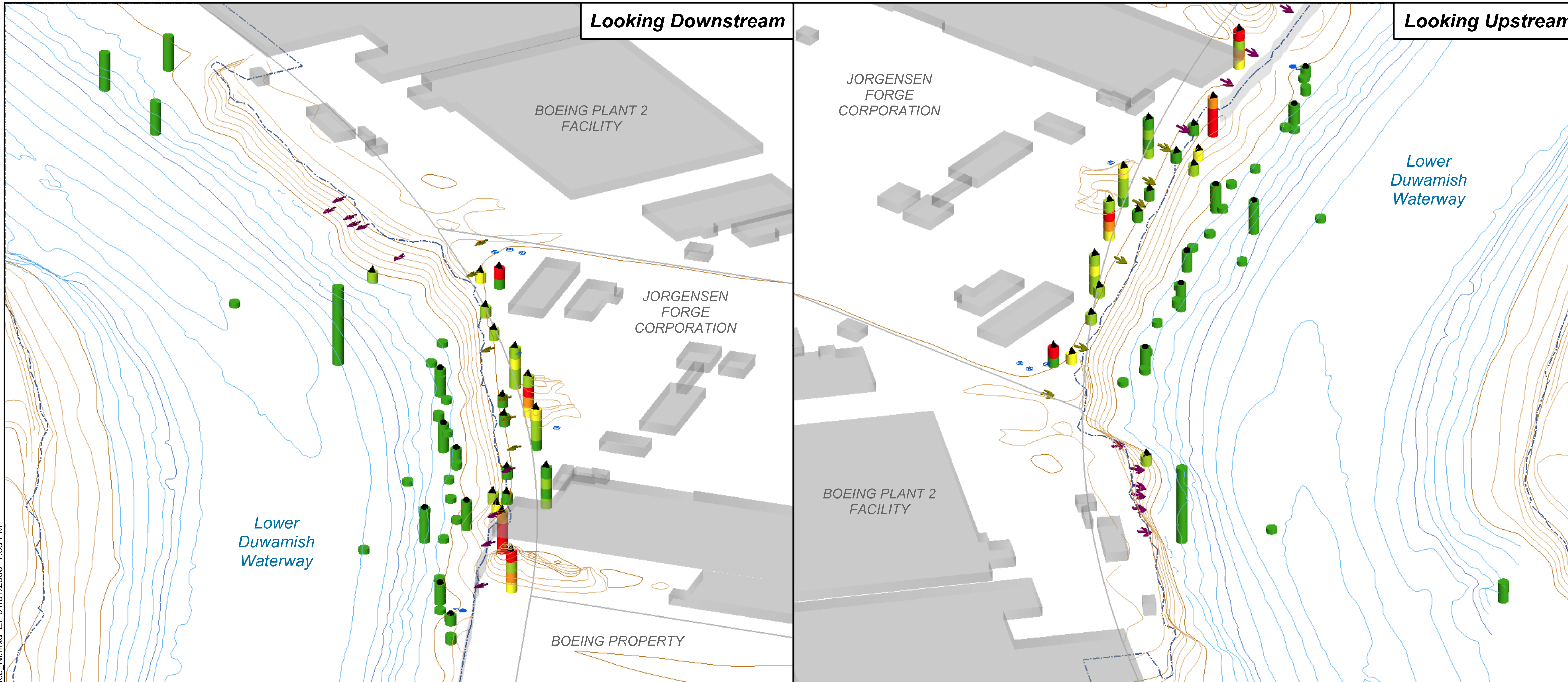
ANCHOR ENVIRONMENTAL, L.L.C.

**Figure 24**
Subsurface Sediment Concentrations - Mercury
Jorgensen Forge Facility
8531 East Marginal Way South
Seattle, Washington




**LEGEND**

**Nickel[1] (mg/kg dry wt.)**

- < 70
- 70 - 200
- 200 - 380
- 380 - 600
- > 600

- Anchor Sampling Locations (2005)
- Soil & Shoreline Sampling Locations (Farallon, 2004)
- Shoreline Monitoring Wells
- Seep Sampling Location (Windward, 2004)
- Active Outfall
- Inactive Outfall

- Property Boundaries
- Buildings
- Shoreline (MHHW)

NOTES:

1. Nickel has no associated SMS criteria. Concentrations shown are ranges rather than comparisons to criteria.

2. Bathymetry surveyed by Lower Duwamish Waterway Group (August 2003).

3. Boeing outfall locations field identified on May 14, 2003.

4. Subsurface sediment data queried from Ecology SEDQUAL database and cooperative EPA and ACOE Triad Sediment Investigation results (ACOE, 2005).

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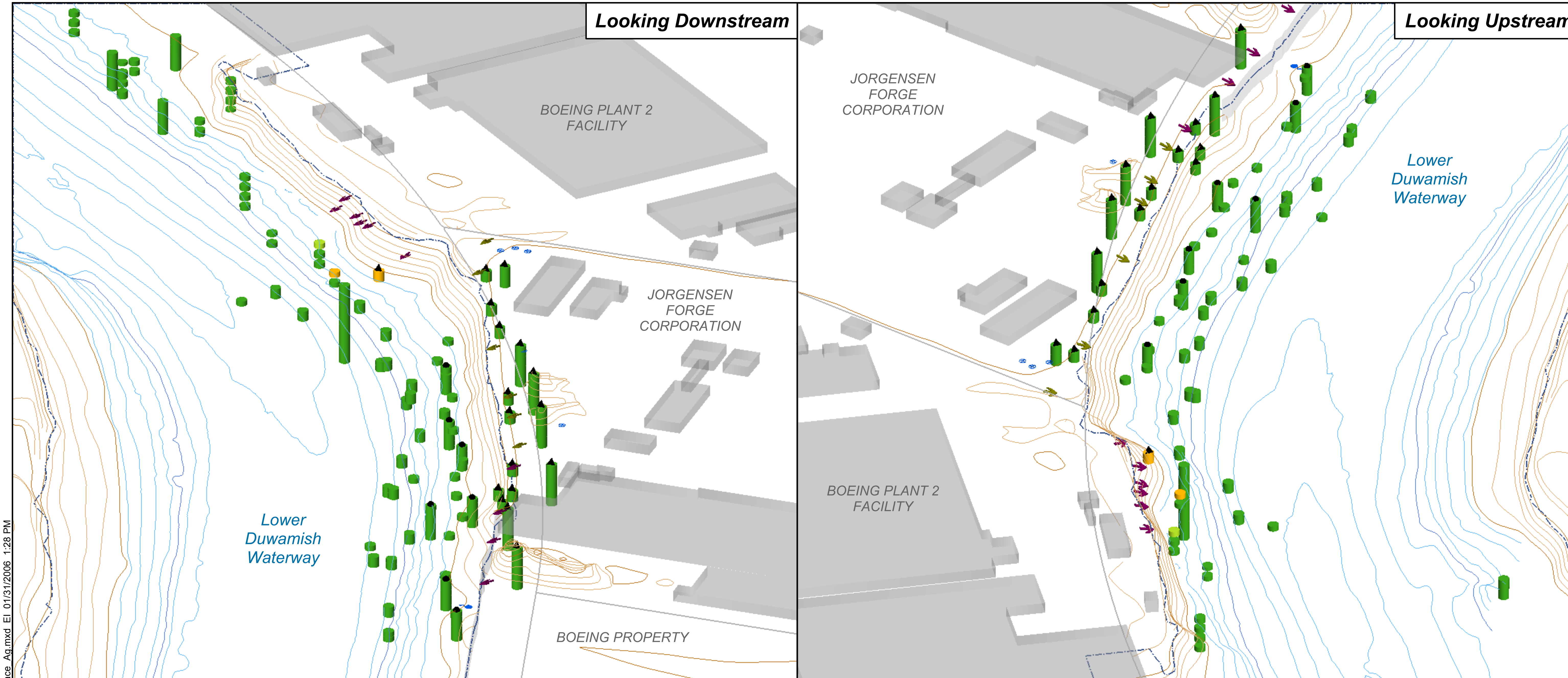
ANCHOR ENVIRONMENTAL, L.L.C.

**Figure 25**
Subsurface Sediment Concentrations - Nickel
Jorgensen Forge Facility
8531 East Marginal Way South
Seattle, Washington




**LEGEND**

**Silver (mg/kg dry wt.)**

- < 0.5x SQS
- 0.5x SQS - CSL
- CSL - 2x CSL
- > 2x CSL

- ● Anchor Sampling Locations (2005)
- ▲ Soil & Shoreline Sampling Locations (Farallon, 2004)
- Shoreline Monitoring Wells
- Seep Sampling Location (Windward, 2004)
- Active Outfall
- Inactive Outfall
- Property Boundaries
- Buildings
- Shoreline (MHHW)

NOTES:
1. Bathymetry surveyed by Lower Duwamish Waterway Group (August 2003).
2. Boeing outfall locations field identified on May 14, 2003.
3. Subsurface sediment data queried from Ecology SEDQUAL database and cooperative EPA and ACOE Triad Sediment Investigation results (ACOE, 2005).
4. Sediment Quality Standard (SQS) = 6.1 mg/kg dry wt.
5. Cleanup Screening Level (CSL) = 6.1 mg/kg dry wt.

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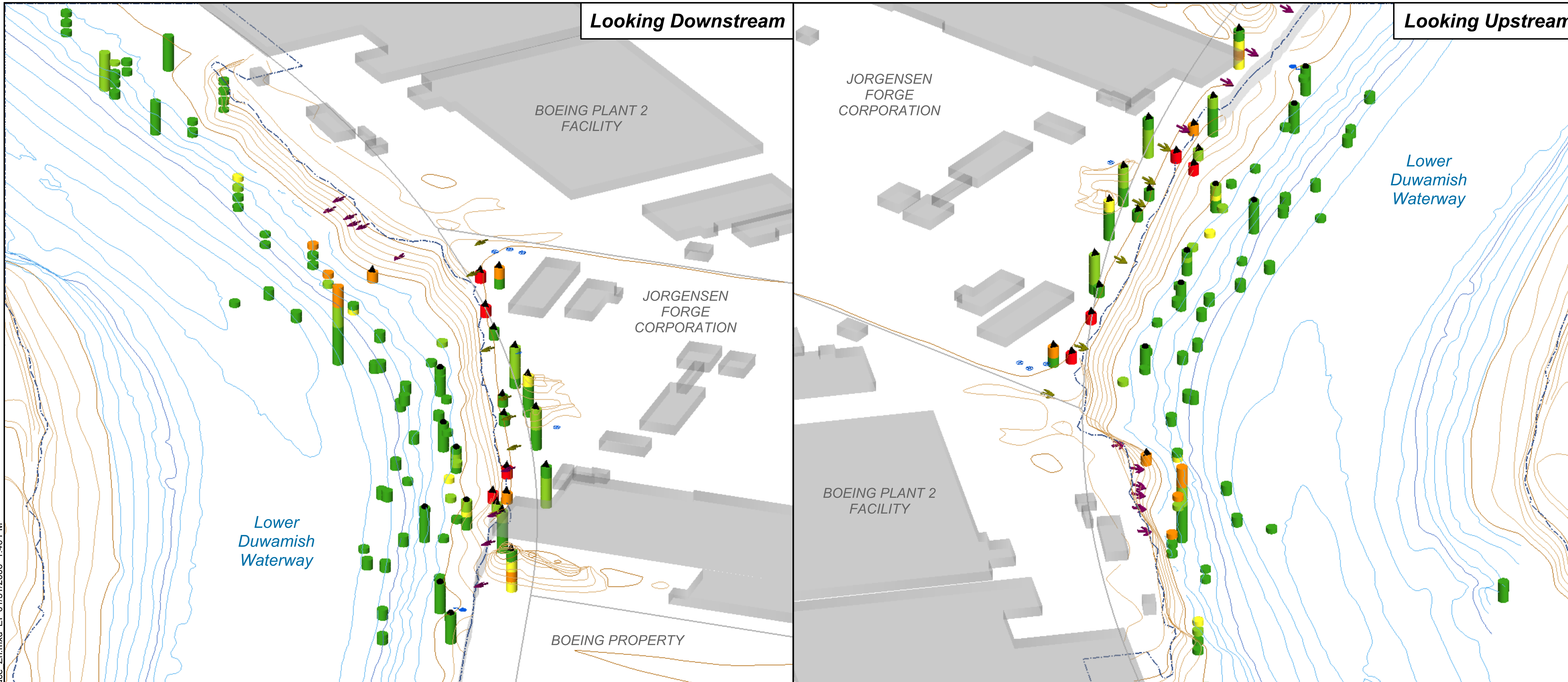
ANCHOR ENVIRONMENTAL, L.L.C.

**Figure 26**
Subsurface Sediment Concentrations - Silver
Jorgensen Forge Facility
8531 East Marginal Way South
Seattle, Washington






**LEGEND**

**Zinc (mg/kg dry wt.)**

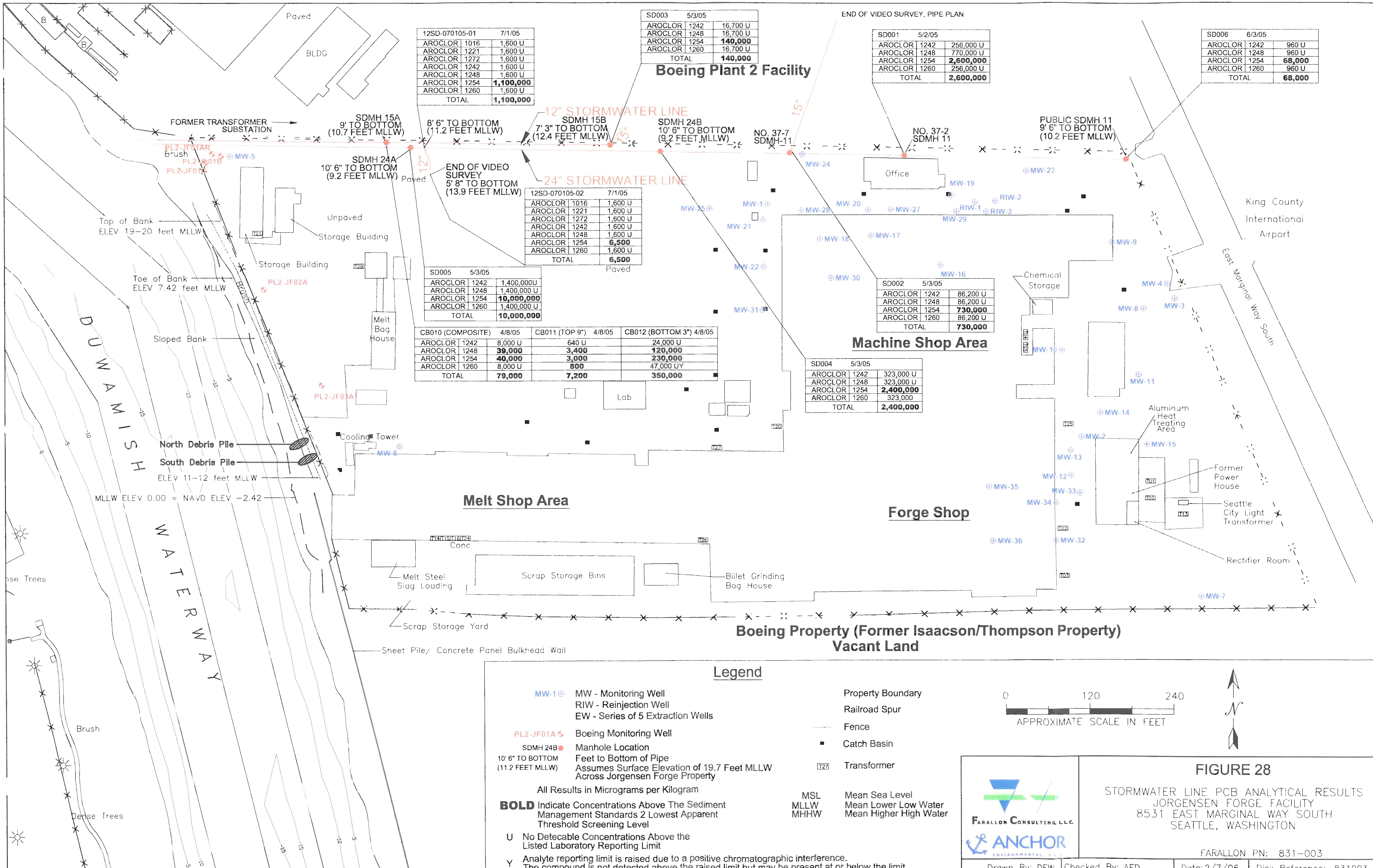
- < 0.5x SQS
- 0.5x SQS - SQS
- SQS-CSL
- CSL - 2x CSL
- > 2x CSL

- Anchor Sampling Locations (2005)
- Soil & Shoreline Sampling Locations (Farallon, 2004)
- Shoreline Monitoring Wells
- Seep Sampling Location (Windward, 2004)
- Active Outfall
- Inactive Outfall
- Property Boundaries
- Buildings
- Shoreline (MHHW)

NOTES:
1. Bathymetry surveyed by Lower Duwamish Waterway Group (August 2003).
2. Boeing outfall locations field identified on May 14, 2003.
3. Subsurface sediment data queried from Ecology SEDQUAL database and cooperative EPA and ACOE Triad Sediment Investigation results (ACOE, 2005).
4. Sediment Quality Standard (SQS) = 410 mg/kg dry wt.
5. Cleanup Screening Level (CSL) = 960 mg/kg dry wt.

ANCHOR ENVIRONMENTAL, L.L.C.

**Figure 27**
Subsurface Sediment Concentrations - Zinc
Jorgensen Forge Facility
8531 East Marginal Way South
Seattle, Washington




| 12SD-070105-01 | | 7/1/05 |
|---|---|---|
| AROCLOR | 1016 | 1,600 U |
| AROCLOR | 1221 | 1,600 U |
| AROCLOR | 1272 | 1,600 U |
| AROCLOR | 1242 | 1,600 U |
| AROCLOR | 1248 | 1,600 U |
| AROCLOR | 1254 | **1,100,000** |
| AROCLOR | 1260 | 1,600 U |
| TOTAL | | **1,100,000** |

| SD003 | | 5/3/05 |
|---|---|---|
| AROCLOR | 1242 | 16,700 U |
| AROCLOR | 1248 | 16,700 U |
| AROCLOR | 1254 | **140,000** |
| AROCLOR | 1260 | 16,700 U |
| TOTAL | | **140,000** |

| SD001 | | 5/2/05 |
|---|---|---|
| AROCLOR | 1242 | 256,000 U |
| AROCLOR | 1248 | 770,000 U |
| AROCLOR | 1254 | **2,600,000** |
| AROCLOR | 1260 | 256,000 U |
| TOTAL | | **2,600,000** |

| SD006 | | 6/3/05 |
|---|---|---|
| AROCLOR | 1242 | 960 U |
| AROCLOR | 1248 | 960 U |
| AROCLOR | 1254 | **68,000** |
| AROCLOR | 1260 | 960 U |
| TOTAL | | **68,000** |

| 12SD-070105-02 | | 7/1/05 |
|---|---|---|
| AROCLOR | 1016 | 1,600 U |
| AROCLOR | 1221 | 1,600 U |
| AROCLOR | 1272 | 1,600 U |
| AROCLOR | 1242 | 1,600 U |
| AROCLOR | 1248 | 1,600 U |
| AROCLOR | 1254 | **6,500** |
| AROCLOR | 1260 | 1,600 U |
| TOTAL | | **6,500** |

| SD005 | | 5/3/05 |
|---|---|---|
| AROCLOR | 1242 | 1,400,000U |
| AROCLOR | 1248 | 1,400,000 U |
| AROCLOR | 1254 | **10,000,000** |
| AROCLOR | 1260 | 1,400,000 U |
| TOTAL | | **10,000,000** |

| SD002 | | 5/3/05 |
|---|---|---|
| AROCLOR | 1242 | 86,200 U |
| AROCLOR | 1248 | 86,200 U |
| AROCLOR | 1254 | **730,000** |
| AROCLOR | 1260 | 86,200 U |
| TOTAL | | **730,000** |

| CB010 (COMPOSITE) | | 4/8/05 | CB011 (TOP 9") 4/8/05 | CB012 (BOTTOM 3") 4/8/05 |
|---|---|---|---|---|
| AROCLOR | 1242 | 8,000 U | 640 U | 24,000 U |
| AROCLOR | 1248 | **39,000** | **3,400** | **120,000** |
| AROCLOR | 1254 | **40,000** | **3,000** | **230,000** |
| AROCLOR | 1260 | 8,000 U | **800** | 47,000 UY |
| TOTAL | | **79,000** | **7,200** | **350,000** |

| SD004 | | 5/3/05 |
|---|---|---|
| AROCLOR | 1242 | 323,000 U |
| AROCLOR | 1248 | 323,000 U |
| AROCLOR | 1254 | **2,400,000** |
| AROCLOR | 1260 | 323,000 |
| TOTAL | | **2,400,000** |

## Legend

- MW-1 — MW - Monitoring Well
- RIW - Reinjection Well
- EW - Series of 5 Extraction Wells
- PL2-JF01A — Boeing Monitoring Well
- SDMH 24B — Manhole Location
- 10' 6" TO BOTTOM (11.2 FEET MLLW) — Feet to Bottom of Pipe. Assumes Surface Elevation of 19.7 Feet MLLW Across Jorgensen Forge Property
- Property Boundary
- Railroad Spur
- Fence
- Catch Basin
- T27 — Transformer

All Results in Micrograms per Kilogram

**BOLD** Indicate Concentrations Above The Sediment Management Standards 2 Lowest Apparent Threshold Screening Level

U No Detectable Concentrations Above the Listed Laboratory Reporting Limit

Y Analyte reporting limit is raised due to a positive chromatographic interference. The compound is not detected above the raised limit but may be present at or below the limit

MSL — Mean Sea Level
MLLW — Mean Lower Low Water
MHHW — Mean Higher High Water

0 120 240
APPROXIMATE SCALE IN FEET

N

# FIGURE 28

STORMWATER LINE PCB ANALYTICAL RESULTS
JORGENSEN FORGE FACILITY
8531 EAST MARGINAL WAY SOUTH
SEATTLE, WASHINGTON

FARALLON CONSULTING L.L.C.
ANCHOR ENVIRONMENTAL L.L.C.

FARALLON PN: 831-003

| Drawn By: DEW | Checked By: AED | Date: 2/7/06 | Disk Reference: 831003 |
|---|---|---|---|

# TABLES

FINAL INVESTIGATION DATA SUMMARY REPORT
Jorgensen Forge Facility
8531 East Marginal Way South
Seattle, Washington
U.S. EPA Docket No. CERCLA 10-2003-0111

Farallon PN: 831-003

## Table 1
## Soil, Groundwater and Sediment Screening Level Criteria
## Jorgensen Forge Facility
## 8531 East Marginal Way South
## Seattle, Washington
## Farallon PN: 831-003

| Analyte | Sediment | | Groundwater | | Soils | |
|---|---|---|---|---|---|---|
| | SQS[1] (mg/kg) | CSL[2] (mg/kg) | MTCA Method A[3] (µg/l) | MTCA Method B[4] (µg/l) | LAET[5] (mg/kg) | 2LAET[6] (mg/kg) |
| **PCBs** | | | | | | |
| Total Aroclor PCBs | 12 OC[7] | 65 OC[7] | 0.1 | NE | 0.13 | 1.0 |
| **Metals** | | | | | | |
| Arsenic | 57 | 93 | 5 | 0.0583 | 57 | 93 |
| Cadmium | 5.1 | 6.7 | 5 | 8 | 5.1 | 6.7 |
| Chromium | 260 | 270 | 50 | NE | 260 | 270 |
| Copper | 390 | 390 | NE | 0.0582 | 390 | 390 |
| Lead | 450 | 530 | 15 | NE | 450 | 530 |
| Mercury | 0.41 | 0.59 | 2 | 4.8 | 0.41 | 0.59 |
| Nickel | NE | NE | NE | NE | >140 | >140 |
| Silver | 6.1 | 6.1 | NE | 80 | 6.1 | 6.1 |
| Zinc | 410 | 960 | NE | 4,800 | 410 | 960 |

NOTES:

[1]Sediment Management Standards (SMS) Sediment Quality Standards (SQS), Section 320 of Chapter 173-204 of the Washington Administrative Code (WAC 173-204-320).

[2]SMS Cleanup Screening Levels (CSL) criteria, WAC 173-204-520

[3]Washington State Department of Ecology Model Toxics Control Act Cleanup Regulation (MTCA), Method A Cleanup Levels for Groundwater, Table 720-1 of Section 900 of WAC 173-340, as amended February 12, 2001.

[4]Cleanup Levels and Risk Calculations under MTCA, Standard Method B Formula Values for Potable Ground Water, Updated November 2001.

[5] SMS Lowest Apparent Effects Threshold (LAET)

[6]SMS Upper LAET

[7]Organic carbon (OC) normalized.

µg/l = micrograms per liter

mg/kg = milligrams per kilogram

NE = not established

PCBs = polychlorinated biphenyls

# Table 2
## Third Phase Investigation Surface Sediment Sampling Collection Information
## Jorgensen Forge Facility
## 8531 East Marginal Way South
## Seattle, Washington
## Farallon PN: 831-003

| Sample Identification | Date Sampled | Sample Location (NAD 83)[1] | | Penetration Depth (cm) |
|---|---|---|---|---|
| | | Latitude | Longitude | |
| AJF-01SD | 5/2/2005 | 47.52709505 N | 122.30931836 W | 7 |
| AJF-02SD | 5/2/2005 | 47.52698071 N | 122.30918397 W | 3 |
| AJF-03SD | 5/2/2005 | 47.52677193 N | 122.30901994 W | 7 |
| AJF-04SD | 5/2/2005 | 47.52650996 N | 122.30885131 W | 2 |
| AJF-05SD | 5/2/2005 | 47.52634031 N | 122.30872738 W | 2 |
| AJF-06SD | 5/2/2005 | 47.52602123 N | 122.30854505 W | 5 |
| AJF-07SD | 5/2/2005 | 47.52599110 N | 122.30875617 W | 12 |
| AJF-08SD | 5/2/2005 | 47.52591870 N | 122.30854009 W | 5 |
| AJF-09SD | 5/2/2005 | 47.52576397 N | 122.30847999 W | 10 |
| AJF-10SD | 5/2/2005 | 47.52559278 N | 122.30841155 W | 9 |
| AJF-11SD | 5/2/2005 | 47.52542507 N | 122.30835620 W | 11 |

NOTES:

[1]Geographical coordinates measured in North American Datum (NAD) 1983 in latitude and longitude decimal degrees.

cm = centimeters

**Table 3**
**Third Phase Investigation Subsurface Sediment Sampling Collection Information**
**Jorgensen Forge Facility**
**8531 East Marginal Way South**
**Seattle, Washington**
**Farallon PN: 831-003**

| Sample Identification | Date Sampled | Date Processed | Sample Location (NAD 83)[1] | | Mudline Elevation (feet MLLW) | Recovery Elevation (feet MLLW)[2] | Percent Recovery[3] |
|---|---|---|---|---|---|---|---|
| | | | Latitude | Longitude | | | |
| AJF-07SD | 5/4/2005 | 5/5/2005 | 47.5259900 N | 122.3087567 W | -5.5 | -12.5 | 100 |
| AJF-11SD | 5/4/2005 | 5/5/2005 | 47.5254283 N | 122.3083500 W | -0.4 | -6.6 | 75 |
| AJF-12SD | 5/4/2005 | 5/6/2005 | 47.5260183 N | 122.3086100 W | -1 | -7 | 75 |
| AJF-13SD | 5/4/2005 | 5/6/2005 | 47.5255817 N | 122.3084800 W | -0.2 | -6.5 | 75 |
| AJF-14SD | 5/4/2005 | 5/5/2005 | 47.5263033 N | 122.3088000 W | -0.7 | -5.9 | 75 |
| AJF-15SD | 5/4/2005 | 5/6/2005 | 47.5264300 N | 122.3089167 W | -1.2 | -7.1 | 75 |
| AJF-16SD | 5/4/2005 | 5/6/2005 | 47.5267217 N | 122.3090833 W | -1 | -6.9 | 75 |

NOTES:

[1] Geographical coordinates measured in North American Datum (NAD) 1983 in latitude and longitude decimal degrees.

[2] Core length measured upon retrieval and is not adjusted to account for compaction that occurs during processing.

[3] Percent recovery was calculated as core recovery/penetration depth x 100.

MLLW = mean lower low water

## Table 4
## Third Phase Investigation Surface Sediment Analytical Results
## Jorgensen Forge Facility
## 8531 East Marginal Way South
## Seattle, Washington
## Farallon PN: 831-003

| Location ID | | | AJF-01 | AJF-02 | AJF-03 | AJF-04 | AJF-05 | AJF-06 | AJF-07 | AJF-08 | AJF-09 | AJF-09 | AJF-10 | AJF-11 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample ID | | | AJF-01SD | AJF-02SD | AJF-03SD | AJF-04SD | AJF-05SD | AJF-06SD | AJF-07SD | AJF-08SD | AJF-09SD | AJF-59SD | AJF-10SD | AJF-11SD |
| Sample Date | SMS | | 5/2/2005 | 5/2/2005 | 5/2/2005 | 5/2/2005 | 5/2/2005 | 5/2/2005 | 5/2/2005 | 5/2/2005 | 5/2/2005 | 5/2/2005 | 5/2/2005 | 5/2/2005 |
| Depth Interval | SQS | CSL | 0-7 cm | 0-3 cm | 0-7 cm | 0-2 cm | 0-2 cm | 0-5 cm | 0-12 cm | 0-5 cm | 0-10 cm | 0-10 cm | 0-9 cm | 0-11 cm |
| **Conventionals (%)** | | | | | | | | | | | | | | |
| Total solids | -- | -- | **76.1** | **88.5** | **75.3** | **74.5** | **71.8** | **72** | **53.7** | **78.1** | **65.3** | **63.9** | **78.3** | **53.4** |
| Total Organic Carbon | -- | -- | **2.23** | **1.47** | **2.62** | **1.71** | **2.11** | **1.82** | **1.3** | **1.41** | **2.4** | **2.44** | **1.24** | **1.16** |
| **Grain Size (%)** | | | | | | | | | | | | | | |
| Gravel | -- | -- | **64.1** | **73** | **39.9** | **53.6** | **44.5** | **43.5** | 0 U | **43.9** | **35.8** | **54.2** | **59.7** | **0.60** |
| Sand, Coarse | -- | -- | **8.40** | **9.30** | **11.4** | **10.1** | **10.4** | **18.3** | **0.40** | **17.5** | **8.1** | **4.10** | **10.7** | **0.50** |
| Sand, Medium | -- | -- | **9.90** | **7** | **14.5** | **11.7** | **12.2** | **15.6** | **2.40** | **19.8** | **9.60** | **6.2** | **11** | **7.10** |
| Sand, Fine | -- | -- | **10.1** | **6.4** | **22.2** | **14.4** | **18** | **12** | **20.2** | **13.6** | **20.8** | **14.3** | **12** | **35.1** |
| Silt | -- | -- | **3.80** | **2** | **5** | **3.50** | **7.80** | **4.80** | **60.8** | **2.80** | **16.7** | **13.6** | **3.90** | **41.2** |
| Clay | -- | -- | **3.80** | **2.20** | **7** | **6.60** | **7.10** | **5.80** | **16.2** | **2.40** | **9.10** | **7.50** | **2.70** | **15.4** |
| **Geochemistry (std units)** | | | | | | | | | | | | | | |
| Liquid Limit | -- | -- | -- | -- | -- | -- | -- | -- | **47** | -- | -- | -- | -- | **42** |
| Plasticity Index | -- | -- | -- | -- | -- | -- | -- | -- | **6** | -- | -- | -- | -- | 0 U |
| Plastic Limit | -- | -- | -- | -- | -- | -- | -- | -- | **41** | -- | -- | -- | -- | 0 U |
| **Metals (mg/kg)** | | | | | | | | | | | | | | |
| Arsenic | 57 | 93 | **9.83** | **22** | **24.40** | **21.20** | **16.80** | **19.20** | **15.80** | **32.50** | **27.10** | **23.70** | **9.10** | **13.10** |
| Cadmium | 5.1 | 6.7 | **0.296** | **28.40 * #** | **1.02** | **1.03** | **0.403** | **3.54** | **0.0569 J** | **1.62** | **0.928** | **1.37** | **0.661** | **0.096 J** |
| Chromium | 260 | 270 | **23.6** | **119** | **96.4** | **250** | **100** | **10600 * #** | **96.7** | **1060 * #** | **133** | **144 J** | **362 * #** | **118** |
| Copper | 390 | 390 | **54.7** | **113** | **232** | **97.4** | **111** | **111** | **43.9** | **2820 * #** | **155** | **161** | **182** | **83.6** |
| Lead | 450 | 530 | **116** | **6830 * #** | **999 * #** | **310** | **245** | **64900 * #** | **334** | **1410 * #** | **244** | **313** | **203** | **99** |
| Mercury | 0.41 | 0.59 | **0.0253** | **0.0452** | **0.0261** | **0.0304** | **0.0391** | **0.0537** | **0.104** | **0.054** | **0.0779** | **0.0924** | **0.0655** | **0.0458** |
| Nickel | -- | -- | **26.60** | **34.40** | **105** | **71.60** | **86** | **72.10** | **31.10** | **496** | **162** | **175 J** | **171** | **57.50** |
| Silver | 6.1 | 6.1 | **0.301** | **1.03** | **0.359** | **0.372** | **0.214 J** | **0.61** | **0.252 J** | **1.38** | **1.91** | **2.47** | **0.576** | **1.03** |
| Zinc | 410 | 960 | **693 *** | **148000 * #** | **2210 * #** | **698 *** | **336** | **17500 * #** | **171** | **1300 * #** | **361** | **500 *** | **437 *** | **117** |
| **PCBs (µg/kg)** | | | | | | | | | | | | | | |
| Aroclor 1016 | -- | -- | 121 U | 1080 U | 12.80 U | 13.30 U | 13.60 U | 647 U | 18.60 U | 123 U | 152 U | 156 U | 12.10 U | 18.50 U |
| Aroclor 1221 | -- | -- | 121 U | 1080 U | 12.80 U | 13.30 U | 13.60 U | 647 U | 18.60 U | 123 U | 152 U | 156 U | 12.10 U | 18.50 U |
| Aroclor 1232 | -- | -- | 121 U | 1080 U | 12.80 U | 13.30 U | 13.60 U | 647 U | 18.60 U | 123 U | 152 U | 156 U | 12.10 U | 18.50 U |
| Aroclor 1242 | -- | -- | 121 U | 1080 U | 12.80 U | 13.30 U | 13.60 U | 647 U | 18.60 U | 123 U | 152 U | 156 U | 12.10 U | 18.50 U |
| Aroclor 1248 | -- | -- | 121 U | 1080 U | 12.80 U | 13.30 U | 13.60 U | 647 U | 18.60 U | 123 U | 152 U | 156 U | 12.10 U | 18.50 U |
| Aroclor 1254 | -- | -- | **2110 J** | **18400 J** | **504** | **320** | **517** | **8710 J** | **201** | **2590 J** | **4250 J** | **4980 J** | **145** | **148** |
| Aroclor 1260 | -- | -- | 121 U | 1080 U | **401** | **198** | **417** | 647 U | **122** | 123 U | 152 U | 156 U | **142** | **119** |
| Total PCBs | -- | -- | **2110 J** | **18400 J** | **905** | **518** | **934** | **8710 J** | **323** | **2590 J** | **4250 J** | **4980 J** | **287** | **267** |
| **PCBs (mg/kg-OC)** | | | | | | | | | | | | | | |
| Total PCBs | 12 | 65 | **94.6 J* #** | **1252 J* #** | **34.5 *** | **30.3 *** | **44.3 *** | **479 J* #** | **24.8 *** | **184 J* #** | **177 J* #** | **204 J* #** | **23.1 *** | **23.0 *** |

**U = not detected**
**J = estimated**
**UJ = not detected at an estimated detection limit**
**B1 = Blank contamination, result < 10x the blank contamination**
**B2 = Blank contamination, result > 10x the blank contamination**

**BOLD: Detected results**
*** (shaded): Result exceeds SMS SQS criteria**
***# (shaded): Result exceeds SMS CSL criteria**

Table 5
Third Phase Investigation Subusurface Sediment Analytical Results
Jorgensen Forge Facility
8531 East Marginal Way South
Seattle, Washington
Farallon PN: 831-003

| Location ID | | | AJF-07 | AJF-07 | AJF-07 | AJF-07 | AJF-07 | AJF-07 | AJF-07 | AJF-11 | AJF-11 | AJF-11 | AJF-11 | AJF-11 | AJF-11 | AJF-11 | AJF-12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample ID | | | AJF-07SD-A | AJF-07SD-B | AJF-07SD-C | AJF-07SD-D | AJF-07SD-E | AJF-07SD-F | AJF-07SD-G | AJF-11SD-A | AJF-11SD-B | AJF-11SD-C | AJF-61SD-C | AJF-11SD-D | AJF-11SD-E | AJF-11SD-F | AJF-12SD-A |
| Sample Date | SMS | | 5/5/2005 | 5/5/2005 | 5/5/2005 | 5/5/2005 | 5/5/2005 | 5/5/2005 | 5/5/2005 | 5/5/2005 | 5/5/2005 | 5/5/2005 | 5/5/2005 | 5/5/2005 | 5/5/2005 | 5/5/2005 | 5/6/2005 |
| Depth Interval | SQS | CSL | 0-1 ft | 1-2 ft | 2-3 ft | 3-4 ft | 4-5 ft | 5-6 ft | 6-6.65 ft | 0-1 ft | 1-2 ft | 2-3 ft | 2-3 ft | 3-4 ft | 4-5 ft | 5-5.7 ft | 0-1 ft |
| **Conventionals (%)** | | | | | | | | | | | | | | | | | |
| Total solids | -- | -- | **56.9** | **61.3** | **57.5** | **52.6** | **63.7** | **69.2** | **60.4** | **58.4** | **72.7** | **79.7** | **79.1** | **82.9** | **81.8** | **79.8** | **49.1** |
| Total Organic Carbon | -- | -- | **1.31** | **1.31** | **1.87** | **2.44** | **1.89** | **0.818** | **1.92** | **0.797** | **0.905** | **0.0612** | **0.0606** | **0.0529** | **0.0398** | **0.123** | **2.42** |
| **Grain Size (%)** | | | | | | | | | | | | | | | | | |
| Gravel | -- | -- | 0 U | 0 U | 0 U | 0 U | 0 U | 0 U | 0 U | **0.80** | 0 U | 0 U | -- | 0 U | 0 U | 0 U | 0 U |
| Sand, Coarse | -- | -- | 0 U | 0 U | 0 U | 0 U | 0 U | 0 U | 0 U | **0.40** | 0 U | 0 U | -- | **0.10** | 0 U | 0 U | **0.20** |
| Sand, Medium | -- | -- | **0.70** | **0.80** | **0.70** | **0.60** | **0.40** | **0 U** | **0.30** | **3.50** | **12.5** | **27.1** | -- | **45.5** | **47.4** | **49.2** | **0.90** |
| Sand, Fine | -- | -- | **14.4** | **20.1** | **11.2** | **8.1** | **20.6** | **10.2** | **21.6** | **51.9** | **47.3** | **69.4** | -- | **50.5** | **49.7** | **45.2** | **8.1** |
| Silt | -- | -- | **74.7** | **72.4** | **80.2** | **82.8** | **71.1** | **81.8** | **69.1** | **33.1** | **28.1** | **1.60** | -- | **2.60** | **1.50** | **4** | **84.5** |
| Clay | -- | -- | **10.2** | **6.70** | **7.90** | **8.40** | **7.80** | **7.90** | **9** | **10.3** | **12.1** | **1.90** | -- | **1.40** | **1.30** | **1.50** | **6.3** |
| **Geochemistry (std units)** | | | | | | | | | | | | | | | | | |
| Liquid Limit | -- | -- | **44** | **40** | -- | **54** | -- | **32** | -- | **30** | **23** | -- | -- | -- | -- | -- | **53** |
| Plasticity Index | -- | -- | 0 U | 0 U | -- | 0 U | -- | 0 U | -- | 0 U | 0 U | -- | -- | -- | -- | -- | 0 U |
| Plastic Limit | -- | -- | 0 U | 0 U | -- | 0 U | -- | 0 U | -- | 0 U | 0 U | -- | -- | -- | -- | -- | 0 U |
| **Metals (mg/kg)** | | | | | | | | | | | | | | | | | |
| Arsenic | 57 | 93 | **15** | **17.20** | **21.40** | **61.40 *** | **11.10** | **7.16** | **61.80 *** | **11.80** | **5.43** | **0.755** | **0.688** | **0.724** | **1.79** | **4.11** | **19.3** |
| Cadmium | 5.1 | 6.7 | **0.576** | **0.566** | **1.20** | **4.09** | **0.178 J** | **0.0235 J** | **1.01** | **0.27 J** | 0.312 U | 0.255 U | 0.255 U | 0.292 U | **0.0285 J** | 0.288 U | **1.65** |
| Chromium | 260 | 270 | **28.9** | **22** | **28.7** | **55** | **18.5** | **16.1** | **47.6** | **47.4** | **13.9** | **8.96** | **8.59** | **7.91** | **6.74** | **7.18** | **78** |
| Copper | 390 | 390 | **45.4** | **32.1** | **41.8** | **59.4** | **31.9** | **25.9** | **53.1** | **77.9** | **18.8** | **7.07** | **6.96** | **11.8** | **14.4** | **13.1** | **96.2** |
| Lead | 450 | 530 | **41.1** | **18.5** | **33.4** | **46.7** | **10.8** | **7.82** | **33.3** | **120** | **11.2** | **1.19** | **1.05** | **1.21** | **1.03** | **1.22** | **274** |
| Nickel | -- | -- | **18.40** | **18** | **18.80** | **21.20** | **14.30** | **12.70** | **17.70** | **32.70** | **11.60** | **4.90** | **4.90** | **5.71** | **7.55** | **11.40** | **61.1** |
| Silver | 6.1 | 6.1 | **0.431 J** | **0.218 J** | **0.409** | **1.03** | **0.174 J** | **0.135 J** | **0.778** | **1.67** | **0.142 J** | **0.0454 J** | **0.0373 J** | **0.0735 J** | **0.0397 J** | **0.0335 J** | **2.44** |
| Zinc | 410 | 960 | **154** | **104** | **129** | **124** | **46.70** | **37.70** | **87.10** | **112** | **32.50** | **15.40** | **14.80** | **19.10** | **16.10** | **17.20** | **262** |
| Mercury | 0.41 | 0.59 | **0.0976** | **0.0119 J** | **0.0445** | **0.0706** | **0.0246 U** | **0.0214 J** | **0.0822** | **0.0129 J** | **0.00693 J** | 0.0227 U | 0.0230 U | 0.0213 U | 0.0224 U | 0.0233 U | **0.138** |
| **PCBs (µg/kg)** | | | | | | | | | | | | | | | | | |
| Aroclor 1016 | -- | -- | 13.80 U | 13.50 U | 16.70 U | 16.4 U | 14.8 U | 10.9 U | 149 U | 14.7 U | 9.46 U | 10.0 U | 2.77 U | 8.17 U | 10.7 U | 9.31 U | 292 U |
| Aroclor 1221 | -- | -- | 13.80 U | 13.50 U | 16.70 U | 16.4 U | 14.8 U | 10.9 U | 149 U | 14.7 U | 9.46 U | 10.0 U | 2.77 U | 8.17 U | 10.7 U | 9.31 U | 292 U |
| Aroclor 1232 | -- | -- | 13.80 U | 13.50 U | 16.70 U | 16.4 U | 14.8 U | 10.9 U | 149 U | 14.7 U | 9.46 U | 10.0 U | 2.77 U | 8.17 U | 10.7 U | 9.31 U | 292 U |
| Aroclor 1242 | -- | -- | 13.80 U | 13.50 U | 16.70 U | 16.4 U | 14.8 U | 10.9 U | 149 U | 14.7 U | 9.46 U | 10.0 U | 2.77 U | 8.17 U | 10.7 U | 9.31 U | 292 U |
| Aroclor 1248 | -- | -- | 13.80 U | 13.50 U | 16.70 U | 16.4 U | 14.8 U | 10.9 U | 149 U | 14.7 U | 9.46 U | 10.0 U | 2.77 U | 8.17 U | 10.7 U | 9.31 U | 292 U |
| Aroclor 1254 | -- | -- | **179** | **37.80** | **109** | **166** | 14.8 U | 10.9 U | 149 U | **140** | 9.46 U | 10.0 U | 2.77 U | 8.17 U | 10.7 U | 9.31 U | **10000 J** |
| Aroclor 1260 | -- | -- | **178** | **49.70** | **163** | **429** | **17.1** | **24.3** | **1049 J** | **119** | 9.46 U | 10.0 U | 2.77 U | 8.17 U | 10.7 U | 9.31 U | 292 U |
| Total PCBs | 130 | 1000 | **357** | **87.5** | **272** | **595** | **17.1** | **24.3** | **1049 J** | **259** | 9.46 U | 10 U | 2.77 U | 8.17 U | 10.7 U | 9.31 U | **10000 J** |
| **PCBs (mg/kg-OC)** | | | | | | | | | | | | | | | | | |
| Total PCBs | 12 | 65 | **27.3 *** | **6.68** | **14.5 *** | **24.4 *** | **0.90** | **2.97** | **54.6 J*** | **32.5 *** | 1.05 U | **NA** | **NA** | **NA** | **NA** | **NA** | **408 J* #** |

Table 5
Third Phase Investigation Subusurface Sediment Analytical Results
Jorgensen Forge Facility
8531 East Marginal Way South
Seattle, Washington
Farallon PN: 831-003

| Location ID | SMS | | AJF-12 | AJF-12 | AJF-12 | AJF-12 | AJF-12 | AJF-13 | AJF-13 | AJF-13 | AJF-13 | AJF-13 | AJF-13 | AJF-14 | AJF-14 | AJF-14 | AJF-14 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample ID | | | AJF-12SD-B | AJF-12SD-C | AJF-12SD-D | AJF-12SD-E | AJF-12SD-F | AJF-13SD-A | AJF-13SD-B | AJF-13SD-C | AJF-13SD-D | AJF-13SD-E | AJF-13SD-F | AJF-14SD-A | AJF-14SD-B | AJF-14SD-C | AJF-14SD-D |
| Sample Date | | | 5/6/2005 | 5/6/2005 | 5/6/2005 | 5/6/2005 | 5/6/2005 | 5/6/2005 | 5/6/2005 | 5/6/2005 | 5/6/2005 | 5/6/2005 | 5/6/2005 | 5/5/2005 | 5/5/2005 | 5/5/2005 | 5/5/2005 |
| Depth Interval | SQS | CSL | 1-2 ft | 2-3 ft | 3-4 ft | 4-5 ft | 5-5.6 ft | 0-1 ft | 1-2 ft | 2-3 ft | 3-4 ft | 4-5 ft | 5-5.85 ft | 0-1 ft | 1-2 ft | 2-3 ft | 3-4 ft |
| **Conventionals (%)** | | | | | | | | | | | | | | | | | |
| Total solids | -- | -- | 52.3 | 72.5 | 77.3 | 72.1 | 64.1 | 66.3 | 64.0 | 68.1 | 77.8 | 76.0 | 77.9 | 53.9 | 75.5 | 75.6 | 81.5 |
| Total Organic Carbon | -- | -- | 1.7 | 1.32 | 0.831 | 1.06 | 1.51 | 1.08 | 1.48 | 1.19 | 0.461 J | 0.165 | 0.266 | 2.42 | 1.28 | 1.1 | 0.687 J |
| **Grain Size (%)** | | | | | | | | | | | | | | | | | |
| Gravel | -- | -- | 0 U | 0.50 | 5.20 | 8.70 | 0 U | 0.40 | 0 U | 0 U | 0 U | 2.20 | 0.30 | 0 U | 15.3 | 0 U | 0 U |
| Sand, Coarse | -- | -- | 0.30 | 1.50 | 9.10 | 6.4 | 1.50 | 0.30 | 0 U | 0 U | 0.70 | 2.50 | 3.90 | 1.60 | 5.60 | 0.80 | 0 U |
| Sand, Medium | -- | -- | 4.10 | 26.1 | 40 | 25.7 | 14.6 | 4.10 | 2.30 | 1.10 | 30.1 | 48.2 | 49.2 | 10 | 31.5 | 9 | 4.70 |
| Sand, Fine | -- | -- | 7.90 | 38.2 | 22.4 | 33.6 | 25.5 | 39.7 | 31.1 | 12.5 | 42.1 | 41.3 | 40 | 43.7 | 37.8 | 65.1 | 90.8 |
| Silt | -- | -- | 81.9 | 30.6 | 20.8 | 22.6 | 50.9 | 50.6 | 61.4 | 65.7 | 18.7 | 3.10 | 4.30 | 39.9 | 7.20 | 21.6 | 2.30 |
| Clay | -- | -- | 5.80 | 3.10 | 2.50 | 3.10 | 7.60 | 4.90 | 5.20 | 20.7 | 8.60 | 2.70 | 2.30 | 4.80 | 2.60 | 3.40 | 2.10 |
| **Geochemistry (std units)** | | | | | | | | | | | | | | | | | |
| Liquid Limit | -- | -- | 50 | -- | -- | -- | 38 | 0 U | 37 | 34 | -- | -- | -- | 38 | 0 U | -- | -- |
| Plasticity Index | -- | -- | 0 U | -- | -- | -- | 0 U | 0 U | 0 U | 0 U | -- | -- | -- | 0 U | 0 U | -- | -- |
| Plastic Limit | -- | -- | 0 U | -- | -- | -- | 0 U | 0 U | 0 U | 0 U | -- | -- | -- | 0 U | 0 U | -- | -- |
| **Metals (mg/kg)** | | | | | | | | | | | | | | | | | |
| Arsenic | 57 | 93 | 17.8 | 28.8 | 14.1 | 12.5 | 9.58 | 42.9 | 16.7 | 5.34 | 1.75 | 0.612 | 1.89 | 7.96 | 8.62 | 4.65 | 1.74 |
| Cadmium | 5.1 | 6.7 | 0.83 | 0.68 | 0.26 J | 0.299 U | 0.333 U | 0.259 J | 0.338 U | 0.31 U | 0.286 U | 0.281 U | 0.262 U | 0.237 J | 0.279 | 0.273 U | 0.282 U |
| Chromium | 260 | 270 | 40.5 | 48.4 | 19.6 | 15.4 | 18.1 | 22.6 | 16.8 | 17.2 | 10.5 | 7.24 | 6.98 | 50.4 | 86.6 | 15.7 | 8.25 |
| Copper | 390 | 390 | 71.6 | 82.7 | 34 | 21.5 | 30 | 31.8 | 25.8 | 26.8 | 12.4 | 6.61 | 9.84 | 49.4 | 60.2 | 22.1 | 9.25 |
| Lead | 450 | 530 | 219 | 411 | 90.6 | 13 | 14 | 17.6 | 12.7 | 6.49 | 3.16 | 1.19 | 1.26 | 281 | 352 | 37.1 | 2.8 |
| Nickel | -- | -- | 34.9 | 30.9 | 14.4 | 12.6 | 14.3 | 11.7 | 12.2 | 13.5 | 7.87 | 5.45 | 7.24 | 36.40 | 33.30 | 12.40 | 7 |
| Silver | 6.1 | 6.1 | 0.864 | 0.795 | 0.449 | 0.11 J | 0.131 J | 0.289 J | 0.106 J | 0.0732 J | 0.0378 J | 0.0236 J | 0.0283 J | 0.308 J | 0.211 J | 0.107 J | 0.0327 J |
| Zinc | 410 | 960 | 209 | 411 * | 113 | 38.5 | 48.4 | 55 | 41.2 | 38.1 | 22.2 | 15.1 | 17.8 | 162 | 240 | 53.30 | 17.50 |
| Mercury | 0.41 | 0.59 | 0.224 | 0.0898 | 0.0618 | 0.0676 | 0.031 | 0.0615 | 0.0202 J | 0.0381 | 0.007 J | 0.0215 U | 0.0233 U | 0.0628 | 0.0287 | 0.00833 J | 0.0241 U |
| **PCBs (µg/kg)** | | | | | | | | | | | | | | | | | |
| Aroclor 1016 | -- | -- | 76.1 U | 107 U | 10.7 U | 9.98 U | 12.1 U | 12.8 U | 11.7 UJ | 12.7 U | 9.83 U | 9.96 U | 10.7 U | 17.9 U | 54.4 U | 106 U | 11.5 U |
| Aroclor 1221 | -- | -- | 76.1 U | 107 U | 10.7 U | 9.98 U | 12.1 U | 12.8 U | 11.7 UJ | 12.7 U | 9.83 U | 9.96 U | 10.7 U | 17.9 U | 54.4 U | 106 U | 11.5 U |
| Aroclor 1232 | -- | -- | 76.1 U | 107 U | 10.7 U | 9.98 U | 12.1 U | 12.8 U | 11.7 UJ | 12.7 U | 9.83 U | 9.96 U | 10.7 U | 17.9 U | 54.4 U | 106 U | 11.5 U |
| Aroclor 1242 | -- | -- | 76.1 U | 107 U | 10.7 U | 9.98 U | 12.1 U | 12.8 U | 11.7 UJ | 12.7 U | 9.83 U | 9.96 U | 10.7 U | 17.9 U | 54.4 U | 106 U | 11.5 U |
| Aroclor 1248 | -- | -- | 76.1 U | 107 U | 10.7 U | 9.98 U | 12.1 U | 12.8 U | 11.7 UJ | 12.7 U | 9.83 U | 9.96 U | 10.7 U | 17.9 U | 54.4 U | 106 U | 11.5 U |
| Aroclor 1254 | -- | -- | 1670 J | 1800 J | 413 | 16 | 12.1 U | 12.8 U | 11.7 UJ | 12.7 U | 8.28 J | 9.96 U | 10.7 U | 385 | 854 | 1380 J | 11.5 U |
| Aroclor 1260 | -- | -- | 76.1 U | 107 U | 10.7 U | 9.98 U | 12.1 U | 250 | 11.7 UJ | 12.7 U | 9.83 U | 9.96 U | 10.7 U | 155 | 236 | 888 J | 11.5 U |
| Total PCBs | 130 | 1000 | 1670 J | 1800 J | 413 | 16 | 12.1 U | 250 | 11.7 UJ | 12.7 U | 8.28 J | 9.96 U | 10.7 U | 540 | 1090 | 2268 J | 11.5 U |
| **PCBs (mg/kg-OC)** | | | | | | | | | | | | | | | | | |
| Total PCBs | 12 | 65 | 98.2 J* # | 127 J* # | 49.7 * | 1.51 | 0.80 U | 23.1 * | 0.79 U | 1.07 U | NA | NA | NA | 22.3 * | 85.2 * # | 206 J* # | 1.67 U |

Table 5
Third Phase Investigation Subusurface Sediment Analytical Results
Jorgensen Forge Facility
8531 East Marginal Way South
Seattle, Washington
Farallon PN: 831-003

| Location ID | | | AJF-14 | AJF-14 | AJF-15 | AJF-15 | AJF-15 | AJF-15 | AJF-15 | AJF-15 | AJF-15 | AJF-16 | AJF-16 | AJF-16 | AJF-16 | AJF-16 | AJF-16 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample ID | | | AJF-64SD-D | AJF-14SD-E | AJF-15SD-A | AJF-15SD-B | AJF-15SD-C | AJF-15SD-D | AJF-15SD-E | AJF-65SD-E | AJF-15SD-F | AJF-16SD-A | AJF-16SD-B | AJF-16SD-C | AJF-16SD-D | AJF-16SD-E | AJF-16SD-F |
| Sample Date | SMS | | 5/5/2005 | 5/5/2005 | 5/6/2005 | 5/6/2005 | 5/6/2005 | 5/6/2005 | 5/6/2005 | 5/6/2005 | 5/6/2005 | 5/6/2005 | 5/6/2005 | 5/6/2005 | 5/6/2005 | 5/6/2005 | 5/6/2005 |
| Depth Interval | SQS | CSL | 3-4 ft | 4-4.8 ft | 0-1 ft | 1-2 ft | 2-3 ft | 3-4 ft | 4-5 ft | 4-5 ft | 5-5.5 ft | 0-1 ft | 1-2 ft | 2-3 ft | 3-4 ft | 4-5 ft | 5-5.4 ft |
| **Conventionals (%)** | | | | | | | | | | | | | | | | | |
| Total solids | -- | -- | **80.8** | **82** | **50.8** | **62.9** | **65.3** | **72.4** | **49.6** | **51.5** | **57.6** | **49.4** | **63.8** | **76.6** | **83.5** | **82.0** | **81.8** |
| Total Organic Carbon | -- | -- | **0.105** | **0.0711** | **2.37** | **1.92** | **1.25** | **1.57** | **3.31 J** | **2.11 J** | **3.6** | **2.21** | **0.653** | **1.72** | **0.397** | **0.0854** | **0.156** |
| **Grain Size (%)** | | | | | | | | | | | | | | | | | |
| Gravel | -- | -- | -- | 0 U | 0 U | 0 U | 0 U | 0 U | 0 U | -- | 0 U | 0 U | **0.20** | 0 U | **2.50** | **0.30** | 0 U |
| Sand, Coarse | -- | -- | -- | 0 U | 0 U | 0 U | **0.20** | 0 U | **1.10** | -- | **0.20** | 0 U | **0.30** | **1.50** | **1** | **0.20** | 0 U |
| Sand, Medium | -- | -- | -- | **9.30** | **2** | **3.60** | **0.80** | **6.70** | **4.30** | -- | **7.50** | **3.20** | **17** | **23.7** | **20.2** | **15.9** | **16.5** |
| Sand, Fine | -- | -- | -- | **87.8** | **8.60** | **27.7** | **13.4** | **55.9** | **44.8** | -- | **67.4** | **11.8** | **42.3** | **61** | **72** | **80.5** | **77.8** |
| Silt | -- | -- | -- | **1.70** | **73.8** | **60.5** | **77.8** | **33.9** | **40.3** | -- | **19.5** | **77.7** | **36.3** | **9** | **2.90** | **2** | **3.80** |
| Clay | -- | -- | -- | **1.30** | **15.6** | **8.1** | **7.80** | **3.60** | **9.60** | -- | **5.30** | **7.40** | **3.80** | **4.80** | **1.30** | **1.10** | **1.90** |
| **Geochemistry (std units)** | | | | | | | | | | | | | | | | | |
| Liquid Limit | -- | -- | -- | -- | **52** | **42** | **40** | -- | -- | -- | -- | **58** | 0 U | -- | -- | -- | -- |
| Plasticity Index | -- | -- | -- | -- | 0 U | 0 U | 0 U | -- | -- | -- | -- | 0 U | 0 U | -- | -- | -- | -- |
| Plastic Limit | -- | -- | -- | -- | 0 U | 0 U | 0 U | -- | -- | -- | -- | 0 U | 0 U | -- | -- | -- | -- |
| **Metals (mg/kg)** | | | | | | | | | | | | | | | | | |
| Arsenic | 57 | 93 | **1.72** | **1.20** | **17.5** | **18.9** | **14.9** | **3.96** | **8.38** | **9.85** | **5.11** | **10.2** | **5.03** | **4.37** | **1.26** | **1.07** | **1.33** |
| Cadmium | 5.1 | 6.7 | 0.282 U | 0.244 U | **0.451** | **0.622** | **0.862** | 0.325 U | 0.482 U | 0.413 U | 0.411 U | **0.126 J** | **0.0207 J** | 0.263 U | **0.0203 J** | 0.276 U | 0.293 U |
| Chromium | 260 | 270 | **7.08** | **7.26** | **40.1** | **28.2** | **30.5** | **10.1** | **15.4** | **15.4** | **12.8** | **37.8** | **27.2** | **28.7** | **22.7** | **11.8** | **7.9** |
| Copper | 390 | 390 | **7.58** | **7.22** | **57.9** | **35.7** | **35.8** | **16.4** | **33.5** | **26.6** | **17.4** | **58.1** | **33.1** | **32.2** | **18.8** | **11.1** | **8.88** |
| Lead | 450 | 530 | **1.48** | **1.5** | **71.9** | **24** | **35.9** | **3.84** | **6.14** | **6.92** | **4.27** | **55.1** | **47.5** | **72.3** | **89.9** | **31.9** | **2.22** |
| Nickel | -- | -- | **5.94** | **6.24** | **21.8** | **18.7** | **17.5** | **8.39** | **12.1** | **12.3** | **10.7** | **30.6** | **21** | **29.4** | **11.5** | **10.6** | **7.12** |
| Silver | 6.1 | 6.1 | **0.0327 J** | **0.0409 J** | **0.648** | **0.764** | **0.276 J** | **0.0591 J** | **0.127 J** | **0.114 J** | **0.0879 J** | **0.31 J** | **0.261 J** | **0.278** | **0.0478 J** | **0.0298 J** | **0.037 J** |
| Zinc | 410 | 960 | **14.90** | **14.80** | **203** | **116** | **131** | **23.7** | **32.1** | **35.1** | **27.6** | **125** | **97.3** | **105** | **53.4** | **25.5** | **19.1** |
| Mercury | 0.41 | 0.59 | 0.0214 U | 0.0213 U | **0.124** | **0.0497** | **0.0279 J** | **0.00919 J** | **0.0329 J** | **0.0255 J** | **0.013 J** | **0.045** | **0.0253 J** | **0.0232** | **0.00861 J** | **0.0373** | 0.0224 U |
| **PCBs (µg/kg)** | | | | | | | | | | | | | | | | | |
| Aroclor 1016 | -- | -- | 10.9 U | 11.6 U | 17.8 U | 14.6 U | 14.2 U | 12.4 U | 18 U | 17 U | 14.2 U | 18.6 U | 14.1 U | 100 U | 8.86 U | 9.12 U | 10.2 U |
| Aroclor 1221 | -- | -- | 10.9 U | 11.6 U | 17.8 U | 14.6 U | 14.2 U | 12.4 U | 18 U | 17 U | 14.2 U | 18.6 U | 14.1 U | 100 U | 8.86 U | 9.12 U | 10.2 U |
| Aroclor 1232 | -- | -- | 10.9 U | 11.6 U | 17.8 U | 14.6 U | 14.2 U | 12.4 U | 18 U | 17 U | 14.2 U | 18.6 U | 14.1 U | 100 U | 8.86 U | 9.12 U | 10.2 U |
| Aroclor 1242 | -- | -- | 10.9 U | 11.6 U | 17.8 U | 14.6 U | 14.2 U | 12.4 U | 18 U | 17 U | 14.2 U | 18.6 U | 14.1 U | 100 U | 8.86 U | 9.12 U | 10.2 U |
| Aroclor 1248 | -- | -- | 10.9 U | 11.6 U | 17.8 U | 14.6 U | 14.2 U | 12.4 U | 18 U | 17 U | 14.2 U | 18.6 U | 14.1 U | 100 U | 8.86 U | 9.12 U | 10.2 U |
| Aroclor 1254 | -- | -- | 10.9 U | 11.6 U | **415** | 14.6 U | 14.2 U | 12.4 U | 18 U | 17 U | 14.2 U | 18.6 U | 14.1 U | **1240 J** | 8.86 U | 9.12 U | 10.2 U |
| Aroclor 1260 | -- | -- | 10.9 U | 11.6 U | 17.8 U | **206** | **158** | **4.97 J** | **7.03 J** | **8.35 J** | **6.99 J** | **7.91 J** | **251** | 100 U | **39.2** | **2.59** | 10.2 U |
| Total PCBs | 130 | 1000 | 10.9 U | 11.6 U | **415** | **206** | **158** | **4.97 J** | **7.03 J** | **8.35 J** | **6.99 J** | **7.91 J** | **251** | **1240 J** | **39.2** | **2.59** | 10.2 U |
| **PCBs (mg/kg-OC)** | | | | | | | | | | | | | | | | | |
| Total PCBs | 12 | 65 | **NA** | **NA** | **17.5 *** | **10.7** | **12.6 *** | **0.32** | **0.21** | **0.40** | **0.19** | **0.36** | **38.4 *** | **72.1 J* #** | **NA** | **NA** | **NA** |

**Notes:**
**Some of the data may not require OC normalization as the TOC results are <0.5%. Criteria in the SMS column is the LAET Marine 1988 and the criteria in the CSL column is the 2LAET.**
**U = not detected**
**J = estimated**
**UJ = not detected at an estimated detection limit**
**B1 = Blank contamination, result < 10x the blank contamination**
**B2 = Blank contamination, result > 10x the blank contamination**

**BOLD: Detected results**
*** (shaded): Result exceeds SMS SQS criteria**
***# (shaded): Result exceeds SMS CSL criteria**

**Table 6**
**Third Phase Investigation Outfall Discharge Analytical Results and Comparative Criteria**
**Jorgensen Forge Facility**
**8531 East Marginal Way South**
**Seattle, Washington**
**Farallon PN: 831-003**

| Location Identification<br>Sample Screening Level Criteria<br>Sample Date | WAC 173-201A<br>Marine<br>Chronic[1] | EPA CCC<br>Marine<br>Chronic[2] | NPDES<br>Baseline Permit<br>Action Level[3] | Outfall 002<br>AJF-02SW-050519<br>5/19/2005 | Outfall 003<br>AJF-03SW-050519<br>5/19/2005 |
|---|---|---|---|---|---|
| **Conventionals** | | | | | |
| pH | -- | -- | 5<pH<10 | **7.90** | **8.52** |
| Total suspended solids (mg/l) | -- | -- | -- | **30** | **23** |
| **Total Metals (mg/l)** | | | | | |
| Arsenic | -- | -- | -- | **0.00535** | **0.00145** |
| Cadmium | -- | -- | -- | **0.000166 J** | **0.000278 J** |
| Chromium | -- | -- | -- | **0.109** | **0.0452** |
| Copper | -- | -- | 0.149 | **0.0681** | **0.0296** |
| Lead | -- | -- | 0.159 | **0.0114** | **0.00864** |
| Mercury | -- | -- | -- | 0.00020 U | 0.00020 U |
| Nickel | -- | -- | -- | **0.103** | **0.0264** |
| Silver | -- | -- | -- | **0.000092 J** | **0.000059 J** |
| Zinc | -- | -- | 0.372 | **0.196** | **0.269** |
| **Dissolved Metals (mg/l)** | | | | | |
| Arsenic | 0.036 | 0.036 | -- | **0.00429** | **0.00109** |
| Cadmium | 0.0093 | 0.0088 | -- | **0.000054 J** | **0.000046 J** |
| Chromium (VI) | 0.05 | 0.05 | -- | **0.00521** | **0.0033** |
| Copper | 0.0031 | 0.0031 | -- | **0.0153** | **0.00909** |
| Lead | 0.0081 | 0.0081 | -- | **0.00028 J** | **0.000436 J** |
| Mercury | 0.025 | 0.00094 | -- | 0.00020 U | 0.00020 U |
| Nickel | 0.0082 | 0.0082 | -- | **0.00914** | **0.00428** |
| Silver | -- | -- | -- | **0.000011 J** | **0.0000050 J** |
| Zinc | 0.081 | 0.081 | -- | **0.0404** | **0.0452** |
| **PCBs (μg/l)** | | | | | |
| Aroclor 1016 | -- | -- | -- | 0.19 U | 0.19 U |
| Aroclor 1221 | -- | -- | -- | 0.19 U | 0.19 U |
| Aroclor 1232 | -- | -- | -- | 0.19 U | 0.19 U |
| Aroclor 1242 | -- | -- | -- | 0.19 U | 0.19 U |
| Aroclor 1248 | -- | -- | -- | 0.19 U | 0.19 U |
| Aroclor 1254 | -- | -- | -- | 0.19 U | 0.19 U |
| Aroclor 1260 | -- | -- | -- | 0.19 U | 0.19 U |
| Total PCBs | 0.03 | 0.00003 | -- | 0.19 U | 0.19 U |

**NOTES:**

[1] Washington State Department of Ecology (Ecology) Chapter 173-201A of the Washington Administrative Code (WAC 173-201A), marine chronic surface water criteria

[2] U.S. Environmental Protection Agency (EPA) Criteria Continuous Concentration (CCC) National Recommended Water Quality Criteria

[3] Ecology Action Levels defined in National Pollutant Discharge Elimination System (NPDES) Industrial Stormwater General Permit

-- = no criteria established
J = estimated
μg/l = micrograms per liter
mg/l = milligrams per liter
PCBs = polychlorinated biphenyls
U = not detected

**APPENDIX A**
**REGULATORY CORRESPONDENCE**

FINAL INVESTIGATION DATA SUMMARY REPORT
Jorgensen Forge Facility
8531 East Marginal Way South
Seattle, Washington
U.S. EPA Docket No. CERCLA 10-2003-0111

Farallon PN: 831-003

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10
1200 Sixth Avenue
Seattle, WA 98101

January 18, 2006

RECEIVED
JAN 19 2006
BY:

Reply to
Attn of: AWT-121

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Peter Jewitt
Farallon Consulting L.L.C.
320 Third Avenue, N.E., Suite 200
Issaquah, WA 98027

William S. Johnson
Earle M. Jorgensen Company
10650 South Alameda
Lynwood, CA 90262

Re: Jorgensen Forge Facility
Administrative Order on Consent, U.S. EPA Docket No CERCLA 10-2003-0111
Draft Investigation Data Summary Report

Dear Mr. Jewitt and Mr. Johnson:

The U.S. Environmental Protection Agency (EPA) has reviewed the document entitled *Draft Investigation Data Summary Report* (Data Summary Report) dated October 10, 2005. In accordance with Paragraph 27 of the above-referenced Administrative Order on Consent (AOC), EPA is providing the attached comments.

The attached comments must be adequately addressed before EPA can approve the Data Summary Report.

If you have any questions, please call me at (206)553-2851 or I can be reached by email at Orlean.Howard@epa.gov.

Sincerely,

Howard Orlean
Howard Orlean
Project Manager

Attachment

cc: Ron Altier, Jorgensen Forge Corporation
William Ernst, The Boeing Company
Laurie Geissinger, Seattle City Light
David Templeton, Anchor Environmental

Brad Helland, Ecology, NWRO
Marla Steinhoff, NOAA
Glen St. Amant, Muckleshoot Tribe
John Wakeman, US ACE

**U.S. Environmental Protection Agency Technical Comments**
**Draft Investigation Data Summary Report**

**General Comments:**

**1.** Jorgensen Forge and Earle M. Jorgensen (EMJ) must develop a conceptual site model (CSM) that shows all contaminant plumes, buildings, shoreline, and soil contaminants. In addition, ground water flow contours, gradients, and other hydrogeological elements need to be put together into a hydrogeological conceptual site model. The "conceptual models" presented in this report are not complete, and should be stated so in the text. The hydrogeologic CSM is especially important near the Boeing Plant 2/Jorgensen Forge property boundary. EPA urges Jorgensen Forge and EMJ to work with The Boeing Company (Boeing) to develop a technically sound hydrogeolgic CSM for the property boundary area. The scope of the CSM should be based on current and not reasonably foreseeable conditions.

**2.** There are numerous statements that contain the phrase "are likely attributable to" or variations thereon; many of these refer to actions or contaminant patterns which may not be attributable to EMJ or Jorgensen Forge. Unless there is clear evidence that specific releases are from a source other than the Jorgensen facility, such statements must be deleted or carefully and thoroughly caveated. We further strongly recommend deletion. We believe attempting to accurately, thoroughly and fairly caveat will likely create prolonged and unnecessary exchanges followed by serial revisions. We are seeking a characterization of existing site conditions rather than a means or analysis ascribing or allocating responsibility.

A particular instance of "are likely attributed to" is illustrative. At least 10 times, the Data Summary Report asserts that the US Army Corps of Engineers' (USACE) actions were likely to have placed the fill onsite. This fill is then disclosed in the document to be contaminated material. EMJ has not provided evidence that the USACE (or any other entity) is responsible for placing the contaminated fill. Therefore these statements must be caveated or deleted. An appropriate caveat is that no records exist that confirm this fill. Another caveat is that the materials are described as items that are not usually associated with hydraulic fill; page 6-1 indicates bricks, wood, and metal debris in the fill. We hope you will avoid unnecessary statements making multiple caveats necessary

The ten locations where the text can be found are as follows:

| Page | Section |
|---|---|
| 1-1 | 1.2 |
| 2-1 | 2.2 |
| 2-3 | 2.3 |
| 2-7 | 2.4 |
| 5-9 | 5.9 |
| 6-1 | 6.1.1 |
| 6-2 | 6.3.1 |

| | |
|---|---|
| 6-3 | 6.3.2 |
| 6-3 | 6.4.1 |
| 6-12 | 6.6.1 |

**3.** While the intent of the Data Summary Report is to fulfill EMJ's responsibility under the current Administrative Order on Consent (AOC) data gaps persist with respect to source control. Soil and groundwater data from the center of the site <u>and</u> groundwater data from the south side of the site along the Isaacson property line are still missing.

At a meeting between EPA, the Washington Department of Ecology (Ecology) and EMJ and Jorgensen Forge consultants on October 21, 2005, the following areas where data gaps persist were discussed:

**(a) South Property Line:** At the October 21, 2005 meeting, maps and the histories of Isaacson, former Slip5, Mineralized Cell, Bissel Wood/Lumber were discussed at length. The stabilized arsenic cleanup which left a narrow strip of arsenic-contaminated soil at the east end of the Jorgensen/Isaacson property line is of particular concern given the lack of groundwater information in this area. There is also a very good chance that historic Mineralized Cell wastes overlap that property line onto/beneath the Jorgensen Forge facility. With observations of low redox in groundwater moving south and west across the Jorgensen Forge property toward Isaacson, there was general agreement that more data in this area is a critical need.

More certainty about where the water is going from the sump beneath the scale is also needed. Water collects in the relatively open vault, but is not plumbed to any discharge point based on EMJ's storm/sanitary site re-mapping. Although the Seep Survey conducted for the Lower Duwamish Waterway (LDW) Phase 2 Remedial Investigation (RI) is located right in the area of potential concern relative to the scale sump, the survey was limited in scope and therefore concerns still remain about groundwater as a possible source/pathway.

**(b) North Property Line:** 1962 Boeing Plant 2 stormwater maps show Plant 2 connections to the highly contaminated 24" and 12" stormwater lines in the right-of-way along the Plant 2/Jorgensen property line extending from the King County Airport to the river. There was additional discussion about the cutting oil pool on the east half of the site, away from the waterway; it's a thick, but stable, lens of contamination. The solvent plumes from the northerly direction were discussed along with the possible effects that the embayment fill (i.e., Bethlehem Steel area) might have on groundwater flow. Prior to conducting cleanup in this area additional groundwater characterization should be conducted in order to potential impact of groundwater contamination on the waterway.

**(c) Additional analytes** Since the focus of the AOC is limited to polychlorinated biphenyls (PCBs) and metals it does not provide sufficient detail to fully assess source control at the Jorgensen Forge facility. However, the scope of remedial action and source control for the LDW must address the balance of Sediment Management Standards (SMS) contaminants. In the future, EMJ and/or Jorgensen Forge will be required to adequately address all media of concern and sampling analyses for polyaromatic hydrocarbons (PAHs), total petroleum hydrocarbons (TPH), phthalates, phenols and miscellaneous constituents (e.g., benzoic acid, benzyl alcohol).

**Specific Comments**

**1. Page 2-2, Section 2.4, and Table 6**
It is stated is Section 2.4 that compliance has been documented against the National Pollutant Discharge Elimination System (NPDES) permit. However, as shown in Table 6, there is no NPDES permit requirement for PCBs. In general, Washington State marine chronic surface water criteria for protection of aquatic life as defined in Ecology Chapter 173-201A of the Washington Administrative Code (WAC 173-201A) and the EPA chronic Criteria Continuous Concentration (CCC) National Recommended Water Quality Criteria are both considerably below the sample-specific detection limits of the outfall sampling (0.19 ug/L). Both criterion values are 0.03 ug/l. Therefore, Table 6 is inconclusive as to whether PCB discharges from the outfalls may pose a risk to aquatic life. Section 2.4 must be revised to state that PCB analyses from the outfalls are inconclusive.

**2. Page 2-2. Section 2.4, and Figure 3**
The last sentence on this page is not consistent with Figure 3 which shows that most of the drainage goes to Outfalls 02 and 03. The text must be clarified.

**3. Page 2-3, Section 2.4, top paragraph**
The discussion of outfalls 005-009 is confusing and inconsistent. The previous paragraph says that they were plugged, and this paragraph says they are inactive but that "original stormwater discharging through inactive outfalls 006-009 are not...." Please clarify whether water is currently discharging from these outfalls.

**4. Page 2-3, Section 2.6**
It was EPA's understanding that only the seaward half of the Jorgensen Forge facility is underlain by fill, yet this text implies the entire site is fill. Please clarify.

**5. Page 2-3, Section 2.6**
The discussion of the underlying geology should be revised to include the deeper stratigraphy, at least to bedrock.

**6. Page 2-4, Section 2.7, Hydrogeology**

**a.** The general statements in this section about hydrogeology are only supported by data for the eastern (landward) half of the site. This must be noted in the document. See general comment about groundwater data gaps. The distance between monitoring wells 5 and 6 is about 480 feet, and in this distance soil contamination at depth and the groundwater pathway to sediments is likely influenced by tidal action; however, this is only a guess pending additional information for both media.

**b.** A ground-water flow map showing ground-water elevations in the monitoring wells must be included in the revised Data Summary Report. This flow map is especially important to delineate ground-water flow near the Jorgensen Forge/Boeing Plant 2 property boundary. EPA urges Jorgensen Forge and EMJ to work with Boeing to construct a mutually agreeable and technically-sound conceptual model of ground-water flow near the Jorgensen Forge/Boeing Plant 2 boundary.

**7. Page 2.5, Section 2-7, Top line on page**
What were the practicable quantitation limits (PQLs) for PCBs, particularly with respect to water quality standards? References or citations for supporting documentation must be included in the text.

**8. Page 2-6, Section 2.8.2, Sediment Transport and Deposition**
The Lower Duwamish Waterway Group (LDWG) is currently conducting a dynamic transport analysis/evaluation as part of their Phase 2 RI. EPA encourages Jorgensen to work with the LDWG to ensure consistency between Jorgensen's and LDWG's conceptual models for waterway dynamics since both are relevant to protecting the integrity of EMJ's and Jorgensen Forge's remedial action and recontamination potential from up/down-stream sources.

**9. Page 3-1, Section 3.1, top 2 paragraphs**
Please add a sentence at the beginning of this section which affirms that statements in these paragraphs do not preclude the pre-regulatory use or application of PCBs by prior occupants of the property.

**10. Page 3-1, Section 3.1, Potential Sources, Third Paragraph, Last Sentence**
Unless there is clear evidence that the source of PCBs is from past hydraulic dredging, this sentence should be deleted. Pre-remedial work planning should include the means to prove or disprove this statement.

**11. Page 3-2, Section 3.2, Potential Contaminant Pathways**
Please add to the first bullet a sentence that states that erosion from the debris piles located near Outfall 004 could be a potential contaminant pathway. Also add a bullet reading "Ground water transport from unknown upland soil sources." There is a potential ground water pathway via other oils, volatile organic contaminants (VOCs), etc. This should be listed, but tagged as unknown, based on current data.

**12. Page 3-2, Section 3.2, last paragraph**
See above comment number 8 re Section 2.8.2.

**13. Page 3-2, Section 3.3, Data Gaps, 1st sentence**
As noted repeatedly in comments on previous documents generated by EMJ, it is not true that the first phase investigation indicated that PCBs had not been used or applied at the site historically. In addition, this sentence is contradictory to earlier statements made in Section 3.1 regarding the presence of PCB's in transformers. Remove the first sentence and strike "However" from the next sentence to begin this paragraph.

**14. Pages 4-1 – 4-2, Section 4.1**
Data discussed in these sections/sub-sections emphasize the need for additional information about groundwater as a potential source to sediments. Analyses for NAPLs and TPH must be included in pre-remedial design sampling throughout this area. See also general comments above and comment re Section 2.7.

**15. Page 4-7, Section 4.2.4.1**
The second sentence of this section states that the catch basin concentrations are above the upper lowermost apparent effect threshold (2LAET). This is not so. The catch basin concentrations are 0.129-0.302 mg/kg, whilst the 2LAET is 1.0 mg/kg. Please revise this sentence accordingly.

**16. Page 4-8, Section 4.5, Identification of Data Gaps**
Please add a bullet to this paragraph stating that a data gap exists concerning the relationship of the debris piles to contamination in the waterway. In addition, add a bullet which includes the statement that information about other sediment management standard (SMS) contaminants is a data gap as well.

**17. Page 5-1, and referenced figures**
It appears that Figures 5-28 are combining third phase sampling results with historical results in the Duwamish Waterway. This is very confusing because the dates of historical results presented are unknown. A figure should be constructed that presents the third phase data results only, similar to the Phase II figures. If historical sediment and soil data is going to be presented, then a description of the data needs to accompany the data, i.e.. date of sampling, or what the data represents, such as historically high values, average values, etc...

**18. Page 5-3, Section 5.2**
This section must describe what the historical data values represent.

**19. Page 5-3, Section 5.2.1.2**
Discuss the ranges in values of sampling results relative to location values. Indicate where the highest and lowest concentrations are located.

**20. Page 5-4, Section 5.2.1.3 and Page 5-5, Section 5.2.2.3**
Discuss the ranges in concentrations for all metals results.

**21. Page 5-5, Section 5.3**
If cleanout occurred and Best Management Practices (BMPs) were implemented when the stormwater system was re-mapped in 2004, when were the catch basins checked for solids and found to be empty? Emptiness may be significant if the time lapse was 12 months and included a full wet season or even longer, but it may not be significant if the time lapse only included the 2-3 month dry season when solids wouldn't be expected to accumulate quickly anyhow.

Further note that, depending on the significance of catch basin emptiness, the source control conclusions based on this text would be (a) loading for more hydro-phobic contaminants of concern (COCs) may be controlled based on controlled solids accumulation or (b) there are no data to support any conclusion about the impacts of total stormwater discharge to sediments (where "total" means whole water plus solids loading).

**22. Page 5-6, Section 5.4, last sentence**
It is not true that marine water quality standards also protect sediments from exceedances. Therefore this statement must be deleted.

In addition, please add a qualifier stating that the simplified source screening method described in this section only works up to a certain point. For the purposes of determining effluent impacts on sediment quality and serving the conceptual model of source control, certain facts must also be considered. Primarily, chemical partitioning and equilibrium at the interfaces between the discharge and the water column and between soils/sediments and the water column may have a greater effect on sediments than is indicated by chemical concentrations in effluent grab samples. This fundamental problem is not unique to this document and is recognized by sediment source control teams who must use NPDES permits as a means of controlling sources to sediments at cleanup sites throughout EPA Region 10.

**23. Page 5-6, Section 5.5**
A single grab sample is not sufficient to chemically characterize the nature of stormwater discharges to the waterway, nor is it sufficient basis to conclude that stormwater discharges impact sediments – now or in the future. A stormwater monitoring plan may be required in the future.

**24. Page 5-7, Section 5.7**
See general comment 2 regarding the 24" and 12" stormwater lines and Plant 2's connection to them.

**25. Pages 5-8 – 5-9, Section 5.8**
**a.** The text in this section references the Phase 2 RI work being done for the LDW Superfund site, but Section 2.8.2 does not. Also, this text infers that "Windward 2005" interprets the data and calculates sedimentation rates which is not so. The final data report cited in references is not a final report. The data evaluation report is still very much in draft form with several issues unresolved. Please revise this section to be consistent with Section 2.8.2.

**b.** EMJ and Jorgensen Forge have not adequately developed a physical conceptual model for how PCBs got to depths in sediment in the section of the river adjacent to the Jorgensen Forge facility. Previous statements in the Data Summary Report that the USACE placed the fill material in the nearshore environment and uplands have not been substantiated. The Data Summary Report must be revised to answer the question as to how PCB contamination got to 4, 5 and 6 feet deep along the bench in this stretch of the river. Possible explanations for the deep PCB contamination include, but may not be limited to the following:

1. A historic dense non-aqueous phase liquid (DNAPL) source.
2. Admixing of sediments to depths by physical disturbance, (e.g., dredging by the USACE).
3. Transport/sedimentation/erosion/sedimentation
4. Collapsing of river walls and redistributing of upland sediments could provide a means for a "gully" to be filled with contaminated material

**c.** EPA, Ecology and the LDWG agree that the bench in front of Jorgensen is an area of "net deposition" over a very long time; however, discussion of the erosion/deposition events over shorter periods of time is ongoing and no conclusions have been reached. Please revise the text accordingly.

**d.** Sg-10 is located by EMJ but the cesium and lead isotope data are still being interpreted, particularly in light of the fact that cores to the south (11b and 11c) are not interpretable. Therefore this section must be generalized by deleting the sentences about isotope-based sedimentation rates and modifying the text to have the last sentences read as follows:

> *"Current data indicate that the bench area adjacent to the navigation channel is an area of deposition over time, although the patterns of deposition and erosion in this particular reach have not yet been determined. Nearshore sedimentation rates, closer to the bank, are also undefined."*

**26. Page 6-1, Section 6.0**

Add the phrase: "This report presents a conceptual site model for PCBs and metals contaminants only. A site-wide characterization that includes other contaminants has not been conducted." Original wording, without this statement makes it seem that the site has been totally characterized and this is a complete representation of a "Site Conceptual Model," which it is not.

**27. Page 6-1, Section 6.1.1 Geology**

**a.** Describe the complete geological stratigraphy at the site, including bedrock. This is necessary because the subsequent section (6.1.2) describes ground water occurring beneath the surficial units.

**b.** The entire 20 upland acres are not impermeable as indicated in the 1st sentence. There are unpaved areas in the vicinity of demolished buildings along the shore. Please modify this sentence accordingly.

**28. Page 6-1, Section 6.1.2 Hydrogeology**

Present a conceptual picture of the ground water flow system and describe in text. Include generalized contours if available.

**29. Page 6-2, Section 6.1.3.**
EPA does not agree with conclusions currently proposed by Windward in the draft data evaluation report, "Windward 2005". Once the final data report is approved by the agencies this report can be cited. See comment number 25 on Section 5.8.

**30. Page 6-4, Light Non-Aqueous Phase Liquid**
See comment number 14 regarding groundwater data gaps and the need for additional information about NAPLs. A discussion must be added to this section regarding the possibilities for NAPL migration to the sediments. The report states that NAPLs found on the eastern part of the site do not pose a risk to sediments via groundwater. However, this statement is not supported by data. A discussion of sampling analyses, including analyses for polyaromatic hydrocarbons (PAHs) from any shoreline wells must also be included in this section.

**31. Page 6-7, Section 6.5**
The groundwater to surface water pathway must be discussed in this section. In Table 1 and A-1, groundwater is screened against drinking water criteria for MTCA A (0.1 ug/L for total Aroclor PCBs) and MTCA B (0.16 ug/L for Aroclor 1254). No detections occurred; and sample detection limits the range between 0.01 and 0.048 ug/L, depending upon the Aroclor. This range encompasses the Marine CMC but not the Marine CCC. A properly caveatted statement should be made that indicates that PCBs in groundwater are not a significant source to surface water, at least within the resolution of the analytical procedures.

**32. Pages 6-7 and 6-8, Section 6.5.1, Direct Migration of Groundwater to Sediment**
The groundwater to sediment pathway must be better documented. The first paragraph of this section states that PCBs have been screened out in the pathway from groundwater to sediment. However, that was with the caveat that PCBs had not been detected. For example, following is an EqP-based argument that says that, had total PCBs been present in groundwater at the CMC (0.03 ug/L), and organic carbon (OC) at 2% (about an average over the site), then sediment concentrations could not have exceeded the LAET of 130 ug/kg from groundwater alone.
Cs = Cw* fOC*Koc
Where:
fOC = fraction organic carbon in sediment (unitless)
Cw = concentration of freely dissolved chemical in the water (μg/L)
Cs = dry concentration of contaminant in sediment (ug/kg). Let critical Cs = 130 ug/kg
Koc = organic carbon-water partition coefficient (L/kg organic carbon)
Let fOC = 0.02
Let Koc = 6.19 (Connell & Hawker, 1998)
Cs ug/kg = 0.03 ug/L * 20 g/kg * 6.19 kg/g
Cs = 37 ug/kg
Sediment at about 6% OC would be needed to begin to exceed LAET from groundwater alone.

**33. Page 6-11, Sections 6.5.3 and 6.5.4.**
See comment number 25 re: Section 5.8.

**34. Section 6.5.4**
Much emphasis has been placed on upstream deposition of sediment as a source of contamination. While this may be plausible, more information and justification to substantiate this statement is needed. Were actual studies of sediment deposition completed by Farallon?

**35. Section 6.6**
Given that available data/information has been limited by the scope of the AOC to PCB investigation and past cleanups, the model is basically sound though incomplete, as listed below. Given the need to fill in the data gaps for comprehensive source control, significant additional information is needed including:

**a)** Data for contaminants other than PCBs and metals.

**b)** Information about the groundwater pathway.

**c)** Characterization of the most probable ongoing sediment source at the site (i.e., stormwater).

In addition, the idea that protected water quality is equivalent to protected sediment quality must be corrected.

**36. Page 7-1, Section 7.0**
Please include a sentence at the end of this paragraph stating that "Approval of this document by EPA will fulfill the requirements of the AOC."

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# T E C H N I C A L   M E M O R A N D U M

**TO:** Mr. Howard Orlean – United States Environmental Protection Agency

**cc:** Mr. William Johnson, Earl M. Jorgensen Company
Mr. Ron Altier, Jorgensen Forge Corporation
Mr. William Joyce, Salter Joyce Ziker
Mr. Rod Brown, Cascadia Law Group

**FROM:** Mr. Peter Jewett, Farallon Consulting
Mr. David Templeton, Anchor Environmental

**DATE:** February 13, 2006

**RE:** **RESPONSE TO EPA COMMENTS DATED JANUARY 18, 2006**
**JORGENSEN FORGE FACILITY**
**ADMINISTRATIVE ORDER ON CONSENT, U.S. EPA DOCKET NO. CERCLA 10-2003-0111**
**FARALLON PN: 831-003**

Farallon Consulting, L.L.C. (Farallon) and Anchor Environmental, L.L.C. (Anchor) have prepared this Technical Memorandum on behalf of Earl M. Jorgensen Company (EMJ) and Jorgensen Forge Corporation (Jorgensen) to provide responses to the comments from the United States Environmental Protection Agency (EPA) dated January 18, 2006 on the *Draft Investigation Data Summary Report* (Data Summary Report) dated October 10, 2005 prepared by Farallon and Anchor. This Technical Memorandum provides responses to each of the comments from EPA with an attached red-lined version and non-red-lined version of the revised text, tables, and figures of the Final Investigation Data Summary Report.

The purpose of the agreed to scope of work (SOW) completed for the Administrative Order on Consent (AOC) is to determine if current or past operations at the Site is, or has been, a source of polychlorinated biphenyls (PCBs) and/or metals detected in sediments within the Lower Duwamish Waterway (LDW) adjacent to the Jorgensen Facility. As Farallon and Anchor discussed with Mr. Howard Orlean on January 19, 2006, a majority of EPA comments address facility-wide upland issues that were not included in the approved scope of work. Jorgensen is currently in discussions with the Washington State Department of Ecology (Ecology) to develop a scope of work and regulatory mechanism to address the facility-wide upland issues. Therefore, as agreed to by Mr. Orlean, the response to comments and revised text do not address facility-wide upland issues and focus on comments that address sources of PCBs and/or metals to the sediments in the LDW, as required by the AOC.

EPA comments are provided below with the responses indented. Revised text, tables, and figures are provided in red-lined and non-red-lined versions.

**General Comments:**

**EPA Comment**

**1.** Jorgensen Forge and Earle M. Jorgensen (EMJ) must develop a conceptual site model (CSM) that shows all contaminant plumes, buildings, shoreline, and soil contaminants. In addition, ground water flow contours, gradients, and other hydrogeological elements need to be put together into a hydrogeological conceptual site model. The "conceptual models" presented in this report are not complete, and should be stated so in the text. The hydrogeologic CSM is especially important near the Boeing Plant 2/Jorgensen Forge property boundary. EPA urges Jorgensen Forge and EMJ to work with The Boeing Company (Boeing) to develop a technically sound hydrogeologic CSM for the property boundary area. The scope of the CSM should be based on current and not reasonably foreseeable conditions.

**Response:**

> The CSM provided in the Data Summary Report fulfills the objectives of the AOC and provides sufficient information to determine potential sources of PCBs and/or metals to sediments in the LDW. This CSM will be refined, as necessary, during pre-design activities to ensure the remedy for the sediment and bank area is protective of sediment quality and surface water quality criteria. The development of a facility-wide hydrogeologic CSM is beyond the scope of the AOC and will be addressed in coordination with the Ecology/EPA Source Control Team process.

**EPA Comment**

**2.** There are numerous statements that contain the phrase "are likely attributable to" or variations thereon; many of these refer to actions or contaminant patterns which may not be attributable to EMJ or Jorgensen Forge. Unless there is clear evidence that specific releases are from a source other than the Jorgensen facility, such statements must be deleted or carefully and thoroughly caveated. We further strongly recommend deletion. We believe attempting to accurately, thoroughly and fairly caveat will likely create prolonged and unnecessary exchanges followed by serial revisions. We are seeking a characterization of existing site conditions rather than a means or analysis ascribing or allocating responsibility.

A particular instance of "are likely attributed to" is illustrative. At least 10 times, the Data Summary Report asserts that the US Army Corps of Engineers' (USACE) actions were likely to have placed the fill onsite. This fill is then disclosed in the document to be contaminated material. EMJ has not provided evidence that the USACE (or any other entity) is responsible for placing the contaminated fill. Therefore these statements must be caveated or deleted. An appropriate caveat is that no records exist that confirm this fill. Another caveat is that the materials are described as items that are not usually associated with hydraulic fill; page 6-1 indicates bricks, wood, and metal debris in the fill. We hope you will avoid unnecessary statements making multiple caveats necessary.

The ten locations where the text can be found are as follows:

| Page | Section |
|---|---|
| 1-1 | 1.2 |
| 2-1 | 2.2 |
| 2-3 | 2.3 |
| 2-7 | 2.4 |
| 5-9 | 5.9 |
| 6-1 | 6.1.1 |
| 6-2 | 6.3.1 |
| 6-3 | 6.3.2 |
| 6-3 | 6.4.1 |
| 6-12 | 6.6.1 |

**Response:**

Definitive statements regarding sources of PCBs and/or metals are difficult to make due to the lack of exact and detailed history of the operations in and around the Jorgensen Facility. Therefore these statements have been modified to reflect this uncertainty.

Farallon/Anchor concur that the assertion that the US Army Corps of Engineers' (ACOE) "likely" placed the fill on the Jorgensen Facility is not supported by adequate documentation. The text of the Data Summary Report has been revised to indicate that the source of the fill may be from LDW dredge sediments as well as other sources.

**EPA Comment:**

**3.** While the intent of the Data Summary Report is to fulfill EMJ's responsibility under the current Administrative Order on Consent (AOC) data gaps persist with respect to source control. Soil and groundwater data from the center of the site <u>and</u> groundwater data from the south side of the site along the Isaacson property line are still missing.

At a meeting between EPA, the Washington Department of Ecology (Ecology) and EMJ and Jorgensen Forge consultants on October 21, 2005, the following areas where data gaps persist were discussed:

**(a) South Property Line:** At the October 21, 2005 meeting, maps and the histories of Isaacson, former Slip5, Mineralized Cell, Bissel Wood/Lumber were discussed at length. The stabilized arsenic cleanup which left a narrow strip of arsenic-contaminated soil at the east end of the Jorgensen/Isaacson property line is of particular concern given the lack of groundwater information in this area. There is also a very good chance that historic Mineralized Cell wastes overlap that property line onto/beneath the Jorgensen Forge facility. With observations of low redox in groundwater moving south and west across the Jorgensen Forge property toward Isaacson, there was general agreement that more data in this area is a critical need.

More certainty about where the water is going from the sump beneath the scale is also needed. Water collects in the relatively open vault, but is not plumbed to any discharge point based on EMJ's storm/sanitary site re-mapping. Although the Seep Survey conducted for the Lower Duwamish Waterway (LDW) Phase 2 Remedial Investigation (RI) is located right in the area of potential concern relative to the scale sump, the survey was limited in scope and therefore concerns still remain about groundwater as a possible source/pathway.

**Response:**

> As noted above, these issues are facility-wide upland issues that are beyond the scope of the AOC and will be addressed in coordination with the Ecology/EPA Source Control Team process.

**(b) North Property Line:** 1962 Boeing Plant 2 stormwater maps show Plant 2 connections to the highly contaminated 24" and 12" stormwater lines in the right-of-way along the Plant 2/Jorgensen property line extending from the King County Airport to the river. There was additional discussion about the cutting oil pool on the east half of the site, away from the waterway; it's a thick, but stable, lens of contamination. The solvent plumes from the northerly direction were discussed along with the possible effects that the embayment fill (i.e., Bethlehem Steel area) might have on groundwater flow. Prior to conducting cleanup in this area additional groundwater characterization should be conducted in order to potential impact of groundwater contamination on the waterway.

**Response:**

> As noted above, these issues are facility-wide upland issues that are beyond the scope of the AOC and will be addressed in coordination with the Ecology/EPA Source Control Team process.

**(c) Additional analytes:** Since the focus of the AOC is limited to polychlorinated biphenyls (PCBs) and metals it does not provide sufficient detail to fully assess source control at the Jorgensen Forge facility. However, the scope of remedial action and source control for the LDW must address the balance of Sediment Management Standards (SMS) contaminants. In the future, EMJ and/or Jorgensen Forge will be required to adequately address all media of concern and sampling analyses for polyaromatic hydrocarbons (PAHs), total petroleum hydrocarbons (TPH), phthalates, phenols and miscellaneous constituents (e.g., benzoic acid, benzyl alcohol).

**Response:**

As noted above, these issues are facility-wide upland issues that are beyond the scope of the AOC and will be addressed in coordination with the Ecology/EPA Source Control Team process.

**Specific Comments**

**EPA Comment:**

**1. Page 2-2, Section 2.4, and Table 6**

It is stated is Section 2.4 that compliance has been documented against the National Pollutant Discharge Elimination System (NPDES) permit. However, as shown in Table 6, there is no NPDES permit requirement for PCBs. In general, Washington State marine chronic surface water criteria for protection of aquatic life as defined in Ecology Chapter 173-201A of the Washington Administrative Code (WAC 173-201A) and the EPA chronic Criteria Continuous Concentration (CCC) National Recommended Water Quality Criteria are both considerably below the sample-specific detection limits of the outfall sampling (0.19 ug/L). Both criterion values are 0.03 ug/l. Therefore, Table 6 is inconclusive as to whether PCB discharges from the outfalls may pose a risk to aquatic life. Section 2.4 must be revised to state that PCB analyses from the outfalls are inconclusive.

**Response:**

The text in Section 2.4 was meant to document that the Jorgensen Facility has conducted the necessary stormwater monitoring activities to maintain compliance with the NPDES Permit (i.e., quarterly stormwater monitoring and reporting). It is understood that there are no NPDES Permit requirements for PCB concentrations and therefore compliance with the NPDES Permit is not assessed via monitoring of stormwater discharge PCB concentrations.

The text of the Data Summary Report has been modified to state that the identified stormwater discharge concentrations were non-detect for PCBs. However, the reporting limit was slightly elevated (due to matrix interferences) above the Ecology (WAC 173-201A) and EPA chronic Criteria Continuous Concentrations (CCC) National Recommend Water Quality Criteria (0.03 ug/L) so the results are inconclusive as to whether PCB discharges from the outfalls during the single monitoring event were at levels that pose a risk to aquatic life.

**EPA Comment:**

**2. Page 2-2, Section 2.4, and Figure 3**

The last sentence on this page is not consistent with Figure 3 which shows that most of the drainage goes to Outfalls 02 and 03. The text must be clarified.

**Response:**

The text of the Data Summary Report has been modified to clarify that the majority of the surface water drainage from paved surfaces on the property discharges through Outfall 003 and Outfalls 001 and 002 discharge runoff primarily from roof surfaces.

**EPA Comment:**

**3. Page 2-3, Section 2.4, top paragraph**

The discussion of outfalls 005-009 is confusing and inconsistent. The previous paragraph says that they were plugged, and this paragraph says they are inactive but that "original stormwater discharging through inactive outfalls 006-009 are not…." Please clarify whether water is currently discharging from these outfalls.

**Response:**

The text of the Data Summary Report has been modified to clarify that Outfalls 005 through 009 are historical outfalls that were plugged and therefore are currently inactive.

**EPA Comment:**

**4. Page 2-3, Section 2.6**

It was EPA's understanding that only the seaward half of the Jorgensen Forge facility is underlain by fill, yet this text implies the entire site is fill. Please clarify.

**Response:**

The text of the Data Summary Report has been modified to clarify that the western portion of the Jorgensen Facility is underlain by fill and the eastern portion is underlain by native silts and sands.

**EPA Comment:**

**5. Page 2-3, Section 2.6**

The discussion of the underlying geology should be revised to include the deeper stratigraphy, at least to bedrock.

**Response:**

The maximum depth of exploration soil borings completed on the Jorgensen Facility is 81.5 feet below ground surface (bgs). It is not necessary, nor appropriate, to conjecture on the subsurface conditions below this depth. The depth to bedrock is unknown. There is sufficient subsurface information to complete the CSM for the sources of PCBs and/or metals to the sediments in the LDW. The text has been revised to provide a discussion of the known subsurface conditions.

**EPA Comment:**

**6. Page 2-4, Section 2.7, Hydrogeology**

**a.** The general statements in this section about hydrogeology are only supported by data for the eastern (landward) half of the site. This must be noted in the document. See general comment about groundwater data gaps. The distance between monitoring wells 5 and 6 is about 480 feet, and in this distance soil contamination at depth and the groundwater pathway to sediments is likely influenced by tidal action; however, this is only a guess pending additional information for both media.

**Response:**

The text has been revised to incorporate facility-wide groundwater data, including shoreline groundwater data. A groundwater gradient figure that includes all available groundwater data is included in the revised Data Summary Report. EPA correctly notes that the distance between monitoring wells MW-5 and MW-6 is 480 feet; however, EPA failed to recognize that monitoring wells PL2-JF03A and PL2-JF02A are located between MW-5 and MW-6. The distribution and monitoring well locations provide sufficient sampling distribution to evaluate the groundwater conditions on the western portion of the facility.

**EPA Comment:**

**b.** A ground-water flow map showing ground-water elevations in the monitoring wells must be included in the revised Data Summary Report. This flow map is especially important to delineate ground-water flow near the Jorgensen Forge/Boeing Plant 2 property boundary. EPA urges Jorgensen Forge and EMJ to work with Boeing to construct a mutually agreeable and technically-sound conceptual model of ground-water flow near the Jorgensen Forge/Boeing Plant 2 boundary.

**Response:**

A groundwater flow map and table with top of casing and groundwater elevations have been included in the revised Data Summary Report.

**EPA Comment:**

**7. Page 2.5, Section 2-7, Top line on page**

What were the practicable quantitation limits (PQLs) for PCBs, particularly with respect to water quality standards? References or citations for supporting documentation must be included in the text.

**Response:**

The PQLs for PCBs are included on Table 5 of the Data Summary Report and vary by aroclor. The text has been revised to incorporate the reference or citations for the PQLs by aroclor.

**EPA Comment:**

**8. Page 2-6, Section 2.8.2, Sediment Transport and Deposition**

The Lower Duwamish Waterway Group (LDWG) is currently conducting a dynamic transport analysis/evaluation as part of their Phase 2 RI. EPA encourages Jorgensen to work with the LDWG to ensure consistency between Jorgensen's and LDWG's conceptual models for waterway dynamics since both are relevant to protecting the integrity of EMJ's and Jorgensen Forge's remedial action and recontamination potential from up/down-stream sources.

**Response:**

The text in Section 2.8.2 was updated to include a summary description of the work that is currently being conducted by LDWG as part of their Phase 2 RI and indicates that LDWG is still in the process of analyzing the data. In accordance with EPA Comment 25 Part D (below) the following statement was added to the text: "*Current data indicate that the bench area adjacent to the navigation channel is an area of deposition over time, although the patterns of deposition and erosion in this particular reach have not yet been determined. Nearshore sedimentation rates, closer to the bank, are also undefined.*" EMJ/Jorgensen will continue to review the findings of the LDWG dynamic transport analysis/evaluation in order to update and maintain consistency between the Jorgensen and LDWG conceptual models for waterway dynamics adjacent to the facility.

**EPA Comment:**

**9. Page 3-1, Section 3.1, top 2 paragraphs**

Please add a sentence at the beginning of this section which affirms that statements in these paragraphs do not preclude the pre-regulatory use or application of PCBs by prior occupants of the property.

**Response:**

The text has been modified to reflect EPA's concern.

**EPA Comment:**

**10. Page 3-1, Section 3.1, Potential Sources, Third Paragraph, Last Sentence**

Unless there is clear evidence that the source of PCBs is from past hydraulic dredging, this sentence should be deleted. Pre-remedial work planning should include the means to prove or disprove this statement.

**Response:**

The text of the Data Summary Report has been modified to indicate that the source of the PCBs in the fill may be from LDW dredge sediments as well as other sources.

**EPA Comment:**

**11. Page 3-2, Section 3.2, Potential Contaminant Pathways**

Please add to the first bullet a sentence that states that erosion from the debris piles located near Outfall 004 could be a potential contaminant pathway. Also add a bullet reading "Ground water transport from unknown upland soil sources." There is a potential ground water pathway via other oils, volatile organic contaminants (VOCs), etc. This should be listed, but tagged as unknown, based on current data.

**Response:**

There are no data to support the conclusion that erosion of the debris piles is a potential contaminant pathway. The debris piles consist of a solid mass of asphalt/concrete like material which physically prohibits erosion. The text has not been revised.

There are sufficient data to confirm that groundwater transport of PCBs and metals from unknown upland soil sources is not a contaminant pathway. The revised Data Summary Report includes tables that summarize the analytical results of PCBs and metals from groundwater samples collected throughout the facility, including samples collected from the shoreline monitoring wells. Groundwater has been eliminated as a contaminant pathway for PCBs and/or metals to sediments. The text has not been revised.

The potential for oils, VOCs, etc. to migrate in groundwater is a facility-wide upland issue that is beyond the scope of the AOC and therefore will be addressed in coordination with the Ecology/EPA Source Control Team process. The text has not been revised.

**EPA Comment:**

**12. Page 3-2, Section 3.2, last paragraph**

See above comment number 8 re Section 2.8.2.

**Response:**

> Section 3.2 provides a summary of the potential contaminant pathways within the LDW as was available during the first phase of the investigation. At that time, the only available information regarding sediment transport dynamics in the LDW was the LDWG Phase 1 RI findings (Windward 2003) and as such only this information is applicable to this section.

**EPA Comment:**

**13. Page 3-2, Section 3.3, Data Gaps, 1st sentence**

As noted repeatedly in comments on previous documents generated by EMJ, it is not true that the first phase investigation indicated that PCBs had not been used or applied at the site historically. In addition, this sentence is contradictory to earlier statements made in Section 3.1 regarding the presence of PCB's in transformers. Remove the first sentence and strike "However" from the next sentence to begin this paragraph.

**Response:**

> The first sentence has been removed.
>
> "However" has also been removed.

**EPA Comment:**

**14. Pages 4-1 – 4-2, Section 4.1**

Data discussed in these sections/sub-sections emphasize the need for additional information about groundwater as a potential source to sediments. Analyses for NAPLs and TPH must be included in pre-remedial design sampling throughout this area. See also general comments above and comment re Section 2.7.

**Response:**

> This is a Site-wide upland issue that is beyond the scope of the AOC and therefore will be addressed in coordination with the Ecology/EPA Source Control Team process. The text has not been revised.

**EPA Comment:**

**15. Page 4-7, Section 4.2.4.1**

The second sentence of this section states that the catch basin concentrations are above the upper lowermost apparent effect threshold (2LAET). This is not so. The catch basin concentrations are 0.129-0.302 mg/kg, whilst the 2LAET is 1.0 mg/kg. Please revise this sentence accordingly.

**Response:**

The text has been revised.

**EPA Comment:**

**16. Page 4-8, Section 4.5, Identification of Data Gaps**

Please add a bullet to this paragraph stating that a data gap exists concerning the relationship of the debris piles to contamination in the waterway. In addition, add a bullet which includes the statement that information about other sediment management standard (SMS) contaminants is a data gap as well.

**Response:**

The data do not support the conclusion that the relationship of the debris piles to contamination in the waterway is a data gap. There are no data to support the conclusion that erosion of the debris piles is a potential contaminant pathway. The debris piles consist of a solid mass of asphalt/concrete like material which physically prohibits erosion. The text has not been revised.

Evaluation of other SMS contaminants is not included in the requirements of the AOC and is therefore not a data gap. The text has not been revised.

**EPA Comment**

**17. Page 5-1, and referenced figures**

It appears that Figures 5-28 are combining third phase sampling results with historical results in the Duwamish Waterway. This is very confusing because the dates of historical results presented are unknown. A figure should be constructed that presents the third phase data results only, similar to the Phase II figures. If historical sediment and soil data is going to be presented, then a description of the data needs to accompany the data, i.e. date of sampling, or what the data represents, such as historically high values, average values, etc…

**Response:**

Figures 5 through 28 summarize both the third phase surface and subsurface sediment results. A single figure cannot be created to show both the surface and subsurface sediment results due to the large amount of data—at least 10 figures are required. To minimize the number of figures required to adequately summarize the data, the Draft Data Summary Report limited the use of figures to present the compiled historical and third phase investigation results. Based on discussions with EPA during drafting of the Environmental Sampling Work Plan Addendum, EPA preferred this style of data presentation. Further, the third phase subsurface sediment sampling locations (Figures 18 through 27) were differentiated from the historical sampling stations by means of a black "dot" on the top of each of the third phase investigation cores. In addition, Tables 2 through 5 summarize the third phase investigation results separately from the historical data and Appendix E summarizes all of the historical data.

The text has been revised to ensure the reader is referenced to tables and figures that are summarizing third phase investigation sediment results versus historically available data (as available in the LDWG river-wide sediment database).

**EPA Comment:**

**18. Page 5-3, Section 5.2**

This section must describe what the historical data values represent.

**Response:**

The comment is unclear. Text in Section 5.2 states that "A comprehensive summary of the LDW river-wide sediment analytical results, including all of the sediment analytical results compiled in the LDWG database, the recent Boeing Upriver Area I Sediment Characterization (Floyd Snyder McCarthy 2004), the cooperative Boeing, EPA, and ACOE Lower Duwamish Triad Sampling (report pending), and the AOC-related sediment sampling are provided in Appendix E." Appendix E provides the pertinent sampling information for each historical data point, including: sampling date, station location, sample ID, and sampling depth.

The text has not been revised.

**EPA Comment:**

**19. Page 5-3, Section 5.2.1.2**

Discuss the ranges in values of sampling results relative to location values. Indicate where the highest and lowest concentrations are located.

**Response:**

The text has been revised to include the range of PCBs identified and the areas with the highest and lowest concentrations observed.

**EPA Comment:**

**20. Page 5-4, Section 5.2.1.3 and Page 5-5, Section 5.2.2.3**

Discuss the ranges in concentrations for all metals results.

**Response:**

The text has been revised to include the range of metals identified.

**EPA Comment:**

**21. Page 5-5, Section 5.3**

If cleanout occurred and Best Management Practices (BMPs) were implemented when the stormwater system was re-mapped in 2004, when were the catch basins checked for solids and found to be empty? Emptiness may be significant if the time lapse was 12 months and included a full wet season or even longer, but it may not be significant if the time lapse only included the 2-3 month dry season when solids wouldn't be expected to accumulate quickly anyhow.

Further note that, depending on the significance of catch basin emptiness, the source control conclusions based on this text would be (a) loading for more hydro-phobic contaminants of concern (COCs) may be controlled based on controlled solids accumulation or (b) there are no data to support any conclusion about the impacts of total stormwater discharge to sediments (where "total" means whole water plus solids loading).

**Response:**

Following the catch basin sampling performed in August 2004 as part of the AOC second phase investigation activities, the catch basins cleaning schedule was revised to occur more frequently to decrease the potential build-up of solids in each basin. The most recent cleanout prior to the May 2005 third phase catch basin sampling (attempted on May 12, 2005) occurred on November 12, 2004. Therefore, approximately 6 months of potential accumulation occurred prior to the third phase catch basin sampling, including the months with historically the most rainfall which would facilitate the highest potential for solids infiltration into the catch basins.

**EPA Comment:**

**22. Page 5-6, Section 5.4, last sentence**

It is not true that marine water quality standards also protect sediments from exceedances. Therefore this statement must be deleted.

In addition, please add a qualifier stating that the simplified source screening method described in this section only works up to a certain point. For the purposes of determining effluent impacts on sediment quality and serving the conceptual model of source control, certain facts must also be considered. Primarily, chemical partitioning and equilibrium at the interfaces between the discharge and the water column and between soils/sediments and the water column may have a greater effect on sediments than is indicated by chemical concentrations in effluent grab samples. This fundamental problem is not unique to this document and is recognized by sediment source control teams who must use NPDES permits as a means of controlling sources to sediments at cleanup sites throughout EPA Region 10.

**Response:**

> Section 5.4 was modified to the following: "…As shown in Table 6, the chromium and zinc concentrations were below the water quality criteria. The identified PCB aroclor concentrations were at non-detectable concentrations but matrix interferences elevated the laboratory MRL (0.19 µg/L) above the applicable water quality criteria (0.03 µg/L) prohibiting direct comparison to the criteria. Assuming a simplified screening approach, concentrations less than the water quality criteria, as was identified for the chromium and zinc concentrations, may indicate that the stormwater discharge has a limited potential to affect sediment quality. However, certain additional facts beyond a simple comparison to water quality criteria must also be considered for the purposes of determining effluent impacts on sediment quality and serving the conceptual model of source control, Primarily, chemical partitioning and equilibrium at the interfaces between the discharge and the water column and between soils/sediments and the water column may have a greater effect on sediments than is indicated by chemical concentrations in effluent grab samples."

**EPA Comment:**

**23. Page 5-6, Section 5.5**

A single grab sample is not sufficient to chemically characterize the nature of stormwater discharges to the waterway, nor is it sufficient basis to conclude that stormwater discharges impact sediments – now or in the future. A stormwater monitoring plan may be required in the future.

**Response:**

We concur that a single grab sample is not sufficient to evaluate the temporal variations of stormwater discharges from the Jorgensen Facility to the LDW.

The text has not been revised.

**EPA Comment:**

**24. Page 5-7, Section 5.7**

See general comment 2 regarding the 24" and 12" stormwater lines and Plant 2's connection to them.

**Response:**

The intent of the comment is unclear. The text in Section 5.7 does not ascribe or allocate responsibility of the elevated PCB concentrations within the drainage lines to Boeing. The text summarizes factual information regarding the collection of a variety of samples from manholes along the 12" and 24" lines and states that these lines convey runoff from the Boeing Plant 2 facility and King County International Airport.

The text has not been revised.

**EPA Comment:**

**25. Pages 5-8 – 5-9, Section 5.8**

**a**. The text in this section references the Phase 2 RI work being done for the LDW Superfund site, but Section 2.8.2 does not. Also, this text infers that "Windward 2005" interprets the data and calculates sedimentation rates which is not so. The final data report cited in references is not a final report. The data evaluation report is still very much in draft form with several issues unresolved. Please revise this section to be consistent with Section 2.8.2.

**Response:**

The text has been revised to be consistent with Section 2.8.2 and indicates that LDWG has conducted additional work to further evaluate sediment fate and transport and is in the process of evaluating the data.

**b.** EMJ and Jorgensen Forge have not adequately developed a physical conceptual model for how PCBs got to depths in sediment in the section of the river adjacent to the Jorgensen Forge facility. Previous statements in the Data Summary Report that the USACE placed the fill material in the nearshore environment and uplands have not been substantiated. The Data Summary Report must be revised to answer the question as to how PCB contamination got to 4, 5 and 6 feet deep along the bench in this stretch of the river. Possible explanations for the deep PCB contamination include, but may not be limited to the following:

1. A historic dense non-aqueous phase liquid (DNAPL) source.
2. Admixing of sediments to depths by physical disturbance, (e.g., dredging by the USACE).
3. Transport/sedimentation/erosion/sedimentation
4. Collapsing of river walls and redistributing of upland sediments could provide a means for a "gully" to be filled with contaminated material

**Response:**

The text has been modified to provide the following potential explanations for the identified elevated PCB concentrations at depth:

1. Deposition during placement of fill material with elevated PCB concentrations (e.g., dredging by the USACE or placement of fill by other entities)
2. Erosion and failure of bank fill with elevated levels of PCBs.
3. Admixing of sediments to depth by physical disturbance (e.g., prop wash and dredging).
4. Sediment transport and subsequent sedimentation (including upstream migration from Boeing outfalls with document historical discharges of PCBs)
5. Historical placement of debris containing PCBs on the shoreline bank.

**c.** EPA, Ecology and the LDWG agree that the bench in front of Jorgensen is an area of “net deposition” over a very long time; however, discussion of the erosion/deposition events over shorter periods of time is ongoing and no conclusions have been reached. Please revise the text accordingly.

**Response:**

The text has been revised to be consistent with Section 2.8.2 and indicates that LDWG has conducted additional work to further evaluate sediment fate and transport and is in the process of evaluating the data.

**d.** Sg-10 is located by EMJ but the cesium and lead isotope data are still being interpreted, particularly in light of the fact that cores to the south (11b and 11c) are not interpretable. Therefore this section must be generalized by deleting the sentences about isotope-based sedimentation rates and modifying the text to have the last sentences read as follows:

> *"Current data indicate that the bench area adjacent to the navigation channel is an area of deposition over time, although the patterns of deposition and erosion in this particular reach have not yet been determined. Nearshore sedimentation rates, closer to the bank, are also undefined."*

**Response:**

The suggested text was inserted in Section 2.8.2.

**EPA Comment:**

**26. Page 6-1, Section 6.0**

Add the phrase: "This report presents a conceptual site model for PCBs and metals contaminants only. A site-wide characterization that includes other contaminants has not been conducted." Original wording, without this statement makes it seem that the site has been totally characterized and this is a complete representation of a "Site Conceptual Model," which it is not.

**Response:**

The text has been revised accordingly.

**EPA Comment:**

**27. Page 6-1, Section 6.1.1 Geology**

**a.** Describe the complete geological stratigraphy at the site, including bedrock. This is necessary because the subsequent section (6.1.2) describes ground water occurring beneath the surficial units.

**Response:**

The text has been revised to provide a more complete discussion of the geologic stratigraphy within the depth of explorations completed on the facility. There are no data available for bedrock conditions at the facility.

**b**. The entire 20 upland acres are not impermeable as indicated in the 1st sentence. There are unpaved areas in the vicinity of demolished buildings along the shore. Please modify this sentence accordingly.

**Response:**

The text has been revised accordingly.

**EPA Comment:**

**28. Page 6-1, Section 6.1.2 Hydrogeology**

Present a conceptual picture of the ground water flow system and describe in text. Include generalized contours if available.

**Response:**

The text has been modified and a figure including groundwater flow directions has been included.

**EPA Comment:**

**29. Page 6-2, Section 6.1.3.**

EPA does not agree with conclusions currently proposed by Windward in the draft data evaluation report, "Windward 2005". Once the final data report is approved by the agencies this report can be cited. See comment number 25 on Section 5.8.

**Response:**

The text has been revised in accordance with the response to Comment 25 above.

**EPA Comment:**

**30. Page 6-4, Light Non-Aqueous Phase Liquid**

See comment number 14 regarding groundwater data gaps and the need for additional information about NAPLs. A discussion must be added to this section regarding the possibilities for NAPL migration to the sediments. The report states that NAPLs found on the eastern part of the site do not pose a risk to sediments via groundwater. However, this statement is not supported by data. A discussion of sampling analyses, including analyses for polyaromatic hydrocarbons (PAHs) from any shoreline wells must also be included in this section.

**Response:**

Evaluation of NAPLs and PAHs is not included in the SOW for the AOC. These issues are beyond the scope of the AOC and will be addressed in coordination with the Ecology/EPA Source Control Team process.

**EPA Comment:**

**31. Page 6-7, Section 6.5**

The groundwater to surface water pathway must be discussed in this section. In Table 1 and A-1, groundwater is screened against drinking water criteria for MTCA A (0.1 ug/L for total Aroclor PCBs) and MTCA B (0.16 ug/L for Aroclor 1254). No detections occurred; and sample detection limits the range between 0.01 and 0.048 ug/L, depending upon the Aroclor. This range encompasses the Marine CMC but not the Marine CCC. A properly caveatted statement should be made that indicates that PCBs in groundwater are not a significant source to surface water, at least within the resolution of the analytical procedures.

**Response:**

> Evaluation of groundwater to surface water pathway is only relevant to this SOW and AOC if it results in or threatens to result in concentrations of PCBs and/or metals in the sediments in the LDW adjacent to the facility above the selected screening levels. Specific screening levels for groundwater were provided and approved by EPA prior to conducting the field investigation. The text has been revised to include the recommended caveat.

**EPA Comment:**

**32. Pages 6-7 and 6-8, Section 6.5.1, Direct Migration of Groundwater to Sediment**

The groundwater to sediment pathway must be better documented. The first paragraph of this section states that PCBs have been screened out in the pathway from groundwater to sediment. However, that was with the caveat that PCBs had not been detected. For example, following is an EqP-based argument that says that, had total PCBs been present in groundwater at the CMC (0.03 ug/L), and organic carbon (OC) at 2% (about an average over the site), then sediment concentrations could not have exceeded the LAET of 130 ug/kg from groundwater alone.

Cs = Cw* fOC*Koc

Where:

fOC = fraction organic carbon in sediment (unitless)

Cw = concentration of freely dissolved chemical in the water (µg/L)

Cs = dry concentration of contaminant in sediment (ug/kg). Let critical Cs = 130 ug/kg

Koc = organic carbon-water partition coefficient (L/kg organic carbon)

Let fOC = 0.02

Let Koc = 6.19 (Connell & Hawker, 1998)

Cs ug/kg = 0.03 ug/L * 20 g/kg * 6.19 kg/g

Cs = 37 ug/kg

Sediment at about 6% OC would be needed to begin to exceed LAET from groundwater alone.

**Response:**

Evaluation of groundwater to sediment pathway is only relevant to this SOW and AOC if it results in or threatens to result in concentrations of PCBs and/or metals in the sediments in the LDW adjacent to the facility above the selected screening levels. Specific screening levels for groundwater were provided and approved by EPA prior to conducting the field investigation. However, to comply with EPA's comment, the highly conservative equilibrium-partitioning (Eq-P) based argument was conducted to compute a conservative groundwater PCB screening level protective of sediment quality. Using the Eq-P approach defined above, the SMS SQS PCB criteria (i.e., 12 mg/kg OC) was converted to a conservative groundwater PCB screening level (assuming equilibrium partitioning from groundwater to sediments). The conservative PCB screening level is 0.039 µg/L. This conservative PCB screening level is nearly an order of magnitude lower than most of the PCB MRLs (ranged from 0.02 to 1 µg/L) obtained for facility data prohibiting comparison of the data to the conservative PCB screening level. As discussed in the Draft Data Summary Report, of the 40 PCB samples collected from the 30 monitoring wells on the facility (from 1994 to 2003), only one sample collected by Weston Solutions, Inc. (Boeing's consultant) in June 2003 was detected above the MRL in MW-6 (0.41 µg/L). However, the PCB concentration in the same well only 2 months prior was non-detect (0.0478 µg/L) for PCBs. Therefore, this isolated detection of PCBs is likely a false detection. As identified in the Draft Data Summary Report, the groundwater to sediment pathway for PCBs is not complete and is therefore screened out of the pathway analysis. Nonetheless, the groundwater to sediment pathway will be an important element during the design of the future remedy for the sediment and adjacent bank areas.

The text has been modified to include a discussion of the aforementioned Eq-P evaluation.

**EPA Comment:**

**33. Page 6-11, Sections 6.5.3 and 6.5.4.**

See comment number 25 re: Section 5.8.

**Response:**

The text has been revised in accordance with the response to Comment 25 above.

**EPA Comment**

**34. Section 6.5.4**

Much emphasis has been placed on upstream deposition of sediment as a source of contamination. While this may be plausible, more information and justification to substantiate this statement is needed. Were actual studies of sediment deposition completed by Farallon?

**Response:**

No studies were conducted to document sediment deposition from downstream locations. The text in Section 6.5.4 provides evidence for upstream transport and deposition through evaluation of the spatial distribution of surface (Figure 8) and subsurface (Figure 18) sediment PCB concentrations along the northwest corner of the property. The identified surface and subsurface sediment concentrations adjacent to the cluster of Boeing outfalls and property line outfalls clearly smear in the upstream direction adjacent to the facility.

The text has not been revised.

**EPA Comment:**

**35. Section 6.6**

Given that available data/information has been limited by the scope of the AOC to PCB investigation and past cleanups, the model is basically sound though incomplete, as listed below. Given the need to fill in the data gaps for comprehensive source control, significant additional information is needed including:

**a)** Data for contaminants other than PCBs and metals.

**b)** Information about the groundwater pathway.

**c)** Characterization of the most probable ongoing sediment source at the site (i.e., stormwater).

In addition, the idea that protected water quality is equivalent to protected sediment quality must be corrected.

**Response:**

The data gaps noted above are beyond the scope of the AOC and will be addressed in coordination with the Ecology/EPA Source Control Team process.

As requested above in EPA Comment 32, facility groundwater PCBs concentrations were compared to computed groundwater conservative PCB screening levels that are protective of sediment quality criteria (based on the Eq-P approach).

The text has not been revised.

**EPA Response**

**36. Page 7-1, Section 7.0**

Please include a sentence at the end of this paragraph stating that "Approval of this document by EPA will fulfill the requirements of the AOC."

**Response:**

The text has been revised accordingly.

Attachments: Final Investigation Summary Report – Red-lined
Final Investigation Summary Report – Non-red-lined

PJ/DT:bjj

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# TECHNICAL MEMORANDUM

**TO:** Mr. Shawn Blocker, L.G. – U.S. Environmental Protection Agency

**cc:** Mr. Howard Orlean – U.S. Environmental Protection Agency
Mr. John Keeling – Washington State Department of Ecology
Mr. Ron Altier – Jorgensen Forge Corporation
Mr. David Templeton and Mr. Ryan Barth – Anchor Environmental, L.L.C.
Ms. Kim Maree Johannessen – Johannessen & Associates

**FROM:** Amy Essig Desai, Associate Scientist AED
Peter Jewett, L.G., L.E.G., Principal Engineering Geologist

**DATE:** June 28, 2005

**RE:** **GROUNDWATER DATA SUMMARY**
**JORGENSEN FORGE CORPORATION**
**8531 EAST MARGINAL WAY SOUTH**
**SEATTLE, WASHINGTON**
**FARALLON PN: 394-001**

Farallon Consulting, L.C.C. (Farallon) has prepared this technical memorandum on behalf of Jorgensen Forge Corporation to provide a summary of groundwater data collected from the northern portion of the Jorgensen Forge Corporation Facility located at 8531 East Marginal Way South in Seattle, Washington (herein referred to as the Site) (Figure 1). The purpose of this technical memorandum is to present a summary of the existing data pertaining to the Site for evaluation of contamination that may have migrated onto the Site from sources on the Boeing Plant 2 facility.

A summary of current and historic groundwater data that have been collected on the northern portion of the Site from 1990 to the present is included in this technical memorandum. In accordance with the U.S. Environmental Protection Agency's request, this summary focuses on the northern portion of the Site, located down-gradient of known releases to groundwater at the Boeing Plant 2 facility. Figure 2 shows the location of all of the existing monitoring wells located on the Site. The monitoring wells shown in blue or red depicted on Figure 2 are included in this data summary. Groundwater samples from the monitoring wells included in this data summary were collected on an irregular sampling frequency. A summary of historic potentiometric groundwater elevation data is included in Table 1. The analytical results of groundwater samples collected from the monitoring wells are summarized in Tables 2 through 7.

The Site is located directly down-gradient of the Boeing Plant 2 facility. The direction of groundwater in the shallow water-bearing zone on the northeastern portion of the Site is to the southwest. A groundwater potentiometric contour map based on the depth to groundwater from the May 18, 2005 sampling event, which is consistent with previous monitoring, is included on Figure 3. The shallow water-bearing zone is a single aquifer system, with the depth to groundwater between 9 and 13 feet below ground surface (Table 1). A more detailed summary of the nature and extent of specific constituents of concern identified on the northern portion of the Site is provided below.

As summarized in the Second Draft – Environmental Sampling Work Plan dated May 12, 2004, prepared by Farallon and Anchor Environmental, L.L.C. (Work Plan), the operations at the Site have not changed substantially over the past 60 years. The Site currently is used as a steel and aluminum forge and mill that produces custom steel and aluminum parts forged and machined to specifications for various industrial clients. The current and former operations at the Site have not used polychlorinated biphenyls (PCBs) or halogenated volatile organic compounds (HVOCs) in the manufacturing process. The major operations conducted at the Site include:

- Melting scrap steel and forming the molten steel into ingots;
- Forging the ingots into billets and/or shape forgings;
- Heat-treating the products; and
- Grinding and machining the billets to required specifications.

Investigations have been conducted on the Site from 1990 to the present. A Remedial Investigation/Feasibility Study was conducted in 1992 to investigate the nature and extent of hydraulic cutting oil in groundwater located on the northern portion of the Site adjacent to and north of the machine shop, between the shop and the office building (Area 1, Figure 2).

Product recovery wells and a groundwater recovery and reinjection system were installed at the Site in 1993. The system consisted of a horizontal recovery well system with pneumatic pumps for recovering cutting oil as light nonaqueous-phase liquid (LNAPL). A total of 7,450 gallons of cutting oil was recovered (Work Plan). The groundwater monitoring data indicate that 15,106 gallons of cutting oil was recovered, and more than 120,500 gallons of groundwater was extracted in Area 1 (Work Plan).

There is limited access to the subsurface in Area 1 due to the presence of machinery and operations. Based on the rate of recovery and the type of oil found in Area 1, continued extraction of cutting oil by pumping was not cost-effective (Work Plan). Based on the data, the cutting oil plume does not appear to be an immediate threat to human health and the environment (Work Plan).

Several feet of cutting oil has been measured in monitoring wells located in Area 1. The extent of the LNAPL cutting oil plume appears to be bounded by monitoring wells MW-1, MW-25, MW-28, MW-30, MW-31, and reinjection well RW-1 (Figure 4). The LNAPL cutting oil plume does not extend onto the up-gradient Boeing Plant 2 facility. Dissolved concentrations of total petroleum hydrocarbons (TPH) as oil-range organics (ORO) or benzene, toluene, ethylbenzene, and xylenes (BTEX) above the Washington State Department of Ecology Model Toxics Control Act Cleanup Regulation (MTCA) Method A cleanup level have not been detected in groundwater in the monitoring wells located down-gradient of the LNAPL cutting oil plume.

Groundwater samples collected from monitoring wells MW-1, MW-9, and MW-23 were analyzed for total arsenic, barium, cadmium, chromium, copper, iron, lead, manganese, mercury, selenium, silver, and/or zinc in 1992. Concentrations of total cadmium slightly above the MTCA Method A cleanup level were detected in groundwater collected from monitoring well MW-1. Metals in groundwater do not appear to be constituents of concern at the Site.

Monitoring wells MW-5, MW-24, MW-25, and MW-31 were sampled and analyzed for PCBs in 1993 and/or 2003. Boeing monitoring well PL2-JF01A was sampled for PCBs from September 1995 to November 1996, and Boeing monitoring wells PL2-JF01AR and PL2-JF02A were sampled in April and/or June 2003. The analytical results did not detect concentrations of PCBs in groundwater above the laboratory practical quantitation limit (PQL).

Concentrations of tetrachloroethene (PCE); trichloroethene (TCE); cis-1,2-dichloroethene (cis-1,2-DCE) and/or trans-1,2-dichlorothene have been detected above the laboratory detection limits in groundwater samples collected from monitoring wells MW-1/2 and MW-23, located in the northeastern corner of the Site (Table 3; Figure 5). Concentrations of PCE were detected above the laboratory detection limits in cutting oil LNAPL samples collected from monitoring wells MW-20 and MW-21 in 1990, but not in cutting oil LNAPL samples collected in 2004.

The northeastern portion of the Site is located directly down-gradient of a known release of PCE and/or TCE to groundwater on the Boeing Plant 2 facility. The detections of PCE and/or TCE in groundwater and cutting oil LNAPL samples collected from monitoring wells located on the Site likely are from off-Site migration from the release(s) on the Boeing Plant 2 facility.

Concentrations of 1,1-dichloroethene (1,1-DCE); cis-1,2-DCE; and vinyl chloride have been detected above the MTCA cleanup levels in the Boeing wells located on the northwestern portion of the Site (Table 3; Figure 5). The Boeing wells are located in close proximity and down-gradient to a known release of HVOCs on the southwestern corner of the Boeing Plant 2 facility. Concentrations of HVOCs detected in groundwater samples collected from the Boeing wells are from off-Site migration from the Boeing Plant 2 facility to the Site.

**Total Petroleum Hydrocarbons**

Several feet of hydraulic cutting oil LNAPL has been measured in monitoring wells located in Area 1 that have been monitored irregularly from 1992 to the present (Table 1). LNAPL was measured in monitoring wells MW-16, MW-17, MW-18, MW-19, MW-20, MW-21, MW-22, MW-26, MW-27, and MW-29 during the May 2005 groundwater monitoring and sampling event. The extent of the LNAPL cutting oil plume appears to be bounded by monitoring wells MW-1, MW-25, MW-28, MW-30, MW-31, and reinjection well RW-1, and measures approximately 385 feet long by 60 to 150 feet wide (Figure 3). The thickness of the LNAPL plume ranges from 0.45 foot (MW-26) to 7.25 feet (MW-29) (Table 1).

LNAPL thicknesses have decreased in monitoring wells MW-17, MW-26, MW-27, and MW-28 from October 1999 to the present (Table 1). Monitoring well MW-28, located on the northern border of the plume, ranged from 7.87 feet of LNAPL in April 2004 to no measurable product in May 2005. LNAPL had not been measured previously in monitoring well MW-22; however, LNAPL has been measured at thicknesses ranging from 0.51 to 5.34 feet since 2000.

Groundwater samples collected from monitoring wells MW-1, MW-9, MW-23 through MW-25, MW-30, and MW-31, located up- and down-gradient of the cutting oil plume, (Figures 3 and 4) from approximately 1992 to the present have been analyzed for one or more of the following TPH-related compounds: GRO, DRO, ORO, and BTEX. Concentrations of dissolved-phase TPH-related compounds in groundwater have decreased to below the laboratory PQL and/or MTCA Method A cleanup levels in all monitoring wells, with the exception of monitoring well MW-31, which is located down-gradient of the cutting oil plume (Figure 4). Groundwater sampling and analysis for TPH and BTEX currently is being conducted on a semi-annual basis in select monitoring wells located on the Site.

Boeing monitoring wells PL2-JF01AR, PL2-JF01B, PL2-JF01C, and PL2-JF02A have been sampled from 1995 to the present, and analyzed for BTEX (Table 2). Concentrations of BTEX or GRO were not detected above the laboratory PQL in the groundwater samples collected from the Boeing monitoring wells, with the exception of monitoring well PL2-JF01AR. Benzene was detected in groundwater in monitoring well PL2-JF01AR in 2002 and 2004. The analytical results of the most recent groundwater sampling event, which was conducted in February 2005, did not detect concentrations of benzene above the laboratory PQL (Table 2).

**Halogenated Volatile Organic Compounds**

Monitoring wells MW-1, MW-22, MW-23, MW-24, and MW-31 were sampled and analyzed for HVOCs in 1992, 1993, and 2004 (Table 3). The analytical results of groundwater samples collected in December 2004 detected concentrations of TCE and the degradation product cis-1,2-DCE in groundwater above the laboratory PQL, but below the MTCA Method A cleanup level in monitoring well MW-23 (Figure 5). Concentrations of PCE were detected in groundwater in monitoring well MW-23 above the laboratory PQL in 1993; however, concentrations of TCE and cis-1,2-DCE were not detected above the laboratory PQL in 1993 (Table 3). No degradation products of PCE or TCE were detected above the laboratory PQL in any other groundwater monitoring wells located in Area 1 (Figure 5). A summary of the HVOC groundwater analytical results is provided in Table 3.

A sample of LNAPL was collected from Site monitoring wells MW-16, MW-18, MW-19, MW-20, and MW-21 in September or December 1992, and from Site monitoring wells MW-16, MW-19, MW-20, MW-22, and MW-28 in December 2004, and submitted for laboratory analysis of HVOCs. All analytical results were below the laboratory PQL, with the exception of PCE detected in LNAPL samples collected from monitoring wells MW-20 and MW-21 in 1992 (Table 4). The analytical results of groundwater samples collected from down-gradient monitoring wells MW-22, MW-25, and MW-31 in 1992, 1993, and/or 2004 did not detect concentrations of PCE, TCE, or degradation products above the laboratory PQL. The LNAPL in monitoring well MW-20 was re-sampled in 2004, and no concentrations of HVOCs were detected above the laboratory PQL.

Farallon understands that HVOCs have been released to groundwater on the Boeing Plant 2 facility north and up-gradient of Area 1 (Figure 5). The groundwater flow direction has consistently been to the southwest in this area, there have been no detections of PCE, TCE, or degradation products in the other monitoring wells located on Site, and there is no known source of PCE or TCE on the Site. The source of the HVOCs detected in the cutting oil LNAPL and the groundwater is from releases on the Boeing Plant 2 facility.

Boeing monitoring wells PL2-JF01AR, PL2-JF01B, PL2-JF01C, and PL2-JF02A, located on the northwestern corner of the Site (Figure 5), have been sampled and analyzed for HVOCs from 1995 to the present. Concentrations of cis-1,2-DCE and vinyl chloride, which are degradation products of PCE and TCE, were detected in groundwater in monitoring wells PL2-JF01AR, PL2-JF01B, and PL2-JF01C at concentrations above the MTCA Method A cleanup levels. The HVOCs detected in groundwater above the MTCA Method A cleanup levels on the northwestern portion of the Site are known to be associated with release(s) from the southwestern corner of the Boeing Plant 2 facility (Figure 5). Boeing conducts quarterly groundwater monitoring of their monitoring wells to measure plume stability. A summary of the HVOC analytical data is provided in Table 4.

**Metals**

Groundwater samples collected from monitoring wells MW-1, MW-9, and MW-23 were analyzed for total arsenic, barium, cadmium, chromium, copper, iron, lead, manganese, mercury, selenium, silver, and/or zinc in 1992. Concentrations of total cadmium slightly above the MTCA Method A cleanup level were detected in groundwater collected from monitoring well MW-1. Metals in groundwater do not appear to be constituents of concern at the Site. A summary of the total and dissolved metals in groundwater is provided in Tables 5A and 5B.

Boeing monitoring wells PL2-JF01AR, PL2-JF01B, PL2-JF01C, and PL2-JF02A have been sampled by Boeing representatives from 1995 to the present, and analyzed for total and dissolved metals, including aluminum, antimony, arsenic, barium, beryllium, cadmium, calcium, chromium, cobalt, copper, iron, lead, magnesium, manganese, mercury, nickel, potassium, selenium, silver, sodium, thallium, vanadium, and/or zinc. The only MTCA Method A exceedance detected in groundwater was total and/or dissolved arsenic in monitoring well PL2-JF01C, and total arsenic in monitoring well PL2-JF02A; however, decreasing trends of total and dissolved arsenic have been observed in those monitoring wells since 2003.

**Polychlorinated Biphenyls**

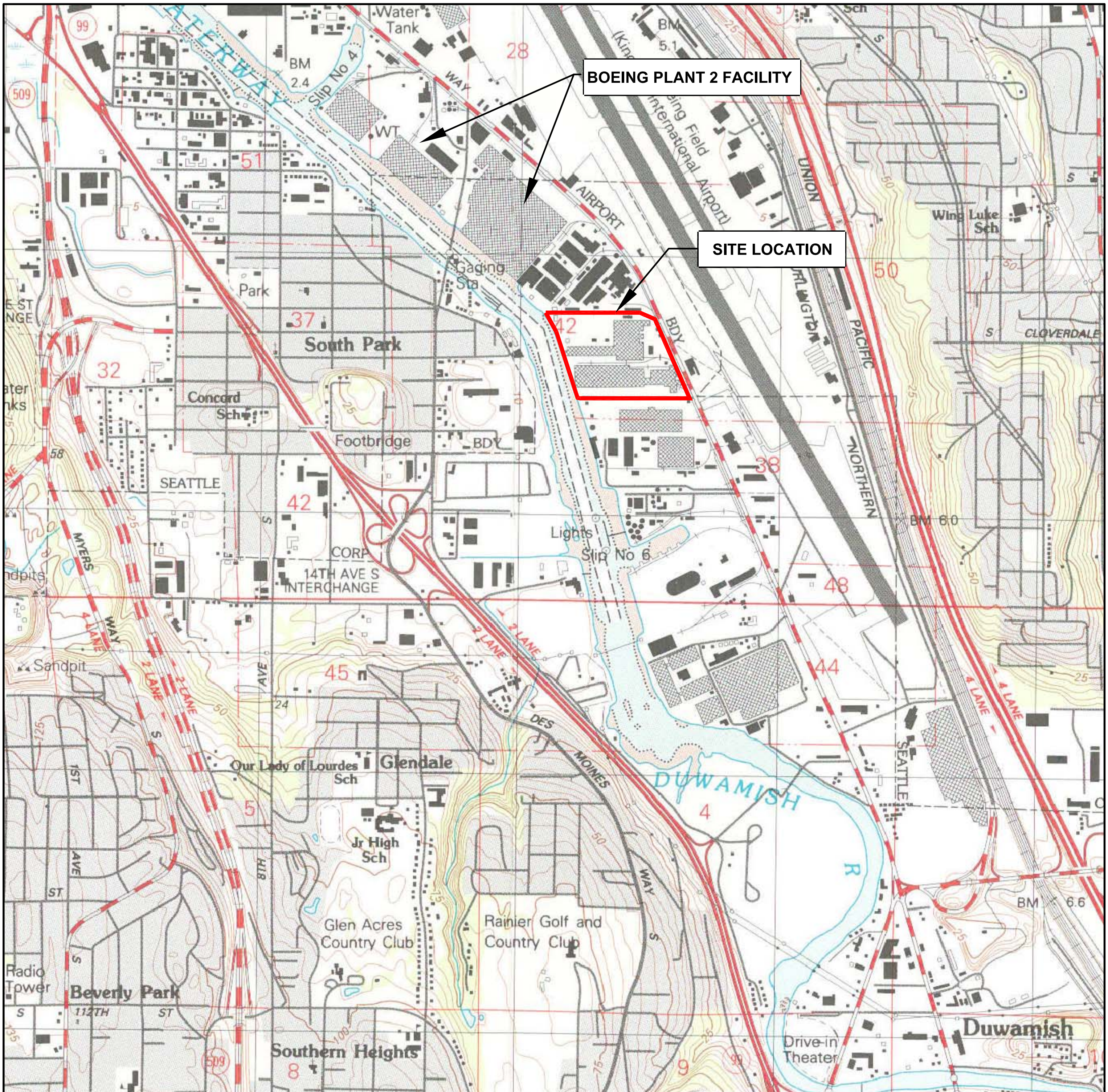
Monitoring wells MW-5, MW-24, MW-25, and MW-31 were sampled and analyzed for PCBs in 1993 and/or 2003 (Figure 2). The groundwater samples were collected from Boeing monitoring well PL2-JF01A from September 1995 to November 1996. Monitoring wells PL2-JF01AR, PL2-JF02A, and PL2-JF03A were sampled in April and/or June 2003. The analytical results did not detect concentrations of PCBs in groundwater above the laboratory PQL. A summary of the PCB results is provided in Table 6.

The analytical results for three cutting oil LNAPL samples collected from monitoring wells MW-19, MW-20, and MW-21; a cutting oil LNAPL sample from the return trough of the Niles Lathe in 1993 (Figure 2); and cutting oil LNAPL samples collected from monitoring wells MW-19 and MW-33 in 2003 did not detect concentrations of PCBs above the laboratory PQLs. A summary of the analytical results for PCBs in LNAPL is presented in Table 7.

Farallon trusts the information presented herein meets your needs. If you have any questions please contact either Ms. Amy Essig Desai or Mr. Peter Jewett at (425) 427-0061.

| | | |
|---|---|---|
| Attachments: | Figure 1 | *Site Location Map* |
| | Figure 2 | *Site Map* |
| | Figure 3 | *Potentiometric Groundwater Contour Map (5/18/05)* |
| | Figure 4 | *LNAPL Cutting Oil Plume(5/18/05)* |
| | Figure 5 | *Groundwater Analytical Results – HVOCs (2004/2005)* |
| | Table 1 | *Potentiometric Elevation Data Summary* |
| | Table 2 | *Summary of Petroleum Hydrocarbon in Groundwater* |
| | Table 3 | *Summary of HVOCs in Groundwater* |
| | Table 4 | *Summary of HVOCs in LNAPL* |
| | Tables 5A/5B | *Summary of Total and Dissolved Metals in Groundwater* |
| | Table 6 | *Summary of PCBs in Groundwater* |
| | Table 7 | *Summary of PCBs in LNAPL* |

AED/PJ:bjj




REFERENCE: 7.5 MINUTE USGS QUADRANGLE SEATTLE SOUTH, WASHINGTON, DATED 1983.


N

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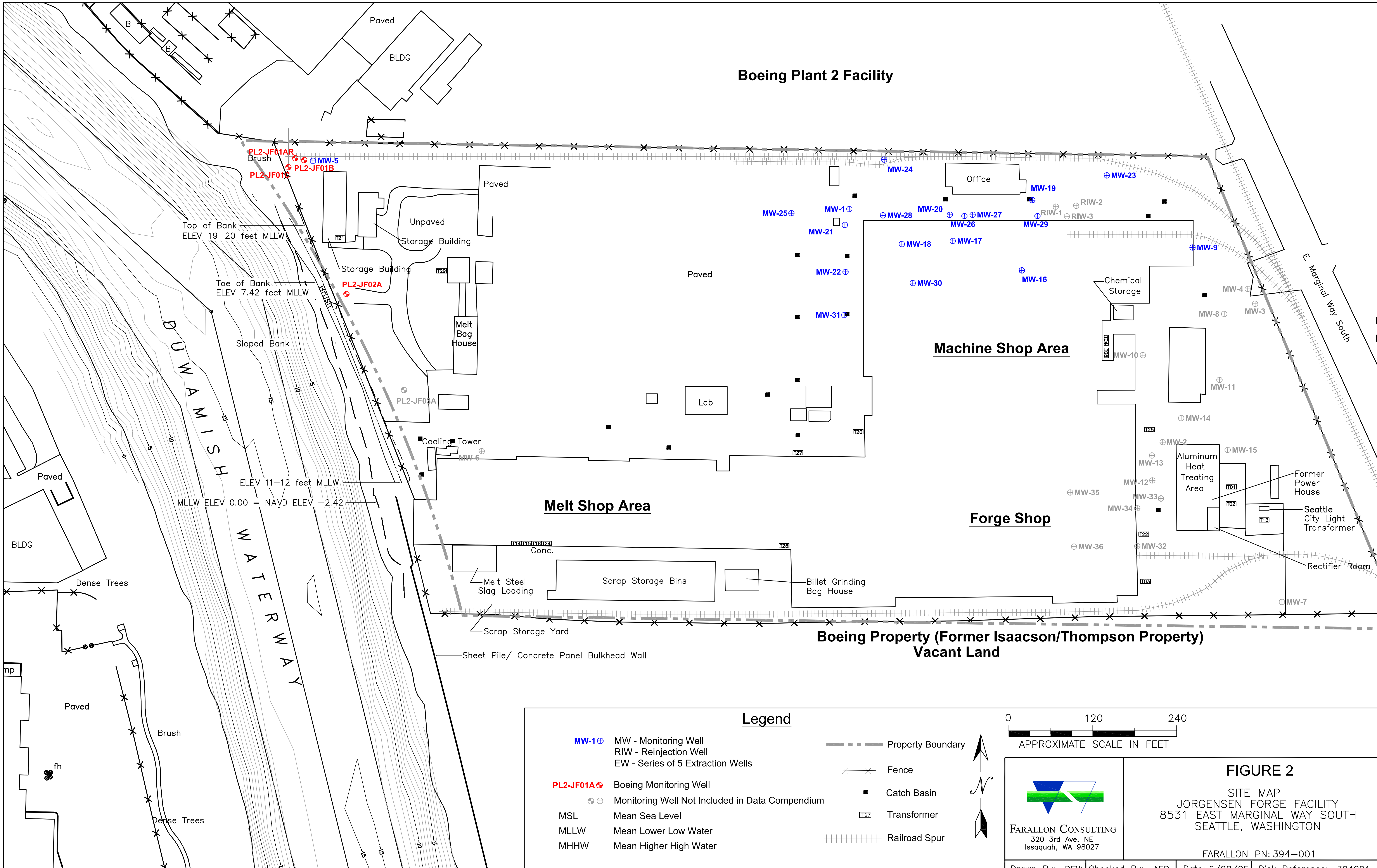
Issaquah, WA 98027

# FIGURE 1

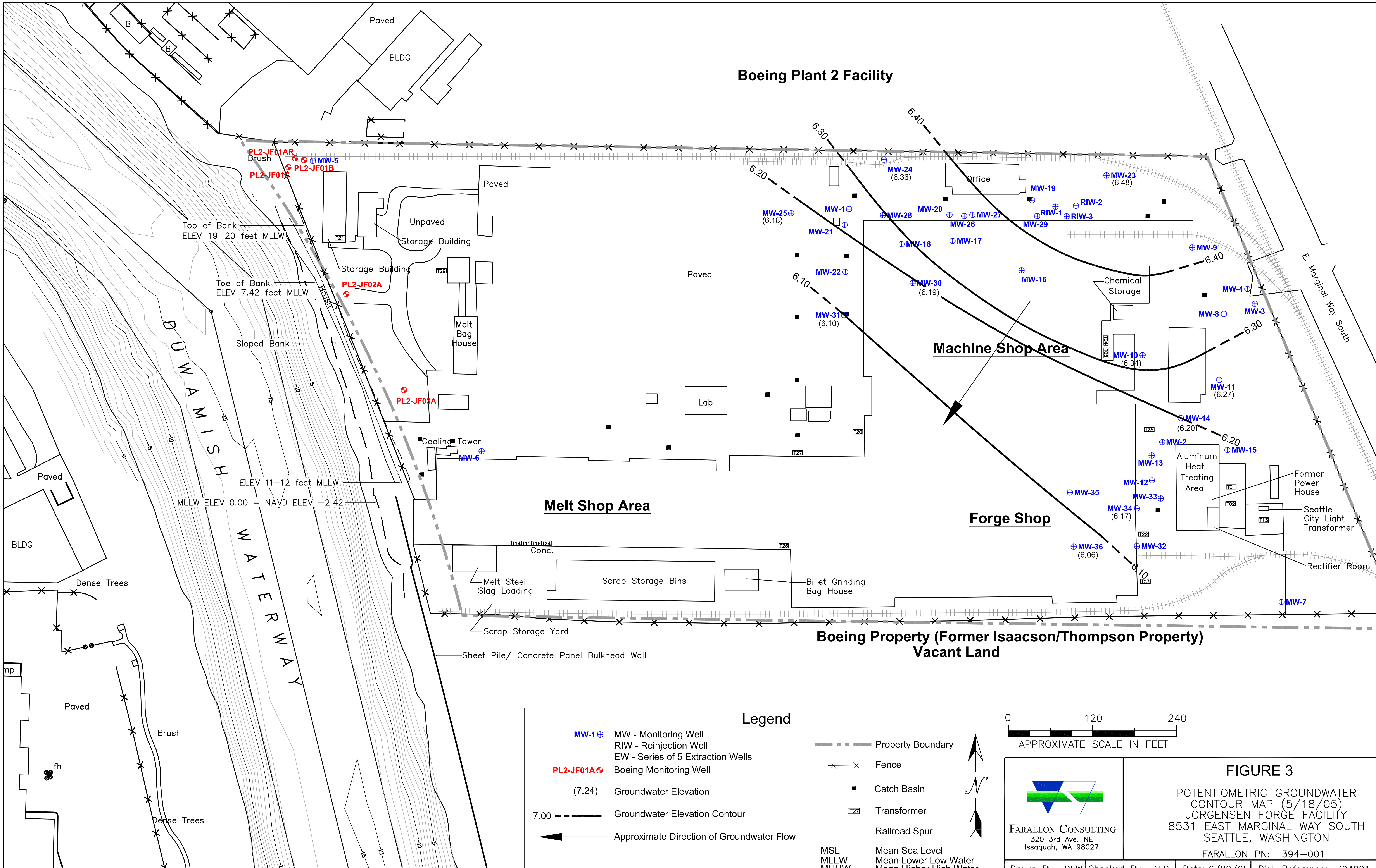
SITE LOCATION MAP
JORGENSEN FORGE FACILITY
8531 EAST MARGINAL WAY SOUTH
SEATTLE, WASHINGTON

FARALLON PN: 394-001

| Drawn By: DEW | Checked By: AED | Date: 6/28/05 | Disk Reference: 394001 |
|---|---|---|---|



Boeing Plant 2 Facility
Paved
BLDG
B
PL2-JF01AR
Brush
MW-5
PL2-JF01B
PL2-JF01A
Top of Bank
ELEV 19–20 feet MLLW
Toe of Bank
ELEV 7.42 feet MLLW
Sloped Bank
DUWAMISH WATERWAY
ELEV 11–12 feet MLLW
MLLW ELEV 0.00 = NAVD ELEV –2.42
Unpaved
Storage Building
PL2-JF02A
Melt Bag House
PL2-JF03A
Cooling Tower
MW-6
Lab
Office
Chemical Storage
Machine Shop Area
Melt Shop Area
Forge Shop
Aluminum Heat Treating Area
Former Power House
Seattle City Light Transformer
Rectifier Room
Conc.
Melt Steel Slag Loading
Scrap Storage Bins
Billet Grinding Bag House
Scrap Storage Yard
Sheet Pile/ Concrete Panel Bulkhead Wall
Dense Trees
Brush
fh
E. Marginal Way South
MW-1
MW-2
MW-3
MW-4
MW-7
MW-8
MW-9
MW-10
MW-11
MW-12
MW-13
MW-14
MW-15
MW-16
MW-17
MW-18
MW-19
MW-20
MW-21
MW-22
MW-23
MW-24
MW-25
MW-26
MW-27
MW-28
MW-29
MW-30
MW-31
MW-32
MW-33
MW-34
MW-35
MW-36
RIW-1
RIW-2
RIW-3
Boeing Property (Former Isaacson/Thompson Property)
Vacant Land
Legend
MW-1 MW - Monitoring Well
RIW - Reinjection Well
EW - Series of 5 Extraction Wells
PL2-JF01A Boeing Monitoring Well
Monitoring Well Not Included in Data Compendium
MSL Mean Sea Level
MLLW Mean Lower Low Water
MHHW Mean Higher High Water
Property Boundary
Fence
Catch Basin
Transformer
Railroad Spur
0 120 240
APPROXIMATE SCALE IN FEET
N
FARALLON CONSULTING
320 3rd Ave. NE
Issaquah, WA 98027
FIGURE 2
SITE MAP
JORGENSEN FORGE FACILITY
8531 EAST MARGINAL WAY SOUTH
SEATTLE, WASHINGTON
FARALLON PN: 394–001
Drawn By: DEW
Checked By: AED
Date: 6/28/05
Disk Reference: 394001



Boeing Plant 2 Facility
Paved
BLDG
Brush
PL2-JF01AR
PL2-JF01B
PL2-JF01A
PL2-JF02A
PL2-JF03A
MW-5
MW-6
MW-24
(6.36)
MW-23
(6.48)
MW-19
MW-25
(6.18)
MW-1
MW-28
MW-20
MW-26
MW-27
RIW-1
RIW-2
RIW-3
MW-29
MW-21
MW-18
MW-17
MW-9
MW-22
MW-30
(6.19)
MW-16
Chemical Storage
MW-4
MW-3
MW-8
MW-31
(6.10)
MW-10
(6.34)
MW-11
(6.27)
MW-14
(6.20)
MW-2
MW-15
MW-13
MW-12
MW-33
MW-35
MW-34
(6.17)
MW-36
(6.06)
MW-32
MW-7
6.40
6.30
6.20
6.10
Office
Top of Bank
ELEV 19–20 feet MLLW
Toe of Bank
ELEV 7.42 feet MLLW
Sloped Bank
Unpaved
Storage Building
Melt Bag House
Lab
Cooling Tower
Machine Shop Area
Melt Shop Area
Forge Shop
Aluminum Heat Treating Area
Former Power House
Seattle City Light Transformer
Rectifier Room
ELEV 11–12 feet MLLW
MLLW ELEV 0.00 = NAVD ELEV –2.42
DUWAMISH WATERWAY
Conc.
Melt Steel Slag Loading
Scrap Storage Bins
Billet Grinding Bag House
Scrap Storage Yard
Sheet Pile/ Concrete Panel Bulkhead Wall
Boeing Property (Former Isaacson/Thompson Property)
Vacant Land
E. Marginal Way South
Dense Trees
Paved
fh
Legend
MW-1 MW - Monitoring Well
RIW - Reinjection Well
EW - Series of 5 Extraction Wells
PL2-JF01A Boeing Monitoring Well
(7.24) Groundwater Elevation
7.00 Groundwater Elevation Contour
Approximate Direction of Groundwater Flow
Property Boundary
Fence
Catch Basin
Transformer
Railroad Spur
MSL Mean Sea Level
MLLW Mean Lower Low Water
MHHW Mean Higher High Water
N
0 120 240
APPROXIMATE SCALE IN FEET
FARALLON CONSULTING
320 3rd Ave. NE
Issaquah, WA 98027
FIGURE 3
POTENTIOMETRIC GROUNDWATER CONTOUR MAP (5/18/05)
JORGENSEN FORGE FACILITY
8531 EAST MARGINAL WAY SOUTH
SEATTLE, WASHINGTON
FARALLON PN: 394–001
Drawn By: DEW
Checked By: AED
Date: 6/28/05
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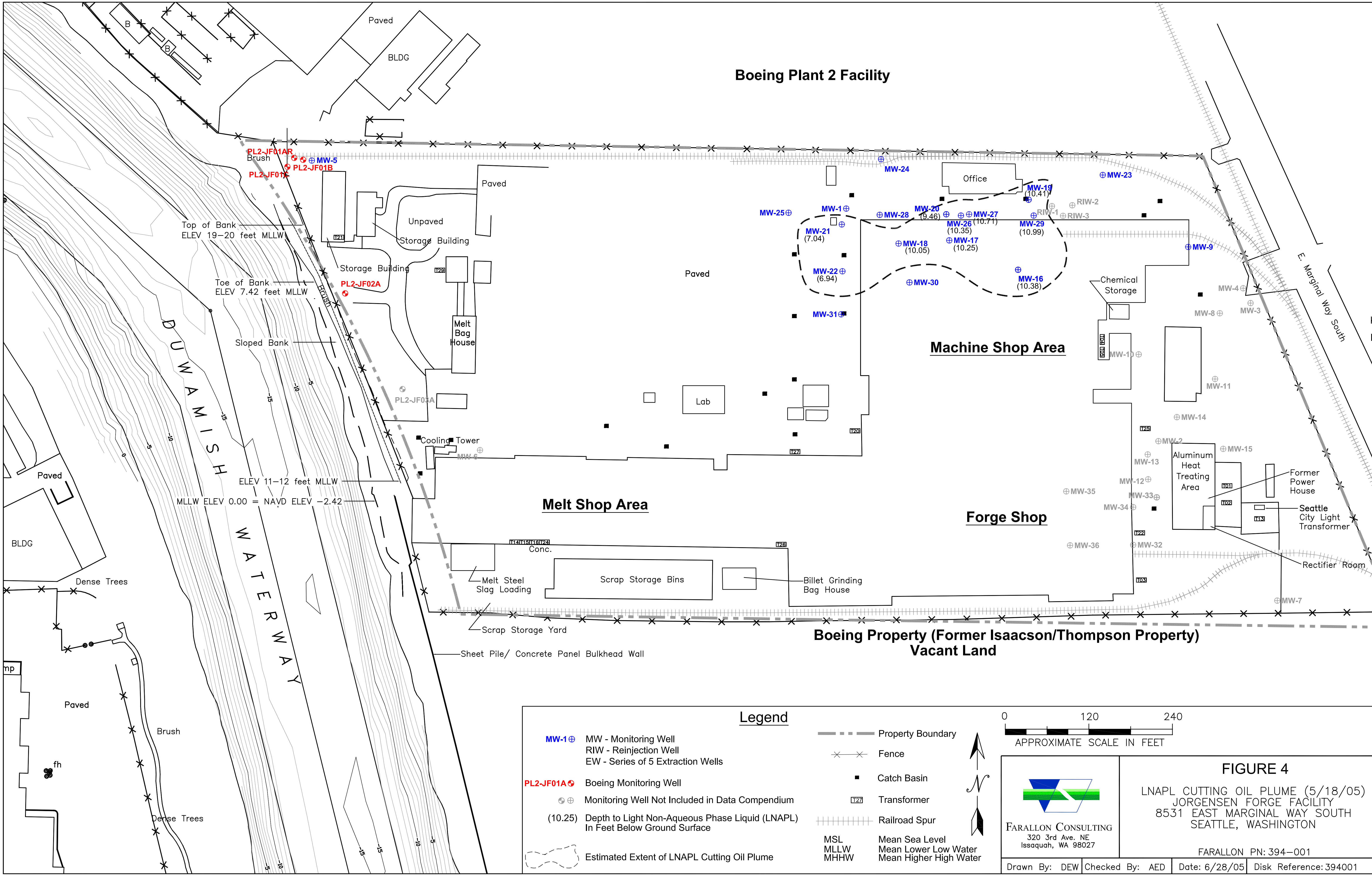
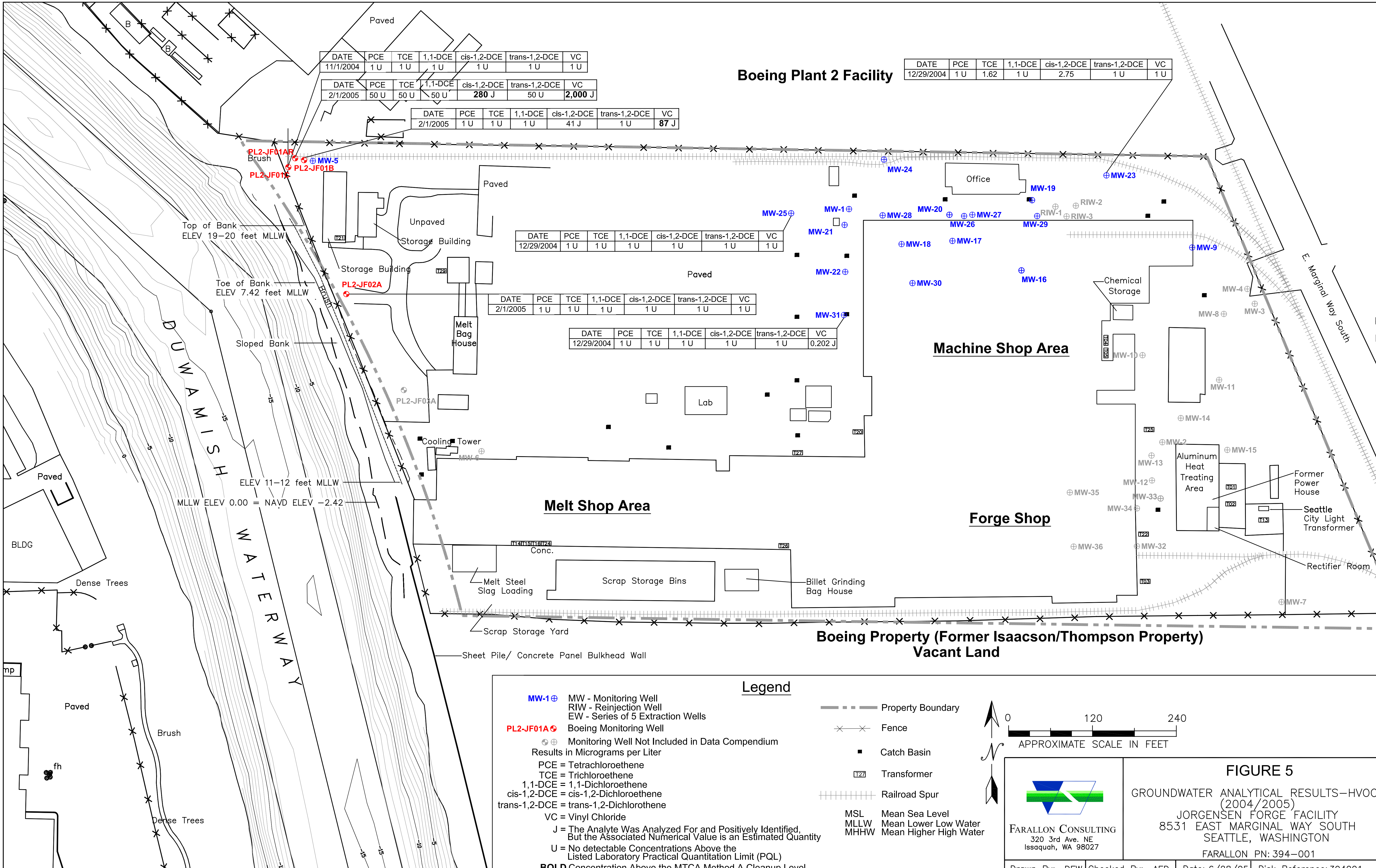


Boeing Plant 2 Facility
Paved
BLDG
Machine Shop Area
Melt Shop Area
Forge Shop
Boeing Property (Former Isaacson/Thompson Property)
Vacant Land
DUWAMISH WATERWAY
Top of Bank
ELEV 19–20 feet MLLW
Toe of Bank
ELEV 7.42 feet MLLW
Sloped Bank
ELEV 11–12 feet MLLW
MLLW ELEV 0.00 = NAVD ELEV –2.42
Sheet Pile/ Concrete Panel Bulkhead Wall
Brush
Dense Trees
Unpaved
Storage Building
Melt Bag House
Lab
Cooling Tower
Office
Chemical Storage
Aluminum Heat Treating Area
Former Power House
Seattle City Light Transformer
Rectifier Room
Conc.
Melt Steel Slag Loading
Scrap Storage Bins
Billet Grinding Bag House
Scrap Storage Yard
E. Marginal Way South
PL2-JF01AR
PL2-JF01B
PL2-JF01A
PL2-JF02A
PL2-JF03A
MW-5
MW-24
MW-23
MW-19 (10.41)
MW-20 (9.46)
MW-27 (10.71)
MW-26 (10.35)
MW-29 (10.99)
MW-1
MW-25
MW-28
MW-21 (7.04)
MW-18 (10.05)
MW-17 (10.25)
MW-22 (6.94)
MW-30
MW-16 (10.38)
MW-31
MW-9
RIW-1
RIW-2
RIW-3
MW-4
MW-8
MW-3
MW-10
MW-11
MW-14
MW-2
MW-15
MW-13
MW-12
MW-35
MW-33
MW-34
MW-36
MW-32
MW-7
MW-6
Legend
MW-1 MW - Monitoring Well
RIW - Reinjection Well
EW - Series of 5 Extraction Wells
PL2-JF01A Boeing Monitoring Well
Monitoring Well Not Included in Data Compendium
(10.25) Depth to Light Non-Aqueous Phase Liquid (LNAPL) In Feet Below Ground Surface
Estimated Extent of LNAPL Cutting Oil Plume
Property Boundary
Fence
Catch Basin
Transformer
Railroad Spur
MSL Mean Sea Level
MLLW Mean Lower Low Water
MHHW Mean Higher High Water
0 120 240
APPROXIMATE SCALE IN FEET
N
FARALLON CONSULTING
320 3rd Ave. NE
Issaquah, WA 98027
FIGURE 4
LNAPL CUTTING OIL PLUME (5/18/05)
JORGENSEN FORGE FACILITY
8531 EAST MARGINAL WAY SOUTH
SEATTLE, WASHINGTON
FARALLON PN: 394–001
Drawn By: DEW
Checked By: AED
Date: 6/28/05
Disk Reference: 394001




| DATE | PCE | TCE | 1,1-DCE | cis-1,2-DCE | trans-1,2-DCE | VC |
|---|---|---|---|---|---|---|
| 11/1/2004 | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U |

| DATE | PCE | TCE | 1,1-DCE | cis-1,2-DCE | trans-1,2-DCE | VC |
|---|---|---|---|---|---|---|
| 2/1/2005 | 50 U | 50 U | 50 U | **280** J | 50 U | **2,000** J |

| DATE | PCE | TCE | 1,1-DCE | cis-1,2-DCE | trans-1,2-DCE | VC |
|---|---|---|---|---|---|---|
| 2/1/2005 | 1 U | 1 U | 1 U | 41 J | 1 U | **87** J |

| DATE | PCE | TCE | 1,1-DCE | cis-1,2-DCE | trans-1,2-DCE | VC |
|---|---|---|---|---|---|---|
| 12/29/2004 | 1 U | 1.62 | 1 U | 2.75 | 1 U | 1 U |

| DATE | PCE | TCE | 1,1-DCE | cis-1,2-DCE | trans-1,2-DCE | VC |
|---|---|---|---|---|---|---|
| 12/29/2004 | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U |

| DATE | PCE | TCE | 1,1-DCE | cis-1,2-DCE | trans-1,2-DCE | VC |
|---|---|---|---|---|---|---|
| 2/1/2005 | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U |

| DATE | PCE | TCE | 1,1-DCE | cis-1,2-DCE | trans-1,2-DCE | VC |
|---|---|---|---|---|---|---|
| 12/29/2004 | 1 U | 1 U | 1 U | 1 U | 1 U | 0.202 J |

## Legend

MW-1 ⊕ MW - Monitoring Well
RIW - Reinjection Well
EW - Series of 5 Extraction Wells
PL2-JF01A Boeing Monitoring Well
Monitoring Well Not Included in Data Compendium

Results in Micrograms per Liter
PCE = Tetrachloroethene
TCE = Trichloroethene
1,1-DCE = 1,1-Dichloroethene
cis-1,2-DCE = cis-1,2-Dichloroethene
trans-1,2-DCE = trans-1,2-Dichloroethene
VC = Vinyl Chloride
J = The Analyte Was Analyzed For and Positively Identified, But the Associated Numerical Value is an Estimated Quantity
U = No detectable Concentrations Above the Listed Laboratory Practical Quantitation Limit (PQL)
**BOLD** Concentration Above the MTCA Method A Cleanup Level

Property Boundary
Fence
Catch Basin
Transformer
Railroad Spur

MSL Mean Sea Level
MLLW Mean Lower Low Water
MHHW Mean Higher High Water

0 120 240
APPROXIMATE SCALE IN FEET

FARALLON CONSULTING
320 3rd Ave. NE
Issaquah, WA 98027

# FIGURE 5
GROUNDWATER ANALYTICAL RESULTS–HVOCs (2004/2005)
JORGENSEN FORGE FACILITY
8531 EAST MARGINAL WAY SOUTH
SEATTLE, WASHINGTON

FARALLON PN: 394–001

Drawn By: DEW | Checked By: AED | Date: 6/28/05 | Disk Reference: 394001

**Table 1**
**Potentiometric Elevation Data Summary**
**Jorgensen Forge Facility**
**Seattle, Washington**
**Farallon PN: 394-001**

| Well ID and TOC Elevation (feet) [1] | Date Collected | Collected By | Casing Elevation (feet)[1] | Depth to Water (feet)[2] | Depth to LNAPL (feet) | LNAPL Thickness (feet) | Potentiometric Surface Elevation[3] (feet)[4] |
|---|---|---|---|---|---|---|---|
| MW-9 | 9/9/1992 | SECOR | 17.79 | 11.88 | NM | 0.00 | 5.91 |
| | 9/17/1992 | SECOR | 17.79 | 11.92 | NM | 0.00 | 5.87 |
| | 9/21/1992 | SECOR | 17.79 | 11.93 | NM | 0.00 | 5.86 |
| | 10/1/1992 | SECOR | 17.79 | 11.82 | NM | 0.00 | 5.97 |
| | 10/8/1992 | SECOR | 17.79 | 11.91 | NM | 0.00 | 5.88 |
| | 10/23/1992 | SECOR | 17.79 | 11.93 | NM | 0.00 | 5.86 |
| | 10/28/1992 | SECOR | 17.79 | NM | NM | NM | NM |
| | 11/20/1992 | SECOR | 17.79 | 11.43 | NM | 0.00 | 6.36 |
| | 12/8/1992 | SECOR | 17.79 | 11.17 | NM | 0.00 | 6.62 |
| | 12/22/1992 | SECOR | 17.79 | NM | NM | NM | NM |
| | 1/8/1993 | SECOR | 17.79 | 11.00 | NM | 0.00 | 6.79 |
| | 1/19/1993 | SECOR | 17.79 | 11.04 | NM | 0.00 | 6.75 |
| | 2/2/1993 | SECOR | 17.79 | 10.76 | NM | 0.00 | 7.03 |
| | 2/19/1993 | SECOR | 17.79 | 10.95 | NM | 0.00 | 6.84 |
| | 3/3/1993 | SECOR | 17.79 | 11.28 | NM | 0.00 | 6.51 |
| | 4/9/1993 | SECOR | 17.79 | 15.12 | NM | 0.00 | 2.67 |
| | 11/10/1993 | SECOR | 17.79 | 15.75 | NM | 0.00 | 2.04 |
| | 3/2/1994 | SECOR | 17.79 | 14.51 | NM | 0.00 | 3.28 |
| | 11/1/1994 | SECOR | 17.79 | 15.54 | NM | 0.00 | 2.25 |
| | 1/4/1995 | SECOR | 17.79 | 13.58 | NM | NM | 4.21 |
| | 4/12/1995 | SECOR | 17.79 | 14.16 | NM | NM | 3.63 |
| | 6/22/1995 | SECOR | 17.79 | 15.08 | NM | NM | 2.71 |
| | 10/4/1995 | SECOR | 17.79 | 15.21 | NM | NM | 2.58 |
| | 1/15/1996 | SECOR | 17.79 | 13.49 | NM | NM | 4.30 |
| | 4/17/1996 | SECOR | 17.79 | 14.23 | NM | NM | 3.56 |
| | 8/28/1996 | SECOR | 17.79 | 15.21 | NM | NM | 2.58 |
| | 10/18-19/1999 | Kane | 17.79 | 11.96 | NA | 0.00 | 5.83 |
| | 1/5/2000 | Kane | 17.79 | 10.77 | NA | 0.00 | 7.02 |
| | 5/2-3/2000 | Kane | 17.79 | 11.23 | NA | 0.00 | 6.56 |
| | 8/22-23/2000 | Kane | 17.79 | 12.03 | NA | 0.00 | 5.76 |
| | 12/12-13/2000 | Kane | 17.79 | 11.66 | NA | 0.00 | 6.13 |
| | 2/14-15/2001 | Kane | 17.79 | 11.25 | NA | 0.00 | 6.54 |
| | 4/9/2002 | Kane | 17.79 | 11.05 | NA | 0.00 | 6.74 |
| | 4/24/2004 | Kane | 17.79 | 10.62 | NA | 0.00 | 7.17 |
| | 5/18/2005 | Farallon | 17.79 | 11.40 | NA | 0.00 | 6.39 |
| MW-16 | 9/9/1992 | SECOR | 17.72 | NM | NM | NM | NM |
| | 9/17/1992 | SECOR | 17.72 | NM | NM | NM | NM |
| | 9/21/1992 | SECOR | 17.72 | NM | NM | NM | NM |
| | 10/2/1992 | SECOR | 17.72 | 13.89 | NM | 2.27 | 5.90 |
| | 10/8/1992 | SECOR | 17.72 | NM | NM | NM | NM |
| | 10/23/1992 | SECOR | 17.72 | NM | NM | NM | NM |
| | 10/28/1992 | SECOR | 17.72 | NM | NM | NM | NM |
| | 11/20/1992 | SECOR | 17.72 | 13.41 | NM | 2.02 | 6.15 |
| | 12/8/1992 | SECOR | 17.72 | 13.58 | NM | 2.70 | 6.60 |
| | 12/22/1992 | SECOR | 17.72 | 13.90 | NM | 3.23 | 6.76 |
| | 1/8/1993 | SECOR | 17.72 | NM | NM | NM | NM |
| | 1/19/1993 | SECOR | 17.72 | 15.33 | NM | 4.83 | 6.79 |
| | 2/2/1993 | SECOR | 17.72 | 15.72 | NM | 5.48 | 6.99 |
| | 2/19/1993 | SECOR | 17.72 | 16.56 | NM | 6.31 | 6.90 |
| | 3/3/1993 | SECOR | 17.72 | 16.56 | NM | 6.06 | 6.67 |
| | 10/18-19/1999 | Kane | 17.72 | 15.50 | 11.00 | 4.50 | 6.32 |
| | 1/5/2000 | Kane | 17.72 | 15.46 | 9.69 | 5.77 | 7.51 |
| | 5/2-3/2000 | Kane | 17.72 | 15.49 | 10.27 | 5.22 | 6.98 |
| | 8/22-23/2000 | Kane | 17.72 | 15.45 | 11.03 | 4.42 | 6.29 |
| | 12/12-13/2000 | Kane | 17.72 | 14.50 | 10.72 | 3.78 | 6.66 |
| | 2/14-15/2001 | Kane | 17.72 | 15.42 | 10.36 | 5.06 | 6.90 |
| | 4/9/2002 | Kane | 17.72 | 17.00 | 11.20 | 5.80 | 6.00 |
| | 4/24/2004 | Kane | 17.72 | 15.09 | 10.03 | 5.06 | 7.23 |
| | 12/29/2004 | Farallon | 17.72 | 15.38 | 9.98 | 5.40 | 7.25 |
| | 5/18/2005 | Farallon | 17.72 | 15.45 | 10.38 | 5.07 | 6.88 |

**Table 1**
**Potentiometric Elevation Data Summary**
**Jorgensen Forge Facility**
**Seattle, Washington**
**Farallon PN: 394-001**

| Well ID and TOC Elevation (feet) [1] | Date Collected | Collected By | Casing Elevation (feet)[1] | Depth to Water (feet)[2] | Depth to LNAPL (feet) | LNAPL Thickness (feet) | Potentiometric Surface Elevation[3] (feet)[4] |
|---|---|---|---|---|---|---|---|
| MW-17 | 10/18-19/1999 | Kane | 17.61 | NM | NM | NM | NM |
| | 1/5/2000 | Kane | 17.61 | NM | NM | NM | NM |
| | 5/2-3/2000 | Kane | 17.61 | NM | NM | NM | NM |
| | 8/22-23/2000 | Kane | 17.61 | 16.71 | 11.12 | 5.59 | 5.99 |
| | 12/12-13/2000 | Kane | 17.61 | 17.32 | 10.90 | 6.42 | 6.13 |
| | 2/14-15/2001 | Kane | 17.61 | 16.02 | 10.45 | 5.57 | 6.66 |
| | 4/9/2002 | Kane | 17.61 | 14.70 | 10.90 | 3.80 | 6.37 |
| | 4/24/2004 | Kane | 17.61 | NM | NM | NM | NM |
| | 5/18/2005 | Farallon | 17.61 | 13.90 | 10.25 | 3.65 | 7.03 |
| MW-18 | 9/9/1992 | SECOR | 17.51 | 12.11 | NM | 0.00 | 5.40 |
| | 9/17/1992 | SECOR | 17.51 | 12.02 | NM | 0.00 | 5.49 |
| | 9/21/1992 | SECOR | 17.51 | 12.13 | NM | 0.00 | 5.38 |
| | 10/1/1992 | SECOR | 17.51 | 11.78 | NM | 0.00 | 5.73 |
| | 10/8/1992 | SECOR | 17.51 | 12.06 | NM | 0.00 | 5.45 |
| | 10/23/1992 | SECOR | 17.51 | 12.03 | NM | 0.00 | 5.48 |
| | 10/28/1992 | SECOR | 17.51 | NM | NM | NM | NM |
| | 11/20/1992 | SECOR | 17.51 | 11.45 | NM | 0.00 | 6.06 |
| | 12/8/1992 | SECOR | 17.51 | 11.41 | NM | 0.80 | 6.83 |
| | 12/22/1992 | SECOR | 17.51 | 9.23 | NM | 0.06 | 8.33 |
| | 1/8/1993 | SECOR | 17.51 | NM | NM | NM | NM |
| | 1/19/1993 | SECOR | 17.51 | 9.15 | NM | 0.30 | 8.63 |
| | 2/2/1993 | SECOR | 17.51 | 13.44 | NM | 3.55 | 7.30 |
| | 2/19/1993 | SECOR | 17.51 | —** | NM | 2.72** | — |
| | 3/3/1993 | SECOR | 17.51 | —** | NM | 2.42** | — |
| | 10/18-19/1999 | Kane | 17.51 | 12.10 | 11.50 | 0.60 | 5.96 |
| | 1/5/2000 | Kane | 17.51 | 11.51 | 10.11 | 1.40 | 7.27 |
| | 5/2-3/2000 | Kane | 17.51 | NM | NM | NM | NM |
| | 8/22-23/2000 | Kane | 17.51 | 12.10 | 11.65 | 0.45 | 5.82 |
| | 12/12-13/2000 | Kane | 17.51 | 13.65 | 11.20 | 2.45 | 6.09 |
| | 2/14-15/2001 | Kane | 17.51 | 11.55 | 10.82 | 0.73 | 6.62 |
| | 4/9/2002 | Kane | 17.51 | NM | NM | NM | NM |
| | 4/24/2004 | Kane | 17.51 | NM | NM | NM | NM |
| | 5/18/2005 | Farallon | 17.51 | 11.69 | 10.05 | 1.64 | 7.31 |
| MW-19 | 9/9/1992 | SECOR | 17.47 | NM | NM | NM | NM |
| | 9/17/1992 | SECOR | 17.47 | NM | NM | NM | NM |
| | 9/21/1992 | SECOR | 17.47 | NM | NM | NM | NM |
| | 10/2/1992 | SECOR | 17.47 | 14.58 | NM | 3.98 | 6.51 |
| | 10/8/1992 | SECOR | 17.47 | NM | NM | NM | NM |
| | 10/23/1992 | SECOR | 17.47 | NM | NM | NM | NM |
| | 10/28/1992 | SECOR | 17.47 | 14.07 | NM | 3.95 | 6.99 |
| | 11/20/1992 | SECOR | 17.47 | 14.54 | NM | 4.20 | 6.75 |
| | 12/8/1992 | SECOR | 17.47 | 14.51 | NM | 4.54 | 7.09 |
| | 12/22/1992 | SECOR | 17.47 | 14.53 | NM | 4.70 | 7.22 |
| | 1/8/1993 | SECOR | 17.47 | 14.55 | NM | 4.72 | 7.22 |
| | 1/19/1993 | SECOR | 17.47 | 14.55 | NM | 4.69 | 7.19 |
| | 2/2/1993 | SECOR | 17.47 | 14.60 | NM | 4.98 | 7.40 |
| | 2/19/1993 | SECOR | 17.47 | 14.81 | NM | 5.07 | 7.27 |
| | 3/3/1993 | SECOR | 17.47 | 14.89 | NM | 4.76 | 6.91 |
| | 10/18-19/1999 | Kane | 17.47 | 14.80 | 10.93 | 3.87 | 6.19 |
| | 1/5/2000 | Kane | 17.47 | 14.85 | 9.72 | 5.13 | 7.29 |
| | 5/2-3/2000 | Kane | 17.47 | 10.24 | NA | NA | 7.23 |
| | 8/22-23/2000 | Kane | 17.47 | 14.70 | 11.01 | 3.69 | 6.13 |
| | 12/12-13/2000 | Kane | 17.47 | 15.50 | 11.30 | 4.20 | 5.79 |
| | 2/14-15/2001 | Kane | 17.47 | 14.78 | 9.98 | 4.80 | 7.06 |
| | 4/9/2002 | Kane | 17.47 | 15.76 | 10.99 | 4.77 | 6.05 |
| | 4/10/2003 | Farallon | 17.47 | 9.74 | NM | 5.04 | 12.32 |
| | 4/24/2004 | Kane | 17.47 | 13.84 | 8.86 | 4.98 | 8.16 |
| | 5/18/2005 | Farallon | 17.47 | 14.64 | 10.41 | 4.23 | 6.68 |

**Table 1**
**Potentiometric Elevation Data Summary**
**Jorgensen Forge Facility**
**Seattle, Washington**
**Farallon PN: 394-001**

| Well ID and TOC Elevation (feet)[1] | Date Collected | Collected By | Casing Elevation (feet)[1] | Depth to Water (feet)[2] | Depth to LNAPL (feet) | LNAPL Thickness (feet) | Potentiometric Surface Elevation[3] (feet)[4] |
|---|---|---|---|---|---|---|---|
| MW-20 | 9/9/1992 | SECOR | 18.22 | NM | NM | NM | NM |
| | 9/17/1992 | SECOR | 18.22 | NM | NM | NM | NM |
| | 9/21/1992 | SECOR | 18.22 | NM | NM | NM | NM |
| | 10/1/1992 | SECOR | 18.22 | 14.68 | NM | 4.30 | 7.45 |
| | 10/8/1992 | SECOR | 18.22 | NM | NM | NM | NM |
| | 10/23/1992 | SECOR | 18.22 | NM | NM | NM | NM |
| | 10/28/1992 | SECOR | 18.22 | 14.68 | NM | 4.18 | 7.34 |
| | 11/20/1992 | SECOR | 18.22 | 14.69 | NM | 4.44 | 7.57 |
| | 12/8/1992 | SECOR | 18.22 | 14.68 | NM | 4.76 | 7.87 |
| | 12/22/1992 | SECOR | 18.22 | 14.62 | NM | 4.80 | 7.97 |
| | 1/8/1993 | SECOR | 18.22 | 14.67 | NM | 4.86 | 7.97 |
| | 1/19/1993 | SECOR | 18.22 | 14.63 | NM | 5.08 | 8.21 |
| | 2/2/1993 | SECOR | 18.22 | 14.73 | NM | 5.39 | 8.39 |
| | 2/19/1993 | SECOR | 18.22 | 15.04 | NM | 5.61 | 8.29 |
| | 3/3/1993 | SECOR | 18.22 | 14.84 | NM | 4.92 | 7.86 |
| | 10/18-19/1999 | Kane | 18.22 | 14.81 | 10.53 | 4.28 | 7.30 |
| | 1/5/2000 | Kane | 18.22 | 14.96 | 9.37 | 5.59 | 8.35 |
| | 5/2-3/2000 | Kane | 18.22 | 14.85 | 9.85 | 5.00 | 7.92 |
| | 8/22-23/2000 | Kane | 18.22 | 14.65 | 10.35 | 4.30 | 7.48 |
| | 12/12-13/2000 | Kane | 18.22 | 14.75 | 10.95 | 3.80 | 6.93 |
| | 2/14-15/2001 | Kane | 18.22 | 14.72 | 10.19 | 4.53 | 7.62 |
| | 4/9/2002 | Kane | 18.22 | 17.76 | 10.29 | 7.47 | 7.26 |
| | 4/24/2004 | Kane | 18.22 | NM | NM | NM | NM |
| | 12/29/2004 | Farallon | 18.22 | 14.56 | 9.41 | 5.15 | 8.35 |
| | 5/18/2005 | Farallon | 18.22 | 14.81 | 9.46 | 5.35 | 8.28 |
| MW-21[4] | 9/9/1992 | SECOR | 13.90 | NM | NM | NM | NM |
| | 9/17/1992 | SECOR | 13.90 | NM | NM | NM | NM |
| | 9/21/1992 | SECOR | 13.90 | NM | NM | NM | NM |
| | 10/1/1992 | SECOR | 13.90 | 14.76 | NM | 5.20 | 3.87 |
| | 10/8/1992 | SECOR | 13.90 | NM | NM | NM | NM |
| | 10/23/1992 | SECOR | 13.90 | NM | NM | NM | NM |
| | 10/28/1992 | SECOR | 13.90 | 14.78 | NM | 6.15 | 4.72 |
| | 11/20/1992 | SECOR | 13.90 | 14.75 | NM | 4.57 | 3.31 |
| | 12/8/1992 | SECOR | 13.90 | 14.73 | NM | 5.22 | 3.92 |
| | 12/22/1992 | SECOR | 13.90 | 14.73 | NM | 5.44 | 4.12 |
| | 1/8/1993 | SECOR | 13.90 | NM | NM | NM | NM |
| | 1/19/1993 | SECOR | 13.90 | 14.82 | NM | 6.80 | 5.27 |
| | 2/2/1993 | SECOR | 13.90 | 15.01 | NM | 7.05 | 5.31 |
| | 2/19/1993 | SECOR | 13.90 | 14.99 | NM | 6.65 | 4.96 |
| | 3/3/1993 | SECOR | 13.90 | 14.56 | NM | 5.50 | 4.35 |
| | 10/18-19/1999 | Kane | 13.90 | 14.85 | 7.85 | 7.00 | 5.42 |
| | 1/5/2000 | Kane | 13.90 | 14.52 | 6.97 | 7.55 | 6.25 |
| | 5/2-3/2000 | Kane | 13.90 | NM | NM | NM | NM |
| | 8/22-23/2000 | Kane | 13.90 | 13.22 | 7.85 | 5.37 | 5.57 |
| | 12/12-13/2000 | Kane | 13.90 | 14.60 | 8.35 | 6.25 | 4.99 |
| | 2/14-15/2001 | Kane | 13.90 | 14.59 | 7.78 | 6.81 | 5.51 |
| | 4/9/2002 | Kane | 13.90 | 14.90 | 6.89 | 8.01 | 6.29 |
| | 4/24/2004 | Kane | 13.90 | NM | NM | NM | NM |
| | 5/18/2005 | Farallon | 13.90 | 11.45 | 7.04 | 4.41 | 6.46 |
| MW-22 | 9/9/1992 | SECOR | 16.98 | 11.72 | NM | 0.00 | 5.26 |
| | 9/17/1992 | SECOR | 16.98 | 11.62 | NM | 0.00 | 5.36 |
| | 9/21/1992 | SECOR | 16.98 | 11.67 | NM | 0.00 | 5.31 |
| | 10/1/1992 | SECOR | 16.98 | 11.30 | NM | 0.00 | 5.68 |
| | 10/8/1992 | SECOR | 16.98 | 11.64 | NM | 0.00 | 5.34 |
| | 10/23/1992 | SECOR | 16.98 | 11.60 | NM | 0.00 | 5.38 |
| | 10/28/1992 | SECOR | 16.98 | NM | NM | NM | — |
| | 11/20/1992 | SECOR | 16.98 | 10.97 | NM | 0.00 | 6.01 |
| | 12/8/1992 | SECOR | 16.98 | 9.73 | NM | 0.00 | 7.25 |
| | 12/22/1992 | SECOR | 16.98 | 6.57 | NM | 0.00 | 10.41 |
| | 1/8/1993 | SECOR | 16.98 | 5.41 | NM | 0.00 | 11.57 |
| | 1/19/1993 | SECOR | 16.98 | 5.17 | NM | 0.00 | 11.81 |
| | 2/2/1993 | SECOR | 16.98 | 6.46 | NM | 0.00 | 10.52 |
| | 2/19/1993 | SECOR | 16.98 | 6.97 | NM | 0.00 | 10.01 |
| | 3/3/1993 | SECOR | 16.98 | 7.73 | NM | 0.00 | 9.25 |
| | 10/18-19/1999 | Kane | 16.98 | 7.70 | NA | 0.00 | 9.28 |
| | 1/5/2000 | Kane | 16.98 | 7.72 | 7.21 | 0.51 | 9.72 |
| | 5/2-3/2000 | Kane | 16.98 | 8.10 | 7.36 | 0.74 | 9.55 |
| | 8/22-23/2000 | Kane | 16.98 | 9.18 | 7.99 | 1.19 | 8.88 |
| | 12/12-13/2000 | Kane | 16.98 | 10.30 | 8.20 | 2.10 | 8.59 |
| | 2/14-15/2001 | Kane | 16.98 | 8.62 | 7.78 | 0.84 | 9.12 |
| | 4/9/2002 | Kane | 16.98 | 8.71 | 6.76 | 1.95 | 10.04 |
| | 4/24/2004 | Kane | 16.98 | 6.92 | 6.21 | 0.71 | 10.71 |
| | 12/29/2004 | Farallon | 16.98 | 12.29 | 6.95 | 5.34 | 9.55 |
| | 5/18/2005 | Farallon | 16.98 | 12.22 | 6.94 | 5.28 | 9.56 |

**Table 1**
**Potentiometric Elevation Data Summary**
**Jorgensen Forge Facility**
**Seattle, Washington**
**Farallon PN: 394-001**

| Well ID and TOC Elevation (feet) [1] | Date Collected | Collected By | Casing Elevation (feet)[1] | Depth to Water (feet)[2] | Depth to LNAPL (feet) | LNAPL Thickness (feet) | Potentiometric Surface Elevation[3] (feet)[4] |
|---|---|---|---|---|---|---|---|
| MW-23 | 10/18-19/1999 | Kane | 17.84 | 12.11 | NA | 0.00 | 5.73 |
| | 1/5/2000 | Kane | 17.84 | 10.82 | NA | 0.00 | 7.02 |
| | 5/2-3/2000 | Kane | 17.84 | 11.28 | NA | 0.00 | 6.56 |
| | 8/22-23/2000 | Kane | 17.84 | 11.98 | NA | 0.00 | 5.86 |
| | 12/12-13/2000 | Kane | 17.84 | 12.30 | NA | 0.00 | 5.54 |
| | 2/14-15/2001 | Kane | 17.84 | 11.35 | NA | 0.00 | 6.49 |
| | 4/9/2002 | Kane | 17.84 | 10.08 | NA | 0.00 | 7.76 |
| | 4/24/2004 | Kane | 17.84 | 11.02 | NA | 0.00 | 6.82 |
| | 12/29/2004 | Farallon | 17.84 | 10.76 | NA | 0.00 | 7.08 |
| | 5/18/2005 | Farallon | 17.84 | 11.36 | NA | 0.00 | 6.48 |
| MW-24 | 10/18-19/1999 | Kane | 17.88 | 12.55 | NA | 0.00 | 5.33 |
| | 1/5/2000 | Kane | 17.88 | 11.14 | NA | 0.00 | 6.74 |
| | 5/2-3/2000 | Kane | 17.88 | 12.78 | NA | 0.00 | 5.10 |
| | 8/22-23/2000 | Kane | 17.88 | 12.55 | NA | 0.00 | 5.33 |
| | 12/12-13/2000 | Kane | 17.88 | 11.92 | NA | 0.00 | 5.96 |
| | 2/14/2000 | Kane | 17.88 | 11.69 | NA | 0.00 | 6.19 |
| | 4/9/2002 | Kane | 17.88 | 11.34 | NA | 0.00 | 6.54 |
| | 4/11/2003 | Farallon | 17.88 | 11.03 | NA | 0.00 | 6.85 |
| | 4/24/2004 | Kane | 17.88 | 11.52 | NA | 0.00 | 6.36 |
| | 5/18/2005 | Farallon | 17.88 | 11.52 | NA | 0.00 | 6.36 |
| MW-25 | 10/18-19/1999 | Kane | 17.64 | 12.50 | NA | 0.00 | 5.14 |
| | 1/5/2000 | Kane | 17.64 | NM | NM | 0.00 | — |
| | 5/2-3/2000 | Kane | 17.64 | 11.82 | NA | 0.00 | 5.82 |
| | 8/22-23/2000 | Kane | 17.64 | 12.52 | NA | 0.00 | 5.12 |
| | 12/12-13/2000 | Kane | 17.64 | 11.88 | NA | 0.00 | 5.76 |
| | 2/14-15/2001 | Kane | 17.64 | 11.59 | NA | 0.00 | 6.05 |
| | 4/9/2002 | Kane | 17.64 | 11.45 | NA | 0.00 | 6.19 |
| | 4/11/2003 | Farallon | 17.64 | 10.98 | NM | 0.00 | 6.66 |
| | 4/24/2004 | Kane | 17.64 | 12.01 | NM | 0.00 | 5.63 |
| | 12/29/2004 | Farallon | 17.64 | 6.86 | NA | 0.00 | 10.78 |
| | 5/18/2005 | Farallon | 17.64 | 11.46 | NA | 0.00 | 6.18 |
| MW-26 | 10/18-19/1999 | Kane | 18.36 | 21.09 | 11.10 | 9.99 | 6.36 |
| | 1/5/2000 | Kane | 18.36 | 20.98 | 9.93 | 11.05 | 7.44 |
| | 5/2-3/2000 | Kane | 18.36 | 21.09 | 10.60 | 10.49 | 6.82 |
| | 8/22-23/2000 | Kane | 18.36 | 20.72 | 11.31 | 9.41 | 6.20 |
| | 12/12-13/2000 | Kane | 18.36 | 21.15 | 11.00 | 10.15 | 6.45 |
| | 2/14-15/2001 | Kane | 18.36 | 21.15 | 10.62 | 10.53 | 6.79 |
| | 4/9/2002 | Kane | 18.36 | 21.02 | 11.13 | 9.89 | 6.34 |
| | 4/24/2004 | Kane | 18.36 | NM | NM | NM | NM |
| | 5/18/2005 | Farallon | 18.36 | 10.80 | 10.35 | 0.45 | 7.97 |
| MW-27 | 10/18-19/1999 | Kane | 18.15 | 18.50 | 11.52 | 6.98 | 6.00 |
| | 1/5/2000 | Kane | 18.15 | 18.20 | 10.28 | 7.92 | 7.16 |
| | 5/2-3/2000 | Kane | 18.15 | 18.55 | 10.90 | 7.65 | 6.56 |
| | 8/22-23/2000 | Kane | 18.15 | 18.66 | 11.64 | 7.02 | 5.88 |
| | 12/12-13/2000 | Kane | 18.15 | 18.30 | 11.25 | 7.05 | 6.27 |
| | 2/14-15/2001 | Kane | 18.15 | 18.20 | 7.85 | 10.35 | 9.37 |
| | 4/9/2002 | Kane | 18.15 | 19.93 | 11.59 | 8.34 | 5.81 |
| | 4/24/2004 | Kane | 18.15 | NM | NM | NM | NM |
| | 5/18/2005 | Farallon | 18.15 | 12.15 | 10.71 | 1.44 | 7.31 |
| MW-28 | 10/18-19/1999 | Kane | 18.35 | 19.00 | 11.20 | 7.80 | 6.45 |
| | 1/5/2000 | Kane | 18.35 | 18.20 | 10.53 | 7.67 | 7.13 |
| | 5/2-3/2000 | Kane | 18.35 | 17.90 | 11.25 | 6.65 | 6.50 |
| | 8/22-23/2000 | Kane | 18.35 | 18.41 | 11.82 | 6.59 | 5.94 |
| | 12/12-13/2000 | Kane | 18.35 | 18.80 | 11.70 | 7.10 | 6.01 |
| | 2/14-15/2001 | Kane | 18.35 | 18.14 | 11.24 | 6.90 | 6.49 |
| | 4/9/2002 | Kane | 18.35 | 18.30 | 11.70 | 6.60 | 6.06 |
| | 4/24/2004 | Kane | 18.35 | 18.49 | 10.62 | 7.87 | 7.02 |
| | 12/29/2004 | Farallon | 18.35 | 13.51 | 10.25 | 3.26 | 7.81 |
| | 5/18/2005 | Farallon | 18.35 | 10.93 | 0.00 | 0.00 | 7.42 |

**Table 1**
**Potentiometric Elevation Data Summary**
**Jorgensen Forge Facility**
**Seattle, Washington**
**Farallon PN: 394-001**

| Well ID and TOC Elevation (feet) [1] | Date Collected | Collected By | Casing Elevation (feet)[1] | Depth to Water (feet)[2] | Depth to LNAPL (feet) | LNAPL Thickness (feet) | Potentiometric Surface Elevation[3] (feet)[4] |
|---|---|---|---|---|---|---|---|
| MW-29 | 10/18-19/1999 | Kane | 18.24 | 21.55 | 11.23 | 10.32 | 6.08 |
| | 1/5/2000 | Kane | 18.24 | 21.38 | 10.00 | 11.38 | 7.22 |
| | 5/2-3/2000 | Kane | 18.24 | 21.42 | 10.67 | 10.75 | 6.60 |
| | 8/22-23/2000 | Kane | 18.24 | NM | 11.39 | 0.00 | — |
| | 12/12-13/2000 | Kane | 18.24 | 21.35 | 11.00 | 10.35 | 6.31 |
| | 2/14-15/2001 | Kane | 18.24 | 21.29 | 10.73 | 10.56 | 6.56 |
| | 4/9/2002 | Kane | 18.24 | 22.59 | 11.39 | 11.20 | 5.84 |
| | 4/24/2004 | Kane | 18.24 | NM | NM | NM | NM |
| | 5/18/2005 | Farallon | 18.24 | 18.24 | 10.99 | 7.25 | 6.60 |
| MW-30 | 10/18-19/1999 | Kane | 17.48 | 12.20 | NA | 0.00 | 5.28 |
| | 1/5/2000 | Kane | 17.48 | 10.94 | NA | 0.00 | 6.54 |
| | 5/2-3/2000 | Kane | 17.48 | 11.60 | NA | 0.00 | 5.88 |
| | 8/22-23/2000 | Kane | 17.48 | NM | NM | NM | NM |
| | 12/12-13/2000 | Kane | 17.48 | 11.70 | NA | 0.00 | 5.78 |
| | 2/14-15/2001 | Kane | 17.48 | 11.33 | NA | 0.00 | 6.15 |
| | 4/9/2002 | Kane | 17.48 | 11.23 | NA | 0.00 | 6.25 |
| | 4/24/2004 | Kane | 17.48 | NM | NM | NM | NM |
| | 5/18/2005 | Farallon | 17.48 | 11.29 | NA | 0.00 | 6.19 |
| MW-31 | 10/18-19/1999 | Kane | 17.50 | 12.36 | NA | 0.00 | 5.14 |
| | 1/5/2000 | Kane | 17.50 | 11.06 | NA | 0.00 | 6.44 |
| | 5/2-3/2000 | Kane | 17.50 | 11.82 | NA | 0.00 | 5.68 |
| | 8/22-23/2000 | Kane | 17.50 | 12.41 | NA | 0.00 | 5.09 |
| | 12/12-13/2000 | Kane | 17.50 | 11.77 | NA | 0.00 | 5.73 |
| | 2/14-15/2001 | Kane | 17.50 | 11.51 | NA | 0.00 | 5.99 |
| | 4/9/2002 | Kane | 17.50 | 11.35 | NA | 0.00 | 6.15 |
| | 4/11/2003 | Farallon | 17.50 | 10.90 | NA | 0.00 | 6.60 |
| | 4/24/2004 | Kane | 17.50 | 11.42 | NA | 0.00 | 6.08 |
| | 12/29/2004 | Farallon | 17.50 | 10.76 | NA | 0.00 | 6.74 |
| | 5/18/2005 | Farallon | 17.50 | 11.40 | NA | 0.00 | 6.10 |

Note:

[1]Relative elevation of top of casing, in feet, as surveyed by PLS, Inc., Issaquah, Washington, 8/22/2003.

[2]Depth to water below top of well casing.

[3]Potentiometric Surface = (Casing Elevation - Depth to Water) +0.91(LNAPL Thickness). The specific gravity for LNAPL is estimated at 0.91 (for typical diesel and/or oil).

[4]Top of casing elevation relative to arbitrary benchmark datum of 15.00 feet established by SECOR, well not located during 8/22/2003 survey event.

— = insufficient data
Farallon = Farallon Consulting, L.L.C.
Kane = Kane Environmental, Inc.
LNAPL = light nonaqueous-phase liquid
NA - not applicable
NM = not measured
SECOR = SECOR International, Inc.
TOC = top of casing
* = LNAPL thickness as observed in polyethylene bailer
**= Due to obstruction in MW-18, DTW was not measured and LNAPL thickness is minimum thickness
***=Groundwater elevation (feet above mean sea level).

**Table 2**
**Summary of Petroleum Hydrocarbon in Groundwater**
**Jorgensen Forge Facility**
**8531 East Marginal Way South**
**Seattle, Washington**
**Farallon PN: 394-001**

| Sample ID | Date Sampled | Analytical Results (micrograms per liter) | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | GRO[1] | DRO[2] | ORO[2] | Benzene[3] | Toluene[3] | Ethylbenzene[3] | Xylenes Total[3] |
| MW-1/2 | 03/02/90 | — | — | — | **22** | 840 | 180 | 560 |
| MW-5 | 08/08/94 | — | 500U | — | — | — | — | — |
| | 08/28/96 | — | — | 500U | — | — | — | — |
| | 11/26/96 | — | — | 500U | — | — | — | — |
| | 01/23/97 | — | — | 500U | — | — | — | — |
| MW-9 | 3/24/1992 | — | — | **1,800** | 0.5 U | 0.5 U | 0.5 U | 0.5 U |
| | 3/13/1993 | 50 U | 300 U | — | — | — | — | — |
| | 2/6/1995 | — | 250 U | 750 U | — | — | — | — |
| | 4/13/1995 | 50 U | 250 U | 750 U | 0.5 U | 1 U | 1 U | 1 U |
| | 2/16/2001 | ND | ND | ND | ND | ND | ND | ND |
| | 5/18/2005 | 100 U | 237 U | 474 U | 0.5 U | 1 U | 1 U | 3 U |
| MW-16 | 9/14/1992 | — | — | — | — | — | 20 U | — |
| MW-18 | 9/10/1992 | — | — | **4,800** | — | — | — | — |
| | 12/8/1992 | — | — | — | — | — | 200 U | — |
| MW-19 | 9/3/1992 | — | — | — | — | — | 20 U | — |
| MW-20 | 9/3/1992 | — | — | — | — | — | 20 U | — |
| MW-21 | 9/3/1992 | — | — | — | — | — | 20 U | — |
| MW-22 | 9/10/1992 | — | — | 1,000 U | — | — | — | — |
| | 9/17/1992 | — | — | — | 2 U | 2 U | 2 U | 2 U |
| | 3/13/1993 | — | 300 U | — | 1 U | 1 U | 1 U | 1 U |
| | 11/10/1993 | — | — | 1,000 U | 2 U | 2 U | 5 U | 5 U |
| | 8/8/1994 | — | 500 U | — | — | — | — | — |
| | 3/7/1995 | — | — | **1,000** | — | — | — | — |
| | 8/28/1996 | — | — | 500 U | — | — | — | — |
| | 11/26/1996 | — | — | 500 U | — | — | — | — |
| | 1/23/1997 | — | — | 500 U | — | — | — | — |
| | 10/18/1999 | — | ND | ND | — | — | — | — |
| MW-23 | 9/10/1992 | — | — | 1,000 U | 2 U | 2 U | 2 U | 2 U |
| | 11/20/1992 | 500 U | — | — | 1 U | 1 U | 1 U | 2 U |
| | 11/10/1993 | — | — | 1,000 U | 2 U | 2 U | 5 U | 5 U |
| | 8/28/1996 | — | — | 500 U | — | — | — | — |
| | 11/26/1996 | — | — | 500 U | — | — | — | — |
| | 8/8/1994 | — | 500 U | — | — | — | — | — |
| | 10/18/1999 | — | ND | ND | — | — | — | — |
| | 2/16/2001 | — | ND | ND | — | — | — | — |
| | 12/29/2004 | — | — | — | 1 U | 0.0908 J | 0.0227 J | 3 U |
| | 5/18/2005 | 100 U | 236 U | 472 U | 0.5 U | 1 U | 1 U | 3 U |
| MW-24 | 9/17/1992 | — | 200 U | — | 100 U | 100 U | 100 U | 100 U |
| | 11/10/1993 | — | — | 1,000 U | 2 U | 2 U | 5 U | 5 U |
| | 8/8/1994 | — | 500 U | — | — | — | — | — |
| | 8/28/1996 | — | — | 500 U | — | — | — | — |
| | 11/26/1996 | — | — | 500 U | — | — | — | — |
| | 1/23/1997 | — | — | 500 U | — | — | — | — |
| | 10/18/1999 | — | ND | ND | — | — | — | — |
| | 2/16/2001 | — | ND | ND | — | — | — | — |
| | 5/18/2005 | 100 U | 121 J | 200 J | 0.5 U | 1 U | 1 U | 3 U |
| MW-25 | 9/17/1992 | — | 200 U | — | 2,000 U | 2,000 U | 2,000 U | 2,000 U |
| | 3/13/1993 | — | **1,400** | — | 1 U | 1 U | 1 U | 1 U |
| | 11/10/1993 | — | — | 1,000 U | 2 U | 2 U | 5 U | 5 U |
| | 8/8/1994 | — | 500 U | — | — | — | — | — |
| | 8/28/1996 | — | — | 500 U | — | — | — | — |
| | 11/26/1996 | — | — | 500 U | — | — | — | — |
| | 1/23/1997 | — | — | 500 U | — | — | — | — |
| | 10/18/1999 | — | ND | ND | — | — | — | — |
| | 2/16/2001 | — | ND | ND | — | — | — | — |
| | 4/10/2002 | — | 250 U | 400 U | — | — | — | — |
| | 4/10/2002 (duplicate) | — | 250 U | — | — | — | — | — |
| | 12/5/2002 | — | 260 U | 410 U | — | — | — | — |
| | 4/24/2004 | — | 200 U | 320 U | — | — | — | — |
| | 12/29/2004 | — | — | — | 1 U | 0.087 J | 0.0284 J | 0.0304 J |
| | 5/18/2005 | 100 U | 238 U | 475 U | 0.5 U | 1 U | 1 U | 3 U |
| **MTCA Method A Cleanup Levels for Groundwater[4]** | | **800** | **500** | **500** | **5** | **1,000** | **700** | **1,000** |

**Table 2**
**Summary of Petroleum Hydrocarbon in Groundwater**
**Jorgensen Forge Facility**
**8531 East Marginal Way South**
**Seattle, Washington**
**Farallon PN: 394-001**

| Sample ID | Date Sampled | Analytical Results (micrograms per liter) | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | GRO[1] | DRO[2] | ORO[2] | Benzene[3] | Toluene[3] | Ethylbenzene[3] | Xylenes Total[3] |
| MW-30 | 8/8/1994 | — | 500 U | — | — | — | — | — |
| | 3/7/1995 | — | — | 500 U | — | — | — | — |
| | 8/28/1996 | — | — | 500 U | — | — | — | — |
| | 11/26/1996 | — | — | 500 U | — | — | — | — |
| | 1/23/1997 | — | — | 500 U | — | — | — | — |
| | 10/18/1999 | — | ND | ND | — | — | — | — |
| | 2/16/2001 | — | ND | ND | — | — | — | — |
| MW-31 | 8/8/1994 | — | 500 U | — | — | — | — | — |
| | 3/7/1995 | — | — | **600** | — | — | — | — |
| | 10/26/1995 | — | **540** | 750 U | — | — | — | — |
| | 8/28/1996 | — | — | 500 U | — | — | — | — |
| | 11/26/1996 | — | — | 500 U | — | — | — | — |
| | 1/23/1997 | — | — | 500 U | — | — | — | — |
| | 10/18/1999 | — | ND | ND | — | — | — | — |
| | 10/18/1999 (duplicate) | — | ND | ND | — | — | — | — |
| | 2/16/2001 | — | ND | ND | — | — | — | — |
| | 4/10/2002 | — | 250 U | 400 U | — | — | — | — |
| | 12/5/2002 | 100 U | 260 U | 420 U | 1 U | 1 U | 1 U | 1 U |
| | 4/24/2004 | — | 220 | 320 U | — | — | — | — |
| | 12/29/2004 | — | — | — | 0.0826 J | 0.0651 J | 1 U | 0.0798 J |
| | 5/18/2005 | 76.9 J | **849 X2** | 195 J | 0.5 U | 1 U | 1 U | 3 U |
| PL2-JF01AR | 5/17/2001 | — | — | — | 5 UD | 5UD | 5 UD | 5 UD |
| | 7/25/2001 | — | — | — | 4 | 1 U | 1 U | 2.7 |
| | 10/24/2001 | — | — | — | 1 | 1 U | 1 U | 2 U |
| | 1/21/2002 | — | — | — | **29** | 680 | 92 | 156 |
| | 6/16/2003 | — | — | — | 100 U | 100 U | 100 U | 100 U |
| | 9/2/2003 | — | — | — | 25 U | 25 U | 25 U | 50 U |
| | 12/8/2003 | — | — | — | 30 U | 30 U | 30 U | 60 U |
| | 12/19/2003 | — | — | — | 5 UD | 20 UJ | 20 UJ | 40 UJ |
| | 2/2/2004 | — | — | — | 20 U | 55 UJ | 20 U | 40 UJ |
| | 5/10/2004 | — | — | — | 50 U | 50 U | 50 U | 100 U |
| | 8/2/2004 | — | — | — | 50 U | 50 U | 50 U | 100 U |
| | 11/1/2004 | — | — | — | **5.6** | 110 | 8.5 | 32 |
| | 2/1/2005 | — | — | — | 50 U | 50 U | 50 U | 100 U |
| PL2-JF01B | 03/31/95 | — | — | — | 1 U | 1 U | 1 U | 2 U |
| | 9/27/1995 | — | — | — | 1 U | 1 U | 1 U | 2 U |
| | 11/17/1995 | — | — | — | 1 U | 1 U | 1 U | 2 U |
| | 3/1/1996 | — | — | — | 1 U | 1 U | 1 U | 2 U |
| | 5/23/1996 | — | — | — | 1 U | 1 U | 1 U | 2 U |
| | 8/26/1996 | — | — | — | 1 U | 1 U | 1 U | 2 U |
| | 11/21/1996 | — | — | — | 1 U | 1 U | 1 U | 2 U |
| | 4/26/2001 | — | — | — | 1 U | 1 U | 1 U | 2 U |
| | 7/25/2001 | — | — | — | 2 U | 2 U | 2 U | 2 U |
| | 10/24/2001 | — | — | — | 1 U | 1 U | 1 U | 2 U |
| | 1/21/2002 | — | — | — | 1 U | 1 U | 1 U | 2 U |
| | 6/16/2003 | — | — | — | 1 U | 1 U | 1 U | 2 U |
| | 9/2/2003 | — | — | — | 1 U | 1 U | 1 U | 2 U |
| | 12/8/2003 | — | — | — | 5 U | 5 U | 5 U | 5 U |
| | 12/19/2003 | — | — | — | 5 U | 5 U | 5 U | 5 U |
| | 2/2/2004 | — | — | — | 5 U | 5 U | 5 U | 5 U |
| | 5/10/2004 | — | — | — | 1 U | 1 U | 1 U | 2 U |
| | 8/2/2004 | | | | 1 U | 1 U | 1 U | 2 U |
| | 11/1/2004 | — | — | — | 1 U | 1 U | 1 U | 2 U |
| | 2/1/2005 | — | — | — | 1 U | 1 U | 1 U | 2 U |
| PL2-JF01C | 5/17/2001 | — | — | — | 1 U | 1 U | 1 U | 2 U |
| | 7/25/2001 | — | — | — | 1 U | 1 U | 1 U | 2 U |
| | 10/24/2001 | — | — | — | 1 U | 1 U | 1 U | 2 U |
| | 1/21/2002 | — | — | — | 1 U | 1 U | 1 U | 2 U |
| | 6/16/2003 | — | — | — | 1 U | 1 U | 1 U | 2 U |
| | 12/8/2003 | — | — | — | 1 U | 1 U | 1 U | 2 U |
| | 12/19/2003 | — | — | — | 0.2 UJ | 0.2 UJ | 0.2 UJ | 0.6 UJ |
| | 5/10/2004 | — | — | — | 1 U | 1 U | 1 U | 2 U |
| | 11/1/2004 | — | — | — | 1 U | 1 U | 1 U | 2 U |
| **MTCA Method A Cleanup Levels for Groundwater[4]** | | **800** | **500** | **500** | **5** | **1,000** | **700** | **1,000** |

**Table 2**
**Summary of Petroleum Hydrocarbon in Groundwater**
**Jorgensen Forge Facility**
**8531 East Marginal Way South**
**Seattle, Washington**
**Farallon PN: 394-001**

| Sample ID | Date Sampled | Analytical Results (micrograms per liter) | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | GRO[1] | DRO[2] | ORO[2] | Benzene[3] | Toluene[3] | Ethylbenzene[3] | Xylenes Total[3] |
| PL2-JF02A | 9/27/1995 | — | — | — | 1.3 | 1 U | 1 U | 2 U |
| | 11/17/1995 | — | — | — | 1 U | 1 U | 1 U | 2 U |
| | 3/1/1996 | — | — | — | 1 U | 1 U | 1 U | 2 U |
| | 5/23/1996 | — | — | — | 1 U | 1 U | 1 U | 2 U |
| | 8/26/1996 | — | — | — | 1 U | 1 U | 1 U | 2 U |
| | 11/21/1996 | — | — | — | 1 U | 1 U | 1 U | 2 U |
| | 4/26/2001 | — | — | — | 1 U | 1 U | 1 U | 2 U |
| | 7/25/2001 | — | — | — | 1 U | 1 U | 1 U | 2 U |
| | 10/24/2001 | — | — | — | 1 U | 1 U | 1 U | 2 U |
| | 1/21/2002 | — | — | — | 1 U | 1 U | 1 U | 2 U |
| | 6/16/2003 | — | — | — | 1 U | 1 U | 1 U | 2 U |
| | 9/2/2003 | — | — | — | 1 U | 1 U | 1 U | 2 U |
| | 12/8/2003 | — | — | — | 1 U | 1 U | 1 U | 2 U |
| | 2/2/2004 | — | — | — | 1 U | 1 U | 1 U | 2 U |
| | 5/10/2004 | — | — | — | 1 U | 1 U | 1 U | 2 U |
| | 8/2/2004 | — | — | — | 1 U | 1 U | 1 U | 2 U |
| | 11/1/2004 | — | — | — | 1 U | 1 U | 1 U | 2 U |
| | 2/1/2005 | — | — | — | 1 U | 1 U | 1 U | 2 U |
| **MTCA Method A Cleanup Levels for Groundwater[4]** | | **800** | **500** | **500** | **5** | **1,000** | **700** | **1,000** |

NOTES:

Results in **BOLD** indicate concentrations above Washington State Model Toxics Control Act Cleanup Regulation (MTCA) Method A Cleanup Levels for Groundwater, Table 720-1 of Section 900 of Chapter 173-340 of the Washington Administrative Code, as amended February 2001.

[1]Analyzed by Northwest Method NWTPH-Gx.

[2]Analyzed by Northwest Method NWTPH-Dx.

[3]Analyzed by U.S. Environmental Protection Agency Method 8021B.

[4]Table 720-1, MTCA, Chapter 173-340 of the Washington Administrative Code, as amended February 2001.

D = the reported result for this analyte was calculated based on a secondary dilution factor.

DRO = total petroleum hydrocarbons as diesel-range organics

GRO = total petroleum hydrocarbons as gasoline-range organics

ND = not detected above the laboratory practical quantitation limit (PQL)

ORO = total petroleum hydrocarbons as heavy oil-range organics

U = no detectable concentrations above the listed laboratory PQL

X2 = Contaminant does not appear to be "typical" product

— = not analyzed

**Table 3**
**Summary of HVOCs in Groundwater**
**Jorgensen Forge Facility**
**8531 East Marginal Way**
**Seattle, Washington**
**Farallon PN: 394-001**

| Sample Location | Sample Date | Analytical Results (micrograms per liter) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | PCE[1] | TCE[1] | 1,1-Dichloroethene[1] | cis-1,2-Dichloroethene[1] | trans-1,2-Dichloroethene[1] | Vinyl Chloride[1] | Vinyl Chloride[2] | 1,1-Dichloroethane[1] | 1,2-Dichloroethane[1] |
| MW-1/2 | 3/2/1990 | 12.5 U | – | 12.5 U | – | 18 | 25 U | – | 12.5 U | 12.5 U |
| MW-22 | 3/13/1993 | 0.001 U | 0.001 U | 0.001 U | – | 0.001 U | 0.001 U | – | 0.001 U | 0.001 U |
| | 9/17/1992 | 2 U | 2 U | 2 U | – | 2 U | 2 U | – | 2 U | 2 U |
| | 11/10/1993 | 5 U | 2 U | 2 U | 5 U | 2 U | 10 U | – | 2 U | 2 U |
| MW-23 | 9/10/1992 | 3 | 2 U | 2 U | – | 2 U | 2 U | – | 2 U | 2 U |
| | 11/10/1993 | 5 U | 2 U | 2 U | 5 U | 2 U | 10 U | – | 2 U | 2 U |
| | 12/29/2004 | 1.0 U | 1.62 | 1 U | 2.75 | 1.0 U | 1.0 U | – | 1 U | 1 U |
| MW-24 | 9/17/1992 | 0.1 U | 0.1 U | 0.1 U | – | 0.1 U | 0.1 U | – | 0.1 U | 0.1 U |
| | 11/10/1993 | 5 U | 2 U | 2 U | 5 U | 2 U | 10 U | – | 2 U | 2 U |
| MW-25 | 3/13/1993 | 0.001 U | 0.001 U | 0.001 U | – | 0.001 U | 0.001 U | – | 0.001 U | 0.001 U |
| | 9/17/1992 | 2 U | 2 U | 2 U | – | 2 U | 2 U | – | 2 U | 2 U |
| | 11/10/1993 | 5 U | 2 U | 2 U | 5 U | 2 U | 10 U | – | 2 U | 2 U |
| | 12/29/2004 | 1.0 U | 1.0 U | 1 U | 1.0 U | 1.0 U | 1.0 U | – | 1 U | 1 U |
| MW-31 | 12/29/2004 | 1.0 U | 1.0 U | 1 U | 1.0 U | 1.0 U | 0.202 J | | 0.096 J | 1 U |
| PL2-JF01AR | 5/17/2001 | 5 UD | 5 UD | 5 UD | **850 D** | 5 UD | **410 D** | – | 5 UD | 5 UD |
| | 7/25/2001 | 1 U | 1 U | **1.1** | **3,100 D** | 3.9 | **2,300 D** | – | 1 U | 1 U |
| | 10/24/2001 | 1 U | 1 U | 1 U | **240 D** | 1 U | **550 D** | – | 1 U | 1 U |
| | 10/24/2001 | 1 U | 1 U | 1 U | **240 D** | 1 U | **540 D** | – | 1 U | 1 U |
| | 1/21/2002 | 5 U | 5 U | **10** | **26,000 D** | 25 | **16,000 D** | – | 5 U | 5 U |
| | 6/16/2003 | 100 U | 100 U | 100 U | **3,000** | 100 U | **4,800** | – | 100 U | 100 U |
| | 9/2/2003 | 25 U | 25 U | 25 U | **260** | 25 U | **1,700** | – | 25 U | 25 U |
| | 12/8/2003 | 30 U | 30 U | 30 U | **300** | 30 U | **1,300** | – | 30 U | 30 U |
| | 12/19/2003 | 20 UJ | 20 UJ | 5 U | **510 J** | 20 UJ | **2,200 J** | – | 5 U | 5 U |
| | 12/19/2003 | 5 U | 5 U | 20 UJ | **470** | 5 U | **2,000 J** | – | 20 UJ | 20 UJ |
| | 2/2/2004 | 20 U | 20 U | 20 U | **4,000** | 20 U | **5,400** | – | 20 U | 20 U |
| | 5/10/2004 | 50 U | 50 U | 50 U | **3,600** | 50 U | **4,500 JL** | – | 50 U | 50 U |
| | 8/2/2004 | 50 U | 50 U | 50 U | **2,200** | 50 U | **7,000 J** | – | 50 U | 50 U |
| | 11/1/2004 | 1 U | 1 U | 1 U | **280** | 1 U | **2,900** | – | 1 U | 1 U |
| | 11/1/2004 | 50 U | 50 U | 50 U | **260** | 50 U | **2,800** | – | 50 U | 50 U |
| | 2/1/2005 | 50 UJ | 50 UJ | 50 UJ | **280 J** | 50 UJ | **2,000 J** | – | 50 UJ | 50 UJ |
| **MTCA Cleanup Levels for Groundwater** | | 5[3] | 5[3] | 0.0729 | 80[4] | 160[4] | 0.2[3] | 0.2[3] | 800[4] | 5[3] |

**Table 3**
**Summary of HVOCs in Groundwater**
**Jorgensen Forge Facility**
**8531 East Marginal Way**
**Seattle, Washington**
**Farallon PN: 394-001**

| Sample Location | Sample Date | Analytical Results (micrograms per liter) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | PCE[1] | TCE[1] | 1,1-Dichloroethene[1] | cis-1,2-Dichloroethene[1] | trans-1,2-Dichloroethene[1] | Vinyl Chloride[1] | Vinyl Chloride[2] | 1,1-Dichloroethane[1] | 1,2-Dichloroethane[1] |
| PL2-JF01B | 3/31/1995 | 1 U | 1 U | 1 U | 1 U | 1 U | 2 U | **0.43** | 1 U | 1 U |
| | 9/27/1995 | 1 U | 1 U | 1 U | 1 U | 1 U | 2 U | **0.32** | 1 U | 1 U |
| | 11/17/1995 | 1 U | 1 U | 1 U | 1 U | 1 U | 2 U | **0.3** | 1 U | 1 U |
| | 3/1/1996 | 1 U | 1 U | 1 U | 1 U | 1 U | 2 U | — | 1 U | 1 U |
| | 5/23/1996 | 1 U | 1 U | 1 U | 1 U | 1 U | 2 U | — | 1 U | 1 U |
| | 8/26/1996 | 1 U | 1 U | 1 U | 1 U | 1 U | 2 U | — | 1 U | 1 U |
| | 11/21/1996 | 1 U | 1 U | 1 U | 1 U | 1 U | 2 U | — | 1 U | 1 U |
| | 4/26/2001 | 1 U | 1 U | 1 U | 68 | 1 U | **130 J** | — | 1 U | 1 U |
| | 7/25/2001 | 2 U | 2 U | 2 U | **170** | 2 U | **170** | — | 2.1 | 2 U |
| | 10/24/2001 | 1 U | 1 U | 1 U | **150** | 1 U | **190 D** | — | 1.8 | 1 U |
| | 1/21/2002 | 1 U | 1 U | 1 U | **100** | 1 U | **150** | — | 2 | 1 U |
| | 6/16/2003 | 1 U | 1 U | 1 U | 38 | 1 U | **57** | — | 1 U | 1 U |
| | 9/2/2003 | 1 U | 1 U | 1 U | **540** | 2.2 | **240** | — | 1.6 | 1 U |
| | 12/8/2003 | 5 U | 5 U | 5 U | **460** | 5 U | **120** | — | 5 U | 5 U |
| | 12/19/2003 | 5 U | 5 U | 5 U | **380** | 5 U | **170 J** | — | 5 U | 5 U |
| | 2/2/2004 | 5 U | 5 U | 5 U | **220** | 5 U | **100** | — | 5 U | 5 U |
| | 5/10/2004 | 1 U | 1 U | 1 U | **130** | 1 U | **13 JL** | — | 1 | 1 U |
| | 8/2/2004 | 1 U | 1 U | 1 U | **160** | 1 U | **38 J** | — | 1.1 | 1 U |
| | 11/1/2004 | 1 U | 1 U | 1 U | **81** | 1 U | **62** | — | 1.2 | 1 U |
| | 2/1/2005 | 1 UJ | 1 UJ | 1 UJ | 41 J | 1 UJ | **87 J** | — | 1.1 J | 1 UJ |
| PL2-JF01C | 5/17/2001 | 1 UJ | 1 UJ | 1 UJ | 1 UJ | 1 UJ | 1 UJ | — | 1 UJ | 1 UJ |
| | 7/25/2001 | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | — | 1 U | 1 U |
| | 10/24/2001 | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | — | 1 U | 1 U |
| | 1/21/2002 | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | — | 1 U | 1 U |
| | 6/16/2003 | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | — | 1 U | 1 U |
| | 12/8/2003 | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | — | 1 U | 1 U |
| | 12/19/2003 | 0.2 UJ | 0.2 UJ | 0.2 UJ | 0.2 UJ | 0.2 UJ | 0.2 UJ | — | 0.2 UJ | 0.2 UJ |
| | 5/10/2004 | 1 U | 1 U | 1 U | 1 U | 1 U | 1 UJL | — | 1 U | 1 U |
| | 11/1/2004 | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | — | 1 U | 1 U |
| **MTCA Cleanup Levels for Groundwater** | | **5**[3] | **5**[3] | **0.0729** | **80**[4] | **160**[4] | **0.2**[3] | **0.2**[3] | **800**[4] | **5**[3] |

**Table 3**
**Summary of HVOCs in Groundwater**
**Jorgensen Forge Facility**
**8531 East Marginal Way**
**Seattle, Washington**
**Farallon PN: 394-001**

| Sample Location | Sample Date | Analytical Results (micrograms per liter) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | PCE[1] | TCE[1] | 1,1-Dichloroethene[1] | cis-1,2-Dichloroethene[1] | trans-1,2-Dichloroethene[1] | Vinyl Chloride[1] | Vinyl Chloride[2] | 1,1-Dichloroethane[1] | 1,2-Dichloroethane[1] |
| PL2-JF02A | 9/27/1995 | 1 U | 1 U | 1 U | 1 U | 1 U | 2 U | **1.3** | 1 U | 1 U |
| | 11/17/1995 | 1 U | 1.2 | 1 U | 1 U | 1 U | 2 U | **0.44** | 1 U | 1 U |
| | 3/1/1996 | 1 U | 1 U | 1 U | 1 U | 1 U | 2 U | — | 1 U | 1 U |
| | 5/23/1996 | 1 U | 1 U | 1 U | 1 U | 1 U | 2 U | — | 1 U | 1 U |
| | 8/26/1996 | 1 U | 1 U | 1 U | 1 U | 1 U | 2 U | — | 1 U | 1 U |
| | 11/21/1996 | 1 U | 1.6 | 1 U | 1 U | 1 U | 2 U | — | 1 U | 1 U |
| | 11/21/1996 | 1 U | 1.5 | 1 U | 1 U | 1 U | 2 U | — | 1 U | 1 U |
| | 4/26/2001 | 1 U | 1 U | 1 U | 1 U | 1 U | **1.2 J** | — | 1 U | 1 U |
| | 7/25/2001 | 1 U | 1 U | 1 U | 1 U | 1 U | **3.3** | — | 1 U | 1 U |
| | 10/24/2001 | 1 U | 1 U | 1 U | 1 U | 1 U | **5.8** | — | 1 U | 1 U |
| | 1/21/2002 | 1 U | 1 U | 1 U | 1 U | 1 U | **2.5** | — | 1 U | 1 U |
| | 6/16/2003 | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | — | 1 U | 1 U |
| | 9/2/2003 | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | — | 1 U | 1 U |
| | 12/8/2003 | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | — | 1 U | 1 U |
| | 2/2/2004 | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | — | 1 U | 1 U |
| | 5/10/2004 | 1 U | 1 U | 1 U | 1 U | 1 U | 1 UJL | — | 1 U | 1 U |
| | 8/2/2004 | 1 U | 1 U | 1 U | 1 U | 1 U | 1 UJ | — | 1 U | 1 U |
| | 11/1/2004 | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | — | 1 U | 1 U |
| | 2/1/2005 | 1 UJ | 1 UJ | 1 UJ | 1 UJ | 1 UJ | 1 UJ | — | 1 UJ | 1 UJ |
| **MTCA Cleanup Levels for Groundwater** | | 5[3] | 5[3] | 0.0729[4] | 80[4] | 160[4] | 0.2[3] | 0.2[3] | 800[4] | 5[3] |

NOTES:
**Bold** indicates sample result exceeds the Washington State Department of Ecology Model Toxics Control Act Cleanup Regulation (MTCA) Cleanup Level for Groundwater.
[1]Analyzed using U.S. Environmental Protection Agency (EPA) Method 8260.
[2]Analyzed using EPA Method 8260 SIM.
[3]MTCA Cleanup Regulation Method A Groundwater Cleanup Level, Chapter 173-340 of the Washington Administrative Code, as amended February 2001.
[4]MTCA Cleanup Levels and Risk Calculations (CLARC) Standard Method B Formula Values, Version 3.1, updated November 2001.

— = not analyzed
D = the reported result for this analyte was calculated based on a secondary dilution factor
HVOCs = halogenated volatile organic compounds
J = the analyte was analyzed for and positively identified, but the associated numerical value is an estimated quantity
L = denotes value less than max shown
PCE = tetrachloroethene
TCE = trichloroethene
U = no detectable concentrations above the listed laboratory practical quantitation limit

**Table 4**
**Summary of HVOCs in LNAPL**
**Jorgensen Forge Facility**
**8531 East Marginal Way South**
**Seattle, Washington**
**Farallon PN: 394-001**

| Sample Location | Sample Date | Analytical Results (milligrams per liter)[1] | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | PCE | TCE | 1,1-Dichloroethene | cis-1,2-Dichloroethene | trans-1,2-Dichloroethene | Vinyl Chloride | 1,1-Dichloroethane | 1,2-Dichloroethane |
| MW-16 | 9/14/1992 | 0.10 U | 0.02 U | 0.02 U | 0.02 U | 0.02 U | 0.02 U | 0.02 U | 0.02 U |
| | 12/29/2004[2] | 3.86 U | 3.86 U | 3.86 U | 3.86 U | 3.86 U | 3.86 U | 3.86 U | 3.86 U |
| MW-18 | 12/8/1992 | 0.2 U | 0.2 U | 0.2 U | 0.2 U | 0.2 U | 0.2 U | 0.2 U | 0.2 U |
| MW-19 | 9/3/1992 | 0.02 U | 0.02 U | 0.02 U | 0.02 U | 0.02 U | 0.02 U | 0.02 U | 0.02 U |
| | 12/29/2004[2] | 3.94 U | 3.94 U | 3.94 U | 3.94 U | 3.94 U | 3.94 U | 3.94 U | 3.94 U |
| MW-20 | 9/3/1992 | 27 | 0.02 U | 0.02 U | 0.02 U | 20 U | 20 U | 20 U | 20 U |
| | 12/29/2004[2] | 4 U | 4 U | 4 U | 4 U | 4 U | 4 U | 4 U | 4 U |
| MW-21 | 9/3/1992 | 8 | 0.02 U | 0.02 U | 0.02 U | 0.02 U | 0.02 U | 0.02 U | 0.02 U |
| MW-22 | 12/29/2004[2] | 3.81 U | 3.81 U | 3.81 U | 3.81 U | 3.81 U | 3.81 U | 3.81 U | 3.81 U |
| MW-28 | 12/29/2004[2] | 0.4 U | 0.4 U | 0.4 U | 0.4 U | 0.4 U | 0.4 U | 0.4 U | 0.4 U |

NOTES:

[1]Analyzed using U.S. Environmental Protection Agency Method 8260/8260B.

[2]Results in milligrams per kilogram.

HVOCs = halogenated volatile organic compounds

LNAPL = light nonaqueous-phase liquid

PCE = tetrachloroethene

TCE = trichloroethene

U = no detectable concentrations above the listed laboratory practical quantitation limits

**Table 5A**
**Summary of Total and Dissolved Metals in Groundwater**
**Jorgensen Forge Facility**
**8531 East Marginal Way South**
**Seattle, Washington**
**Farallon PN: 831-003**

| **Sample Location** | **Sample Date** | **Analytical Results (micrograms per liter)** | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | **Aluminum** | | **Antimony** | | **Arsenic** | | **Barium** | | **Beryllium** | | **Cadmium** | | **Calcium** | | **Chromium** | | **Cobalt** | | **Copper** | | **Iron** | | **Lead** | |
| | | **Total** | **Dissolved** | **Total** | **Dissolved** | **Total** | **Dissolved** | **Total** | **Dissolved** | **Total** | **Dissolved** | **Total** | **Dissolved** | **Total** | **Dissolved** | **Total** | **Dissolved** | **Total** | **Dissolved** | **Total** | **Dissolved** | **Total** | **Dissolved** | **Total** | **Dissolved** |
| MW-1/2 | 03/02/90 | — | — | — | — | **3** | — | 407 | — | — | — | **6** | — | — | — | 48 | — | — | — | — | — | — | — | 52 U | — |
| MW-9 | 03/24/92 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 110 | — | 2,500 | — | — | — |
| MW-23 | 11/20/92 | — | — | — | — | 50 U | — | 200 U | — | — | — | 25 U | — | — | — | 100 U | — | — | — | 100 U | — | 1,400 | — | 500 U | — |
| PL2-JF01AR | 05/17/01 | — | — | 2 UJ | 2 UJ | 0.5 U | 0.5 U | — | — | 0.2 U | 0.2 U | 2 U | 2 U | — | — | 5 U | 5 U | — | — | 2 | 0.5 U | — | — | 1 U | 1 U |
| | 07/25/01 | — | — | 2 U | 2 U | **0.7** | 0.5 U | — | — | 0.2 U | 0.2 U | 2 U | 2 U | — | — | 5 U | 5 U | — | — | 0.5 U | 0.5 U | — | — | 1 U | 1 U |
| | 10/24/01 | — | — | 2 U | 2 U | 0.5 U | 0.5 U | — | — | 0.2 U | 0.2 U | 2 U | 2 U | — | — | 5 U | 5 U | — | — | 0.5 | 0.5 U | — | — | 1 | 1 U |
| | 10/24/01 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| | 10/24/01 | — | — | 2 U | 2 U | **0.8** | 1 U | — | — | 0.2 U | 0.2 U | 2 U | 2 U | — | — | 5 U | 5 U | — | — | 0.6 | 0.5 | — | — | 1 U | 1 U |
| | 10/24/01 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| | 01/21/02 | — | — | 2 U | 2 U | **0.6** | **0.7** | — | — | 0.2 U | 0.2 U | 2 U | 2 U | — | — | 5 U | 5 U | — | — | 0.5 U | 0.5 | — | — | 1 U | 1 U |
| | 01/21/02 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| | 06/16/03 | — | — | 50 U | 50 U | 0.5 U | **0.4** | — | — | 0.2 U | 0.2 U | 2 U | 2 U | — | — | 5 U | 5 U | — | — | 0.5 U | 0.5 | — | — | 1 U | 1 U |
| | 09/02/03 | — | — | 2 U | 2 U | **0.4** | **0.4** | — | — | 0.2 U | 0.2 U | 2 U | 2 U | — | — | 5 U | 5 U | — | — | 0.9 | 0.9 | — | — | 1 U | 1 U |
| | 12/08/03 | — | — | 2 U | 2 U | **0.4** | **0.3** | — | — | 0.2 U | 0.2 U | 2 U | 2 U | — | — | 5 U | 5 U | — | — | 0.7 | 0.5 U | — | — | 1 U | 1 U |
| | 12/19/03 | — | — | 50 U | — | **0.3** | — | — | — | 1 U | — | 2 U | — | — | — | 5 U | — | — | — | 0.6 | — | — | — | 1 U | — |
| | 02/02/04 | — | — | 2 U | 2 U | **0.4** | 0.5 U | — | — | 0.2 U | 0.2 U | 2 U | 2 U | — | — | 6 | 8 | — | — | 1 | 0.5 | — | — | 1 U | 1 U |
| | 05/10/04 | — | — | 2 U | 2 U | **0.4** | **0.4** | — | — | 0.2 U | 0.2 U | 2 U | 2 U | — | — | 5 U | 5 U | — | — | 0.5 U | 0.5 U | — | — | 1 U | 1 U |
| | 08/02/04 | — | — | 2 U | 2 U | **0.4** | **0.4** | — | — | 0.2 U | 0.2 U | 2 U | 2 U | — | — | 5 U | 5 U | — | — | 0.5 U | 0.5 U | — | — | 1 U | 1 U |
| | 11/01/04 | — | — | 2 U | 2 UJ | 0.5 U | **0.8** | — | — | 0.2 U | 0.2 U | 2 U | 2 U | — | — | 5 U | 5 U | — | — | 0.7 U | 0.5 U | — | — | 1 U | 1 U |
| | 11/01/04 | — | — | 2 U | 2 UJ | 0.5 U | **0.7** | — | — | 0.2 U | 0.2 U | 2 U | 2 U | — | — | 5 U | 5 U | — | — | 0.6 U | 0.5 U | — | — | 1 U | 1 U |
| | 02/01/05 | — | — | 2 U | 2 U | **0.4** | 0.5 U | — | — | 0.2 U | 0.2 U | 2 U | 2 U | — | — | 5 U | 5 U | — | — | 0.5 | 0.5 U | — | — | 1 U | 1 U |
| PL2-JF01B | 03/31/95 | 30 | 20 U | 1 U | 1 U | 1 U | **1** | 17 J | 18 J | 1 U | 1 U | 2 U | 2 U | 18,200 | 18,400 | 5 U | 5 U | 3 U | 3 U | 2 U | 2 U | 13,100 | 13,200 | 1 U | 1 U |
| | 09/27/95 | 30 | — | 1 U | — | **2** | — | 22 | — | 1 U | — | 2 U | — | 23,900 | 23,900 | 5 U | — | 3 U | — | 2 U | — | 14,000 | 13,600 | 1 UB | — |
| | 11/17/95 | — | — | 1 U | — | 1 U | — | 22 | — | 1 U | — | 2 U | — | — | — | 5 U | — | — | — | 2 U | — | — | — | 1 | — |
| | 03/01/96 | — | — | 1 U | — | 1 U | — | 16 | — | 1 U | — | 2 U | — | — | — | 5 U | — | — | — | 2 U | — | — | — | 4 UB | — |
| | 05/23/96 | — | — | 1 U | — | **1** | — | 13 | — | 1 U | — | 2 U | — | — | — | 5 U | — | — | — | 2 U | — | — | — | 1 U | — |
| | 08/26/96 | — | — | 1 U | — | 1 U | — | 12 | — | 1 U | — | 2 U | — | — | — | 5 U | — | — | — | 2 U | — | — | — | 1 U | — |
| | 11/21/96 | — | — | 1 U | — | 1 U | — | 19 | — | 1 U | — | 2 U | — | — | — | 5 U | — | — | — | 2 U | — | — | — | 1 | — |
| | 04/26/01 | — | — | 2 UJ | 2 UJ | **1** | **1** | — | — | 0.2 U | 0.2 U | 2 U | 2 U | — | — | 5 U | 5 U | — | — | 2.5 B | 1.1 | — | — | 1 U | 1 U |
| | 04/26/01 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| | 07/25/01 | — | — | 2 U | 2 U | 1 U | 1 U | — | — | 0.5 U | 0.4 U | 2 U | 2 U | — | — | 5 U | 5 U | — | — | 3 | 1 | — | — | 2 U | 2 U |
| | 10/24/01 | — | — | 2 U | 2 U | **2.9** | 2 U | — | — | 0.2 U | 0.2 U | 2 U | 2 U | — | — | 5 U | 5 U | — | — | 1.5 | 1.2 | — | — | 1 U | 1 U |
| | 10/24/01 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| | 01/21/02 | — | — | 2 U | 2 U | **2** | **1** | — | — | 0.5 U | 0.4 U | 2 U | 2 U | — | — | 5 U | 5 U | — | — | 1 | 1 | — | — | 2 U | 2 U |
| | 01/21/02 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| | 06/16/03 | — | — | 50 U | 50 U | 0.5 U | 0.5 U | — | — | 0.2 U | 0.2 U | 2 U | 2 U | — | — | 5 U | 5 U | — | — | 1.8 | 0.8 | — | — | 1 U | 1 U |
| | 09/02/03 | — | — | 2 U | 2 U | **2.2** | **3.5** | — | — | 0.2 U | 0.2 U | 2 U | 2 U | — | — | 5 U | 5 U | — | — | 1.7 | 1.5 | — | — | 1 U | 1 U |
| | 12/08/03 | — | — | 2 U | 2 U | 1 U | 1 U | — | — | 0.5 U | 0.5 U | 2 U | 2 U | — | — | 5 U | 5 U | — | — | 1 U | 1 U | — | — | 2 U | 2 U |
| | 12/19/03 | — | — | 50 U | — | **1.6** | — | — | — | 1 U | — | 2 U | — | — | — | 5 U | — | — | — | 3 | — | — | — | 2 U | — |
| | 02/02/04 | — | — | 2 U | 2 U | **1** | 0.5 U | — | — | 0.2 U | 0.2 U | 2 U | 2 U | — | — | 5 U | 5 U | — | — | 4.4 | 1.7 | — | — | 1 U | 1 U |
| | 05/10/04 | — | — | 2 | 2 U | 1 U | 1 U | — | — | 0.5 U | 0.5 U | 4 U | 4 U | — | — | 10 U | 10 U | — | — | 2 | 1 U | — | — | 2 U | 2 U |
| | 08/02/04 | — | — | 2 U | 2 U | **0.7** | **1.3** | — | — | 0.2 U | 0.2 U | 2 U | 2 U | — | — | 5 U | 5 U | — | — | 2 U | 1.4 U | — | — | 1 U | 1 U |
| | 11/01/04 | — | — | 4 U | 4 UJ | **2.2** | **2.4** | — | — | 0.5 U | 0.5 U | 2 U | 2 U | — | — | 5 U | 5 U | — | — | 2 | 2 | — | — | 2 U | 2 U |
| | 02/01/05 | — | — | 2 U | 2 U | 1 U | 1 U | — | — | 0.2 U | 0.2 U | 2 U | 2 U | — | — | 5 U | 5 U | — | — | 2 | 2 | — | — | 2 U | 2 U |
| **MTCA Method A Groundwater Cleanup Levels[1]** | | **NE** | | **NE** | | **5** | | **NE** | | **NE** | | **5** | | **NE** | | **50** | | **NE** | | **NE** | | **NE** | | **15** | |
| **MTCA Method B Groundwater Cleanup Levels2** | | **NE** | | **6** | | **0.0583** | | **560** | | **32** | | **8** | | **NE** | | **48** | | **NE** | | **592** | | **NE** | | **NE** | |

**Table 5A**
**Summary of Total and Dissolved Metals in Groundwater**
**Jorgensen Forge Facility**
**8531 East Marginal Way South**
**Seattle, Washington**
**Farallon PN: 831-003**

| Sample Location | Sample Date | Analytical Results (micrograms per liter) | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Aluminum | | Antimony | | Arsenic | | Barium | | Beryllium | | Cadmium | | Calcium | | Chromium | | Cobalt | | Copper | | Iron | | Lead | |
| | | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Dissolved |
| PL2-JF01C | 05/17/01 | — | — | 2 UJ | 2 UJ | **8** | 4 | — | — | 1 U | 1 U | 4 U | 4 U | — | — | 10 | 10 U | — | — | 30 | 2 U | — | — | 5 U | 5 U |
| | 07/25/01 | — | — | 2 U | 4 U | **3** | 2 U | — | — | 1 U | 1 U | 2 U | 2 U | — | — | 8 | 5 U | — | — | 23 | 2 U | — | — | 5 U | 5 U |
| | 10/24/01 | — | — | 10 U | 10 U | **10** | **6** | — | — | 1 U | 1 U | 2 U | 2 U | — | — | 5 U | 5 U | — | — | 14 | 3 | — | — | 5 U | 5 U |
| | 10/24/01 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| | 01/21/02 | — | — | 10 U | 10 U | 5 U | **6** | — | — | 2 U | 2 U | 2 U | 2 U | — | — | 5 U | 5 U | — | — | 15 | 5 U | — | — | 10 U | 10 U |
| | 01/21/02 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| | 06/16/03 | — | — | 100 U | 100 U | **6** | **3** | — | — | 1 U | 1 U | 4 U | 4 U | — | — | 10 U | 10 U | — | — | 36 | 2 U | — | — | 5 U | 5 U |
| | 12/08/03 | — | — | 10 U | 10 U | **2.78** | **0.363** | — | — | 1 U | 1 U | 4 U | 4 U | — | — | 10 | 10 U | — | — | 28 | 2 U | — | — | 5 U | 5 U |
| | 12/08/03 | — | — | — | — | **4** | 2 U | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 5 U | 1 U |
| | 12/19/03 | — | — | 100 U | — | **4** | — | — | — | 2 U | — | 4 U | | — | — | 10 U | — | — | — | 3 | — | — | — | 5 U | — |
| | 11/01/04 | — | — | 10 U | 20 UJ | — | — | — | — | 1 U | 1 U | 4 U | 4 U | — | — | 10 U | 10 U | — | — | 20 | 4 | — | — | 6 | 5 U |
| | 11/03/04 | — | — | — | — | **0.4** | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| PL2-JF02A | 09/27/95 | 50 | — | 1 U | — | **5** | — | 21 | — | 1 U | — | 2 U | — | 32,000 | 32,600 | 5 U | — | 3 U | — | 2 U | — | 4,630 | 5,000 | 2 UB | — |
| | 11/17/95 | — | — | 1 U | — | **2** | — | 10 | — | 1 U | — | 2 U | — | — | — | 5 U | — | — | — | 2 U | — | — | — | 1 | — |
| | 03/01/96 | — | — | 1 U | — | **4** | — | 14 | — | 1 U | — | 2 U | — | — | — | 5 U | — | — | — | 2 U | — | — | — | 1 U | — |
| | 05/23/96 | — | — | 1 U | — | **4** | — | 6 | — | 1 U | — | 2 U | — | — | — | 5 U | — | — | — | 2 U | — | — | — | 1 U | — |
| | 08/26/96 | — | — | 1 U | — | **4** | — | 9 | — | 1 U | — | 2 U | — | — | — | 5 U | — | — | — | 2 U | — | — | — | 1 | — |
| | 11/21/96 | — | — | 1 U | — | **2** | — | 3 | — | 1 U | — | 2 U | — | — | — | 5 U | — | — | — | 2 U | — | — | — | 1 U | — |
| | 11/21/96 | — | — | 1 U | — | **2** | — | 4 | — | 1 U | — | 2 U | — | — | — | 5 U | — | — | — | 2 U | — | — | — | 1 U | — |
| | 04/26/01 | — | — | 2 UJ | 2 UJ | **0.7** | **0.4** | — | — | 0.2 U | 0.2 U | 2 U | 2 U | — | — | 5 U | 5 U | — | — | 4.6 B | 0.6 | — | — | 1 U | 1 U |
| | 04/26/01 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| | 07/25/01 | — | — | 2 U | 2 U | **0.9** | **0.7** | — | — | 0.2 U | 0.2 U | 2 U | 2 U | — | — | 5 U | 5 U | — | — | 0.7 | 0.5 U | — | — | 1 U | 1 U |
| | 10/24/01 | — | — | 2 U | 2 U | 0.5 U | 0.5 U | — | — | 0.2 U | 0.2 U | 2 U | 2 U | — | — | 5 U | 5 U | — | — | 0.5 U | 0.5 U | — | — | 1 U | 1 U |
| | 10/24/01 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| | 01/21/02 | — | — | 2 U | 2 U | **3.8** | **3.9** | — | — | 0.2 U | 0.2 U | 2 U | 2 U | — | — | 5 U | 5 U | — | — | 1.7 | 1.5 | — | — | 1 U | 1 U |
| | 01/21/02 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| | 06/16/03 | — | — | 50 U | 50 U | 0.5 U | **0.5** | — | — | 0.2 U | 0.2 U | 2 U | 2 U | — | — | 5 U | 5 U | — | — | 0.9 | 1 | — | — | 1 U | 1 U |
| | 09/02/03 | — | — | 2 U | 2 U | 0.5 U | **0.8** | — | — | 0.2 U | 0.2 U | 2 U | 2 U | — | — | 5 U | 5 U | — | — | 1.1 | 0.8 | — | — | 1 U | 1 U |
| | 12/08/03 | — | — | 2 U | 2 U | **1** | **0.8** | — | — | 0.2 U | 0.2 U | 2 U | 2 U | — | — | 5 U | 5 U | — | — | 0.9 | 0.6 | — | — | 1 U | 1 U |
| | 02/02/04 | — | — | 2 U | 2 U | **1.4** | **0.8** | — | — | 0.2 U | 0.2 U | 2 U | 2 U | — | — | 6 | 6 | — | — | 1.2 | 0.7 | — | — | 1 U | 1 U |
| | 05/10/04 | — | — | 2 | 2 U | **1.1** | **0.6** | — | — | 0.2 U | 0.2 U | 2 U | 2 U | — | — | 5 U | 5 U | — | — | 1.3 | 0.5 U | — | — | 1 U | 1 U |
| | 08/02/04 | — | — | 2 U | 2 U | **1.1** | **1** | — | — | 0.2 U | 0.2 U | 2 U | 2 U | — | — | 5 U | 5 U | — | — | 1.6 | 0.7 | — | — | 1 U | 1 U |
| | 11/01/04 | — | — | 2 U | 2 UJ | **1.3** | **0.4** | — | — | 0.2 U | 0.2 U | 2 U | 2 U | — | — | 5 U | 5 U | — | — | 1 U | 0.5 U | — | — | 1 U | 1 U |
| | 02/01/05 | — | — | 2 U | 2 U | **1.1** | **0.3** | — | — | 0.2 U | 0.2 U | 2 U | 2 U | — | — | 5 U | 5 U | — | — | 1.1 | 0.5 U | — | — | 1 U | 1 U |
| **MTCA Method A Groundwater Cleanup Levels[1]** | | **NE** | | **NE** | | **5** | | **NE** | | **NE** | | **5** | | **NE** | | **50** | | **NE** | | **NE** | | **NE** | | **15** | |
| **MTCA Method B Groundwater Cleanup Levels[2]** | | **NE** | | **6** | | **0.0583** | | **560** | | **32** | | **8** | | **NE** | | **48** | | **NE** | | **592** | | **NE** | | **NE** | |

NOTES:
**Bold** indicates sample result or reporting limit exceeds the MTCA Method A Groundwater Cleanup Level.
[1]Table 720-1 Model Toxics Control Act (MTCA) Cleanup Regulation Chapter 173-340 of the Washington Administrative Code (WAC) amended February 12, 2001.
[2]MTCA Cleanup Levels and Risk Calculations November 2001.

— = not analyzed
J = denotes result reported is an estimate
NE = not established
U = no detectable concentrations above the listed laboratory practical quantitation limit
UB = the analyte was qualified as undetected due to blank contamination

**Table 5B**
**Summary of Total and Dissolved Metals in Groundwater**
**Jorgensen Forge Facility**
**8531 East Marginal Way South**
**Seattle, Washington**
**Farallon PN: 831-003**

| Sample Location | Sample Date | Analytical Results (micrograms per liter)[1] | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Lead | Magnesium | | Manganese | | Mercury[2] | | Nickel | | Potassium | | Selenium | | Silver | | Sodium | | Thallium | | Vanadium | | Zinc | |
| | | Dissolved | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Dissolved |
| MW-1/2 | 03/02/90 | — | — | — | — | — | 0.2 | — | — | — | — | — | 0.3 | — | 10 U | — | — | — | — | — | — | — | — | — |
| MW-9 | 03/24/92 | — | — | — | 1,400 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 90 | — |
| MW-23 | 11/20/92 | — | — | — | 600 | — | 500 U | — | — | — | — | — | 500 U | — | 100 U | — | — | — | — | — | — | — | 100 U | — |
| PL2-JF01AR | 05/17/01 | 1 U | — | — | — | — | 0.000917 | 0.000401 J | 1.2 | 0.8 | — | — | 50 U | 50 U | 0.5 UJ | 0.5 UJ | — | — | 0.2 U | 0.2 U | 19 | 21 | 8 | 6 UJ |
| | 07/25/01 | 1 U | — | — | — | — | 0.000544 J | 0.000588 J | 0.8 | 0.7 | — | — | 50 U | 50 U | 0.5 U | 0.5 U | — | — | 0.2 U | 0.2 U | 20 | 21 | 6 U | 6 U |
| | 10/24/01 | 1 U | — | — | — | — | 0.1 U | 0.1 U | 1.3 | 1 | — | — | 50 U | 50 U | 0.6 | 0.5 U | — | — | 0.2 U | 0.2 U | 11 | 13 | 6 U | 6 U |
| | 10/24/01 | — | — | — | — | — | 0.000345 J | 0.000234 J | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| | 10/24/01 | 1 U | — | — | — | — | 0.1 U | 0.1 U | 1.2 | 1.1 | — | — | 50 U | 50 U | 0.5 U | 0.5 U | — | — | 0.2 U | 0.2 U | 11 | 12 | 6 U | 6 U |
| | 10/24/01 | — | — | — | — | — | 0.000334 J | 0.000296 J | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| | 01/21/02 | 1 U | — | — | — | — | 0.000227 J | 0.000254 J | 1.6 | 1.3 | — | — | 50 U | 50 U | 0.5 U | 2 U | — | — | 0.2 U | 0.2 U | 10 | 11 | 6 U | 6 U |
| | 01/21/02 | — | — | — | — | — | 0.1 U | 0.1 U | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| | 06/16/03 | 1 U | — | — | — | — | 0.025 U | 0.025 U | 0.8 | 0.8 | — | — | 2 U | 0.9 | 0.5 U | 0.5 U | — | — | 0.2 U | 0.2 U | 13 | 13 | 6 U | 6 U |
| | 09/02/03 | 1 U | — | — | — | — | 0.025 U | 0.025 U | 1.2 | 0.9 | — | — | 0.8 | 0.8 | 0.5 U | 0.5 U | — | — | 0.2 U | 0.2 U | 13 | 13 | 4 | 6 |
| | 12/08/03 | 1 U | — | — | — | — | 0.025 U | 0.025 U | 0.9 | 0.8 | — | — | 50 U | 50 U | 0.5 U | 0.5 U | — | — | 0.2 U | 0.2 U | 16 | 15 | 6 U | 6 U |
| | 12/19/03 | — | — | — | — | — | 0.025 U | — | 0.7 | — | — | — | 50 U | — | 0.5 U | — | — | — | 50 U | — | 16 | — | 6 U | — |
| | 02/02/04 | 1 U | — | — | — | — | 0.025 U | 0.025 U | 1.1 | 1.1 | — | — | 50 U | 50 U | 0.5 U | 0.5 U | — | — | 0.2 U | 0.2 U | 14 | 14 | 6 U | 6 U |
| | 05/10/04 | 1 U | — | — | — | — | 0.025 U | 0.025 U | 1.1 | 1 | — | — | 50 U | 50 U | 0.5 U | 0.5 U | — | — | 0.2 U | 0.2 U | 19 | 19 | 6 U | 6 U |
| | 08/02/04 | 1 U | — | — | — | — | 0.025 U | 0.025 U | 1.2 | 1 | — | — | 50 U | 50 U | 0.2 U | 0.2 U | — | — | 0.2 U | 0.2 U | 15 | 13 | 6 U | 6 U |
| | 11/01/04 | 1 U | — | — | — | — | 0.025 U | 0.025 U | 2.6 | 2.4 | — | — | 50 U | 50 U | 0.2 U | 0.2 U | — | — | 0.2 U | 0.2 U | 14 | 13 | 6 U | 6 U |
| | 11/01/04 | 1 U | — | — | — | — | 0.025 U | 0.025 U | 2.5 | 2.4 | — | — | 50 U | 50 U | 0.2 U | 0.2 U | — | — | 0.2 U | 0.2 U | 13 | 13 | 6 U | 6 |
| | 02/01/05 | 1 U | — | — | — | — | 0.025 U | 0.025 U | 1 | 0.9 | — | — | 50 U | 50 U | 0.2 U | 0.2 U | — | — | 0.2 U | 0.2 U | 17 | 15 | 7 | 6 U |
| PL2-JF01B | 03/31/95 | 1 U | 15,100 | 15,100 | 508 | 511 | 0.1 U | 0.1 U | 10 U | 10 U | 14,800 | 14,500 | 50 U | 50 U | 3 U | 3 U | 255,000 | 255,000 | 50 U | 50 U | 8 | 7 | 4 U | 4 U |
| | 09/27/95 | — | 28,000 | 28,400 | 540 | 531 | 0.1 U | — | 10 U | — | 19,300 | 19,600 | 50 U | — | 3 U | — | 372,000 | 377,000 | 50 U | — | 7 | — | 4 U | — |
| | 11/17/95 | — | — | — | — | — | 0.1 U | — | 10 U | — | — | — | 50 U | — | 3 U | — | — | — | 50 U | — | — | — | 4 U | — |
| | 03/01/96 | — | — | — | — | — | 0.1 U | — | 10 U | — | — | — | 50 U | — | 3 U | — | — | — | 50 U | — | — | — | 4 U | — |
| | 05/23/96 | — | — | — | — | — | 0.1 U | — | 10 U | — | — | — | 50 U | — | 3 U | — | — | — | 50 U | — | — | — | 4 U | — |
| | 08/26/96 | — | — | — | — | — | 0.1 U | — | 10 U | — | — | — | 50 U | — | 3 U | — | — | — | 50 U | — | — | — | 4 U | — |
| | 11/21/96 | — | — | — | — | — | 0.1 U | — | 10 U | — | — | — | 50 U | — | 3 U | — | — | — | 50 U | — | — | — | 4 U | — |
| | 04/26/01 | 1 U | — | — | — | — | 0.0002 U | 0.1 U | 1.8 | 2.6 | — | — | 50 U | 50 U | 0.5 UJ | 0.5 UJ | — | — | 0.2 U | 0.2 U | 4 | 4 | 6 UJ | 6 UJ |
| | 04/26/01 | — | — | — | — | — | 0.1 U | 0.0002 U | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| | 07/25/01 | 2 U | — | — | — | — | 0.0002 UJ | 0.0002 UJ | 7 | 2 | — | — | 50 | 60 | 1 U | 1 U | — | — | 0.5 U | 0.4 U | 3 | 6 | 6 U | 6 U |
| | 10/24/01 | 1 U | — | — | — | — | 0.1 U | 0.0002 U | 3.4 | 2.2 | — | — | 50 | 50 U | 0.5 U | 0.5 U | — | — | 0.2 U | 0.2 U | 3 U | 3 U | 6 U | 6 U |
| | 10/24/01 | — | — | — | — | — | 0.000274 J | 0.1 U | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| | 01/21/02 | 2 U | — | — | — | — | 0.0002 U | 0.1 U | 3 | 2 | — | — | 50 | 50 U | 2 | 1 U | — | — | 0.5 U | 0.4 U | 4 | 3 | 6 U | 6 U |
| | 01/21/02 | — | — | — | — | — | 0.1 U | 0.000234 J | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| | 06/16/03 | 1 U | — | — | — | — | 0.025 U | 0.025 U | 3 | 1.6 | — | — | 2 | 3 | 0.5 U | 0.5 U | — | — | 0.2 U | 0.2 U | 4 | 3 | 6 U | 6 U |
| | 09/02/03 | 1 U | — | — | — | — | 0.025 U | 0.025 U | 3.4 | 6.1 | — | — | 1.9 | 1.4 | 0.5 U | 0.5 U | — | — | 0.2 U | 0.2 U | 3 U | 3 U | 4 U | 4 U |
| | 12/08/03 | 2 U | — | — | — | — | 0.025 U | 0.025 U | 3 | 2 | — | — | 50 U | 50 U | 1 U | 1 U | — | — | 0.5 U | 0.5 U | 3 | 3 | 6 U | 6 U |
| | 12/19/03 | — | — | — | — | — | 0.025 U | — | 3 | — | — | — | 50 U | — | 1 U | — | — | — | 50 U | — | 5 | — | 16 | — |
| | 02/02/04 | 1 U | — | — | — | — | 0.025 U | 0.025 U | 3.7 | 2.4 | — | — | 50 U | 50 U | 0.5 U | 0.5 U | — | — | 0.2 U | 0.2 U | 9 | 3 U | 9 | 6 U |
| | 05/10/04 | 2 U | — | — | — | — | 0.0365 | 0.025 U | 4 | 4 | — | — | 100 U | 100 U | 1 U | 1 U | — | — | 0.5 U | 0.5 U | 6 U | 6 U | 10 U | 10 U |
| | 08/02/04 | 1 U | — | — | — | — | 0.025 U | 0.025 U | 4.6 | 3.2 | — | — | 50 U | 50 U | 0.2 U | 0.2 U | — | — | 0.2 U | 0.2 U | 3 | 3 U | 6 U | 6 U |
| | 11/01/04 | 2 U | — | — | — | — | 0.025 U | 0.025 U | 6 | 5 | — | — | 50 U | 50 U | 0.5 U | 0.5 U | — | — | 0.5 U | 0.5 U | 4 | 4 | 6 U | 6 |
| | 02/01/05 | 2 U | — | — | — | — | 0.025 U | 0.025 U | 3 | 3 | — | — | 50 U | 50 U | 0.5 U | 0.4 U | — | — | 0.5 U | 0.4 U | 3 U | 3 U | 6 U | 6 U |
| **MTCA Method A Groundwater Cleanup Levels[3]** | | **15** | **NE** | | **NE** | | **2** | | **NE** | | **NE** | | **NE** | | **NE** | | **NE** | | **NE** | | **NE** | | **NE** | |
| **MTCA Method B Groundwater Cleanup Levels[4]** | | **NE** | **NE** | | **2,240** | | **4.8** | | **320** | | **NE** | | **80** | | **80** | | **NE** | | **1.12** | | **112** | | **4,800** | |

**Table 5B**
**Summary of Total and Dissolved Metals in Groundwater**
**Jorgensen Forge Facility**
**8531 East Marginal Way South**
**Seattle, Washington**
**Farallon PN: 831-003**

| Sample Location | Sample Date | Analytical Results (micrograms per liter)[1] | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Lead | Magnesium | | Manganese | | Mercury[2] | | Nickel | | Potassium | | Selenium | | Silver | | Sodium | | Thallium | | Vanadium | | Zinc | |
| | | Dissolved | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Dissolved |
| PL2-JF01C | 05/17/01 | 5 U | — | — | — | — | 0.0248 | 0.0002 U | 15 | 5 | — | — | **110** | **120** | 2 UJ | 2 UJ | — | — | 1 U | 1 U | 34 | 6 U | 130 | 60 |
| | 07/25/01 | 5 U | — | — | — | — | 0.0224 J | 0.0002 UJ | 13 | 6 | — | — | 50 U | 70 | 2 U | 2 U | — | — | 1 U | 1 U | 22 | 5 | 48 | 6 U |
| | 10/24/01 | 5 U | — | — | — | — | 0.0082 | 0.00045 J | 9 | 6 | — | — | **90** | **90** | 2 U | 5 U | — | — | 1 U | 1 U | 17 | 3 | 18 | 6 U |
| | 10/24/01 | — | — | — | — | — | 0.1 U | 0.1 UJ | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| | 01/21/02 | 10 U | — | — | — | — | 0.0114 | 0.0002 U | 10 | 7 | — | — | 50 U | 50 U | 5 U | 5 U | — | — | 2 U | 2 U | 18 | 4 | 20 | 6 U |
| | 01/21/02 | — | — | — | — | — | 0.1 U | 0.1 U | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| | 06/16/03 | 5 U | — | — | — | — | 0.025 U | 0.025 U | 16 | 5 | — | — | 12 | 12 | 2 U | 2 U | — | — | 1 U | 1 U | 37 | 6 U | 50 | 10 U |
| | 12/08/03 | 5 U | — | — | — | — | 0.0276 | 0.025 U | 16 | 6 | — | — | 100 U | 0.18 | 2 U | 2 U | — | — | 1 U | 5 U | 39 | 6 | 30 | 10 U |
| | 12/08/03 | 1 U | — | — | — | — | — | — | — | — | — | — | 0.275 | 100 U | — | — | — | — | **6 J** | 1 U | — | — | — | — |
| | 12/19/03 | — | — | — | — | — | 0.025 U | — | 5 | — | — | — | 100 U | — | 2 U | — | — | — | 100 U | | 6 U | — | 20 | — |
| | 11/01/04 | 5 U | — | — | — | — | 0.025 U | 0.025 U | 15 | 10 | — | — | — | — | 1 U | 1 U | — | — | 5 U | 5 U | 24 | 7 | 10 | 10 U |
| | 11/03/04 | — | — | — | — | — | — | — | — | — | — | — | 0.113 U | — | — | — | — | — | — | — | — | — | — | — |
| PL2-JF02A | 09/27/95 | — | 38,800 | 39,900 | 743 | 765 | 0.1 U | — | 10 U | — | 24,800 | 25,300 | 50 U | — | 3 U | — | 77,700 | 78,900 | 50 U | — | 10 | — | 4 U | — |
| | 11/17/95 | — | — | — | — | — | 0.1 U | — | 10 U | — | — | — | 50 U | — | 3 U | — | — | — | 50 U | — | — | — | 4 U | — |
| | 03/01/96 | — | — | — | — | — | 0.1 U | — | 10 U | — | — | — | 50 U | — | 3 U | — | — | — | 50 U | — | — | — | 4 U | — |
| | 05/23/96 | — | — | — | — | — | 0.1 U | — | 10 U | — | — | — | 50 U | — | 3 U | — | — | — | 50 U | — | — | — | 4 U | — |
| | 08/26/96 | — | — | — | — | — | 0.1 U | — | 10 U | — | — | — | 50 U | — | 3 U | — | — | — | 50 U | — | — | — | 5 | — |
| | 11/21/96 | — | — | — | — | — | 0.1 U | — | 10 U | — | — | — | 50 U | — | 3 U | — | — | — | 50 U | — | — | — | 4 U | — |
| | 11/21/96 | — | — | — | — | — | 0.1 U | — | 10 U | — | — | — | 50 U | — | 3 U | — | — | — | 50 U | — | — | — | 4 U | — |
| | 04/26/01 | 1 U | — | — | — | — | 0.1 U | 0.00103 | 2.6 | 0.7 | — | — | 50 U | 50 U | 0.5 UJ | 0.5 UJ | — | — | 0.2 U | 0.2 U | 7 | 5 | 6 UJ | 6 UJ |
| | 04/26/01 | — | — | — | — | — | 0.00104 | 0.1 U | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| | 07/25/01 | 1 U | — | — | — | — | 0.000899 J | 0.000964 J | 0.8 | 0.7 | — | — | 50 U | 50 U | 0.5 U | 0.5 U | — | — | 0.2 U | 0.2 U | 6 | 6 | 6 U | 6 U |
| | 10/24/01 | 1 U | — | — | — | — | 0.1 U | 0.00064 | 1.2 | 1 | — | — | 50 U | 50 U | 0.5 U | 0.5 U | — | — | 0.2 U | 0.2 U | 4 | 5 | 6 U | 6 U |
| | 10/24/01 | — | — | — | — | — | 0.000668 | 0.1 U | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| | 01/21/02 | 1 U | — | — | — | — | 0.00177 | 0.00084 | 3.2 | 2.4 | — | — | 50 U | 50 U | 0.5 U | 0.5 U | — | — | 0.2 U | 0.2 U | 13 | 13 | 6 U | 6 U |
| | 01/21/02 | — | — | — | — | — | 0.1 U | 0.1 U | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| | 06/16/03 | 1 U | — | — | — | — | 0.025 U | 0.025 U | 1.4 | 1.2 | — | — | 2 U | 2 U | 0.5 U | 0.5 U | — | — | 0.2 U | 0.2 U | 5 | 4 | 6 U | 9 |
| | 09/02/03 | 1 U | — | — | — | — | 0.025 U | 0.025 U | 1.4 | 2.1 | — | — | 2 U | 2 | 0.5 U | 0.5 U | — | — | 0.2 U | 0.2 U | 6 | 4 | 4 U | 4 U |
| | 12/08/03 | 1 U | — | — | — | — | 0.025 U | 0.025 U | 0.9 | 0.7 | — | — | 50 U | 50 U | 0.5 U | 0.5 U | — | — | 0.2 U | 0.2 U | 8 | 7 | 6 U | 6 U |
| | 02/02/04 | 1 U | — | — | — | — | 0.025 U | 0.025 U | 2.3 | 0.8 | — | — | 50 U | 50 U | 0.5 U | 0.5 U | — | — | 0.2 U | 0.2 U | 9 | 8 | 6 U | 6 U |
| | 05/10/04 | 1 U | — | — | — | — | 0.025 U | 0.025 U | 1.5 | 1.2 | — | — | 50 U | 50 U | 0.5 U | 0.5 U | — | — | 0.2 U | 0.2 U | 8 | 7 | 6 U | 6 U |
| | 08/02/04 | 1 U | — | — | — | — | 0.025 U | 0.025 U | 2.2 | 2 | — | — | 50 U | 50 U | 0.2 U | 0.2 U | — | — | 0.2 U | 0.2 U | 8 | 9 | 6 U | 6 U |
| | 11/01/04 | 1 U | — | — | — | — | 0.025 U | 0.025 U | 1.1 | 0.9 | — | — | 50 U | 50 U | 0.2 U | 0.2 U | — | — | 0.2 U | 0.2 U | 10 | 7 | 6 U | 6 U |
| | 02/01/05 | 1 U | — | — | — | — | 0.025 U | 0.025 U | 0.8 | 1 | — | — | 50 U | 50 U | 0.2 U | 0.2 U | — | — | 0.2 U | 0.2 U | 10 | 6 | 7 | 6 U |
| **MTCA Method A Groundwater Cleanup Levels[3]** | | **15** | **NE** | | **NE** | | **2** | | **NE** | | **NE** | | **NE** | | **NE** | | **NE** | | **NE** | | **NE** | | **NE** | |
| **MTCA Method B Groundwater Cleanup Levels[4]** | | **NE** | **NE** | | **2,240** | | **4.8** | | **320** | | **NE** | | **80** | | **80** | | **NE** | | **1.12** | | **112** | | **4,800** | |

NOTES:

**Bold** indicates sample result or reporting limit exceeds the MTCA Method A Groundwater Cleanup Level.
[1]Analyzed by U.S. Environmental Protection Agency Method SW-846-6010B.
[2]Analyzed by U.S. Environmental Protection Agency Method 7470.
[3]Table 720-1 Model Toxics Control Act (MTCA) Cleanup Regulation Chapter 173-340 of the Washington Administrative Code, amended February 12, 2001.
[4]MTCA Cleanup Levels and Risk Calculations November 2001.

— = not analyzed
J = denotes result reported in an estimate
NE = not established
U = no detectable concentrations above the listed laboratory practical quantitation limit
UB = the analyte was qualified as undetected due to blank contamination

**Table 6**
**Summary of PCBs in Groundwater**
**Jorgensen Forge Facility**
**8531 East Marginal Way South**
**Seattle, Washington**
**Farallon PN: 394-001**

| Sample ID | Date Sampled | Analytical Results (micrograms per liter) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Aroclor | | | | | | | | |
| | | 1016 | 1221 | 1232 | 1242 | 1248 | 1254 | 1260 | 1262 | 1268 |
| MW-5 | 4/10/2003 | 0.0478 U | 0.0478 U | 0.0478 U | 0.0478 U | 0.0478 U | 0.0478 U | 0.0478 U | | |
| MW-24 | 4/11/2003[1] | 0.0478 U | 0.0478 U | 0.0478 U | 0.0478 U | 0.0478 U | 0.0478 U | 0.0478 U | — | — |
| MW-25 | 4/11/2003[1] | 0.0475 U | 0.0475 U | 0.0475 U | 0.0475 U | 0.0475 U | 0.0475 U | 0.0475 U | — | — |
| MW-31 | 5/7/1993[2] | 0.021 U | 0.052 U | 0.052 U | 0.021 U | 0.021 U | 0.021 U | 0.021 U | — | — |
| | 4/11/2003[1] | 0.0476 U | 0.0476 U | 0.0476 U | 0.0476 U | 0.0476 U | 0.0476 U | 0.0476 U | — | — |
| PL2-JF01AR | 6/16/2003[1] | 0.010 U | 0.020 U | 0.010 U | 0.010 U | 0.010 U | 0.010 U | 0.010 U | 0.010 U | 0.010 U |
| PL2-JF02A | 4/10/2003[1] | 0.0476 U | 0.0476 U | 0.0476 U | 0.0476 U | 0.0476 U | 0.0476 U | 0.0476 U | — | — |
| | 6/16/2003[1] | 0.010 U | 0.020 U | 0.010 U | 0.010 U | 0.010 U | 0.010 U | 0.010 U | 0.12 U | 0.010 U |

NOTES:

[1]Analyzed by U.S. Environmental Protection Agency Method 8082.

[2]Analyzed by U.S. Environmental Protection Agency Method 8080.

— = not analyzed

LNAPL = light nonaqueous-phase liquid

PCBs = polychlorinated biphenyls

U = no detectable concentrations above the listed laboratory practical quantitation limit

**Table 7**
**Summary of PCBs in LNAPL**
**Jorgensen Forge Facility**
**8531 East Marginal Way South**
**Seattle, Washington**
**Farallon PN: 394-001**

| Sample ID | Date Sampled | Analytical Results (milligrams per liter) | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | Aroclor | | | | | | |
| | | 1016 | 1221 | 1232 | 1242 | 1248 | 1254 | 1260 |
| MW-19 | 9/3/1992[1] | 10 U | 10 U | 10 U | 10 U | 10 U | 10 U | 10 U |
| | 4/11/2003[2] | 1 UQ | 1 UQ | 1 UQ | 1 UQ | 1 UQ | 1 UQ | 1 UQ |
| MW-20 | 9/3/1992[1] | 10 U | 10 U | 10 U | 10 U | 10 U | 10 U | 10 U |
| MW-21 | 9/3/1992[1] | 10 U | 10 U | 10 U | 10 U | 10 U | 10 U | 10 U |
| MW-33 | 4/10/2003[2] | 0.99 U | 0.99 U | 0.99 U | 0.99 U | 0.99 U | 0.99 U | 0.99 U |

NOTES:

[1]Analyzed by U.S. Environmental Protection Agency Method 8080.

[2]Analyzed by U.S. Environmental Protection Agency Method 8082. Results in milligrams per kilogram.

PCBs = polychlorinated biphenyls

LNAPL = light nonaqueous-phase liquid

Q = denotes that surrogate recovery was outside the control limits

U = no detectable concentrations above the listed laboratory practical quantitation limit

**APPENDIX B**
**SECOND PHASE ENVIRONMENTAL SAMPLING RESULTS**
**FIGURES, TABLES, AND BORING LOGS**

FINAL INVESTIGATION DATA SUMMARY REPORT
Jorgensen Forge Facility
8531 East Marginal Way South
Seattle, Washington
U.S. EPA Docket No. CERCLA 10-2003-0111

Farallon PN: 831-003

## FIGURES



## TABLES



## BORING LOGS

# APPENDIX B
# SECOND PHASE ENVIRONMENTAL SAMPLING RESULTS
# FIGURES

Final Investigation Data Summary Report
Jorgensen Forge Facility
8531 East Marginal Way South
Seattle, Washington
U.S. EPA Docket No. CERCLA 10-2003-0111

Farallon PN: 831-003

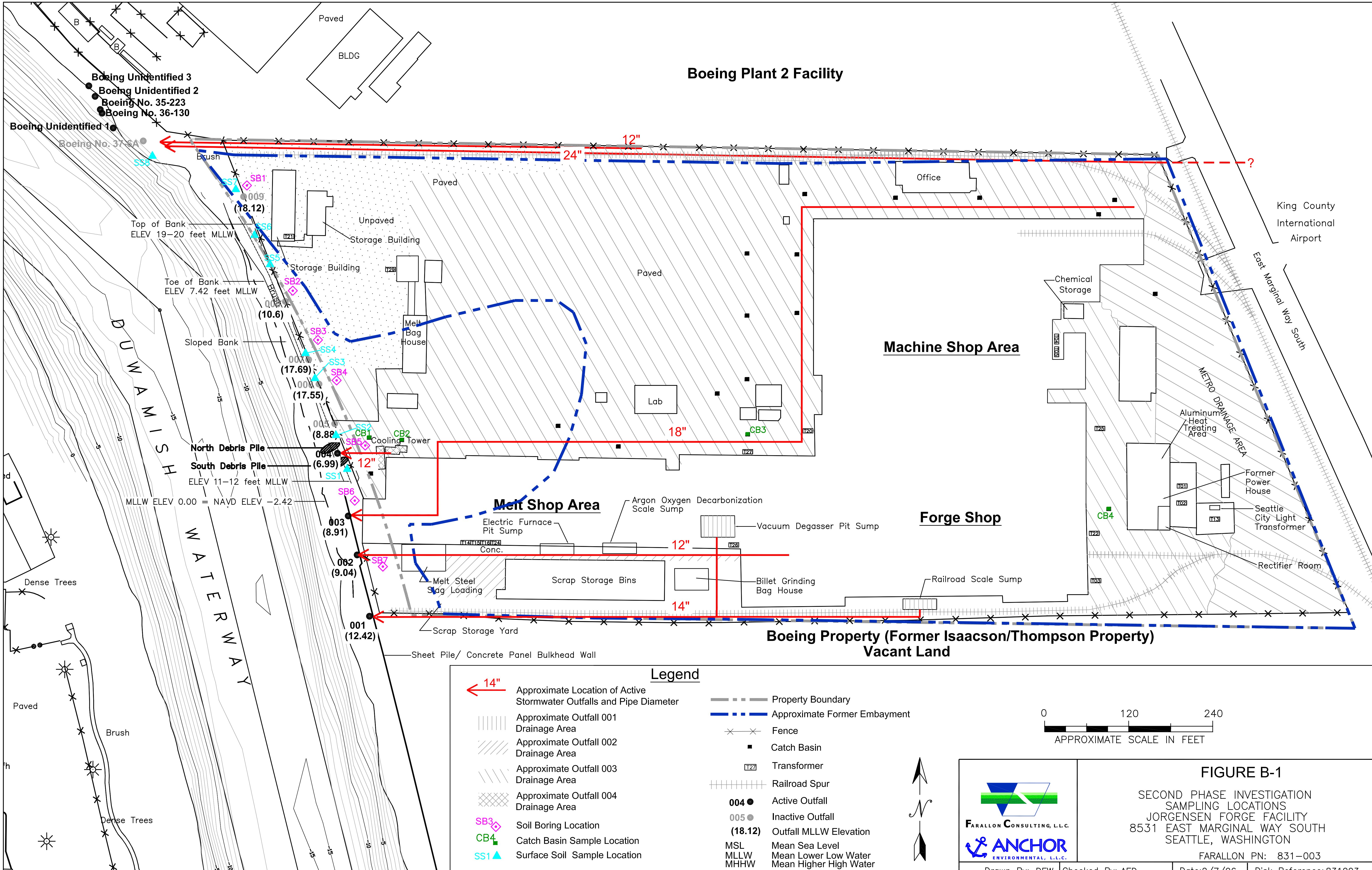
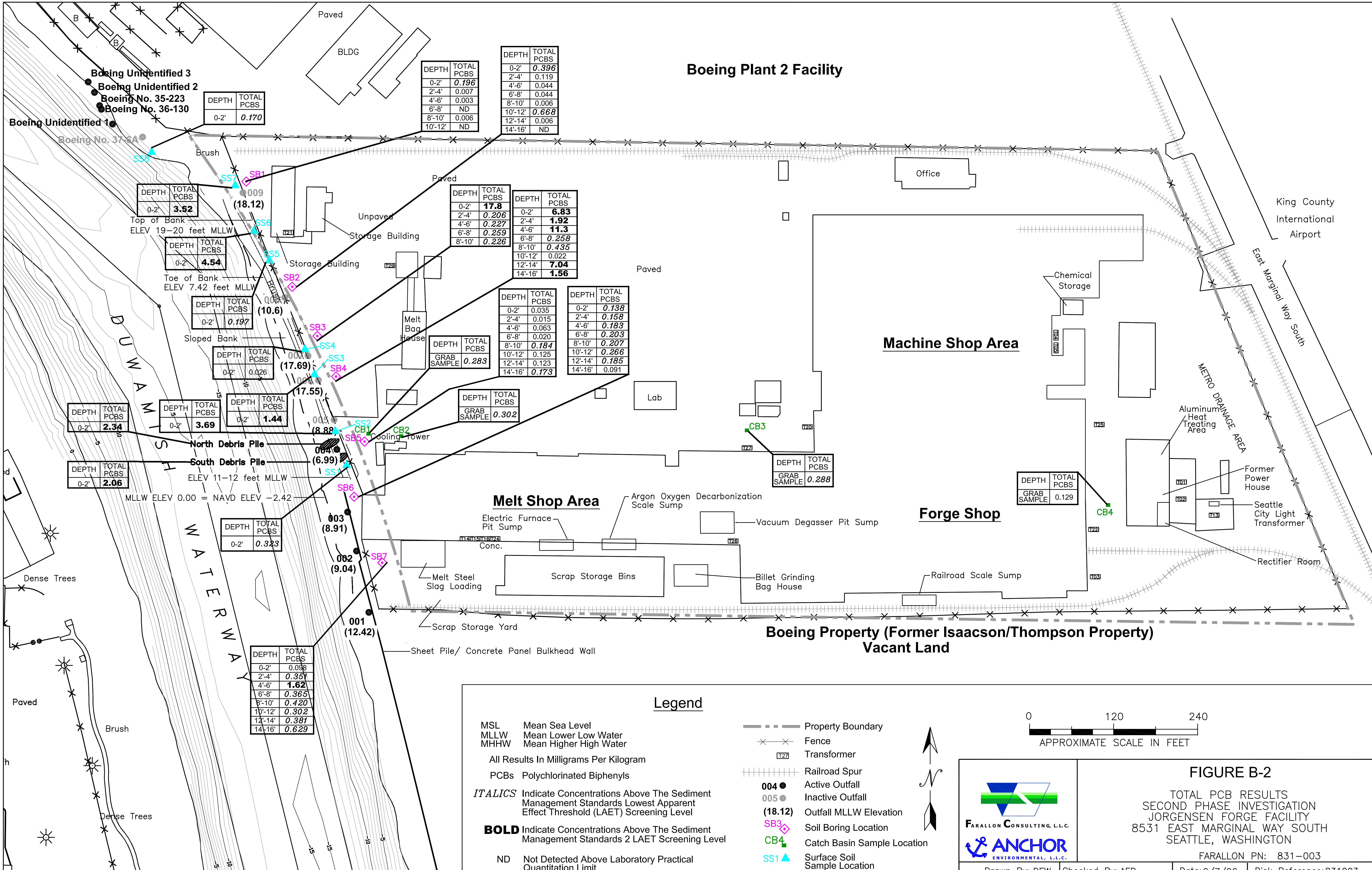



FIGURE B-1
SECOND PHASE INVESTIGATION
SAMPLING LOCATIONS
JORGENSEN FORGE FACILITY
8531 EAST MARGINAL WAY SOUTH
SEATTLE, WASHINGTON



Boeing Plant 2 Facility
Paved
BLDG
Boeing Unidentified 3
Boeing Unidentified 2
Boeing No. 35-223
Boeing No. 36-130
Boeing Unidentified 1
Boeing No. 37-SA
DEPTH TOTAL PCBS 0-2' 0.170
DEPTH TOTAL PCBS 0-2' 0.196 2'-4' 0.007 4'-6' 0.003 6'-8' ND 8'-10' 0.006 10'-12' ND
DEPTH TOTAL PCBS 0-2' 0.396 2'-4' 0.119 4'-6' 0.044 6'-8' 0.044 8'-10' 0.006 10'-12' 0.668 12'-14' 0.006 14'-16' ND
SS8
Brush
SS7
SB1
009
(18.12)
DEPTH TOTAL PCBS 0-2' 3.52
Top of Bank
ELEV 19–20 feet MLLW
SS6
Paved
Unpaved
Storage Building
Storage Building
DEPTH TOTAL PCBS 0-2' 17.8 2'-4' 0.206 4'-6' 0.227 6'-8' 0.259 8'-10' 0.226
DEPTH TOTAL PCBS 0-2' 6.83 2'-4' 1.92 4'-6' 11.3 6'-8' 0.258 8'-10' 0.435 10'-12' 0.022 12'-14' 7.04 14'-16' 1.56
DEPTH TOTAL PCBS 0-2' 4.54
SS5
Toe of Bank
ELEV 7.42 feet MLLW
SB2
Brush
DEPTH TOTAL PCBS 0-2' 0.197
(10.6)
DUWAMISH WATERWAY
Sloped Bank
SB3
SS4
SS3
SB4
DEPTH TOTAL PCBS 0-2' 0.026
(17.69)
(17.55)
Melt Bag House
DEPTH TOTAL PCBS GRAB SAMPLE 0.283
DEPTH TOTAL PCBS 0-2' 0.035 2'-4' 0.015 4'-6' 0.063 6'-8' 0.020 8'-10' 0.184 10'-12' 0.125 12'-14' 0.123 14'-16' 0.173
DEPTH TOTAL PCBS 0-2' 0.138 2'-4' 0.158 4'-6' 0.183 6'-8' 0.203 8'-10' 0.207 10'-12' 0.266 12'-14' 0.185 14'-16' 0.091
Paved
Machine Shop Area
Chemical Storage
Office
King County International Airport
East Marginal Way South
METRO DRAINAGE AREA
DEPTH TOTAL PCBS 0-2' 2.34
DEPTH TOTAL PCBS 0-2' 3.69
DEPTH TOTAL PCBS 0-2' 1.44
DEPTH TOTAL PCBS GRAB SAMPLE 0.302
Lab
CB3
005
(8.88)
SS2
CB1
CB2
SB5
Cooling Tower
North Debris Pile
004
(6.99)
South Debris Pile
DEPTH TOTAL PCBS 0-2' 2.06
SS1
ELEV 11–12 feet MLLW
MLLW ELEV 0.00 = NAVD ELEV –2.42
SB6
DEPTH TOTAL PCBS GRAB SAMPLE 0.288
DEPTH TOTAL PCBS GRAB SAMPLE 0.129
CB4
Aluminum Heat Treating Area
Former Power House
Seattle City Light Transformer
Melt Shop Area
Argon Oxygen Decarbonization Scale Sump
Electric Furnace Pit Sump
Vacuum Degasser Pit Sump
Forge Shop
DEPTH TOTAL PCBS 0-2' 0.323
003
(8.91)
Conc.
002
(9.04)
SB7
Dense Trees
Melt Steel Slag Loading
Scrap Storage Bins
Billet Grinding Bag House
Railroad Scale Sump
Rectifier Room
001
(12.42)
Scrap Storage Yard
Boeing Property (Former Isaacson/Thompson Property)
Vacant Land
Sheet Pile/ Concrete Panel Bulkhead Wall
DEPTH TOTAL PCBS 0-2' 0.098 2'-4' 0.357 4'-6' 1.62 6'-8' 0.365 8'-10' 0.420 10'-12' 0.302 12'-14' 0.381 14'-16' 0.629
Paved
Brush
Dense Trees
Legend
MSL Mean Sea Level
MLLW Mean Lower Low Water
MHHW Mean Higher High Water
All Results In Milligrams Per Kilogram
PCBs Polychlorinated Biphenyls
ITALICS Indicate Concentrations Above The Sediment Management Standards Lowest Apparent Effect Threshold (LAET) Screening Level
BOLD Indicate Concentrations Above The Sediment Management Standards 2 LAET Screening Level
ND Not Detected Above Laboratory Practical Quantitation Limit
Property Boundary
Fence
Transformer
Railroad Spur
004 Active Outfall
005 Inactive Outfall
(18.12) Outfall MLLW Elevation
SB3 Soil Boring Location
CB4 Catch Basin Sample Location
SS1 Surface Soil Sample Location
N
0 120 240
APPROXIMATE SCALE IN FEET
FARALLON CONSULTING, L.L.C.
ANCHOR ENVIRONMENTAL, L.L.C.
FIGURE B-2
TOTAL PCB RESULTS
SECOND PHASE INVESTIGATION
JORGENSEN FORGE FACILITY
8531 EAST MARGINAL WAY SOUTH
SEATTLE, WASHINGTON
FARALLON PN: 831–003
Drawn By: DEW
Checked By: AED
Date: 2/7/06
Disk Reference: 831003

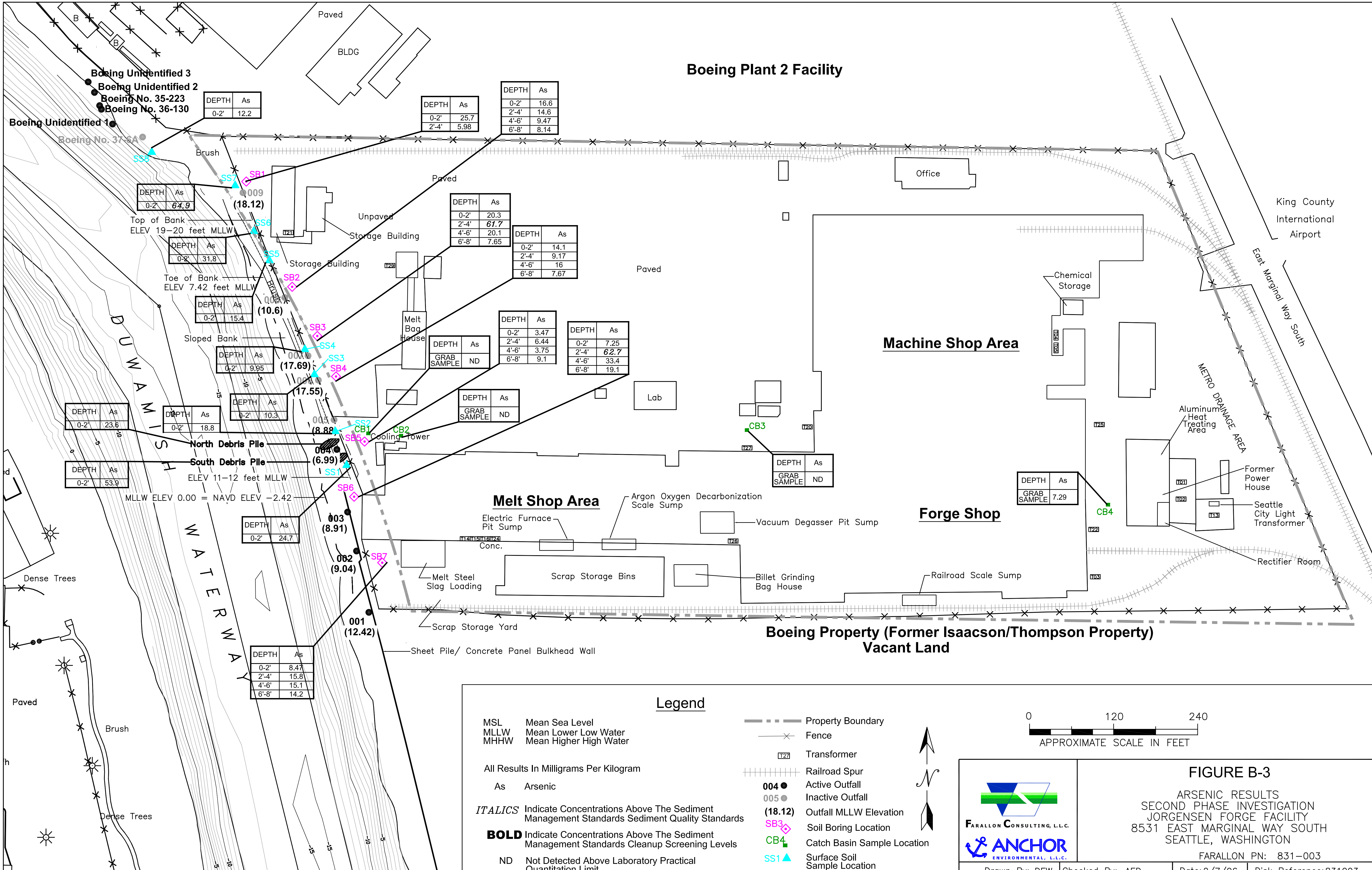
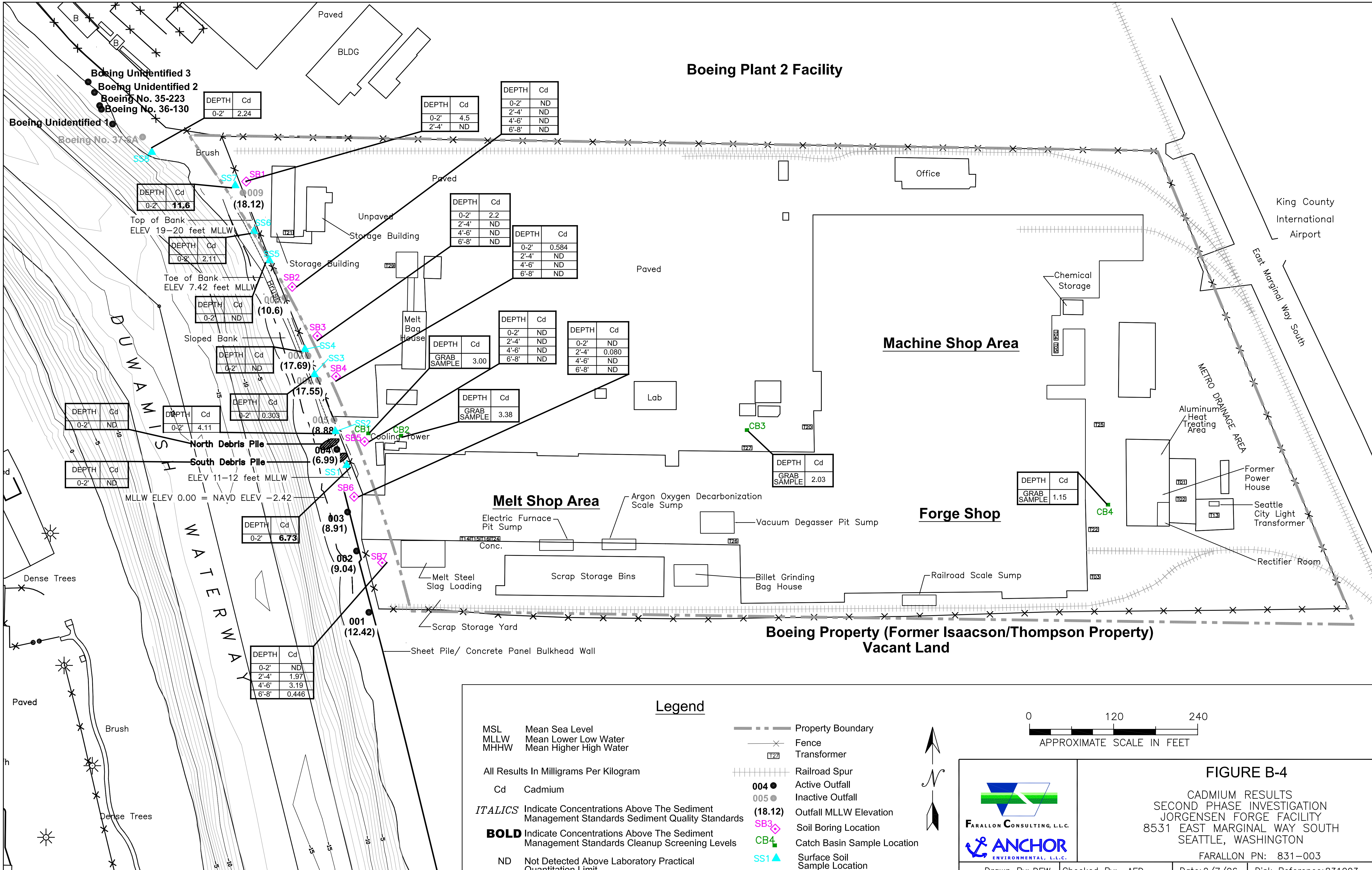
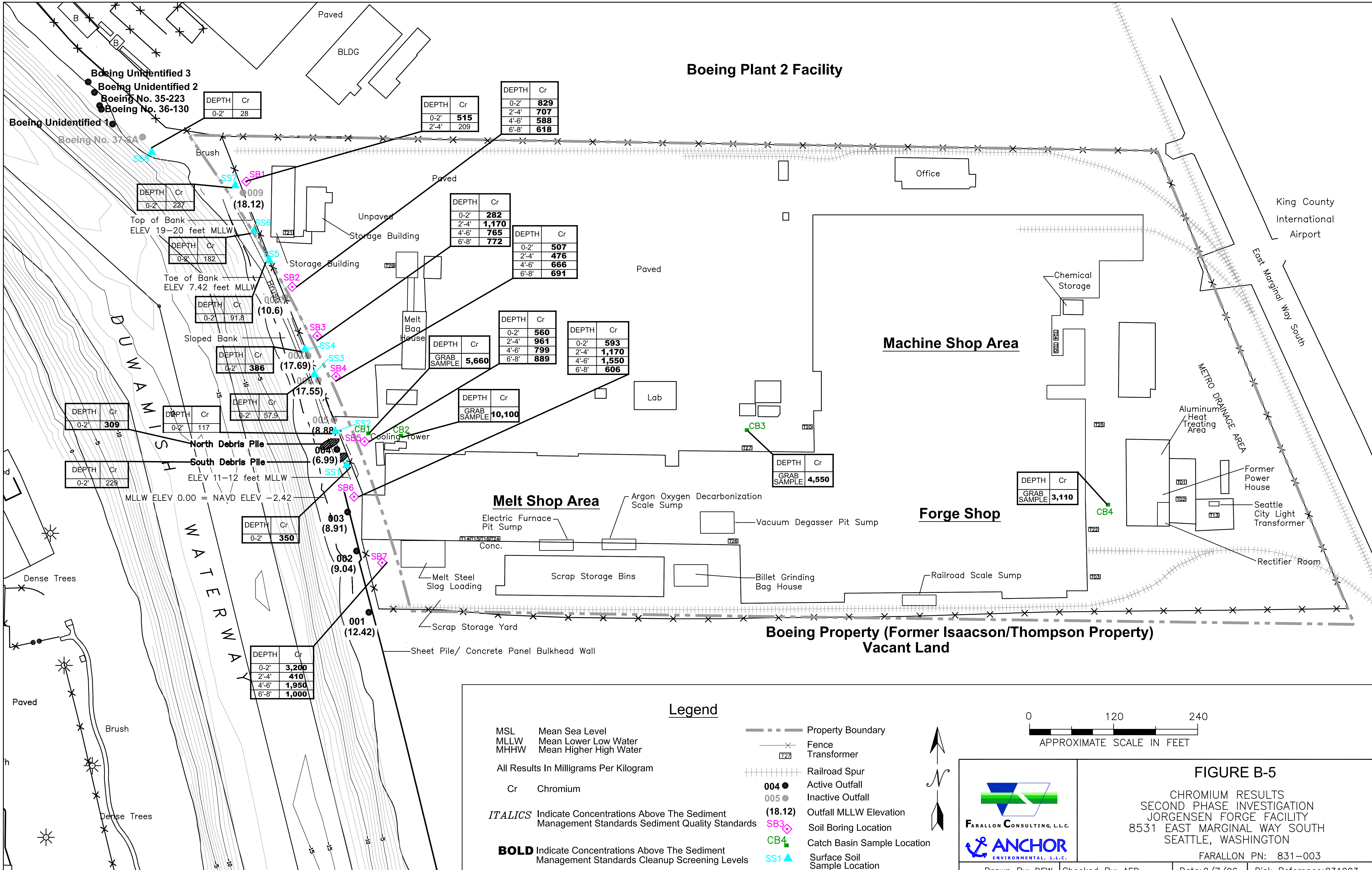



FIGURE B-3
ARSENIC RESULTS
SECOND PHASE INVESTIGATION
JORGENSEN FORGE FACILITY
8531 EAST MARGINAL WAY SOUTH
SEATTLE, WASHINGTON


Boeing Plant 2 Facility
Paved
BLDG
Boeing Unidentified 3
Boeing Unidentified 2
Boeing No. 35-223
Boeing No. 36-130
Boeing Unidentified 1
Boeing No. 37-SA
Brush
Unpaved
Storage Building
Storage Building
Melt Bag House
Top of Bank ELEV 19–20 feet MLLW
Toe of Bank ELEV 7.42 feet MLLW
Sloped Bank
North Debris Pile
South Debris Pile
ELEV 11–12 feet MLLW
MLLW ELEV 0.00 = NAVD ELEV –2.42
DUWAMISH WATERWAY
Dense Trees
Paved
Brush
Dense Trees
SS1 SS2 SS3 SS4 SS5 SS6 SS7 SS8
SB1 SB2 SB3 SB4 SB5 SB6 SB7
CB1 CB2 CB3 CB4
009 (18.12)
008 (10.6)
007 (17.69)
006 (17.55)
005 (8.88)
004 (6.99)
003 (8.91)
002 (9.04)
001 (12.42)
DEPTH Cd 0-2' 2.24
DEPTH Cd 0-2' 11.6
DEPTH Cd 0-2' 2.11
DEPTH Cd 0-2' ND
DEPTH Cd 0-2' ND
DEPTH Cd 0-2' 0.303
DEPTH Cd 0-2' 4.11
DEPTH Cd 0-2' ND
DEPTH Cd 0-2' ND
DEPTH Cd 0-2' 6.73
DEPTH Cd 0-2' ND 2'-4' 1.97 4'-6' 3.19 6'-8' 0.446
DEPTH Cd 0-2' 4.5 2'-4' ND
DEPTH Cd 0-2' ND 2'-4' ND 4'-6' ND 6'-8' ND
DEPTH Cd 0-2' 2.2 2'-4' ND 4'-6' ND 6'-8' ND
DEPTH Cd 0-2' 0.584 2'-4' ND 4'-6' ND 6'-8' ND
DEPTH Cd GRAB SAMPLE 3.00
DEPTH Cd 0-2' ND 2'-4' ND 4'-6' ND 6'-8' ND
DEPTH Cd 0-2' ND 2'-4' 0.080 4'-6' ND 6'-8' ND
DEPTH Cd GRAB SAMPLE 3.38
DEPTH Cd GRAB SAMPLE 2.03
DEPTH Cd GRAB SAMPLE 1.15
Cooling Tower
Lab
Office
Machine Shop Area
Chemical Storage
Melt Shop Area
Forge Shop
Electric Furnace Pit Sump
Argon Oxygen Decarbonization Scale Sump
Vacuum Degasser Pit Sump
Conc.
Melt Steel Slag Loading
Scrap Storage Bins
Billet Grinding Bag House
Railroad Scale Sump
Scrap Storage Yard
Sheet Pile/ Concrete Panel Bulkhead Wall
Aluminum Heat Treating Area
Former Power House
Seattle City Light Transformer
Rectifier Room
METRO DRAINAGE AREA
East Marginal Way South
King County International Airport
Boeing Property (Former Isaacson/Thompson Property) Vacant Land
Legend
MSL Mean Sea Level
MLLW Mean Lower Low Water
MHHW Mean Higher High Water
All Results In Milligrams Per Kilogram
Cd Cadmium
ITALICS Indicate Concentrations Above The Sediment Management Standards Sediment Quality Standards
BOLD Indicate Concentrations Above The Sediment Management Standards Cleanup Screening Levels
ND Not Detected Above Laboratory Practical Quantitation Limit
Property Boundary
Fence
Transformer
Railroad Spur
004 Active Outfall
005 Inactive Outfall
(18.12) Outfall MLLW Elevation
SB3 Soil Boring Location
CB4 Catch Basin Sample Location
SS1 Surface Soil Sample Location
N
0 120 240
APPROXIMATE SCALE IN FEET
FARALLON CONSULTING, L.L.C.
ANCHOR ENVIRONMENTAL, L.L.C.
FIGURE B-4
CADMIUM RESULTS
SECOND PHASE INVESTIGATION
JORGENSEN FORGE FACILITY
8531 EAST MARGINAL WAY SOUTH
SEATTLE, WASHINGTON
FARALLON PN: 831-003
Drawn By: DEW
Checked By: AED
Date: 2/7/06
Disk Reference: 831003



Boeing Plant 2 Facility
Paved
BLDG
Boeing Unidentified 3
Boeing Unidentified 2
Boeing No. 35-223
Boeing No. 36-130
Boeing Unidentified 1
Boeing No. 37-6A
Brush
Paved
Unpaved
Storage Building
Storage Building
Office
Paved
Melt Bag House
Machine Shop Area
Chemical Storage
Lab
King County International Airport
East Marginal Way South
METRO DRAINAGE AREA
Aluminum Heat Treating Area
Former Power House
Seattle City Light Transformer
Rectifier Room
Forge Shop
Melt Shop Area
Argon Oxygen Decarbonization Scale Sump
Electric Furnace Pit Sump
Vacuum Degasser Pit Sump
Conc.
Scrap Storage Bins
Melt Steel Slag Loading
Billet Grinding Bag House
Railroad Scale Sump
Scrap Storage Yard
Sheet Pile/ Concrete Panel Bulkhead Wall
Boeing Property (Former Isaacson/Thompson Property) Vacant Land
Cooling Tower
North Debris Pile
South Debris Pile
ELEV 11–12 feet MLLW
MLLW ELEV 0.00 = NAVD ELEV −2.42
Top of Bank ELEV 19–20 feet MLLW
Toe of Bank ELEV 7.42 feet MLLW
Sloped Bank
DUWAMISH WATERWAY
Dense Trees
Paved
Brush
Dense Trees
SS1 SS2 SS3 SS4 SS5 SS6 SS7 SS8
SB1 SB2 SB3 SB4 SB5 SB6 SB7
CB1 CB2 CB3 CB4
009 (18.12)
(10.6)
(17.69)
(17.55)
005 (8.88)
004 (6.99)
003 (8.91)
002 (9.04)
001 (12.42)
DEPTH Cr 0-2' 28
DEPTH Cr 0-2' 227
DEPTH Cr 0-2' 182
DEPTH Cr 0-2' 91.8
DEPTH Cr 0-2' 386
DEPTH Cr 0-2' 57.9
DEPTH Cr 0-2' 117
DEPTH Cr 0-2' 309
DEPTH Cr 0-2' 229
DEPTH Cr 0-2' 350
DEPTH Cr 0-2' 515 2'-4' 209
DEPTH Cr 0-2' 829 2'-4' 707 4'-6' 588 6'-8' 618
DEPTH Cr 0-2' 282 2'-4' 1,170 4'-6' 765 6'-8' 772
DEPTH Cr 0-2' 507 2'-4' 476 4'-6' 666 6'-8' 691
DEPTH Cr GRAB SAMPLE 5,660
DEPTH Cr 0-2' 560 2'-4' 961 4'-6' 799 6'-8' 889
DEPTH Cr 0-2' 593 2'-4' 1,170 4'-6' 1,550 6'-8' 606
DEPTH Cr GRAB SAMPLE 10,100
DEPTH Cr GRAB SAMPLE 4,550
DEPTH Cr GRAB SAMPLE 3,110
DEPTH Cr 0-2' 3,200 2'-4' 410 4'-6' 1,950 6'-8' 1,000
Legend
MSL Mean Sea Level
MLLW Mean Lower Low Water
MHHW Mean Higher High Water
All Results In Milligrams Per Kilogram
Cr Chromium
ITALICS Indicate Concentrations Above The Sediment Management Standards Sediment Quality Standards
BOLD Indicate Concentrations Above The Sediment Management Standards Cleanup Screening Levels
Property Boundary
Fence
Transformer
Railroad Spur
004 Active Outfall
005 Inactive Outfall
(18.12) Outfall MLLW Elevation
SB3 Soil Boring Location
CB4 Catch Basin Sample Location
SS1 Surface Soil Sample Location
N
0 120 240
APPROXIMATE SCALE IN FEET
FARALLON CONSULTING, L.L.C.
ANCHOR ENVIRONMENTAL, L.L.C.
FIGURE B-5
CHROMIUM RESULTS
SECOND PHASE INVESTIGATION
JORGENSEN FORGE FACILITY
8531 EAST MARGINAL WAY SOUTH
SEATTLE, WASHINGTON
FARALLON PN: 831-003
Drawn By: DEW
Checked By: AED
Date: 2/7/06
Disk Reference: 831003

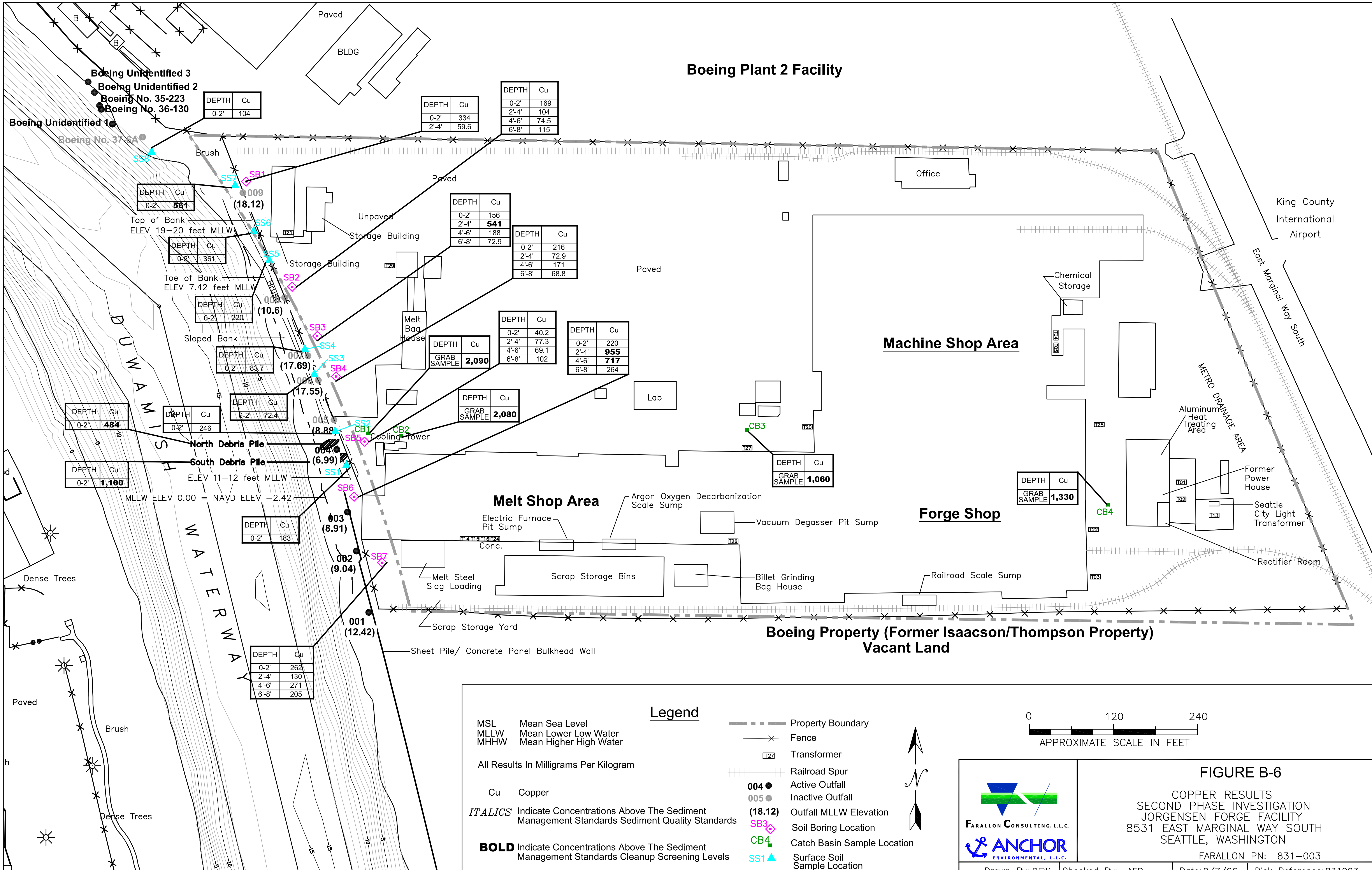



FIGURE B-6

COPPER RESULTS
SECOND PHASE INVESTIGATION
JORGENSEN FORGE FACILITY
8531 EAST MARGINAL WAY SOUTH
SEATTLE, WASHINGTON

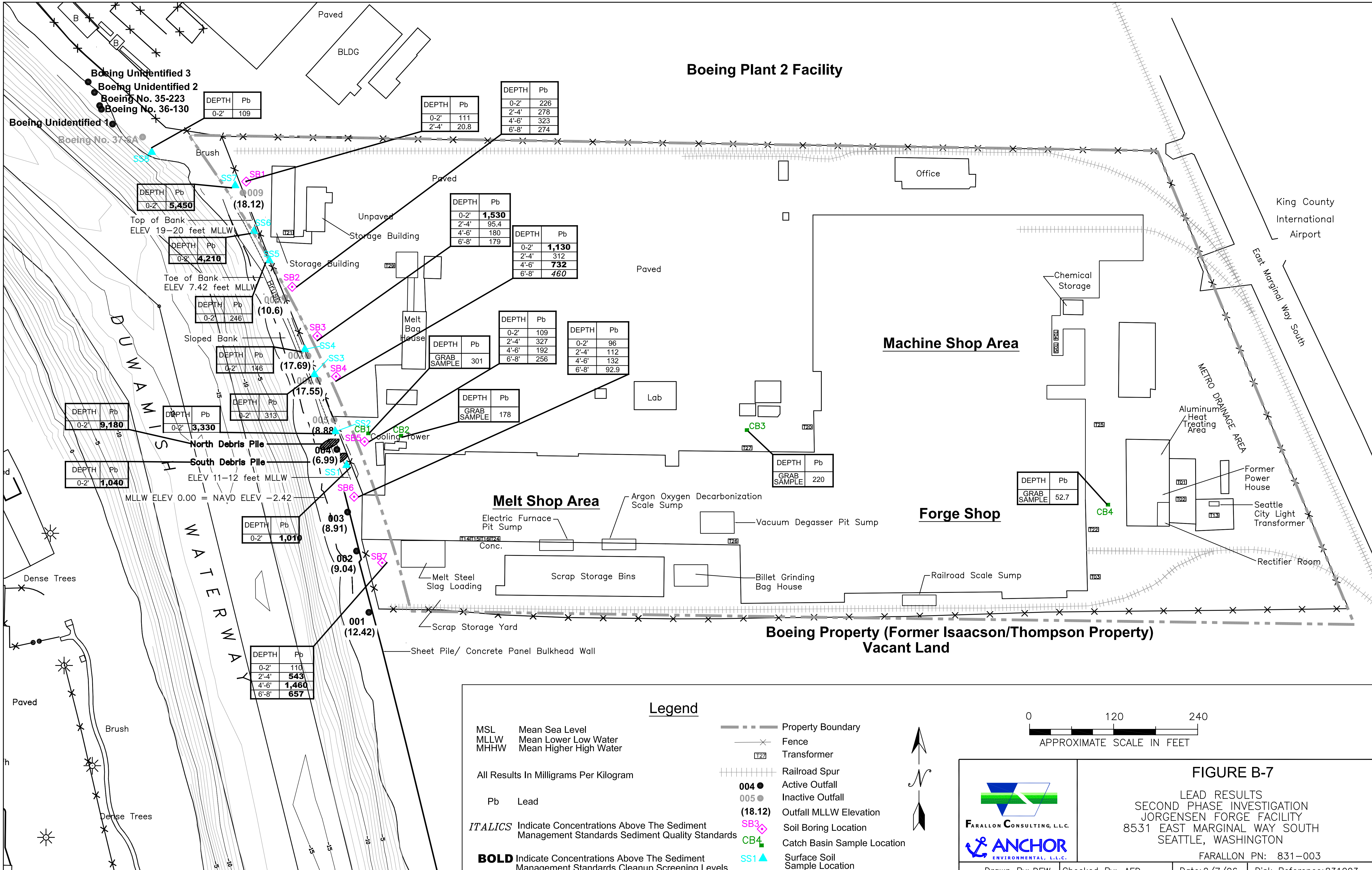
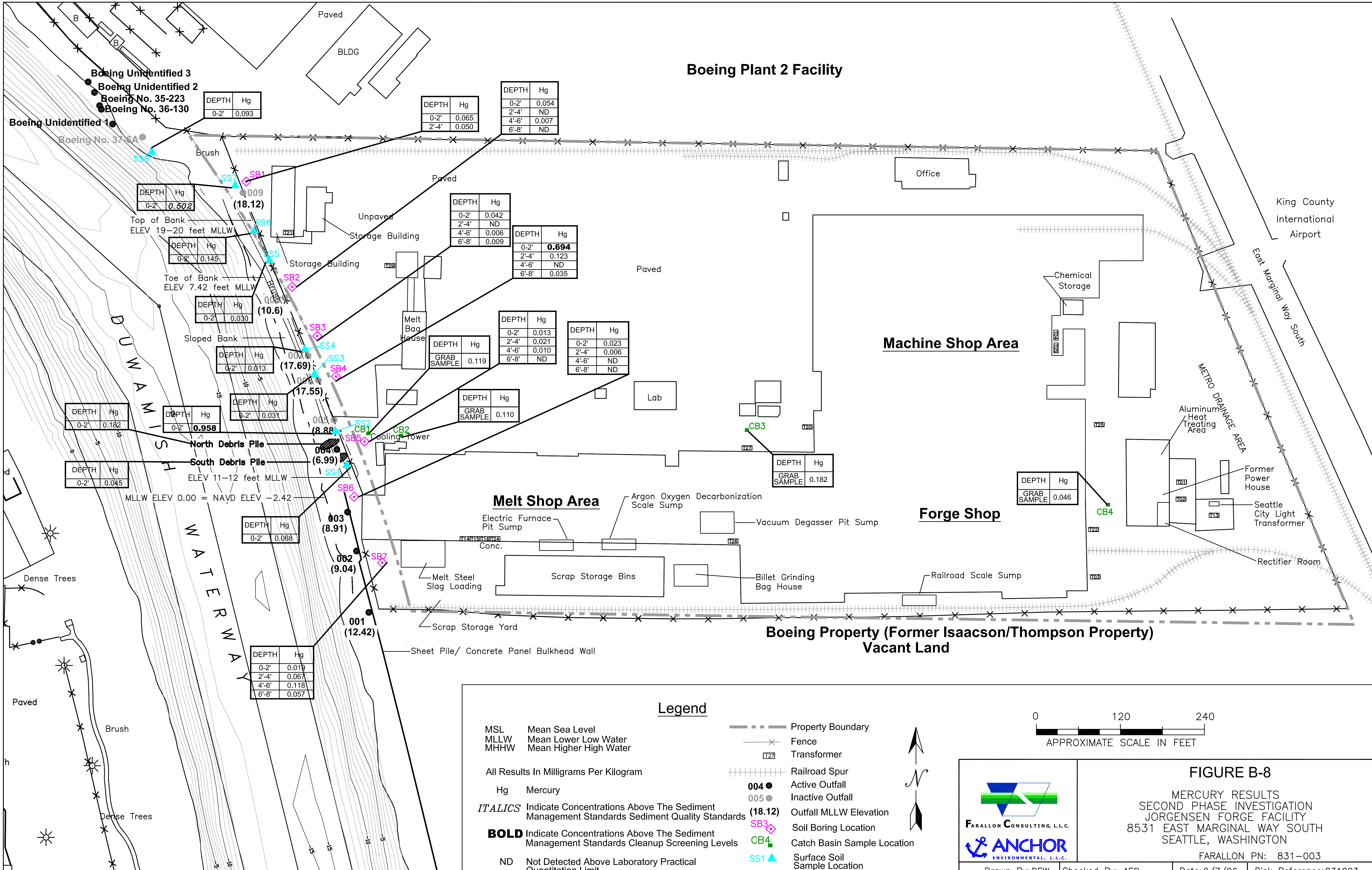
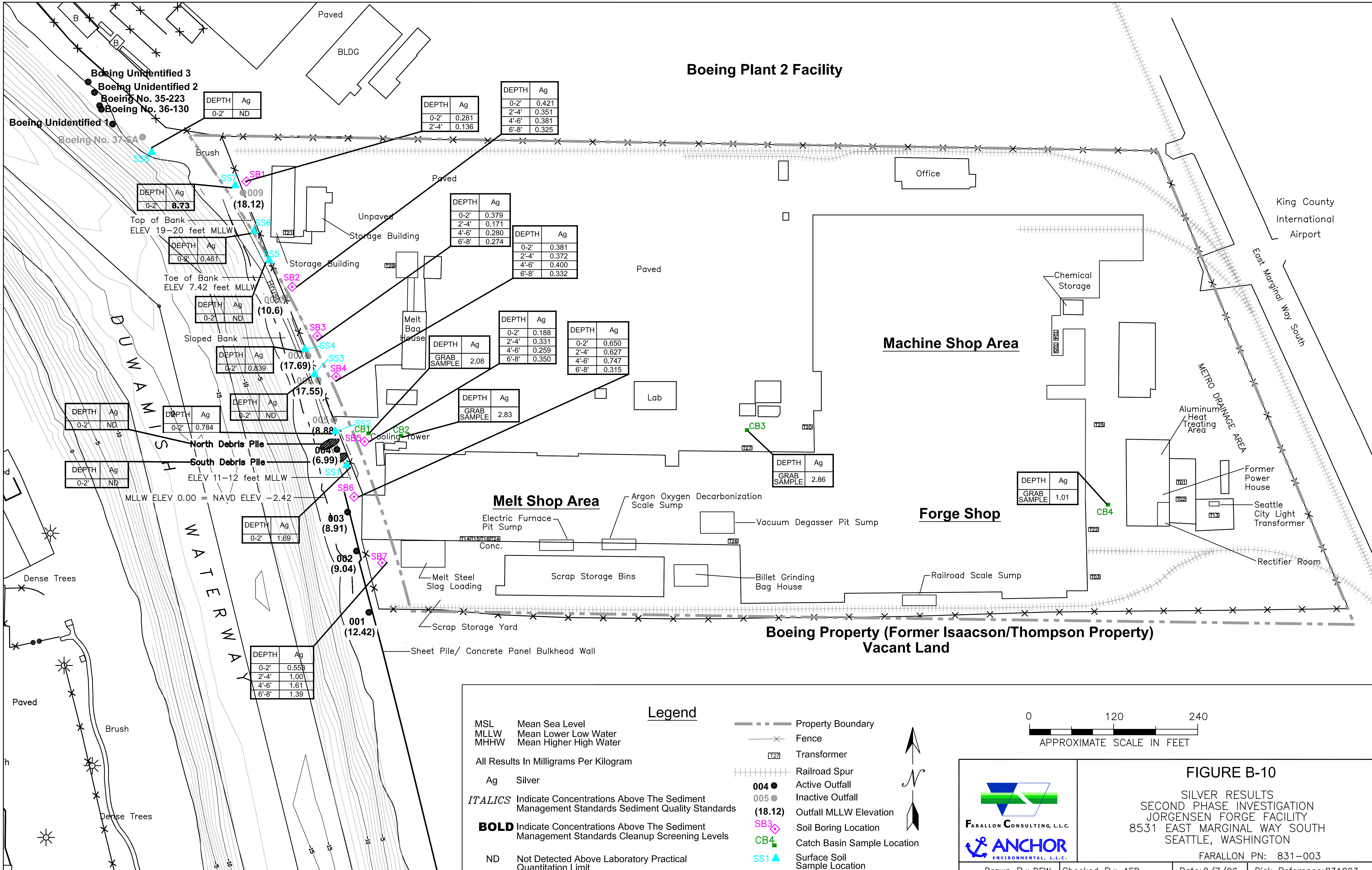


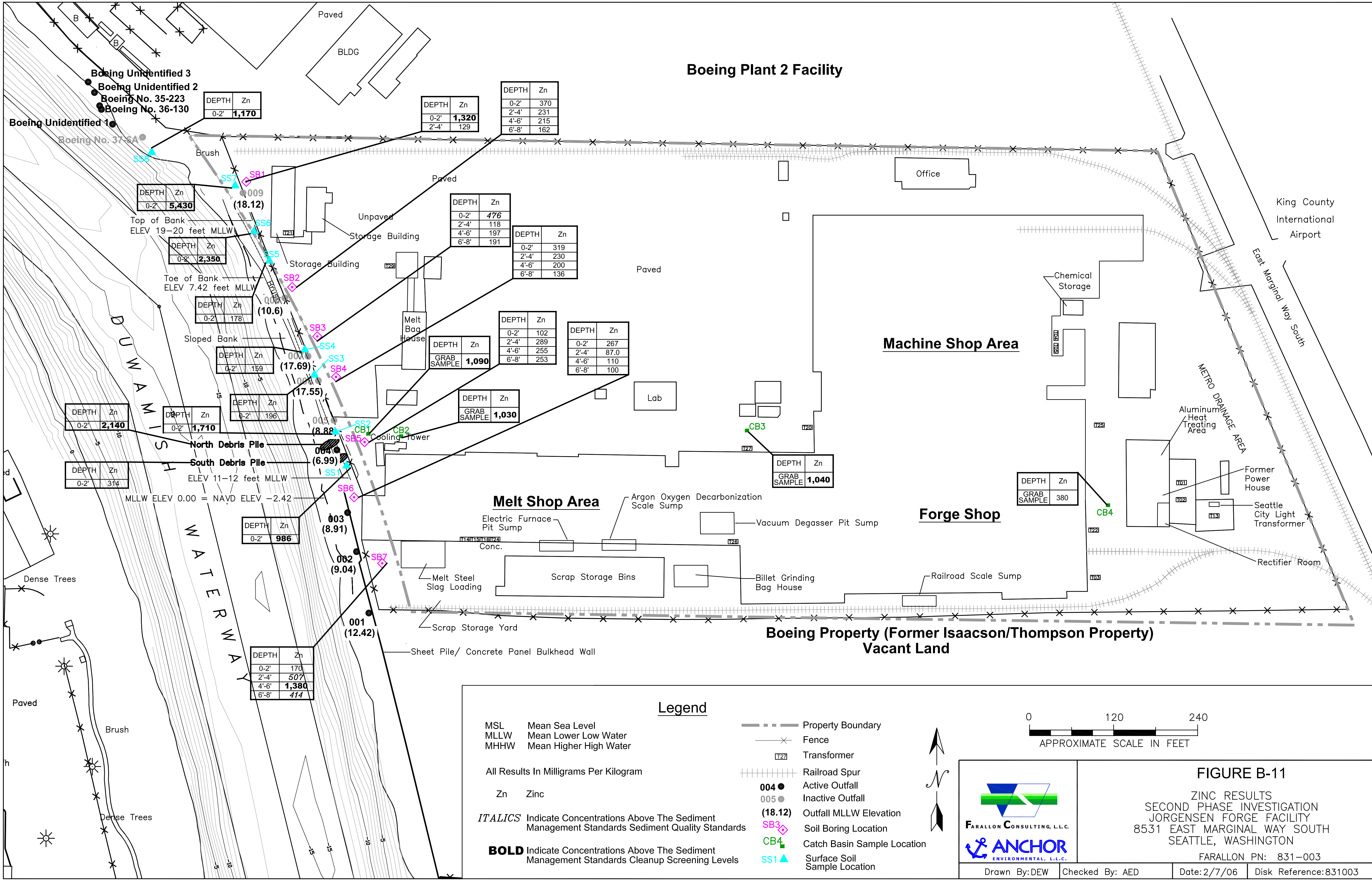
FIGURE B-7
LEAD RESULTS
SECOND PHASE INVESTIGATION
JORGENSEN FORGE FACILITY
8531 EAST MARGINAL WAY SOUTH
SEATTLE, WASHINGTON



Boeing Plant 2 Facility
Paved
BLDG
Boeing Unidentified 3
Boeing Unidentified 2
Boeing No. 35-223
Boeing No. 36-130
Boeing Unidentified 1
Boeing No. 37-SA
DEPTH Hg 0-2' 0.093
DEPTH Hg 0-2' 0.065 2'-4' 0.050
DEPTH Hg 0-2' 0.054 2'-4' ND 4'-6' 0.007 6'-8' ND
SS8
Brush
SS7
SB1
009 (18.12)
DEPTH Hg 0-2' 0.502
Paved
Unpaved
Storage Building
Top of Bank ELEV 19–20 feet MLLW
SS6
DEPTH Hg 0-2' 0.145
SS5
Storage Building
DEPTH Hg 0-2' 0.042 2'-4' ND 4'-6' 0.006 6'-8' 0.009
DEPTH Hg 0-2' 0.694 2'-4' 0.123 4'-6' ND 6'-8' 0.035
Paved
Office
King County International Airport
East Marginal Way South
Toe of Bank ELEV 7.42 feet MLLW
SB2
DEPTH Hg 0-2' 0.030
(10.6)
SB3
Melt Bag House
Chemical Storage
Sloped Bank
SS4
SS3
SB4
DEPTH Hg 0-2' 0.013
(17.69)
(17.55)
DEPTH Hg GRAB SAMPLE 0.119
DEPTH Hg 0-2' 0.013 2'-4' 0.021 4'-6' 0.010 6'-8' ND
DEPTH Hg 0-2' 0.023 2'-4' 0.006 4'-6' ND 6'-8' ND
Machine Shop Area
METRO DRAINAGE AREA
DUWAMISH WATERWAY
DEPTH Hg 0-2' 0.182
DEPTH Hg 0-2' 0.958
DEPTH Hg 0-2' 0.031
005 (8.88)
SS2
CB1
CB2
SB5
Cooling Tower
DEPTH Hg GRAB SAMPLE 0.110
Lab
CB3
Aluminum Heat Treating Area
North Debris Pile
South Debris Pile
004 (6.99)
SS1
DEPTH Hg 0-2' 0.045
ELEV 11–12 feet MLLW
MLLW ELEV 0.00 = NAVD ELEV –2.42
SB6
DEPTH Hg GRAB SAMPLE 0.182
DEPTH Hg GRAB SAMPLE 0.046
CB4
Former Power House
Seattle City Light Transformer
Melt Shop Area
Argon Oxygen Decarbonization Scale Sump
Electric Furnace Pit Sump
Vacuum Degasser Pit Sump
Forge Shop
003 (8.91)
DEPTH Hg 0-2' 0.068
Conc.
Dense Trees
002 (9.04)
SB7
Melt Steel Slag Loading
Scrap Storage Bins
Billet Grinding Bag House
Railroad Scale Sump
Rectifier Room
001 (12.42)
Scrap Storage Yard
Boeing Property (Former Isaacson/Thompson Property) Vacant Land
Sheet Pile/ Concrete Panel Bulkhead Wall
DEPTH Hg 0-2' 0.019 2'-4' 0.067 4'-6' 0.118 6'-8' 0.057
Paved
Brush
Dense Trees
Legend
MSL Mean Sea Level
MLLW Mean Lower Low Water
MHHW Mean Higher High Water
All Results In Milligrams Per Kilogram
Hg Mercury
ITALICS Indicate Concentrations Above The Sediment Management Standards Sediment Quality Standards
BOLD Indicate Concentrations Above The Sediment Management Standards Cleanup Screening Levels
ND Not Detected Above Laboratory Practical Quantitation Limit
Property Boundary
Fence
Transformer
Railroad Spur
004 Active Outfall
005 Inactive Outfall
(18.12) Outfall MLLW Elevation
SB3 Soil Boring Location
CB4 Catch Basin Sample Location
SS1 Surface Soil Sample Location
0 120 240
APPROXIMATE SCALE IN FEET
FARALLON CONSULTING, L.L.C.
ANCHOR ENVIRONMENTAL, L.L.C.
FIGURE B-8
MERCURY RESULTS
SECOND PHASE INVESTIGATION
JORGENSEN FORGE FACILITY
8531 EAST MARGINAL WAY SOUTH
SEATTLE, WASHINGTON
FARALLON PN: 831–003
Drawn By: DEW
Checked By: AED
Date: 2/7/06
Disk Reference: 831003



Boeing Plant 2 Facility
Paved
BLDG
B
Boeing Unidentified 3
Boeing Unidentified 2
Boeing No. 35-223
Boeing No. 36-130
Boeing Unidentified 1
Boeing No. 37-6A
DEPTH Ag 0-2' ND
DEPTH Ag 0-2' 0.281 2-4' 0.136
DEPTH Ag 0-2' 0.421 2-4' 0.351 4-6' 0.381 6-8' 0.325
SS8
Brush
SS7
SB1
009
(18.12)
DEPTH Ag 0-2' 8.73
Top of Bank ELEV 19-20 feet MLLW
SS6
DEPTH Ag 0-2' 0.461
SS5
Unpaved
Storage Building
Storage Building
SB2
Toe of Bank ELEV 7.42 feet MLLW
DEPTH Ag 0-2' ND
(10.6)
Brush
Sloped Bank
DEPTH Ag 0-2' 0.379 2-4' 0.171 4-6' 0.280 6-8' 0.274
DEPTH Ag 0-2' 0.381 2-4' 0.372 4-6' 0.400 6-8' 0.332
Paved
Melt Bag House
SB3
SS4
SS3
SB4
DEPTH Ag 0-2' 0.839
(17.69)
(17.55)
DEPTH Ag GRAB SAMPLE 2.08
DEPTH Ag 0-2' 0.188 2-4' 0.331 4-6' 0.259 6-8' 0.350
DEPTH Ag 0-2' 0.650 2-4' 0.627 4-6' 0.747 6-8' 0.315
Machine Shop Area
DUWAMISH WATERWAY
DEPTH Ag 0-2' ND
DEPTH Ag 0-2' 0.784
DEPTH Ag 0-2' ND
DEPTH Ag GRAB SAMPLE 2.83
Lab
005
(8.88)
SS2
CB1
CB2
Cooling Tower
SB5
North Debris Pile
South Debris Pile
004
(6.99)
SS1
DEPTH Ag 0-2' ND
ELEV 11-12 feet MLLW
MLLW ELEV 0.00 = NAVD ELEV -2.42
SB6
CB3
DEPTH Ag GRAB SAMPLE 2.86
DEPTH Ag GRAB SAMPLE 1.01
CB4
Office
King County International Airport
East Marginal Way South
Chemical Storage
METRO DRAINAGE AREA
Aluminum Heat Treating Area
Former Power House
Seattle City Light Transformer
Rectifier Room
Forge Shop
Melt Shop Area
Argon Oxygen Decarbonization Scale Sump
Electric Furnace Pit Sump
Vacuum Degasser Pit Sump
DEPTH Ag 0-2' 1.69
003
(8.91)
Conc.
002
(9.04)
SB7
Melt Steel Slag Loading
Scrap Storage Bins
Billet Grinding Bag House
Railroad Scale Sump
Dense Trees
001
(12.42)
Scrap Storage Yard
Boeing Property (Former Isaacson/Thompson Property)
Vacant Land
Sheet Pile/ Concrete Panel Bulkhead Wall
DEPTH Ag 0-2' 0.553 2-4' 1.00 4-6' 1.61 6-8' 1.39
Paved
Brush
Dense Trees
Legend
MSL Mean Sea Level
MLLW Mean Lower Low Water
MHHW Mean Higher High Water
All Results In Milligrams Per Kilogram
Ag Silver
ITALICS Indicate Concentrations Above The Sediment Management Standards Sediment Quality Standards
BOLD Indicate Concentrations Above The Sediment Management Standards Cleanup Screening Levels
ND Not Detected Above Laboratory Practical Quantitation Limit
Property Boundary
Fence
Transformer
Railroad Spur
004 Active Outfall
005 Inactive Outfall
(18.12) Outfall MLLW Elevation
SB3 Soil Boring Location
CB4 Catch Basin Sample Location
SS1 Surface Soil Sample Location
0 120 240
APPROXIMATE SCALE IN FEET
FARALLON CONSULTING, L.L.C.
ANCHOR ENVIRONMENTAL, L.L.C.
FIGURE B-10
SILVER RESULTS
SECOND PHASE INVESTIGATION
JORGENSEN FORGE FACILITY
8531 EAST MARGINAL WAY SOUTH
SEATTLE, WASHINGTON
FARALLON PN: 831-003
Drawn By: DEW
Checked By: AED
Date: 2/7/06
Disk Reference: 831003



Boeing Plant 2 Facility
Paved
BLDG
B
Boeing Unidentified 3
Boeing Unidentified 2
Boeing No. 35-223
Boeing No. 36-130
Boeing Unidentified 1
Boeing No. 37-6A
DEPTH Zn 0-2' 1,170
DEPTH Zn 0-2' 1,320 2-4' 129
DEPTH Zn 0-2' 370 2-4' 231 4-6' 215 6-8' 162
SS8
Brush
SS7
SB1
009 (18.12)
DEPTH Zn 0-2' 5,430
Top of Bank ELEV 19–20 feet MLLW
SS6
DEPTH Zn 0-2' 2,350
SS5
Storage Building
Unpaved
Paved
Office
King County International Airport
East Marginal Way South
DEPTH Zn 0-2' 476 2-4' 118 4-6' 197 6-8' 191
DEPTH Zn 0-2' 319 2-4' 230 4-6' 200 6-8' 136
Toe of Bank ELEV 7.42 feet MLLW
SB2
DEPTH Zn 0-2' 178
(10.6)
Melt Bag House
Chemical Storage
Machine Shop Area
SB3
Sloped Bank
SS4
SS3
DEPTH Zn 0-2' 159
(17.69)
SB4
(17.55)
DEPTH Zn GRAB SAMPLE 1,090
DEPTH Zn 0-2' 102 2-4' 289 4-6' 255 6-8' 253
DEPTH Zn 0-2' 267 2-4' 87.0 4-6' 110 6-8' 100
Lab
METRO DRAINAGE AREA
DUWAMISH WATERWAY
DEPTH Zn 0-2' 2,140
DEPTH Zn 0-2' 1,710
DEPTH Zn 0-2' 196
005 (8.88)
SS2
CB1
CB2
Cooling Tower
DEPTH Zn GRAB SAMPLE 1,030
CB3
Aluminum Heat Treating Area
North Debris Pile
SB5
004 (6.99)
South Debris Pile
DEPTH Zn 0-2' 314
ELEV 11–12 feet MLLW
SS1
DEPTH Zn GRAB SAMPLE 1,040
DEPTH Zn GRAB SAMPLE 380
CB4
Former Power House
Seattle City Light Transformer
SB6
MLLW ELEV 0.00 = NAVD ELEV –2.42
Melt Shop Area
Argon Oxygen Decarbonization Scale Sump
Electric Furnace Pit Sump
Vacuum Degasser Pit Sump
Forge Shop
003 (8.91)
DEPTH Zn 0-2' 986
Conc.
Dense Trees
002 (9.04)
SB7
Melt Steel Slag Loading
Scrap Storage Bins
Billet Grinding Bag House
Railroad Scale Sump
Rectifier Room
001 (12.42)
Scrap Storage Yard
Boeing Property (Former Isaacson/Thompson Property) Vacant Land
Sheet Pile/ Concrete Panel Bulkhead Wall
DEPTH Zn 0-2' 170 2-4' 507 4-6' 1,380 6-8' 414
Paved
Brush
Dense Trees
Legend
MSL Mean Sea Level
MLLW Mean Lower Low Water
MHHW Mean Higher High Water
All Results In Milligrams Per Kilogram
Zn Zinc
ITALICS Indicate Concentrations Above The Sediment Management Standards Sediment Quality Standards
BOLD Indicate Concentrations Above The Sediment Management Standards Cleanup Screening Levels
Property Boundary
Fence
Transformer
Railroad Spur
004 Active Outfall
005 Inactive Outfall
(18.12) Outfall MLLW Elevation
SB3 Soil Boring Location
CB4 Catch Basin Sample Location
SS1 Surface Soil Sample Location
N
0 120 240
APPROXIMATE SCALE IN FEET
FARALLON CONSULTING, L.L.C.
ANCHOR ENVIRONMENTAL, L.L.C.
FIGURE B-11
ZINC RESULTS
SECOND PHASE INVESTIGATION
JORGENSEN FORGE FACILITY
8531 EAST MARGINAL WAY SOUTH
SEATTLE, WASHINGTON
FARALLON PN: 831–003
Drawn By: DEW
Checked By: AED
Date: 2/7/06
Disk Reference: 831003

# APPENDIX B
# SECOND PHASE ENVIRONMENTAL SAMPLING RESULTS TABLES

Final Investigation Data Summary Report
Jorgensen Forge Facility
8531 East Marginal Way South
Seattle, Washington
U.S. EPA Docket No. CERCLA 10-2003-0111

Farallon PN: 831-003

**Table B-1**
**Groundwater Analytical Results - PCBs**
**Jorgensen Forge Facility**
**8531 East Marginal Way South**
**Seattle, Washington**
**Farallon PN: 394-001**

| Sample Location | Sample Date | Analytical Results[1] (micrograms per liter) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Aroclor-1016 | Aroclor-1221 | Aroclor-1232 | Aroclor-1242 | Aroclor-1248 | Aroclor-1254 | Aroclor-1260 | Aroclor-1262 | Aroclor-1268 |
| MW-5 | 4/10/2003 | 0.0478 U | 0.0478 U | 0.0478 U | 0.0478 U | 0.0478 U | 0.0478 U | 0.0478 U | — | — |
| MW-6 | 4/11/2003 | 0.0478 U | 0.0478 U | 0.0478 U | 0.0478 U | 0.0478 U | 0.0478 U | 0.0478 U | — | — |
| MW-24 | 4/11/2003 | 0.0478 U | 0.0478 U | 0.0478 U | 0.0478 U | 0.0478 U | 0.0478 U | 0.0478 U | — | — |
| MW-25 | 4/11/2003 | 0.0475 U | 0.0475 U | 0.0475 U | 0.0475 U | 0.0475 U | 0.0475 U | 0.0475 U | — | — |
| MW-31 | 5/7/1993[2] | 0.021 U | 0.052 U | 0.052 U | 0.021 U | 0.021 U | 0.021 U | 0.021 U | — | — |
| | 4/1120/03 | 0.0476 U | 0.0476 U | 0.0476 U | 0.0476 U | 0.0476 U | 0.0476 U | 0.0476 U | — | — |
| PL2-JF01AR | 6/16/2003 | 0.010 U | 0.020 U | 0.010 U | 0.010 U | 0.010 U | 0.010 U | 0.010 U | 0.010 U | 0.010 U |
| PL2-JF02A | 4/10/2003 | 0.0476 U | 0.0476 U | 0.0476 U | 0.0476 U | 0.0476 U | 0.0476 U | 0.0476 U | — | — |
| | 6/16/2003 | 0.010 U | 0.020 U | 0.010 U | 0.010 U | 0.010 U | 0.010 U | 0.010 U | 0.12 U | 0.010 U |
| **MTCA Method A Cleanup Levels[3]** | | **0.1[4]** | **0.1[4]** | **0.1[4]** | **0.1[4]** | **0.1[4]** | **0.1[4]** | **0.1[4]** | **0.1[4]** | **0.1[4]** |
| **MTCA Method B Cleanup Levels[5]** | | **1.12** | **NE** | **NE** | **NE** | **NE** | **0.16** | **NE** | **NE** | **NE** |

NOTES:

[1]Analyzed by U.S. Environmental Protection Agency (EPA) Method 8082.

[2]Analyzed by EPA Method 8080.

[3]Washington State Department of Ecology (Ecology) Model Toxics Control Act Cleanup Regulation (MTCA) Method A Cleanup Levels for Groundwater, Table 720-1 of Section 900 of Chapter 173-340 of the Washington Administrative Code, as amended February 2001.

[4]PCB mixtures, total value for all PCBs.

[5]MTCA Cleanup Levels and Risk Calculations, Version 3.1, Standard Method B Values for Groundwater, Ecology Publication No. 94-145, as updated November 2001. Where both carcinogen and non-carcinogen values are listed, the lower of the two values is presented.

— = not analyzed

NE = not established

PCBs = polychlorinated biphenyls

U = no detectable concentrations above the listed laboratory practical quantitation limit

# Table B-2A
# Groundwater Analytical Results - Metals
## Jorgensen Forge Facility
## 8531 East Marginal Way South
## Seattle, Washington
## Farallon PN: 831-003

| Sample Location | Sample Date | Analytical Results (micrograms per liter)[1] | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Aluminum | | Antimony | | Arsenic | | Barium | | Beryllium | | Cadmium | | Calcium | | Chromium | | Cobalt | | Copper | | Iron | | Lead | |
| | | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Dissolved |
| MW-1/2 | 03/02/90 | — | — | — | — | 3 | — | 407 | — | — | — | **6** | — | — | — | 48 | — | — | — | — | — | — | — | 52 U | — |
| MW-9 | 03/24/92 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 110 | — | 2,500 | — | — | — |
| MW-23 | 11/20/92 | — | — | — | — | 50 U | — | 200 U | — | — | — | 25 U | — | — | — | 100 U | — | — | — | 100 U | — | 1,400 | — | 500 U | — |
| PL2-JF01AR | 05/17/01 | — | — | 2 UJ | 2 UJ | 0.5 U | 0.5 U | — | — | 0.2 U | 0.2 U | 2 U | 2 U | — | — | 5 U | 5 U | — | — | 2 | 0.5 U | — | — | 1 U | 1 U |
| | 07/25/01 | — | — | 2 U | 2 U | 0.7 | 0.5 U | — | — | 0.2 U | 0.2 U | 2 U | 2 U | — | — | 5 U | 5 U | — | — | 0.5 U | 0.5 U | — | — | 1 U | 1 U |
| | 10/24/01 | — | — | 2 U | 2 U | 0.5 U | 0.5 U | — | — | 0.2 U | 0.2 U | 2 U | 2 U | — | — | 5 U | 5 U | — | — | 0.5 | 0.5 U | — | — | 1 | 1 U |
| | 10/24/01 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| | 10/24/01 | — | — | 2 U | 2 U | 0.8 | 1 U | — | — | 0.2 U | 0.2 U | 2 U | 2 U | — | — | 5 U | 5 U | — | — | 0.6 | 0.5 | — | — | 1 U | 1 U |
| | 10/24/01 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| | 01/21/02 | — | — | 2 U | 2 U | 0.6 | 0.7 | — | — | 0.2 U | 0.2 U | 2 U | 2 U | — | — | 5 U | 5 U | — | — | 0.5 U | 0.5 | — | — | 1 U | 1 U |
| | 01/21/02 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| | 06/16/03 | — | — | 50 U | 50 U | 0.5 U | 0.4 | — | — | 0.2 U | 0.2 U | 2 U | 2 U | — | — | 5 U | 5 U | — | — | 0.5 U | 0.5 | — | — | 1 U | 1 U |
| | 09/02/03 | — | — | 2 U | 2 U | 0.4 | 0.4 | — | — | 0.2 U | 0.2 U | 2 U | 2 U | — | — | 5 U | 5 U | — | — | 0.9 | 0.9 | — | — | 1 U | 1 U |
| | 12/08/03 | — | — | 2 U | 2 U | 0.4 | 0.3 | — | — | 0.2 U | 0.2 U | 2 U | 2 U | — | — | 5 U | 5 U | — | — | 0.7 | 0.5 U | — | — | 1 U | 1 U |
| | 12/19/03 | — | — | 50 U | — | 0.3 | — | — | — | 1 U | — | 2 U | — | — | — | 5 U | — | — | — | 0.6 | — | — | — | 1 U | — |
| | 02/02/04 | — | — | 2 U | 2 U | 0.4 | 0.5 U | — | — | 0.2 U | 0.2 U | 2 U | 2 U | — | — | 6 | 8 | — | — | 1 | 0.5 | — | — | 1 U | 1 U |
| | 05/10/04 | — | — | 2 U | 2 U | 0.4 | 0.4 | — | — | 0.2 U | 0.2 U | 2 U | 2 U | — | — | 5 U | 5 U | — | — | 0.5 U | 0.5 U | — | — | 1 U | 1 U |
| | 08/02/04 | — | — | 2 U | 2 U | 0.4 | 0.4 | — | — | 0.2 U | 0.2 U | 2 U | 2 U | — | — | 5 U | 5 U | — | — | 0.5 U | 0.5 U | — | — | 1 U | 1 U |
| | 11/01/04 | — | — | 2 U | 2 UJ | 0.5 U | 0.8 | — | — | 0.2 U | 0.2 U | 2 U | 2 U | — | — | 5 U | 5 U | — | — | 0.7 U | 0.5 U | — | — | 1 U | 1 U |
| | 11/01/04 | — | — | 2 U | 2 UJ | 0.5 U | 0.7 | — | — | 0.2 U | 0.2 U | 2 U | 2 U | — | — | 5 U | 5 U | — | — | 0.6 U | 0.5 U | — | — | 1 U | 1 U |
| | 02/01/05 | — | — | 2 U | 2 U | 0.4 | 0.5 U | — | — | 0.2 U | 0.2 U | 2 U | 2 U | — | — | 5 U | 5 U | — | — | 0.5 | 0.5 U | — | — | 1 U | 1 U |
| PL2-JF01B | 03/31/95 | 30 | 20 U | 1 U | 1 U | 1 U | 1 | 17 J | 18 J | 1 U | 1 U | 2 U | 2 U | 18,200 | 18,400 | 5 U | 5 U | 3 U | 3 U | 2 U | 2 U | 13,100 | 13,200 | 1 U | 1 U |
| | 09/27/95 | 30 | — | 1 U | — | 2 | — | 22 | — | 1 U | — | 2 U | — | 23,900 | 23,900 | 5 U | — | 3 U | — | 2 U | — | 14,000 | 13,600 | 1 UB | — |
| | 11/17/95 | — | — | 1 U | — | 1 U | — | 22 | — | 1 U | — | 2 U | — | — | — | 5 U | — | — | — | 2 U | — | — | — | 1 | — |
| | 03/01/96 | — | — | 1 U | — | 1 U | — | 16 | — | 1 U | — | 2 U | — | — | — | 5 U | — | — | — | 2 U | — | — | — | 4 UB | — |
| | 05/23/96 | — | — | 1 U | — | 1 | — | 13 | — | 1 U | — | 2 U | — | — | — | 5 U | — | — | — | 2 U | — | — | — | 1 U | — |
| | 08/26/96 | — | — | 1 U | — | 1 U | — | 12 | — | 1 U | — | 2 U | — | — | — | 5 U | — | — | — | 2 U | — | — | — | 1 U | — |
| | 11/21/96 | — | — | 1 U | — | 1 U | — | 19 | — | 1 U | — | 2 U | — | — | — | 5 U | — | — | — | 2 U | — | — | — | 1 | — |
| | 04/26/01 | — | — | 2 UJ | 2 UJ | 1 | 1 | — | — | 0.2 U | 0.2 U | 2 U | 2 U | — | — | 5 U | 5 U | — | — | 2.5 B | 1.1 | — | — | 1 U | 1 U |
| | 04/26/01 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| **MTCA Method A Cleanup Levels[1]** | | **NE** | | **NE** | | **5** | | **NE** | | **NE** | | **5** | | **NE** | | **50** | | **NE** | | **NE** | | **NE** | | **15** | |
| **MTCA Method B Cleanup Levels[2]** | | **NE** | | **6** | | **0.0583** | | **560** | | **32** | | **8** | | **NE** | | **48** | | **NE** | | **592** | | **NE** | | **NE** | |

**Table B-2A**
**Groundwater Analytical Results - Metals**
**Jorgensen Forge Facility**
**8531 East Marginal Way South**
**Seattle, Washington**
**Farallon PN: 831-003**

| Sample Location | Sample Date | Analytical Results (micrograms per liter) | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Aluminum | | Antimony | | Arsenic | | Barium | | Beryllium | | Cadmium | | Calcium | | Chromium | | Cobalt | | Copper | | Iron | | Lead | |
| | | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Dissolved |
| PL2-JF01B | 07/25/01 | — | — | 2 U | 2 U | 1 U | 1 U | — | — | 0.5 U | 0.4 U | 2 U | 2 U | — | — | 5 U | 5 U | — | — | 3 | 1 | — | — | 2 U | 2 U |
| | 10/24/01 | — | — | 2 U | 2 U | 2.9 | 2 U | — | — | 0.2 U | 0.2 U | 2 U | 2 U | — | — | 5 U | 5 U | — | — | 1.5 | 1.2 | — | — | 1 U | 1 U |
| | 10/24/01 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| | 01/21/02 | — | — | 2 U | 2 U | 2 | 1 | — | — | 0.5 U | 0.4 U | 2 U | 2 U | — | — | 5 U | 5 U | — | — | 1 | 1 | — | — | 2 U | 2 U |
| | 01/21/02 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| | 06/16/03 | — | — | 50 U | 50 U | 0.5 U | 0.5 U | — | — | 0.2 U | 0.2 U | 2 U | 2 U | — | — | 5 U | 5 U | — | — | 1.8 | 0.8 | — | — | 1 U | 1 U |
| | 09/02/03 | — | — | 2 U | 2 U | 2.2 | 3.5 | — | — | 0.2 U | 0.2 U | 2 U | 2 U | — | — | 5 U | 5 U | — | — | 1.7 | 1.5 | — | — | 1 U | 1 U |
| | 12/08/03 | — | — | 2 U | 2 U | 1 U | 1 U | — | — | 0.5 U | 0.5 U | 2 U | 2 U | — | — | 5 U | 5 U | — | — | 1 U | 1 U | — | — | 2 U | 2 U |
| | 12/19/03 | — | — | 50 U | — | 1.6 | — | — | — | 1 U | — | 2 U | — | — | — | 5 U | — | — | — | 3 | — | — | — | 2 U | — |
| | 02/02/04 | — | — | 2 U | 2 U | 1 | 0.5 U | — | — | 0.2 U | 0.2 U | 2 U | 2 U | — | — | 5 U | 5 U | — | — | 4.4 | 1.7 | — | — | 1 U | 1 U |
| | 05/10/04 | — | — | 2 | 2 U | 1 U | 1 U | — | — | 0.5 U | 0.5 U | 4 U | 4 U | — | — | 10 U | 10 U | — | — | 2 | 1 U | — | — | 2 U | 2 U |
| | 08/02/04 | — | — | 2 U | 2 U | 0.7 | 1.3 | — | — | 0.2 U | 0.2 U | 2 U | 2 U | — | — | 5 U | 5 U | — | — | 2 U | 1.4 U | — | — | 1 U | 1 U |
| | 11/01/04 | — | — | 4 U | 4 UJ | 2.2 | 2.4 | — | — | 0.5 U | 0.5 U | 2 U | 2 U | — | — | 5 U | 5 U | — | — | 2 | 2 | — | — | 2 U | 2 U |
| | 02/01/05 | — | — | 2 U | 2 U | 1 U | 1 U | — | — | 0.2 U | 0.2 U | 2 U | 2 U | — | — | 5 U | 5 U | — | — | 2 | 2 | — | — | 2 U | 2 U |
| PL2-JF01C | 05/17/01 | — | — | 2 UJ | 2 UJ | **8** | 4 | — | — | 1 U | 1 U | 4 U | 4 U | — | — | 10 | 10 U | — | — | 30 | 2 U | — | — | 5 U | 5 U |
| | 07/25/01 | — | — | 2 U | 4 U | 3 | 2 U | — | — | 1 U | 1 U | 2 U | 2 U | — | — | 8 | 5 U | — | — | 23 | 2 U | — | — | 5 U | 5 U |
| | 10/24/01 | — | — | 10 U | 10 U | **10** | **6** | — | — | 1 U | 1 U | 2 U | 2 U | — | — | 5 U | 5 U | — | — | 14 | 3 | — | — | 5 U | 5 U |
| | 10/24/01 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| | 01/21/02 | — | — | 10 U | 10 U | 5 U | **6** | — | — | 2 U | 2 U | 2 U | 2 U | — | — | 5 U | 5 U | — | — | 15 | 5 U | — | — | 10 U | 10 U |
| | 01/21/02 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| | 06/16/03 | — | — | 100 U | 100 U | **6** | 3 | — | — | 1 U | 1 U | 4 U | 4 U | — | — | 10 U | 10 U | — | — | 36 | 2 U | — | — | 5 U | 5 U |
| | 12/08/03 | — | — | 10 U | 10 U | 2.78 | 0.363 | — | — | 1 U | 1 U | 4 U | 4 U | — | — | 10 | 10 U | — | — | 28 | 2 U | — | — | 5 U | 5 U |
| | 12/08/03 | — | — | — | — | 4 | 2 U | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 5 U | 1 U |
| | 12/19/03 | — | — | 100 U | — | 4 | — | — | — | 2 U | — | 4 U | | — | — | 10 U | — | — | — | 3 | — | — | — | 5 U | — |
| | 11/01/04 | — | — | 10 U | 20 UJ | — | — | — | — | 1 U | 1 U | 4 U | 4 U | — | — | 10 U | 10 U | — | — | 20 | 4 | — | — | 6 | 5 U |
| | 11/03/04 | — | — | — | — | 0.4 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| PL2-JF02A | 09/27/95 | 50 | — | 1 U | — | **5** | — | 21 | — | 1 U | — | 2 U | — | 32,000 | 32,600 | 5 U | — | 3 U | — | 2 U | — | 4,630 | 5,000 | 2 UB | — |
| | 11/17/95 | — | — | 1 U | — | 2 | — | 10 | — | 1 U | — | 2 U | — | — | — | 5 U | — | — | — | 2 U | — | — | — | 1 | — |
| | 03/01/96 | — | — | 1 U | — | 4 | — | 14 | — | 1 U | — | 2 U | — | — | — | 5 U | — | — | — | 2 U | — | — | — | 1 U | — |
| | 05/23/96 | — | — | 1 U | — | 4 | — | 6 | — | 1 U | — | 2 U | — | — | — | 5 U | — | — | — | 2 U | — | — | — | 1 U | — |
| **MTCA Method A Cleanup Levels[1]** | | **NE** | | **NE** | | **5** | | **NE** | | **NE** | | **5** | | **NE** | | **50** | | **NE** | | **NE** | | **NE** | | **15** | |
| **MTCA Method B Cleanup Levels[2]** | | **NE** | | **6** | | **0.0583** | | **560** | | **32** | | **8** | | **NE** | | **48** | | **NE** | | **592** | | **NE** | | **NE** | |

## Table B-2A
## Groundwater Analytical Results - Metals
## Jorgensen Forge Facility
## 8531 East Marginal Way South
## Seattle, Washington
## Farallon PN: 831-003

| Sample Location | Sample Date | Analytical Results (micrograms per liter) Aluminum | | Antimony | | Arsenic | | Barium | | Beryllium | | Cadmium | | Calcium | | Chromium | | Cobalt | | Copper | | Iron | | Lead | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Dissolved |
| PL2-JF02A | 08/26/96 | — | — | 1 U | — | 4 | — | 9 | — | 1 U | — | 2 U | — | — | — | 5 U | — | — | — | 2 U | — | — | — | 1 | — |
| | 11/21/96 | — | — | 1 U | — | 2 | — | 3 | — | 1 U | — | 2 U | — | — | — | 5 U | — | — | — | 2 U | — | — | — | 1 U | — |
| | 11/21/96 | — | — | 1 U | — | 2 | — | 4 | — | 1 U | — | 2 U | — | — | — | 5 U | — | — | — | 2 U | — | — | — | 1 U | — |
| | 04/26/01 | — | — | 2 UJ | 2 UJ | 0.7 | 0.4 | — | — | 0.2 U | 0.2 U | 2 U | 2 U | — | — | 5 U | 5 U | — | — | 4.6 B | 0.6 | — | — | 1 U | 1 U |
| | 04/26/01 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| | 07/25/01 | — | — | 2 U | 2 U | 0.9 | 0.7 | — | — | 0.2 U | 0.2 U | 2 U | 2 U | — | — | 5 U | 5 U | — | — | 0.7 | 0.5 U | — | — | 1 U | 1 U |
| | 10/24/01 | — | — | 2 U | 2 U | 0.5 U | 0.5 U | — | — | 0.2 U | 0.2 U | 2 U | 2 U | — | — | 5 U | 5 U | — | — | 0.5 U | 0.5 U | — | — | 1 U | 1 U |
| | 10/24/01 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| | 01/21/02 | — | — | 2 U | 2 U | 3.8 | 3.9 | — | — | 0.2 U | 0.2 U | 2 U | 2 U | — | — | 5 U | 5 U | — | — | 1.7 | 1.5 | — | — | 1 U | 1 U |
| | 01/21/02 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| | 06/16/03 | — | — | 50 U | 50 U | 0.5 U | 0.5 | — | — | 0.2 U | 0.2 U | 2 U | 2 U | — | — | 5 U | 5 U | — | — | 0.9 | 1 | — | — | 1 U | 1 U |
| | 09/02/03 | — | — | 2 U | 2 U | 0.5 U | 0.8 | — | — | 0.2 U | 0.2 U | 2 U | 2 U | — | — | 5 U | 5 U | — | — | 1.1 | 0.8 | — | — | 1 U | 1 U |
| | 12/08/03 | — | — | 2 U | 2 U | 1 | 0.8 | — | — | 0.2 U | 0.2 U | 2 U | 2 U | — | — | 5 U | 5 U | — | — | 0.9 | 0.6 | — | — | 1 U | 1 U |
| | 02/02/04 | — | — | 2 U | 2 U | 1.4 | 0.8 | — | — | 0.2 U | 0.2 U | 2 U | 2 U | — | — | 6 | 6 | — | — | 1.2 | 0.7 | — | — | 1 U | 1 U |
| | 05/10/04 | — | — | 2 | 2 U | 1.1 | 0.6 | — | — | 0.2 U | 0.2 U | 2 U | 2 U | — | — | 5 U | 5 U | — | — | 1.3 | 0.5 U | — | — | 1 U | 1 U |
| | 08/02/04 | — | — | 2 U | 2 U | 1.1 | 1 | — | — | 0.2 U | 0.2 U | 2 U | 2 U | — | — | 5 U | 5 U | — | — | 1.6 | 0.7 | — | — | 1 U | 1 U |
| | 11/01/04 | — | — | 2 U | 2 UJ | 1.3 | 0.4 | — | — | 0.2 U | 0.2 U | 2 U | 2 U | — | — | 5 U | 5 U | — | — | 1 U | 0.5 U | — | — | 1 U | 1 U |
| | 02/01/05 | — | — | 2 U | 2 U | 1.1 | 0.3 | — | — | 0.2 U | 0.2 U | 2 U | 2 U | — | — | 5 U | 5 U | — | — | 1.1 | 0.5 U | — | — | 1 U | 1 U |
| PL2-JF03A | 09/28/95 | 50 J | — | 4 | — | 2 | — | 23 | — | 1 U | — | 2 U | — | 85,500 | 88,100 | 5 U | — | 3 U | — | 2 U | — | 8,140 | 2,870 | 1 U | — |
| | 11/17/95 | — | — | 1 U | — | 2 | — | 18 | — | 1 U | — | 2 U | — | — | — | 5 U | — | — | — | 2 U | — | — | — | 1 | — |
| | 03/01/96 | — | — | 1 U | — | 1 U | — | 7 | — | 1 U | — | 2 U | — | — | — | 5 U | — | — | — | 2 U | — | — | — | 1 U | — |
| | 05/23/96 | — | — | 1 U | — | 1 | — | 7 | — | 1 U | — | 2 U | — | — | — | 5 U | — | — | — | 8 | — | — | — | 2 | — |
| | 08/26/96 | — | — | 1 U | — | 1 | — | 15 | — | 1 U | — | 2 U | — | — | — | 5 U | — | — | — | 7 | — | — | — | 2 | — |
| | 11/21/96 | — | — | 1 U | — | 1 U | — | 13 | — | 1 U | — | 2 U | — | — | — | 5 U | — | — | — | 2 U | — | — | — | 1 U | — |
| | 04/26/01 | — | — | 2 UJ | 2 UJ | 0.4 | 0.4 | — | — | 0.2 U | 0.2 U | 2 U | 2 U | — | — | 5 U | 5 U | — | — | 2.2 B | 2.9 | — | — | 1 U | 1 U |
| | 07/25/01 | — | — | 2 U | 2 U | 0.6 | 0.6 | — | — | 0.2 U | 0.2 U | 2 U | 2 U | — | — | 5 U | 5 U | — | — | 0.7 | 0.5 U | — | — | 2 | 1 U |
| | 10/24/01 | — | — | 2 U | 2 U | 0.7 | 0.6 | — | — | 0.2 U | 0.2 U | 2 U | 2 U | — | — | 5 U | 5 U | — | — | 0.5 U | 0.5 U | — | — | 1 U | 1 U |
| | 01/21/02 | — | — | 2 U | 2 U | 0.8 | 0.8 | — | — | 0.2 U | 0.2 U | 2 U | 2 U | — | — | 5 U | 5 U | — | — | 1 | 0.6 | — | — | 1 U | 1 U |
| | 06/16/03 | — | — | 50 U | 50 U | 1.1 | 1 | — | — | 0.2 U | 0.2 U | 2 U | 2 U | — | — | 5 U | 5 U | — | — | 1.3 | 0.5 U | — | — | 1 U | 1 U |
| | 12/08/03 | — | — | 2 U | 2 U | 0.4 | 0.4 | — | — | 0.2 U | 0.2 U | 2 U | 2 U | — | — | 5 U | 5 U | — | — | 2.1 | 0.5 U | — | — | 1 U | 1 U |
| | 11/01/04 | — | — | 2 U | 2 UJ | 0.5 | 0.5 | — | — | 0.2 U | 0.2 U | 2 U | 2 U | — | — | 5 U | 5 U | — | — | 2.1 | 0.6 U | — | — | 1 U | 1 U |
| **MTCA Method A Cleanup Levels[1]** | | **NE** | | **NE** | | **5** | | **NE** | | **NE** | | **5** | | **NE** | | **50** | | **NE** | | **NE** | | **NE** | | **15** | |
| **MTCA Method B Cleanup Levels[2]** | | **NE** | | **6** | | **0.0583** | | **560** | | **32** | | **8** | | **NE** | | **48** | | **NE** | | **592** | | **NE** | | **NE** | |

NOTES:

Shaded indicates sample result exceeds the Washington State Department of Ecology (Ecology) Model Toxics Control Act Cleanup Regulation (MTCA) Method A Groundwater Cleanup Level.

[1]Analyzed by U.S. Environmental Protection Agency Method SW-846-6010B.

2Washington State Department of Ecology (Ecology) MTCA Method A Cleanup Levels for Groundwater, Table 720-1 of Section 900 of Chapter 173-340 of the Washington Administrative Code, as amended February 2001.

[3]MTCA and Risk Calculations, Version 3.1, Standard Method B Values for Groundwater, Ecology Publication No. 94-145, as updated November 2001.

— = not analyzed

J = result reported is an estimate

NE = not established

U = no detectable concentrations above the listed laboratory practical quantitation limit

UB = the analyte was qualified as undetected due to blank contamination

**Table B-2B**
**Groundwater Analytical Results - Metals**
**Jorgensen Forge Facility**
**8531 East Marginal Way South**
**Seattle, Washington**
**Farallon PN: 831-003**

| Sample Location | Sample Date | Analytical Results (micrograms per liter)[1] | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Magnesium | | Manganese | | Mercury[2] | | Nickel | | Potassium | | Selenium | | Silver | | Sodium | | Thallium | | Vanadium | | Zinc | |
| | | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Dissolved |
| MW-1/2 | 03/02/90 | — | — | — | — | 0.2 | — | — | — | — | — | 0.3 | — | 10 U | — | — | — | — | — | — | — | — | — |
| MW-9 | 03/24/92 | — | — | 1,400 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 90 | — |
| MW-23 | 11/20/92 | — | — | 600 | — | 500 U | — | — | — | — | — | 500 U | — | 100 U | — | — | — | — | — | — | — | 100 U | — |
| PL2-JF01AR | 05/17/01 | — | — | — | — | 0.000917 | 0.000401 J | 1.2 | 0.8 | — | — | 50 U | 50 U | 0.5 UJ | 0.5 UJ | — | — | 0.2 U | 0.2 U | 19 | 21 | 8 | 6 UJ |
| | 07/25/01 | — | — | — | — | 0.000544 J | 0.000588 J | 0.8 | 0.7 | — | — | 50 U | 50 U | 0.5 U | 0.5 U | — | — | 0.2 U | 0.2 U | 20 | 21 | 6 U | 6 U |
| | 10/24/01 | — | — | — | — | 0.1 U | 0.1 U | 1.3 | 1 | — | — | 50 U | 50 U | 0.6 | 0.5 U | — | — | 0.2 U | 0.2 U | 11 | 13 | 6 U | 6 U |
| | 10/24/01 | — | — | — | — | 0.000345 J | 0.000234 J | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| | 10/24/01 | — | — | — | — | 0.1 U | 0.1 U | 1.2 | 1.1 | — | — | 50 U | 50 U | 0.5 U | 0.5 U | — | — | 0.2 U | 0.2 U | 11 | 12 | 6 U | 6 U |
| | 10/24/01 | — | — | — | — | 0.000334 J | 0.000296 J | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| | 01/21/02 | — | — | — | — | 0.000227 J | 0.000254 J | 1.6 | 1.3 | — | — | 50 U | 50 U | 0.5 U | 2 U | — | — | 0.2 U | 0.2 U | 10 | 11 | 6 U | 6 U |
| | 01/21/02 | — | — | — | — | 0.1 U | 0.1 U | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| | 06/16/03 | — | — | — | — | 0.025 U | 0.025 U | 0.8 | 0.8 | — | — | 2 U | 0.9 | 0.5 U | 0.5 U | — | — | 0.2 U | 0.2 U | 13 | 13 | 6 U | 6 U |
| | 09/02/03 | — | — | — | — | 0.025 U | 0.025 U | 1.2 | 0.9 | — | — | 0.8 | 0.8 | 0.5 U | 0.5 U | — | — | 0.2 U | 0.2 U | 13 | 13 | 4 | 6 |
| | 12/08/03 | — | — | — | — | 0.025 U | 0.025 U | 0.9 | 0.8 | — | — | 50 U | 50 U | 0.5 U | 0.5 U | — | — | 0.2 U | 0.2 U | 16 | 15 | 6 U | 6 U |
| | 12/19/03 | — | — | — | — | 0.025 U | — | 0.7 | — | — | — | 50 U | — | 0.5 U | — | — | — | 50 U | — | 16 | — | 6 U | — |
| | 02/02/04 | — | — | — | — | 0.025 U | 0.025 U | 1.1 | 1.1 | — | — | 50 U | 50 U | 0.5 U | 0.5 U | — | — | 0.2 U | 0.2 U | 14 | 14 | 6 U | 6 U |
| | 05/10/04 | — | — | — | — | 0.025 U | 0.025 U | 1.1 | 1 | — | — | 50 U | 50 U | 0.5 U | 0.5 U | — | — | 0.2 U | 0.2 U | 19 | 19 | 6 U | 6 U |
| | 08/02/04 | — | — | — | — | 0.025 U | 0.025 U | 1.2 | 1 | — | — | 50 U | 50 U | 0.2 U | 0.2 U | — | — | 0.2 U | 0.2 U | 15 | 13 | 6 U | 6 U |
| | 11/01/04 | — | — | — | — | 0.025 U | 0.025 U | 2.6 | 2.4 | — | — | 50 U | 50 U | 0.2 U | 0.2 U | — | — | 0.2 U | 0.2 U | 14 | 13 | 6 U | 6 U |
| | 11/01/04 | — | — | — | — | 0.025 U | 0.025 U | 2.5 | 2.4 | — | — | 50 U | 50 U | 0.2 U | 0.2 U | — | — | 0.2 U | 0.2 U | 13 | 13 | 6 U | 6 |
| | 02/01/05 | — | — | — | — | 0.025 U | 0.025 U | 1 | 0.9 | — | — | 50 U | 50 U | 0.2 U | 0.2 U | — | — | 0.2 U | 0.2 U | 17 | 15 | 7 | 6 U |
| PL2-JF01B | 03/31/95 | 15,100 | 15,100 | 508 | 511 | 0.1 U | 0.1 U | 10 U | 10 U | 14,800 | 14,500 | 50 U | 50 U | 3 U | 3 U | 255,000 | 255,000 | 50 U | 50 U | 8 | 7 | 4 U | 4 U |
| | 09/27/95 | 28,000 | 28,400 | 540 | 531 | 0.1 U | — | 10 U | — | 19,300 | 19,600 | 50 U | — | 3 U | — | 372,000 | 377,000 | 50 U | — | 7 | — | 4 U | — |
| | 11/17/95 | — | — | — | — | 0.1 U | — | 10 U | — | — | — | 50 U | — | 3 U | — | — | — | 50 U | — | — | — | 4 U | — |
| | 03/01/96 | — | — | — | — | 0.1 U | — | 10 U | — | — | — | 50 U | — | 3 U | — | — | — | 50 U | — | — | — | 4 U | — |
| | 05/23/96 | — | — | — | — | 0.1 U | — | 10 U | — | — | — | 50 U | — | 3 U | — | — | — | 50 U | — | — | — | 4 U | — |
| | 08/26/96 | — | — | — | — | 0.1 U | — | 10 U | — | — | — | 50 U | — | 3 U | — | — | — | 50 U | — | — | — | 4 U | — |
| | 11/21/96 | — | — | — | — | 0.1 U | — | 10 U | — | — | — | 50 U | — | 3 U | — | — | — | 50 U | — | — | — | 4 U | — |
| | 04/26/01 | — | — | — | — | 0.0002 U | 0.1 U | 1.8 | 2.6 | — | — | 50 U | 50 U | 0.5 UJ | 0.5 UJ | — | — | 0.2 U | 0.2 U | 4 | 4 | 6 UJ | 6 UJ |
| **MTCA Method A Cleanup Levels[3]** | | **NE** | | **NE** | | **2** | | **NE** | | **NE** | | **NE** | | **NE** | | **NE** | | **NE** | | **NE** | | **NE** | |
| **MTCA Method B Cleanup Levels[4]** | | **NE** | | **2,240** | | **4.8** | | **320** | | **NE** | | **80** | | **80** | | **NE** | | **1.12** | | **112** | | **4,800** | |

# Table B-2B
## Groundwater Analytical Results - Metals
## Jorgensen Forge Facility
## 8531 East Marginal Way South
## Seattle, Washington
## Farallon PN: 831-003

| Sample Location | Sample Date | Analytical Results (micrograms per liter)[1] | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Magnesium | | Manganese | | Mercury[2] | | Nickel | | Potassium | | Selenium | | Silver | | Sodium | | Thallium | | Vanadium | | Zinc | |
| | | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Dissolved |
| PL2-JF01B | 04/26/01 | — | — | — | — | 0.1 U | 0.0002 U | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| | 07/25/01 | — | — | — | — | 0.0002 UJ | 0.0002 UJ | 7 | 2 | — | — | 50 | 60 | 1 U | 1 U | — | — | 0.5 U | 0.4 U | 3 | 6 | 6 U | 6 U |
| | 10/24/01 | — | — | — | — | 0.1 U | 0.0002 U | 3.4 | 2.2 | — | — | 50 | 50 U | 0.5 U | 0.5 U | — | — | 0.2 U | 0.2 U | 3 U | 3 U | 6 U | 6 U |
| | 10/24/01 | — | — | — | — | 0.000274 J | 0.1 U | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| | 01/21/02 | — | — | — | — | 0.0002 U | 0.1 U | 3 | 2 | — | — | 50 | 50 U | 2 | 1 U | — | — | 0.5 U | 0.4 U | 4 | 3 | 6 U | 6 U |
| | 01/21/02 | — | — | — | — | 0.1 U | 0.000234 J | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| | 06/16/03 | — | — | — | — | 0.025 U | 0.025 U | 3 | 1.6 | — | — | 2 | 3 | 0.5 U | 0.5 U | — | — | 0.2 U | 0.2 U | 4 | 3 | 6 U | 6 U |
| | 09/02/03 | — | — | — | — | 0.025 U | 0.025 U | 3.4 | 6.1 | — | — | 1.9 | 1.4 | 0.5 U | 0.5 U | — | — | 0.2 U | 0.2 U | 3 U | 3 U | 4 U | 4 U |
| | 12/08/03 | — | — | — | — | 0.025 U | 0.025 U | 3 | 2 | — | — | 50 U | 50 U | 1 U | 1 U | — | — | 0.5 U | 0.5 U | 3 | 3 | 6 U | 6 U |
| | 12/19/03 | — | — | — | — | 0.025 U | — | 3 | — | — | — | 50 U | — | 1 U | — | — | — | 50 U | — | 5 | — | 16 | — |
| | 02/02/04 | — | — | — | — | 0.025 U | 0.025 U | 3.7 | 2.4 | — | — | 50 U | 50 U | 0.5 U | 0.5 U | — | — | 0.2 U | 0.2 U | 9 | 3 U | 9 | 6 U |
| | 05/10/04 | — | — | — | — | 0.0365 | 0.025 U | 4 | 4 | — | — | 100 U | 100 U | 1 U | 1 U | — | — | 0.5 U | 0.5 U | 6 U | 6 U | 10 U | 10 U |
| | 08/02/04 | — | — | — | — | 0.025 U | 0.025 U | 4.6 | 3.2 | — | — | 50 U | 50 U | 0.2 U | 0.2 U | — | — | 0.2 U | 0.2 U | 3 | 3 U | 6 U | 6 U |
| | 11/01/04 | — | — | — | — | 0.025 U | 0.025 U | 6 | 5 | — | — | 50 U | 50 U | 0.5 U | 0.5 U | — | — | 0.5 U | 0.5 U | 4 | 4 | 6 U | 6 |
| | 02/01/05 | — | — | — | — | 0.025 U | 0.025 U | 3 | 3 | — | — | 50 U | 50 U | 0.5 U | 0.4 U | — | — | 0.5 U | 0.4 U | 3 U | 3 U | 6 U | 6 U |
| PL2-JF01C | 05/17/01 | — | — | — | — | 0.0248 | 0.0002 U | 15 | 5 | — | — | 110 | 120 | 2 UJ | 2 UJ | — | — | 1 U | 1 U | 34 | 6 U | 130 | 60 |
| | 07/25/01 | — | — | — | — | 0.0224 J | 0.0002 UJ | 13 | 6 | — | — | 50 U | 70 | 2 U | 2 U | — | — | 1 U | 1 U | 22 | 5 | 48 | 6 U |
| | 10/24/01 | — | — | — | — | 0.0082 | 0.00045 J | 9 | 6 | — | — | 90 | 90 | 2 U | 5 U | — | — | 1 U | 1 U | 17 | 3 | 18 | 6 U |
| | 10/24/01 | — | — | — | — | 0.1 U | 0.1 UJ | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| | 01/21/02 | — | — | — | — | 0.0114 | 0.0002 U | 10 | 7 | — | — | 50 U | 50 U | 5 U | 5 U | — | — | 2 U | 2 U | 18 | 4 | 20 | 6 U |
| | 01/21/02 | — | — | — | — | 0.1 U | 0.1 U | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| | 06/16/03 | — | — | — | — | 0.025 U | 0.025 U | 16 | 5 | — | — | 12 | 12 | 2 U | 2 U | — | — | 1 U | 1 U | 37 | 6 U | 50 | 10 U |
| | 12/08/03 | — | — | — | — | 0.0276 | 0.025 U | 16 | 6 | — | — | 100 U | 0.18 | 2 U | 2 U | — | — | 1 U | 5 U | 39 | 6 | 30 | 10 U |
| | 12/08/03 | — | — | — | — | — | — | — | — | — | — | 0.275 | 100 U | — | — | — | — | 6 J | 1 U | — | — | — | — |
| | 12/19/03 | — | — | — | — | 0.025 U | — | 5 | — | — | — | 100 U | — | 2 U | — | — | — | 100 U | | 6 U | — | 20 | — |
| | 11/01/04 | — | — | — | — | 0.025 U | 0.025 U | 15 | 10 | — | — | — | — | 1 U | 1 U | — | — | 5 U | 5 U | 24 | 7 | 10 | 10 U |
| | 11/03/04 | — | — | — | — | — | — | — | — | — | — | 0.113 U | — | — | — | — | — | — | — | — | — | — | — |
| PL2-JF02A | 09/27/95 | 38,800 | 39,900 | 743 | 765 | 0.1 U | — | 10 U | — | 24,800 | 25,300 | 50 U | — | 3 U | — | 77,700 | 78,900 | 50 U | — | 10 | — | 4 U | — |
| | 11/17/95 | — | — | — | — | 0.1 U | — | 10 U | — | — | — | 50 U | — | 3 U | — | — | — | 50 U | — | — | — | 4 U | — |
| | 03/01/96 | — | — | — | — | 0.1 U | — | 10 U | — | — | — | 50 U | — | 3 U | — | — | — | 50 U | — | — | — | 4 U | — |
| **MTCA Method A Cleanup Levels[3]** | | **NE** | | **NE** | | **2** | | **NE** | | **NE** | | **NE** | | **NE** | | **NE** | | **NE** | | **NE** | | **NE** | |
| **MTCA Method B Cleanup Levels[4]** | | **NE** | | **2,240** | | **4.8** | | **320** | | **NE** | | **80** | | **80** | | **NE** | | **1.12** | | **112** | | **4,800** | |

## Table B-2B
## Groundwater Analytical Results - Metals
## Jorgensen Forge Facility
## 8531 East Marginal Way South
## Seattle, Washington
## Farallon PN: 831-003

| Sample Location | Sample Date | Analytical Results (micrograms per liter)[1] | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Magnesium | | Manganese | | Mercury[2] | | Nickel | | Potassium | | Selenium | | Silver | | Sodium | | Thallium | | Vanadium | | Zinc | |
| | | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Dissolved |
| PL2-JF02A | 05/23/96 | — | — | — | — | 0.1 U | — | 10 U | — | — | — | 50 U | — | 3 U | — | — | — | 50 U | — | — | — | 4 U | — |
| | 08/26/96 | — | — | — | — | 0.1 U | — | 10 U | — | — | — | 50 U | — | 3 U | — | — | — | 50 U | — | — | — | 5 | — |
| | 11/21/96 | — | — | — | — | 0.1 U | — | 10 U | — | — | — | 50 U | — | 3 U | — | — | — | 50 U | — | — | — | 4 U | — |
| | 11/21/96 | — | — | — | — | 0.1 U | — | 10 U | — | — | — | 50 U | — | 3 U | — | — | — | 50 U | — | — | — | 4 U | — |
| | 04/26/01 | — | — | — | — | 0.1 U | 0.00103 | 2.6 | 0.7 | — | — | 50 U | 50 U | 0.5 UJ | 0.5 UJ | — | — | 0.2 U | 0.2 U | 7 | 5 | 6 UJ | 6 UJ |
| | 04/26/01 | — | — | — | — | 0.00104 | 0.1 U | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| | 07/25/01 | — | — | — | — | 0.000899 J | 0.000964 J | 0.8 | 0.7 | — | — | 50 U | 50 U | 0.5 U | 0.5 U | — | — | 0.2 U | 0.2 U | 6 | 6 | 6 U | 6 U |
| | 10/24/01 | — | — | — | — | 0.1 U | 0.00064 | 1.2 | 1 | — | — | 50 U | 50 U | 0.5 U | 0.5 U | — | — | 0.2 U | 0.2 U | 4 | 5 | 6 U | 6 U |
| | 10/24/01 | — | — | — | — | 0.000668 | 0.1 U | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| | 01/21/02 | — | — | — | — | 0.00177 | 0.00084 | 3.2 | 2.4 | — | — | 50 U | 50 U | 0.5 U | 0.5 U | — | — | 0.2 U | 0.2 U | 13 | 13 | 6 U | 6 U |
| | 01/21/02 | — | — | — | — | 0.1 U | 0.1 U | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| | 06/16/03 | — | — | — | — | 0.025 U | 0.025 U | 1.4 | 1.2 | — | — | 2 U | 2 U | 0.5 U | 0.5 U | — | — | 0.2 U | 0.2 U | 5 | 4 | 6 U | 9 |
| | 09/02/03 | — | — | — | — | 0.025 U | 0.025 U | 1.4 | 2.1 | — | — | 2 U | 2 | 0.5 U | 0.5 U | — | — | 0.2 U | 0.2 U | 6 | 4 | 4 U | 4 U |
| | 12/08/03 | — | — | — | — | 0.025 U | 0.025 U | 0.9 | 0.7 | — | — | 50 U | 50 U | 0.5 U | 0.5 U | — | — | 0.2 U | 0.2 U | 8 | 7 | 6 U | 6 U |
| | 02/02/04 | — | — | — | — | 0.025 U | 0.025 U | 2.3 | 0.8 | — | — | 50 U | 50 U | 0.5 U | 0.5 U | — | — | 0.2 U | 0.2 U | 9 | 8 | 6 U | 6 U |
| | 05/10/04 | — | — | — | — | 0.025 U | 0.025 U | 1.5 | 1.2 | — | — | 50 U | 50 U | 0.5 U | 0.5 U | — | — | 0.2 U | 0.2 U | 8 | 7 | 6 U | 6 U |
| | 08/02/04 | — | — | — | — | 0.025 U | 0.025 U | 2.2 | 2 | — | — | 50 U | 50 U | 0.2 U | 0.2 U | — | — | 0.2 U | 0.2 U | 8 | 9 | 6 U | 6 U |
| | 11/01/04 | — | — | — | — | 0.025 U | 0.025 U | 1.1 | 0.9 | — | — | 50 U | 50 U | 0.2 U | 0.2 U | — | — | 0.2 U | 0.2 U | 10 | 7 | 6 U | 6 U |
| | 02/01/05 | — | — | — | — | 0.025 U | 0.025 U | 0.8 | 1 | — | — | 50 U | 50 U | 0.2 U | 0.2 U | — | — | 0.2 U | 0.2 U | 10 | 6 | 7 | 6 U |
| PL2-JF03A | 09/28/95 | 46,900 | 48,300 | 1,840 | 1,890 | 0.1 U | — | 10 U | — | 29,200 | 29,900 | 50 U | — | 3 U | — | 81,500 | 82,800 | 50 U | — | 2 U | — | 4 U | — |
| | 11/17/95 | — | — | — | — | 0.1 U | — | 10 | — | — | — | 50 U | — | 3 U | — | — | — | 50 U | — | — | — | 4 U | — |
| | 03/01/96 | — | — | — | — | 0.1 U | — | 10 U | — | — | — | 50 U | — | 3 U | — | — | — | 50 U | — | — | — | 4 U | — |
| | 05/23/96 | — | — | — | — | 0.1 U | — | 10 U | — | — | — | 50 U | — | 3 U | — | — | — | 50 U | — | — | — | 7 | — |
| | 08/26/96 | — | — | — | — | 0.1 U | — | 10 U | — | — | — | 50 U | — | 3 U | — | — | — | 50 U | — | — | — | 14 | — |
| | 11/21/96 | — | — | — | — | 0.1 U | — | 10 U | — | — | — | 50 U | — | 3 U | — | — | — | 50 U | — | — | — | 4 U | — |
| | 04/26/01 | — | — | — | — | 0.000221 J | 0.0002 U | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| | 04/26/01 | — | — | — | — | 0.000426 J | 0.1 U | 1.4 | 1.1 | — | — | 50 U | 50 U | 0.5 UJ | 0.5 UJ | — | — | 0.2 U | 0.2 U | 3 U | 3 U | 14 | 6 UJ |
| | 07/25/01 | — | — | — | — | 0.00514 J | 0.0002 UJ | 1.2 | 1 | — | — | 50 U | 50 U | 0.5 U | 0.5 U | — | — | 0.2 U | 0.2 U | 3 U | 3 U | 6 U | 6 U |
| **MTCA Method A Cleanup Levels[3]** | | **NE** | | **NE** | | **2** | | **NE** | | **NE** | | **NE** | | **NE** | | **NE** | | **NE** | | **NE** | | **NE** | |
| **MTCA Method B Cleanup Levels[4]** | | **NE** | | **2,240** | | **4.8** | | **320** | | **NE** | | **80** | | **80** | | **NE** | | **1.12** | | **112** | | **4,800** | |

# Table B-2B
# Groundwater Analytical Results - Metals
# Jorgensen Forge Facility
# 8531 East Marginal Way South
# Seattle, Washington
# Farallon PN: 831-003

| Sample Location | Sample Date | Analytical Results (micrograms per liter)[1] | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Magnesium | | Manganese | | Mercury[2] | | Nickel | | Potassium | | Selenium | | Silver | | Sodium | | Thallium | | Vanadium | | Zinc | |
| | | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Dissolved |
| PL2-JF03A | 10/24/01 | — | — | — | — | 0.0002 U | 0.000283 J | 1.6 | 1.2 | — | — | 50 U | 50 U | 0.5 U | 0.5 U | — | — | 0.2 U | 0.2 U | 3 U | 3 U | 6 U | 6 U |
| | 01/21/02 | — | — | — | — | 0.1 U | 0.1 U | 1.6 | 0.9 | — | — | 50 U | 50 U | 0.5 U | 0.5 U | — | — | 0.2 U | 0.2 U | 3 U | 3 U | 6 U | 6 U |
| | 06/16/03 | — | — | — | — | 0.025 U | 0.025 U | 1.5 | 1.2 | — | — | 0.5 U | 0.5 U | 0.5 U | 0.5 U | — | — | 0.2 U | 0.2 U | 3 U | 3 U | 6 U | 6 U |
| | 12/08/03 | — | — | — | — | 0.025 U | 0.025 U | 1.6 | 0.8 | — | — | 50 U | 50 U | 0.5 U | 0.5 U | — | — | 0.2 U | 0.2 U | 3 U | 3 U | 6 U | 6 U |
| | 11/01/04 | — | — | — | — | 0.025 U | 0.025 U | 1.1 | 1 | — | — | 50 U | 50 U | 0.2 U | 0.2 U | — | — | 0.2 U | 0.2 U | 3 U | 3 U | 6 U | 6 U |
| **MTCA Method A Cleanup Levels[3]** | | **NE** | | **NE** | | **2** | | **NE** | | **NE** | | **NE** | | **NE** | | **NE** | | **NE** | | **NE** | | **NE** | |
| **MTCA Method B Cleanup Levels[4]** | | **NE** | | **2,240** | | **4.8** | | **320** | | **NE** | | **80** | | **80** | | **NE** | | **1.12** | | **112** | | **4,800** | |

NOTES:

[1]Analyzed by U.S. Environmental Protection Agency (EPA) Method SW-846-6010B.

[2]Analyzed by EPA Method 7470.

[3]Washington State Department of Ecology (Ecology) Model Toxics Control Act Cleanup Regulation (MTCA) Method A Cleanup Levels for Groundwater, Table 720-1 of Section 900 of Chapter 173-340 of the Washington Administrative Code, as amended February 2001.

[4]Ecology MTCA and Risk Calculations, Version 3.1, Standard Method B Values for Groundwater, Ecology Publication No. 94-145, as updated November 2001.

— = not analyzed

J = denotes result reported in an estimate

NE = not established

U = no detectable concentrations above the listed laboratory practical quantitation limit

UB = the analyte was qualified as undetected due to blank contamination

# Table B-3
# Soil Analytical Results - PCBs
# Jorgensen Forge Facility
# 8531 East Marginal Way South
# Seattle, Washington
# Farallon PN: 831-003

| Sample Location | Sample ID | Sample Date | Surface Elevation | Longitude (X-Coordinate) | Latitude (Y-Coordinate) | Sample Depth (feet) [1] | Results reported in milligrams per kilogram[2] | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Aroclor 1016 | Aroclor 1221 | Aroclor 1232 | Aroclor 1242 | Aroclor 1248 | Aroclor 1254 | Aroclor 1260 | Total PCBs |
| SB1 | 082604-0850-01 | 8/26/2004 | 14 | 122.30894 | 47.52696 | 0-2 | < 0.0101 | < 0.0101 | < 0.0101 | < 0.0101 | < 0.0101 | 0.0908 C1 | 0.105 C1 | **0.1958** |
| | 082604-0855-02 | 8/26/2004 | | | | 2-4 | < 0.0103 | < 0.0103 | < 0.0103 | < 0.0103 | < 0.0103 | < 0.0103 | 0.00702 J C1 | 0.0070 |
| | 082604-0900-03 | 8/26/2004 | | | | 4-6 | < 0.0109 | < 0.0109 | < 0.0109 | < 0.0109 | < 0.0109 | < 0.0109 | 0.00345 J C1 | 0.0035 |
| | 082604-0902-04 | 8/26/2004 | | | | 6-8 | < 0.0095 | < 0.0095 | < 0.0095 | < 0.0095 | < 0.0095 | < 0.0095 | < 0.0095 | < 0.0095 |
| | 082604-0910-05 | 8/26/2004 | | | | 8-10 | < 0.0113 | < 0.0113 | < 0.0113 | < 0.0113 | < 0.0113 | < 0.0113 | 0.00568 J C1 | 0.0057 |
| | 082604-0915-06 | 8/26/2004 | | | | 10-12 | < 0.0136 | < 0.0136 | < 0.0136 | < 0.0136 | < 0.0136 | < 0.0136 | < 0.0136 | < 0.0136 |
| SB2 | 082604-0940-07 | 8/26/2004 | 19 | 122.30878 | 47.52657 | 0-2 | < 0.0111 | < 0.0111 | < 0.0111 | < 0.0111 | < 0.0111 | 0.396 C1 | < 0.0111 | **0.3960** |
| | 082604-0943-08 | 8/26/2004 | | | | 2-4 | < 0.0113 | < 0.0113 | < 0.0113 | < 0.0113 | < 0.0113 | 0.0937 C1 | 0.0251 C1 | 0.1188 |
| | 082604-0945-09 | 8/26/2004 | | | | 4-6 | < 0.0116 | < 0.0116 | < 0.0116 | < 0.0116 | < 0.0116 | 0.0294 C1 | 0.0148 C1 | 0.0442 |
| | 082604-0952-10 | 8/26/2004 | | | | 6-8 | < 0.0111 | < 0.0111 | < 0.0111 | < 0.0111 | < 0.0111 | 0.0282 C1 | 0.0155 C1 | 0.0437 |
| | 082604-0956-11 | 8/26/2004 | | | | 8-10 | < 0.0125 | < 0.0125 | < 0.0125 | < 0.0125 | < 0.0125 | < 0.0125 | 0.00618 J C1 | 0.0062 |
| | 082604-1000-12 | 8/26/2004 | | | | 10-12 | < 0.0106 | < 0.0106 | < 0.0106 | < 0.0106 | < 0.0106 | 0.415 C1 | 0.253 C1 | **0.6680** |
| | 082604-1012-13 | 8/26/2004 | | | | 12-14 | < 0.0102 | < 0.0102 | < 0.0102 | < 0.0102 | < 0.0102 | 0.00606 J C1 | < 0.0102 | 0.0061 |
| | 082604-1020-14 | 8/26/2004 | | | | 14-16 | < 0.0114 | < 0.0114 | < 0.0114 | < 0.0114 | < 0.0114 | < 0.0114 | < 0.0114 | < 0.0114 |
| SB3 | 082604-1100-15 | 8/26/2004 | 22 | 122.30866 | 47.52640 | 0-2 | < 0.524 | < 0.524 | < 0.524 | < 0.524 | < 0.524 | 15.5 C1 | 2.27 C1 | **17.77** |
| | 082604-1106-16 | 8/26/2004 | | | | 2-4 | < 0.0098 | < 0.0098 | < 0.0098 | < 0.0098 | < 0.0098 | 0.174 C1 | 0.0323 C1 | **0.2063** |
| | 082604-1109-17 | 8/26/2004 | | | | 4-6 | < 0.0103 | < 0.0103 | < 0.0103 | < 0.0103 | < 0.0103 | 0.194 C1 | 0.0334 C1 | **0.2274** |
| | 082604-1118-18 | 8/26/2004 | | | | 6-8 | < 0.0116 | < 0.0116 | < 0.0116 | < 0.0116 | < 0.0116 | 0.22 C1 | 0.0385 C1 | **0.2585** |
| | 082604-1140-19 | 8/26/2004 | | | | DUP (6-8) | < 0.0111 | < 0.0111 | < 0.0111 | < 0.0111 | < 0.0111 | 0.208 C1 | 0.0404 C1 | **0.2484** |
| | 082604-1146-20 | 8/26/2004 | | | | 8-10 | < 0.0117 | < 0.0117 | < 0.0117 | < 0.0117 | < 0.0117 | 0.156 C1 | 0.0695 C1 | **0.2255** |
| SB4 | 082604-1305-21 | 8/26/2004 | 21 | 122.30853 | 47.52620 | 0-2 | < 0.202 | < 0.202 | < 0.202 | < 0.202 | < 0.202 | 5.93 C1 | 0.904 C1 | **6.834** |
| | 082604-1308-22 | 8/26/2004 | | | | 2-4 | < 0.0562 | < 0.0562 | < 0.0562 | < 0.0562 | < 0.0562 | 1.15 C1 | 0.774 C1 | **1.924** |
| | 082604-1312-23 | 8/26/2004 | | | | 4-6 | < 0.587 | < 0.587 | < 0.587 | < 0.587 | < 0.587 | 9.86 C1 | 1.47 C1 | **11.33** |
| | 082604-1318-24 | 8/26/2004 | | | | 6-8 | < 0.0114 | < 0.0114 | < 0.0114 | < 0.0114 | < 0.0114 | 0.22 C1 | 0.0385 C1 | **0.2585** |
| | 082604-1322-25 | 8/26/2004 | | | | 8-10 | < 0.0118 | < 0.0118 | < 0.0118 | < 0.0118 | < 0.0118 | 0.328 C1 | 0.107 C1 | **0.4350** |
| | 082604-1326-26 | 8/26/2004 | | | | 10-12 | < 0.0124 | < 0.0124 | < 0.0124 | < 0.0124 | < 0.0124 | 0.0127 C1 | 0.00935 J C1 | 0.0221 |
| | 082604-1330-27 | 8/26/2004 | | | | 12-14 | < 0.22 | < 0.22 | < 0.22 | < 0.22 | < 0.22 | 6.01 C1 | 1.03 C1 | **7.04** |
| | 082604-1335-28 | 8/26/2004 | | | | DUP (12-14) | < 0.217 | < 0.217 | < 0.217 | < 0.217 | < 0.217 | 5.96 C1 | 1.04 C1 | **7** |
| | 082604-1345-29 | 8/26/2004 | | | | 14-16 | < 0.118 | < 0.118 | < 0.118 | < 0.118 | < 0.118 | 1.37 C1 | 0.19 C1 | **1.56** |
| SB5 | 082604-1414-30 | 8/26/2004 | 22 | 122.30836 | 47.52599 | 0-2 | < 0.0102 | < 0.0102 | < 0.0102 | < 0.0102 | < 0.0102 | 0.0267 C1 | 0.00801 J C1 | 0.0347 |
| | 082604-1416-31 | 8/26/2004 | | | | 2-4 | < 0.0122 | < 0.0122 | < 0.0122 | < 0.0122 | < 0.0122 | 0.00778 J C1 | 0.00713 J C1 | 0.0149 |
| | 082604-1421-32 | 8/26/2004 | | | | 4-6 | < 0.0112 | < 0.0112 | < 0.0112 | < 0.0112 | < 0.0112 | 0.049 C1 | 0.014 C1 | 0.0630 |
| | 082604-1425-33 | 8/26/2004 | | | | 6-8 | < 0.011 | < 0.011 | < 0.011 | < 0.011 | < 0.011 | 0.0116 C1 | 0.00851 J C1 | 0.0201 |
| | 082604-1428-34 | 8/26/2004 | | | | 8-10 | < 0.0114 | < 0.0114 | < 0.0114 | < 0.0114 | < 0.0114 | 0.0967 C1 | 0.0875 C1 | **0.1842** |
| | 082604-1455-35 | 8/26/2004 | | | | 10-12 | < 0.012 | < 0.012 | < 0.012 | < 0.012 | < 0.012 | 0.0528 C1 | 0.0725 C1 | 0.1253 |
| | 082604-1500-36 | 8/26/2004 | | | | 12-14 | < 0.0111 | < 0.0111 | < 0.0111 | < 0.0111 | < 0.0111 | 0.0505 C1 | 0.0724 C1 | 0.1229 |
| | 082604-1505-37 | 8/26/2004 | | | | 14-16 | < 0.0128 | < 0.0128 | < 0.0128 | < 0.0128 | < 0.0128 | 0.0745 C1 | 0.0989 C1 | **0.1734** |
| SB6 | 082704-0856-01 | 8/27/2004 | 24 | 122.30810 | 47.52576 | 0-2 | < 0.0099 | < 0.0099 | < 0.0099 | < 0.0099 | < 0.0099 | 0.0594 C1 | 0.0782 C1 | **0.1376** |
| | 082704-0900-02 | 8/27/2004 | | | | 2-4 | < 0.0095 | < 0.0095 | < 0.0095 | < 0.0095 | < 0.0095 | 0.0905 C1 | 0.0673 C1 | **0.1578** |
| | 082704-0910-03 | 8/27/2004 | | | | 4-6 | < 0.01 | < 0.01 | < 0.01 | < 0.01 | < 0.01 | 0.122 C1 | 0.0605 C1 | **0.1825** |
| | 082704-0915-04 | 8/27/2004 | | | | 6-8 | < 0.0097 | < 0.0097 | < 0.0097 | < 0.0097 | < 0.0097 | 0.145 C1 | 0.0584 C1 | **0.2034** |
| | 082704-0920-05 | 8/27/2004 | | | | DUP (6-8) | < 0.0105 | < 0.0105 | < 0.0105 | < 0.0105 | < 0.0105 | 0.142 C1 | 0.0538 C1 | **0.1958** |
| | 082704-0930-06 | 8/27/2004 | | | | 8-10 | < 0.0101 | < 0.0101 | < 0.0101 | < 0.0101 | < 0.0101 | 0.0935 C1 | 0.113 C1 | **0.2065** |
| | 082704-0935-07 | 8/27/2004 | | | | 10-12 | < 0.0103 | < 0.0103 | < 0.0103 | < 0.0103 | < 0.0103 | 0.172 C1 | 0.0938 C1 | **0.2658** |
| | 082704-0940-08 | 8/27/2004 | | | | 12-14 | < 0.0106 | < 0.0106 | < 0.0106 | < 0.0106 | < 0.0106 | 0.133 C1 | 0.0523 C1 | **0.1853** |
| | 082704-0942-09 | 8/27/2004 | | | | 14-16 | < 0.0103 | < 0.0103 | < 0.0103 | < 0.0103 | < 0.0103 | 0.0404 C1 | 0.0503 C1 | 0.0907 |
| **Sediment Management Standards - LAET[3]** | | | | | | | | | | | | | | **0.13** |
| **Sediment Management Standards - 2LAET[4]** | | | | | | | | | | | | | | **1** |

# Table B-3
## Soil Analytical Results - PCBs
## Jorgensen Forge Facility
## 8531 East Marginal Way South
## Seattle, Washington
## Farallon PN: 831-003

| Sample Location | Sample ID | Sample Date | Surface Elevation | Longitude (X-Coordinate) | Latitude (Y-Coordinate) | Sample Depth (feet) [1] | Results reported in milligrams per kilogram[2] | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Aroclor 1016 | Aroclor 1221 | Aroclor 1232 | Aroclor 1242 | Aroclor 1248 | Aroclor 1254 | Aroclor 1260 | Total PCBs |
| SB7 | 082704-1032-010 | 8/27/2004 | 25 | 122.30876 | 47.52569 | 0-2 | < 0.0102 | < 0.0102 | < 0.0102 | < 0.0102 | < 0.0102 | 0.0683 C1 | 0.0293 C1 | 0.0976 |
| | 082704-1034-011 | 8/27/2004 | | | | 2-4 | < 0.0105 | < 0.0105 | < 0.0105 | < 0.0105 | < 0.0105 | 0.256 C1 | 0.0952 C1 | **0.3512** |
| | 082704-1038-012 | 8/27/2004 | | | | 4-6 | < 0.054 | < 0.054 | < 0.054 | < 0.054 | < 0.054 | 1.13 C1 | 0.493 C1 | **1.623** |
| | 082704-1044-013 | 8/27/2004 | | | | 6-8 | < 0.0099 | < 0.0099 | < 0.0099 | < 0.0099 | < 0.0099 | 0.251 C1 | 0.114 C1 | **0.3650** |
| | 082704-1054-014 | 8/27/2004 | | | | 8-10 | < 0.011 | < 0.011 | < 0.011 | < 0.011 | < 0.011 | 0.323 C1 | 0.0967 C1 | **0.4197** |
| | 082704-1100-015 | 8/27/2004 | | | | 10-12 | < 0.0119 | < 0.0119 | < 0.0119 | < 0.0119 | < 0.0119 | 0.21 C1 | 0.0924 C1 | **0.3024** |
| | 082704-1110-016 | 8/27/2004 | | | | 12-14 | < 0.0111 | < 0.0111 | < 0.0111 | < 0.0111 | < 0.0111 | 0.253 C1 | 0.128 C1 | **0.3810** |
| | 082704-1115-017 | 8/27/2004 | | | | 14-16 | < 0.0124 | < 0.0124 | < 0.0124 | < 0.0124 | < 0.0124 | 0.204 C1 | 0.425 C1 | **0.6290** |
| SS1 | 083104-1140-03 | 8/31/2004 | 14 | 122.30846 | 47.52598 | 0-2 | < 0.011 | < 0.011 | < 0.011 | < 0.011 | < 0.011 | 0.152 C1 | 0.171 C1 | **0.3230** |
| SS2 | 083104-1200-04 | 8/31/2004 | 14 | 122.30854 | 47.52640 | 0-2 | < 0.103 | < 0.103 | < 0.103 | < 0.103 | < 0.103 | 2.92 C1 | 0.767 C1 | **3.687** |
| | 083104-1215-05 | 8/31/2004 | | | | DUP (0-2) | < 0.105 | < 0.105 | < 0.105 | < 0.105 | < 0.105 | 3.15 C1 | 0.95 C1 | **4.1** |
| SS3 | 083004-1230-06 | 8/30/2004 | 14 | 122.30864 | 47.52622 | 0-2 | < 0.0519 | < 0.0519 | < 0.0519 | < 0.0519 | < 0.0519 | 1.02 C1 | 0.423 C1 | **1.443** |
| SS4 | 083004-1215-05 | 8/30/2004 | 14 | 122.30868 | 47.52638 | 0-2 | < 0.0102 | < 0.0102 | < 0.0102 | < 0.0102 | < 0.0102 | 0.0118 C1 | 0.0137 C1 | 0.0255 |
| SS5 | 083004-1145-04 | 8/30/2004 | 14 | 122.30893 | 47.52674 | 0-2 | < 0.0105 | < 0.0105 | < 0.0105 | < 0.0105 | < 0.0105 | 0.0837 C1 | 0.113 C1 | **0.1967** |
| SS6 | 083004-1055-03 | 8/30/2004 | 14 | 122.30894 | 47.52690 | 0-2 | < 0.103 | < 0.103 | < 0.103 | < 0.103 | < 0.103 | 2.78 C1 | 1.76 C1 | **4.54** |
| SS7 | 083004-1040-02 | 8/30/2004 | 14 | 122.30916 | 47.52702 | 0-2 | < 0.11 | < 0.11 | < 0.11 | < 0.11 | < 0.11 | 2.19 C1 | 1.33 C1 | **3.52** |
| SS8 | 083004-1020-01 | 8/30/2004 | 14 | 122.30927 | 47.52712 | 0-2 | < 0.0101 | < 0.0101 | < 0.0101 | < 0.0101 | < 0.0101 | 0.0546 C1 | 0.115 C1 | **0.1696** |
| CB1 | 083104-1010-01 | 8/31/2004 | 17 | 122.30824 | 47.52612 | Grab Sample | < 0.0215 | < 0.0215 | < 0.0215 | < 0.0215 | < 0.0215 | 0.174 C1 | 0.109 C1 | **0.2830** |
| CB2 | 083104-1040-02 | 8/31/2004 | 17 | 122.30798 | 47.52611 | Grab Sample | < 0.0184 | < 0.0184 | < 0.0184 | < 0.0184 | < 0.0184 | 0.193 C1 | 0.109 C1 | **0.3020** |
| CB3 | 083104-1330-08 | 8/31/2004 | 17 | 122.30614 | 47.52614 | Grab Sample | < 0.0139 | < 0.0139 | < 0.0139 | < 0.0139 | < 0.0139 | 0.106 C1 | 0.182 C1 | **0.2880** |
| CB4 | 083104-1400-09 | 8/31/2004 | 16 | 122.30429 | 47.52574 | Grab Sample | < 0.0146 | < 0.0146 | < 0.0146 | < 0.0146 | < 0.0146 | 0.079 C1 | 0.0502 C1 | 0.1292 |
| South debris pile | 083104-1230-06 | 8/31/2004 | 4 | NS | NS | 0-2 | < 0.118 | < 0.118 | < 0.118 | < 0.118 | < 0.118 | 1.05 C1 | 1.01 C1 | **2.06** |
| North debris pile | 083104-1240-07 | 8/31/2004 | 4 | NS | NS | 0-2 | < 0.0603 | < 0.0603 | < 0.0603 | < 0.0603 | < 0.0603 | 1.94 C1 | 0.397 C1 | **2.337** |
| **Sediment Management Standards - LAET[3]** | | | | | | | | | | | | | | **0.13** |
| **Sediment Management Standards - 2LAET[4]** | | | | | | | | | | | | | | **1** |

NOTES:

Results in BOLD denote concentrations are above the Sediment Management Standards (SMS).

Chapter 173-340 of the Washington Administrative Code - Lowest Apparent Effect Threshold (LAET).

Results shaded denote concentrations are above the SMS - 2LAET.

[1]Depth in feet below ground level.

[2]Analyzed by U.S. Environmental Protection Agency Method 8082.

[3] SMS - LAET.

[4] SMS - 2LAET.

< = constituent was not detected above the stated laboratory practical quantitation limit

C1 = Second column confirmation was performed. The relative percent difference value (RPD) between the results on the two columns was evaluated and determined to be 40 percent.

DUP = Duplicate sample of preceding sample

J = an estimated concentration when the value is less than the calculated reporting limit

NS = not surveyed

PCBs = polychlorinated biphenyls

**Table B-4**
**Soil Analytical Results - Metals**
**Jorgensen Forge Facility**
**8531 East Marginal Way South**
**Seattle, Washington**
**Farallon PN: 831-003**

| Sample Location | Sample ID | Sample Date | Surface Elevation (feet) | Longitude (X-Coordinate) | Latitude (Y-Coordinate) | Sample Depth (feet)[1] | Results reported in milligrams per kilogram[2] | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Arsenic | Cadmium | Chromium | Copper | Lead | Mercury | Nickel | Silver | Zinc |
| SB1 | 082604-0850-01 | 8/26/2004 | 14 | 122.30894 | 47.52696 | 0-2 | 25.7 | 4.5 | **515** | 334 B2 | 111 B2 | 0.065 | 1,130 B2 | 0.281 J | **1,320 B2** |
| | 082604-0855-02 | 8/26/2004 | | | | 2-4 | 5.98 | < 1.06 | 209 | 59.6 B2 | 20.8 B2 | 0.0501 | 62.5 B2 | 0.136 J | 129 B2 |
| SB2 | 082604-0940-07 | 8/26/2004 | 19 | 122.30878 | 47.52657 | 0-2 | 16.6 | < 1.15 | **829** | 169 B2 | 226 B2 | 0.0542 | 125 B2 | 0.421 J | 370 B2 |
| | 082604-0943-08 | 8/26/2004 | | | | 2-4 | 14.6 | < 1.06 | **707** | 104 B2 | 278 B2 | < 0.0205 | 243 B2 | 0.351 J | 231 B2 |
| | 082604-0945-09 | 8/26/2004 | | | | 4-6 | 9.47 | <0.283 | **588 B2** | 74.5 | 323 | 0.0074 J | 173 | 0.381 | 215 B2 |
| | 082604-0952-10 | 8/26/2004 | | | | 6-8 | 8.14 | <0.265 | **618 B2** | 115 | 274 | <0.0192 | 189 | 0.325 | 162 B2 |
| SB3 | 082604-1100-15 | 8/26/2004 | 22 | 122.30866 | 47.52640 | 0-2 | 20.3 | 2.2 | **282** | 156 B2 | **1,530 B2** | 0.0422 | 159 B2 | 0.379 J | **476 B2** |
| | 082604-1106-16 | 8/26/2004 | | | | 2-4 | **61.7** | < 1.02 | **1,170** | **541 B2** | 95.4 B2 | < 0.0193 | 3,410 B2 | 0.171 J | 118 B2 |
| | 082604-1109-17 | 8/26/2004 | | | | 4-6 | 20.1 | <0.266 | **765 B2** | 188 | 180 | 0.0058 J | 584 | 0.28 | 197 B2 |
| | 082604-1118-18 | 8/26/2004 | | | | 6-8 | 7.65 | <0.252 | **772 B2** | 72.9 | 179 | 0.00899 J | 207 | 0.274 | 191 B2 |
| SB4 | 082604-1305-21 | 8/26/2004 | 21 | 122.30853 | 47.52620 | 0-2 | 14.1 | 0.584 J | **507** | 216 B2 | **1,130 B2** | **0.694** | 290 B2 | 0.381 J | 319 B2 |
| | 082604-1308-22 | 8/26/2004 | | | | 2-4 | 9.17 | < 1.1 | **476** | 72.9 B2 | 312 B2 | 0.123 | 98.1 B2 | 0.372 J | 230 B2 |
| | 082604-1317-23 | 8/26/2004 | | | | 4-6 | 16 | <0.289 | **666 B2** | 171 | **732** | <0.0239 | 99.1 | 0.4 | 200 B2 |
| | 082604-1318-24 | 8/26/2004 | | | | 6-8 | 7.67 | <0.288 | **691 B2** | 68.8 | **460** | 0.0352 | 62.2 | 0.332 | 136 B2 |
| SB5 | 082604-1414-30 | 8/26/2004 | 22 | 122.30836 | 47.52599 | 0-2 | 3.47 | < 0.967 | **560** | 40.2 B2 | 109 B2 | 0.0128 J | 28.6 B2 | 0.188 J | 102 B2 |
| | 082604-1416-31 | 8/26/2004 | | | | 2-4 | 6.44 | < 1.25 | **961** | 77.3 B2 | 327 B2 | 0.0208 J | 73.1 B2 | 0.331 J | 289 B2 |
| | 082604-1421-32 | 8/26/2004 | | | | 4-6 | 3.75 | <0.282 | **799 B2** | 69.1 | 192 | 0.0098 J | 61 | 0.259 J | 255 B2 |
| | 082604-1425-33 | 8/26/2004 | | | | 6-8 | 9.1 | <0.319 | **889 B2** | 102 | 256 | <0.0244 | 95.2 | 0.35 | 253 B2 |
| SB6 | 082704-0856-01 | 8/27/2004 | 24 | 122.30810 | 47.52576 | 0-2 | 7.25 | < 0.892 | **593** | 220 B2 | 96 B2 | 0.0226 | 433 B2 | 0.65 J | 267 B2 |
| | 082704-0900-02 | 8/27/2004 | | | | 2-4 | **62.7** | 0.0799 J | **1,170** | **955 B2** | 112 B2 | 0.00545 J | 5,560 B2 | 0.627 J | 87 B2 |
| | 082704-0910-03 | 8/27/2004 | | | | 4-6 | 33.4 | <0.219 | **1,550 B2** | **717** | 132 | <0.0183 | 2,340 | 0.747 | 110 B2 |
| | 082704-0915-04 | 8/27/2004 | | | | 6-8 | 19.1 | <0.252 | **606 B2** | 264 | 92.9 | <0.0159 | 1,430 | 0.315 | 100 B2 |
| SB7 | 082704-1032-10 | 8/27/2004 | 25 | 122.30876 | 47.52569 | 0-2 | 8.47 | < 1.09 | **3,200** | 262 B2 | 110 B2 | 0.0192 J | 1,060 B2 | 0.553 J | 170 B2 |
| | 082704-1034-11 | 8/27/2004 | | | | 2-4 | 15.8 | 1.97 | **410** | 130 B2 | **543 B2** | 0.0673 | 158 B2 | 1 J | **507 B2** |
| | 082704-1038-12 | 8/27/2004 | | | | 4-6 | 15.1 | 3.19 | **1,950 B2** | 271 | **1,460** | 0.118 | 521 | 1.61 | **1,380 B2** |
| | 082704-1044-13 | 8/27/2004 | | | | 6-8 | 14.2 | 0.446 | **1,000 B2** | 205 | **657** | 0.0573 | 374 | 1.39 | **414 B2** |
| SS1 | 083104-1140-03 | 8/31/2004 | 14 | 122.30846 | 47.52598 | 0-2 | 24.7 | **6.73 B2** | **350** | 183 B2 | **1,010** | 0.0681 | 54.7 | 1.69 B2 | **986 B2** |
| SS2 | 083104-1200-04 | 8/31/2004 | 14 | 122.30854 | 47.52640 | 0-2 | 18.8 | 4.11 B2 | 117 | 246 B2 | **3,330** | **0.958** | 53.5 | 0.784 J B2 | **1,710 B2** |
| | 083104-1215-05 | 8/31/2004 | | | | DUP (0-2) | 22.5 | **6.66 B2** | 133 | 179 B2 | **5,010** | **0.866** | 57.1 | 0.867 J B2 | **2,700 B2** |
| SS3 | 083004-1230-06 | 8/30/2004 | 14 | 122.30864 | 47.52622 | 0-2 | 10.3 | 0.303 J B1 | 57.9 | 72.4 B2 | 313 | 0.0311 | 47.5 | < 1.03 | 196 B2 |
| SS4 | 083004-1215-05 | 8/30/2004 | 14 | 122.30868 | 47.52638 | 0-2 | 9.95 | < 0.517 | **386** | 83.7 B2 | 146 | 0.0128 J | 45 | 0.839 J B2 | 159 B2 |
| SS5 | 083004-1145-04 | 8/30/2004 | 14 | 122.30893 | 47.52674 | 0-2 | 15.4 | < 0.479 | 91.8 | 220 B2 | 246 | 0.03 | 163 | < 0.957 | 178 B2 |
| SS6 | 083004-1055-03 | 8/30/2004 | 14 | 122.30894 | 47.52690 | 0-2 | 31.8 | 2.11 B2 | 182 | 361 B2 | **4,210** | 0.145 | 118 | 0.461 J B1 | **2,350 B2** |
| SS7 | 083004-1040-02 | 8/30/2004 | 14 | 122.30916 | 47.52702 | 0-2 | **64.9** | **11.6 B2** | 227 | **561 B2** | **5,450** | **0.502** | 241 | **8.73 B2** | **5,430 B2** |
| SS8 | 083004-1020-01 | 8/30/2004 | 14 | 122.30927 | 47.52712 | 0-2 | 12.2 | 2.24 B2 | 28 | 104 B2 | 109 | 0.0928 | 89.8 | < 1.03 | **1,170 B2** |
| CB1 | 083104-1010-01 | 8/31/2004 | 17 | 122.30824 | 47.52612 | Grab Sample | < 4.17 | 3 B2 | **5,660** | **2,090 B2** | 301 | 0.119 | 1,770 | 2.08 J B2 | **1,090 B2** |
| CB2 | 083104-1040-02 | 8/31/2004 | 8 | 122.30798 | 47.52611 | Grab Sample | < 3.88 | 3.38 B2 | **10,100** | **2,080 B2** | 178 | 0.11 | 3,620 | 2.83 B2 | **1,030 B2** |
| CB3 | 083104-1330-08 | 8/31/2004 | 10 | 122.30614 | 47.52614 | Grab Sample | < 2.74 | 2.03 B2 | **4,550** | **1,060 B2** | 220 | 0.182 | 2,470 | 2.86 B2 | **1,040 B2** |
| CB4 | 083104-1400-09 | 8/31/2004 | 16 | 122.30429 | 47.52574 | Grab Sample | 7.29 | 1.15 B2 | **3,110** | **1,330** | 52.7 B2 | 0.0455 | 3,230 | 1.01 J B1 | 380 B2 |
| North Debris Pile | 083104-1240-07 | 8/31/2004 | 4 | NS | NS | 0-2 | 23.6 | < 0.598 | **309** | **484 B2** | **9,180** | 0.182 | 146 | < 1.2 | **2,140 B2** |
| South Debris Pile | 083104-1230-06 | 8/31/2004 | 4 | NS | NS | 0-2 | 53.9 | < 0.587 | 229 | **1,100 B2** | **1,040** | 0.0449 | 239 | < 1.17 | 314 B2 |
| **Sediment Management Standards - SQS[3]** | | | | | | | **57** | **5.1** | **260** | **390** | **450** | **0.41** | **NV** | **6.1** | **410** |
| **Sediment Management Standards - CSL[4]** | | | | | | | **93** | **6.7** | **270** | **390** | **530** | **0.59** | **NV** | **6.1** | **960** |

NOTES:

Results in **BOLD** denote concentrations above the Sediment Management Standards (SMS), Chapter 173-340 of the Washington Administrative Code, Marine Sediment Quality Standards (SQS) - Chemical Criteria.

Results shaded denote concentrations are above the SMS - Puget Sound Marine Sediment Cleanup Screening Levels (CSL).

[1]Depth in feet below ground level.

[2]Analyzed by U.S. Environmental Protection Agency (EPA) Method 6010/6020. Mercury was analyzed by EPA Method 7471.

[3] SMS - SQS

[4] SMS - CSL

B1 = This analyte was detected in the associated method blank. The analyte concentration was determined not to be significantly higher than the associated method blank (less than ten times the concentration reported in the blank).

B2 = This analyte was detected in the associated method blank. The analyte concentration in the sample was determined to be significantly higher than the method blank (greater then ten times the concentration reported in the blank.)

DUP = Duplicate sample of preceding sample

J = the analyte was analyzed for and positively identified, but the associated numerical value is an estimated quantity.

NS = not surveyed

NV = no cleanup value established

# APPENDIX B
# SECOND PHASE ENVIRONMENTAL SAMPLING RESULTS
# BORING LOGS

Final Investigation Data Summary Report
Jorgensen Forge Facility
8531 East Marginal Way South
Seattle, Washington
U.S. EPA Docket No. CERCLA 10-2003-0111

Farallon PN: 831-003

FARALLON CONSULTING
320 3rd Avenue NE
Issaquah, WA 98027

# USCS Classification and Graphic Legend

| Major Divisions | | | USCS Graphic Symbol | USCS Letter Symbol | Lithologic Description |
|---|---|---|---|---|---|
| Coarse-Grained Soil (More than 50% of material is larger than No. 200 sieve size) | GRAVEL AND GRAVELLY SOIL (More than 50% of coarse fraction retained on No. 4 sieve) | CLEAN GRAVEL (Little or no fines) | | GW | Well graded GRAVEL, well graded GRAVEL with sand |
| | | | | GP | Poorly graded GRAVEL, GRAVEL with sand |
| | | GRAVEL WITH FINES (Appreciable amount of fines) | | GP-GM | Poorly graded GRAVEL - GRAVEL with sand and silt |
| | | | | GM | Silty GRAVEL |
| | | | | GC | Clayey GRAVEL |
| | SAND AND SANDY SOIL (More than 50% of coarse fraction passed through No. 4 sieve) | CLEAN SAND (Little or no fines) | | SW | Well graded SAND |
| | | | | SP | Poorly graded SAND |
| | | SAND WITH FINES (Appreciable amount of fines) | | SP-SM | Poorly graded SAND - silty SAND |
| | | | | SM | Silty SAND |
| | | | | SC | Clayey SAND |
| | | | | SM-ML | SILT - Silty SAND |
| Fine-Grained Soil (More than 50% of material is smaller than No. 200 sieve size) | SILT AND CLAY (Liquid limit less than 50) | | | ML | SILT |
| | | | | CL | CLAY |
| | | | | OL | Organic SILT |
| | SILT AND CLAY (Liquid limit greater than 50) | | | MH | Inorganic SILT |
| | | | | CH | Inorganic CLAY |
| | | | | OH | Organic CLAY |
| | | Highly Organic Soil | | PT | Peat |
| OTHER MATERIALS | PAVEMENT | | | AC | Asphalt concrete |
| | | | | CO | Concrete |
| | OTHER | | | RK | Bedrock |
| | | | | WD | Wood Debris |
| | | | | DB | Debris (Miscellaneous) |
| | | | | PC | Portland cement |

## Legend

Sample Interval

G Grab Sample Interval

Water level at time of drilling

Water level at time of sampling

Blank Casing

Screened Casing

Cement Grout

Bentonite

Sand Pack

Well Cap

Solid line indicates sharp contact between units well defined.

Dashed line indicates gradational contact between units.

feet bgs = feet below ground surface
NE = Not Encountered
NA = Not Applicable
PID = Photoionization Detector
PN = Project Number
ppm = Parts per Million
USCS = Unified Soil Classification System

**Farallon Consulting**
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Issaquah, WA 98027

# Log of Boring: SB-1



**Client:** EMJ/Jorgensen Forge
**Project:** Jorgensen Forge
**Location:** Seattle, WA
**Farallon PN:** 831-003
**Logged By:** JAK and JAS

| | | | |
|---|---|---|---|
| **Date/Time Started:** | 8/26/04 0850 | **Sampler Type:** | 4-foot sampler |
| **Date/Time Completed:** | 8/26/04 0915 | **Drive Hammer (lbs.):** | 140 |
| **Equipment:** | Geoprobe | **Depth of Water ATD (ft bgs):** | 12 |
| **Drilling Company:** | Cascade Drilling | **Total Boring Depth (ft bgs):** | 12 |
| **Drilling Foreman:** | Kasey Goble | **Total Well Depth (ft bgs):** | NA |
| **Drilling Method:** | Geoprobe | | |

| Depth (feet bgs.) | Sample Interval | Lithologic Description | USCS | USGS Graphic | % Recovery | Blow Counts 8/8/8 | PID (units) | Sample ID | Sample Analyzed | Well Construction Details |
|---|---|---|---|---|---|---|---|---|---|---|
| 0 | X | FILL--GRAVEL with silt minor sand. 65% fine-coarse gravel, 20% silt, 15% fine sand. Brown, moist, no odor. | | | 50 | NA | NA | 082604-0850-01 | X | |
| | X | FILL--GRAVEL minor sand trace silt. 80% fine-coarse gravel, 15% fine-coarse sand, and 5% silt. Brown, moist, no odor. White brick material at 3 feet bgs. | | | 50 | NA | NA | 082604-0855-02 | X | Well not installed |
| 5 | X | FILL--Silty GRAVEL with sand. 45% fine-coarse gravel, 40% silt, and 15% fine-coarse fine-course sand. Brown, moist, no odor. | | | 50 | NA | NA | 082604-0900-03 | X | |
| | X | FILL--SAND trace silt. 95% fine-coarse sand, 5% silt. Brown, moist, no odor. | | | 50 | NA | NA | 082604-0902-04 | X | |
| | X | | | | 50 | NA | NA | 082604-0910-05 | X | |
| 10 | X | SILT. 100% silt. Grey with orange mottling, moist, no-odor. | MH | | 60 | NA | NA | 0826-04-0915-06 | X | |
| | X | SAME wet | | | | | | | | ▼ (water level at 12 ft) |
| 15 | | | | | | | | | | |
| 20 | | | | | | | | | | |

## Well Construction Information

| | | | |
|---|---|---|---|
| **Monument Type:** | NA | **Ground Surface Elevation (ft):** | 14-feet |
| **Casing Diameter (inches):** | NA | **Top of Casing Elevation (ft):** | NA |
| **Screen Slot Size (inches):** | NA | **Boring Abandonment:** | Bentonite chips |
| **Screened Interval (ft bgs):** | NA | **Surveyed Location:** | X: 122.30894 Y: 47.52696 |
| **Filter Pack:** | NA | | |
| **Surface Seal:** | NA | | |
| **Annular Seal:** | NA | | |

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# Log of Boring: SB-2



**Client:** EMJ/Jorgensen Forge
**Project:** Jorgensen Forge
**Location:** Seattle, WA
**Farallon PN:** 831-003
**Logged By:** JAK and JAS

| | | | |
|---|---|---|---|
| **Date/Time Started:** | 08/26/04 0940 | **Sampler Type:** | 4-foot sampler |
| **Date/Time Completed:** | 08/26/04 1020 | **Drive Hammer (lbs.):** | 140 |
| **Equipment:** | Geoprobe | **Depth of Water ATD (ft bgs):** | 14 |
| **Drilling Company:** | Cascade Drilling | **Total Boring Depth (ft bgs):** | 16 |
| **Drilling Foreman:** | Kasey Goble | **Total Well Depth (ft bgs):** | NA |
| **Drilling Method:** | Geoprobe | | |

| Depth (feet bgs.) | Sample Interval | Lithologic Description | USCS | USGS Graphic | % Recovery | Blow Counts 8/8/8 | PID (units) | Sample ID | Sample Analyzed | Well Construction Details |
|---|---|---|---|---|---|---|---|---|---|---|
| 0 | X | FILL--GRAVEL minor sand trace silt. 80% fine-coarse gravel, 15% fine-coarse sand, 5% silt. Brown. moist, no odor. | | | 40 | NA | NA | 082604-0940-07 | X | Well not installed |
| | X | | | | 40 | NA | NA | 082604-0943-08 | X | |
| | X | FILL--SAME with marbeling | | | 50 | NA | NA | 082604-0945-09 | X | |
| 5 | X | FILL-SAME with cobble and black obsidion like material | | | 70 | NA | NA | 082604-0952-10 | X | |
| | X | FILL--Gravel with sand trace silt. 70% fine-coarse gravel, 25% fine-coarse sand, and 5% silt. Marbeled brown, moist, no odor. | | | 50 | NA | NA | 082604-0956-11 | X | |
| 10 | X | FILL--White brick | | | 50 | NA | NA | 082604-1000-12 | X | |
| | X | FILL--SAND minor gravel minor silt. 75% fine-coarse sand, 15% coarse gravel, 10% silt. Grey, moist, no odor. | | | 50 | NA | NA | 082604-1012-13 | X | |
| | X | FILL--SAND. 100% fine-coarse sand. Grey, moist, no odor, very dense. | | | | | | | | |
| | X | SAME but not very dense. | | | 60 | NA | NA | 082604-1020-14 | X | ▼ |
| 15 | X | FILL--SAND with gravel. 65% fine-coarse sand and 35% fine-coarse gravel. Grey, wet, no odor | | | | | | | | |
| 20 | | | | | | | | | | |

## Well Construction Information

| | | | | | |
|---|---|---|---|---|---|
| **Monument Type:** | NA | **Filter Pack:** | NA | **Ground Surface Elevation (ft):** | 14-feet |
| **Casing Diameter (inches):** | NA | **Surface Seal:** | NA | **Top of Casing Elevation (ft):** | NA |
| **Screen Slot Size (inches):** | NA | **Annular Seal:** | NA | **Boring Abandonment:** | Bentonite chips |
| **Screened Interval (ft bgs):** | NA | | | **Surveyed Location:** | X: 122.30818 Y: 47.52657 |

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# Log of Boring: SB-3



**Client:** EMJ/Jorgensen Forge
**Project:** Jorgensen Forge
**Location:** Seattle, WA
**Farallon PN:** 831-003
**Logged By:** JAK and JAS

**Date/Time Started:** 08/26/04 1055
**Date/Time Completed:** 08/26/04 1300
**Equipment:** Geoprobe
**Drilling Company:** Cascade Drilling
**Drilling Foreman:** Kasey Goble
**Drilling Method:** Geoprobe

**Sampler Type:** 4-foot sampler
**Drive Hammer (lbs.):** 140
**Depth of Water ATD (ft bgs):** NE
**Total Boring Depth (ft bgs):** 10
**Total Well Depth (ft bgs):** NA

| Depth (feet bgs.) | Sample Interval | Lithologic Description | USCS | USGS Graphic | % Recovery | Blow Counts 8/8/8 | PID (units) | Sample ID | Sample Analyzed | Well Construction Details |
|---|---|---|---|---|---|---|---|---|---|---|
| 0 | X | FILL--GRAVEL with sand minor silt. 65% fine-coarse gravel, 20% fine-coarse sand, 15% silt. Brown, moist, no odor. | | | 50 | NA | NA | 082604-1105-15 | X | |
| | X | FILL--GRAVEL with sand trace silt. 70% fine-coarse gravel, 25% fine-coarse sand, 5% silt. Brown, moist, no odor. Black obsidion like material at 2 feet. | | | 60 | NA | NA | 082604-1106-16 | X | Well not installed |
| 5 | X | FILL--GRAVEL minor sand. 90% fine-coarse gravel and 10% fine-coarse sand. Marbeled brown, moist, no odor. | | | 50 | NA | NA | 082604-1109-17 | X | |
| | X | FILL--GRAVEL with sand trace silt. 75% fine-coarse gravel, 20% fine-coarse sand, 5% silt. Brown/orange, moist, no odor. | | | 65 | NA | NA | 082604-1118-18<br>082604-1240-19 | X | |
| | X | REFUSAL--move one foot north/<br>SAME as 6'-8' | | | 50 | NA | NA | 082604-1246-20 | X | |
| 10 | | REFUSAL move one foot north, sampler breaks inside boring. | | | 0 | NA | NA | | | |
| 15 | | | | | | | | | | |
| 20 | | | | | | | | | | |

## Well Construction Information

**Monument Type:** NA
**Casing Diameter (inches):** NA
**Screen Slot Size (inches):** NA
**Screened Interval (ft bgs):** NA

**Filter Pack:** NA
**Surface Seal:** NA
**Annular Seal:** NA

**Ground Surface Elevation (ft):** 15-feet
**Top of Casing Elevation (ft):** NA
**Boring Abandonment:** Bentonite chips
**Surveyed Location:** **X:** 122.30866 **Y:** 47.52640

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# Log of Boring: SB-4



**Client:** EMJ/Jorgensen Forge
**Project:** Jorgensen Forge
**Location:** Seattle, WA

**Farallon PN:** 831-003

**Logged By:** JAK and JAS

| | | | |
|---|---|---|---|
| **Date/Time Started:** | 08/26/04 1300 | **Sampler Type:** | 4-foot sampler |
| **Date/Time Completed:** | 08/26/04 1345 | **Drive Hammer (lbs.):** | 140 |
| **Equipment:** | Geoprobe | **Depth of Water ATD (ft bgs):** | 12 |
| **Drilling Company:** | Cascade Drilling | **Total Boring Depth (ft bgs):** | 16 |
| **Drilling Foreman:** | Kasey Goble | **Total Well Depth (ft bgs):** | NA |
| **Drilling Method:** | Geoprobe | | |

| Depth (feet bgs.) | Lithologic Description | USCS | USGS Graphic | % Recovery | Blow Counts 8/8/8 | PID (units) | Sample ID | Sample Analyzed | Well Construction Details |
|---|---|---|---|---|---|---|---|---|---|
| 0 | FILL--GRAVEL with sand trace silt. 85% fine-coarse gravel, 10% fine-coarse sand, and 5% silt. Brown, moist, no odor. | | | 50 | NA | NA | 082604-1305-21 | X | |
| 2 | REFUSAL--Move one foot north and begin at two feet bgs. SAME as previous in new boring. | | | 50 | NA | NA | 082604-1308-22 | X | Well not installed |
| 4 | SAME | | | 40 | NA | NA | 082604-1312-23 | X | |
| 6 | | | | 70 | NA | NA | 082604-1318-24 | X | |
| 8 | | | | 70 | NA | NA | 082604-1322-25 | X | |
| 10 | | | | 80 | NA | NA | 082604-1326-26 | X | |
| 11.5 | FILL--wood debris. Strong creosote odor, shiny, black. | | | | | | | | ▼ |
| 12 | SAME as 4-11.5' | | | 80 | NA | NA | 082604-1330-27<br>082604-1335-28 | X | |
| 13 | FILL--SAND minor silt. 90% fine sand, 10% silt. Brown, wet, apparent creosote odor observed. | | | | | | | | |
| 14 | FILL--SAND minor silt. 85% fine sand, 15% silt. Blue/grey, wet, strong petroleum odor, sheen observed on sand. | | | 20 | NA | NA | 082604-1345-29 | X | |
| 20 | | | | | | | | | |

## Well Construction Information

| | | | |
|---|---|---|---|
| **Monument Type:** | NA | **Filter Pack:** | NA |
| **Casing Diameter (inches):** | NA | **Surface Seal:** | NA |
| **Screen Slot Size (inches):** | NA | **Annular Seal:** | NA |
| **Screened Interval (ft bgs):** | NA | | |

**Ground Surface Elevation (ft):** 21 feet
**Top of Casing Elevation (ft):** NA
**Boring Abandonment:** Bentonite chips
**Surveyed Location:** X: 122.30853 Y: 47.52620

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# Log of Boring: SB-5



**Client:** EMJ/Jorgensen Forge
**Project:** Jorgensen Forge
**Location:** Seattle, WA
**Farallon PN:** 831-003
**Logged By:** JAK and JAS

| | | | |
|---|---|---|---|
| **Date/Time Started:** | 08/26/04 1415 | **Sampler Type:** | 4-foot sampler |
| **Date/Time Completed:** | 08/26/04 1510 | **Drive Hammer (lbs.):** | 140 |
| **Equipment:** | Geoprobe | **Depth of Water ATD (ft bgs):** | 12 |
| **Drilling Company:** | Cascade Drilling | **Total Boring Depth (ft bgs):** | 16 |
| **Drilling Foreman:** | Kasey Goble | **Total Well Depth (ft bgs):** | NA |
| **Drilling Method:** | Geoprobe | | |

| Depth (feet bgs.) | Sample Interval | Lithologic Description | USCS | USGS Graphic | % Recovery | Blow Counts 8/8/8 | PID (units) | Sample ID | Sample Analyzed | Well Construction Details |
|---|---|---|---|---|---|---|---|---|---|---|
| 0 | | FILL--GRAVEL minor sand, trace silt. 80% fine-coarse gravel, 15% fine-coarse sand, 5% silt. Light brown, moist, no odor. | | | 60 | NA | NA | 082604-1414-30 | X | |
| | | FILL-GRAVEL with sand, trace silt. 70% fine-coarse gravel, 25% fine-coarse sand, 5% silt. Orangish brown, moist, no odor. | | | 50 | NA | NA | 082604-1416-31 | X | Well not installed |
| | | | | | 40 | NA | NA | 082604-1421-32 | X | |
| 5 | | | | | 40 | NA | NA | 082604-1425-33 | X | |
| | | | | | 40 | NA | NA | 082604-1428-34 | X | |
| 10 | | | | | 50 | NA | NA | 082604-1455-35 | X | |
| | | REFUSAL move one foot north and begin at 10 feet bgs. | | | 20 | NA | NA | 082604-1500-36 | X | ▼ |
| | | FILL--SAND minor gravel. 85% fine-coarse sand and 15% fine gravel. Brown, wet, no odor. | | | 100 | NA | NA | 082604-1505-37 | X | |
| 15 | | | | | | | | | | |
| 20 | | | | | | | | | | |

## Well Construction Information

**Monument Type:** NA
**Casing Diameter (inches):** NA
**Screen Slot Size (inches):** NA
**Screened Interval (ft bgs):** NA

**Filter Pack:** NA
**Surface Seal:** NA
**Annular Seal:** NA

**Ground Surface Elevation (ft):** 20-feet
**Top of Casing Elevation (ft):** NA
**Boring Abandonment:** Bentonite chips
**Surveyed Location:** **X:** 122.30836 **Y:** 47.52599

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Issaquah, WA 98027

# Log of Boring: SB-6



**Client:** EMJ/Jorgensen Forge
**Project:** Jorgensen Forge
**Location:** Seattle, WA
**Farallon PN:** 831-003
**Logged By:** JAK and JAS

| | | | |
|---|---|---|---|
| **Date/Time Started:** | 08/27/04 0845 | **Sampler Type:** | 4-foot sampler |
| **Date/Time Completed:** | 08/27/04 0948 | **Drive Hammer (lbs.):** | 140 |
| **Equipment:** | Geoprobe | **Depth of Water ATD (ft bgs):** | 11.5 |
| **Drilling Company:** | Cascade Drilling | **Total Boring Depth (ft bgs):** | 16 |
| **Drilling Foreman:** | Jaymen Lauer | **Total Well Depth (ft bgs):** | NA |
| **Drilling Method:** | Geoprobe - Limited Access | | |

| Depth (feet bgs.) | Lithologic Description | USCS | % Recovery | Blow Counts 8/8/8 | PID (units) | Sample ID | Sample Analyzed | Well Construction Details |
|---|---|---|---|---|---|---|---|---|
| 0 | FILL--GRAVEL trace sand. 95% fine-coarse gravel and 5% sand. Brown, moist, no odor. | | 30 | NA | NA | 082704-0856-01 | X | Well not installed |
| | | | 40 | NA | NA | 082704-0900-02 | X | |
| | SAME with white brick. | | 20 | NA | NA | 082704-0910-03 | X | |
| 5 | | | 100 | NA | NA | 082704-0915-04<br>082704-0920-05 | X | |
| | FILL--SAND. 100% fine-coarse sand. Tan, dry, no odor, very hard. | | | | | | | |
| | FILL--GRAVEL with sand trace silt. 75% fine-coarse gravel, 20% fine-coarse sand, and 5% silt. Brown, moist, no odor. | | 100 | NA | NA | 082704-0930-06 | X | |
| | FILL--GRAVEL trace sand. 95% fine-coarse gravel, 5% fine-coarse sand. Black with obsidion like material, moist, no odor. | | | | | | | |
| 10 | | | 100 | NA | NA | 082704-0935-07 | X | ▼ |
| | FILL--SAME as 7.5-8. wet, some red brick. | | 80 | NA | NA | 082704-0940-08 | X | |
| | | | 50 | NA | NA | 082704-0942-09 | X | |
| 15 | SAND trace silt. 95% fine sand and 5% silty. Grey, wet, no odor | SW | | | | | | |
| 20 | | | | | | | | |

## Well Construction Information

| | | | | | |
|---|---|---|---|---|---|
| **Monument Type:** | NA | **Filter Pack:** | NA | **Ground Surface Elevation (ft):** | 22 |
| **Casing Diameter (inches):** | Geoprobe | **Surface Seal:** | NA | **Top of Casing Elevation (ft):** | NA |
| **Screen Slot Size (inches):** | NA | **Annular Seal:** | NA | **Boring Abandonment:** | Bentonite chips |
| **Screened Interval (ft bgs):** | NA | | | **Surveyed Location:** | **X:** 122.30840 **Y:** 47.52576 |

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Issaquah, WA 98027

# Log of Boring: SB-7



**Client:** EMJ/Jorgensen Forge
**Project:** Jorgensen Forge
**Location:** Seattle, WA
**Farallon PN:** 831-003
**Logged By:** JAK and JAS

| | | | |
|---|---|---|---|
| **Date/Time Started:** | 08/27/04 1030 | **Sampler Type:** | 4-foot sampler |
| **Date/Time Completed:** | 08/27/04 1120 | **Drive Hammer (lbs.):** | 140 |
| **Equipment:** | Geoprobe | **Depth of Water ATD (ft bgs):** | 13.5 |
| **Drilling Company:** | Cascade Drilling | **Total Boring Depth (ft bgs):** | 16 |
| **Drilling Foreman:** | Jaymen Lauer | **Total Well Depth (ft bgs):** | NA |
| **Drilling Method:** | Geoprobe | | |

| Depth (feet bgs.) | Lithologic Description | USCS | % Recovery | Blow Counts 8/8/8 | PID (units) | Sample ID | Sample Analyzed | Well Construction Details |
|---|---|---|---|---|---|---|---|---|
| 0 | 8-inches of concrete | CO | 50 | NA | NA | 082704-1032-10 | X | Well not installed |
| | FILL--GRAVEL with sand minor silt. 40% fine-coarse gravel, 40% coarse sand, 20% silt. Brown, moist, no odor | | 40 | NA | NA | 082704-1034-11 | X | |
| | SAME but 50% red brick. | | 20 | NA | NA | 082704-1038-12 | X | |
| 5 | SAME no brick | | 20 | NA | NA | 082704-1044-13 | X | |
| | FILL--GRAVEL with sand, trace silt. 75% fine-coarse gravel, 20% fine-coarse sand, and 5% silt. Brown with orangish brown, moist, no odor. Metal debris. | | 60 | NA | NA | 082704-1054-14 | X | |
| 10 | | | 100 | NA | NA | 082704-1100-15 | X | |
| | FILL--GRAVEL trace sand. 95% fine-coarse gravel and 5% fine-coarse sand. Brown, moist, no odor. | | 100 | NA | NA | 082704-1110-16 | X | |
| | SAME as 6-8' interval. Brick throughout. Wet at 13.5 | | 20 | NA | NA | 082704-1115-17 | X | ▼ |
| 15 | | | | | | | | |
| 20 | | | | | | | | |

## Well Construction Information

**Monument Type:** NA
**Casing Diameter (inches):** NA
**Screen Slot Size (inches):** NA
**Screened Interval (ft bgs):** NA
**Filter Pack:** NA
**Surface Seal:** NA
**Annular Seal:** NA
**Ground Surface Elevation (ft):** 25
**Top of Casing Elevation (ft):** NA
**Boring Abandonment:** Bentonite chips
**Surveyed Location:** **X:** 122.30826 **Y:** 47.52569

# APPENDIX C
# HISTORICAL DATA SOIL AND GROUNDWATER

FINAL INVESTIGATION DATA SUMMARY REPORT
Jorgensen Forge Facility
8531 East Marginal Way South
Seattle, Washington
U.S. EPA Docket No. CERCLA 10-2003-0111

Farallon PN: 831-003

## FIGURES



## TABLES

# APPENDIX C
# HISTORICAL DATA SOIL AND GROUNDWATER FIGURES

Final Investigation Data Summary Report
Jorgensen Forge Facility
8531 East Marginal Way South
Seattle, Washington
U.S. EPA Docket No. CERCLA 10-2003-0111

Farallon PN: 831-003

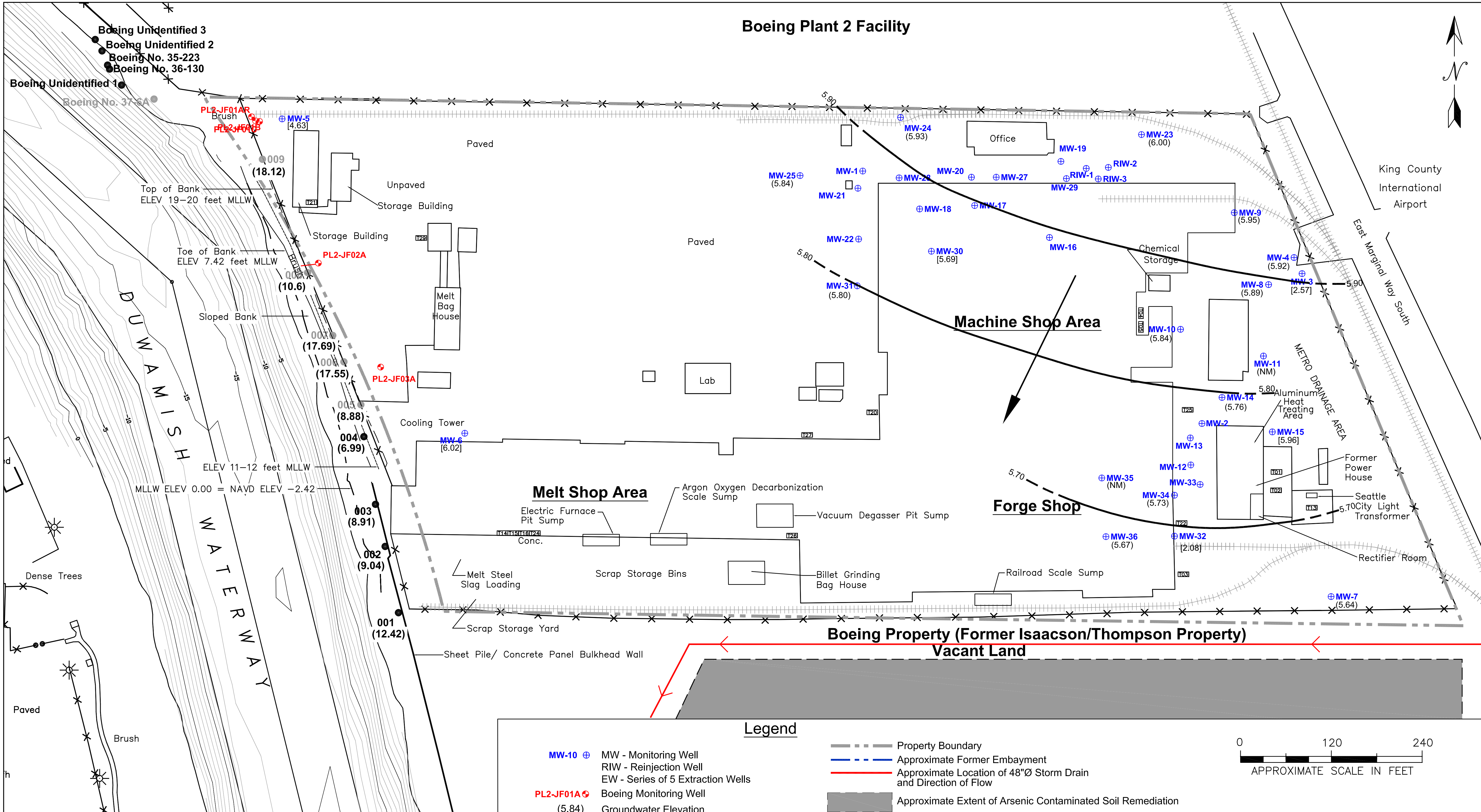



FIGURE C-1

SITE PLAN SHOWING GROUNDWATER CONTOURS (12/13/05)
JORGENSEN FORGE FACILITY
8531 EAST MARGINAL WAY SOUTH
SEATTLE, WASHINGTON

FARALLON CONSULTING, L.L.C.
ANCHOR ENVIRONMENTAL, L.L.C.

FARALLON PN: 831–001

| Drawn By: DEW | Checked By: AED | Date2/7/06 | Disk Reference:831–003a |
|---|---|---|---|

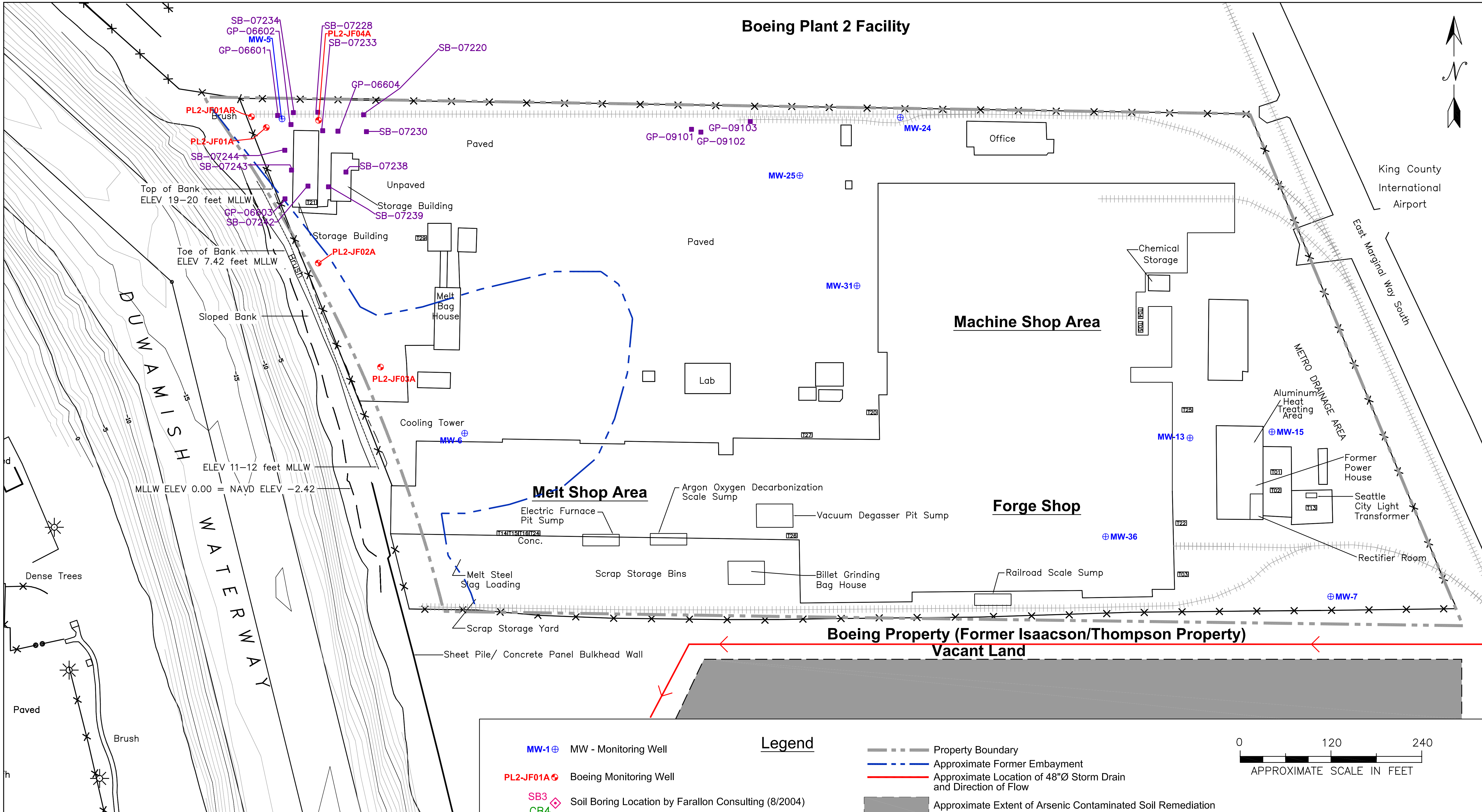
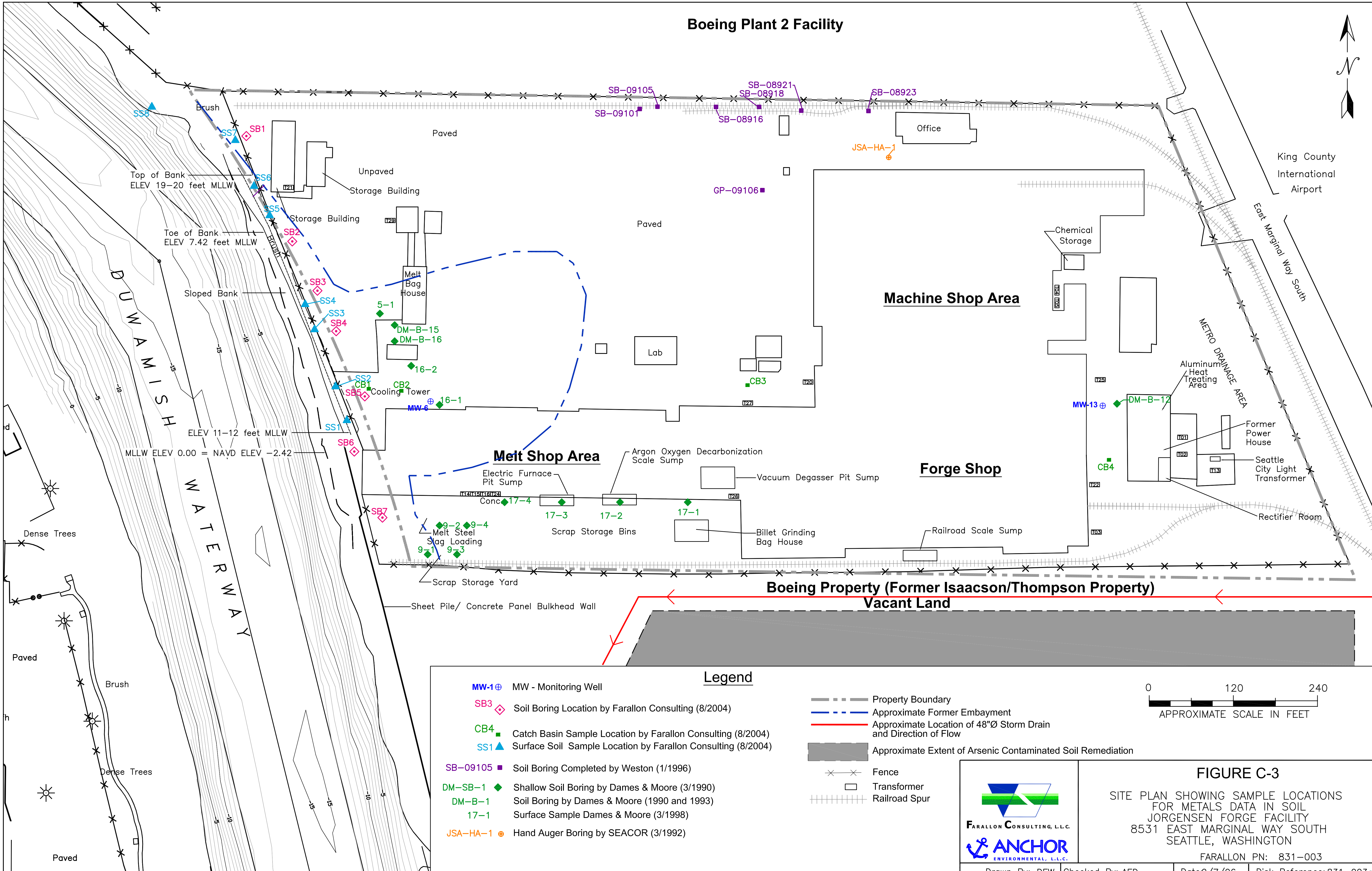



FIGURE C-4

SITE PLAN SHOWING SAMPLE LOCATIONS FOR PCB DATA IN GROUNDWATER JORGENSEN FORGE FACILITY 8531 EAST MARGINAL WAY SOUTH SEATTLE, WASHINGTON

FARALLON PN: 831-003

| Drawn By: DEW | Checked By: AED | Date 2/7/06 | Disk Reference: 831-003a |
|---|---|---|---|




## Legend

| | |
|---|---|
| MW-1 | MW - Monitoring Well |
| SB3 | Soil Boring Location by Farallon Consulting (8/2004) |
| CB4 | Catch Basin Sample Location by Farallon Consulting (8/2004) |
| SS1 | Surface Soil Sample Location by Farallon Consulting (8/2004) |
| SB-09105 | Soil Boring Completed by Weston (1/1996) |
| DM-SB-1 | Shallow Soil Boring by Dames & Moore (3/1990) |
| DM-B-1 | Soil Boring by Dames & Moore (1990 and 1993) |
| 17-1 | Surface Sample Dames & Moore (3/1998) |
| JSA-HA-1 | Hand Auger Boring by SEACOR (3/1992) |
| | Property Boundary |
| | Approximate Former Embayment |
| | Approximate Location of 48"Ø Storm Drain and Direction of Flow |
| | Approximate Extent of Arsenic Contaminated Soil Remediation |
| | Fence |
| | Transformer |
| | Railroad Spur |

FIGURE C-3

SITE PLAN SHOWING SAMPLE LOCATIONS FOR METALS DATA IN SOIL
JORGENSEN FORGE FACILITY
8531 EAST MARGINAL WAY SOUTH
SEATTLE, WASHINGTON

Farallon Consulting, L.L.C.
ANCHOR ENVIRONMENTAL, L.L.C.

FARALLON PN: 831-003

Drawn By: DEW | Checked By: AED | Date 2/7/06 | Disk Reference: 831-003a

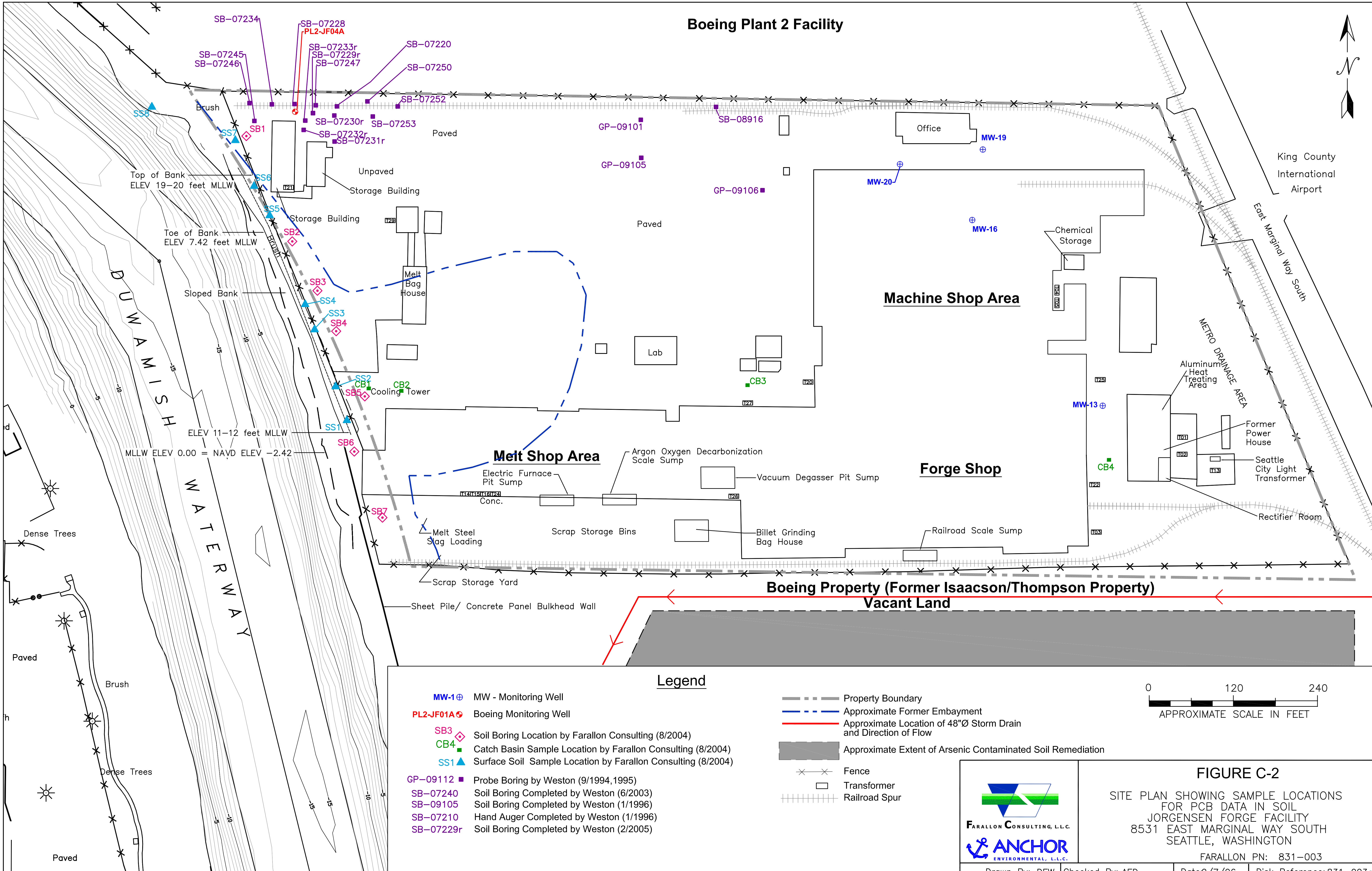



FIGURE C-2

SITE PLAN SHOWING SAMPLE LOCATIONS FOR PCB DATA IN SOIL
JORGENSEN FORGE FACILITY
8531 EAST MARGINAL WAY SOUTH
SEATTLE, WASHINGTON

FARALLON PN: 831-003

Drawn By: DEW | Checked By: AED | Date 2/7/06 | Disk Reference: 831-003a

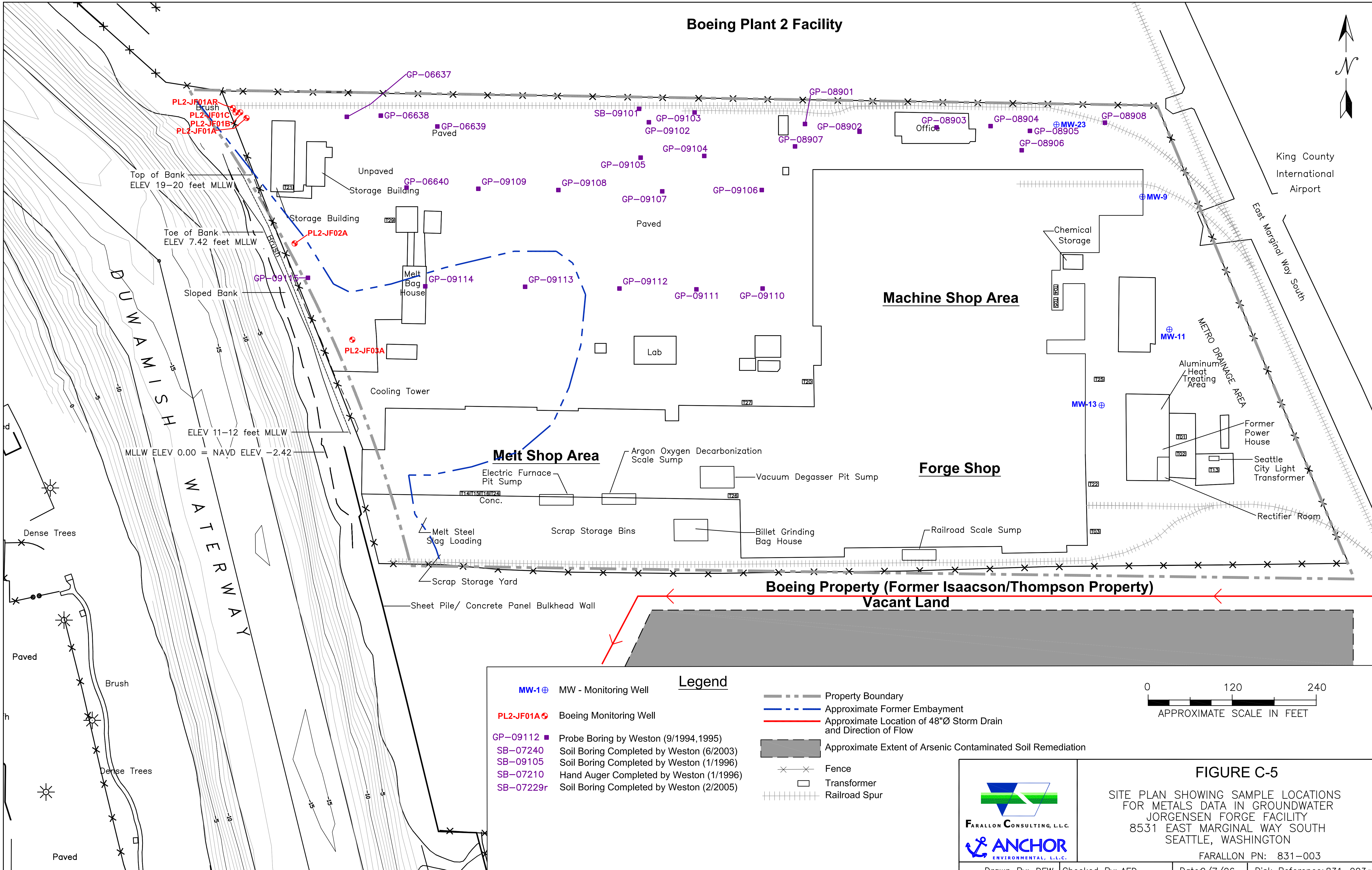



FIGURE C-5

SITE PLAN SHOWING SAMPLE LOCATIONS FOR METALS DATA IN GROUNDWATER JORGENSEN FORGE FACILITY 8531 EAST MARGINAL WAY SOUTH SEATTLE, WASHINGTON

FARALLON PN: 831-003

Drawn By: DEW | Checked By: AED | Date 2/7/06 | Disk Reference: 831-003a

# APPENDIX C
# HISTORICAL DATA SOIL AND GROUNDWATER TABLES

Final Investigation Data Summary Report
Jorgensen Forge Facility
8531 East Marginal Way South
Seattle, Washington
U.S. EPA Docket No. CERCLA 10-2003-0111

Farallon PN: 831-003

## Table C-1
## Comprehensive Summary of Polychlorinated Biphenyls in Groundwater
## Jorgensen Forge Facility
## 8531 East Marginal Way South
## Seattle, Washington
## Farallon PN: 831-003

| | | | | Analytical Results (micrograms per liter) [1] | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Sample Depth/Screened Interval (feet bgs) | Aroclor | | | | | | | | | | |
| Sample Location | Sample Date | Sampled by | | 1016 | 1016/1242 | 1221 | 1232 | 1242 | 1248 | 1254 | 1260 | 1262 | 1268 | Total PCBs |
| GP-06601 | 9/12/1994 | Weston | 13 | — | 1 U | — | — | — | 1 U | 1 U | 1 U | — | — | 1 U |
| GP-06602 | 9/13/1994 | Weston | 14 | — | 1 U | — | — | — | 1 U | 1 U | 1 U | — | — | 1 U |
| GP-06603 | 9/12/1994 | Weston | 14 | — | 1 U | — | — | — | 1 U | 1 U | 1 U | — | — | 1 U |
| GP-06604 | 9/13/1994 | Weston | 14 | — | 17 UY | — | — | — | 1 U | 1 U | 1 U | — | — | 17 UY |
| GP-09101 | 9/12/1994 | Weston | 15 | — | 1 U | — | — | — | 1 U | 1 U | 1 U | — | — | 1 U |
| GP-09102 | 9/8/1994 | Weston | 14 | — | 1 U | — | — | — | 1 U | 1 U | 1 U | — | — | 1 U |
| GP-09103 | 9/8/1994 | Weston | 14 | — | 1 U | — | — | — | 1 U | 1 U | 1 U | — | — | 1 U |
| MW-5 | 4/10/2003 | Farallon | 10-20 | 0.0478 U | — | 0.0478 U | 0.0478 U | 0.0478 U | 0.0478 U | 0.0478 U | 0.0478 U | — | — | 0.0478 U |
| MW-6 | 4/11/2003 | Farallon | 10-20 | 0.0478 U | — | 0.0478 U | 0.0478 U | 0.0478 U | 0.0478 U | 0.0478 U | 0.0478 U | — | — | 0.0478 U |
| | 6/16/2003 | Weston | | 0.01 UY | — | 0.02 UY | 0.01 UY | 0.01 UY | 0.01 UY | 0.13 | 0.28 | 0.01 UY | 0.01 UY | **0.41** |
| MW-7 | 4/11/2003 | Farallon | 10-20 | 0.0477 U | — | 0.0477 U | 0.0477 U | 0.0477 U | 0.0477 U | 0.0477 U | 0.0477 U | — | — | 0.0477 U |
| | 6/16/2003 | Weston | | 0.01 UY | — | 0.02 UY | 0.01 UY | 0.01 UY | 0.01 UY | 0.01 UY | 0.01 UY | 0.01 UY | 0.01 UY | 0.02 UY |
| MW-13 | 9/10/1992 | SECOR | 5-20 | 0.1 U | — | 0.1 U | 0.1 U | 0.1 U | 0.1 U | 0.1 U | 0.1 U | — | — | 0.1 U |
| MW-15 | 4/11/2003 | Farallon | 5-20 | 0.0476 U | — | 0.0476 U | 0.0476 U | 0.0476 U | 0.0476 U | 0.0476 U | 0.0476 U | — | — | 0.0476 U |
| MW-24 | 4/11/2003 | Farallon | 6-19.75 | 0.0478 UZ | — | 0.0478 UZ | 0.0478 UZ | 0.0478 UZ | 0.0478 UZ | 0.0478 UZ | 0.0478 UZ | — | — | 0.0478 UZ |
| MW-25 | 4/11/2003 | Farallon | 6-19.75 | 0.0475 U | — | 0.0475 U | 0.0475 U | 0.0475 U | 0.0475 U | 0.0475 U | 0.0475 U | — | — | 0.0475 U |
| MW-31 | 5/7/1993 | SECOR | 5-19 | 0.021 U | — | 0.052 U | 0.052 U | 0.021 U | 0.021 U | 0.021 U | 0.021 U | — | — | 0.052 U |
| | 4/11/2003 | Farallon | | 0.0476 U | — | 0.0476 U | 0.0476 U | 0.0476 U | 0.0476 U | 0.0476 U | 0.0476 U | — | — | 0.0476 U |
| MW-36 | 4/11/2003 | Farallon | NA | 0.0478 U | — | 0.0478 U | 0.0478 U | 0.0478 U | 0.0478 U | 0.0478 U | 0.0478 U | — | — | 0.0478 U |
| PL2-JF01A | 9/27/1995 | Boeing | NA | 1 U | — | — | — | 1 U | 1 U | 1 U | 1 U | — | — | 1 U |
| | 11/17/1995 | Boeing | | 1 U | — | — | — | 1 U | 1 U | 1 U | 1 U | — | — | 1 U |
| | 3/1/1996 | Boeing | | 1 U | — | — | — | 1 U | 1 U | 1 U | 1 U | — | — | 1 U |
| | 5/23/1996 | Boeing | | 1 U | — | — | — | 1 U | 1 U | 1 U | 1 U | — | — | 1 U |
| | 8/26/1996 | Boeing | | 1 U | — | — | — | 1 U | 1 U | 1 U | 1 U | — | — | 1 U |
| | 11/21/1996 | Boeing | | 1 U | — | — | — | 1 U | 1 U | 1 U | 1 U | — | — | 1 U |
| PL2-JF01AR | 6/16/2003 | Boeing | 23-27 | 0.01 U | — | 0.02 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.02 U |
| PL2-JF02A | 4/10/2003 | Farallon | 8-22.75 | 0.0476 U | — | 0.0476 U | 0.0476 U | 0.0476 U | 0.0476 U | 0.0476 U | 0.0476 U | — | — | 0.0476 U |
| | 6/16/2003 | Boeing | | 0.01 U | — | 0.02 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.02 U |
| PL2-JF03A | 4/10/2003 | Farallon | 8-22.75 | 0.0477 U | — | 0.0477 U | 0.0477 U | 0.0477 U | 0.0477 U | 0.0477 U | 0.0477 U | — | — | 0.0477 U |
| PL2-JF04A | 2/18/2005 | Boeing | 8-18 | 0.02 UY | | 0.01 U | 0.05 UY | 0.03 UY | 0.04 UY | 0.01 U | 0.01 UY | — | — | 0.05 UY |
| SB-07220 | 6/10/2003 | Weston | 4-6 | 1 U | — | 2 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1.2 U | 1 U | 2 U |
| SB-07228 | 6/10/2003 | Weston | 6-8 | 1 U | — | 2 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1.2 U | 1 U | 2 U |
| SB-07230 | 6/11/2003 | Weston | 6-8 | 1 U | — | 2 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1.2 U | 1 U | 2 U |
| SB-07233 | 6/11/2003 | Weston | 6-8 | 1 U | — | 2 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1.2 U | 1 U | 2 U |
| SB-07234 | 6/10/2003 | Weston | 2-4 | 1 U | — | 2 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1.2 U | 1 U | 2 U |
| SB-07238 | 6/13/2003 | Weston | 6-8 | 1 U | — | 2 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1.2 U | 1 U | 2 U |
| SB-07239 | 6/12/2003 | Weston | 6-8 | 1 U | — | 2 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1.2 U | 1 U | 2 U |
| **MTCA Method A Cleanup Levels [2]** | | | | | | | | | | | | | | **0.1** |

**Table C-1**
**Comprehensive Summary of Polychlorinated Biphenyls in Groundwater**
**Jorgensen Forge Facility**
**8531 East Marginal Way South**
**Seattle, Washington**
**Farallon PN: 831-003**

| | | | | Analytical Results (micrograms per liter) [1] | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Aroclor | | | | | | | | | | |
| Sample Location | Sample Date | Sampled by | Sample Depth/Screened Interval (feet bgs) | 1016 | 1016/1242 | 1221 | 1232 | 1242 | 1248 | 1254 | 1260 | 1262 | 1268 | Total PCBs |
| SB-07242 | 6/13/2003 | Weston | 6-8 | 1 U | — | 2 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1.2 U | 1 U | 2 U |
| SB-07243 | 6/12/2003 | Weston | 6-8 | 1 U | — | 2 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1.2 U | 1 U | 2 U |
| SB-07244 | 6/11/2003 | Weston | 6-8 | 1 U | — | 2 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1.2 U | 1 U | 2 U |
| **MTCA Method A Cleanup Levels [2]** | | | | | | | | | | | | | | **0.1** |

NOTES:
[1]Analyzed by U.S. Environmental Protection Agency Method 608, 8080, 8081, or 8082.
[2] MTCA Method A Cleanup Levels for Groundwater, Table 720-1 of Section 900 of Chapter 173-340 of the Washington Administrative Code, as amended February 2001.

— = not analyzed
bgs = below ground surface
NA = not available
U = no detectable concentrations above the listed laboratory practical quantitation limit
Y = The analyte reporting limit is raised due to a positive chromatographic interference. The compound is not detected above the raised limit but may be present at or below the limit
Z = sample extract treated with mercury cleanup procedure

# Table C-2
# Comprehensive Summary of Polychlorinated Biphenyls in Soil
## Jorgensen Forge Facility
## 8531 East Marginal Way South
## Seattle, Washington
## Farallon PN: 831-003

| Sample Location | Sample Depth (feet) | Sample Date | Sampled by | Analytical Results (milligrams per kilogram)[1] | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Aroclor | | | | | | | | | | |
| | | | | 1016 | 1016/1242 | 1221 | 1232 | 1242 | 1248 | 1254 | 1260 | 1262 | 1268 | Total PCBs |
| CB1 | 0 | 8/31/2004 | Farallon | 0.0215 U | — | 0.0215 U | 0.0215 U | 0.0215 U | 0.0215 U | 0.174 C1 | 0.109 C1 | — | — | 0.2830 |
| CB2 | 0 | 8/31/2004 | Farallon | 0.0184 U | — | 0.0184 U | 0.0184 U | 0.0184 U | 0.0184 U | 0.193 C1 | 0.109 C1 | — | — | 0.3020 |
| CB3 | 0 | 8/31/2004 | Farallon | 0.0139 U | — | 0.0139 U | 0.0139 U | 0.0139 U | 0.0139 U | 0.106 C1 | 0.182 C1 | — | — | 0.2880 |
| CB4 | 0 | 8/31/2004 | Farallon | 0.0146 U | — | 0.0146 U | 0.0146 U | 0.0146 U | 0.0146 U | 0.079 C1 | 0.0502 C1 | — | — | 0.1292 |
| MW-13 | 6 - 6.5 | 8/27/1992 | SECOR | 0.05 U | — | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | — | — | 0.05 U |
| MW-16 | 9 - 9.5 | 8/29/1992 | SECOR | 0.05 U | — | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | — | — | 0.05 U |
| MW-19 | 9 - 9.5 | 8/26/1992 | SECOR | 0.05 U | — | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | — | — | 0.05 U |
| MW-20 | 6 - 6.5 | 8/28/1992 | SECOR | 0.05 U | — | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | — | — | 0.05 U |
| PL2-JF04A | 6 - 8 | 2/16/2005 | Weston | 0.046 U | — | 0.046 U | 0.046 U | 0.046 U | 0.046 U | 0.046 U | 0.046 U | — | — | 0.046 U |
| | 8 - 10 | 2/16/2005 | | 0.046 U | — | 0.046 U | 0.046 U | 0.046 U | 0.046 U | 0.046 U | 0.046 U | — | — | 0.046 U |
| | 10 - 12 | 2/16/2005 | | 0.045 U | — | 0.045 U | 0.045 U | 0.045 U | 0.045 U | 0.045 U | 0.045 U | — | — | 0.045 U |
| | 12 - 14 | 2/16/2005 | | 0.044 U | — | 0.044 U | 0.044 U | 0.044 U | 0.044 U | 0.044 U | 0.044 U | — | — | 0.044 U |
| | 14 - 16 | 2/16/2005 | | 0.044 U | — | 0.044 U | 0.044 U | 0.044 U | 0.044 U | 0.044 U | 0.044 U | — | — | 0.044 U |
| | 16 - 18 | 2/16/2005 | | 0.043 U | — | 0.043 U | 0.043 U | 0.043 U | 0.043 U | 0.043 U | 0.043 U | — | — | 0.043 U |
| SB-07220 | 0 - 2 | 6/10/2003 | Weston | 0.036 U | — | 0.073 U | 0.036 U | 0.036 U | 0.036 U | 0.11 | 0.11 UJ | 0.036 U | 0.11 | 0.22 |
| | 2 - 4 | 6/10/2003 | | 0.043 U | — | 0.085 U | 0.043 U | 0.043 U | 0.043 U | 0.043 U | 0.043 U | 0.043 U | 0.043 U | 0.085 U |
| | 4 - 6 | 6/10/2003 | | 0.043 U | — | 0.086 U | 0.043 U | 0.043 U | 0.043 U | 0.043 U | 0.043 U | 0.043 U | 0.043 U | 0.086 U |
| | 6 - 8 | 6/10/2003 | | 0.039 U | — | 0.077 U | 0.039 U | 0.039 U | 0.039 U | 0.046 | 0.039 U | 0.039 U | 0.037 J | 0.083 J |
| | 8 - 10 | 6/10/2003 | | 0.038 U | — | 0.076 U | 0.038 U | 0.038 U | 0.038 U | 0.073 | 0.059 UJ | 0.038 U | 0.059 | 0.132 |
| | 10 - 12 | 6/10/2003 | | 0.041 U | — | 0.082 U | 0.041 U | 0.041 U | 0.041 U | 0.041 U | 0.041 U | 0.041 U | 0.024 J | 0.024 J |
| | 12 - 14 | 6/10/2003 | | 0.044 U | — | 0.088 U | 0.044 U | 0.044 U | 0.044 U | 0.044 U | 0.044 U | 0.044 U | 0.044 U | 0.088 U |
| | 14 - 16 | 6/10/2003 | | 0.043 U | — | 0.086 U | 0.043 U | 0.043 U | 0.043 U | 0.043 U | 0.043 U | 0.043 U | 0.043 U | 0.086 U |
| SB-07228 | 0 - 2 | 6/10/2003 | Weston | 0.036 U | — | 0.073 U | 0.036 U | 0.036 U | 0.036 U | 0.056 | 0.054 UJ | 0.044 U | 0.044 | 0.1 |
| | 2 - 4 | 6/10/2003 | | 0.037 U | — | 0.073 U | 0.037 U | 0.037 U | 0.037 U | 0.2 | 0.039 UJ | 0.044 U | 0.037 U | 0.2 |
| | 4 - 6 | 6/10/2003 | | 0.038 U | — | 0.076 U | 0.038 U | 0.038 U | 0.038 U | 0.038 U | 0.038 U | 0.046 U | 0.038 U | 0.076 U |
| | 6 - 8 | 6/10/2003 | | 0.045 U | — | 0.089 U | 0.045 U | 0.045 U | 0.045 U | 0.045 U | 0.045 U | 0.054 U | 0.045 U | 0.089 U |
| | 8 - 10 | 6/10/2003 | | 0.045 U | — | 0.09 U | 0.045 U | 0.045 U | 0.045 U | 0.045 U | 0.045 U | 0.054 U | 0.045 U | 0.09 U |
| | 10 - 12 | 6/10/2003 | | 0.044 U | — | 0.087 U | 0.044 U | 0.044 U | 0.044 U | 0.053 UJ | 0.1 | 0.052 U | 0.044 U | 0.1 |
| | 12 - 14 | 6/10/2003 | | 0.048 U | — | 0.096 U | 0.048 U | 0.048 U | 0.048 U | 0.048 U | 0.034 J | 0.057 U | 0.048 U | 0.034 J |
| | 14 - 16 | 6/10/2003 | | 0.043 U | — | 0.085 U | 0.043 U | 0.043 U | 0.043 U | 0.043 U | 0.043 U | 0.051 U | 0.043 U | 0.085 U |
| **MTCA Method A Cleanup Levels**[2] | | | | | | | | | | | | | | 1 |

## Table C-2
## Comprehensive Summary of Polychlorinated Biphenyls in Soil
## Jorgensen Forge Facility
## 8531 East Marginal Way South
## Seattle, Washington
## Farallon PN: 831-003

| Sample Location | Sample Depth (feet) | Sample Date | Sampled by | Analytical Results (milligrams per kilogram)[1] | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Aroclor | | | | | | | | | | |
| | | | | 1016 | 1016/1242 | 1221 | 1232 | 1242 | 1248 | 1254 | 1260 | 1262 | 1268 | Total PCBs |
| SB-07229r | 6 - 8 | 2/14/2005 | Weston | 0.064 U | — | 0.064 U | 0.064 U | 0.064 U | 0.064 U | 0.064 U | 0.064 U | — | — | 0.064 U |
| | 8 - 10 | 2/14/2005 | | 0.036 U | — | 0.036 U | 0.036 U | 0.036 U | 0.036 U | 0.036 U | 0.036 U | — | — | 0.036 U |
| | 10 - 12 | 2/14/2005 | | 0.047 U | — | 0.047 U | 0.047 U | 0.047 U | 0.047 U | 0.047 U | 0.047 U | — | — | 0.047 U |
| | 12 - 14 | 2/14/2005 | | 0.045 U | — | 0.045 U | 0.045 U | 0.045 U | 0.045 U | 0.045 U | 0.045 U | — | — | 0.045 U |
| | 14 - 16 | 2/14/2005 | | 0.044 U | — | 0.044 U | 0.044 U | 0.044 U | 0.044 U | 0.044 U | 0.044 U | — | — | 0.044 U |
| SB-07230r | 6 - 8 | 2/14/2005 | Weston | 0.036 U | — | 0.036 U | 0.036 U | 0.036 U | 0.036 U | 0.036 U | 0.036 U | — | — | 0.036 U |
| | 8 - 10 | 2/14/2005 | | 0.040 U | — | 0.040 U | 0.040 U | 0.040 U | 0.040 U | 0.040 U | 0.040 U | — | — | 0.040 U |
| | 10 - 12 | 2/14/2005 | | 0.048 U | — | 0.048 U | 0.048 U | 0.048 U | 0.048 U | 0.048 U | 0.048 U | — | — | 0.048 U |
| | 12 - 14 | 2/14/2005 | | 0.045 U | — | 0.045 U | 0.045 U | 0.045 U | 0.045 U | 0.045 U | 0.045 U | — | — | 0.045 U |
| | 14 - 16 | 2/14/2005 | | 0.044 U | — | 0.044 U | 0.044 U | 0.044 U | 0.044 U | 0.044 U | 0.044 U | — | — | 0.044 U |
| SB-07231r | 6 - 8 | 2/14/2005 | Weston | 0.036 U | — | 0.036 U | 0.036 U | 0.036 U | 0.036 U | 0.036 U | 0.036 U | — | — | 0.036 U |
| | 8 - 10 | 2/14/2005 | | 0.039 U | — | 0.039 U | 0.039 U | 0.039 U | 0.039 U | 0.039 U | 0.039 U | — | — | 0.039 U |
| | 10 - 12 | 2/14/2005 | | 0.046 U | — | 0.046 U | 0.046 U | 0.046 U | 0.046 U | 0.046 U | 0.046 U | — | — | 0.046 U |
| | 12 - 14 | 2/14/2005 | | 0.044 U | — | 0.044 U | 0.044 U | 0.044 U | 0.044 U | 0.044 U | 0.044 U | — | — | 0.044 U |
| | 14 - 16 | 2/14/2005 | | 0.044 U | — | 0.044 U | 0.044 U | 0.044 U | 0.044 U | 0.044 U | 0.044 U | — | — | 0.044 U |
| SB-07232r | 6 - 8 | 2/14/2005 | Weston | 0.037 U | — | 0.037 U | 0.037 U | 0.037 U | 0.037 U | 0.037 U | 0.037 U | — | — | 0.037 U |
| | 8 - 10 | 2/14/2005 | | 0.047 U | — | 0.047 U | 0.047 U | 0.047 U | 0.047 U | 0.047 U | 0.047 U | — | — | 0.047 U |
| | 10 - 12 | 2/14/2005 | | 0.049 U | — | 0.049 U | 0.049 U | 0.049 U | 0.049 U | 0.049 U | 0.049 U | — | — | 0.049 U |
| | 12 - 14 | 2/14/2005 | | 0.046 U | — | 0.046 U | 0.046 U | 0.046 U | 0.046 U | 0.046 U | 0.046 U | — | — | 0.046 U |
| | 14 - 16 | 2/14/2005 | | 0.044 U | — | 0.044 U | 0.044 U | 0.044 U | 0.044 U | 0.044 U | 0.088 UY | — | — | 0.088 UY |
| SB-07233r | 6 - 8 | 2/14/2005 | Weston | 0.044 U | — | 0.044 U | 0.044 U | 0.044 U | 0.044 U | 0.044 U | 0.220 UY | — | — | 0.220 UY |
| | 8 - 10 | 2/14/2005 | | 0.044 U | — | 0.088 UY | 0.130 UY | 0.088 UY | 0.044 U | 0.130 UY | 0.220 UY | — | — | 0.220 UY |
| | 10 - 12 | 2/14/2005 | | 0.046 U | — | 0.046 U | 0.046 U | 0.046 U | 0.046 U | 0.046 U | 0.046 U | — | — | 0.046 U |
| | 12 - 14 | 2/14/2005 | | 0.044 U | — | 0.044 U | 0.044 U | 0.044 U | 0.044 U | 0.044 U | 0.044 U | — | — | 0.044 U |
| | 14 - 16 | 2/14/2005 | | 0.044 U | — | 0.044 U | 0.044 U | 0.044 U | 0.044 U | 0.044 U | 0.044 U | — | — | 0.044 U |
| SB-07234 | 0 - 2 | 6/10/2003 | Weston | 0.034 U | — | 0.069 U | 0.034 U | 0.034 U | 0.034 U | 0.03 J | 0.052 | 0.034 U | 0.034 U | 0.082 J |
| | 2 - 4 | 6/10/2003 | | 0.038 U | — | 0.075 U | 0.038 U | 0.038 U | 0.038 U | 0.038 U | 0.038 U | 0.038 U | 0.038 U | 0.075 U |
| | 4 - 6 | 6/10/2003 | | 0.04 U | — | 0.08 U | 0.04 U | 0.04 U | 0.04 U | 0.04 U | 0.04 U | 0.04 U | 0.04 U | 0.08 U |
| | 6 - 8 | 6/10/2003 | | 0.043 U | — | 0.087 U | 0.043 U | 0.043 U | 0.043 U | 0.043 U | 0.043 U | 0.043 U | 0.043 U | 0.087 U |
| | 8 - 10 | 6/10/2003 | | 0.039 U | — | 0.078 U | 0.039 U | 0.039 U | 0.039 U | 0.025 J | 0.039 U | 0.039 U | 0.039 U | 0.078 U |
| | 10 - 12 | 6/10/2003 | | 0.043 U | — | 0.087 U | 0.043 U | 0.043 U | 0.043 U | 0.045 | 0.062 | 0.043 U | 0.043 U | 0.107 |
| | 12 - 14 | 6/10/2003 | | 0.043 U | — | 0.086 U | 0.043 U | 0.043 U | 0.043 U | 0.043 U | 0.043 U | 0.043 U | 0.043 U | 0.086 U |
| | 14 - 16 | 6/10/2003 | | 0.042 U | — | 0.084 U | 0.042 U | 0.042 U | 0.042 U | 0.042 U | 0.042 U | 0.042 U | 0.042 U | 0.084 U |
| **MTCA Method A Cleanup Levels**[2] | | | | | | | | | | | | | | 1 |

# Table C-2
## Comprehensive Summary of Polychlorinated Biphenyls in Soil
## Jorgensen Forge Facility
## 8531 East Marginal Way South
## Seattle, Washington
## Farallon PN: 831-003

| Sample Location | Sample Depth (feet) | Sample Date | Sampled by | Analytical Results (milligrams per kilogram)[1] | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Aroclor | | | | | | | | | | Total PCBs |
| | | | | 1016 | 1016/1242 | 1221 | 1232 | 1242 | 1248 | 1254 | 1260 | 1262 | 1268 | |
| SB-07245 | 0 - 0 | 6/10/2003 | Weston | 0.038 U | — | 0.075 U | 0.038 U | 0.038 U | 0.038 U | 0.072 | 0.038 U | 0.045 U | 0.038 U | 0.072 |
| | 0 - 2 | 6/10/2003 | | 0.042 U | — | 0.085 U | 0.042 U | 0.042 U | 0.042 U | 0.042 U | 0.042 U | 0.051 U | 0.042 U | 0.085 U |
| | 2 - 4 | 6/10/2003 | | 0.038 U | — | 0.077 U | 0.038 U | 0.038 U | 0.038 U | 0.038 U | 0.038 U | 0.046 U | 0.038 U | 0.077 U |
| | 4 - 6 | 6/10/2003 | | 0.038 U | — | 0.075 U | 0.038 U | 0.038 U | 0.038 U | 0.038 U | 0.038 U | 0.045 U | 0.038 U | 0.075 U |
| | 6 - 8 | 6/10/2003 | | 0.042 U | — | 0.085 U | 0.042 U | 0.042 U | 0.042 U | 0.042 U | 0.042 U | 0.051 U | 0.042 U | 0.085 U |
| | 8 - 10 | 6/10/2003 | | 0.039 U | — | 0.079 U | 0.039 U | 0.039 U | 0.039 U | 0.039 U | 0.039 U | 0.047 U | 0.039 U | 0.079 U |
| | 10 - 12 | 6/10/2003 | | 0.044 U | — | 0.088 U | 0.044 U | 0.044 U | 0.044 U | 0.023 J | 0.044 U | 0.053 U | 0.044 U | 0.088 U |
| | 12 - 14 | 6/10/2003 | | 0.042 U | — | 0.085 U | 0.042 U | 0.042 U | 0.042 U | 0.047 | 0.042 U | 0.051 U | 0.042 U | 0.047 |
| SB-07246 | 0 - 0 | 6/10/2003 | Weston | 0.036 U | — | 0.072 U | 0.036 U | 0.036 U | 0.036 U | 0.036 U | 0.13 | 0.036 U | 0.071 | 0.201 |
| | 0 - 2 | 6/10/2003 | | 0.036 U | — | 0.072 U | 0.036 U | 0.036 U | 0.036 U | 0.036 U | 0.036 U | 0.036 U | 0.036 U | 0.072 U |
| | 2 - 4 | 6/10/2003 | | 0.039 U | — | 0.078 U | 0.039 U | 0.039 U | 0.039 U | 0.039 U | 0.039 U | 0.039 U | 0.039 U | 0.078 U |
| | 4 - 6 | 6/10/2003 | | 0.037 U | — | 0.074 U | 0.037 U | 0.037 U | 0.037 U | 0.051 | 0.061 | 0.037 U | 0.027 J | 0.139 J |
| | 8 - 10 | 6/10/2003 | | 0.044 U | — | 0.089 U | 0.044 U | 0.044 U | 0.044 U | 0.044 U | 0.044 U | 0.044 U | 0.044 U | 0.089 U |
| | 10 - 12 | 6/10/2003 | | 0.047 U | — | 0.095 U | 0.047 U | 0.047 U | 0.047 U | 0.047 U | 0.047 U | 0.047 U | 0.047 U | 0.095 U |
| | 12 - 14 | 6/10/2003 | | 0.046 U | — | 0.091 U | 0.046 U | 0.046 U | 0.046 U | 0.046 U | 0.046 U | 0.046 U | 0.046 U | 0.091 U |
| SB-07247 | 0 - 0 | 6/10/2003 | Weston | 0.037 U | — | 0.074 U | 0.037 U | 0.037 U | 0.037 U | 0.11 | 0.098 UY | 0.044 U | 0.085 | 0.195 |
| | 0 - 2 | 6/10/2003 | | 0.039 U | — | 0.078 U | 0.039 U | 0.039 U | 0.039 U | 0.039 U | 0.039 U | 0.046 UY | 0.039 U | 0.078 U |
| | 2 - 4 | 6/10/2003 | | 0.041 U | — | 0.082 U | 0.041 U | 0.041 U | 0.041 U | 0.041 U | 0.041 U | 0.049 U | 0.041 U | 0.082 U |
| | 4 - 6 | 6/10/2003 | | 0.037 U | — | 0.074 U | 0.037 U | 0.037 U | 0.037 U | 0.037 U | 0.037 U | 0.045 U | 0.02 J | 0.02 J |
| | 6 - 8 | 6/10/2003 | | 0.039 U | — | 0.078 U | 0.039 U | 0.039 U | 0.039 U | 0.039 U | 0.039 U | 0.047 U | 0.039 U | 0.078 U |
| | 8 - 10 | 6/10/2003 | | 0.047 U | — | 0.093 U | 0.047 U | 0.047 U | 0.047 U | 0.047 U | 0.047 U | 0.056 U | 0.047 U | 0.093 U |
| | 10 - 12 | 6/10/2003 | | 0.046 U | — | 0.091 U | 0.046 U | 0.046 U | 0.046 U | 0.046 U | 0.046 U | 0.055 U | 0.046 U | 0.091 U |
| | 12 - 14 | 6/10/2003 | | 0.043 U | — | 0.086 U | 0.043 U | 0.043 U | 0.043 U | 0.043 U | 0.043 U | 0.052 U | 0.043 U | 0.086 U |
| SB-07250 | 0 - 2 | 2/14/05 | Weston | 0.110 U | — | 0.110 U | 0.110 U | 0.110 U | 0.110 U | 0.64 | 0.500 J | — | — | 1.140 J |
| | 2 - 4 | 2/14/2005 | | 0.500 U | — | 0.500 U | 0.500 U | 0.500 U | 0.500 U | 1.000 UY | 3.000 | — | — | **3.00** |
| | 4 - 6 | 2/14/2005 | | 0.043 U | — | 0.043 U | 0.043 U | 0.043 U | 0.043 U | 0.086 UY | 0.110 | — | — | 0.110 |
| | 6 - 8 | 2/14/2005 | | 0.045 U | — | 0.045 U | 0.045 U | 0.045 U | 0.045 U | 0.045 U | 0.045 U | — | — | 0.045 U |
| | 8 - 10 | 2/14/2005 | | 0.044 U | — | 0.044 U | 0.044 U | 0.044 U | 0.044 U | 0.180 UY | 0.5 | — | — | 0.500 |
| | 10 - 12 | 2/14/2005 | | 0.040 U | — | 0.040 U | 0.040 U | 0.040 U | 0.040 U | 0.040 U | 0.040 U | — | — | 0.040 U |
| | 12 - 14 | 2/14/2005 | | 0.043 U | — | 0.043 U | 0.043 U | 0.043 U | 0.043 U | 0.043 U | 0.043 U | — | — | 0.043 U |
| | 14 - 16 | 2/14/2005 | | 0.044 U | — | 0.044 U | 0.044 U | 0.044 U | 0.044 U | 0.044 U | 0.044 U | — | — | 0.044 U |
| SB-07252 | 0 - 2 | 2/15/2005 | Weston | 0.120 U | — | 0.120 U | 0.120 U | 0.120 U | 0.120 U | 0.590 UY | 0.490 | — | — | 0.490 |
| | 2 - 4 | 2/15/2005 | | 0.032 U | — | 0.032 U | 0.032 U | 0.032 U | 0.032 U | 0.032 U | 0.032 U | — | — | 0.032 U |
| **MTCA Method A Cleanup Levels[2]** | | | | | | | | | | | | | | 1 |

**Table C-2**
**Comprehensive Summary of Polychlorinated Biphenyls in Soil**
**Jorgensen Forge Facility**
**8531 East Marginal Way South**
**Seattle, Washington**
**Farallon PN: 831-003**

| Sample Location | Sample Depth (feet) | Sample Date | Sampled by | Analytical Results (milligrams per kilogram)[1] | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Aroclor | | | | | | | | | | |
| | | | | 1016 | 1016/1242 | 1221 | 1232 | 1242 | 1248 | 1254 | 1260 | 1262 | 1268 | Total PCBs |
| SB-07253 | 0 - 2 | 2/15/05 | Weston | 0.036 U | — | 0.036 U | 0.036 U | 0.036 U | 0.036 U | 0.036 U | 0.130 | — | — | 0.130 |
| | 2 - 4 | 2/15/2005 | | 0.032 U | — | 0.032 U | 0.032 U | 0.032 U | 0.032 U | 0.032 U | 0.032 U | — | — | 0.032 U |
| | 4 - 6 | 2/15/2005 | | 0.032 U | — | 0.032 U | 0.032 U | 0.032 U | 0.032 U | 0.032 U | 0.032 U | — | — | 0.032 U |
| | 6 - 8 | 2/15/2005 | | 0.033 U | — | 0.033 U | 0.033 U | 0.033 U | 0.033 U | 0.033 U | 0.033 U | — | — | 0.033 U |
| | 8 - 10 | 2/15/2005 | | 0.033 U | — | 0.033 U | 0.033 U | 0.033 U | 0.033 U | 0.033 U | 0.033 U | — | — | 0.033 U |
| | 10 - 12 | 2/15/2005 | | 0.032 U | — | 0.032 U | 0.032 U | 0.032 U | 0.032 U | 0.032 U | 0.032 U | — | — | 0.032 U |
| SB-08916 | 2 | 9/13/1994 | Weston | — | 0.072 U | — | — | — | 0.072 U | 0.072 U | 0.072 U | — | — | 0.072 U |
| | 5 | 9/13/1994 | | — | 0.083 U | — | — | — | 0.083 U | 0.083 U | 0.083 U | — | — | 0.083 U |
| | 12.5 | 9/13/1994 | | — | 0.088 UJH | — | — | — | 0.088 UJH | 0.088 UJH | 0.088 UJH | — | — | 0.088 UJH |
| SB-09101 | 2 | 9/12/1994 | Weston | — | 0.035 U | — | — | — | 0.035 U | 0.035 U | 0.035 U | — | — | 0.035 U |
| | 5 | 9/12/1994 | | — | 0.036 U | — | — | — | 0.036 U | 0.036 U | 0.036 U | — | — | 0.036 U |
| | 12.5 | 9/12/1994 | | — | 0.045 U | — | — | — | 0.045 U | 0.045 U | 0.045 U | — | — | 0.045 U |
| SB-09105 | 2 | 9/12/1994 | Weston | — | 0.035 U | — | — | — | 0.035 U | 0.035 U | 0.07 UY | — | — | 0.07 UY |
| | 5 | 9/12/1994 | | — | 0.036 U | — | — | — | 0.036 U | 0.036 U | 0.036 U | — | — | 0.036 U |
| | 12.5 | 9/12/1994 | | — | 0.044 U | — | — | — | 0.044 U | 0.044 U | 0.044 U | — | — | 0.044 U |
| SB-09106 | 2 | 9/12/1994 | Weston | — | 0.035 U | — | — | — | 0.035 U | 0.035 U | 0.069 J | — | — | 0.069 J |
| | 5 | 9/12/1994 | | — | 0.083 UY | — | — | — | 0.042 U | 0.042 U | 0.042 U | — | — | 0.083 UY |
| | 12.5 | 9/12/1994 | | — | 0.045 U | — | — | — | 0.045 U | 0.045 U | 0.045 U | — | — | 0.045 U |
| SB1 | 0 - 2 | 8/26/2004 | Farallon | 0.0101 U | — | 0.0101 U | 0.0101 U | 0.0101 U | 0.0101 U | 0.0908 C1 | 0.105 C1 | — | — | 0.1958 |
| | 2 - 4 | 8/26/2004 | | 0.0103 U | — | 0.0103 U | 0.0103 U | 0.0103 U | 0.0103 U | 0.0103 U | 0.007 J C1 | — | — | 0.007 J |
| | 4 - 6 | 8/26/2004 | | 0.0109 U | — | 0.0109 U | 0.0109 U | 0.0109 U | 0.0109 U | 0.0109 U | 0.0035 J C1 | — | — | 0.0035 J |
| | 6 - 8 | 8/26/2004 | | 0.0095 U | — | 0.0095 U | 0.0095 U | 0.0095 U | 0.0095 U | 0.0095 U | 0.0095 U | — | — | 0.00568 J |
| | 8 - 10 | 8/26/2004 | | 0.0113 U | — | 0.0113 U | 0.0113 U | 0.0113 U | 0.0113 U | 0.0113 U | 0.00568 J C1 | — | — | 0.0057 |
| | 10 - 12 | 8/26/2004 | | 0.0136 U | — | 0.0136 U | 0.0136 U | 0.0136 U | 0.0136 U | 0.0136 U | 0.0136 U | — | — | 0.0136 U |
| SB2 | 0 - 2 | 8/26/2004 | Farallon | 0.0111 U | — | 0.0111 U | 0.0111 U | 0.0111 U | 0.0111 U | 0.396 C1 | 0.0111 U | — | — | 0.3960 |
| | 2 - 4 | 8/26/2004 | | 0.0113 U | — | 0.0113 U | 0.0113 U | 0.0113 U | 0.0113 U | 0.0937 C1 | 0.0251 C1 | — | — | 0.1188 |
| | 4 - 6 | 8/26/2004 | | 0.0116 U | — | 0.0116 U | 0.0116 U | 0.0116 U | 0.0116 U | 0.0294 C1 | 0.0148 C1 | — | — | 0.0442 |
| | 6 - 8 | 8/26/2004 | | 0.0111 U | — | 0.0111 U | 0.0111 U | 0.0111 U | 0.0111 U | 0.0282 C1 | 0.0155 C1 | — | — | 0.0437 |
| | 8 - 10 | 8/26/2004 | | 0.0125 U | — | 0.0125 U | 0.0125 U | 0.0125 U | 0.0125 U | 0.0125 U | 0.00618 J C1 | — | — | 0.00618 J |
| | 10 - 12 | 8/26/2004 | | 0.0106 U | — | 0.0106 U | 0.0106 U | 0.0106 U | 0.0106 U | 0.415 C1 | 0.253 C1 | — | — | 0.6680 |
| | 12 - 14 | 8/26/2004 | | 0.0102 U | — | 0.0102 U | 0.0102 U | 0.0102 U | 0.0102 U | 0.00606 J C1 | 0.0102 U | — | — | 0.0061 |
| | 14 - 16 | 8/26/2004 | | 0.0114 U | — | 0.0114 U | 0.0114 U | 0.0114 U | 0.0114 U | 0.0114 U | 0.0114 U | — | — | 0.00606 J |
| **MTCA Method A Cleanup Levels[2]** | | | | | | | | | | | | | | 1 |

# Table C-2
## Comprehensive Summary of Polychlorinated Biphenyls in Soil
## Jorgensen Forge Facility
## 8531 East Marginal Way South
## Seattle, Washington
## Farallon PN: 831-003

| Sample Location | Sample Depth (feet) | Sample Date | Sampled by | Analytical Results (milligrams per kilogram)[1] | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Aroclor | | | | | | | | | | |
| | | | | 1016 | 1016/1242 | 1221 | 1232 | 1242 | 1248 | 1254 | 1260 | 1262 | 1268 | Total PCBs |
| SB3 | 0 - 2 | 8/26/2004 | Farallon | 0.524 U | — | 0.524 U | 0.524 U | 0.524 U | 0.524 U | 15.5 C1 | 2.27 C1 | — | — | **17.77** |
| | 2 - 4 | 8/26/2004 | | 0.0098 U | — | 0.0098 U | 0.0098 U | 0.0098 U | 0.0098 U | 0.174 C1 | 0.0323 C1 | — | — | 0.2063 |
| | 4 - 6 | 8/26/2004 | | 0.0103 U | — | 0.0103 U | 0.0103 U | 0.0103 U | 0.0103 U | 0.194 C1 | 0.0334 C1 | — | — | 0.2274 |
| | 6 - 8 | 8/26/2004 | | 0.0116 U | — | 0.0116 U | 0.0116 U | 0.0116 U | 0.0116 U | 0.22 C1 | 0.0385 C1 | — | — | 0.2585 |
| | 8 - 10 | 8/26/2004 | | 0.0117 U | — | 0.0117 U | 0.0117 U | 0.0117 U | 0.0117 U | 0.156 C1 | 0.0695 C1 | — | — | 0.2255 |
| SB4 | 0 - 2 | 8/26/2004 | Farallon | 0.202 U | — | 0.202 U | 0.202 U | 0.202 U | 0.202 U | 5.93 C1 | 0.904 C1 | — | — | **6.834** |
| | 2 - 4 | 8/26/2004 | | 0.0562 U | — | 0.0562 U | 0.0562 U | 0.0562 U | 0.0562 U | 1.15 C1 | 0.774 C1 | — | — | **1.924** |
| | 4 - 6 | 8/26/2004 | | 0.587 U | — | 0.587 U | 0.587 U | 0.587 U | 0.587 U | 9.86 C1 | 1.47 C1 | — | — | **11.33** |
| | 6 - 8 | 8/26/2004 | | 0.0114 U | — | 0.0114 U | 0.0114 U | 0.0114 U | 0.0114 U | 0.32 C1 | 0.0768 C1 | — | — | 0.3968 |
| | 8 - 10 | 8/26/2004 | | 0.0118 U | — | 0.0118 U | 0.0118 U | 0.0118 U | 0.0118 U | 0.328 C1 | 0.107 C1 | — | — | 0.4350 |
| | 10 - 12 | 8/26/2004 | | 0.0124 U | — | 0.0124 U | 0.0124 U | 0.0124 U | 0.0124 U | 0.0127 C1 | 0.00935 J C1 | — | — | 0.02205 J |
| | 12 - 14 | 8/26/2004 | | 0.22 U | — | 0.22 U | 0.22 U | 0.22 U | 0.22 U | 6.01 C1 | 1.03 C1 | — | — | **7.04** |
| | 14 - 16 | 8/26/2004 | | 0.118 U | — | 0.118 U | 0.118 U | 0.118 U | 0.118 U | 1.37 C1 | 0.19 C1 | — | — | **1.56** |
| SB5 | 0 - 2 | 8/26/2004 | Farallon | 0.0102 U | — | 0.0102 U | 0.0102 U | 0.0102 U | 0.0102 U | 0.0267 C1 | 0.00801 J C1 | — | — | 0.03471 J |
| | 2 - 4 | 8/26/2004 | | 0.0122 U | — | 0.0122 U | 0.0122 U | 0.0122 U | 0.0122 U | 0.00778 J C1 | 0.00713 J C1 | — | — | 0.01491 J |
| | 4 - 6 | 8/26/2004 | | 0.0112 U | — | 0.0112 U | 0.0112 U | 0.0112 U | 0.0112 U | 0.049 C1 | 0.014 C1 | — | — | 0.063 |
| | 6 - 8 | 8/26/2004 | | 0.011 U | — | 0.011 U | 0.011 U | 0.011 U | 0.011 U | 0.0116 C1 | 0.00851 J C1 | — | — | 0.02011 J |
| | 8 - 10 | 8/26/2004 | | 0.0114 U | — | 0.0114 U | 0.0114 U | 0.0114 U | 0.0114 U | 0.0967 C1 | 0.0875 C1 | — | — | 0.1842 |
| | 10 - 12 | 8/26/2004 | | 0.012 U | — | 0.012 U | 0.012 U | 0.012 U | 0.012 U | 0.0528 C1 | 0.0725 C1 | — | — | 0.1253 |
| | 12 - 14 | 8/26/2004 | | 0.0111 U | — | 0.0111 U | 0.0111 U | 0.0111 U | 0.0111 U | 0.0505 C1 | 0.0724 C1 | — | — | 0.1229 |
| | 14 - 16 | 8/26/2004 | | 0.0128 U | — | 0.0128 U | 0.0128 U | 0.0128 U | 0.0128 U | 0.0745 C1 | 0.0989 C1 | — | — | 0.1734 |
| SB6 | 0 - 2 | 8/27/2004 | Farallon | 0.0099 U | — | 0.0099 U | 0.0099 U | 0.0099 U | 0.0099 U | 0.0594 C1 | 0.0782 C1 | — | — | 0.1376 |
| | 2 - 4 | 8/27/2004 | | 0.0095 U | — | 0.0095 U | 0.0095 U | 0.0095 U | 0.0095 U | 0.0905 C1 | 0.0673 C1 | — | — | 0.1578 |
| | 4 - 6 | 8/27/2004 | | 0.01 U | — | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.122 C1 | 0.0605 C1 | — | — | 0.1825 |
| | 6 - 8 | 8/27/2004 | | 0.0097 U | — | 0.0097 U | 0.0097 U | 0.0097 U | 0.0097 U | 0.145 C1 | 0.0584 C1 | — | — | 0.2034 |
| | 8 - 10 | 8/27/2004 | | 0.0101 U | — | 0.0101 U | 0.0101 U | 0.0101 U | 0.0101 U | 0.0935 C1 | 0.113 C1 | — | — | 0.2065 |
| | 10 - 12 | 8/27/2004 | | 0.0103 U | — | 0.0103 U | 0.0103 U | 0.0103 U | 0.0103 U | 0.172 C1 | 0.0938 C1 | — | — | 0.2658 |
| | 12 - 14 | 8/27/2004 | | 0.0106 U | — | 0.0106 U | 0.0106 U | 0.0106 U | 0.0106 U | 0.133 C1 | 0.0523 C1 | — | — | 0.1853 |
| | 14 - 16 | 8/27/2004 | | 0.0103 U | — | 0.0103 U | 0.0103 U | 0.0103 U | 0.0103 U | 0.0404 C1 | 0.0503 C1 | — | — | 0.0907 |
| **MTCA Method A Cleanup Levels**[2] | | | | | | | | | | | | | | 1 |

## Table C-2
## Comprehensive Summary of Polychlorinated Biphenyls in Soil
## Jorgensen Forge Facility
## 8531 East Marginal Way South
## Seattle, Washington
## Farallon PN: 831-003

| Sample Location | Sample Depth (feet) | Sample Date | Sampled by | Analytical Results (milligrams per kilogram)[1] | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Aroclor | | | | | | | | | | Total PCBs |
| | | | | 1016 | 1016/1242 | 1221 | 1232 | 1242 | 1248 | 1254 | 1260 | 1262 | 1268 | |
| SB7 | 0 - 2 | 8/27/2004 | Farallon | 0.0102 U | — | 0.0102 U | 0.0102 U | 0.0102 U | 0.0102 U | 0.0683 C1 | 0.0293 C1 | — | — | 0.0976 |
| | 2 - 4 | 8/27/2004 | | 0.0105 U | — | 0.0105 U | 0.0105 U | 0.0105 U | 0.0105 U | 0.256 C1 | 0.0952 C1 | — | — | 0.3512 |
| | 4 - 6 | 8/27/2004 | | 0.054 U | — | 0.054 U | 0.054 U | 0.054 U | 0.054 U | 1.13 C1 | 0.493 C1 | — | — | **1.623** |
| | 6 - 8 | 8/27/2004 | | 0.0099 U | — | 0.0099 U | 0.0099 U | 0.0099 U | 0.0099 U | 0.251 C1 | 0.114 C1 | — | — | 0.365 |
| | 8 - 10 | 8/27/2004 | | 0.011 U | — | 0.011 U | 0.011 U | 0.011 U | 0.011 U | 0.323 C1 | 0.0967 C1 | — | — | 0.4197 |
| | 10 - 12 | 8/27/2004 | | 0.0119 U | — | 0.0119 U | 0.0119 U | 0.0119 U | 0.0119 U | 0.21 C1 | 0.0924 C1 | — | — | 0.3024 |
| | 12 - 14 | 8/27/2004 | | 0.0111 U | — | 0.0111 U | 0.0111 U | 0.0111 U | 0.0111 U | 0.253 C1 | 0.128 C1 | — | — | 0.381 |
| | 14 - 16 | 8/27/2004 | | 0.0124 U | — | 0.0124 U | 0.0124 U | 0.0124 U | 0.0124 U | 0.204 C1 | 0.425 C1 | — | — | 0.629 |
| SS1 | 0 - 1 | 8/31/2004 | Farallon | 0.011 U | — | 0.011 U | 0.011 U | 0.011 U | 0.011 U | 0.152 C1 | 0.171 C1 | — | — | 0.323 |
| SS2 | 0 - 1 | 8/31/2004 | Farallon | 0.103 U | — | 0.103 U | 0.103 U | 0.103 U | 0.103 U | 2.92 C1 | 0.767 C1 | — | — | **3.687** |
| SS3 | 0 - 1 | 8/30/2004 | Farallon | 0.0519 U | — | 0.0519 U | 0.0519 U | 0.0519 U | 0.0519 U | 1.02 C1 | 0.423 C1 | — | — | **1.443** |
| SS4 | 0 - 1 | 8/30/2004 | Farallon | 0.0102 U | — | 0.0102 U | 0.0102 U | 0.0102 U | 0.0102 U | 0.0118 C1 | 0.0137 C1 | — | — | 0.0255 |
| SS5 | 0 - 1 | 8/30/2004 | Farallon | 0.0105 U | — | 0.0105 U | 0.0105 U | 0.0105 U | 0.0105 U | 0.0837 C1 | 0.113 C1 | — | — | 0.1967 |
| SS6 | 0 - 1 | 8/30/2004 | Farallon | 0.103 U | — | 0.103 U | 0.103 U | 0.103 U | 0.103 U | 2.78 C1 | 1.76 C1 | — | — | **4.54** |
| SS7 | 0 - 1 | 8/30/2004 | Farallon | 0.11 U | — | 0.11 U | 0.11 U | 0.11 U | 0.11 U | 2.19 C1 | 1.33 C1 | — | — | **3.52** |
| SS8 | 0 - 1 | 8/30/2004 | Farallon | 0.0101 U | — | 0.0101 U | 0.0101 U | 0.0101 U | 0.0101 U | 0.0546 C1 | 0.115 C1 | — | — | 0.1696 |
| **MTCA Method A Cleanup Levels**[2] | | | | | | | | | | | | | | 1 |

NOTES:

Results in **BOLD** indicate sample result or reporting limit exceeds Washington State Department of Ecology Model Toxics Control Act Cleanup Regulation (MTCA) Method A Cleanup Level for Soil.

[1]Analyzed by U.S. Environmental Protection Agency Method 8080, 8081, or 8082.

[2] MTCA Method A Cleanup Levels for Soil, Table 740-1 of Section 900 of Chapter 173-340 of the Washington Administrative Code, as amended February 2001.

— = not analyzed

C1 = Second column confirmation was performed. The relative percent difference between the two column results was below 40%.

H = denotes value greater than minimum shown

J = the analyte was analyzed for and positively identified, but the associated numerical value is an estimated quantity

U = no detectable concentrations above the listed laboratory practical quantitation limit

UJ = estimated detection limit

Y = The analyte reporting limit is raised due to a positive chromatographic interference. The compound is not detected above the raised limit but may be present at or below the limit.

**Table C-3A**
**Comprehensive Summary of Total and Dissolved Metals in Groundwater - Arsenic to Lead**
**Jorgensen Forge Facility**
**8531 East Marginal Way South**
**Seattle, Washington**
**Farallon PN: 831-003**

| Sample Location | Sample Date | Sampled by | Sample Depth/Screened Interval (feet bgs) | Analytical Results (micrograms per liter)[1] | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Aluminum | | Antimony | | Arsenic | | Barium | | Beryllium | | Bromide | Cadmium | | Chromium | | Cobalt | | Copper | | Lead | |
| | | | | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Dissolved |
| GP-06637 | 3/15/1995 | Weston | 14 | 52,700 | 150 | 1 U | 1 U | 3 | 2 | 167 | 6 B | 1 | 1 U | — | 2 U | 2 U | 45 | 5 U | 9 | 3 U | 47 | 4 | 8 JB | 1 UJ |
| | 3/15/1995 | Weston | 25 | 46,500 | 50 | 1 | 1 | 2 | 1 U | 181 | 13 | 1 U | 1 U | — | 2 U | 2 U | 45 | 5 U | 16 | 3 U | 45 | 2 U | 6 JB | 1 UJ |
| | 3/15/1995 | Weston | 45 | 17,600 | 40 | 3 | 2 | 4 | 1 U | 55 | 10 B | 1 U | 1 U | — | 2 U | 2 U | 19 | 5 U | 6 | 3 U | 22 | 2 U | 4 JB | 1 UJ |
| GP-06638 | 3/16/1995 | Weston | 14 | 72,800 | 180 | 1 U | 2 | **10** | 7 | 229 | 5 | 1 | 1 U | — | 2 U | 2 U | 70 | 5 U | 14 | 3 U | 88 | 2 | 10 | 1 |
| | 3/16/1995 | Weston | 25 | 70,300 | 200 | 1 | 2 | 4 | 1 | 292 | 12 | 1 U | 1 U | — | 2 U | 2 U | 70 | 5 U | 25 | 3 U | 55 | 2 U | 8 | 1 |
| | 3/16/1995 | Weston | 45 | 51,300 | 60 | 2 | 2 | **6** | 1 U | 151 | 10 | 1 U | 1 U | — | 2 U | 2 U | 82 | 5 U | 17 | 3 U | 116 | 2 U | 8 | 1 U |
| GP-06639 | 3/16/1995 | Weston | 14 | 39,100 J | 310 J | 2 | 2 | **13** | 7 | 166 J | 16 | 1 U | 1 U | — | 2 U | 2 U | 47 JB | 9 | 10 | 3 U | 67 J | 6 | 8 J | 1 U |
| | 3/16/1995 | Weston | 25 | 81,100 | 60 | 1 U | 1 | 2 | 1 U | 279 | 11 | 1 U | 1 U | — | 2 U | 2 U | 80 | 5 U | 23 | 3 U | 67 | 2 U | 9 | 1 |
| | 3/16/1995 | Weston | 45 | 11,700 | 50 | 1 U | 1 | 3 | 1 U | 41 | 6 | 1 U | 1 U | — | 2 U | 2 U | 13 B | 5 U | 5 | 3 U | 16 B | 2 U | 2 | 1 U |
| GP-06640 | 3/15/1995 | Weston | 14 | 2,320 J | 20 | 1 | 2 U | 1 U | 1 U | 31 J | 23 | 1 U | 1 U | — | 2 U | 2 U | 5 UJ | 5 U | 12 J | 10 | 3 J | 2 U | 2 JB | 1 J |
| | 3/15/1995 | Weston | 25 | 51,100 | 30 | 1 U | 1 U | **9** | 2 | 196 | 14 | 1 | 1 U | — | 2 U | 2 U | 53 | 5 U | 20 | 3 U | 45 | 2 U | 7 JB | 1 UJ |
| | 3/15/1995 | Weston | 45 | 31,700 | 90 | 2 | 2 | **9** | 1 U | 84 | 6 B | 1 U | 1 U | — | 2 U | 2 U | 55 | 5 U | 11 | 3 U | 60 | 2 U | 7 JB | 1 J |
| GP-08901 | 9/14/1994 | Boeing | 14 | 21,400 | 40 | 1 U | 5 | **25** | 24 | 82 | 12 | 1 U | 1 U | — | 2 U | 2 U | 30 | 5 U | 6 | 3 U | 16 | 2 | 7 | 1 U |
| GP-08902 | 9/14/1994 | Weston | 14 | 16,500 | 30 | 1 U | 5 | **50** | 50 | 67 | 13 | 1 U | 1 U | — | 2 U | 2 U | 19 | 5 U | 5 | 3 U | 15 | 2 U | 7 | 2 |
| GP-08903 | 9/14/1994 | Weston | 14 | 27,300 | 40 | 1 U | 5 | **11** | 9 | 93 | 1 | 1 U | 1 U | — | 2 U | 2 U | 16 | 5 U | 4 | 3 U | 19 | 2 U | 4 UB | 2 |
| **MTCA Method A Cleanup Levels [2]** | | | | NE | | NE | | 5 | | NE | | NE | | NE | 5 | | 50 | | NE | | NE | | 15 | |
| **MTCA Method B Cleanup Levels [3]** | | | | NE | | 6.4 | | 0.0583 | | 560 | | 32 | | NE | 8 | | 48 | | NE | | 592 | | NE | |

# Table C-3A
## Comprehensive Summary of Total and Dissolved Metals in Groundwater - Arsenic to Lead
## Jorgensen Forge Facility
## 8531 East Marginal Way South
## Seattle, Washington
## Farallon PN: 831-003

| Sample Location | Sample Date | Sampled by | Sample Depth/Screened Interval (feet bgs) | Analytical Results (micrograms per liter)[1] Aluminum | | Antimony | | Arsenic | | Barium | | Beryllium | | Bromide | Cadmium | | Chromium | | Cobalt | | Copper | | Lead | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Dissolved |
| GP-08904 | 9/14/1994 | Weston | 14 | 14,700 | 20 U | 1 U | 8 | 3 | 1 U | 49 | 1 | 1 U | 1 U | — | 2 U | 2 U | 13 | 5 U | 7 | 3 | 12 | 2 | 3 UB | 3 |
| GP-08905 | 9/13/1994 | Weston | 14 | 17,300 | 40 | 1 U | 8 | 3 | 2 U | 72 | 4 | 1 U | 1 U | — | 2 U | 2 | 20 | 5 U | 5 | 3 U | 17 | 2 U | 3 | 2 |
| GP-08906 | 11/29/1994 | Weston | 15 | — | — | 1 U | 1 U | **25** | 16 | — | — | 1 U | 1 U | — | 2 U | 2 U | 42 UB | 5 U | — | — | 51 | 2 UB | 12 | 3 UB |
| | 11/29/1994 | Weston | 25 | — | — | 1 U | 1 U | 4 | 4 | — | — | 1 U | 1 U | — | 2 U | 2 U | 6 UB | 5 U | — | — | 5 UJB | 2 U | 3 UB | 1 UB |
| | 11/29/1994 | Weston | 45 | — | — | 1 U | 1 U | 3 | 1 | — | — | 1 U | 1 U | — | 2 U | 2 U | 15 UB | 5 U | — | — | 19 | 2 U | 4 UB | 1 UB |
| | 11/29/1994 | Weston | 65 | — | — | 5 U | 5 U | **6** | 1 U | — | — | 1 U | 1 U | — | 2 U | 2 U | 30 UB | 5 U | — | — | 16 | 2 U | 4 UB | 1 U |
| GP-08907 | 11/28/1994 | Weston | 15 | — | — | 1 U | 1 U | **10** | 7 | — | — | 1 | 1 U | — | 2 U | 2 U | **100** | 5 U | — | — | 100 | 3 | 16 | 3 UB |
| | 11/28/1994 | Weston | 25 | — | — | 1 U | 1 U | **8** | 4 | — | — | 1 U | 1 U | — | 2 U | 2 U | **60** | 5 U | — | — | 62 | 2 U | 9 | 2 UB |
| | 11/28/1994 | Weston | 45 | — | — | 1 U | 1 U | 3 | 1 U | — | — | 1 U | 1 U | — | 2 U | 2 U | 23 | 5 U | — | — | 26 | 2 U | 6 | 3 UB |
| | 11/29/1994 | Weston | 63 | — | — | 1 | 3 | **18** | 1 U | — | — | 2 | 1 U | — | 2 U | 2 U | **301** | 5 U | — | — | 350 | 2 U | 29 | 3 UB |
| GP-08908 | 3/17/1995 | Boeing | 14 | 23,600 | 20 | 1 U | 1 U | 4 | 1 | 114 | 30 | 1 U | 1 U | — | 2 U | 2 U | 18 | 5 U | 14 | 6 | 25 | 2 U | 4 | 1 U |
| | 3/17/1995 | Boeing | 25 | 19,200 | 170 | 1 U | 1 U | **9** | 6 | 90 | 9 | 1 U | 1 U | — | 2 U | 2 U | 14 | 5 U | 8 | 3 U | 20 | 6 | 4 | 1 |
| | 3/17/1995 | Boeing | 45 | 6,800 | 40 | 1 U | 1 U | 1 U | 1 U | 32 | 15 | 1 U | 1 U | — | 2 U | 2 U | 5 | 5 U | 3 U | 3 U | 6 | 2 U | 1 | 1 |
| GP-09101 | 9/12/1994 | Weston | 15 | 5,150 | 100 | 1 U | 6 UB | **24** | 23 | 31 | 15 | 1 U | 1 U | — | 2 U | 2 U | 11 | 6 | 3 | 3 U | 6 | 2 U | 3 UB | 3 UB |
| GP-09102 | 9/8/1994 | Weston | 14 | 1,590 | 20 U | 1 U | 3 | **30** | 34 | 16 | 6 | 1 U | 1 U | — | 2 U | 2 U | 5 U | 5 U | 3 U | 3 U | 2 U | 2 U | 3 UB | 2 |
| GP-09103 | 9/8/1994 | Boeing | 14 | 11,000 | 20 U | 1 U | 4 | **8** | 7 | 48 | 10 | 1 U | 1 U | — | 2 U | 2 U | 9 | 5 U | 3 U | 3 U | 9 | 2 U | 4 UB | 4 |
| GP-09104 | 11/23/1994 | Weston | 15 | 31,900 | 170 | 1 | 2 | **21** | 7 | **1,110** | 23 | 5 | 1 U | — | 2 | 2 U | **307** | 7 | 89 | 3 U | 517 | 2 U | 83 | 2 |
| | 11/23/1994 | Weston | 25 | 78,400 | 50 | 1 U | 2 | 4 | 1 U | 284 | 7 | 1 U | 1 U | — | 2 U | 2 U | **73** | 5 U | 20 | 3 U | 65 | 2 U | 10 | 2 |
| | 11/23/1994 | Weston | 45 | 34,400 | 60 | 1 U | 1 U | **10** | 1 | 101 | 4 | 1 U | 1 U | — | 2 U | 2 U | **60** | 5 U | 13 | 3 U | 101 | 2 U | 8 UB | 1 U |
| GP-09105 | 11/23/1994 | Weston | 15 | 313,000 | 120 | 2 | 4 | **61** | 92 | **1,100** | 17 | 5 | 1 U | — | 2 U | 2 U | **300** | 5 U | 90 | 3 U | 398 | 2 U | 59 | 2 |
| | 11/23/1994 | Weston | 25 | 28,500 | 20 | 1 U | 4 | 2 | 1 U | 141 | 13 | 1 U | 1 U | — | 2 U | 2 U | 34 | 5 U | 7 | 3 U | 39 | 2 U | 7 UB | 2 |
| | 11/23/1994 | Weston | 45 | 21,400 | 40 | 1 U | 3 | 3 | 1 U | 74 | 7 | 1 U | 1 U | — | 2 U | 2 U | 51 | 5 U | 7 | 3 U | 122 | 2 U | 7 UB | 1 |
| **MTCA Method A Cleanup Levels [2]** | | | | NE | | NE | | 5 | | NE | | NE | | NE | 5 | | 50 | | NE | | NE | | 15 | |
| **MTCA Method B Cleanup Levels [3]** | | | | NE | | 6.4 | | 0.0583 | | 560 | | 32 | | NE | 8 | | 48 | | NE | | 592 | | NE | |

**Table C-3A**
**Comprehensive Summary of Total and Dissolved Metals in Groundwater - Arsenic to Lead**
**Jorgensen Forge Facility**
**8531 East Marginal Way South**
**Seattle, Washington**
**Farallon PN: 831-003**

| Sample Location | Sample Date | Sampled by | Sample Depth/Screened Interval (feet bgs) | Analytical Results (micrograms per liter)[1] | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Aluminum | | Antimony | | Arsenic | | Barium | | Beryllium | | Bromide | Cadmium | | Chromium | | Cobalt | | Copper | | Lead | |
| | | | | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Dissolved |
| GP-09106 | 3/14/1995 | Weston | 14 | 130 | 26,600 | 2 | 1 U | **46** | **31** | 28 | 132 | 1 U | 1 U | — | 2 U | 2 U | 5 U | 28 | 10 | 19 | 3 | 43 | 7 | 7 |
| | 3/14/1995 | Weston | 25 | 47,200 | 50 | 1 | 1 U | 4 | 1 U | 187 | 15 | 1 U | 1 U | — | 2 U | 2 U | 48 | 5 U | 13 | 3 U | 40 | 2 U | 6 | 1 U |
| | 3/14/1995 | Weston | 45 | 29,000 | 20 | 1 | 1 U | **5** | 1 U | 84 | 4 | 1 U | 1 U | — | 2 U | 2 U | 29 | 5 U | 10 | 3 U | 25 | 2 U | 5 | 1 U |
| GP-09107 | 3/14/1995 | Weston | 14 | 54,500 | 130 | 2 | 1 U | **86** | **76** | 213 | 23 | 1 U | 1 U | — | 2 U | 2 U | 45 | 5 U | 14 | 3 U | 53 | 2 U | 9 | 1 U |
| | 3/14/1995 | Weston | 25 | 69,900 | 120 | 1 | 1 U | 2 | 1 U | 274 | 8 | 1 U | 1 U | — | 2 U | 2 U | **69** | 5 U | 19 | 3 U | 63 | 2 U | 11 | 1 U |
| | 3/14/1995 | Weston | 45 | 23,600 | 50 | 2 | 1 U | 4 | 1 U | 76 | 2 | 1 U | 1 U | — | 2 U | 2 U | **66** | 5 U | 9 | 3 U | 97 | 2 U | 7 | 1 U |
| GP-09108 | 3/14/1995 | Weston | 14 | 44,500 | 350 | 1 | 1 U | **85** | **72** | 180 | 20 | 1 U | 1 U | — | 2 U | 2 U | 47 | 6 | 11 | 3 U | 56 | 3 | 8 | 1 |
| | 3/14/1995 | Weston | 25 | 16,900 | 30 | 1 U | 1 U | 3 | 2 | 75 | 12 | 1 U | 1 U | — | 2 U | 2 U | 21 | 5 U | 6 | 3 U | 12 | 2 U | 4 | 1 U |
| | 3/14/1995 | Weston | 45 | 6,930 | 20 U | 1 | 1 U | 4 | 1 U | 24 | 3 | 1 U | 1 U | — | 2 U | 2 U | 8 | 5 U | 4 | 3 U | 13 | 2 U | 4 | 1 U |
| GP-09109 | 3/15/1995 | Weston | 14 | 22,400 | 410 | 1 | 3 | **13** | **11** | 81 | 10 B | 1 U | 1 U | — | 2 U | 2 U | 38 | 15 | 6 | 3 U | 37 | 7 | 6 JB | 1 J |
| | 3/15/1995 | Weston | 25 | 47,500 | 130 | 1 | 2 U | **12** | **8** | 177 | 10 B | 1 U | 1 U | — | 2 U | 2 U | 40 | 5 U | 15 | 3 U | 37 | 2 U | 8 JB | 1 UJ |
| | 3/15/1995 | Weston | 45 | 27,000 | 70 | 1 | 1 | 4 | 1 U | 77 | 2 B | 1 U | 1 U | — | 2 U | 2 U | 30 | 5 U | 9 | 3 U | 46 | 2 U | 8 JB | 1 UJ |
| GP-09110 | 9/19/1995 | Weston | 15 | — | — | 1 U | 1 U | **14** | **14** | 32 | 17 | 1 U | 1 U | — | 2 U | 2 U | 19 | 17 | — | — | 15 | 7 | 4 UB | 4 UB |
| | 9/19/1995 | Weston | 25 | — | — | 1 U | 1 U | 1 U | 1 | 39 | 7 | 1 U | 1 U | — | 2 U | 2 U | 6 | 5 U | — | — | 6 | 2 U | 2 UB | 1 UB |
| | 9/19/1995 | Weston | 45 | — | — | 1 U | 1 U | 1 | 1 | 16 | 9 | 1 U | 1 U | 5,000 U | 2 U | 2 U | 5 U | 5 U | — | — | 3 | 2 U | 2 UB | 2 UB |
| GP-09111 | 9/20/1995 | Weston | 15 | — | — | 1 U | 1 U | **12** | **9** | 154 | 13 UB | 1 U | 1 U | — | 2 U | 2 U | 45 UB | 20 | — | — | 63 | 14 UB | 10 | 2 UB |
| | 9/20/1995 | Weston | 25 | — | — | 1 U | 1 U | 2 | 2 | 20 | 9 UB | 1 U | 1 U | — | 2 U | 2 U | 5 U | 5 U | — | — | 3 | 2 U | 2 | 1 U |
| | 9/20/1995 | Weston | 45 | — | — | 1 U | 1 U | 1 | 1 U | 14 | 9 UB | 1 U | 1 U | — | 2 U | 2 U | 5 U | 5 U | — | — | 3 | 2 U | 2 | 1 UB |
| GP-09112 | 9/19/1995 | Weston | 15 | — | — | 1 U | 1 U | **29** | **32** | 107 | 9 | 1 U | 1 U | — | 2 U | 2 U | 33 | 5 U | — | — | 30 | 2 U | 8 | 1 U |
| | 9/19/1995 | Weston | 25 | — | — | 1 U | 1 U | 1 U | 1 | 50 | 13 | 1 U | 1 U | — | 2 U | 2 U | 9 | 5 U | — | — | 9 | 2 U | 2 UB | 1 U |
| | 9/19/1995 | Weston | 45 | — | — | 1 U | 1 U | 3 | 1 | 68 | 3 | 1 U | 1 U | 5,000 U | 2 U | 2 U | 17 | 5 U | — | — | 25 | 2 | 5 UB | 1 UB |
| **MTCA Method A Cleanup Levels [2]** | | | | NE | | NE | | 5 | | NE | | NE | | NE | 5 | | 50 | | NE | | NE | | 15 | |
| **MTCA Method B Cleanup Levels [3]** | | | | NE | | 6.4 | | 0.0583 | | 560 | | 32 | | NE | 8 | | 48 | | NE | | 592 | | NE | |

# Table C-3A
## Comprehensive Summary of Total and Dissolved Metals in Groundwater - Arsenic to Lead
## Jorgensen Forge Facility
## 8531 East Marginal Way South
## Seattle, Washington
## Farallon PN: 831-003

| Sample Location | Sample Date | Sampled by | Sample Depth/Screened Interval (feet bgs) | Analytical Results (micrograms per liter)[1] | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Aluminum | | Antimony | | Arsenic | | Barium | | Beryllium | | Bromide | Cadmium | | Chromium | | Cobalt | | Copper | | Lead | |
| | | | | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Dissolved |
| GP-09113 | 9/19/1995 | Weston | 15 | — | — | 1 U | 1 | 4 | 2 | 67 | 7 | 1 U | 1 U | — | 2 U | 2 U | 25 | 5 U | — | — | 45 | 2 U | 12 | 2 UB |
| | 9/19/1995 | Weston | 25 | — | — | 1 U | 1 U | **49** | **46** | 15 | 7 | 1 U | 1 U | — | 2 U | 2 U | 5 U | 5 U | — | — | 3 | 2 U | 3 UB | 1 U |
| | 9/19/1995 | Weston | 45 | — | — | 1 U | 1 U | 1 U | 1 | 29 | 17 | 1 U | 1 U | — | 2 U | 2 U | 5 U | 5 U | — | — | 4 | 2 U | 2 UB | 1 U |
| GP-09114 | 9/20/1995 | Weston | 15 | — | — | 1 U | 1 U | **6** | 2 | 50 | 5 UB | 1 U | 1 U | — | 2 U | 2 U | 14 UB | 7 | — | — | 16 | 3 UB | 6 | 2 UB |
| | 9/20/1995 | Weston | 25 | — | — | 2 U | 1 U | **11** | 4 | 127 | 11 UB | 1 U | 1 U | — | 2 U | 2 U | 13 UB | 5 U | — | — | 15 | 2 U | 8 | 8 |
| | 9/20/1995 | Weston | 45 | — | — | 1 U | 1 U | 2 | 1 | 29 J | 2 UB | 1 U | 1 U | 1,000 U | 2 U | 2 U | 5 U | 8 | — | — | 6 | 2 UB | 1 | 3 UB |
| GP-09115 | 9/19/1995 | Weston | 15 | — | — | 5 U | 5 U | **8** | 5 U | 144 | 133 | 1 U | 1 U | — | 2 U | 2 U | 5 U | 5 U | — | — | 5 | 2 U | 9 | 6 |
| | 9/19/1995 | Weston | 25 | — | — | 1 U | 1 U | **10** | **7** | 33 | 2 | 1 U | 1 U | — | 2 U | 2 U | 5 | 5 U | — | — | 5 | 2 U | 2 | 1 UB |
| | 9/19/1995 | Weston | 45 | — | — | 1 U | 1 U | 1 | 1 U | 11 | 1 | 1 U | 1 U | — | 2 U | 2 U | 5 U | 5 U | — | — | 5 | 2 U | 1 | 2 UB |
| MW-9 | 3/24/1992 | SECOR | 5-20 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 110 | — | — | — |
| MW-11 | 3/24/1992 | SECOR | 5-20 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | 38 | — | — | — |
| MW-13 | 9/10/1992 | SECOR | 5-20 | — | — | — | — | **19** | — | — | — | — | — | — | 0.1 U | — | **90** | — | — | — | — | — | **30** | — |
| MW-23 | 11/20/1992 | SECOR | 6-15.75 | — | — | — | — | 50 U | — | 2,000 U | — | — | — | — | 25 U | — | 100 U | — | — | — | 100 U | — | 500 U | — |
| **MTCA Method A Cleanup Levels [2]** | | | | NE | | NE | | 5 | | NE | | NE | | NE | 5 | | 50 | | NE | | NE | | 15 | |
| **MTCA Method B Cleanup Levels [3]** | | | | NE | | 6.4 | | 0.0583 | | 560 | | 32 | | NE | 8 | | 48 | | NE | | 592 | | NE | |

# Table C-3A
## Comprehensive Summary of Total and Dissolved Metals in Groundwater - Arsenic to Lead
## Jorgensen Forge Facility
## 8531 East Marginal Way South
## Seattle, Washington
## Farallon PN: 831-003

| Sample Location | Sample Date | Sampled by | Sample Depth/Screened Interval (feet bgs) | Analytical Results (micrograms per liter)[1] | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Aluminum | | Antimony | | Arsenic | | Barium | | Beryllium | | Bromide | Cadmium | | Chromium | | Cobalt | | Copper | | Lead | |
| | | | | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Dissolved |
| PL2-JF01A | 3/10/1995 | Boeing | NA | 50 | 30 | 1 | 2 | 1 | 1 | 12 | 11 | 1 U | 1 U | — | 2 U | 2 U | 5 U | 5 U | 3 U | 3 U | 2 U | 2 U | 1 UB | 1 UB |
| | 9/27/1995 | Boeing | | 60 | — | 1 U | — | 2 | — | 17 | — | 1 U | — | — | 2 U | — | 5 U | — | 3 U | — | 2 U | — | 1 UB | — |
| | 11/17/1995 | Boeing | | — | — | 1 U | — | 1 U | — | 14 | — | 1 U | — | — | 2 U | — | 5 U | — | — | — | 2 U | — | 1 U | — |
| | 3/1/1996 | Boeing | | — | — | 1 U | — | 1 | — | 7 | — | 1 U | — | — | 2 U | — | 5 U | — | — | — | 2 | — | 2 UB | — |
| | 5/23/1996 | Boeing | | — | — | 1 U | — | 2 | — | 7 | — | 1 U | — | — | 2 U | — | 5 U | — | — | — | 2 U | — | 1 U | — |
| | 8/26/1996 | Boeing | | — | — | 1 U | — | 1 U | — | 10 | — | 1 U | — | — | 2 U | — | 5 U | — | — | — | 2 U | — | 1 U | — |
| | 11/21/1996 | Boeing | | — | — | 1 U | — | 1 U | — | 10 | — | 1 U | — | — | 2 U | — | 5 U | — | — | — | 2 U | — | 1 U | — |
| PL2-JF01AR | 5/17/2001 | Boeing | 23-27 | — | — | 2 UJ | 2 UJ | 0.5 U | 0.5 U | — | — | 0.2 U | 0.2 U | — | 2 U | 2 U | 5 U | 5 U | — | — | 2 | 0.5 U | 1 U | 1 U |
| | 7/25/2001 | Boeing | | — | — | 2 U | 2 U | 0.7 | 0.5 U | — | — | 0.2 U | 0.2 U | — | 2 U | 2 U | 5 U | 5 U | — | — | 0.5 U | 0.5 U | 1 U | 1 U |
| | 10/24/2001 | Boeing | | — | — | 2 U | 2 U | 0.8 | 1 U | — | — | 0.2 U | 0.2 U | — | 2 U | 2 U | 5 U | 5 U | — | — | 0.6 | 0.5 | 1 U | 1 U |
| | 1/21/2002 | Boeing | | — | — | 2 U | 2 U | 0.6 | 0.7 | — | — | 0.2 U | 0.2 U | — | 2 U | 2 U | 5 U | 5 U | — | — | 0.5 U | 0.5 | 1 U | 1 U |
| | 6/16/2003 | Boeing | | — | — | 50 U | 50 U | 0.5 U | 0.4 | — | — | 0.2 U | 0.2 U | — | 2 U | 2 U | 5 U | 5 U | — | — | 0.5 U | 0.5 | 1 U | 1 U |
| | 9/2/2003 | Boeing | | — | — | 2 U | 2 U | 0.4 | 0.4 | — | — | 0.2 U | 0.2 U | — | 2 U | 2 U | 5 U | 5 U | — | — | 0.9 | 0.9 | 1 U | 1 U |
| | 12/8/2003 | Boeing | | — | — | 2 U | 2 U | 0.4 | 0.3 | — | — | 0.2 U | 0.2 U | — | 2 U | 2 U | 5 U | 5 U | — | — | 0.7 | 0.5 U | 1 U | 1 U |
| | 12/19/2003 | Boeing | | — | — | 50 U | — | 0.3 | — | — | — | 1 U | — | — | 2 U | — | 5 U | — | — | — | 0.6 | — | 1 U | — |
| | 2/2/2004 | Boeing | | — | — | 2 U | 2 U | 0.4 | 0.5 U | — | — | 0.2 U | 0.2 U | — | 2 U | 2 U | 6 | 8 | — | — | 1 | 0.5 | 1 U | 1 U |
| | 5/10/2004 | Boeing | | — | — | 2 U | 2 U | 0.4 | 0.4 | — | — | 0.2 U | 0.2 U | — | 2 U | 2 U | 5 U | 5 U | — | — | 0.5 U | 0.5 U | 1 U | 1 U |
| | 8/2/2004 | Boeing | | — | — | 2 U | 2 U | 0.4 | 0.4 | — | — | 0.2 U | 0.2 U | — | 2 U | 2 U | 5 U | 5 U | — | — | 0.5 U | 0.5 U | 1 U | 1 U |
| | 11/1/2004 | Boeing | | — | — | 2 U | 2 UJ | 0.5 U | 0.8 | — | — | 0.2 U | 0.2 U | — | 2 U | 2 U | 5 U | 5 U | — | — | 0.7 U | 0.5 U | 1 U | 1 U |
| | 2/1/2005 | Boeing | | — | — | 2 U | 2 U | 0.4 | 0.5 U | — | — | 0.2 U | 0.2 U | — | 2 U | 2 U | 5 U | 5 U | — | — | 0.5 | 0.5 U | 1 U | 1 U |
| | 8/1/2005 | Boeing | | — | — | 2 U | 2 U | 0.4 | 0.5 | — | — | 0.2 U | 0.2 U | — | 2 U | 2 U | 6 | 6 | — | — | 1.4 U | 0.5 U | 1 U | 1 U |
| **MTCA Method A Cleanup Levels [2]** | | | | NE | | NE | | 5 | | NE | | NE | | NE | 5 | | 50 | | NE | | NE | | 15 | |
| **MTCA Method B Cleanup Levels [3]** | | | | NE | | 6.4 | | 0.0583 | | 560 | | 32 | | NE | 8 | | 48 | | NE | | 592 | | NE | |

# Table C-3A
# Comprehensive Summary of Total and Dissolved Metals in Groundwater - Arsenic to Lead
# Jorgensen Forge Facility
# 8531 East Marginal Way South
# Seattle, Washington
# Farallon PN: 831-003

| Sample Location | Sample Date | Sampled by | Sample Depth/Screened Interval (feet bgs) | Analytical Results (micrograms per liter)[1] | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Aluminum | | Antimony | | Arsenic | | Barium | | Beryllium | | Bromide | Cadmium | | Chromium | | Cobalt | | Copper | | Lead | |
| | | | | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Dissolved |
| | 3/31/1995 | Boeing | | 30 | 20 U | 1 U | 1 U | 1 U | 1 | 17 J | 18 J | 1 U | 1 U | — | 2 U | 2 U | 5 U | 5 U | 3 U | 3 U | 2 U | 2 U | 1 U | 1 U |
| | 9/27/1995 | Boeing | | 30 | — | 1 U | — | 2 | — | 22 | — | 1 U | — | 5,000 U | 2 U | — | 5 U | — | 3 U | — | 2 U | — | 1 UB | — |
| | 11/17/1995 | Boeing | | — | — | 1 U | — | 1 U | — | 22 | — | 1 U | — | — | 2 U | — | 5 U | — | — | — | 2 U | — | 1 | — |
| | 3/1/1996 | Boeing | | — | — | 1 U | — | 1 U | — | 16 | — | 1 U | — | — | 2 U | — | 5 U | — | — | — | 2 U | — | 4 UB | — |
| | 5/23/1996 | Boeing | | — | — | 1 U | — | 1 | — | 13 | — | 1 U | — | — | 2 U | — | 5 U | — | — | — | 2 U | — | 1 U | — |
| | 8/26/1996 | Boeing | | — | — | 1 U | — | 1 U | — | 12 | — | 1 U | — | — | 2 U | — | 5 U | — | — | — | 2 U | — | 1 U | — |
| | 11/21/1996 | Boeing | | — | — | 1 U | — | 1 U | — | 19 | — | 1 U | — | — | 2 U | — | 5 U | — | — | — | 2 U | — | 1 | — |
| | 4/26/2001 | Boeing | | — | — | 2 UJ | 2 UJ | 1 | 1 | — | — | 0.2 U | 0.2 U | — | 2 U | 2 U | 5 U | 5 U | — | — | 2.5 B | 1.1 | 1 U | 1 U |
| | 7/25/2001 | Boeing | | — | — | 2 U | 2 U | 1 U | 1 U | — | — | 0.5 U | 0.4 U | — | 2 U | 2 U | 5 U | 5 U | — | — | 3 | 1 | 2 U | 2 U |
| | 10/24/2001 | Boeing | | — | — | 2 U | 2 U | 2.9 | 2 U | — | — | 0.2 U | 0.2 U | — | 2 U | 2 U | 5 U | 5 U | — | — | 1.5 | 1.2 | 1 U | 1 U |
| PL2-JF01B | 1/21/2002 | Boeing | 40-50 | — | — | 2 U | 2 U | 2 | 1 | — | — | 0.5 U | 0.4 U | — | 2 U | 2 U | 5 U | 5 U | — | — | 1 | 1 | 2 U | 2 U |
| | 6/16/2003 | Boeing | | — | — | 50 U | 50 U | 0.5 U | 0.5 U | — | — | 0.2 U | 0.2 U | — | 2 U | 2 U | 5 U | 5 U | — | — | 1.8 | 0.8 | 1 U | 1 U |
| | 9/2/2003 | Boeing | | — | — | 2 U | 2 U | 2.2 | 3.5 | — | — | 0.2 U | 0.2 U | — | 2 U | 2 U | 5 U | 5 U | — | — | 1.7 | 1.5 | 1 U | 1 U |
| | 12/8/2003 | Boeing | | — | — | 2 U | 2 U | 1 U | 1 U | — | — | 0.5 U | 0.5 U | — | 2 U | 2 U | 5 U | 5 U | — | — | 1 U | 1 U | 2 U | 2 U |
| | 12/19/2003 | Boeing | | — | — | 50 U | — | 1.6 | — | — | — | 1 U | — | — | 2 U | — | 5 U | — | — | — | 3 | — | 2 U | — |
| | 2/2/2004 | Boeing | | — | — | 2 U | 2 U | 1 | 0.5 U | — | — | 0.2 U | 0.2 U | — | 2 U | 2 U | 5 U | 5 U | — | — | 4.4 | 1.7 | 1 U | 1 U |
| | 5/10/2004 | Boeing | | — | — | 2 | 2 U | 1 U | 1 U | — | — | 0.5 U | 0.5 U | — | 4 U | 4 U | 10 U | 10 U | — | — | 2 | 1 U | 2 U | 2 U |
| | 8/2/2004 | Boeing | | — | — | 2 U | 2 U | 0.7 | 1.3 | — | — | 0.2 U | 0.2 U | — | 2 U | 2 U | 5 U | 5 U | — | — | 2 U | 1.4 U | 1 U | 1 U |
| | 11/1/2004 | Boeing | | — | — | 4 U | 4 UJ | 2.2 | 2.4 | — | — | 0.5 U | 0.5 U | — | 2 U | 2 U | 5 U | 5 U | — | — | 2 | 2 | 2 U | 2 U |
| | 2/1/2005 | Boeing | | — | — | 2 U | 2 U | 1 U | 1 U | — | — | 0.2 U | 0.2 U | — | 2 U | 2 U | 5 U | 5 U | — | — | 2 | 2 | 2 U | 2 U |
| | 8/1/2005 | Boeing | | — | — | 2 U | 2 U | 0.5 | 0.6 | — | — | 0.2 U | 0.2 U | — | 2 U | 2 U | 10 | 12 | — | — | 1.7 U | 1.3 U | 1 U | 1 U |
| **MTCA Method A Cleanup Levels [2]** | | | | NE | | NE | | 5 | | NE | | NE | | NE | 5 | | 50 | | NE | | NE | | 15 | |
| **MTCA Method B Cleanup Levels [3]** | | | | NE | | 6.4 | | 0.0583 | | 560 | | 32 | | NE | 8 | | 48 | | NE | | 592 | | NE | |

# Table C-3A
## Comprehensive Summary of Total and Dissolved Metals in Groundwater - Arsenic to Lead
## Jorgensen Forge Facility
## 8531 East Marginal Way South
## Seattle, Washington
## Farallon PN: 831-003

| Sample Location | Sample Date | Sampled by | Sample Depth/Screened Interval (feet bgs) | Analytical Results (micrograms per liter)[1] | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Aluminum | | Antimony | | Arsenic | | Barium | | Beryllium | | Bromide | Cadmium | | Chromium | | Cobalt | | Copper | | Lead | |
| | | | | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Dissolved |
| PL2-JF01C | 5/17/2001 | Boeing | 74-78 | — | — | 2 UJ | 2 UJ | **8** | 4 | — | — | 1 U | 1 U | — | 4 U | 4 U | 10 | 10 U | — | — | 30 | 2 U | 5 U | 5 U |
| | 7/25/2001 | Boeing | | — | — | 2 U | 4 U | 3 | 2 U | — | — | 1 U | 1 U | — | 2 U | 2 U | 8 | 5 U | — | — | 23 | 2 U | 5 U | 5 U |
| | 10/24/2001 | Boeing | | — | — | 10 U | 10 U | **10** | **6** | — | — | 1 U | 1 U | — | 2 U | 2 U | 5 U | 5 U | — | — | 14 | 3 | 5 U | 5 U |
| | 1/21/2002 | Boeing | | — | — | 10 U | 10 U | 5 U | **6** | — | — | 2 U | 2 U | — | 2 U | 2 U | 5 U | 5 U | — | — | 15 | 5 U | 10 U | 10 U |
| | 6/16/2003 | Boeing | | — | — | 100 U | 100 U | **6** | 3 | — | — | 1 U | 1 U | — | 4 U | 4 U | 10 U | 10 U | — | — | 36 | 2 U | 5 U | 5 U |
| | 12/8/2003 | Boeing | | — | — | 10 U | 10 U | 4 | 2 U | — | — | 1 U | 1 U | — | 4 U | 4 U | 10 | 10 U | — | — | 28 | 2 U | 5 U | 5 U |
| | 12/19/2003 | Boeing | | — | — | 100 U | — | 4 | — | — | — | 2 U | — | — | 4 U | — | 10 U | — | — | — | 3 | — | 5 U | — |
| | 11/1/2004 | Boeing | | — | — | 10 U | 20 UJ | — | — | — | — | 1 U | 1 U | — | 4 U | 4 U | 10 U | 10 U | — | — | 20 | 4 | 6 | 5 U |
| | 11/3/2004 | Boeing | | — | — | — | — | 0.4 | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| PL2-JF02A | 9/27/1995 | Boeing | 8-22.75 | 50 | — | 1 U | — | **5** | — | 21 | — | 1 U | — | 5,000 U | 2 U | — | 5 U | — | 3 U | — | 2 U | — | 2 UB | — |
| | 11/17/1995 | Boeing | | — | — | 1 U | — | 2 | — | 10 | — | 1 U | — | — | 2 U | — | 5 U | — | — | — | 2 U | — | 1 | — |
| | 3/1/1996 | Boeing | | — | — | 1 U | — | 4 | — | 14 | — | 1 U | — | — | 2 U | — | 5 U | — | — | — | 2 U | — | 1 U | — |
| | 5/23/1996 | Boeing | | — | — | 1 U | — | 4 | — | 6 | — | 1 U | — | — | 2 U | — | 5 U | — | — | — | 2 U | — | 1 U | — |
| | 8/26/1996 | Boeing | | — | — | 1 U | — | 4 | — | 9 | — | 1 U | — | — | 2 U | — | 5 U | — | — | — | 2 U | — | 1 | — |
| | 11/21/1996 | Boeing | | — | — | 1 U | — | 2 | — | 3 | — | 1 U | — | — | 2 U | — | 5 U | — | — | — | 2 U | — | 1 U | — |
| | 11/21/1996 | Boeing | | — | — | 1 U | — | 2 | — | 4 | — | 1 U | — | — | 2 U | — | 5 U | — | — | — | 2 U | — | 1 U | — |
| | 4/26/2001 | Boeing | | — | — | 2 UJ | 2 UJ | 0.7 | 0.4 | — | — | 0.2 U | 0.2 U | — | 2 U | 2 U | 5 U | 5 U | — | — | 4.6 B | 0.6 | 1 U | 1 U |
| | 7/25/2001 | Boeing | | — | — | 2 U | 2 U | 0.9 | 0.7 | — | — | 0.2 U | 0.2 U | — | 2 U | 2 U | 5 U | 5 U | — | — | 0.7 | 0.5 U | 1 U | 1 U |
| | 10/24/2001 | Boeing | | — | — | 2 U | 2 U | 0.5 U | 0.5 U | — | — | 0.2 U | 0.2 U | — | 2 U | 2 U | 5 U | 5 U | — | — | 0.5 U | 0.5 U | 1 U | 1 U |
| **MTCA Method A Cleanup Levels [2]** | | | | NE | | NE | | 5 | | NE | | NE | | NE | 5 | | 50 | | NE | | NE | | 15 | |
| **MTCA Method B Cleanup Levels [3]** | | | | NE | | 6.4 | | 0.0583 | | 560 | | 32 | | NE | 8 | | 48 | | NE | | 592 | | NE | |

# Table C-3A
# Comprehensive Summary of Total and Dissolved Metals in Groundwater - Arsenic to Lead
## Jorgensen Forge Facility
## 8531 East Marginal Way South
## Seattle, Washington
## Farallon PN: 831-003

| Sample Location | Sample Date | Sampled by | Sample Depth/Screened Interval (feet bgs) | Analytical Results (micrograms per liter)[1] | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Aluminum | | Antimony | | Arsenic | | Barium | | Beryllium | | Bromide | Cadmium | | Chromium | | Cobalt | | Copper | | Lead | |
| | | | | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Dissolved |
| PL2-JF02A | 1/21/2002 | Boeing | 8-22.75 | — | — | 2 U | 2 U | 3.8 | 3.9 | — | — | 0.2 U | 0.2 U | — | 2 U | 2 U | 5 U | 5 U | — | — | 1.7 | 1.5 | 1 U | 1 U |
| | 6/16/2003 | Boeing | | — | — | 50 U | 50 U | 0.5 U | 0.5 | — | — | 0.2 U | 0.2 U | — | 2 U | 2 U | 5 U | 5 U | — | — | 0.9 | 1 | 1 U | 1 U |
| | 9/2/2003 | Boeing | | — | — | 2 U | 2 U | 0.5 U | 0.8 | — | — | 0.2 U | 0.2 U | — | 2 U | 2 U | 5 U | 5 U | — | — | 1.1 | 0.8 | 1 U | 1 U |
| | 12/8/2003 | Boeing | | — | — | 2 U | 2 U | 1 | 0.8 | — | — | 0.2 U | 0.2 U | — | 2 U | 2 U | 5 U | 5 U | — | — | 0.9 | 0.6 | 1 U | 1 U |
| | 2/2/2004 | Boeing | | — | — | 2 U | 2 U | 1.4 | 0.8 | — | — | 0.2 U | 0.2 U | — | 2 U | 2 U | 6 | 6 | — | — | 1.2 | 0.7 | 1 U | 1 U |
| | 5/10/2004 | Boeing | | — | — | 2 | 2 U | 1.1 | 0.6 | — | — | 0.2 U | 0.2 U | — | 2 U | 2 U | 5 U | 5 U | — | — | 1.3 | 0.5 U | 1 U | 1 U |
| | 8/2/2004 | Boeing | | — | — | 2 U | 2 U | 1.1 | 1 | — | — | 0.2 U | 0.2 U | — | 2 U | 2 U | 5 U | 5 U | — | — | 1.6 | 0.7 | 1 U | 1 U |
| | 11/1/2004 | Boeing | | — | — | 2 U | 2 UJ | 1.3 | 0.4 | — | — | 0.2 U | 0.2 U | — | 2 U | 2 U | 5 U | 5 U | — | — | 1 U | 0.5 U | 1 U | 1 U |
| | 8/1/2005 | Boeing | | — | — | 2 U | 2 U | 0.4 | 0.4 | — | — | 0.2 U | 0.2 U | — | 2 U | 2 U | 6 | 6 | — | — | 2 | 0.5 U | 1 U | 1 U |
| PL2-JF03A | 9/28/1995 | Boeing | 8-22.75 | 50 J | — | 4 | — | 2 | — | 23 | — | 1 U | — | 5,000 U | 2 U | — | 5 U | — | 3 U | — | 2 U | — | 1 U | — |
| | 11/17/1995 | Boeing | | — | — | 1 U | — | 2 | — | 18 | — | 1 U | — | — | 2 U | — | 5 U | — | — | — | 2 U | — | 1 | — |
| | 3/1/1996 | Boeing | | — | — | 1 U | — | 1 U | — | 7 | — | 1 U | — | — | 2 U | — | 5 U | — | — | — | 2 U | — | 1 U | — |
| | 5/23/1996 | Boeing | | — | — | 1 U | — | 1 | — | 7 | — | 1 U | — | — | 2 U | — | 5 U | — | — | — | 8 | — | 2 | — |
| | 8/26/1996 | Boeing | | — | — | 1 U | — | 1 | — | 15 | — | 1 U | — | — | 2 U | — | 5 U | — | — | — | 7 | — | 2 | — |
| | 11/21/1996 | Boeing | | — | — | 1 U | — | 1 U | — | 13 | — | 1 U | — | — | 2 U | — | 5 U | — | — | — | 2 U | — | 1 U | — |
| | 4/26/2001 | Boeing | | — | — | 2 UJ | 2 UJ | 0.4 | 0.4 | — | — | 0.2 U | 0.2 U | — | 2 U | 2 U | 5 U | 5 U | — | — | 2.2 B | 2.9 | 1 U | 1 U |
| | 7/25/2001 | Boeing | | — | — | 2 U | 2 U | 0.6 | 0.6 | — | — | 0.2 U | 0.2 U | — | 2 U | 2 U | 5 U | 5 U | — | — | 0.7 | 0.5 U | 2 | 1 U |
| | 10/24/2001 | Boeing | | — | — | 2 U | 2 U | 0.7 | 0.6 | — | — | 0.2 U | 0.2 U | — | 2 U | 2 U | 5 U | 5 U | — | — | 0.5 U | 0.5 U | 1 U | 1 U |
| | 1/21/2002 | Boeing | | — | — | 2 U | 2 U | 0.8 | 0.8 | — | — | 0.2 U | 0.2 U | — | 2 U | 2 U | 5 U | 5 U | — | — | 1 | 0.6 | 1 U | 1 U |
| | 6/16/2003 | Boeing | | — | — | 50 U | 50 U | 1.1 | 1 | — | — | 0.2 U | 0.2 U | — | 2 U | 2 U | 5 U | 5 U | — | — | 1.3 | 0.5 U | 1 U | 1 U |
| | 12/8/2003 | Boeing | | — | — | 2 U | 2 U | 0.4 | 0.4 | — | — | 0.2 U | 0.2 U | — | 2 U | 2 U | 5 U | 5 U | — | — | 2.1 | 0.5 U | 1 U | 1 U |
| | 11/1/2004 | Boeing | | — | — | 2 U | 2 UJ | 0.5 | 0.5 | — | — | 0.2 U | 0.2 U | — | 2 U | 2 U | 5 U | 5 U | — | — | 2.1 | 0.6 U | 1 U | 1 U |
| **MTCA Method A Cleanup Levels [2]** | | | | NE | | NE | | 5 | | NE | | NE | | NE | 5 | | 50 | | NE | | NE | | 15 | |
| **MTCA Method B Cleanup Levels [3]** | | | | NE | | 6.4 | | 0.0583 | | 560 | | 32 | | NE | 8 | | 48 | | NE | | 592 | | NE | |

NOTES:

Results in **BOLD** indicates sample result or reporting limit exceeds Washington State Department of Ecology Model Toxics Control Act Cleanup Regulation (MTCA) Method A Cleanup Levels for Groundwater or MTCA Method B Cleanup Levels for Groundwater.

[1] Analyzed by U.S. Environmental Protection Agency 6000/7000 Series Methods.

[2] MTCA Method A Cleanup Levels for Groundwater, Table 720-1 of Section 900 of Chapter 173-340 of the Washington Administrative Code, as amended February 2001.

[3] MTCA Cleanup Levels and Risk Calculations, Version 3.1, Standard Method B Values for Groundwater, Ecology Publication No. 94-145, as updated November 2001.

— = not analyzed

B = the analyte was detected in the associated method blank.

bgs = below ground surface

J = denotes result reported is an estimate

NA = not available

NE = not established

U = no detectable concentrations above the listed laboratory practical quantitation limit

**Table C-3B**
**Comphrehensive Summary of Total and Dissolved Metals in Groundwater - Mercury to Zinc**
**Jorgensen Forge Facility**
**8531 East Marginal Way South**
**Seattle, Washington**
**Farallon PN: 831-003**

| Sample Location | Sample Date | Sampled by | Sample Depth/Screened Interval (feet bgs) | Analytical Results (micrograms per liter) [1] | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Mercury | | Nickel | | Selenium | | Silver | | Thallium | | Vanadium | | Zinc | |
| | | | | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Dissolved |
| GP-06637 | 3/15/1995 | Weston | 14 | 0.1 | 0.1 U | 110 | 60 | 50 U | 50 U | 3 U | 3 U | 50 U | 50 U | **184** | 27 | 421 | 91 |
| | 3/15/1995 | Weston | 25 | 0.1 U | 0.1 U | 30 | 10 U | 50 U | 50 U | 3 U | 3 U | 50 U | 50 U | **133** | 12 | 490 | 76 |
| | 3/15/1995 | Weston | 45 | 0.1 U | 0.1 U | 10 | 10 | 50 U | 50 U | 3 U | 3 U | 50 U | 50 U | 39 | 2 U | 85 | 59 |
| GP-06638 | 3/16/1995 | Weston | 14 | 0.1 | 0.1 U | 50 | 10 | 50 U | 50 U | 3 U | 3 U | 50 U | 50 U | **212** | 12 | 654 | 111 |
| | 3/16/1995 | Weston | 25 | 0.1 U | 0.1 U | 50 | 10 U | 50 U | 50 U | 3 U | 3 U | 50 U | 50 U | **213** | 18 | 2,440 | 293 |
| | 3/16/1995 | Weston | 45 | 0.1 U | 0.1 U | 60 | 10 U | 50 U | 50 U | 3 U | 3 U | 50 U | 50 U | 105 | 6 | 170 | 18 B |
| GP-06639 | 3/16/1995 | Weston | 14 | 0.1 | 0.1 U | 30 | 10 U | 50 U | 50 U | 3 U | 3 U | 50 U | 50 U | 177 J | 54 | 240 J | 40 B |
| | 3/16/1995 | Weston | 25 | 0.5 | 0.1 U | 50 | 10 U | 50 U | 50 U | 3 U | 3 U | 50 U | 50 U | **201** | 5 | 137 | 6 B |
| | 3/16/1995 | Weston | 45 | 0.1 U | 0.1 U | 10 | 10 U | 50 U | 50 U | 3 U | 3 U | 50 U | 50 U | 32 | 5 | 29 B | 4 U |
| GP-06640 | 3/15/1995 | Weston | 14 | 0.1 U | 0.1 U | 20 J | 20 | 50 U | 50 U | 3 U | 3 U | 50 U | 50 U | 25 J | 20 | 116 J | 106 |
| | 3/15/1995 | Weston | 25 | 0.1 U | 0.1 U | 40 | 10 U | 50 U | 50 U | 3 U | 3 U | 50 U | 50 U | **191** | 2 U | 101 | 10 B |
| | 3/15/1995 | Weston | 45 | 0.1 | 0.1 U | 50 | 20 | 50 U | 50 U | 3 U | 3 U | 50 U | 50 U | 67 | 2 | 173 | 68 |
| GP-08901 | 9/14/1994 | Boeing | 14 | 0.2 | 0.1 U | 10 | 10 U | 50 U | 50 U | 3 U | 3 U | 50 U | 50 U | 62 | 10 | 38 | 4 U |
| GP-08902 | 9/14/1994 | Weston | 14 | 0.1 U | 0.1 U | 10 | 10 U | 50 U | 50 U | 3 U | 3 U | 50 U | 50 U | 57 | 21 | 20 | 4 U |
| GP-08903 | 9/14/1994 | Weston | 14 | 0.1 U | 0.1 U | 10 | 10 U | 50 U | 50 U | 3 U | 3 U | 50 U | 50 U | 53 | 2 U | 36 | 4 |
| GP-08904 | 9/14/1994 | Weston | 14 | 0.1 U | 0.1 U | 10 | 10 U | 50 U | 50 U | 3 U | 3 U | 50 U | 50 U | 39 | 6 | 25 | 7 |
| GP-08905 | 9/13/1994 | Weston | 14 | 0.1 U | 0.1 U | 20 | 10 U | 50 U | 50 U | 3 U | 3 U | 50 U | 50 U | 35 | 2 U | 30 | 6 |
| GP-08906 | 11/29/1994 | Weston | 15 | 0.1 | 0.1 U | 30 UB | 10 U | 50 U | 50 U | 3 U | 3 U | 50 U | 50 U | — | — | 65 UB | 4 UB |
| | 11/29/1994 | Weston | 25 | 0.1 U | 0.1 U | 10 U | 10 U | 50 U | 50 U | 3 U | 3 U | 50 U | 50 U | — | — | 13 UB | 4 U |
| | 11/29/1994 | Weston | 45 | 0.1 U | 0.1 U | 20 UB | 10 U | 50 U | 50 U | 3 U | 3 U | 50 U | 50 U | — | — | 27 UB | 5 UB |
| | 11/29/1994 | Weston | 65 | 0.1 U | 0.1 U | 10 UB | 10 U | 50 U | 50 U | 3 U | 3 U | 50 U | 50 U | — | — | 27 UB | 4 U |
| GP-08907 | 11/28/1994 | Weston | 15 | 0.2 | 0.1 U | 60 | 10 U | 50 U | 50 U | 3 U | 3 U | 50 U | 50 U | — | — | 188 | 9 |
| | 11/28/1994 | Weston | 25 | 0.1 | 0.1 U | 40 | 10 U | 50 U | 50 U | 3 U | 3 U | 50 U | 50 U | — | — | 109 | 6 |
| | 11/28/1994 | Weston | 45 | 0.1 U | 0.1 U | 10 | 10 U | 50 U | 50 U | 3 U | 3 U | 50 U | 50 U | — | — | 39 | 4 |
| | 11/29/1994 | Weston | 63 | 0.3 | 0.1 U | 150 | 10 U | 60 | 50 U | 3 U | 3 U | 50 U | 50 U | — | — | 430 | 4 UB |
| **MTCA Method A Cleanup Levels[2]** | | | | 2 | | NE | | NE | | NE | | NE | | NE | | NE | |
| **MTCA Method B Cleanup Levels[3]** | | | | 4.8 | | 320 | | 80 | | 80 | | 1.12 | | 112 | | 4,800 | |

**Table C-3B**
**Comphrehensive Summary of Total and Dissolved Metals in Groundwater - Mercury to Zinc**
**Jorgensen Forge Facility**
**8531 East Marginal Way South**
**Seattle, Washington**
**Farallon PN: 831-003**

| Sample Location | Sample Date | Sampled by | Sample Depth/Screened Interval (feet bgs) | Analytical Results (micrograms per liter) [1] Mercury | | Nickel | | Selenium | | Silver | | Thallium | | Vanadium | | Zinc | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Dissolved |
| GP-08908 | 3/17/1995 | Boeing | 14 | 0.1 U | 0.1 U | 30 | 10 U | 50 U | 50 U | 3 U | 3 U | 50 U | 50 U | 64 | 2 U | 43 | 4 |
| | 3/17/1995 | Boeing | 25 | 0.1 U | 0.1 U | 30 | 20 | 50 U | 50 U | 3 U | 3 U | 50 U | 50 U | 43 | 7 | 34 | 7 |
| | 3/17/1995 | Boeing | 45 | 0.1 U | 0.1 U | 10 U | 10 U | 50 U | 50 U | 3 U | 3 U | 50 U | 50 U | 15 | 2 | 16 | 4 U |
| GP-09101 | 9/12/1994 | Weston | 15 | 0.1 U | 0.1 U | 10 U | 10 U | 50 U | 50 U | 3 U | 3 U | 50 U | 50 U | 41 | 29 | 9 UB | 7 |
| GP-09102 | 9/8/1994 | Weston | 14 | 0.1 U | 0.1 U | 10 U | 10 U | 50 U | 50 U | 3 U | 3 U | 50 U | 50 U | 15 | 10 | 7 | 5 |
| GP-09103 | 9/8/1994 | Boeing | 14 | 0.1 U | 0.1 U | 10 U | 10 U | 50 U | 50 U | 3 U | 3 U | 50 U | 50 U | 27 | 3 | 20 | 4 |
| GP-09104 | 11/23/1994 | Weston | 15 | 0.9 | 0.1 U | 210 | 10 U | 70 | 50 U | 3 U | 3 U | **80** | 50 U | **1,020** | 40 | 527 | 4 U |
| | 11/23/1994 | Weston | 25 | 0.1 U | 0.1 U | 60 | 10 U | 50 U | 50 U | 3 U | 3 U | 50 U | 50 U | **179** | 9 | 123 | 4 U |
| | 11/23/1994 | Weston | 45 | 0.1 U | 0.1 U | 30 | 10 U | 50 U | 50 U | 3 U | 3 U | 50 U | 50 U | 69 | 2 U | 98 | 4 U |
| GP-09105 | 11/23/1994 | Weston | 15 | 0.8 | 0.1 U | 210 | 10 U | 60 | 50 U | 3 U | 3 U | **60** | 50 U | **865** | 29 | 509 | 4 U |
| | 11/23/1994 | Weston | 25 | 0.1 U | 0.1 U | 30 | 10 U | 50 U | 50 U | 3 U | 3 U | 50 U | 50 U | 63 | 5 | 54 | 4 U |
| | 11/23/1994 | Weston | 45 | 0.1 U | 0.1 U | 40 | 10 U | 50 U | 50 U | 3 U | 3 U | 50 U | 50 U | 34 | 2 U | 92 | 7 |
| GP-09106 | 3/14/1995 | Weston | 14 | 0.1 U | 0.1 U | 10 U | 20 | 50 U | 50 U | 3 U | 3 U | 50 U | 50 U | 18 | 90 | 4 U | 46 |
| | 3/14/1995 | Weston | 25 | 0.1 U | 0.1 U | 30 | 20 | 50 U | 50 U | 3 U | 3 U | 50 U | 50 U | 104 | 7 | 71 | 4 U |
| | 3/14/1995 | Weston | 45 | 0.3 | 0.1 U | 20 | 10 U | 50 U | 50 U | 3 U | 3 U | 50 U | 50 U | 57 | 2 U | 54 | 4 U |
| GP-09107 | 3/14/1995 | Weston | 14 | 0.2 | 0.1 U | 30 | 10 U | 50 U | 50 U | 3 U | 3 U | 50 U | 50 U | **154** | 23 | 73 | 4 U |
| | 3/14/1995 | Weston | 25 | 0.1 | 0.1 U | 50 | 10 U | 50 U | 50 U | 3 U | 3 U | 50 U | 50 U | **149** | 10 | 108 | 4 U |
| | 3/14/1995 | Weston | 45 | 0.1 U | 0.1 U | 30 | 10 U | 50 U | 50 U | 3 U | 3 U | 50 U | 50 U | 46 | 2 U | 78 | 4 U |
| GP-09108 | 3/14/1995 | Weston | 14 | 0.1 | 0.1 U | 30 | 10 U | 50 U | 50 U | 3 U | 3 U | 50 U | 50 U | **143** | 36 | 66 | 4 U |
| | 3/14/1995 | Weston | 25 | 0.1 U | 0.1 U | 10 | 10 U | 50 U | 50 U | 3 U | 3 U | 50 U | 50 U | 41 | 5 | 27 | 4 U |
| | 3/14/1995 | Weston | 45 | 0.1 U | 0.1 U | 10 U | 10 | 50 U | 50 U | 3 U | 3 U | 50 U | 50 U | 16 | 2 U | 16 | 4 U |
| GP-09109 | 3/15/1995 | Weston | 14 | 0.1 U | 0.1 U | 20 | 10 U | 50 U | 50 U | 3 U | 3 U | 50 U | 50 U | 144 | 75 | 39 B | 6 B |
| | 3/15/1995 | Weston | 25 | 0.1 U | 0.1 U | 30 | 10 U | 50 U | 50 U | 3 U | 3 U | 50 U | 50 U | 109 | 9 | 79 | 4 U |
| | 3/15/1995 | Weston | 45 | 0.1 U | 0.1 U | 20 | 10 U | 50 U | 50 U | 3 U | 3 U | 50 U | 50 U | 57 | 2 U | 50 B | 5 B |
| GP-09110 | 9/19/1995 | Weston | 15 | 0.1 U | 0.1 U | 10 U | 10 U | 50 U | 50 U | 3 U | 3 U | 50 U | 50 U | — | — | 10 | 5 |
| | 9/19/1995 | Weston | 25 | 0.1 U | 0.1 U | 10 U | 10 U | 50 U | 50 U | 3 U | 3 U | 50 U | 50 U | — | — | 15 | 4 U |
| | 9/19/1995 | Weston | 45 | 0.1 U | 0.1 U | 10 U | 10 U | 50 U | 50 U | 3 U | 3 U | 50 U | 50 U | — | — | 7 | 4 U |
| GP-09111 | 9/20/1995 | Weston | 15 | 0.1 U | 0.1 U | 10 U | 10 U | 50 U | 50 U | 3 U | 3 U | 50 U | 50 U | — | — | 66 UB | 4 U |
| | 9/20/1995 | Weston | 25 | 0.1 U | 0.1 U | 10 U | 10 U | 50 U | 50 U | 3 U | 3 U | 50 U | 50 U | — | — | 7 UB | 4 U |
| | 9/20/1995 | Weston | 45 | 0.1 U | 0.1 U | 10 U | 10 U | 50 U | 50 U | 3 U | 3 U | 50 U | 50 U | — | — | 4 U | 4 U |
| GP-09112 | 9/19/1995 | Weston | 15 | 0.1 U | 0.1 U | 30 | 10 U | 50 U | 50 U | 3 U | 3 U | 50 U | 50 U | — | — | 59 | 4 U |
| | 9/19/1995 | Weston | 25 | 0.1 U | 0.1 U | 10 U | 10 U | 50 U | 50 U | 3 U | 3 U | 50 U | 50 U | — | — | 13 | 4 U |
| | 9/19/1995 | Weston | 45 | 0.1 U | 0.1 U | 10 | 10 U | 50 U | 50 U | 3 U | 3 U | 50 U | 50 U | — | — | 29 | 4 U |
| GP-09113 | 9/19/1995 | Weston | 15 | 0.1 U | 0.1 U | 50 | 20 | 50 U | 50 U | 3 U | 3 U | 50 U | 50 U | — | — | 44 | 4 U |
| | 9/19/1995 | Weston | 25 | 0.1 U | 0.1 U | 10 U | 10 U | 50 U | 50 U | 3 U | 3 U | 50 U | 50 U | — | — | 6 | 4 U |
| | 9/19/1995 | Weston | 45 | 0.1 U | 0.1 U | 10 U | 10 U | 50 U | 50 U | 3 U | 3 U | 50 U | 50 U | — | — | 6 | 4 U |
| GP-09114 | 9/20/1995 | Weston | 15 | 0.1 U | 0.1 U | 10 U | 10 U | 50 U | 50 U | 3 U | 3 U | 50 U | 50 U | — | — | 33 UB | 4 U |
| **MTCA Method A Cleanup Levels[2]** | | | | 2 | | NE | | NE | | NE | | NE | | NE | | NE | |
| **MTCA Method B Cleanup Levels[3]** | | | | 4.8 | | 320 | | 80 | | 80 | | 1.12 | | 112 | | 4,800 | |

## Table C-3B
## Comphrehensive Summary of Total and Dissolved Metals in Groundwater - Mercury to Zinc
## Jorgensen Forge Facility
## 8531 East Marginal Way South
## Seattle, Washington
## Farallon PN: 831-003

| | | | | Analytical Results (micrograms per liter) [1] | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Sample | Mercury | | Nickel | | Selenium | | Silver | | Thallium | | Vanadium | | Zinc | |
| Sample Location | Sample Date | Sampled by | Depth/Screened Interval (feet bgs) | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Dissolved |
| MW-9 | 3/24/1992 | SECOR | 5-20 | — | — | — | — | — | — | — | — | — | — | — | — | 90 | — |
| MW-11 | 3/24/1992 | SECOR | 5-20 | — | — | — | — | — | — | — | — | — | — | — | — | 78 | — |
| MW-13 | 9/10/1992 | SECOR | 5-20 | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| MW-23 | 11/20/1992 | SECOR | 6-15.75 | 500 U | — | — | — | 500 U | — | 100 U | — | — | — | — | — | 100 U | — |
| PL2-JF01A | 3/10/1995 | Boeing | NA | 0.1 U | 0.1 U | 10 U | 10 U | 50 U | 50 U | 3 U | 3 U | 50 U | 50 U | 18 | 17 | 4 U | 5 |
| | 9/27/1995 | Boeing | | 0.1 U | — | 10 U | — | 50 U | — | 3 U | — | 50 U | — | 21 | — | 4 U | — |
| | 11/17/1995 | Boeing | | 0.1 U | — | 10 U | — | 50 U | — | 3 U | — | 50 U | — | — | — | 4 U | — |
| | 3/1/1996 | Boeing | | 0.1 U | — | 10 U | — | 50 U | — | 3 U | — | 50 U | — | — | — | 4 U | — |
| | 5/23/1996 | Boeing | | 0.1 U | — | 10 U | — | 50 U | — | 3 U | — | 50 U | — | — | — | 4 U | — |
| | 8/26/1996 | Boeing | | 0.1 U | — | 10 U | — | 50 U | — | 3 U | — | 50 U | — | — | — | 4 | — |
| | 11/21/1996 | Boeing | | 0.1 U | — | 10 U | — | 50 U | — | 3 U | — | 50 U | — | — | — | 4 U | — |
| PL2-JF01AR | 5/17/2001 | Boeing | 23-27 | 0.000917 | 0.000401 J | 1.2 | 0.8 | 50 U | 50 U | 0.5 UJ | 0.5 UJ | 0.2 U | 0.2 U | 19 | 21 | 8 | 6 UJ |
| | 7/25/2001 | Boeing | | 0.000544 J | 0.000588 J | 0.8 | 0.7 | 50 U | 50 U | 0.5 U | 0.5 U | 0.2 U | 0.2 U | 20 | 21 | 6 U | 6 U |
| | 10/24/2001 | Boeing | | 0.000334 J | 0.000296 J | 1.2 | 1.1 | 50 U | 50 U | 0.5 U | 0.5 U | 0.2 U | 0.2 U | 11 | 12 | 6 U | 6 U |
| | 1/21/2002 | Boeing | | 0.000227 J | 0.000254 J | 1.6 | 1.3 | 50 U | 50 U | 0.5 U | 2 U | 0.2 U | 0.2 U | 10 | 11 | 6 U | 6 U |
| | 6/16/2003 | Boeing | | 0.025 U | 0.025 U | 0.8 | 0.8 | 2 U | 0.9 | 0.5 U | 0.5 U | 0.2 U | 0.2 U | 13 | 13 | 6 U | 6 U |
| | 9/2/2003 | Boeing | | 0.025 U | 0.025 U | 1.2 | 0.9 | 0.8 | 0.8 | 0.5 U | 0.5 U | 0.2 U | 0.2 U | 13 | 13 | 4 | 6 |
| | 12/8/2003 | Boeing | | 0.025 U | 0.025 U | 0.9 | 0.8 | 50 U | 50 U | 0.5 U | 0.5 U | 0.2 U | 0.2 U | 16 | 15 | 6 U | 6 U |
| | 12/19/2003 | Boeing | | 0.025 U | — | 0.7 | — | 50 U | — | 0.5 U | — | 50 U | — | 16 | — | 6 U | — |
| | 2/2/2004 | Boeing | | 0.025 U | 0.025 U | 1.1 | 1.1 | 50 U | 50 U | 0.5 U | 0.5 U | 0.2 U | 0.2 U | 14 | 14 | 6 U | 6 U |
| | 5/10/2004 | Boeing | | 0.025 U | 0.025 U | 1.1 | 1 | 50 U | 50 U | 0.5 U | 0.5 U | 0.2 U | 0.2 U | 19 | 19 | 6 U | 6 U |
| | 8/2/2004 | Boeing | | 0.025 U | 0.025 U | 1.2 | 1 | 50 U | 50 U | 0.2 U | 0.2 U | 0.2 U | 0.2 U | 15 | 13 | 6 U | 6 U |
| | 11/1/2004 | Boeing | | 0.025 U | 0.025 U | 2.6 | 2.4 | 50 U | 50 U | 0.2 U | 0.2 U | 0.2 U | 0.2 U | 14 | 13 | 6 U | 6 U |
| | 2/1/2005 | Boeing | | 0.025 U | 0.025 U | 1 | 0.9 | 50 U | 50 U | 0.2 U | 0.2 U | 0.2 U | 0.2 U | 17 | 15 | 7 | 6 U |
| | 8/1/2005 | Boeing | | 0.025 U | 0.025 U | 1.4 | 1.2 | 50 U | 50 U | 0.2 U | 0.2 U | 0.2 U | 0.2 U | 12 | 11 | 6 U | 6 U |
| **MTCA Method A Cleanup Levels[2]** | | | | 2 | | NE | | NE | | NE | | NE | | NE | | NE | |
| **MTCA Method B Cleanup Levels[3]** | | | | 4.8 | | 320 | | 80 | | 80 | | 1.12 | | 112 | | 4,800 | |

**Table C-3B**
**Comphrehensive Summary of Total and Dissolved Metals in Groundwater - Mercury to Zinc**
**Jorgensen Forge Facility**
**8531 East Marginal Way South**
**Seattle, Washington**
**Farallon PN: 831-003**

| Sample Location | Sample Date | Sampled by | Sample Depth/Screened Interval (feet bgs) | Analytical Results (micrograms per liter) [1] | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Mercury | | Nickel | | Selenium | | Silver | | Thallium | | Vanadium | | Zinc | |
| | | | | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Dissolved |
| PL2-JF01B | 3/31/1995 | Boeing | 40-50 | 0.1 U | 0.1 U | 10 U | 10 U | 50 U | 50 U | 3 U | 3 U | 50 U | 50 U | 8 | 7 | 4 U | 4 U |
| | 9/27/1995 | Boeing | | 0.1 U | — | 10 U | — | 50 U | — | 3 U | — | 50 U | — | 7 | — | 4 U | — |
| | 11/17/1995 | Boeing | | 0.1 U | — | 10 U | — | 50 U | — | 3 U | — | 50 U | — | — | — | 4 U | — |
| | 3/1/1996 | Boeing | | 0.1 U | — | 10 U | — | 50 U | — | 3 U | — | 50 U | — | — | — | 4 U | — |
| | 5/23/1996 | Boeing | | 0.1 U | — | 10 U | — | 50 U | — | 3 U | — | 50 U | — | — | — | 4 U | — |
| | 8/26/1996 | Boeing | | 0.1 U | — | 10 U | — | 50 U | — | 3 U | — | 50 U | — | — | — | 4 U | — |
| | 11/21/1996 | Boeing | | 0.1 U | — | 10 U | — | 50 U | — | 3 U | — | 50 U | — | — | — | 4 U | — |
| | 4/26/2001 | Boeing | | 0.0002 U | 0.0002 U | 1.8 | 2.6 | 50 U | 50 U | 0.5 UJ | 0.5 UJ | 0.2 U | 0.2 U | 4 | 4 | 6 UJ | 6 UJ |
| | 7/25/2001 | Boeing | | 0.0002 UJ | 0.0002 UJ | 7 | 2 | 50 | 60 | 1 U | 1 U | 0.5 U | 0.4 U | 3 | 6 | 6 U | 6 U |
| | 10/24/2001 | Boeing | | 0.000274 J | 0.0002 U | 3.4 | 2.2 | 50 | 50 U | 0.5 U | 0.5 U | 0.2 U | 0.2 U | 3 U | 3 U | 6 U | 6 U |
| | 1/21/2002 | Boeing | | 0.0002 U | 0.000234 J | 3 | 2 | 50 | 50 U | 2 | 1 U | 0.5 U | 0.4 U | 4 | 3 | 6 U | 6 U |
| | 6/16/2003 | Boeing | | 0.025 U | 0.025 U | 3 | 1.6 | 2 | 3 | 0.5 U | 0.5 U | 0.2 U | 0.2 U | 4 | 3 | 6 U | 6 U |
| | 9/2/2003 | Boeing | | 0.025 U | 0.025 U | 3.4 | 6.1 | 1.9 | 1.4 | 0.5 U | 0.5 U | 0.2 U | 0.2 U | 3 U | 3 U | 4 U | 4 U |
| | 12/8/2003 | Boeing | | 0.025 U | 0.025 U | 3 | 2 | 50 U | 50 U | 1 U | 1 U | 0.5 U | 0.5 U | 3 | 3 | 6 U | 6 U |
| | 12/19/2003 | Boeing | | 0.025 U | — | 3 | — | 50 U | — | 1 U | — | 50 U | — | 5 | — | 16 | — |
| | 2/2/2004 | Boeing | | 0.025 U | 0.025 U | 3.7 | 2.4 | 50 U | 50 U | 0.5 U | 0.5 U | 0.2 U | 0.2 U | 9 | 3 U | 9 | 6 U |
| | 5/10/2004 | Boeing | | 0.0365 | 0.025 U | 4 | 4 | 100 U | 100 U | 1 U | 1 U | 0.5 U | 0.5 U | 6 U | 6 U | 10 U | 10 U |
| | 8/2/2004 | Boeing | | 0.025 U | 0.025 U | 4.6 | 3.2 | 50 U | 50 U | 0.2 U | 0.2 U | 0.2 U | 0.2 U | 3 | 3 U | 6 U | 6 U |
| | 11/1/2004 | Boeing | | 0.025 U | 0.025 U | 6 | 5 | 50 U | 50 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 4 | 4 | 6 U | 6 |
| | 2/1/2005 | Boeing | | 0.025 U | 0.025 U | 3 | 3 | 50 U | 50 U | 0.5 U | 0.4 U | 0.5 U | 0.4 U | 3 U | 3 U | 6 U | 6 U |
| | 8/1/2005 | Boeing | | 0.025 U | 0.025 U | 2.7 | 2.7 | 50 U | 50 U | 0.2 U | 0.2 U | 0.2 U | 0.2 U | 5 | 4 | 6 U | 6 U |
| PL2-JF01C | 5/17/2001 | Boeing | 74-78 | 0.0248 | 0.0002 U | 15 | 5 | 110 | 120 | 2 UJ | 2 UJ | 1 U | 1 U | 34 | 6 U | 130 | 60 |
| | 7/25/2001 | Boeing | | 0.0224 J | 0.0002 UJ | 13 | 6 | 50 U | 70 | 2 U | 2 U | 1 U | 1 U | 22 | 5 | 48 | 6 U |
| | 10/24/2001 | Boeing | | 0.0082 | 0.00045 J | 9 | 6 | **90** | **90** | 2 U | 5 U | 1 U | 1 U | 17 | 3 | 18 | 6 U |
| | 1/21/2002 | Boeing | | 0.0114 | 0.0002 U | 10 | 7 | 50 U | 50 U | 5 U | 5 U | 2 U | 2 U | 18 | 4 | 20 | 6 U |
| | 6/16/2003 | Boeing | | 0.025 U | 0.025 U | 16 | 5 | 12 | 12 | 2 U | 2 U | 1 U | 1 U | 37 | 6 U | 50 | 10 U |
| | 12/8/2003 | Boeing | | 0.0276 | 0.025 U | 16 | 6 | 100 U | 100 U | 2 U | 2 U | 1 U | 1 U | 39 | 6 | 30 | 10 U |
| | 12/19/2003 | Boeing | | 0.025 U | — | 5 | — | 100 U | — | 2 U | — | 100 U | — | 6 U | — | 20 | — |
| | 11/1/2004 | Boeing | | 0.025 U | 0.025 U | 15 | 10 | — | — | 1 U | 1 U | 5 U | 5 U | 24 | 7 | 10 | 10 U |
| | 11/3/2004 | Boeing | | — | — | — | — | 0.113 U | — | — | — | — | — | — | — | — | — |
| **MTCA Method A Cleanup Levels[2]** | | | | 2 | | NE | | NE | | NE | | NE | | NE | | NE | |
| **MTCA Method B Cleanup Levels[3]** | | | | 4.8 | | 320 | | 80 | | 80 | | 1.12 | | 112 | | 4,800 | |

# Table C-3B
# Comprehensive Summary of Total and Dissolved Metals in Groundwater - Mercury to Zinc
## Jorgensen Forge Facility
## 8531 East Marginal Way South
## Seattle, Washington
## Farallon PN: 831-003

| Sample Location | Sample Date | Sampled by | Sample Depth/Screened Interval (feet bgs) | Analytical Results (micrograms per liter) [1] | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Mercury | | Nickel | | Selenium | | Silver | | Thallium | | Vanadium | | Zinc | |
| | | | | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Dissolved |
| PL2-JF02A | 9/27/1995 | Boeing | 8-22.75 | 0.1 U | — | 10 U | — | 50 U | — | 3 U | — | 50 U | — | 10 | — | 4 U | — |
| | 11/17/1995 | Boeing | | 0.1 U | — | 10 U | — | 50 U | — | 3 U | — | 50 U | — | — | — | 4 U | — |
| | 3/1/1996 | Boeing | | 0.1 U | — | 10 U | — | 50 U | — | 3 U | — | 50 U | — | — | — | 4 U | — |
| | 5/23/1996 | Boeing | | 0.1 U | — | 10 U | — | 50 U | — | 3 U | — | 50 U | — | — | — | 4 U | — |
| | 8/26/1996 | Boeing | | 0.1 U | — | 10 U | — | 50 U | — | 3 U | — | 50 U | — | — | — | 5 | — |
| | 11/21/1996 | Boeing | | 0.1 U | — | 10 U | — | 50 U | — | 3 U | — | 50 U | — | — | — | 4 U | — |
| | 11/21/1996 | Boeing | | 0.1 U | — | 10 U | — | 50 U | — | 3 U | — | 50 U | — | — | — | 4 U | — |
| | 4/26/2001 | Boeing | | 0.00104 | 0.00103 | 2.6 | 0.7 | 50 U | 50 U | 0.5 UJ | 0.5 UJ | 0.2 U | 0.2 U | 7 | 5 | 6 UJ | 6 UJ |
| | 7/25/2001 | Boeing | | 0.000899 J | 0.000964 J | 0.8 | 0.7 | 50 U | 50 U | 0.5 U | 0.5 U | 0.2 U | 0.2 U | 6 | 6 | 6 U | 6 U |
| | 10/24/2001 | Boeing | | 0.000668 | 0.00064 | 1.2 | 1 | 50 U | 50 U | 0.5 U | 0.5 U | 0.2 U | 0.2 U | 4 | 5 | 6 U | 6 U |
| | 1/21/2002 | Boeing | | 0.00177 | 0.00084 | 3.2 | 2.4 | 50 U | 50 U | 0.5 U | 0.5 U | 0.2 U | 0.2 U | 13 | 13 | 6 U | 6 U |
| | 6/16/2003 | Boeing | | 0.025 U | 0.025 U | 1.4 | 1.2 | 2 U | 2 U | 0.5 U | 0.5 U | 0.2 U | 0.2 U | 5 | 4 | 6 U | 9 |
| | 9/2/2003 | Boeing | | 0.025 U | 0.025 U | 1.4 | 2.1 | 2 U | 2 | 0.5 U | 0.5 U | 0.2 U | 0.2 U | 6 | 4 | 4 U | 4 U |
| | 12/8/2003 | Boeing | | 0.025 U | 0.025 U | 0.9 | 0.7 | 50 U | 50 U | 0.5 U | 0.5 U | 0.2 U | 0.2 U | 8 | 7 | 6 U | 6 U |
| | 2/2/2004 | Boeing | | 0.025 U | 0.025 U | 2.3 | 0.8 | 50 U | 50 U | 0.5 U | 0.5 U | 0.2 U | 0.2 U | 9 | 8 | 6 U | 6 U |
| | 5/10/2004 | Boeing | | 0.025 U | 0.025 U | 1.5 | 1.2 | 50 U | 50 U | 0.5 U | 0.5 U | 0.2 U | 0.2 U | 8 | 7 | 6 U | 6 U |
| | 8/2/2004 | Boeing | | 0.025 U | 0.025 U | 2.2 | 2 | 50 U | 50 U | 0.2 U | 0.2 U | 0.2 U | 0.2 U | 8 | 9 | 6 U | 6 U |
| | 11/1/2004 | Boeing | | 0.025 U | 0.025 U | 1.1 | 0.9 | 50 U | 50 U | 0.2 U | 0.2 U | 0.2 U | 0.2 U | 10 | 7 | 6 U | 6 U |
| | 2/1/2005 | Boeing | | 0.025 U | 0.025 U | 0.8 | 1 | 50 U | 50 U | 0.2 U | 0.2 U | 0.2 U | 0.2 U | 10 | 6 | 7 | 6 U |
| | 8/1/2005 | Boeing | | 0.025 U | 0.025 U | 1.4 | 1.2 | 50 U | 50 U | 0.2 U | 0.2 U | 0.2 U | 0.2 U | 6 | 6 | 6 U | 6 U |
| PL2-JF03A | 9/28/1995 | Boeing | 8-22.75 | 0.1 U | — | 10 U | — | 50 U | — | 3 U | — | 50 U | — | 2 U | — | 4 U | — |
| | 11/17/1995 | Boeing | | 0.1 U | — | 10 | — | 50 U | — | 3 U | — | 50 U | — | — | — | 4 U | — |
| | 3/1/1996 | Boeing | | 0.1 U | — | 10 U | — | 50 U | — | 3 U | — | 50 U | — | — | — | 4 U | — |
| | 5/23/1996 | Boeing | | 0.1 U | — | 10 U | — | 50 U | — | 3 U | — | 50 U | — | — | — | 7 | — |
| | 8/26/1996 | Boeing | | 0.1 U | — | 10 U | — | 50 U | — | 3 U | — | 50 U | — | — | — | 14 | — |
| | 11/21/1996 | Boeing | | 0.1 U | — | 10 U | — | 50 U | — | 3 U | — | 50 U | — | — | — | 4 U | — |
| | 4/26/2001 | Boeing | | 0.000426 J | 0.0002 U | 1.4 | 1.1 | 50 U | 50 U | 0.5 UJ | 0.5 UJ | 0.2 U | 0.2 U | 3 U | 3 U | 14 | 6 UJ |
| | 7/25/2001 | Boeing | | 0.00514 J | 0.0002 UJ | 1.2 | 1 | 50 U | 50 U | 0.5 U | 0.5 U | 0.2 U | 0.2 U | 3 U | 3 U | 6 U | 6 U |
| | 10/24/2001 | Boeing | | 0.0002 U | 0.000283 J | 1.6 | 1.2 | 50 U | 50 U | 0.5 U | 0.5 U | 0.2 U | 0.2 U | 3 U | 3 U | 6 U | 6 U |
| | 1/21/2002 | Boeing | | 0.000422 J | 0.0002 U | 1.6 | 0.9 | 50 U | 50 U | 0.5 U | 0.5 U | 0.2 U | 0.2 U | 3 U | 3 U | 6 U | 6 U |
| | 6/16/2003 | Boeing | | 0.025 U | 0.025 U | 1.5 | 1.2 | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.2 U | 0.2 U | 3 U | 3 U | 6 U | 6 U |
| | 12/8/2003 | Boeing | | 0.025 U | 0.025 U | 1.6 | 0.8 | 50 U | 50 U | 0.5 U | 0.5 U | 0.2 U | 0.2 U | 3 U | 3 U | 6 U | 6 U |
| | 11/1/2004 | Boeing | | 0.025 U | 0.025 U | 1.1 | 1 | 50 U | 50 U | 0.2 U | 0.2 U | 0.2 U | 0.2 U | 3 U | 3 U | 6 U | 6 U |
| **MTCA Method A Cleanup Levels[2]** | | | | 2 | | NE | | NE | | NE | | NE | | NE | | NE | |
| **MTCA Method B Cleanup Levels[3]** | | | | 4.8 | | 320 | | 80 | | 80 | | 1.12 | | 112 | | 4,800 | |

NOTES:

Results in **BOLD** indicate sample result or reporting limit exceeds Washington State Department of Ecology Model Toxics Control Act Cleanup Regulation (MTCA) Method A Cleanup Levels for Groundwater or MTCA Method B Cleanup Levels for Groundwater.

[1] Analyzed by U.S. Environmental Protection Agency 6000/7000 Series Methods.

[2] MTCA Method A Cleanup Levels for Groundwater, Table 720-1 of Section 900 of Chapter 173-340 of the Washington Administrative Code, as amended February 2001.

[3] MTCA Cleanup Levels and Risk Calculations, Version 3.1, Standard Method B Values for Groundwater, Ecology Publication No. 94-145, as updated November 2001.

— = not analyzed
B = the analyte was detected in the associated method blank.
bgs = below ground surface
J = denotes result reported is an estimate
NA = not available
NE = not established
U = no detectable concentrations above the listed laboratory practical quantitation limit

**Table C-4**
**Comprehensive Summary of Metals in Soil**
**Jorgensen Forge Facility**
**8531 East Marginal Way South**
**Seattle, Washington**
**Farallon PN: 831-003**

| Sample Location | Sample Depth (ft) | Sample Date | Sampled by | Analytical Results (milligrams per kilogram) [1] | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Aluminum | Antimony | Arsenic | Barium | Beryllium | Cadmium | Chromium | Cobalt | Copper | Lead | Mercury | Nickel | Selenium | Silver | Thallium | Vanadium | Zinc |
| 5-1 | 0 | 3/1/1990 | Dames and Moore | — | — | 2 | 32.4 | — | 1.15 | 37.2 | — | — | 57.7 | 0.05 | — | 0.02 U | 0.2 U | — | — | — |
| 9-1 | 0 | 3/1/1990 | Dames and Moore | — | — | 2 | 20.6 | — | 1.75 | 914 | — | — | 25.5 | 0.04 U | — | 0.2 | 0.2 U | — | — | — |
| 9-2 | 0 | 3/1/1990 | Dames and Moore | — | — | 3 | 25 | — | **2.58** | **6,500** | — | — | 25.9 | 0.04 U | — | 0.1 | 0.2 U | — | — | — |
| 9-3 | 0 | 3/1/1990 | Dames and Moore | — | — | 3 | 58.9 | — | **2.98** | 1,910 | — | — | 32.4 | 0.04 U | — | 0.2 | 1.6 | — | — | — |
| 9-4 | 0 | 3/1/1990 | Dames and Moore | — | — | 3 | 162 | — | **4.92** | 504 | — | — | 282 | 0.05 | — | 0.05 | 1.1 | — | — | — |
| 16-1 | 0 | 3/1/1990 | Dames and Moore | — | — | 6 | 59 | — | **4.31** | 1,740 | — | — | 69.4 | 0.04 U | — | 0.02 U | 1.1 | — | — | — |
| 16-2 | 0 | 3/1/1990 | Dames and Moore | — | — | 5 | 53.7 | — | **2.33** | 913 | — | — | 67.9 | 0.04 U | — | 0.09 | 0.87 | — | — | — |
| 17-1 | 0 | 3/1/1990 | Dames and Moore | — | — | 6.1 | 130 | — | **5.13** | 780 | — | — | 241 | 0.3 | — | 0.1 | 3.62 | — | — | — |
| 17-2 | 0 | 3/1/1990 | Dames and Moore | — | — | 6.5 | 49.2 | — | **3.8** | 282 | — | — | 127 | 0.04 U | — | 0.02 U | 0.2 U | — | — | — |
| 17-3 | 0 | 3/1/1990 | Dames and Moore | — | — | 7.1 | 39.5 | — | **2.86** | 301 | — | — | 134 | 0.1 | — | 0.1 | 0.7 | — | — | — |
| 17-4 | 0 | 3/1/1990 | Dames and Moore | — | — | 5 | 82.2 | — | **7.02** | **3,720** | — | — | 208 | 0.09 | — | 2.6 | 0.93 | — | — | — |
| CB1 | 0 | 8/31/2004 | Farallon | — | — | 4.17 U | — | — | 3 B2 | **5,660** | — | 2,090 B2 | 301 | 0.119 | 1,770 | — | 2.08 J B2 | — | — | 1,090 B2 |
| CB2 | 0 | 8/31/2004 | Farallon | — | — | 3.88 U | — | — | 3.38 B2 | **10,100** | — | 2,080 B2 | 178 | 0.11 | 3,620 | — | 2.83 B2 | — | — | 1,030 B2 |
| CB3 | 0 | 8/31/2004 | Farallon | — | — | 2.74 U | — | — | 2.03 B2 | **4,550** | — | 1,060 B2 | 220 | 0.182 | 2,470 | — | 2.86 B2 | — | — | 1,040 B2 |
| CB4 | 0 | 8/31/2004 | Farallon | — | — | 7.26 | — | — | 1.15 B2 | 3,110 B2 | — | 1,330 | 52.7 B2 | 0.0455 | 3,230 | — | 1.01 J B1 | — | — | 380 B2 |
| DM-B-12 | 13.5 | 3/1/1990 | Dames and Moore | — | — | 4 | 30.5 | — | 1.3 | 8.85 | — | — | 0.98 U | 0.04 U | — | 0.6 U | 0.2 U | — | — | — |
| DM-B-15 | 10 | 2/28/1990 | Dames and Moore | — | — | 3 | 19.8 | — | 0.9 | 7.57 | — | — | 29.4 | 0.04 U | — | 0.02 | 0.2 U | — | — | — |
| DM-B-16 | 11.5 | 2/28/1990 | Dames and Moore | — | — | 2 | 14.8 | — | 0.8 | 6.17 | — | — | 1 U | 0.04 U | — | 0.02 U | 0.2 U | — | — | — |
| JSA-HA-1 | 7.5 | 3/6/1992 | SECOR | — | — | 20 U | — | — | 1 U | 7 | — | 5 | 10 U | — | 6 | — | — | — | — | 20 |
| MW-13 | 6 - 6.5 | 8/27/1992 | SECOR | — | — | 10 U | — | — | 0.5 U | 9.7 | — | — | 5 U | — | — | — | — | — | — | — |
| SB-08916 | 2 | 9/13/1994 | Weston | 9,500 | 5 UJ | 5 U | 28.8 | 0.1 | 0.2 U | 14.6 | 3.8 | 12.1 | 10 | 0.05 U | 11 | 5 U | 0.3 U | 5 U | 39.3 | 64.1 |
| | 5 | 9/13/1994 | | 13,400 | 6 UJ | 6 U | 41.4 | 0.1 | 0.2 U | 13.8 | 4.8 | 11.1 | 3 | 0.06 U | 9 | 6 U | 0.3 U | 6 U | 40.8 | 27.2 |
| | 12.5 | 9/13/1994 | | 11,800 | 6 UJ | 6 U | 41.4 | 0.1 U | 0.3 U | 14.3 | 4.1 | 21.9 J | 3 U | 0.06 U | 10 | 6 U | 0.4 U | 6 U | 50.3 | 24.7 |
| SB-08918 | 2 | 9/13/1994 | Weston | 8,550 | 5 UJ | 5 U | 32.4 | 0.1 U | 0.3 | 13.5 | 3.7 | 20 | 20 | 0.05 U | 13 | 5 U | 0.3 U | 5 U | 39.7 | 124 |
| | 5 | 9/13/1994 | | 14,500 | 6 UJ | 8 | 48 | 0.2 | 0.2 U | 15.9 | 5.2 | 14.8 | 6 | 0.05 U | 12 | 6 U | 0.3 U | 6 U | 47.7 | 32.1 |
| | 12.5 | 9/13/1994 | | 20,200 | 6 UJ | 9 | 78 | 0.3 | 0.3 U | 21.1 | 7.8 | 24 | 7 | 0.06 U | 16 | 6 U | 0.4 U | 6 U | 61.6 | 37.5 |
| SB-08921 | 2 | 9/13/1994 | Weston | 9,070 | 5 UJ | 8 | 26.4 | 0.1 U | 0.2 U | 11.7 | 4.7 | 11.2 | 14 | 0.05 U | 10 | 5 U | 0.3 U | 5 U | 39.6 | 41.8 |
| | 5 | 9/13/1994 | | 9,630 | 5 UJ | 5 U | 25.8 | 0.1 | 0.2 U | 12.6 | 5.8 | 9 | 5 | 0.05 U | 12 | 6 | 0.3 U | 5 U | 38.4 | 28.1 |
| | 12.5 | 9/13/1994 | | 13,800 | 6 UJ | 6 U | 45.4 | 0.2 | 0.3 U | 16.9 | 5.2 | 14.8 | 3 U | 0.06 U | 11 | 6 U | 0.4 U | 6 U | 50.6 | 27.1 |
| **MTCA Cleanup Levels** | | | | NE | 32 [2] | 20 [3] | 5,600 [2] | 160 [2] | 2 [3] | 2,000 [3] | 2,960 [2] | 2,960 [2] | 250 [3] | 2 [3] | 1,600 [2] | 400 [2] | 400 [2] | 5.6 [2] | 560 [2] | 24,000 [2] |

# Table C-4
# Comprehensive Summary of Metals in Soil
# Jorgensen Forge Facility
# 8531 East Marginal Way South
# Seattle, Washington
# Farallon PN: 831-003

| | | | | Analytical Results (milligrams per kilogram) [1] | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Sample Location** | **Sample Depth (ft)** | **Sample Date** | **Sampled by** | **Aluminum** | **Antimony** | **Arsenic** | **Barium** | **Beryllium** | **Cadmium** | **Chromium** | **Cobalt** | **Copper** | **Lead** | **Mercury** | **Nickel** | **Selenium** | **Silver** | **Thallium** | **Vanadium** | **Zinc** |
| SB-08923 | 2 | 9/13/1994 | Weston | 13,300 | 6 UJ | 7 | 48.3 | 0.1 | 0.2 U | 16.1 | 4.9 | 17.4 | 9 | 0.06 U | 11 | 6 U | 0.3 U | 6 U | 49.8 | 33.1 |
| | 5 | 9/13/1994 | | 13,200 | 6 UJ | 6 U | 42.5 | 0.2 | 0.2 U | 15.2 | 5.2 | 14 | 7 | 0.05 U | 12 | 6 U | 0.3 U | 6 U | 45.9 | 30.4 |
| | 12.5 | 9/13/1994 | | 18,600 | 6 UJ | 6 U | 66.1 | 0.3 | 0.3 U | 19.4 | 5.2 | 22.6 | 5 | 0.06 U | 13 | 6 U | 0.4 U | 6 U | 59.8 | 27.4 |
| SB-09101 | 2 | 9/12/1994 | Weston | 11,100 | R | 5 U | 36.7 | 0.1 | 0.2 U | 20.8 | 5.8 | 15.5 | 16 | 0.16 | 35 | 5 U | 0.3 U | 5 U | 42.8 | 54.9 |
| | 5 | 9/12/1994 | | 9,460 | R | 5 U | 26.9 | 0.1 U | 0.2 U | 14.4 | 4.6 | 11.9 | 5 | 0.05 U | 14 | 5 U | 0.3 U | 5 U | 35.8 | 31.5 |
| | 12.5 | 9/12/1994 | | 24,200 | R | 12 | 97.5 | 0.3 | 0.3 U | 24 | 6.6 | 27.2 | 18 | 0.08 | 19 | 7 U | 0.4 U | 7 U | 54.9 | 72.3 |
| SB-09105 | 2 | 9/12/1994 | Weston | 8,900 | R | 6 | 25.8 | 0.1 U | 0.2 U | 11.5 | 4.2 | 9.6 | 6 | 0.05 U | 10 | 5 U | 0.3 U | 5 U | 37.8 | 31.7 |
| | 5 | 9/12/1994 | | 18,700 | R | 8 | 63.9 | 0.2 | 0.3 U | 21.8 | 6.3 | 21.6 | 7 | 0.09 | 15 | 7 U | 0.4 U | 7 U | 55.9 | 36.9 |
| | 12.5 | 9/12/1994 | | 16,100 | R | 7 | 59.2 | 0.2 | 0.3 U | 18.5 | 5.7 | 18.8 | 5 | 0.06 U | 13 | 6 U | 0.4 U | 6 U | 56.9 | 28.8 |
| SB-09106 | 2 | 9/12/1994 | Weston | 10,100 | R | 13 | 38.9 | 0.1 U | 0.6 | 111 | 15.5 | 91.8 | 117 | 0.05 U | 501 | 5 U | 0.3 U | 5 U | 52.7 | 169 |
| | 5 | 9/12/1994 | | 18,600 | R | 7 U | 74.7 | 0.3 | 0.3 U | 20.5 | 6.9 | 21.6 | 7 | 0.05 U | 15 | 7 U | 0.4 U | 7 U | 54.8 | 36.5 |
| | 12.5 | 9/12/1994 | | 12,300 | R | 6 U | 40.7 | 0.1 U | 0.3 U | 15.9 | 4.5 | 12.4 | 3 | 0.05 U | 9 | 6 U | 0.4 U | 6 U | 51.4 | 25.8 |
| SB1 | 0 - 2 | 8/26/2004 | Farallon | — | — | **25.7** | — | — | **4.5** | 515 | — | 334 B2 | 111 B2 | 0.065 | 1,130 B2 | — | 0.281 J | — | — | 1,320 B2 |
| | 2 - 4 | 8/26/2004 | | — | — | 5.98 | — | — | 1.06 U | 209 | — | 59.6 B2 | 20.8 B2 | 0.0501 | 62.5 B2 | — | 0.136 J | — | — | 129 B2 |
| SB2 | 0 - 2 | 8/26/2004 | Farallon | — | — | 16.6 | — | — | 1.15 U | 829 | — | 169 B2 | 226 B2 | 0.0542 | 125 B2 | — | 0.421 J | — | — | 370 B2 |
| | 2 - 4 | 8/26/2004 | | — | — | 14.6 | — | — | 1.06 U | 707 | — | 104 B2 | 278 B2 | 0.0205 U | 243 B2 | — | 0.351 J | — | — | 231 B2 |
| | 4 - 6 | 8/26/2004 | | — | — | 9.47 | — | — | 0.283 U | 588 B2 | — | 74.5 | **323** | 0.0074 J | 173 | — | 0.381 | — | — | 215 B2 |
| | 6 - 8 | 8/26/2004 | | — | — | 8.14 | — | — | 0.265 U | 618 B2 | — | 115 | **274** | 0.0192 U | 189 | — | 0.325 | — | — | 162 B2 |
| SB3 | 0 - 2 | 8/26/2004 | Farallon | — | — | **20.3** | — | — | **2.2** | 282 | — | 156 B2 | 1,530 B2 | 0.0422 | 159 B2 | — | 0.379 J | — | — | 476 B2 |
| | 2 - 4 | 8/26/2004 | | — | — | **61.7** | — | — | 1.02 U | 1170 | — | 541 B2 | 95.4 B2 | 0.0193 U | 3,410 B2 | — | 0.171 J | — | — | 118 B2 |
| | 4 - 6 | 8/26/2004 | | — | — | **20.1** | — | — | 0.266 U | 765 B2 | — | 188 | 180 | 0.0058 J | 584 | — | 0.28 | — | — | 197 B2 |
| | 6 - 8 | 8/26/2004 | | — | — | 7.65 | — | — | 0.252 U | 772 B2 | — | 72.9 | 179 | 0.009 J | 207 | — | 0.274 | — | — | 191 B2 |
| SB4 | 0 - 2 | 8/26/2004 | Farallon | — | — | 14.1 | — | — | 0.584 J | 507 | — | 216 B2 | 1,130 B2 | 0.694 | 290 B2 | — | 0.381 J | — | — | 319 B2 |
| | 2 - 4 | 8/26/2004 | | — | — | 9.17 | — | — | 1.1 U | 476 | — | 72.9 B2 | 312 B2 | 0.123 | 98.1 B2 | — | 0.372 J | — | — | 230 B2 |
| | 4 - 6 | 8/26/2004 | | — | — | 16 | — | — | 0.289 U | 666 B2 | — | 171 | **732** | 0.0239 U | 99.1 | — | 0.4 | — | — | 200 B2 |
| | 6 - 8 | 8/26/2004 | | — | — | 7.67 | — | — | 0.288 U | 691 B2 | — | 68.8 | **460** | 0.0352 | 62.2 | — | 0.332 | — | — | 136 B2 |
| SB5 | 0 - 2 | 8/26/2004 | Farallon | — | — | 3.47 | — | — | 0.967 U | 560 | — | 40.2 B2 | 109 B2 | 0.0128 J | 28.6 B2 | — | 0.188 J | — | — | 102 B2 |
| | 2 - 4 | 8/26/2004 | | — | — | 6.44 | — | — | 1.25 U | 961 | — | 77.3 B2 | 327 B2 | 0.0208 J | 73.1 B2 | — | 0.331 J | — | — | 289 B2 |
| | 4 - 6 | 8/26/2004 | | — | — | 3.75 | — | — | 0.282 U | 799 B2 | — | 69.1 | 192 | 0.0098 J | 61 | — | 0.259 J | — | — | 255 B2 |
| | 6 - 8 | 8/26/2004 | | — | — | 9.1 | — | — | 0.319 U | 889 B2 | — | 102 | **256** | 0.0244 U | 95.2 | — | 0.35 | — | — | 253 B2 |
| **MTCA Cleanup Levels** | | | | NE | 32 [2] | 20 [3] | 5,600 [2] | 160 [2] | 2 [3] | 2,000 [3] | 2,960 [2] | 2,960 [2] | 250 [3] | 2 [3] | 1,600 [2] | 400 [2] | 400 [2] | 5.6 [2] | 560 [2] | 24,000 [2] |

# Table C-4
# Comprehensive Summary of Metals in Soil
# Jorgensen Forge Facility
# 8531 East Marginal Way South
# Seattle, Washington
# Farallon PN: 831-003

| Sample Location | Sample Depth (ft) | Sample Date | Sampled by | Analytical Results (milligrams per kilogram) [1] | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Aluminum | Antimony | Arsenic | Barium | Beryllium | Cadmium | Chromium | Cobalt | Copper | Lead | Mercury | Nickel | Selenium | Silver | Thallium | Vanadium | Zinc |
| SB6 | 0 - 2 | 8/27/2004 | Farallon | — | — | 7.25 | — | — | 0.892 U | 593 | — | 220 B2 | 96 B2 | 0.0226 | 433 B2 | — | 0.65 J | — | — | 267 B2 |
| | 2 - 4 | 8/27/2004 | | — | — | 62.7 | — | — | 0.0799 J | 1,170 | — | 955 B2 | 112 B2 | 0.0055 J | 5,560 B2 | — | 0.627 J | — | — | 87 B2 |
| | 4 - 6 | 8/27/2004 | | — | — | 33.4 | — | — | 0.219 U | 1,550 B2 | — | 717 | 132 | 0.0183 U | 2,340 | — | 0.747 | — | — | 110 B2 |
| | 6 - 8 | 8/27/2004 | | — | — | 19.1 | — | — | 0.252 U | 606 B2 | — | 264 | 92.9 | 0.0159 U | 1,430 | — | 0.315 | — | — | 100 B2 |
| SB7 | 0 - 2 | 8/27/2004 | Farallon | — | — | 8.47 | — | — | 1.09 U | 3,200 | — | 262 B2 | 110 B2 | 0.0192 J | 1,060 B2 | — | 0.553 J | — | — | 170 B2 |
| | 2 - 4 | 8/27/2004 | | — | — | 15.8 | — | — | 1.97 | 410 | — | 130 B2 | 543 B2 | 0.0673 | 158 B2 | — | 1 J | — | — | 507 B2 |
| | 4 - 6 | 8/27/2004 | | — | — | 15.1 | — | — | 3.19 | 1,950 B2 | — | 271 | 1460 | 0.118 | 521 | — | 1.61 | — | — | 1,380 B2 |
| | 6 - 8 | 8/27/2004 | | — | — | 14.2 | — | — | 0.446 | 1,000 B2 | — | 205 | 657 | 0.0573 | 374 | — | 1.39 | — | — | 414 B2 |
| SS1 | 0 - 1 | 8/31/2004 | Farallon | — | — | 24.7 | — | — | 6.73 B2 | 350 | — | 183 B2 | 1,010 | 0.0681 | 54.7 | — | 1.69 B2 | — | — | 986 B2 |
| SS2 | 0 - 1 | 8/31/2004 | Farallon | — | — | 18.8 | — | — | 4.11 B2 | 117 | — | 246 B2 | 3,330 | 0.958 | 53.5 | — | 0.784 J B2 | — | — | 1,710 B2 |
| SS3 | 0 - 1 | 8/30/2004 | Farallon | — | — | 10.3 | — | — | 0.303 J B1 | 57.9 | — | 72.4 B2 | 313 | 0.0311 | 47.5 | — | 1.03 U | — | — | 196 B2 |
| SS4 | 0 - 1 | 8/30/2004 | Farallon | — | — | 9.95 | — | — | 0.517 U | 386 | — | 83.7 B2 | 146 | 0.0128 J | 45 | — | 0.839 J B2 | — | — | 159 B2 |
| SS5 | 0 - 1 | 8/30/2004 | Farallon | — | — | 15.4 | — | — | 0.479 U | 91.8 | — | 220 B2 | 246 | 0.03 | 163 | — | 0.957 U | — | — | 178 B2 |
| SS6 | 0 - 1 | 8/30/2004 | Farallon | — | — | 31.8 | — | — | 2.11 B2 | 182 | — | 361 B2 | 4,210 | 0.145 | 118 | — | 0.461 J B1 | — | — | 2,350 B2 |
| SS7 | 0 - 1 | 8/30/2004 | Farallon | — | — | 64.9 | — | — | 11.6 B2 | 227 | — | 561 B2 | 5,450 | 0.502 | 241 | — | 8.73 B2 | — | — | 5,430 B2 |
| SS8 | 0 - 1 | 8/30/2004 | Farallon | — | — | 12.2 | — | — | 2.24 B2 | 28 | — | 104 B2 | 109 | 0.0928 | 89.8 | — | 1.03 U | — | — | 1,170 B2 |
| **MTCA Cleanup Levels** | | | | NE | 32 [2] | 20 [3] | 5,600 [2] | 160 [2] | 2 [3] | 2,000 [3] | 2,960 [2] | 2,960 [2] | 250 [3] | 2 [3] | 1,600 [2] | 400 [2] | 400 [2] | 5.6 [2] | 560 [2] | 24,000 [2] |

NOTES:

Results in **BOLD** indicates sample result or reporting limit exceeds Washington State Department of Ecology Model Toxics Control Act Cleanup Regulation (MTCA) Method A Cleanup Levels for Soil or MTCA Method B Cleanup Levels for Soil.

[1]Analyzed by U.S. Environmental Protection Agency 6000/7000 Series Methods.

[2] MTCA Cleanup Levels and Risk Calculations, Version 3.1, Method B, Soil Cleanup Levels for Direct Contact Pathway, Ecology Publication No. 94-145, as updated November 2001.

[3] MTCA Method A Cleanup Levels for Soil, Table 740-1 of Section 900 of Chapter 173-340 of the Washington Administrative Code, as amended February 2001.

B1 = the analyte was detected in the associated method blank at a level above one-tenth the sample concentration.

B2 = the analyte was detected in the associated method blank at a level below one-tenth the sample concentration.

J = the analyte was analyzed for and positively identified, but the associated numerical value is an estimated quantity

NE = not established

R = the result was rejected as unusable

U = no detectable concentrations above the listed laboratory practical quantitation limit

UJ = estimated detection limit

**Table C-5**
**Summary of Groundwater Elevation and LNAPL Data**
**Jorgensen Forge Facility**
**Seattle, Washington**
**Farallon PN: 831-003**

| Monitoring Well ID | Date Collected | Collected By | Casing Elevation (feet)[1] | Depth to Water (feet)[2] | Depth to LNAPL (feet) | LNAPL Thickness (feet) | Potentiometric Surface Elevation[3] (feet)[4] |
|---|---|---|---|---|---|---|---|
| MW-3[4] | 9/9/1992 | SECOR | 14.05 | 11.55 | -- | 0.00 | 2.50 |
| | 9/17/1992 | SECOR | 14.05 | 11.61 | -- | 0.00 | 2.44 |
| | 9/21/1992 | SECOR | 14.05 | 11.61 | -- | 0.00 | 2.44 |
| | 10/1/1992 | SECOR | 14.05 | 11.58 | -- | 0.00 | 2.47 |
| | 10/8/1992 | SECOR | 14.05 | 11.61 | -- | 0.00 | 2.44 |
| | 10/23/1992 | SECOR | 14.05 | 11.62 | -- | 0.00 | 2.43 |
| | 10/28/1992 | SECOR | 14.05 | NM | NM | NM | NM |
| | 11/20/1992 | SECOR | 14.05 | 11.11 | -- | 0.00 | 2.94 |
| | 12/8/1992 | SECOR | 14.05 | 10.84 | -- | 0.00 | 3.21 |
| | 12/22/1992 | SECOR | 14.05 | 10.36 | -- | 0.00 | 3.69 |
| | 1/8/1993 | SECOR | 14.05 | 10.38 | -- | 0.00 | 3.67 |
| | 1/19/1993 | SECOR | 14.05 | 10.45 | -- | 0.00 | 3.60 |
| | 2/2/1993 | SECOR | 14.05 | 10.12 | -- | 0.00 | 3.93 |
| | 2/19/1993 | SECOR | 14.05 | 10.21 | -- | 0.00 | 3.84 |
| | 3/3/1993 | SECOR | 14.05 | 10.72 | -- | 0.00 | 3.33 |
| | 6/22/1995 | SECOR | 14.05 | 11.01 | NM | NM | 3.04 |
| | 1/15/1996 | SECOR | 14.05 | 9.35 | NM | NM | 4.70 |
| | 4/17/1996 | SECOR | 14.05 | 10.86 | NM | NM | 3.19 |
| | 8/28/1996 | SECOR | 14.05 | 11.80 | NM | NM | 2.25 |
| | 10/18-19/1999 | URS | 14.05 | 11.55 | -- | 0.00 | 2.50 |
| | 1/5/2000 | URS | 14.05 | 10.38 | -- | 0.00 | 3.67 |
| | 5/2-3/2000 | URS | 14.05 | NM | NM | NM | NM |
| | 8/22-23/2000 | URS | 14.05 | NM | NM | NM | NM |
| | 12/12-13/2000 | URS | 14.05 | 11.23 | -- | 0.00 | 2.82 |
| | 2/14-15/2001 | URS | 14.05 | 10.89 | -- | 0.00 | 3.16 |
| | 4/9/2002 | Kane | 14.05 | 10.65 | -- | 0.00 | 3.40 |
| | 4/24/2004 | Kane | 14.05 | NM | NM | NM | NM |
| | 5/18/2005 | Farallon | 14.05 | 11.03 | -- | 0.00 | 3.02 |
| | 12/13/2005 | Farallon | 14.05 | 11.48 | -- | 0.00 | 2.57 |

**Table C-5**
**Summary of Groundwater Elevation and LNAPL Data**
**Jorgensen Forge Facility**
**Seattle, Washington**
**Farallon PN: 831-003**

| Monitoring Well ID | Date Collected | Collected By | Casing Elevation (feet)[1] | Depth to Water (feet)[2] | Depth to LNAPL (feet) | LNAPL Thickness (feet) | Potentiometric Surface Elevation[3] (feet)[4] |
|---|---|---|---|---|---|---|---|
| MW-4 | 9/9/1992 | SECOR | 17.48 | 11.54 | -- | 0.00 | 5.94 |
| | 9/17/1992 | SECOR | 17.48 | 11.60 | -- | 0.00 | 5.88 |
| | 9/21/1992 | SECOR | 17.48 | 11.62 | -- | 0.00 | 5.86 |
| | 10/1/1992 | SECOR | 17.48 | 11.53 | -- | 0.00 | 5.95 |
| | 10/8/1992 | SECOR | 17.48 | 11.61 | -- | 0.00 | 5.87 |
| | 10/23/1992 | SECOR | 17.48 | 11.62 | -- | 0.00 | 5.86 |
| | 10/28/1992 | SECOR | 17.48 | NM | NM | NM | NM |
| | 11/20/1992 | SECOR | 17.48 | 11.12 | -- | 0.00 | 6.36 |
| | 12/8/1992 | SECOR | 17.48 | 10.88 | -- | 0.00 | 6.60 |
| | 12/22/1992 | SECOR | 17.48 | 10.58 | -- | 0.00 | 6.90 |
| | 1/8/1993 | SECOR | 17.48 | 10.67 | -- | 0.00 | 6.81 |
| | 1/19/1993 | SECOR | 17.48 | 10.73 | -- | 0.00 | 6.75 |
| | 2/2/1993 | SECOR | 17.48 | 10.43 | -- | 0.00 | 7.05 |
| | 2/19/1993 | SECOR | 17.48 | 10.62 | -- | 0.00 | 6.86 |
| | 3/3/1993 | SECOR | 17.48 | 10.96 | -- | 0.00 | 6.52 |
| | 4/9/1993 | SECOR | 17.48 | 14.93 | -- | 0.00 | 2.55 |
| | 11/10/1993 | SECOR | 17.48 | 15.59 | -- | 0.00 | 1.89 |
| | 3/2/1994 | SECOR | 17.48 | 14.33 | -- | 0.00 | 3.15 |
| | 11/1/1994 | SECOR | 17.48 | 15.46 | -- | 0.00 | 2.02 |
| | 1/4/1995 | SECOR | 17.48 | 13.55 | -- | 0.00 | 3.93 |
| | 4/12/1995 | SECOR | 17.48 | 14.14 | -- | 0.00 | 3.34 |
| | 6/22/1995 | SECOR | 17.48 | 15.04 | -- | 0.00 | 2.44 |
| | 10/4/1995 | SECOR | 17.48 | 15.18 | -- | 0.00 | 2.30 |
| | 1/15/1996 | SECOR | 17.48 | 12.82 | -- | 0.00 | 4.66 |
| | 4/17/1996 | SECOR | 17.48 | 14.92 | -- | 0.00 | 2.56 |
| | 8/28/1996 | SECOR | 17.48 | 15.50 | -- | 0.00 | 1.98 |
| | 10/18/999 | URS | 17.48 | 11.65 | -- | 0.00 | 5.83 |
| | 1/5/2000 | URS | 17.48 | 10.47 | -- | 0.00 | 7.01 |
| | 5/2-3/2000 | URS | 17.48 | 10.95 | -- | 0.00 | 6.53 |
| | 8/22-23/2000 | URS | 17.48 | 11.70 | -- | 0.00 | 5.78 |
| | 12/12-13/2000 | URS | 17.48 | 11.33 | -- | 0.00 | 6.15 |
| | 2/14-15/2001 | URS | 17.48 | 10.99 | -- | 0.00 | 6.49 |
| | 4/9/2002 | Kane | 17.48 | 10.70 | -- | 0.00 | 6.78 |
| | 4/24/2004 | Kane | 17.48 | 10.38 | -- | 0.00 | 7.10 |
| | 5/18/2005 | Farallon | 17.48 | 11.11 | -- | 0.00 | 6.37 |
| | 12/13/2005 | Farallon | 17.48 | 11.56 | -- | 0.00 | 5.92 |

**Table C-5**
**Summary of Groundwater Elevation and LNAPL Data**
**Jorgensen Forge Facility**
**Seattle, Washington**
**Farallon PN: 831-003**

| Monitoring Well ID | Date Collected | Collected By | Casing Elevation (feet)[1] | Depth to Water (feet)[2] | Depth to LNAPL (feet) | LNAPL Thickness (feet) | Potentiometric Surface Elevation[3] (feet)[4] |
|---|---|---|---|---|---|---|---|
| MW-5 | 9/9/1992 | SECOR | 17.03 | 13.33 | -- | 0.00 | 3.70 |
| | 9/17/1992 | SECOR | 17.03 | 12.78 | -- | 0.00 | 4.25 |
| | 9/21/1992 | SECOR | 17.03 | 10.90 | -- | 0.00 | 6.13 |
| | 10/1/1992 | SECOR | 17.03 | 11.75 | -- | 0.00 | 5.28 |
| | 10/8/1992 | SECOR | 17.03 | 14.18 | -- | 0.00 | 2.85 |
| | 10/23/1992 | SECOR | 17.03 | 13.20 | -- | 0.00 | 3.83 |
| | 10/28/1992 | SECOR | 17.03 | NM | -- | NM | NM |
| | 11/20/1992 | SECOR | 17.03 | 11.37 | -- | 0.00 | 5.66 |
| | 12/8/1992 | SECOR | 17.03 | 10.09 | -- | 0.00 | 6.94 |
| | 12/22/1992 | SECOR | 17.03 | 11.45 | -- | 0.00 | 5.58 |
| | 1/8/1993 | SECOR | 17.03 | 10.86 | -- | 0.00 | 6.17 |
| | 1/19/1993 | SECOR | 17.03 | 10.66 | -- | 0.00 | 6.37 |
| | 2/2/1993 | SECOR | 17.03 | 10.64 | -- | 0.00 | 6.39 |
| | 2/19/1993 | SECOR | 17.03 | 11.28 | -- | 0.00 | 5.75 |
| | 3/3/1993 | SECOR | 17.03 | 11.18 | -- | 0.00 | 5.85 |
| | 10/18-19/1999 | URS | 17.03 | 8.11 | -- | 0.00 | 8.92 |
| | 1/5/2000 | URS | 17.03 | 10.15 | -- | 0.00 | 6.88 |
| | 5/2-3/2000 | URS | 17.03 | 11.55 | -- | 0.00 | 5.48 |
| | 8/22-23/2000 | URS | 17.03 | NM | NM | NM | NM |
| | 12/12-13/2000 | URS | 17.03 | NM | NM | NM | NM |
| | 2/14-15/2001 | URS | 17.03 | 14.57 | -- | 0.00 | 2.46 |
| | 4/9/2002 | Kane | 17.03 | 11.91 | -- | 0.00 | 5.12 |
| | 4/10/2003 | Farallon | 17.03 | 13.72 | -- | 0.00 | 3.31 |
| | 4/24/2004 | Kane | 17.03 | 11.72 | -- | 0.00 | 5.31 |
| | 5/18/2005 | Farallon | 17.03 | 11.00 | -- | 0.00 | 6.03 |
| | 12/13/2005 | Farallon | 17.03 | 12.40 | -- | 0.00 | 4.63 |

**Table C-5**
**Summary of Groundwater Elevation and LNAPL Data**
**Jorgensen Forge Facility**
**Seattle, Washington**
**Farallon PN: 831-003**

| Monitoring Well ID | Date Collected | Collected By | Casing Elevation (feet)[1] | Depth to Water (feet)[2] | Depth to LNAPL (feet) | LNAPL Thickness (feet) | Potentiometric Surface Elevation[3] (feet)[4] |
|---|---|---|---|---|---|---|---|
| MW-6 | 9/9/1992 | SECOR | 20.61 | 15.61 | -- | 0.00 | 5.00 |
| | 9/17/1992 | SECOR | 20.61 | 15.73 | -- | 0.00 | 4.88 |
| | 9/21/1992 | SECOR | 20.61 | 15.68 | -- | 0.00 | 4.93 |
| | 10/1/1992 | SECOR | 20.61 | 15.46 | -- | 0.00 | 5.15 |
| | 10/8/1992 | SECOR | 20.61 | 15.51 | -- | 0.00 | 5.10 |
| | 10/23/1992 | SECOR | 20.61 | 15.61 | -- | 0.00 | 5.00 |
| | 10/28/1992 | SECOR | 20.61 | NM | NM | NM | NM |
| | 11/20/1992 | SECOR | 20.61 | 15.48 | -- | 0.00 | 5.13 |
| | 12/8/1992 | SECOR | 20.61 | 14.19 | -- | 0.00 | 6.42 |
| | 12/22/1992 | SECOR | 20.61 | 15.16 | -- | 0.00 | 5.45 |
| | 1/8/1993 | SECOR | 20.61 | 14.85 | -- | 0.00 | 5.76 |
| | 1/19/1993 | SECOR | 20.61 | 13.98 | -- | 0.00 | 6.63 |
| | 2/2/1993 | SECOR | 20.61 | 14.41 | -- | 0.00 | 6.20 |
| | 2/19/1993 | SECOR | 20.61 | 14.03 | -- | 0.00 | 6.58 |
| | 3/3/1993 | SECOR | 20.61 | 14.60 | -- | 0.00 | 6.01 |
| | 10/18-19/1999 | URS | 20.61 | NM | NM | NM | NM |
| | 1/5/2000 | URS | 20.61 | 14.40 | -- | 0.00 | 6.21 |
| | 5/2-3/2000 | URS | 20.61 | NM | NM | NM | NM |
| | 8/22-23/2000 | URS | 20.61 | NM | NM | NM | NM |
| | 12/12-13/2000 | URS | 20.61 | NM | NM | NM | NM |
| | 2/14-15/2001 | URS | 20.61 | 15.05 | -- | 0.00 | 5.56 |
| | 4/9/2002 | Kane | 20.61 | NM | NM | NM | NM |
| | 4/11/2003 | Farallon | 20.61 | 13.57 | -- | 0.00 | 7.04 |
| | 4/24/2004 | Kane | 20.61 | NM | NM | NM | NM |
| | 5/18/2005 | Farallon | 20.61 | 14.07 | -- | 0.00 | 6.54 |
| | 12/13/2005 | Farallon | 20.61 | 14.59 | -- | 0.00 | 6.02 |

**Table C-5**
**Summary of Groundwater Elevation and LNAPL Data**
**Jorgensen Forge Facility**
**Seattle, Washington**
**Farallon PN: 831-003**

| Monitoring Well ID | Date Collected | Collected By | Casing Elevation (feet)[1] | Depth to Water (feet)[2] | Depth to LNAPL (feet) | LNAPL Thickness (feet) | Potentiometric Surface Elevation[3] (feet)[4] |
|---|---|---|---|---|---|---|---|
| MW-7 | 9/9/1992 | SECOR | 20.84 | 15.05 | -- | 0.00 | 5.79 |
| | 9/17/1992 | SECOR | 20.84 | 15.10 | -- | 0.00 | 5.74 |
| | 9/21/1992 | SECOR | 20.84 | 15.11 | -- | 0.00 | 5.73 |
| | 10/1/1992 | SECOR | 20.84 | 14.99 | -- | 0.00 | 5.85 |
| | 10/8/1992 | SECOR | 20.84 | 15.11 | -- | 0.00 | 5.73 |
| | 10/23/1992 | SECOR | 20.84 | 15.10 | -- | 0.00 | 5.74 |
| | 10/28/1992 | SECOR | 20.84 | NM | -- | NM | NM |
| | 11/20/1992 | SECOR | 20.84 | 14.62 | -- | 0.00 | 6.22 |
| | 12/8/1992 | SECOR | 20.84 | 14.93 | -- | 0.00 | 5.91 |
| | 12/22/1992 | SECOR | 20.84 | 14.12 | -- | 0.00 | 6.72 |
| | 1/8/1993 | SECOR | 20.84 | 14.23 | -- | 0.00 | 6.61 |
| | 1/19/1993 | SECOR | 20.84 | 14.28 | -- | 0.00 | 6.56 |
| | 2/2/1993 | SECOR | 20.84 | 14.01 | -- | 0.00 | 6.83 |
| | 2/19/1993 | SECOR | 20.84 | 14.23 | -- | 0.00 | 6.61 |
| | 3/3/1993 | SECOR | 20.84 | 14.52 | -- | 0.00 | 6.32 |
| | 10/18-19/1999 | URS | 20.84 | 15.25 | -- | 0.00 | 5.59 |
| | 1/5/2000 | URS | 20.84 | 14.14 | -- | 0.00 | 6.70 |
| | 5/2-3/2000 | URS | 20.84 | NM | NM | NM | NM |
| | 8/22-23/2000 | URS | 20.84 | NM | NM | NM | NM |
| | 12/12-13/2000 | URS | 20.84 | NM | NM | NM | NM |
| | 2/14-15/2001 | URS | 20.84 | 12.51 | -- | 0.00 | 8.33 |
| | 4/9/2002 | Kane | 20.84 | NM | NM | NM | NM |
| | 4/11/2003 | Farallon | 20.84 | 14.19 | -- | 0.00 | 6.65 |
| | 4/24/2004 | Kane | 20.84 | 13.98 | -- | 0.00 | 6.86 |
| | 5/18/2005 | Farallon | 20.84 | 14.82 | -- | 0.00 | 6.02 |
| | 12/13/2005 | Farallon | 20.84 | 15.20 | -- | 0.00 | 5.64 |

**Table C-5**
**Summary of Groundwater Elevation and LNAPL Data**
**Jorgensen Forge Facility**
**Seattle, Washington**
**Farallon PN: 831-003**

| Monitoring Well ID | Date Collected | Collected By | Casing Elevation (feet)[1] | Depth to Water (feet)[2] | Depth to LNAPL (feet) | LNAPL Thickness (feet) | Potentiometric Surface Elevation[3] (feet)[4] |
|---|---|---|---|---|---|---|---|
| MW-8 | 9/9/1992 | SECOR | 17.70 | 11.81 | -- | 0.00 | 5.89 |
| | 9/17/1992 | SECOR | 17.70 | 11.86 | -- | 0.00 | 5.84 |
| | 9/21/1992 | SECOR | 17.70 | 11.88 | -- | 0.00 | 5.82 |
| | 10/1/1992 | SECOR | 17.70 | 11.76 | -- | 0.00 | 5.94 |
| | 10/8/1992 | SECOR | 17.70 | 11.87 | -- | 0.00 | 5.83 |
| | 10/23/1992 | SECOR | 17.70 | 11.87 | -- | 0.00 | 5.83 |
| | 10/28/1992 | SECOR | 17.70 | NM | NM | NM | NM |
| | 11/20/1992 | SECOR | 17.70 | 11.38 | -- | 0.00 | 6.32 |
| | 12/8/1992 | SECOR | 17.70 | 11.13 | -- | 0.00 | 6.57 |
| | 12/22/1992 | SECOR | 17.70 | 10.87 | -- | 0.00 | 6.83 |
| | 1/8/1993 | SECOR | 17.70 | 10.95 | -- | 0.00 | 6.75 |
| | 1/19/1993 | SECOR | 17.70 | 11.00 | -- | 0.00 | 6.70 |
| | 2/2/1993 | SECOR | 17.70 | 10.73 | -- | 0.00 | 6.97 |
| | 2/19/1993 | SECOR | 17.70 | 10.90 | -- | 0.00 | 6.80 |
| | 3/3/1993 | SECOR | 17.70 | 11.24 | -- | 0.00 | 6.46 |
| | 4/9/1993 | SECOR | 17.70 | 15.15 | -- | 0.00 | 2.55 |
| | 11/10/1993 | SECOR | 17.70 | 15.77 | -- | 0.00 | 1.93 |
| | 3/2/1994 | SECOR | 17.70 | 14.53 | -- | 0.00 | 3.17 |
| | 11/1/1994 | SECOR | 17.70 | 15.57 | -- | 0.00 | 2.13 |
| | 1/4/1995 | SECOR | 17.70 | 13.64 | -- | 0.00 | 4.06 |
| | 4/12/1995 | SECOR | 17.70 | 14.38 | -- | 0.00 | 3.32 |
| | 6/22/1995 | SECOR | 17.70 | 15.29 | -- | 0.00 | 2.41 |
| | 10/4/1995 | SECOR | 17.70 | 15.41 | -- | 0.00 | 2.29 |
| | 1/15/1996 | SECOR | 17.70 | 13.60 | -- | 0.00 | 4.10 |
| | 4/17/1996 | SECOR | 17.70 | 14.92 | -- | 0.00 | 2.78 |
| | 8/28/1996 | SECOR | 17.70 | 15.58 | -- | 0.00 | 2.12 |
| | 10/18-19/1999 | URS | 17.70 | 11.91 | -- | 0.00 | 5.79 |
| | 1/5/2000 | URS | 17.70 | 10.76 | -- | 0.00 | 6.94 |
| | 5/2-3/2000 | URS | 17.70 | 11.20 | -- | 0.00 | 6.50 |
| | 8/22-23/2000 | URS | 17.70 | NM | NM | NM | NM |
| | 12/12-13/2000 | URS | 17.70 | 11.58 | -- | 0.00 | 6.12 |
| | 2/14-15/2001 | URS | 17.70 | 11.24 | -- | 0.00 | 6.46 |
| | 4/9/2002 | Kane | 17.70 | 11.02 | -- | 0.00 | 6.68 |
| | 4/24/2004 | Kane | 17.70 | 10.59 | -- | 0.00 | 7.11 |
| | 5/18/2005 | Farallon | 17.70 | 11.36 | -- | 0.00 | 6.34 |
| | 12/13/2005 | Farallon | 17.70 | 11.81 | -- | 0.00 | 5.89 |

**Table C-5**
**Summary of Groundwater Elevation and LNAPL Data**
**Jorgensen Forge Facility**
**Seattle, Washington**
**Farallon PN: 831-003**

| Monitoring Well ID | Date Collected | Collected By | Casing Elevation (feet)[1] | Depth to Water (feet)[2] | Depth to LNAPL (feet) | LNAPL Thickness (feet) | Potentiometric Surface Elevation[3] (feet)[4] |
|---|---|---|---|---|---|---|---|
| MW-9 | 9/9/1992 | SECOR | 17.79 | 11.88 | -- | 0.00 | 5.91 |
| | 9/17/1992 | SECOR | 17.79 | 11.92 | -- | 0.00 | 5.87 |
| | 9/21/1992 | SECOR | 17.79 | 11.93 | -- | 0.00 | 5.86 |
| | 10/1/1992 | SECOR | 17.79 | 11.82 | -- | 0.00 | 5.97 |
| | 10/8/1992 | SECOR | 17.79 | 11.91 | -- | 0.00 | 5.88 |
| | 10/23/1992 | SECOR | 17.79 | 11.93 | -- | 0.00 | 5.86 |
| | 10/28/1992 | SECOR | 17.79 | NM | NM | NM | NM |
| | 11/20/1992 | SECOR | 17.79 | 11.43 | -- | 0.00 | 6.36 |
| | 12/8/1992 | SECOR | 17.79 | 11.17 | -- | 0.00 | 6.62 |
| | 12/22/1992 | SECOR | 17.79 | NM | NM | NM | NM |
| | 1/8/1993 | SECOR | 17.79 | 11.00 | -- | 0.00 | 6.79 |
| | 1/19/1993 | SECOR | 17.79 | 11.04 | -- | 0.00 | 6.75 |
| | 2/2/1993 | SECOR | 17.79 | 10.76 | -- | 0.00 | 7.03 |
| | 2/19/1993 | SECOR | 17.79 | 10.95 | -- | 0.00 | 6.84 |
| | 3/3/1993 | SECOR | 17.79 | 11.28 | -- | 0.00 | 6.51 |
| | 4/9/1993 | SECOR | 17.79 | 15.12 | -- | 0.00 | 2.67 |
| | 11/10/1993 | SECOR | 17.79 | 15.75 | -- | 0.00 | 2.04 |
| | 3/2/1994 | SECOR | 17.79 | 14.51 | -- | 0.00 | 3.28 |
| | 11/1/1994 | SECOR | 17.79 | 15.54 | -- | 0.00 | 2.25 |
| | 1/4/1995 | SECOR | 17.79 | 13.58 | NM | NM | 4.21 |
| | 4/12/1995 | SECOR | 17.79 | 14.16 | NM | NM | 3.63 |
| | 6/22/1995 | SECOR | 17.79 | 15.08 | NM | NM | 2.71 |
| | 10/4/1995 | SECOR | 17.79 | 15.21 | NM | NM | 2.58 |
| | 1/15/1996 | SECOR | 17.79 | 13.49 | NM | NM | 4.30 |
| | 4/17/1996 | SECOR | 17.79 | 14.23 | NM | NM | 3.56 |
| | 8/28/1996 | SECOR | 17.79 | 15.21 | NM | NM | 2.58 |
| | 10/18-19/1999 | URS | 17.79 | 11.96 | -- | 0.00 | 5.83 |
| | 1/5/2000 | URS | 17.79 | 10.77 | -- | 0.00 | 7.02 |
| | 5/2-3/2000 | URS | 17.79 | 11.23 | -- | 0.00 | 6.56 |
| | 8/22-23/2000 | URS | 17.79 | 12.03 | -- | 0.00 | 5.76 |
| | 12/12-13/2000 | URS | 17.79 | 11.66 | -- | 0.00 | 6.13 |
| | 2/14-15/2001 | URS | 17.79 | 11.25 | -- | 0.00 | 6.54 |
| | 4/9/2002 | Kane | 17.79 | 11.05 | -- | 0.00 | 6.74 |
| | 4/24/2004 | Kane | 17.79 | 10.62 | -- | 0.00 | 7.17 |
| | 5/18/2005 | Farallon | 17.79 | 11.40 | -- | 0.00 | 6.39 |
| | 12/13/2005 | Farallon | 17.79 | 11.84 | -- | 0.00 | 5.95 |

**Table C-5**
**Summary of Groundwater Elevation and LNAPL Data**
**Jorgensen Forge Facility**
**Seattle, Washington**
**Farallon PN: 831-003**

| Monitoring Well ID | Date Collected | Collected By | Casing Elevation (feet)[1] | Depth to Water (feet)[2] | Depth to LNAPL (feet) | LNAPL Thickness (feet) | Potentiometric Surface Elevation[3] (feet)[4] |
|---|---|---|---|---|---|---|---|
| MW-10 | 9/9/1992 | SECOR | 17.57 | 11.80 | -- | 0.00 | 5.77 |
| | 9/17/1992 | SECOR | 17.57 | 11.85 | -- | 0.00 | 5.72 |
| | 9/21/1992 | SECOR | 17.57 | 11.84 | -- | 0.00 | 5.73 |
| | 10/1/1992 | SECOR | 17.57 | 11.71 | -- | 0.00 | 5.86 |
| | 10/8/1992 | SECOR | 17.57 | 11.83 | -- | 0.00 | 5.74 |
| | 10/23/1992 | SECOR | 17.57 | 11.83 | -- | 0.00 | 5.74 |
| | 10/28/1992 | SECOR | 17.57 | NM | -- | NM | NM |
| | 11/20/1992 | SECOR | 17.57 | 11.34 | -- | 0.00 | 6.23 |
| | 12/8/1992 | SECOR | 17.57 | 11.05 | -- | 0.00 | 6.52 |
| | 12/22/1992 | SECOR | 17.57 | 10.85 | -- | 0.00 | 6.72 |
| | 1/8/1993 | SECOR | 17.57 | 10.62 | -- | 0.00 | 6.95 |
| | 1/19/1993 | SECOR | 17.57 | 10.19 | -- | 0.00 | 7.38 |
| | 2/2/1993 | SECOR | 17.57 | 10.69 | -- | 0.00 | 6.88 |
| | 2/19/1993 | SECOR | 17.57 | 10.90 | -- | 0.00 | 6.67 |
| | 3/3/1993 | SECOR | 17.57 | 11.18 | -- | 0.00 | 6.39 |
| | 4/9/1993 | SECOR | 17.57 | 14.87 | NM | NM | 2.70 |
| | 11/10/1993 | SECOR | 17.57 | 15.52 | NM | NM | 2.05 |
| | 3/2/1994 | SECOR | 17.57 | 14.29 | NM | NM | 3.28 |
| | 11/1/1994 | SECOR | 17.57 | 15.33 | NM | NM | 2.24 |
| | 1/4/1995 | SECOR | 17.57 | 13.67 | NM | NM | 3.90 |
| | 4/12/1995 | SECOR | 17.57 | 14.24 | NM | NM | 3.33 |
| | 6/22/1995 | SECOR | 17.57 | 15.05 | NM | NM | 2.52 |
| | 10/4/1995 | SECOR | 17.57 | 15.13 | NM | NM | 2.44 |
| | 1/15/1996 | SECOR | 17.57 | 13.72 | NM | NM | 3.85 |
| | 4/17/1996 | SECOR | 17.57 | 14.24 | NM | NM | 3.33 |
| | 8/28/1996 | SECOR | 17.57 | 15.10 | NM | NM | 2.47 |
| | 11/26/1996 | SECOR | 17.57 | 14.53 | NM | NM | 3.04 |
| | 10/18-19/1999 | URS | 17.57 | 11.90 | -- | 0.00 | 5.67 |
| | 1/5/2000 | URS | 17.57 | 10.75 | -- | 0.00 | 6.82 |
| | 5/2-3/2000 | URS | 17.57 | 11.23 | -- | 0.00 | 6.34 |
| | 8/22-23/2000 | URS | 17.57 | 11.98 | -- | 0.00 | 5.59 |
| | 12/12-13/2000 | URS | 17.57 | 11.56 | -- | 0.00 | 6.01 |
| | 2/14-15/2001 | URS | 17.57 | 11.23 | -- | 0.00 | 6.34 |
| | 4/9/2002 | Kane | 17.57 | 10.89 | -- | 0.00 | 6.68 |
| | 4/24/2004 | Kane | 17.57 | 10.92 | -- | 0.00 | 6.65 |
| | 5/18/2005 | Farallon | 17.57 | 11.23 | -- | 0.00 | 6.34 |

**Table C-5**
**Summary of Groundwater Elevation and LNAPL Data**
**Jorgensen Forge Facility**
**Seattle, Washington**
**Farallon PN: 831-003**

| Monitoring Well ID | Date Collected | Collected By | Casing Elevation (feet)[1] | Depth to Water (feet)[2] | Depth to LNAPL (feet) | LNAPL Thickness (feet) | Potentiometric Surface Elevation[3] (feet)[4] |
|---|---|---|---|---|---|---|---|
| | 12/13/2005 | Farallon | 17.57 | 11.73 | -- | 0.00 | 5.84 |

**Table C-5**
**Summary of Groundwater Elevation and LNAPL Data**
**Jorgensen Forge Facility**
**Seattle, Washington**
**Farallon PN: 831-003**

| Monitoring Well ID | Date Collected | Collected By | Casing Elevation (feet)[1] | Depth to Water (feet)[2] | Depth to LNAPL (feet) | LNAPL Thickness (feet) | Potentiometric Surface Elevation[3] (feet)[4] |
|---|---|---|---|---|---|---|---|
| MW-11 | 9/9/1992 | SECOR | 17.70 | 11.85 | -- | 0.00 | 5.85 |
| | 9/17/1992 | SECOR | 17.70 | 11.90 | -- | 0.00 | 5.80 |
| | 9/21/1992 | SECOR | 17.70 | 11.92 | -- | 0.00 | 5.78 |
| | 10/1/1992 | SECOR | 17.70 | 11.79 | -- | 0.00 | 5.91 |
| | 10/8/1992 | SECOR | 17.70 | 11.92 | -- | 0.00 | 5.78 |
| | 10/23/1992 | SECOR | 17.70 | 11.91 | -- | 0.00 | 5.79 |
| | 10/28/1992 | SECOR | 17.70 | NM | NM | NM | NM |
| | 11/20/1992 | SECOR | 17.70 | 11.42 | -- | 0.00 | 6.28 |
| | 12/8/1992 | SECOR | 17.70 | 11.17 | -- | 0.00 | 6.53 |
| | 12/22/1992 | SECOR | 17.70 | 10.93 | -- | 0.00 | 6.77 |
| | 1/8/1993 | SECOR | 17.70 | 11.01 | -- | 0.00 | 6.69 |
| | 1/19/1993 | SECOR | 17.70 | 11.04 | -- | 0.00 | 6.66 |
| | 2/2/1993 | SECOR | 17.70 | 10.78 | -- | 0.00 | 6.92 |
| | 2/19/1993 | SECOR | 17.70 | 10.97 | -- | 0.00 | 6.73 |
| | 3/3/1993 | SECOR | 17.70 | 11.29 | -- | 0.00 | 6.41 |
| | 11/10/1993 | SECOR | 17.70 | 15.60 | NM | NM | 2.10 |
| | 3/2/1994 | SECOR | 17.70 | 14.36 | NM | NM | 3.34 |
| | 4/12/1995 | SECOR | 17.70 | 14.24 | NM | NM | 3.46 |
| | 6/22/1995 | SECOR | 17.70 | 15.13 | NM | NM | 2.57 |
| | 10/4/1995 | SECOR | 17.70 | 15.19 | NM | NM | 2.51 |
| | 1/15/1996 | SECOR | 17.70 | 13.60 | NM | NM | 4.10 |
| | 4/17/1996 | SECOR | 17.70 | 14.46 | NM | NM | 3.24 |
| | 8/28/1996 | SECOR | 17.70 | 14.79 | NM | NM | 2.91 |
| | 11/26/1996 | SECOR | 17.70 | 14.26 | NM | NM | 3.44 |
| | 10/18-19/1999 | URS | 17.70 | 12.00 | -- | 0.00 | 5.70 |
| | 1/5/2000 | URS | 17.70 | NM | NM | NM | NM |
| | 5/2-3/2000 | URS | 17.70 | NM | NM | NM | NM |
| | 8/22-23/2000 | URS | 17.70 | NM | NM | NM | NM |
| | 12/12-13/2000 | URS | 17.70 | 11.65 | -- | 0.00 | 6.05 |
| | 2/14-15/2001 | URS | 17.70 | 11.38 | -- | 0.00 | 6.32 |
| | 4/9/2002 | Kane | 17.70 | NM | NM | NM | NM |
| | 4/24/2004 | Kane | 17.70 | NM | NM | NM | NM |
| | 5/18/2005 | Farallon | 17.70 | 11.43 | -- | 0.00 | 6.27 |
| | 12/13/2005 | Farallon | 17.70 | NM | NM | NM | NM |

**Table C-5**
**Summary of Groundwater Elevation and LNAPL Data**
**Jorgensen Forge Facility**
**Seattle, Washington**
**Farallon PN: 831-003**

| Monitoring Well ID | Date Collected | Collected By | Casing Elevation (feet)[1] | Depth to Water (feet)[2] | Depth to LNAPL (feet) | LNAPL Thickness (feet) | Potentiometric Surface Elevation[3] (feet)[4] |
|---|---|---|---|---|---|---|---|
| MW-12 | 9/9/1992 | SECOR | 17.19 | 11.56 | -- | 0.00 | 5.63 |
| | 9/17/1992 | SECOR | 17.19 | 11.53 | -- | 0.00 | 5.66 |
| | 9/21/1992 | SECOR | 17.19 | 11.55 | -- | 0.00 | 5.64 |
| | 10/1/1992 | SECOR | 17.19 | 11.40 | -- | 0.00 | 5.79 |
| | 10/8/1992 | SECOR | 17.19 | 11.59 | -- | 0.00 | 5.60 |
| | 10/23/1992 | SECOR | 17.19 | 11.54 | -- | 0.00 | 5.65 |
| | 10/28/1992 | SECOR | 17.19 | NM | NM | NM | NM |
| | 11/20/1992 | SECOR | 17.19 | 11.05 | -- | 0.00 | 6.14 |
| | 12/8/1992 | SECOR | 17.19 | 10.77 | -- | 0.00 | 6.42 |
| | 1/22/1992 | SECOR | 17.19 | 10.58 | -- | 0.00 | 6.61 |
| | 1/8/1993 | SECOR | 17.19 | 10.65 | -- | 0.00 | 6.54 |
| | 1/19/1993 | SECOR | 17.19 | 10.65 | -- | 0.00 | 6.54 |
| | 2/2/1993 | SECOR | 17.19 | 10.42 | -- | 0.00 | 6.77 |
| | 2/19/1993 | SECOR | 17.19 | 10.61 | -- | 0.00 | 6.58 |
| | 3/3/1993 | SECOR | 17.19 | 10.93 | -- | 0.00 | 6.26 |
| | 10/18-19/1999 | URS | 17.19 | 13.50 | 11.28 | 2.22 | 5.71 |
| | 1/5/2000 | URS | 17.19 | NM | NM | NM | NM |
| | 5/2-3/2000 | URS | 17.19 | 13.01 | 10.84 | 2.17 | 6.15 |
| | 8/22-23/2000 | URS | 17.19 | 12.90 | 11.30 | 1.60 | 5.75 |
| | 12/12-13/2000 | URS | 17.19 | 12.89 | 11.03 | 1.86 | 5.99 |
| | 2/14-15/2001 | URS | 17.19 | 12.75 | 10.75 | 2.00 | 6.26 |
| | 4/9/2002 | Kane | 17.19 | 13.51 | 11.57 | 1.94 | 5.45 |
| | 4/24/2004 | Kane | 17.19 | 13.75 | 11.02 | 2.73 | 5.92 |
| | 5/18/2005 | Farallon | 17.19 | 12.21 | 11.00 | 1.21 | 6.08 |
| | 12/13/2005 | Farallon | 17.19 | 12.15 | 11.41 | 0.74 | 5.71 |

**Table C-5**
**Summary of Groundwater Elevation and LNAPL Data**
**Jorgensen Forge Facility**
**Seattle, Washington**
**Farallon PN: 831-003**

| Monitoring Well ID | Date Collected | Collected By | Casing Elevation (feet)[1] | Depth to Water (feet)[2] | Depth to LNAPL (feet) | LNAPL Thickness (feet) | Potentiometric Surface Elevation[3] (feet)[4] |
|---|---|---|---|---|---|---|---|
| MW-13 | 9/9/1992 | SECOR | 17.44 | 11.82 | -- | 0.00 | 5.62 |
| | 9/17/1992 | SECOR | 17.44 | 11.79 | -- | 0.00 | 5.65 |
| | 9/21/1992 | SECOR | 17.44 | 11.82 | -- | 0.00 | 5.62 |
| | 10/1/1992 | SECOR | 17.44 | 11.65 | -- | 0.00 | 5.79 |
| | 10/8/1992 | SECOR | 17.44 | 11.85 | -- | 0.00 | 5.59 |
| | 10/23/1992 | SECOR | 17.44 | 11.80 | -- | 0.00 | 5.64 |
| | 10/28/1992 | SECOR | 17.44 | NM | NM | NM | NM |
| | 11/20/1992 | SECOR | 17.44 | 11.33 | -- | 0.00 | 6.11 |
| | 12/8/1992 | SECOR | 17.44 | 11.00 | -- | 0.00 | 6.44 |
| | 12/22/1992 | SECOR | 17.44 | 10.84 | -- | 0.00 | 6.60 |
| | 1/8/1993 | SECOR | 17.44 | 11.11 | -- | 0.03* | 6.36 |
| | 1/19/1993 | SECOR | 17.44 | 10.87 | -- | 0.08* | 6.64 |
| | 2/2/1993 | SECOR | 17.44 | 10.85 | -- | 0.21 | 6.78 |
| | 2/19/1993 | SECOR | 17.44 | 11.58 | -- | 0.78 | 6.57 |
| | 3/3/1993 | SECOR | 17.44 | 11.96 | -- | 0.84 | 6.24 |
| | 10/18-19/1999 | URS | 17.44 | 14.15 | 11.51 | 2.64 | 5.69 |
| | 1/5/2000 | URS | 17.44 | 13.75 | 10.40 | 3.35 | 6.74 |
| | 5/2-3/2000 | URS | 17.44 | 14.06 | 10.88 | 3.18 | 6.27 |
| | 8/22-23/2000 | URS | 17.44 | 11.49 | -- | 0.00 | 5.95 |
| | 12/12-13/2000 | URS | 17.44 | 13.61 | 11.22 | 2.39 | 6.00 |
| | 2/14-15/2001 | URS | 17.44 | 13.46 | 10.95 | 2.51 | 6.26 |
| | 4/9/2002 | Kane | 17.44 | 14.80 | 11.71 | 3.09 | 5.45 |
| | 4/24/2004 | Kane | 17.44 | 14.25 | 11.52 | 2.73 | 5.67 |
| | 5/18/2005 | Farallon | 17.44 | 13.28 | 11.14 | 2.14 | 6.11 |
| | 12/13/2005 | Farallon | 17.44 | 12.85 | 11.61 | 1.24 | 5.72 |

**Table C-5**
**Summary of Groundwater Elevation and LNAPL Data**
**Jorgensen Forge Facility**
**Seattle, Washington**
**Farallon PN: 831-003**

| Monitoring Well ID | Date Collected | Collected By | Casing Elevation (feet)[1] | Depth to Water (feet)[2] | Depth to LNAPL (feet) | LNAPL Thickness (feet) | Potentiometric Surface Elevation[3] (feet)[4] |
|---|---|---|---|---|---|---|---|
| MW-14 | 9/9/1992 | SECOR | 17.64 | 11.94 | -- | 0.00 | 5.70 |
| | 9/17/1992 | SECOR | 17.64 | 11.91 | -- | 0.00 | 5.73 |
| | 9/21/1992 | SECOR | 17.64 | 11.93 | -- | 0.00 | 5.71 |
| | 10/1/1992 | SECOR | 17.64 | 11.79 | -- | 0.00 | 5.85 |
| | 10/8/1992 | SECOR | 17.64 | 11.96 | -- | 0.00 | 5.68 |
| | 10/23/1992 | SECOR | 17.64 | 11.92 | -- | 0.00 | 5.72 |
| | 10/28/1992 | SECOR | 17.64 | NM | NM | NM | NM |
| | 11/20/1992 | SECOR | 17.64 | NM | NM | NM | NM |
| | 12/8/1992 | SECOR | 17.64 | 11.15 | -- | 0.00 | 6.49 |
| | 12/22/1992 | SECOR | 17.64 | 10.94 | -- | 0.00 | 6.70 |
| | 1/8/1993 | SECOR | 17.64 | 11.04 | -- | 0.00 | 6.60 |
| | 1/19/1993 | SECOR | 17.64 | 11.03 | -- | 0.00 | 6.61 |
| | 2/2/1993 | SECOR | 17.64 | 10.79 | -- | 0.00 | 6.85 |
| | 2/19/1993 | SECOR | 17.64 | 10.98 | -- | 0.00 | 6.66 |
| | 3/3/1993 | SECOR | 17.64 | 11.30 | -- | 0.00 | 6.34 |
| | 10/18-19/1999 | URS | 17.64 | NM | NM | NM | NM |
| | 1/5/2000 | URS | 17.64 | 11.00 | -- | 0.00 | 6.64 |
| | 5/2-3/2000 | URS | 17.64 | 11.38 | -- | 0.00 | 6.26 |
| | 8/22-23/2000 | URS | 17.64 | 12.02 | -- | 0.00 | 5.62 |
| | 12/12-13/2000 | URS | 17.64 | 11.66 | -- | 0.00 | 5.98 |
| | 2/14-15/2001 | URS | 17.64 | 11.43 | -- | 0.00 | 6.21 |
| | 4/9/2002 | Kane | 17.64 | 11.19 | -- | 0.00 | 6.45 |
| | 4/24/2004 | Kane | 17.64 | NM | NM | NM | NM |
| | 5/18/2005 | Farallon | 17.64 | 11.44 | -- | 0.00 | 6.20 |
| | 12/13/2005 | Farallon | 17.64 | 11.88 | -- | 0.00 | 5.76 |

**Table C-5**
**Summary of Groundwater Elevation and LNAPL Data**
**Jorgensen Forge Facility**
**Seattle, Washington**
**Farallon PN: 831-003**

| Monitoring Well ID | Date Collected | Collected By | Casing Elevation (feet)[1] | Depth to Water (feet)[2] | Depth to LNAPL (feet) | LNAPL Thickness (feet) | Potentiometric Surface Elevation[3] (feet)[4] |
|---|---|---|---|---|---|---|---|
| MW-15 | 9/9/1992 | SECOR | 17.65 | 11.82 | -- | 0.00 | 5.83 |
| | 9/17/1992 | SECOR | 17.65 | 11.87 | -- | 0.00 | 5.78 |
| | 9/21/1992 | SECOR | 17.65 | 11.89 | -- | 0.00 | 5.76 |
| | 10/1/1992 | SECOR | 17.65 | 11.75 | -- | 0.00 | 5.90 |
| | 10/8/1992 | SECOR | 17.65 | 11.89 | -- | 0.00 | 5.76 |
| | 10/23/1992 | SECOR | 17.65 | 11.87 | -- | 0.00 | 5.78 |
| | 10/28/1992 | SECOR | 17.65 | NM | NM | NM | NM |
| | 11/20/1992 | SECOR | 17.65 | 11.38 | -- | 0.00 | 6.27 |
| | 12/8/1992 | SECOR | 17.65 | 11.14 | -- | 0.00 | 6.51 |
| | 12/22/1992 | SECOR | 17.65 | 10.89 | -- | 0.00 | 6.76 |
| | 1/8/1993 | SECOR | 17.65 | 10.95 | -- | 0.00 | 6.70 |
| | 1/19/1993 | SECOR | 17.65 | 10.95 | -- | 0.00 | 6.70 |
| | 2/2/1993 | SECOR | 17.65 | 10.72 | -- | 0.00 | 6.93 |
| | 2/19/1993 | SECOR | 17.65 | 10.90 | -- | 0.00 | 6.75 |
| | 3/3/1993 | SECOR | 17.65 | 11.21 | -- | 0.00 | 6.44 |
| | 10/18-19/1999 | URS | 17.65 | 9.41 | -- | 0.00 | 8.24 |
| | 1/5/2000 | URS | 17.65 | 10.17 | -- | 0.00 | 7.48 |
| | 5/2-3/2000 | URS | 17.65 | 11.26 | -- | 0.00 | 6.39 |
| | 8/22-23/2000 | URS | 17.65 | 11.95 | -- | 0.00 | 5.70 |
| | 12/12-13/2000 | URS | 17.65 | 11.62 | -- | 0.00 | 6.03 |
| | 2/14-15/2001 | URS | 17.65 | 10.83 | -- | 0.00 | 6.82 |
| | 4/9/2002 | Kane | 17.65 | 10.36 | -- | 0.00 | 7.29 |
| | 4/11/2003 | Farallon | 17.65 | 8.77 | -- | 0.00 | 8.88 |
| | 4/24/2004 | Kane | 17.65 | 10.58 | -- | 0.00 | 7.07 |
| | 5/18/2005 | Farallon | 17.65 | 10.25 | -- | 0.00 | 7.40 |
| | 12/13/2005 | Farallon | 17.65 | 11.69 | -- | 0.00 | 5.96 |

**Table C-5**
**Summary of Groundwater Elevation and LNAPL Data**
**Jorgensen Forge Facility**
**Seattle, Washington**
**Farallon PN: 831-003**

| Monitoring Well ID | Date Collected | Collected By | Casing Elevation (feet)[1] | Depth to Water (feet)[2] | Depth to LNAPL (feet) | LNAPL Thickness (feet) | Potentiometric Surface Elevation[3] (feet)[4] |
|---|---|---|---|---|---|---|---|
| MW-16 | 9/9/1992 | SECOR | 17.72 | NM | NM | NM | NM |
| | 9/17/1992 | SECOR | 17.72 | NM | NM | NM | NM |
| | 9/21/1992 | SECOR | 17.72 | NM | NM | NM | NM |
| | 10/2/1992 | SECOR | 17.72 | 13.89 | -- | 2.27 | 5.90 |
| | 10/8/1992 | SECOR | 17.72 | NM | NM | NM | NM |
| | 10/23/1992 | SECOR | 17.72 | NM | NM | NM | NM |
| | 10/28/1992 | SECOR | 17.72 | NM | NM | NM | NM |
| | 11/20/1992 | SECOR | 17.72 | 13.41 | 11.39 | 2.02 | 6.15 |
| | 12/8/1992 | SECOR | 17.72 | 13.58 | 10.88 | 2.70 | 6.60 |
| | 12/22/1992 | SECOR | 17.72 | 13.90 | 10.67 | 3.23 | 6.76 |
| | 1/8/1993 | SECOR | 17.72 | NM | NM | NM | NM |
| | 1/19/1993 | SECOR | 17.72 | 15.33 | 10.50 | 4.83 | 6.79 |
| | 2/2/1993 | SECOR | 17.72 | 15.72 | 10.24 | 5.48 | 6.99 |
| | 2/19/1993 | SECOR | 17.72 | 16.56 | 10.25 | 6.31 | 6.90 |
| | 3/3/1993 | SECOR | 17.72 | 16.56 | 10.50 | 6.06 | 6.67 |
| | 10/18-19/1999 | URS | 17.72 | 15.50 | 11.00 | 4.50 | 6.32 |
| | 1/5/2000 | URS | 17.72 | 15.46 | 9.69 | 5.77 | 7.51 |
| | 5/2-3/2000 | URS | 17.72 | 15.49 | 10.27 | 5.22 | 6.98 |
| | 8/22-23/2000 | URS | 17.72 | 15.45 | 11.03 | 4.42 | 6.29 |
| | 12/12-13/2000 | URS | 17.72 | 14.50 | 10.72 | 3.78 | 6.66 |
| | 2/14-15/2001 | URS | 17.72 | 15.42 | 10.36 | 5.06 | 6.90 |
| | 4/9/2002 | Kane | 17.72 | 17.00 | 11.20 | 5.80 | 6.00 |
| | 4/24/2004 | Kane | 17.72 | 15.09 | 10.03 | 5.06 | 7.23 |
| | 12/29/2004 | Farallon | 17.72 | 15.38 | 9.98 | 5.40 | 7.25 |
| | 5/18/2005 | Farallon | 17.72 | 15.45 | 10.38 | 5.07 | 6.88 |
| | 12/13/2005 | Farallon | 17.72 | 17.72 | 11.00 | 6.72 | 6.12 |
| MW-17 | 10/18-19/1999 | URS | 17.61 | NM | NM | NM | NM |
| | 1/5/2000 | URS | 17.61 | NM | NM | NM | NM |
| | 5/2-3/2000 | URS | 17.61 | NM | NM | NM | NM |
| | 8/22-23/2000 | URS | 17.61 | 16.71 | 11.12 | 5.59 | 5.99 |
| | 12/12-13/2000 | URS | 17.61 | 17.32 | 10.90 | 6.42 | 6.13 |
| | 2/14-15/2001 | URS | 17.61 | 16.02 | 10.45 | 5.57 | 6.66 |
| | 4/9/2002 | Kane | 17.61 | 14.70 | 10.90 | 3.80 | 6.37 |
| | 4/24/2004 | Kane | 17.61 | NM | NM | NM | NM |
| | 5/18/2005 | Farallon | 17.61 | 13.90 | 10.25 | 3.65 | 7.03 |
| | 12/13/2005 | Farallon | 17.61 | 16.20 | 10.92 | 5.28 | 6.21 |

**Table C-5**
**Summary of Groundwater Elevation and LNAPL Data**
**Jorgensen Forge Facility**
**Seattle, Washington**
**Farallon PN: 831-003**

| Monitoring Well ID | Date Collected | Collected By | Casing Elevation (feet)[1] | Depth to Water (feet)[2] | Depth to LNAPL (feet) | LNAPL Thickness (feet) | Potentiometric Surface Elevation[3] (feet)[4] |
|---|---|---|---|---|---|---|---|
| MW-18 | 9/9/1992 | SECOR | 17.51 | 12.11 | -- | 0.00 | 5.40 |
| | 9/17/1992 | SECOR | 17.51 | 12.02 | -- | 0.00 | 5.49 |
| | 9/21/1992 | SECOR | 17.51 | 12.13 | -- | 0.00 | 5.38 |
| | 10/1/1992 | SECOR | 17.51 | 11.78 | -- | 0.00 | 5.73 |
| | 10/8/1992 | SECOR | 17.51 | 12.06 | -- | 0.00 | 5.45 |
| | 10/23/1992 | SECOR | 17.51 | 12.03 | -- | 0.00 | 5.48 |
| | 10/28/1992 | SECOR | 17.51 | NM | NM | NM | NM |
| | 11/20/1992 | SECOR | 17.51 | 11.45 | -- | 0.00 | 6.06 |
| | 12/8/1992 | SECOR | 17.51 | 11.41 | -- | 0.80 | 6.83 |
| | 12/22/1992 | SECOR | 17.51 | 9.23 | -- | 0.06 | 8.33 |
| | 1/8/1993 | SECOR | 17.51 | NM | NM | NM | NM |
| | 1/19/1993 | SECOR | 17.51 | 9.15 | -- | 0.30 | 8.63 |
| | 2/2/1993 | SECOR | 17.51 | 13.44 | -- | 3.55 | 7.30 |
| | 2/19/1993 | SECOR | 17.51 | —** | -- | 2.72** | -- |
| | 3/3/1993 | SECOR | 17.51 | —** | -- | 2.42** | -- |
| | 10/18-19/1999 | URS | 17.51 | 12.10 | 11.50 | 0.60 | 5.96 |
| | 1/5/2000 | URS | 17.51 | 11.51 | 10.11 | 1.40 | 7.27 |
| | 5/2-3/2000 | URS | 17.51 | NM | NM | NM | NM |
| | 8/22-23/2000 | URS | 17.51 | 12.10 | 11.65 | 0.45 | 5.82 |
| | 12/12-13/2000 | URS | 17.51 | 13.65 | 11.20 | 2.45 | 6.09 |
| | 2/14-15/2001 | URS | 17.51 | 11.55 | 10.82 | 0.73 | 6.62 |
| | 4/9/2002 | Kane | 17.51 | NM | NM | NM | NM |
| | 4/24/2004 | Kane | 17.51 | NM | NM | NM | NM |
| | 5/18/2005 | Farallon | 17.51 | 11.69 | 10.05 | 1.64 | 7.31 |
| | 12/13/2005 | Farallon | 17.51 | 11.60 | 11.02 | 0.58 | 6.44 |

**Table C-5**
**Summary of Groundwater Elevation and LNAPL Data**
**Jorgensen Forge Facility**
**Seattle, Washington**
**Farallon PN: 831-003**

| Monitoring Well ID | Date Collected | Collected By | Casing Elevation (feet)[1] | Depth to Water (feet)[2] | Depth to LNAPL (feet) | LNAPL Thickness (feet) | Potentiometric Surface Elevation[3] (feet)[4] |
|---|---|---|---|---|---|---|---|
| MW-19 | 9/9/1992 | SECOR | 17.47 | NM | NM | NM | NM |
| | 9/17/1992 | SECOR | 17.47 | NM | NM | NM | NM |
| | 9/21/1992 | SECOR | 17.47 | NM | NM | NM | NM |
| | 10/2/1992 | SECOR | 17.47 | 14.58 | -- | 3.98 | 6.51 |
| | 10/8/1992 | SECOR | 17.47 | NM | NM | NM | NM |
| | 10/23/1992 | SECOR | 17.47 | NM | NM | NM | NM |
| | 10/28/1992 | SECOR | 17.47 | 14.07 | -- | 3.95 | 6.99 |
| | 11/20/1992 | SECOR | 17.47 | 14.54 | -- | 4.20 | 6.75 |
| | 12/8/1992 | SECOR | 17.47 | 14.51 | -- | 4.54 | 7.09 |
| | 12/22/1992 | SECOR | 17.47 | 14.53 | -- | 4.70 | 7.22 |
| | 1/8/1993 | SECOR | 17.47 | 14.55 | -- | 4.72 | 7.22 |
| | 1/19/1993 | SECOR | 17.47 | 14.55 | -- | 4.69 | 7.19 |
| | 2/2/1993 | SECOR | 17.47 | 14.60 | -- | 4.98 | 7.40 |
| | 2/19/1993 | SECOR | 17.47 | 14.81 | -- | 5.07 | 7.27 |
| | 3/3/1993 | SECOR | 17.47 | 14.89 | -- | 4.76 | 6.91 |
| | 10/18-19/1999 | URS | 17.47 | 14.80 | 10.93 | 3.87 | 6.19 |
| | 1/5/2000 | URS | 17.47 | 14.85 | 9.72 | 5.13 | 7.29 |
| | 5/2-3/2000 | URS | 17.47 | 10.24 | NA | NA | 7.23 |
| | 8/22-23/2000 | URS | 17.47 | 14.70 | 11.01 | 3.69 | 6.13 |
| | 12/12-13/2000 | URS | 17.47 | 15.50 | 11.30 | 4.20 | 5.79 |
| | 2/14-15/2001 | URS | 17.47 | 14.78 | 9.98 | 4.80 | 7.06 |
| | 4/9/2002 | Kane | 17.47 | 15.76 | 10.99 | 4.77 | 6.05 |
| | 4/10/2003 | Farallon | 17.47 | 9.74 | -- | 5.04 | 12.32 |
| | 4/24/2004 | Kane | 17.47 | 13.84 | 8.86 | 4.98 | 8.16 |
| | 5/18/2005 | Farallon | 17.47 | 14.64 | 10.41 | 4.23 | 6.68 |
| | 12/13/2005 | Farallon | 17.47 | 14.90 | 10.80 | 4.10 | 6.30 |

**Table C-5**
**Summary of Groundwater Elevation and LNAPL Data**
**Jorgensen Forge Facility**
**Seattle, Washington**
**Farallon PN: 831-003**

| Monitoring Well ID | Date Collected | Collected By | Casing Elevation (feet)[1] | Depth to Water (feet)[2] | Depth to LNAPL (feet) | LNAPL Thickness (feet) | Potentiometric Surface Elevation[3] (feet)[4] |
|---|---|---|---|---|---|---|---|
| MW-20 | 9/9/1992 | SECOR | 18.22 | NM | NM | NM | NM |
| | 9/17/1992 | SECOR | 18.22 | NM | NM | NM | NM |
| | 9/21/1992 | SECOR | 18.22 | NM | NM | NM | NM |
| | 10/1/1992 | SECOR | 18.22 | 14.68 | -- | 4.30 | 7.45 |
| | 10/8/1992 | SECOR | 18.22 | NM | NM | NM | NM |
| | 10/23/1992 | SECOR | 18.22 | NM | NM | NM | NM |
| | 10/28/1992 | SECOR | 18.22 | 14.68 | -- | 4.18 | 7.34 |
| | 11/20/1992 | SECOR | 18.22 | 14.69 | -- | 4.44 | 7.57 |
| | 12/8/1992 | SECOR | 18.22 | 14.68 | -- | 4.76 | 7.87 |
| | 12/22/1992 | SECOR | 18.22 | 14.62 | -- | 4.80 | 7.97 |
| | 1/8/1993 | SECOR | 18.22 | 14.67 | -- | 4.86 | 7.97 |
| | 1/19/1993 | SECOR | 18.22 | 14.63 | -- | 5.08 | 8.21 |
| | 2/2/1993 | SECOR | 18.22 | 14.73 | -- | 5.39 | 8.39 |
| | 2/19/1993 | SECOR | 18.22 | 15.04 | -- | 5.61 | 8.29 |
| | 3/3/1993 | SECOR | 18.22 | 14.84 | -- | 4.92 | 7.86 |
| | 10/18-19/1999 | URS | 18.22 | 14.81 | 10.53 | 4.28 | 7.30 |
| | 1/5/2000 | URS | 18.22 | 14.96 | 9.37 | 5.59 | 8.35 |
| | 5/2-3/2000 | URS | 18.22 | 14.85 | 9.85 | 5.00 | 7.92 |
| | 8/22-23/2000 | URS | 18.22 | 14.65 | 10.35 | 4.30 | 7.48 |
| | 12/12-13/2000 | URS | 18.22 | 14.75 | 10.95 | 3.80 | 6.93 |
| | 2/14-15/2001 | URS | 18.22 | 14.72 | 10.19 | 4.53 | 7.62 |
| | 4/9/2002 | Kane | 18.22 | 17.76 | 10.29 | 7.47 | 7.26 |
| | 4/24/2004 | Kane | 18.22 | NM | NM | NM | NM |
| | 12/29/2004 | Farallon | 18.22 | 14.56 | 9.41 | 5.15 | 8.35 |
| | 5/18/2005 | Farallon | 18.22 | 14.81 | 9.46 | 5.35 | 8.28 |
| | 12/13/2005 | Farallon | 18.22 | 14.77 | 10.12 | 4.65 | 7.68 |

**Table C-5**
**Summary of Groundwater Elevation and LNAPL Data**
**Jorgensen Forge Facility**
**Seattle, Washington**
**Farallon PN: 831-003**

| Monitoring Well ID | Date Collected | Collected By | Casing Elevation (feet)[1] | Depth to Water (feet)[2] | Depth to LNAPL (feet) | LNAPL Thickness (feet) | Potentiometric Surface Elevation[3] (feet)[4] |
|---|---|---|---|---|---|---|---|
| MW-21[4] | 9/9/1992 | SECOR | 13.90 | NM | NM | NM | NM |
| | 9/17/1992 | SECOR | 13.90 | NM | NM | NM | NM |
| | 9/21/1992 | SECOR | 13.90 | NM | NM | NM | NM |
| | 10/1/1992 | SECOR | 13.90 | 14.76 | -- | 5.20 | 3.87 |
| | 10/8/1992 | SECOR | 13.90 | NM | NM | NM | NM |
| | 10/23/1992 | SECOR | 13.90 | NM | NM | NM | NM |
| | 10/28/1992 | SECOR | 13.90 | 14.78 | -- | 6.15 | 4.72 |
| | 11/20/1992 | SECOR | 13.90 | 14.75 | -- | 4.57 | 3.31 |
| | 12/8/1992 | SECOR | 13.90 | 14.73 | -- | 5.22 | 3.92 |
| | 12/22/1992 | SECOR | 13.90 | 14.73 | -- | 5.44 | 4.12 |
| | 1/8/1993 | SECOR | 13.90 | NM | -- | NM | NM |
| | 1/19/1993 | SECOR | 13.90 | 14.82 | -- | 6.80 | 5.27 |
| | 2/2/1993 | SECOR | 13.90 | 15.01 | -- | 7.05 | 5.31 |
| | 2/19/1993 | SECOR | 13.90 | 14.99 | -- | 6.65 | 4.96 |
| | 3/3/1993 | SECOR | 13.90 | 14.56 | -- | 5.50 | 4.35 |
| | 10/18-19/1999 | URS | 13.90 | 14.85 | 7.85 | 7.00 | 5.42 |
| | 1/5/2000 | URS | 13.90 | 14.52 | 6.97 | 7.55 | 6.25 |
| | 5/2-3/2000 | URS | 13.90 | NM | NM | NM | NM |
| | 8/22-23/2000 | URS | 13.90 | 13.22 | 7.85 | 5.37 | 5.57 |
| | 12/12-13/2000 | URS | 13.90 | 14.60 | 8.35 | 6.25 | 4.99 |
| | 2/14-15/2001 | URS | 13.90 | 14.59 | 7.78 | 6.81 | 5.51 |
| | 4/9/2002 | Kane | 13.90 | 14.90 | 6.89 | 8.01 | 6.29 |
| | 4/24/2004 | Kane | 13.90 | NM | NM | NM | NM |
| | 5/18/2005 | Farallon | 13.90 | 11.45 | 7.04 | 4.41 | 6.46 |
| | 12/13/2005 | Farallon | 13.90 | 14.00 | 7.77 | 6.23 | 5.57 |

**Table C-5**
**Summary of Groundwater Elevation and LNAPL Data**
**Jorgensen Forge Facility**
**Seattle, Washington**
**Farallon PN: 831-003**

| Monitoring Well ID | Date Collected | Collected By | Casing Elevation (feet)[1] | Depth to Water (feet)[2] | Depth to LNAPL (feet) | LNAPL Thickness (feet) | Potentiometric Surface Elevation[3] (feet)[4] |
|---|---|---|---|---|---|---|---|
| MW-22 | 9/9/1992 | SECOR | 16.98 | 11.72 | -- | 0.00 | 5.26 |
| | 9/17/1992 | SECOR | 16.98 | 11.62 | -- | 0.00 | 5.36 |
| | 9/21/1992 | SECOR | 16.98 | 11.67 | -- | 0.00 | 5.31 |
| | 10/1/1992 | SECOR | 16.98 | 11.30 | -- | 0.00 | 5.68 |
| | 10/8/1992 | SECOR | 16.98 | 11.64 | -- | 0.00 | 5.34 |
| | 10/23/1992 | SECOR | 16.98 | 11.60 | -- | 0.00 | 5.38 |
| | 10/28/1992 | SECOR | 16.98 | NM | NM | NM | — |
| | 11/20/1992 | SECOR | 16.98 | 10.97 | -- | 0.00 | 6.01 |
| | 12/8/1992 | SECOR | 16.98 | 9.73 | -- | 0.00 | 7.25 |
| | 12/22/1992 | SECOR | 16.98 | 6.57 | -- | 0.00 | 10.41 |
| | 1/8/1993 | SECOR | 16.98 | 5.41 | -- | 0.00 | 11.57 |
| | 1/19/1993 | SECOR | 16.98 | 5.17 | -- | 0.00 | 11.81 |
| | 2/2/1993 | SECOR | 16.98 | 6.46 | -- | 0.00 | 10.52 |
| | 2/19/1993 | SECOR | 16.98 | 6.97 | -- | 0.00 | 10.01 |
| | 3/3/1993 | SECOR | 16.98 | 7.73 | -- | 0.00 | 9.25 |
| | 10/18-19/1999 | URS | 16.98 | 7.70 | -- | 0.00 | 9.28 |
| | 1/5/2000 | URS | 16.98 | 7.72 | 7.21 | 0.51 | 9.72 |
| | 5/2-3/2000 | URS | 16.98 | 8.10 | 7.36 | 0.74 | 9.55 |
| | 8/22-23/2000 | URS | 16.98 | 9.18 | 7.99 | 1.19 | 8.88 |
| | 12/12-13/2000 | URS | 16.98 | 10.30 | 8.20 | 2.10 | 8.59 |
| | 2/14-15/2001 | URS | 16.98 | 8.62 | 7.78 | 0.84 | 9.12 |
| | 4/9/2002 | Kane | 16.98 | 8.71 | 6.76 | 1.95 | 10.04 |
| | 4/24/2004 | Kane | 16.98 | 6.92 | 6.21 | 0.71 | 10.71 |
| | 12/29/2004 | Farallon | 16.98 | 12.29 | 6.95 | 5.34 | 9.55 |
| | 5/18/2005 | Farallon | 16.98 | 12.22 | 6.94 | 5.28 | 9.56 |
| | 12/13/2005 | Farallon | 16.98 | 12.35 | 7.45 | 4.90 | 9.09 |
| MW-23 | 10/18-19/1999 | URS | 17.84 | 12.11 | -- | 0.00 | 5.73 |
| | 1/5/2000 | URS | 17.84 | 10.82 | -- | 0.00 | 7.02 |
| | 5/2-3/2000 | URS | 17.84 | 11.28 | -- | 0.00 | 6.56 |
| | 8/22-23/2000 | URS | 17.84 | 11.98 | -- | 0.00 | 5.86 |
| | 12/12-13/2000 | URS | 17.84 | 12.30 | -- | 0.00 | 5.54 |
| | 2/14-15/2001 | URS | 17.84 | 11.35 | -- | 0.00 | 6.49 |
| | 4/9/2002 | Kane | 17.84 | 10.08 | -- | 0.00 | 7.76 |
| | 4/24/2004 | Kane | 17.84 | 11.02 | -- | 0.00 | 6.82 |
| | 12/29/2004 | Farallon | 17.84 | 10.76 | -- | 0.00 | 7.08 |
| | 5/18/2005 | Farallon | 17.84 | 11.36 | -- | 0.00 | 6.48 |

**Table C-5**
**Summary of Groundwater Elevation and LNAPL Data**
**Jorgensen Forge Facility**
**Seattle, Washington**
**Farallon PN: 831-003**

| Monitoring Well ID | Date Collected | Collected By | Casing Elevation (feet)[1] | Depth to Water (feet)[2] | Depth to LNAPL (feet) | LNAPL Thickness (feet) | Potentiometric Surface Elevation[3] (feet)[4] |
|---|---|---|---|---|---|---|---|
| | 12/13/2005 | Farallon | 17.84 | 11.84 | -- | 0.00 | 6.00 |

**Table C-5**
**Summary of Groundwater Elevation and LNAPL Data**
**Jorgensen Forge Facility**
**Seattle, Washington**
**Farallon PN: 831-003**

| Monitoring Well ID | Date Collected | Collected By | Casing Elevation (feet)[1] | Depth to Water (feet)[2] | Depth to LNAPL (feet) | LNAPL Thickness (feet) | Potentiometric Surface Elevation[3] (feet)[4] |
|---|---|---|---|---|---|---|---|
| MW-24 | 10/18-19/1999 | URS | 17.88 | 12.55 | -- | 0.00 | 5.33 |
| | 1/5/2000 | URS | 17.88 | 11.14 | -- | 0.00 | 6.74 |
| | 5/2-3/2000 | URS | 17.88 | 12.78 | -- | 0.00 | 5.10 |
| | 8/22-23/2000 | URS | 17.88 | 12.55 | -- | 0.00 | 5.33 |
| | 12/12-13/2000 | URS | 17.88 | 11.92 | -- | 0.00 | 5.96 |
| | 2/14/2000 | URS | 17.88 | 11.69 | -- | 0.00 | 6.19 |
| | 4/9/2002 | Kane | 17.88 | 11.34 | -- | 0.00 | 6.54 |
| | 4/11/2003 | Farallon | 17.88 | 11.03 | -- | 0.00 | 6.85 |
| | 4/24/2004 | Kane | 17.88 | 11.52 | -- | 0.00 | 6.36 |
| | 5/18/2005 | Farallon | 17.88 | 11.52 | -- | 0.00 | 6.36 |
| | 12/13/2005 | Farallon | 17.88 | 11.95 | -- | 0.00 | 5.93 |
| MW-25 | 10/18-19/1999 | URS | 17.64 | 12.50 | -- | 0.00 | 5.14 |
| | 1/5/2000 | URS | 17.64 | NM | NM | NM | NM |
| | 5/2-3/2000 | URS | 17.64 | 11.82 | -- | 0.00 | 5.82 |
| | 8/22-23/2000 | URS | 17.64 | 12.52 | -- | 0.00 | 5.12 |
| | 12/12-13/2000 | URS | 17.64 | 11.88 | -- | 0.00 | 5.76 |
| | 2/14-15/2001 | URS | 17.64 | 11.59 | -- | 0.00 | 6.05 |
| | 4/9/2002 | Kane | 17.64 | 11.45 | -- | 0.00 | 6.19 |
| | 4/11/2003 | Farallon | 17.64 | 10.98 | -- | 0.00 | 6.66 |
| | 4/24/2004 | Kane | 17.64 | 12.01 | -- | 0.00 | 5.63 |
| | 12/29/2004 | Farallon | 17.64 | 6.86 | -- | 0.00 | 10.78 |
| | 5/18/2005 | Farallon | 17.64 | 11.46 | -- | 0.00 | 6.18 |
| | 12/13/2005 | Farallon | 17.64 | 11.80 | -- | 0.00 | 5.84 |
| MW-26 | 10/18-19/1999 | URS | 18.36 | 21.09 | 11.10 | 9.99 | 6.36 |
| | 1/5/2000 | URS | 18.36 | 20.98 | 9.93 | 11.05 | 7.44 |
| | 5/2-3/2000 | URS | 18.36 | 21.09 | 10.60 | 10.49 | 6.82 |
| | 8/22-23/2000 | URS | 18.36 | 20.72 | 11.31 | 9.41 | 6.20 |
| | 12/12-13/2000 | URS | 18.36 | 21.15 | 11.00 | 10.15 | 6.45 |
| | 2/14-15/2001 | URS | 18.36 | 21.15 | 10.62 | 10.53 | 6.79 |
| | 4/9/2002 | Kane | 18.36 | 21.02 | 11.13 | 9.89 | 6.34 |
| | 4/24/2004 | Kane | 18.36 | NM | NM | NM | NM |
| | 5/18/2005 | Farallon | 18.36 | 10.80 | 10.35 | 0.45**** | 7.97 |
| | 12/13/2005 | Farallon | 18.36 | 19.35 | 10.92 | 8.43 | 6.68 |

**Table C-5**
**Summary of Groundwater Elevation and LNAPL Data**
**Jorgensen Forge Facility**
**Seattle, Washington**
**Farallon PN: 831-003**

| Monitoring Well ID | Date Collected | Collected By | Casing Elevation (feet)[1] | Depth to Water (feet)[2] | Depth to LNAPL (feet) | LNAPL Thickness (feet) | Potentiometric Surface Elevation[3] (feet)[4] |
|---|---|---|---|---|---|---|---|
| MW-27 | 10/18-19/1999 | URS | 18.15 | 18.50 | 11.52 | 6.98 | 6.00 |
| | 1/5/2000 | URS | 18.15 | 18.20 | 10.28 | 7.92 | 7.16 |
| | 5/2-3/2000 | URS | 18.15 | 18.55 | 10.90 | 7.65 | 6.56 |
| | 8/22-23/2000 | URS | 18.15 | 18.66 | 11.64 | 7.02 | 5.88 |
| | 12/12-13/2000 | URS | 18.15 | 18.30 | 11.25 | 7.05 | 6.27 |
| | 2/14-15/2001 | URS | 18.15 | 18.20 | 7.85 | 10.35 | 9.37 |
| | 4/9/2002 | Kane | 18.15 | 19.93 | 11.59 | 8.34 | 5.81 |
| | 4/24/2004 | Kane | 18.15 | NM | NM | NM | NM |
| | 5/18/2005 | Farallon | 18.15 | 12.15 | 10.71 | 1.44 | 7.31 |
| | 12/13/2005 | Farallon | 18.15 | 21.20 | 11.22 | 9.98 | 6.03 |
| MW-28 | 10/18-19/1999 | URS | 18.35 | 19.00 | 11.20 | 7.80 | 6.45 |
| | 1/5/2000 | URS | 18.35 | 18.20 | 10.53 | 7.67 | 7.13 |
| | 5/2-3/2000 | URS | 18.35 | 17.90 | 11.25 | 6.65 | 6.50 |
| | 8/22-23/2000 | URS | 18.35 | 18.41 | 11.82 | 6.59 | 5.94 |
| | 12/12-13/2000 | URS | 18.35 | 18.80 | 11.70 | 7.10 | 6.01 |
| | 2/14-15/2001 | URS | 18.35 | 18.14 | 11.24 | 6.90 | 6.49 |
| | 4/9/2002 | Kane | 18.35 | 18.30 | 11.70 | 6.60 | 6.06 |
| | 4/24/2004 | Kane | 18.35 | 18.49 | 10.62 | 7.87 | 7.02 |
| | 12/29/2004 | Farallon | 18.35 | 13.51 | 10.25 | 3.26**** | 7.81 |
| | 5/18/2005 | Farallon | 18.35 | 10.93 | 0.00 | 0**** | 7.42 |
| | 12/13/2005 | Farallon | 18.35 | 17.35 | 11.22 | 6.13 | 6.58 |
| MW-29 | 10/18-19/1999 | URS | 18.24 | 21.55 | 11.23 | 10.32 | 6.08 |
| | 1/5/2000 | URS | 18.24 | 21.38 | 10.00 | 11.38 | 7.22 |
| | 5/2-3/2000 | URS | 18.24 | 21.42 | 10.67 | 10.75 | 6.60 |
| | 8/22-23/2000 | URS | 18.24 | -- | 11.39 | 0.00 | — |
| | 12/12-13/2000 | URS | 18.24 | 21.35 | 11.00 | 10.35 | 6.31 |
| | 2/14-15/2001 | URS | 18.24 | 21.29 | 10.73 | 10.56 | 6.56 |
| | 4/9/2002 | Kane | 18.24 | 22.59 | 11.39 | 11.20 | 5.84 |
| | 4/24/2004 | Kane | 18.24 | NM | NM | NM | NM |
| | 5/18/2005 | Farallon | 18.24 | 18.24 | 10.99 | 7.25 | 6.60 |
| | 12/13/2005 | Farallon | 18.24 | 18.72 | 11.50 | 7.22 | 6.09 |

**Table C-5**
**Summary of Groundwater Elevation and LNAPL Data**
**Jorgensen Forge Facility**
**Seattle, Washington**
**Farallon PN: 831-003**

| Monitoring Well ID | Date Collected | Collected By | Casing Elevation (feet)[1] | Depth to Water (feet)[2] | Depth to LNAPL (feet) | LNAPL Thickness (feet) | Potentiometric Surface Elevation[3] (feet)[4] |
|---|---|---|---|---|---|---|---|
| MW-30 | 10/18-19/1999 | URS | 17.48 | 12.20 | -- | 0.00 | 5.28 |
| | 1/5/2000 | URS | 17.48 | 10.94 | -- | 0.00 | 6.54 |
| | 5/2-3/2000 | URS | 17.48 | 11.60 | -- | 0.00 | 5.88 |
| | 8/22-23/2000 | URS | 17.48 | NM | NM | NM | NM |
| | 12/12-13/2000 | URS | 17.48 | 11.70 | -- | 0.00 | 5.78 |
| | 2/14-15/2001 | URS | 17.48 | 11.33 | -- | 0.00 | 6.15 |
| | 4/9/2002 | Kane | 17.48 | 11.23 | -- | 0.00 | 6.25 |
| | 4/24/2004 | Kane | 17.48 | NM | NM | NM | NM |
| | 5/18/2005 | Farallon | 17.48 | 11.29 | -- | 0.00 | 6.19 |
| | 12/13/2005 | Farallon | 17.48 | 11.79 | -- | 0.00 | 5.69 |
| MW-31 | 10/18-19/1999 | URS | 17.50 | 12.36 | -- | 0.00 | 5.14 |
| | 1/5/2000 | URS | 17.50 | 11.06 | -- | 0.00 | 6.44 |
| | 5/2-3/2000 | URS | 17.50 | 11.82 | -- | 0.00 | 5.68 |
| | 8/22-23/2000 | URS | 17.50 | 12.41 | -- | 0.00 | 5.09 |
| | 12/12-13/2000 | URS | 17.50 | 11.77 | -- | 0.00 | 5.73 |
| | 2/14-15/2001 | URS | 17.50 | 11.51 | -- | 0.00 | 5.99 |
| | 4/9/2002 | Kane | 17.50 | 11.35 | -- | 0.00 | 6.15 |
| | 4/11/2003 | Farallon | 17.50 | 10.90 | -- | 0.00 | 6.60 |
| | 4/24/2004 | Kane | 17.50 | 11.42 | -- | 0.00 | 6.08 |
| | 12/29/2004 | Farallon | 17.50 | 10.76 | -- | 0.00 | 6.74 |
| | 5/18/2005 | Farallon | 17.50 | 11.40 | -- | 0.00 | 6.10 |
| | 12/13/2005 | Farallon | 17.50 | 11.70 | -- | 0.00 | 5.80 |
| MW-32 | 10/18-19/1999 | URS | 13.62 | 11.75 | -- | 0.00 | 1.87 |
| | 1/5/2000 | URS | 13.62 | 10.62 | -- | 0.00 | 3.00 |
| | 5/2-3/2000 | URS | 13.62 | 10.97 | -- | 0.00 | 2.65 |
| | 8/22-23/2000 | URS | 13.62 | 11.62 | -- | 0.00 | 2.00 |
| | 12/12-13/2000 | URS | 13.62 | 11.25 | -- | 0.00 | 2.37 |
| | 2/14-15/2001 | URS | 13.62 | 11.04 | -- | 0.00 | 2.58 |
| | 4/9/2002 | Kane | 13.62 | 10.94 | -- | 0.00 | 2.68 |
| | 4/24/2004 | Kane | 13.62 | 10.62 | -- | 0.00 | 3.00 |
| | 5/18/2005 | Farallon | 13.62 | NM | NM | NM | NM |
| | 12/13/2005 | Farallon | 13.62 | 11.54 | -- | 0.00 | 2.08 |

**Table C-5**
**Summary of Groundwater Elevation and LNAPL Data**
**Jorgensen Forge Facility**
**Seattle, Washington**
**Farallon PN: 831-003**

| Monitoring Well ID | Date Collected | Collected By | Casing Elevation (feet)[1] | Depth to Water (feet)[2] | Depth to LNAPL (feet) | LNAPL Thickness (feet) | Potentiometric Surface Elevation[3] (feet)[4] |
|---|---|---|---|---|---|---|---|
| MW-33 | 10/18-19/1999 | URS | 17.23 | 12.10 | 11.70 | 0.40 | 5.49 |
| | 1/5/2000 | URS | 17.23 | 11.71 | 10.38 | 1.33 | 6.73 |
| | 5/1/2000 | URS | 17.23 | 10.68 | NA | 0.00 | 6.55 |
| | 8/22-23/2000 | URS | 17.23 | 13.00 | 11.40 | 1.60 | 5.69 |
| | 12/12-13/2000 | URS | 17.23 | 13.12 | 11.00 | 2.12 | 6.04 |
| | 2/14-15/2001 | URS | 17.23 | 12.70 | 10.78 | 1.92 | 6.28 |
| | 4/9/2002 | Kane | 17.23 | NM | NM | NM | NM |
| | 4/11/2003 | Farallon | 17.23 | 12.04 | -- | 1.72 | 6.76 |
| | 4/24/2004 | Kane | 17.23 | 10.71 | -- | 0.00 | 6.52 |
| | 5/18/2005 | Farallon | 17.23 | 12.56 | 10.95 | 1.61 | 6.14 |
| | 12/13/2005 | Farallon | 17.23 | 12.86 | 11.32 | 1.54 | 5.77 |
| MW-34 | 10/18-19/1999 | URS | 17.13 | 11.39 | -- | 0.00 | 5.74 |
| | 1/5/2000 | URS | 17.13 | 10.36 | -- | 0.00 | 6.77 |
| | 5/2-3/2000 | URS | 17.13 | 10.81 | -- | 0.00 | 6.32 |
| | 8/22-23/2000 | URS | 17.13 | 11.43 | -- | 0.00 | 5.70 |
| | 12/12-13/2000 | URS | 17.13 | 11.08 | -- | 0.00 | 6.05 |
| | 2/14-15/2001 | URS | 17.13 | 10.85 | -- | 0.00 | 6.28 |
| | 4/9/2002 | Kane | 17.13 | 10.75 | -- | 0.00 | 6.38 |
| | 4/24/2004 | Kane | 17.13 | 10.92 | -- | 0.00 | 6.21 |
| | 5/18/2005 | Farallon | 17.13 | 10.96 | -- | 0.00 | 6.17 |
| | 12/13/2005 | Farallon | 17.13 | 11.40 | -- | 0.00 | 5.73 |
| MW-35[4] | 10/18-19/1999 | URS | 13.96 | 19.20 | 11.00 | 8.20 | 2.22 |
| | 1/5/2000 | URS | 13.96 | 18.85 | 9.70 | 9.15 | 3.44 |
| | 5/2-3/2000 | URS | 13.96 | NM | NM | NM | NM |
| | 8/22-23/2000 | URS | 13.96 | NM | NM | NM | NM |
| | 12/12-13/2000 | URS | 13.96 | NM | NM | NM | NM |
| | 2/14-15/2001 | URS | 13.96 | NM | NM | NM | NM |
| | 4/9/2002 | Kane | 13.96 | NM | NM | NM | NM |
| | 4/24/2004 | Kane | 13.96 | NM | NM | NM | NM |
| | 5/18/2005 | Farallon | 13.96 | NM | NM | NM | NM |
| | 12/13/2005 | Farallon | 13.96 | NM | NM | NM | NM |

**Table C-5**
**Summary of Groundwater Elevation and LNAPL Data**
**Jorgensen Forge Facility**
**Seattle, Washington**
**Farallon PN: 831-003**

| Monitoring Well ID | Date Collected | Collected By | Casing Elevation (feet)[1] | Depth to Water (feet)[2] | Depth to LNAPL (feet) | LNAPL Thickness (feet) | Potentiometric Surface Elevation[3] (feet)[4] |
|---|---|---|---|---|---|---|---|
| MW-36 | 10/18-19/1999 | URS | 17.41 | 12.14 | -- | 0.00 | 5.27 |
| | 1/5/2000 | URS | 17.41 | 10.97 | -- | 0.00 | 6.44 |
| | 5/2-3/2000 | URS | 17.41 | 11.36 | -- | 0.00 | 6.05 |
| | 8/22-23/2000 | URS | 17.41 | NM | NM | NM | NM |
| | 12/12-13/2000 | URS | 17.41 | 12.58 | -- | 0.00 | 4.83 |
| | 2/14-15/2001 | URS | 17.41 | 11.32 | -- | 0.00 | 6.09 |
| | 4/9/2002 | Kane | 17.41 | 11.17 | -- | 0.00 | 6.24 |
| | 4/11/2003 | Farallon | 17.41 | 10.85 | -- | 0.00 | 6.56 |
| | 4/24/2004 | Kane | 17.41 | 11.44 | -- | 0.00 | 5.97 |
| | 5/18/2005 | Farallon | 17.41 | 11.35 | -- | 0.00 | 6.06 |
| | 12/13/2005 | Farallon | 17.41 | 11.74 | -- | 0.00 | 5.67 |

NOTES:

[1]Relative elevation of top of casing, in feet, as surveyed by PLS, Inc., Issaquah, Washington, 8/22/2003.

[2]Depth to water below top of well casing.

[3]Potentiometric Surface = (Casing Elevation - Depth to Water) +0.91(LNAPL Thickness). The specific gravity for LNAPL is estimated at 0.91 (for tyipical diesel and/or oil).

[4]Top of casing elevation relative to arbitary benchmark datum of 15.00 feet established by SECOR, well not located during 8/22/2003 survey event.

* = LNAPL thickness as observed in polyethylene bailer.

**= Due to obstruction in MW-18, DTW was not measured and LNAPL thickness is minimum thickness.

***=Groundwater elevation (feet above mean sea level).

****= Measurement affected by equipment malufunction

— = insufficient data

Farallon = Farallon Consulting, L.L.C.

Kane = Kane Environmental, Inc.

LNAPL = light non-aqueous phase liquid

NM = not measured

SECOR = SECOR International, Inc.

TOC = top of casing

**APPENDIX D**
**THIRD PHASE INVESTIGATION CORING LOGS**

FINAL INVESTIGATION DATA SUMMARY REPORT
Jorgensen Forge Facility
8531 East Marginal Way South
Seattle, Washington
U.S. EPA Docket No. CERCLA 10-2003-0111

Farallon PN: 831-003

# Sediment Core Log: AJF-07SD

Date: 5/5/05

Drive Length in Feet (Field): 7

Recovery in Feet (Processing): 6.65

Percent Recovery: 95%

Type of Sample: Vibracore

Diameter of Sample: 4

Sample Quality: Good

Sediment Description

Mudline Elevation in Feet (MLLW): -5.5

Top 4 inches - worm tubes (1/16 dia.)
Moist, dark gray, medium stiff, slightly (v.f.) sandy SILT with moderate plasitcity (0/10/90)

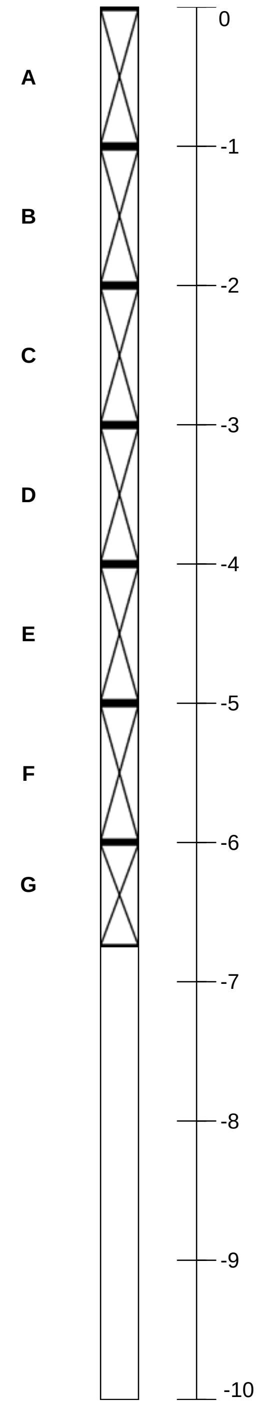
- Trace wood debris (black) at 24" to 37".

- Sediment is darker (black) in color from 3' to 4'.

Bottom of Sediment Core at 6.75 Feet.
Completed 5/5/05.

Notes:
1. Samples collected in approximately 1-foot intervals for the following analyses: PCBs (aroclor), metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel, silver, and zinc), total solids, and total organic carbon. Sample intervals were not corrected to account for percent recovery.
2. Coring conducted by Marine Sampling Systems and processing performed by Anchor Environmental, L.L.C.

Sample No. | Sample Symbol | Depth in Feet






ANCHOR ENVIRONMENTAL, L.L.C.

**Appendix B**
Sediment Core Log AJF-07SD
Third Phase Sampling Activities

# Sediment Core Log: AJF-11SD

Date: 5/5/05

Drive Length in Feet (Field): 6.5

Recovery in Feet (Processing): 5.7

Percent Recovery: 88%

Type of Sample: Vibracore

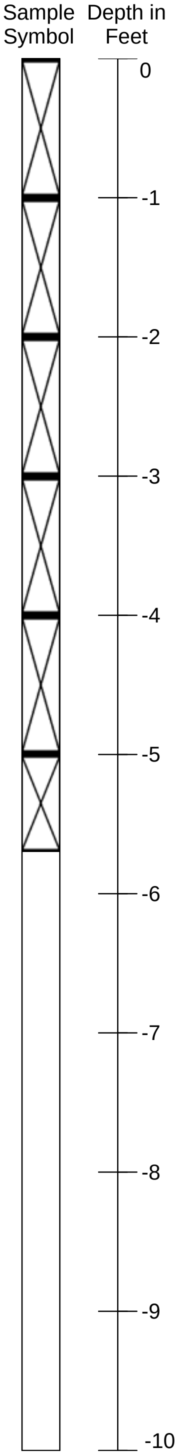
Diameter of Sample: 4

Sample Quality: Good

## Sediment Description

Mudline Elevation in Feet (MLLW): -0.4

| Sediment Description | Sample No. |
|---|---|
| Very soft, moist to wet, dark olive gray SILT (2" lense of black at 2" to 4" (2" rock at 5.5"). | A |
| Medium stiff, moist, olive gray, fine SAND and SILT. (low plasticity) (0/40/60). | B |
| Medium dense, moist, dark gray (with white and red), medium SAND. (0/100/0) | C, D, E, F |
| Bottom of Sediment Core at 5.7 feet.<br>Completed 5/5/05. | |




Notes:
1. Samples collected in approximately 1-foot intervals for the following analyses: PCBs (aroclor), metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel, silver, and zinc), total solids, and total organic carbon. Sample intervals were not corrected to account for percent recovery.
2. Coring conducted by Marine Sampling Systems and processing performed by Anchor Environmental, L.L.C.

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**Appendix B**
Sediment Core Log AJF-11SD
Third Phase Sampling Activities

# Sediment Core Log: AJF-12SD

Date: 5/5/05

Drive Length in Feet (Field): 6.5

Recovery in Feet (Processing): 5.6

Percent Recovery: 87%

Type of Sample: Vibracore

Diameter of Sample: 4

Sample Quality: Good

Sediment Description

Mudline Elevation in Feet (MLLW): -1.0

Soft to very soft, moist to wet, dark olive gray to black SILT. (high plasiticity) (0/0/100)

- Live worm at 6".

- Intach shells at 9.5" (1/2" dia.)

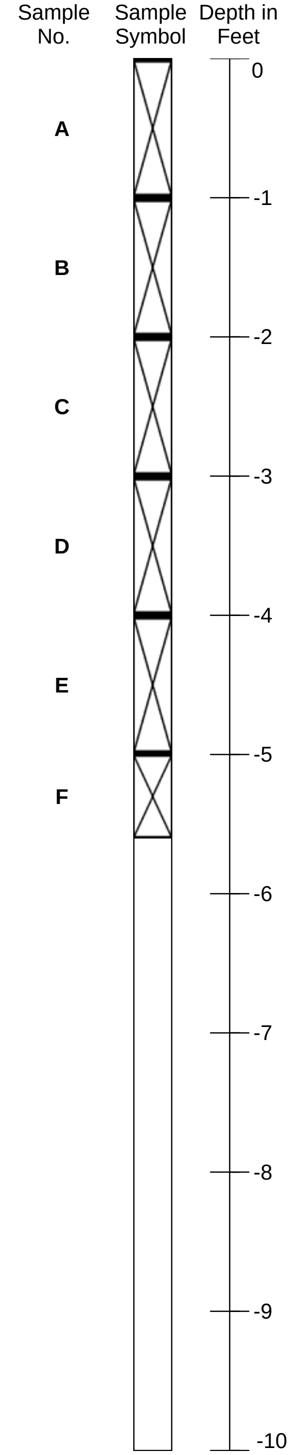
Alternating layers of soft, moist, dark gray SILT (0/10/90) and loose to medium dense, moist, coarse to fine SAND (0/95/95. Thickness varies 2" to 5"

- Very black from 3' to end of core.

- 3" lense of fine gravels. (15/80/5

Bottom of Sediment Core at 5.6 feet.
Completed 5/5/05.

Notes:
1. Samples collected in approximately 1-foot intervals for the following analyses: PCBs (aroclor), metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel, silver, and zinc), total solids, and total organic carbon. Sample intervals were not corrected to account for percent recovery.
2. Coring conducted by Marine Sampling Systems and processing performed by Anchor Environmental, L.L.C.



# Sediment Core Log: AJF-13SD

Date: 5/6/05

Drive Length in Feet (Field): 6.5

Recovery in Feet (Processing): 5.85

Percent Recovery: 90%

Type of Sample: Vibracore

Diameter of Sample: 4

Sample Quality: Good

Sediment Description

Mudline Elevation in Feet (MLLW): -0.2

| Sediment Description | Sample No. | Depth in Feet |
|---|---|---|
| Soft, wet, to moist, brown, fine, gravelly, sandy SILT. (10/15/75 | | 0 |
| Soft, wet, black SILT with few 1/2" lenses of fine sand. (medium plastsicity) (0/5/95) | A | |
| | B | -1 |
| Soft to medium stiff, moist, dark olive gray SILT. (low plasticity) (0/0/100<br>- Intact branch at 2.25' | C | -2 |
| Medium dense, moist, dark gray with white and red, coarse to fine SAND. (0/100/0) | D | -3 |
| | E | -4 |
| | F | -5 |
| Bottom of Sediment Core at 5.85 Feet.<br>Completed 5/6/05. | | -6 |
| | | -7 |
| | | -8 |
| | | -9 |
| | | -10 |

Notes:
1. Samples collected in approximately 1-foot intervals for the following analyses: PCBs (aroclor), metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel, silver, and zinc), total solids, and total organic carbon. Sample intervals were not corrected to account for percent recovery.
2. Coring conducted by Marine Sampling Systems and processing performed by Anchor Environmental, L.L.C.

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ANCHOR ENVIRONMENTAL, L.L.C.

# Sediment Core Log: AJF-14SD

Date: 5/5/05

Drive Length in Feet (Field): 6.0

Recovery in Feet (Processing): 4.8

Percent Recovery: 80%

Type of Sample: Vibracore

Diameter of Sample: 4

Sample Quality: Good

Sediment Description

Mudline Elevation in Feet (MLLW): -0.7

| Sediment Description | Sample No. | Depth in Feet |
|---|---|---|
| Very soft, wet, black SILT. (5/0/95)<br>2" of rock at top of core.<br>- 2" chunk of wood/layer at 10" | A | 0 to -1 |
| Loose, moist, dark olive gray, silty, coarse SAND with gravel. (10/60/30) | B | -1 to -2 |
| Medium dense, moist, dark gray, fine SAND. (0/100/0) | C, D, E | -2 to -4.8 |
| Bottom of Sediment Core at 4.8 feet.<br>Completed 5/5/05. | | |

Depth in Feet: 0, -1, -2, -3, -4, -5, -6, -7, -8, -9, -10

Notes:
1. Samples collected in approximately 1-foot intervals for the following analyses: PCBs (aroclor), metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel, silver, and zinc), total solids, and total organic carbon. Sample intervals were not corrected to account for percent recovery.
2. Coring conducted by Marine Sampling Systems and processing performed by Anchor Environmental, L.L.C.

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ANCHOR ENVIRONMENTAL, L.L.C.

**Appendix B**
Sediment Core Log AJF-14SD
Third Phase Sampling Activities

# Sediment Core Log: AJF-15SD

Date: 5/6/05

Drive Length in Feet (Field): 6.1

Recovery in Feet (Processing): 5.5

Percent Recovery: 90%

Type of Sample: Vibracore

Diameter of Sample: 4

Sample Quality: Good

Sediment Description

Mudline Elevation in Feet (MLLW): -1.2

Soft, moist to wet, dark gray to black SILT. (med to low plasticity) (0/0/100)

- Becomes stiff and moist at 1.1'.

Loose to medium dense, moist, dark gray, fine SAND. (0/100/0).

- Branch at 3.3'.

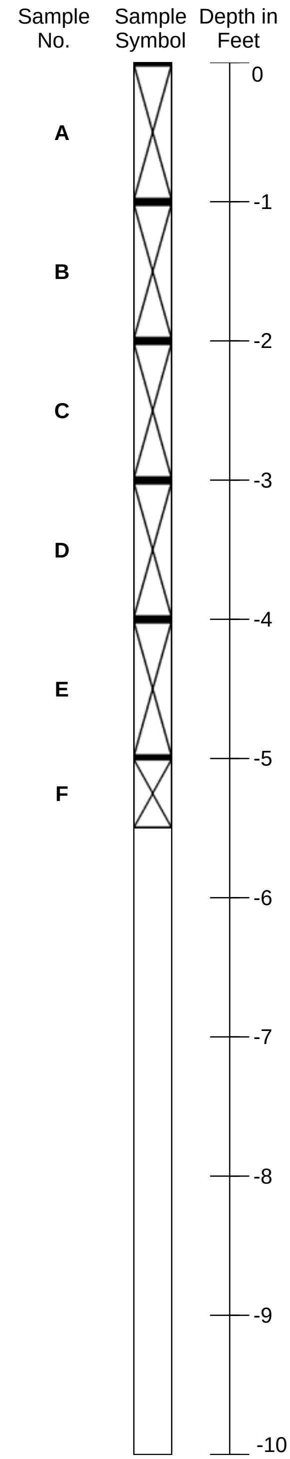
-Layer of very fiberous/wood vegetation material from 3.9' to 4.2' . (20/80/0).

Dense, large wood debris and sand. (50/50/50 all debris, no gravel)

Loose to medium dense, moist, dark gray, fine SAND with wood debris. (20/80/0)

Bottom of Sediment Core at 5.5 Feet.
Completed 5/5/05.

Notes:
1. Samples collected in approximately 1-foot intervals for the following analyses: PCBs (aroclor), metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel, silver, and zinc), total solids, and total organic carbon. Sample intervals were not corrected to account for percent recovery.
2. Coring conducted by Marine Sampling Systems and processing performed by Anchor Environmental, L.L.C.



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# Sediment Core Log: AJF-16SD

Date: 5/6/05

Type of Sample: Vibracore

Drive Length in Feet (Field): 6.8

Diameter of Sample: 4

Recovery in Feet (Processing): 5.4

Sample Quality: Good

Percent Recovery: 79%

Sediment Description

Mudline Elevation in Feet (MLLW): -1.0

| Sediment Description | Sample No. | Depth in Feet |
|---|---|---|
| Soft, wet to moist, dark olive gray to black SILT. (medium plasticity) (0/0/100) | A | 0 to -1 |
| | B | -1 to -2 |
| Alternating layers (~1" to 2" thick) of soft, wet to moist, dark olive gray to black SILT and moist, loose tomedium dense, dark gray, fine SAND. | | |
| Soft, wet to moist, dark olive gray to black SILT and moist, loose tomedium dense, dark gray, fine SAND.<br>- 3" dia. rocks at 2.5' and 2.8'. | C | -2 to -3 |
| | D | -3 to -4 |
| | E | -4 to -5 |
| | F | -5 to -5.4 |

Bottom of Sediment Core at 5.4 Feet.
Completed 5/5/05.

Notes:
1. Samples collected in approximately 1-foot intervals for the following analyses: PCBs (aroclor), metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel, silver, and zinc), total solids, and total organic carbon. Sample intervals were not correctd to accoung for percent recovery.
2. Coring conducted by Marine Sampling Systems and processing performed by Anchor Environmental, L.L.C.

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# APPENDIX E
# EXISTING LOWER DUWAMISH WATERWAY SURFACE AND SUBSURFACE SEDIMENT RESULTS

FINAL INVESTIGATION DATA SUMMARY REPORT
Jorgensen Forge Facility
8531 East Marginal Way South
Seattle, Washington
U.S. EPA Docket No. CERCLA 10-2003-0111

Farallon PN: 831-003

## Appendix E
## Existing Lower Duwamish Waterway Surface and Subsurface Sediment Results - Vicinity of Jorgensen Facility

| Location ID | | | | | CH0009 | CH0010 | CH0011 | DR184 | DR185 | DR186 | DR206 | DR206 | DR206 | DR207 | DR208 | DR209 | DR219 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample ID | | | | | CH03-01 | CH03-02 | CH03-03 | SD-184-0000 | SD-185-0000 | SD-186-0000 | SD-206-0000 | SD-206-0000A | SD-206-0020 | SD-207-0000 | SD-208-0000 | SD-209-0000 | SD-219-0000 |
| Sample Date | SMS Criteria | | | | 10/15/1997 | 10/15/1997 | 10/15/1997 | 8/19/1998 | 8/27/1998 | 8/27/1998 | 8/27/1998 | 9/22/1998 | 9/22/1998 | 8/27/1998 | 8/27/1998 | 8/27/1998 | 9/14/1998 |
| Depth Interval | SQS | CSL | LAET | 2LAET | 0-10 cm | 0-10 cm | 0-10 cm | 0-10 cm | 0-10 cm | 0-10 cm | 0-10 cm | 0-2 ft | 2-4 ft | 0-10 cm | 0-10 cm | 0-10 cm | 0-10 cm |
| **Conventionals** | | | | | | | | | | | | | | | | | |
| Total solids (%) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| TOC (%) | -- | -- | -- | -- | **1.91** | **1.74** | **1.89** | **2.21** | **1.96** | **2.01** | **2.97** | **0.79** | **2.45** | **3.17** | **1.29** | **1.03** | **2.22** |
| **Metals (mg/kg)** | | | | | | | | | | | | | | | | | |
| Aluminum | -- | -- | -- | -- | -- | -- | -- | **20900** | **22300** | **17900** | **26600** | **22300 J** | **22100** | **15300** | **15500** | **22400** | **21300** |
| Antimony | -- | -- | -- | -- | -- | -- | -- | 10 UJ | 10 U | 10 U | 10 UJ | 10 UJ | 10 UJ | **6 J** | 10 U | 10 U | 10 U |
| Arsenic | 57 | 93 | 57 | 93 | -- | -- | -- | **10.1** | **9.5** | **24.9** | **7.4** | **7 J** | **8** | **15.9** | **9.6** | **9.8** | **10.8** |
| Barium | -- | -- | -- | -- | -- | -- | -- | **69** | **64** | **69** | **75** | **73 J** | **91** | **52** | **41** | **72** | **72** |
| Beryllium | -- | -- | -- | -- | -- | -- | -- | **0.45** | **0.4** | **0.34** | **0.49** | **0.39 J** | **0.41** | **0.3** | **0.28** | **0.39** | **0.4 J** |
| Cadmium | 5.1 | 6.7 | 5.1 | 6.7 | -- | -- | -- | **0.3** | **0.4** | **1** | **0.4** | **0.39 J** | **0.74** | **0.2** | **0.2** | **0.2** | **0.3** |
| Calcium | -- | -- | -- | -- | -- | -- | -- | **5910** | **6160** | **5570** | **6920** | **5850 J** | **6150** | **7010** | **4780** | **3020** | **5840** |
| Chromium | 260 | 270 | 260 | 270 | -- | -- | -- | **27** | **31** | **180** | **34** | **29 J** | **30** | **26** | **22** | **14** | **28** |
| Cobalt | -- | -- | -- | -- | -- | -- | -- | **10** | **10** | **10** | **11** | **10 J** | **9** | **8** | **7** | **6** | **10** |
| Copper | 390 | 390 | 390 | 390 | -- | -- | -- | **47** | **44** | **157** | **46** | **50 J** | **53** | **42** | **32** | **26** | **44** |
| Iron | -- | -- | -- | -- | -- | -- | -- | **28100 J** | **28800** | **32000** | **32300 J** | **28600 J** | **28600** | **26700 J** | **24000** | **23900** | **30500** |
| Lead | 450 | 530 | 450 | 530 | -- | -- | -- | **18.5** | **26.2** | **152** | **16.9** | **31.6 J** | **48.2** | **46.4** | **25.9** | **12.7** | **24.6 J** |
| Magnesium | -- | -- | -- | -- | -- | -- | -- | **8500** | **8250** | **6780** | **9440** | **8110 J** | **7020** | **6850** | **5520** | **5780** | **8130** |
| Manganese | -- | -- | -- | -- | -- | -- | -- | **300** | **293** | **721** | **317** | **282 J** | **276** | **411** | **327** | **533** | **316** |
| Mercury | 0.41 | 0.59 | 0.41 | 0.59 | -- | -- | -- | **0.13** | **0.13** | **0.19** | **0.1** | **0.2 J** | **0.2** | **0.1** | **0.07** | **0.04 J** | **0.14** |
| Nickel | -- | -- | -- | -- | -- | -- | -- | **21.3** | **24.5** | **96.4** | **24.2** | **19.9 J** | **17.6** | **17.6** | **15.9** | **9.1** | **22.2** |
| Potassium | -- | -- | -- | -- | -- | -- | -- | **2700** | **2680** | **1900** | **3400** | **3100 J** | **2600** | **2800** | **2480** | **11100** | **2600** |
| Selenium | -- | -- | -- | -- | -- | -- | -- | **6 J** | **15.9** | **15** | **17.5 J** | 2 UJ | 2 U | **11 J** | **12** | **13** | 1 U |
| Silver | 6.1 | 6.1 | 6.1 | 6.1 | -- | -- | -- | **0.25** | **0.21** | **0.43** | **0.19** | **0.33 J** | **0.54** | **0.15** | **0.16** | **0.29** | **0.22** |
| Sodium | -- | -- | -- | -- | -- | -- | -- | **13200** | **12000** | **8520** | **14600** | **10700 J** | **5870** | **8200** | **8060** | **13000** | **12300** |
| Thallium | -- | -- | -- | -- | -- | -- | -- | **0.07 J** | **0.12** | **0.11** | **0.1** | **0.07 J** | **0.1 J** | **0.04** | **0.06** | **0.04 J** | **0.08 J** |
| Tin | -- | -- | -- | -- | -- | -- | -- | 2 UJ | 4 UJ | 9 UJ | 4 UJ | **5 J** | **6** | **6** | 4 UJ | 3 UJ | 4 UJ |
| Vanadium | -- | -- | | | -- | -- | -- | **60** | **67** | **66** | **81** | **65 J** | **65** | **61** | **55** | **39** | **65** |
| Zinc | 410 | 960 | 410 | 960 | -- | -- | -- | **95** | **94** | **240** | **93** | **113 J** | **120** | **131** | **79** | **66** | **96** |
| **PCBs (µg/kg)** | | | | | | | | | | | | | | | | | |
| Total PCBs | -- | -- | 130 | 1000 | -- | -- | -- | **139 J *** | **75 J** | **1178 J * #** | **205 J *** | **1250 J * #** | 40 UJ | **12000 J * #** | **388 J *** | **67 J** | **186 J *** |
| Total PCBs (field) | -- | -- | 130 | 1000 | -- | **10.22** | **73.63 * #** | **22.7 *** | -- | **14.29 *** | **40.83 *** | **13.51 *** | -- | -- | -- | **8.69** | -- |
| **PCBs (mg/kg-OC)** | | | | | | | | | | | | | | | | | |
| Total PCBs | 12 | 65 | -- | -- | **3.94764** | **0.68965** | **1.60317** | **6.28 J** | **3.82 J** | **58.6 J *** | **6.9 J** | **158.22 J * #** | 1.63 UJ | **378.54 J * #** | **30.07 J *** | **6.5 J** | **8.37 J** |
| Total PCBs (field) | 12 | 65 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |

**Appendix E**

**Existing Lower Duwamish Waterway Surface and Subsurface Sediment Results - Vicinity of Jorgensen Facility**

| Location ID | SMS Criteria | | | | DR229 | DR235 | DW-19 | DW-19 | EST149 | EST150 | EST152 | EST154 | EST155 | EST156 | EST157 | SD-DUW314 | SD-DUW314 | SD-DUW314 | SD-DUW314A |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample ID | | | | | SD-229-0000 | SD-235-0000 | DAC-DW-19 | DAC-DW-19A | EST11-01 | EST11-02 | EST11-03 | EST11-04 | EST11-05 | EST11-06 | EST11-07 | EST11-08 | EST11-09 | EST11-10 | EST11-11 |
| Sample Date | | | | | 8/27/1998 | 8/26/1998 | 6/15/1994 | 6/15/1994 | 11/13/1997 | 10/21/1997 | 9/24/1997 | 9/24/1997 | 9/24/1997 | 9/24/1997 | 9/24/1997 | 9/24/1997 | 9/24/1997 | 9/25/1997 | 11/13/1997 |
| Depth Interval | SQS | CSL | LAET | 2LAET | 0-10 cm | 0-10 cm | 0-10 cm | 0-2 cm | 0-10 cm | 0-10 cm | 0-10 cm | 0-10 cm | 0-10 cm | 0-10 cm | 0-10 cm | 0-10 cm | 0-10 cm | 0-10 cm | 0-10 cm |
| **Conventionals** | | | | | | | | | | | | | | | | | | | |
| Total solids (%) | -- | -- | -- | -- | -- | -- | 49.7 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| TOC (%) | -- | -- | -- | -- | 2.04 | 1.92 | 2.39 | -- | 2.03 | 1.88 | 1.97 | 1.54 | 1.71 | 1.55 | 1.79 | 1.52 | 1.19 | 1.59 | 0.85 |
| **Metals (mg/kg)** | | | | | | | | | | | | | | | | | | | |
| Aluminum | -- | -- | -- | -- | 21800 | 21000 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Antimony | -- | -- | -- | -- | 10 UJ | 10 U | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Arsenic | 57 | 93 | 57 | 93 | 7.7 | 10 | 20 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Barium | -- | -- | -- | -- | 71 | 69 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Beryllium | -- | -- | -- | -- | 0.42 | 0.4 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Cadmium | 5.1 | 6.7 | 5.1 | 6.7 | 0.4 | 0.3 | 0.6 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Calcium | -- | -- | -- | -- | 6180 | 5980 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Chromium | 260 | 270 | 260 | 270 | 29 | 27 | 42 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Cobalt | -- | -- | -- | -- | 10 | 9 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Copper | 390 | 390 | 390 | 390 | 39 | 39 | 61.4 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Iron | -- | -- | -- | -- | 28400 J | 28800 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Lead | 450 | 530 | 450 | 530 | 16.6 | 18.5 | 46 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Magnesium | -- | -- | -- | -- | 7740 | 7650 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Manganese | -- | -- | -- | -- | 305 | 299 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Mercury | 0.41 | 0.59 | 0.41 | 0.59 | 0.13 | 0.13 | 0.34 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Nickel | -- | -- | -- | -- | 21.5 | 22 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Potassium | -- | -- | -- | -- | 2600 | 2460 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Selenium | -- | -- | -- | -- | 14.7 J | 14 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Silver | 6.1 | 6.1 | 6.1 | 6.1 | 0.23 | 0.16 | 1.4 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Sodium | -- | -- | -- | -- | 11000 | 11200 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Thallium | -- | -- | -- | -- | 0.08 | 0.11 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Tin | -- | -- | -- | -- | 5 | 4 UJ | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Vanadium | -- | -- | | | 70 | 65 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Zinc | 410 | 960 | 410 | 960 | 85 | 85 | 146 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| **PCBs (µg/kg)** | | | | | | | | | | | | | | | | | | | |
| Total PCBs | -- | -- | 130 | 1000 | 22 J | 75 J | 130 J * | 990 J * | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Total PCBs (field) | -- | -- | 130 | 1000 | 150 * # | 399 * # | 618 * # | -- | 171 * # | -- | -- | -- | 3.54 | -- | -- | -- | -- | 0.81 U | -- |
| **PCBs (mg/kg-OC)** | | | | | | | | | | | | | | | | | | | |
| Total PCBs | 12 | 65 | -- | -- | 1.07 J | 3.9 J | 5.43 J | -- | 66.20 * # | 4.505 | 12.48 * | 8.27 | 16.26 * | 12.26 * | 1.23 | 3.80 | 7.74 | 2.07 | 18.65 * |
| Total PCBs (field) | 12 | 65 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |

## Appendix E
## Existing Lower Duwamish Waterway Surface and Subsurface Sediment Results - Vicinity of Jorgensen Facility

| Location ID | | | | | SD-DUW314A | R17 | R18 | R19 | SD-201-PL2 | SD-201-PL2 | SD-201-PL2 | SD-201-PL2 | SD-201-PL2 | SD-201-PL2 | SD-202-PL2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample ID | | | | | SD0011 | SD0010 | SD0018 | SD0019 | SD-201-0000-PL2 | SD-201-0010-PL2 | SD-201-0020-PL2 | SD-201-0030-PL2 | SD-201-0040-PL2 | SD-201-0050-PL2 | SD-202-0000-PL2 |
| Sample Date | SMS Criteria | | | | 10/10/1997 | 10/9/1997 | 10/11/1997 | 10/11/1997 | 4/21/2004 | 4/21/2004 | 4/21/2004 | 4/21/2004 | 4/21/2004 | 4/21/2004 | 4/22/2004 |
| Depth Interval | SQS | CSL | LAET | 2LAET | 0-10 cm | 0-10 cm | 0-10 cm | 0-10 cm | 0-1 ft | 1-2 ft | 2-3 ft | 3-4 ft | 4-5 ft | 5-5.7 ft | 0-1 ft |
| **Conventionals** | | | | | | | | | | | | | | | |
| Total solids (%) | -- | -- | -- | -- | **52.8** | **49.9** | **56.3** | **47.9** | **52.5** | **55.1** | **66.1** | **53.9** | **65.6** | **66.7** | **48.3** |
| TOC (%) | -- | -- | -- | -- | **1.1** | **1.2** | **1** | **1.3** | **2.1** | **2.47** | **2.08** | **2.35** | **1.42** | **2.61** | **2.88** |
| **Metals (mg/kg)** | | | | | | | | | | | | | | | |
| Aluminum | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Antimony | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Arsenic | 57 | 93 | 57 | 93 | **12.4** | **10.6** | **11.9** | **13.6** | -- | -- | -- | -- | -- | -- | -- |
| Barium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Beryllium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Cadmium | 5.1 | 6.7 | 5.1 | 6.7 | 0.4 U | 0.4 U | 0.4 U | 0.4 U | **0.7** | **1.2** | -- | -- | -- | -- | 0.4 U |
| Calcium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Chromium | 260 | 270 | 260 | 270 | **26** | **27** | **21** | **28** | **32.1** | **37.9** | -- | -- | -- | -- | **30 J** |
| Cobalt | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Copper | 390 | 390 | 390 | 390 | **37** | **44** | **32** | **41** | **64.8** | **62.5** | -- | -- | -- | -- | **56.3** |
| Iron | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Lead | 450 | 530 | 450 | 530 | **19** | **21** | **21** | **18** | **42** | **53** | -- | -- | -- | -- | **28** |
| Magnesium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Manganese | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Mercury | 0.41 | 0.59 | 0.41 | 0.59 | **0.09** | **0.1** | 0.08 U | **0.12** | **0.27** | **0.32** | -- | -- | -- | -- | **0.2** |
| Nickel | -- | -- | -- | -- | **24** | **24** | **17** | **25** | -- | -- | -- | -- | -- | -- | -- |
| Potassium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Selenium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Silver | 6.1 | 6.1 | 6.1 | 6.1 | 0.4 U | 0.4 U | 0.4 U | 0.4 U | **0.8** | **0.8** | -- | -- | -- | -- | 0.6 U |
| Sodium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Thallium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Tin | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Vanadium | -- | -- | | | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Zinc | 410 | 960 | 410 | 960 | **88** | **95** | **79** | **86** | **133** | **158** | -- | -- | -- | -- | **113** |
| **PCBs (µg/kg)** | | | | | | | | | | | | | | | |
| Total PCBs | -- | -- | 130 | 1000 | **2400 * #** | **177 *** | **201 *** | **193 *** | **338 *** | **2500 * #** | **3440 * #** | **319 *** | **217 *** | **50** | **110** |
| Total PCBs (field) | -- | -- | 130 | 1000 | -- | -- | 5.38 U | -- | -- | -- | **44.27 *** | **41.65 *** | **200 * #** | -- | **76.45 * #** |
| **PCBs (mg/kg-OC)** | | | | | | | | | | | | | | | |
| Total PCBs | 12 | 65 | -- | -- | **218 * #** | **14.75 *** | **20.1 *** | **14.84 *** | **16.09 *** | **101 * #** | **165 * #** | **13.57 *** | **15.28 *** | **1.91** | **3.81** |
| Total PCBs (field) | 12 | 65 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |

**Existing Lower Duwamish Waterway Surface and Subsurface Sediment Results - Vicinity of Jorgensen Facility**

| Location ID | | SMS Criteria | | | SD-202-PL2 | SD-203-PL2 | SD-203-PL2 | SD-203-PL2 | SD-204-PL2 | SD-204-PL2 | SD-204-PL2 | SD-204-PL2 | SD-204-PL2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample ID | | | | | SD-202-0010-PL2 | SD-203-0000-PL2 | SD-203-0010-PL2 | SD-203-0020-PL2 | SD-204-0000-PL2 | SD-204-0010-PL2 | SD-204-0020-PL2 | SD-204-0030-PL2 | SD-204-0040-PL2 |
| Sample Date | | | | | 4/22/2004 | 4/22/2004 | 4/22/2004 | 4/22/2004 | 4/22/2004 | 4/22/2004 | 4/22/2004 | 4/22/2004 | 4/22/2004 |
| Depth Interval | SQS | CSL | LAET | 2LAET | 1-2 ft | 0-1 ft | 1-2 ft | 2-2.9 ft | 0-1 ft | 1-2 ft | 2-3 ft | 3-4 ft | 4-5 ft |
| **Conventionals** | | | | | | | | | | | | | |
| Total solids (%) | -- | -- | -- | -- | **49.2** | **68.7** | **75.6** | **92.6** | **52.8** | **53.3** | **65.6** | **54.8** | **61.9** |
| TOC (%) | -- | -- | -- | -- | **2.03** | **1.39** | **1.05** | **0.28** | **2.28** | **1.84** | **1.35** | **2.23** | **2.03** |
| **Metals (mg/kg)** | | | | | | | | | | | | | |
| Aluminum | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Antimony | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Arsenic | 57 | 93 | 57 | 93 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Barium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Beryllium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Cadmium | 5.1 | 6.7 | 5.1 | 6.7 | 0.4 U | **0.8** | **2.4** | -- | 0.4 U | **0.5** | -- | -- | -- |
| Calcium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Chromium | 260 | 270 | 260 | 270 | **32 J** | **44.2 J** | **94.9 J** | **26.2 J** | **31 J** | **32 J** | -- | -- | -- |
| Cobalt | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Copper | 390 | 390 | 390 | 390 | **48.6** | **55.3** | **45.3** | **23.9 J** | **47.1** | **51.4** | -- | -- | -- |
| Iron | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Lead | 450 | 530 | 450 | 530 | **21** | **66** | **152** | -- | **26** | **30** | -- | -- | -- |
| Magnesium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Manganese | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Mercury | 0.41 | 0.59 | 0.41 | 0.59 | **0.22** | **0.13** | **0.18** | -- | **0.12** | **0.15** | -- | -- | -- |
| Nickel | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Potassium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Selenium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Silver | 6.1 | 6.1 | 6.1 | 6.1 | 0.6 U | **0.5** | **0.9** | -- | 0.6 U | 0.6 U | -- | -- | -- |
| Sodium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Thallium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Tin | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Vanadium | -- | -- | | | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Zinc | 410 | 960 | 410 | 960 | **97** | **183** | **567 *** | -- | **106** | **116** | -- | -- | -- |
| **PCBs (µg/kg)** | | | | | | | | | | | | | |
| Total PCBs | -- | -- | 130 | 1000 | **48 J** | **7100 J * #** | **6500 * #** | **38** | **125** | **243 *** | **281 *** | **7570 * #** | **4800 * #** |
| Total PCBs (field) | -- | -- | 130 | 1000 | **495 * #** | **202 * #** | -- | -- | -- | -- | **5.99** | -- | -- |
| **PCBs (mg/kg-OC)** | | | | | | | | | | | | | |
| Total PCBs | 12 | 65 | -- | -- | **2.36 J** | **511 J * #** | **619 * #** | **13.57 *** | **5.48** | **13.2 *** | **20.81 *** | **339 * #** | **236 * #** |
| Total PCBs (field) | 12 | 65 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |

## Existing Lower Duwamish Waterway Surface and Subsurface Sediment Results - Vicinity of Jorgensen Facility

| Location ID | SMS Criteria | | | | SD-204-PL2 | SD-204-PL2 | SD-204-PL2 | SD-204-PL2 | SD-205D-PL2 | SD-205D-PL2 | SD-205-PL2 | SD-205-PL2 | SD-206-PL2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample ID | | | | | SD-204-0050-PL2 | SD-204-0060-PL2 | SD-204-0070-PL2 | SD-204-0080-PL2 | SD-205D-0000-PL2 | SD-205D-0010-PL2 | SD-205-0000-PL2 | SD-205-0010-PL2 | SD-206-0000-PL2 |
| Sample Date | | | | | 4/22/2004 | 4/22/2004 | 4/22/2004 | 4/22/2004 | 4/23/2004 | 4/23/2004 | 4/22/2004 | 4/22/2004 | 4/20/2004 |
| Depth Interval | SQS | CSL | LAET | 2LAET | 5-6 ft | 6-6.9 ft | 7-7.8 ft | 8-8.7 ft | 0-1 ft | 1-2 ft | 0-1 ft | 1-2 ft | 0-1 ft |
| **Conventionals** | | | | | | | | | | | | | |
| Total solids (%) | -- | -- | -- | -- | **58.4** | **67.5** | **85.9** | **78.6** | **47.8** | **50.4** | **52** | **52.4** | **48.7** |
| TOC (%) | -- | -- | -- | -- | **2.12** | **1.62** | **0.61** | **0.73** | **2.82** | **2.51** | **2.25** | **2.03** | **2.1** |
| **Metals (mg/kg)** | | | | | | | | | | | | | |
| Aluminum | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Antimony | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Arsenic | 57 | 93 | 57 | 93 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Barium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Beryllium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Cadmium | 5.1 | 6.7 | 5.1 | 6.7 | -- | -- | -- | -- | **0.4** | **0.5** | 0.4 U | **0.5** | **0.4** |
| Calcium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Chromium | 260 | 270 | 260 | 270 | -- | -- | -- | -- | **31.3** | **30.9** | **30.3 J** | **32.8 J** | **33** |
| Cobalt | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Copper | 390 | 390 | 390 | 390 | -- | -- | -- | -- | **50.5** | **53** | **48.2** | **55.6** | **48.6** |
| Iron | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Lead | 450 | 530 | 450 | 530 | -- | -- | -- | -- | **26** | **32** | **24** | **39** | **29** |
| Magnesium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Manganese | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Mercury | 0.41 | 0.59 | 0.41 | 0.59 | -- | -- | -- | -- | **0.13** | **0.15** | **0.1** | **0.18** | **0.19 J** |
| Nickel | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Potassium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Selenium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Silver | 6.1 | 6.1 | 6.1 | 6.1 | -- | -- | -- | -- | 0.6 U | 0.5 U | 0.6 U | 0.5 U | 0.6 U |
| Sodium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Thallium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Tin | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Vanadium | -- | -- | | | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Zinc | 410 | 960 | 410 | 960 | -- | -- | -- | -- | **106** | **113** | **103** | **130** | **118** |
| **PCBs (µg/kg)** | | | | | | | | | | | | | |
| Total PCBs | -- | -- | 130 | 1000 | **4740 * #** | **2070 * #** | **542 *** | **690 *** | **83** | **158 *** | **117** | **128** | **74** |
| Total PCBs (field) | -- | -- | 130 | 1000 | **66.11 * #** | **51.63 * #** | **13.06 * #** | **32.03 *** | -- | -- | **44.49 *** | **18.26 *** | **16.78 *** |
| **PCBs (mg/kg-OC)** | | | | | | | | | | | | | |
| Total PCBs | 12 | 65 | -- | -- | **224 * #** | **128 * #** | **88.85 * #** | **94.52 * #** | **2.94** | **6.29** | **5.2** | **6.3** | **3.52** |
| Total PCBs (field) | 12 | 65 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |

## Appendix E
## Existing Lower Duwamish Waterway Surface and Subsurface Sediment Results - Vicinity of Jorgensen Facility

| Location ID | SMS Criteria | | | | SD-206-PL2 | SD-206-PL2 | SD-207-PL2 | SD-207-PL2 | SD-208-PL2 | SD-208-PL2 | SD-209-PL2 | SD-209-PL2 | SD-210D-PL2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample ID | | | | | SD-206-0010-PL2 | SD-206-0020-PL2 | SD-207-0000-PL2 | SD-207-0010-PL2 | SD-208-0000-PL2 | SD-208-0010-PL2 | SD-209-0000-PL2 | SD-209-0010-PL2 | SD-210D-0000-PL2 |
| Sample Date | | | | | 4/20/2004 | 4/20/2004 | 4/20/2004 | 4/20/2004 | 4/20/2004 | 4/20/2004 | 4/20/2004 | 4/20/2004 | 4/21/2004 |
| Depth Interval | SQS | CSL | LAET | 2LAET | 1-2 ft | 2-3 ft | 0-1 ft | 1-2 ft | 0-1 ft | 1-2 ft | 0-1 ft | 1-2 ft | 0-1 ft |
| **Conventionals** | | | | | | | | | | | | | |
| Total solids (%) | -- | -- | -- | -- | **52.3** | **61.6** | **48.8** | **53.8** | **53.3** | **61.3** | **46.1** | **50** | **62.5 J** |
| TOC (%) | -- | -- | -- | -- | **1.82** | **2.79** | **1.92** | **2.14** | **1.96** | **1.97** | **2.64** | **2.1** | **1.68 J** |
| **Metals (mg/kg)** | | | | | | | | | | | | | |
| Aluminum | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Antimony | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Arsenic | 57 | 93 | 57 | 93 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Barium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Beryllium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Cadmium | 5.1 | 6.7 | 5.1 | 6.7 | **0.8** | -- | **0.4** | **0.8** | **0.5** | **1.1** | 0.4 U | 0.4 U | -- |
| Calcium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Chromium | 260 | 270 | 260 | 270 | **32.6** | -- | **33.5** | **34.7** | **36.6** | **37** | **31** | **31.4** | -- |
| Cobalt | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Copper | 390 | 390 | 390 | 390 | **55.9** | -- | **53.2** | **60.7** | **50** | **50.2** | **54.5** | **50.3** | -- |
| Iron | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Lead | 450 | 530 | 450 | 530 | **52** | -- | **34** | **58** | **37** | **41** | **27** | **24** | -- |
| Magnesium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Manganese | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Mercury | 0.41 | 0.59 | 0.41 | 0.59 | **0.16 J** | -- | **0.17 J** | **0.16 J** | **0.12 J** | **0.26 J** | **0.1 J** | **0.17 J** | -- |
| Nickel | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Potassium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Selenium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Silver | 6.1 | 6.1 | 6.1 | 6.1 | **0.8** | -- | 0.6 U | **0.9** | 0.5 U | 0.5 U | 0.6 U | 0.6 U | -- |
| Sodium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Thallium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Tin | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Vanadium | -- | -- | | | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Zinc | 410 | 960 | 410 | 960 | **139** | -- | **119** | **144** | **118** | **178** | **117** | **109** | -- |
| **PCBs (µg/kg)** | | | | | | | | | | | | | |
| Total PCBs | -- | -- | 130 | 1000 | **221 *** | **146 *** | **175 *** | **156 *** | **94** | **137 *** | **19 J** | **26** | 20 U |
| Total PCBs (field) | -- | -- | 130 | 1000 | -- | **50.68 *** | **105 * #** | **51.13 *** | **8.75** | **27.29 *** | **11.44** | -- | -- |
| **PCBs (mg/kg-OC)** | | | | | | | | | | | | | |
| Total PCBs | 12 | 65 | -- | -- | **12.14 *** | **5.23** | **9.11** | **7.28** | **4.79** | **6.95** | **0.71 J** | **1.23** | 1.19 U |
| Total PCBs (field) | 12 | 65 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |

## Appendix E
## Existing Lower Duwamish Waterway Surface and Subsurface Sediment Results - Vicinity of Jorgensen Facility

| Location ID | | SMS Criteria | | | SD-210D-PL2 | SD-210-PL2 | SD-210-PL2 | SD-211-PL2 | SD-211-PL2 | SD-211-PL2 | SD-211-PL2 | SD-211-PL2 | SD-211-PL2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample ID | | | | | SD-210D-0010-PL2 | SD-210-0000-PL2 | SD-210-0010-PL2 | SD-211-0000-PL2 | SD-211-0010-PL2 | SD-211-0020-PL2 | SD-211-0030-PL2 | SD-211-0040-PL2 | SD-211-0050-PL2 |
| Sample Date | | | | | 4/21/2004 | 4/20/2004 | 4/20/2004 | 4/21/2004 | 4/21/2004 | 4/21/2004 | 4/21/2004 | 4/21/2004 | 4/21/2004 |
| Depth Interval | SQS | CSL | LAET | 2LAET | 1-2 ft | 0-1 ft | 1-2 ft | 0-1 ft | 1-2 ft | 2-3 ft | 3-4 ft | 4-4.8 ft | 5-5.8 ft |
| **Conventionals** | | | | | | | | | | | | | |
| Total solids (%) | -- | -- | -- | -- | **50.3** | **45.5 J** | **49.5 J** | **51.6** | **55** | **74.2** | **72.4** | **83.9** | **84.6** |
| TOC (%) | -- | -- | -- | -- | **1.87** | **2.86 J** | **2.34 J** | **1.99** | **1.89** | **1.5** | **1.44** | **0.74** | **0.1** |
| **Metals (mg/kg)** | | | | | | | | | | | | | |
| Aluminum | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Antimony | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Arsenic | 57 | 93 | 57 | 93 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Barium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Beryllium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Cadmium | 5.1 | 6.7 | 5.1 | 6.7 | -- | **0.4** | **0.4** | **1** | **0.9** | -- | -- | -- | -- |
| Calcium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Chromium | 260 | 270 | 260 | 270 | -- | **33** | **32.5** | **57.3** | **40.3** | -- | -- | -- | -- |
| Cobalt | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Copper | 390 | 390 | 390 | 390 | -- | **56.9** | **54.3** | **85** | **76.2** | -- | -- | -- | -- |
| Iron | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Lead | 450 | 530 | 450 | 530 | -- | **30** | **30** | **158** | **112** | -- | -- | -- | -- |
| Magnesium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Manganese | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Mercury | 0.41 | 0.59 | 0.41 | 0.59 | -- | **0.1 J** | **0.13 J** | **0.15** | **0.16** | -- | -- | -- | -- |
| Nickel | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Potassium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Selenium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Silver | 6.1 | 6.1 | 6.1 | 6.1 | -- | 0.6 U | 0.5 U | **1.4** | **1.4** | -- | -- | -- | -- |
| Sodium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Thallium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Tin | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Vanadium | -- | -- | | | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Zinc | 410 | 960 | 410 | 960 | -- | **123** | **118** | **200** | **168** | -- | -- | -- | -- |
| **PCBs (µg/kg)** | | | | | | | | | | | | | |
| Total PCBs | -- | -- | 130 | 1000 | **299 *** | **31** | **90** | **1170 J * #** | **670 *** | **1540 J * #** | **1660 * #** | **653 *** | 19 U |
| Total PCBs (field) | -- | -- | 130 | 1000 | -- | **61.45 *** | -- | -- | **16.11 *** | -- | **13.52 *** | -- | -- |
| **PCBs (mg/kg-OC)** | | | | | | | | | | | | | |
| Total PCBs | 12 | 65 | -- | -- | **15.98 *** | **1.08** | **3.84** | **58.79 J *** | **35.44 *** | **103 J * #** | **115 * #** | **88.24 * #** | 19 U |
| Total PCBs (field) | 12 | 65 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |

## Appendix E
## Existing Lower Duwamish Waterway Surface and Subsurface Sediment Results - Vicinity of Jorgensen Facility

| Location ID | SMS Criteria | | | | SD-211-PL2 | SD-DUW338A | SD-DUW338A | SD-212-PL2 | SD-213-PL2 | SD-213-PL2 | SD-214-PL2 | SD-214-PL2 | SD-215-PL2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample ID | | | | | SD-211-0060-PL2 | SD-212-0000-PL2 | SD-212-0010-PL2 | SD-212-0020-PL2 | SD-213-0000-PL2 | SD-213-0010-PL2 | SD-214-0000-PL2 | SD-214-0010-PL2 | SD-215-0000-PL2 |
| Sample Date | | | | | 4/21/2004 | 4/21/2004 | 4/21/2004 | 4/21/2004 | 4/20/2004 | 4/20/2004 | 4/21/2004 | 4/21/2004 | 4/20/2004 |
| Depth Interval | SQS | CSL | LAET | 2LAET | 6-7 ft | 0-1 ft | 1-2 ft | 2-3 ft | 0-1 ft | 1-2 ft | 0-1 ft | 1-2 ft | 0-1 ft |
| **Conventionals** | | | | | | | | | | | | | |
| Total solids (%) | -- | -- | -- | -- | 83.2 | 48.5 | 60.5 | 69.6 | 48.9 | 53 | 48.2 | 57.1 | 56.8 |
| TOC (%) | -- | -- | -- | -- | 0.08 | 2.02 | 1.67 | 1.72 | 2.18 | 2.08 | 2.43 | 1.72 | 1.98 |
| **Metals (mg/kg)** | | | | | | | | | | | | | |
| Aluminum | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Antimony | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Arsenic | 57 | 93 | 57 | 93 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Barium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Beryllium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Cadmium | 5.1 | 6.7 | 5.1 | 6.7 | -- | 0.4 U | 0.6 | -- | 0.4 U | 0.6 | 0.4 U | 0.6 | 1.2 |
| Calcium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Chromium | 260 | 270 | 260 | 270 | -- | 33 | 46.9 | -- | 32.2 | 32.7 | 30 | 30.4 | 36.7 |
| Cobalt | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Copper | 390 | 390 | 390 | 390 | -- | 50.4 | 66 | -- | 48.2 | 54 | 50.3 | 56.3 | 47.1 |
| Iron | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Lead | 450 | 530 | 450 | 530 | -- | 32 | 53 | -- | 26 | 41 | 25 | 46 | 38 |
| Magnesium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Manganese | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Mercury | 0.41 | 0.59 | 0.41 | 0.59 | -- | 0.13 | 0.15 | -- | 0.1 J | 0.18 J | 0.15 | 0.14 | 0.19 J |
| Nickel | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Potassium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Selenium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Silver | 6.1 | 6.1 | 6.1 | 6.1 | -- | 0.6 U | 0.8 | -- | 0.6 U | 0.5 U | 0.6 U | 0.8 | 0.5 U |
| Sodium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Thallium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Tin | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Vanadium | -- | -- | | | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Zinc | 410 | 960 | 410 | 960 | -- | 106 | 125 | -- | 103 | 127 | 102 | 120 | 197 |
| **PCBs (µg/kg)** | | | | | | | | | | | | | |
| Total PCBs | -- | -- | 130 | 1000 | 19 U | 26 | 225 * | 29 | 35 | 186 * | 27 | 171 * | 121 |
| Total PCBs (field) | -- | -- | 130 | 1000 | 64.47 * | -- | -- | -- | -- | -- | 97.79 * # | -- | -- |
| **PCBs (mg/kg-OC)** | | | | | | | | | | | | | |
| Total PCBs | 12 | 65 | -- | -- | 23.75 U | 1.28 | 13.47 * | 1.68 | 1.6 | 8.94 | 1.11 | 9.94 | 6.11 |
| Total PCBs (field) | 12 | 65 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |

**Existing Lower Duwamish Waterway Surface and Subsurface Sediment Results - Vicinity of Jorgensen Facility**

| Location ID | SMS Criteria | | | | SD-215-PL2 | SD-215-PL2 | SD-216-PL2 | SD-216-PL2 | SD-216-PL2 | SD-216-PL2 | SD-216-PL2 | SD-216-PL2 | SD-216-PL2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample ID | | | | | SD-215-0010-PL2 | SD-215-0020-PL2 | SD-216-0000-PL2 | SD-216-0010-PL2 | SD-216-0020-PL2 | SD-216-0030-PL2 | SD-216-0040-PL2 | SD-216-0050-PL2 | SD-216-0060-PL2 |
| Sample Date | | | | | 4/20/2004 | 4/20/2004 | 4/21/2004 | 4/21/2004 | 4/21/2004 | 4/21/2004 | 4/21/2004 | 4/21/2004 | 4/21/2004 |
| Depth Interval | SQS | CSL | LAET | 2LAET | 1-2 ft | 2-3 ft | 0-1 ft | 1-2 ft | 2-3 ft | 3-4 ft | 4-5 ft | 5-5.9 ft | 6-7 ft |
| **Conventionals** | | | | | | | | | | | | | |
| Total solids (%) | -- | -- | -- | -- | **58.2** | **65.2** | **49.1** | **61.4** | **70.4** | **65.9** | **73.2** | **71.6** | **77.6** |
| TOC (%) | -- | -- | -- | -- | **2.19** | **1.78** | **1.61** | **1.58** | **1.43** | **1.33** | **1.13** | **1.02** | **1.09** |
| **Metals (mg/kg)** | | | | | | | | | | | | | |
| Aluminum | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Antimony | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Arsenic | 57 | 93 | 57 | 93 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Barium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Beryllium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Cadmium | 5.1 | 6.7 | 5.1 | 6.7 | **1.2** | -- | **0.6** | **1.5** | -- | -- | -- | -- | -- |
| Calcium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Chromium | 260 | 270 | 260 | 270 | **36.5** | -- | **33.3** | **49.1** | -- | -- | -- | -- | -- |
| Cobalt | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Copper | 390 | 390 | 390 | 390 | **54.5** | -- | **51.8** | **80.8** | -- | -- | -- | -- | -- |
| Iron | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Lead | 450 | 530 | 450 | 530 | **63** | -- | **33** | **119** | -- | -- | -- | -- | -- |
| Magnesium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Manganese | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Mercury | 0.41 | 0.59 | 0.41 | 0.59 | **0.19 J** | -- | **0.12** | **0.16** | -- | -- | -- | -- | -- |
| Nickel | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Potassium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Selenium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Silver | 6.1 | 6.1 | 6.1 | 6.1 | **0.6** | -- | 0.6 U | **1.6** | -- | -- | -- | -- | -- |
| Sodium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Thallium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Tin | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Vanadium | -- | -- | | | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Zinc | 410 | 960 | 410 | 960 | **174** | -- | **108** | **172** | -- | -- | -- | -- | -- |
| **PCBs (µg/kg)** | | | | | | | | | | | | | |
| Total PCBs | -- | -- | 130 | 1000 | **420 *** | **105 J** | **62 J** | **230 *** | **527 J *** | **980 *** | **483 *** | **236 *** | **1290 * #** |
| Total PCBs (field) | -- | -- | 130 | 1000 | **14.67 *** | 755 * # | -- | -- | 197 * # | -- | -- | -- | -- |
| **PCBs (mg/kg-OC)** | | | | | | | | | | | | | |
| Total PCBs | 12 | 65 | -- | -- | **19.17 *** | **5.89 J** | **3.85 J** | **14.55 *** | **36.85 J *** | **73.68 * #** | **42.74 *** | **23.13 *** | **118 * #** |
| Total PCBs (field) | 12 | 65 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |

**Appendix E**
**Existing Lower Duwamish Waterway Surface and Subsurface Sediment Results - Vicinity of Jorgensen Facility**

| Location ID | | | | | SD-216-PL2 | SD-217-PL2 | SD-217-PL2 | SD-217-PL2 | SD-217-PL2 | SD-217-PL2 | SD-217-PL2 | SD-DUW133 | SD-DUW133 | SD-DUW133 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample ID | | | | | SD-216-0070-PL2 | SD-217-0000-PL2 | SD-217-0010-PL2 | SD-217-0020-PL2 | SD-217-0030-PL2 | SD-217-0040-PL2 | SD-217-0050-PL2 | DUW133-0020 | DUW133-0040 | DUW133-0050 |
| Sample Date | SMS Criteria | | | | 4/21/2004 | 4/22/2004 | 4/22/2004 | 4/22/2004 | 4/22/2004 | 4/22/2004 | 4/22/2004 | 6/8/2001 | 6/8/2001 | 6/8/2001 |
| Depth Interval | SQS | CSL | LAET | 2LAET | 7-7.7 ft | 0-0.9 ft | 1-1.9 ft | 2-2.9 ft | 3-3.7 ft | 4-4.5 ft | 5-5.6 ft | 2-2.7 ft | 4-4.9 ft | 5-5.7 ft |
| **Conventionals** | | | | | | | | | | | | | | |
| Total solids (%) | -- | -- | -- | -- | **75.4** | **61.2** | **61.4** | **78** | **78.3** | **82.9** | **81.2** | -- | -- | -- |
| TOC (%) | -- | -- | -- | -- | **0.96** | **1.73** | **1.51** | **1.15** | **1.09** | **0.28** | **0.07** | **1.1** | **0.24** | **2.1** |
| **Metals (mg/kg)** | | | | | | | | | | | | | | |
| Aluminum | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Antimony | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Arsenic | 57 | 93 | 57 | 93 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Barium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Beryllium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Cadmium | 5.1 | 6.7 | 5.1 | 6.7 | -- | **0.7** | **0.6** | -- | -- | -- | -- | **0.7** | 0.3 U | -- |
| Calcium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Chromium | 260 | 270 | 260 | 270 | -- | **143 J** | **37.4 J** | -- | -- | -- | -- | **34.9 J** | **19.5** | -- |
| Cobalt | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Copper | 390 | 390 | 390 | 390 | -- | **69.5** | **72.4** | -- | -- | -- | -- | **62.5 J** | **18.7** | -- |
| Iron | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Lead | 450 | 530 | 450 | 530 | -- | **97** | **106** | -- | -- | -- | -- | **80 J** | **20** | -- |
| Magnesium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Manganese | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Mercury | 0.41 | 0.59 | 0.41 | 0.59 | -- | **0.16** | **0.13** | -- | -- | -- | -- | **0.18** | **0.06** | -- |
| Nickel | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Potassium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Selenium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Silver | 6.1 | 6.1 | 6.1 | 6.1 | -- | **1.3** | **1.5** | -- | -- | -- | -- | **0.6** | 0.4 U | -- |
| Sodium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Thallium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Tin | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Vanadium | -- | -- | | | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Zinc | 410 | 960 | 410 | 960 | -- | **150** | **141** | -- | -- | -- | -- | **153 J** | **62.6** | -- |
| **PCBs (µg/kg)** | | | | | | | | | | | | | | |
| Total PCBs | -- | -- | 130 | 1000 | **910 *** | **400 *** | **690 *** | **279 *** | **456 *** | **34.3** | 19 U | **16200 * #** | **310 *** | **105** |
| Total PCBs (field) | -- | -- | 130 | 1000 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| **PCBs (mg/kg-OC)** | | | | | | | | | | | | | | |
| Total PCBs | 12 | 65 | -- | -- | **94.79 * #** | **23.12 *** | **45.69 *** | **24.26 *** | **41.83 *** | **12.25 *** | 27.14 U | **1472.7 * #** | **129.2 * #** | **5.0** |
| Total PCBs (field) | 12 | 65 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |

## Appendix E
## Existing Lower Duwamish Waterway Surface and Subsurface Sediment Results - Vicinity of Jorgensen Facility

| Location ID | SMS Criteria | | | | SD-DUW134 | SD-DUW134 | SD-DUW134 | SD-DUW134 | SD-DUW135 | SD-DUW135 | SD-DUW135 | SD-DUW135 | SD-DUW15 | SD-DUW15 | SD-DUW15 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample ID | | | | | DUW134-0020 | DUW134-0030 | DUW134-0040 | DUW134-0060 | DUW135-0020 | DUW135-0040 | DUW135-0050 | DUW135-0060 | DUW15-0000 | DUW15-0000C | DUW15-0040 |
| Sample Date | | | | | 6/13/2001 | 6/13/2001 | 6/13/2001 | 6/13/2001 | 6/14/2001 | 6/14/2001 | 6/14/2001 | 6/14/2001 | 10/23/1995 | 3/20/1996 | 3/20/1996 |
| Depth Interval | SQS | CSL | LAET | 2LAET | 2-3 ft | 3-4 ft | 4-5 ft | 6-7 ft | 2-3 ft | 4-5 ft | 5-5.7 ft | 6-6.8 ft | 0-10 cm | 0-4 ft | 4-8 ft |
| **Conventionals** | | | | | | | | | | | | | | | |
| Total solids (%) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| TOC (%) | -- | -- | -- | -- | **1.6** | **3.7** | **2.2** | **0.76** | **1.7** | **1.5** | **1.4** | **1.3** | **1.2** | **1.9** | **0.92** |
| **Metals (mg/kg)** | | | | | | | | | | | | | | | |
| Aluminum | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | **15000** | -- | -- |
| Antimony | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Arsenic | 57 | 93 | 57 | 93 | -- | -- | -- | -- | -- | -- | -- | -- | **23** | -- | -- |
| Barium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | **67** | -- | -- |
| Beryllium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | **0.2** | -- | -- |
| Cadmium | 5.1 | 6.7 | 5.1 | 6.7 | **9.8 * #** | -- | **0.5** | 0.2 U | **8 * #** | **1.6** | -- | -- | **0.7** | -- | -- |
| Calcium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | **5200 J** | -- | -- |
| Chromium | 260 | 270 | 260 | 270 | **214** | -- | **17.2** | **10** | **86.7** | **40** | -- | -- | **42** | -- | -- |
| Cobalt | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | **7.3** | -- | -- |
| Copper | 390 | 390 | 390 | 390 | **441 * #** | -- | **22.4** | **10.7** | **599 * #** | **67.3** | -- | -- | **110** | -- | -- |
| Iron | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | **31000** | -- | -- |
| Lead | 450 | 530 | 450 | 530 | **300** | -- | **12** | **3** | **356** | **64** | -- | -- | **110** | -- | -- |
| Magnesium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | **5100** | -- | -- |
| Manganese | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | **260** | -- | -- |
| Mercury | 0.41 | 0.59 | 0.41 | 0.59 | **0.31** | -- | 0.05 U | 0.05 U | **0.36** | **0.24 J** | -- | -- | **0.14** | -- | -- |
| Nickel | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | **22** | -- | -- |
| Potassium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | **1700** | -- | -- |
| Selenium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 9 U | -- | -- |
| Silver | 6.1 | 6.1 | 6.1 | 6.1 | **3.3** | -- | 0.4 U | 0.4 U | **7.3 * #** | **1.2** | -- | -- | **0.7** | -- | -- |
| Sodium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | **8600** | -- | -- |
| Thallium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 9 U | -- | -- |
| Tin | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Vanadium | -- | -- | | | -- | -- | -- | -- | -- | -- | -- | -- | **51** | -- | -- |
| Zinc | 410 | 960 | 410 | 960 | **1770 * #** | -- | **81.7** | **24.8** | **1150 * #** | **310** | -- | -- | **260** | -- | -- |
| **PCBs (µg/kg)** | | | | | | | | | | | | | | | |
| Total PCBs | -- | -- | 130 | 1000 | **29400 J * #** | **9100 * #** | **409 J *** | 35 U | **560 J *** | **1720 * #** | **158 *** | **125** | **2800 * #** | **8500 * #** | **1190 * #** |
| Total PCBs (field) | -- | -- | 130 | 1000 | -- | -- | -- | -- | -- | -- | 603 * # | 66.86 * # | -- | -- | -- |
| **PCBs (mg/kg-OC)** | | | | | | | | | | | | | | | |
| Total PCBs | 12 | 65 | -- | -- | **1837.5 J * #** | **245.9 * #** | **18.6 JM *** | 4.6 U | **32.9 J *** | **115 * #** | **11.3** | **9.62** | **233.33 * #** | **447.36 * #** | **129.34 * #** |
| Total PCBs (field) | 12 | 65 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |

## Appendix E
## Existing Lower Duwamish Waterway Surface and Subsurface Sediment Results - Vicinity of Jorgensen Facility

| Location ID | | | | | SD-DUW15 | SD-DUW153 | SD-DUW153 | SD-DUW153 | SD-DUW154 | SD-DUW154 | SD-DUW154 | SD-DUW155 | SD-DUW155 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample ID | | | | | DUW15-0080 | SD-DUW153-0000 | SD-DUW153-0020 | SD-DUW153-0040 | SD-DUW154-0000 | SD-DUW154-0020 | SD-DUW154-0040 | SD-DUW155-0000 | SD-DUW155-0020 |
| Sample Date | SMS Criteria | | | | 3/20/1996 | 8/21/2003 | 8/21/2003 | 8/21/2003 | 8/20/2003 | 8/20/2003 | 8/20/2003 | 8/20/2003 | 8/20/2003 |
| Depth Interval | SQS | CSL | LAET | 2LAET | 8-9.1 ft | 0-1 ft | 2-4 ft | 4-5 ft | 0-1 ft | 2-4 ft | 4-6 ft | 0-1 ft | 2-3.7 ft |
| **Conventionals** | | | | | | | | | | | | | |
| Total solids (%) | -- | -- | -- | -- | -- | **56.2** | **66** | **64.4** | **84.7** | **79** | **70.5** | **73.2** | **72.5** |
| TOC (%) | -- | -- | -- | -- | **0.24** | **4** | **3.4** | **3.5** | **0.4** | **0.48** | **1.4** | **1.1** | **2.2** |
| **Metals (mg/kg)** | | | | | | | | | | | | | |
| Aluminum | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Antimony | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Arsenic | 57 | 93 | 57 | 93 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Barium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Beryllium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Cadmium | 5.1 | 6.7 | 5.1 | 6.7 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Calcium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Chromium | 260 | 270 | 260 | 270 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Cobalt | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Copper | 390 | 390 | 390 | 390 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Iron | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Lead | 450 | 530 | 450 | 530 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Magnesium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Manganese | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Mercury | 0.41 | 0.59 | 0.41 | 0.59 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Nickel | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Potassium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Selenium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Silver | 6.1 | 6.1 | 6.1 | 6.1 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Sodium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Thallium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Tin | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Vanadium | -- | -- | | | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Zinc | 410 | 960 | 410 | 960 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| **PCBs (µg/kg)** | | | | | | | | | | | | | |
| Total PCBs | -- | -- | 130 | 1000 | **380 *** | **160000 * #** | **6200 * #** | **1740 * #** | **970 *** | **1390 * #** | **1010 * #** | **2490 * #** | **3100 * #** |
| Total PCBs (field) | -- | -- | 130 | 1000 | 316 * # | -- | -- | -- | -- | -- | -- | -- | -- |
| **PCBs (mg/kg-OC)** | | | | | | | | | | | | | |
| Total PCBs | 12 | 65 | -- | -- | **158.33 * #** | **4000 * #** | **182 * #** | **49.71 *** | **243 * #** | **290 * #** | **72.14 * #** | **226 * #** | **141 * #** |
| Total PCBs (field) | 12 | 65 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |

## Appendix E
## Existing Lower Duwamish Waterway Surface and Subsurface Sediment Results - Vicinity of Jorgensen Facility

| Location ID | | | | | SD-DUW155 | SD-DUW156 | SD-DUW156 | SD-DUW156 | SD-DUW157 | SD-DUW157 | SD-DUW157 | SD-DUW157D | SD-DUW157D |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample ID | | | | | SD-DUW155-0040 | SD-DUW156-0000 | SD-DUW156-0020 | SD-DUW156-0040 | SD-DUW157-0000 | SD-DUW157-0020 | SD-DUW157-0040 | SD-DUW157D-0000 | SD-DUW157D-0020 |
| Sample Date | SMS Criteria | | | | 8/20/2003 | 8/20/2003 | 8/20/2003 | 8/20/2003 | 8/21/2003 | 8/21/2003 | 8/21/2003 | 8/22/2003 | 8/22/2003 |
| Depth Interval | SQS | CSL | LAET | 2LAET | 4-5 ft | 0-0.8 ft | 2-3 ft | 4-4.8 ft | 0-1 ft | 2-3 ft | 4-6 ft | 0-1 ft | 2-3 ft |
| **Conventionals** | | | | | | | | | | | | | |
| Total solids (%) | -- | -- | -- | -- | **73.3** | **55.3** | **64.5** | **59.5** | **69** | **80.1** | **82** | **71.8** | **80.5** |
| TOC (%) | -- | -- | -- | -- | **4.4** | **2** | **1.5** | **1.8** | **2.1** | **1.3** | **0.19** | **3.1** | **1.3** |
| **Metals (mg/kg)** | | | | | | | | | | | | | |
| Aluminum | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Antimony | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Arsenic | 57 | 93 | 57 | 93 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Barium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Beryllium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Cadmium | 5.1 | 6.7 | 5.1 | 6.7 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Calcium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Chromium | 260 | 270 | 260 | 270 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Cobalt | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Copper | 390 | 390 | 390 | 390 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Iron | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Lead | 450 | 530 | 450 | 530 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Magnesium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Manganese | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Mercury | 0.41 | 0.59 | 0.41 | 0.59 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Nickel | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Potassium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Selenium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Silver | 6.1 | 6.1 | 6.1 | 6.1 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Sodium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Thallium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Tin | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Vanadium | -- | -- | | | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Zinc | 410 | 960 | 410 | 960 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| **PCBs (µg/kg)** | | | | | | | | | | | | | |
| Total PCBs | -- | -- | 130 | 1000 | **2760 * #** | **830 *** | **373 *** | **1230 * #** | **30000 * #** | 130 U | 39 U | **37000 * #** | **489 *** |
| Total PCBs (field) | -- | -- | 130 | 1000 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| **PCBs (mg/kg-OC)** | | | | | | | | | | | | | |
| Total PCBs | 12 | 65 | -- | -- | **62.72 *** | **41.5 *** | **24.86 *** | **68.33 * #** | **1429 * #** | 10 U | 21 U | **1194 * #** | **37.61 *** |
| Total PCBs (field) | 12 | 65 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |

## Appendix E
## Existing Lower Duwamish Waterway Surface and Subsurface Sediment Results - Vicinity of Jorgensen Facility

| Location ID | | SMS Criteria | | | SD-DUW158 | SD-DUW158 | SD-DUW158 | SD-DUW159 | SD-DUW159 | SD-DUW159 | SD-DUW16 | SD-DUW16 | SD-DUW16 | SD-DUW160 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample ID | | | | | SD-DUW158-0000 | SD-DUW158-0020 | SD-DUW158-0040 | SD-DUW159-0000 | SD-DUW159-0020 | SD-DUW159-0040 | DUW16-0000 | DUW16-0000C | DUW16-0036 | SD-DUW160-0000 |
| Sample Date | | | | | 8/21/2003 | 8/21/2003 | 8/21/2003 | 8/20/2003 | 8/20/2003 | 8/20/2003 | 10/23/1995 | 3/20/1996 | 3/20/1996 | 8/21/2003 |
| Depth Interval | SQS | CSL | LAET | 2LAET | 0-1 ft | 2-2.9 ft | 4-4.9 ft | 0-1 ft | 2-2.8 ft | 4-5 ft | 0-10 cm | 0-3.6 ft | 3.6-7.6 ft | 0-0.9 ft |
| **Conventionals** | | | | | | | | | | | | | | |
| Total solids (%) | -- | -- | -- | -- | **61.5** | **77.8** | **80.5** | **63.7** | **78.2** | **74.7** | -- | -- | -- | **52.2** |
| TOC (%) | -- | -- | -- | -- | **1.8** | **1.4** | **0.2** | **1.7** | **1** | **0.8** | **2.4** | **1.5** | **0.14** | **2.3** |
| **Metals (mg/kg)** | | | | | | | | | | | | | | |
| Aluminum | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | **22000** | -- | -- | -- |
| Antimony | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Arsenic | 57 | 93 | 57 | 93 | -- | -- | -- | -- | -- | -- | **20** | -- | -- | -- |
| Barium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | **87** | -- | -- | -- |
| Beryllium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | **0.4** | -- | -- | -- |
| Cadmium | 5.1 | 6.7 | 5.1 | 6.7 | -- | -- | -- | -- | -- | -- | 0.5 U | -- | -- | -- |
| Calcium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | **7200 J** | -- | -- | -- |
| Chromium | 260 | 270 | 260 | 270 | -- | -- | -- | -- | -- | -- | **41** | -- | -- | -- |
| Cobalt | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | **7.1** | -- | -- | -- |
| Copper | 390 | 390 | 390 | 390 | -- | -- | -- | -- | -- | -- | **57** | -- | -- | -- |
| Iron | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | **59000** | -- | -- | -- |
| Lead | 450 | 530 | 450 | 530 | -- | -- | -- | -- | -- | -- | **94** | -- | -- | -- |
| Magnesium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | **8000** | -- | -- | -- |
| Manganese | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | **360** | -- | -- | -- |
| Mercury | 0.41 | 0.59 | 0.41 | 0.59 | -- | -- | -- | -- | -- | -- | **0.1** | -- | -- | -- |
| Nickel | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | **30** | -- | -- | -- |
| Potassium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | **2800** | -- | -- | -- |
| Selenium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 10 U | -- | -- | -- |
| Silver | 6.1 | 6.1 | 6.1 | 6.1 | -- | -- | -- | -- | -- | -- | 0.7 U | -- | -- | -- |
| Sodium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | **14000** | -- | -- | -- |
| Thallium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 10 U | -- | -- | -- |
| Tin | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Vanadium | -- | -- | | | -- | -- | -- | -- | -- | -- | **73** | -- | -- | -- |
| Zinc | 410 | 960 | 410 | 960 | -- | -- | -- | -- | -- | -- | **180** | -- | -- | -- |
| **PCBs (µg/kg)** | | | | | | | | | | | | | | |
| Total PCBs | -- | -- | 130 | 1000 | **5000 * #** | **177 *** | 39 U | **2290 * #** | **380 *** | 38 U | **2510 * #** | **7600 * #** | 39 U | **3100 * #** |
| Total PCBs (field) | -- | -- | 130 | 1000 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| **PCBs (mg/kg-OC)** | | | | | | | | | | | | | | |
| Total PCBs | 12 | 65 | -- | -- | **278 * #** | **12.64 *** | 19.5 U | **135 * #** | **38 *** | 4.75 U | **105 * #** | **506.66 * #** | 27.85 U | **135 * #** |
| Total PCBs (field) | 12 | 65 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |

**Appendix E**
**Existing Lower Duwamish Waterway Surface and Subsurface Sediment Results - Vicinity of Jorgensen Facility**

| Location ID | | SMS Criteria | | | SD-DUW160 | SD-DUW160 | SD-DUW161 | SD-DUW161 | SD-DUW161 | SD-DUW162 | SD-DUW162 | SD-DUW162 | SD-DUW163 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample ID | | | | | SD-DUW160-0020 | SD-DUW160-0040 | SD-DUW161-0000 | SD-DUW161-0020 | SD-DUW161-0040 | SD-DUW162-0000 | SD-DUW162-0020 | SD-DUW162-0040 | SD-DUW163-0000 |
| Sample Date | | | | | 8/21/2003 | 8/21/2003 | 8/20/2003 | 8/20/2003 | 8/20/2003 | 8/21/2003 | 8/21/2003 | 8/21/2003 | 8/22/2003 |
| Depth Interval | SQS | CSL | LAET | 2LAET | 2-3 ft | 4-4.6 ft | 0-0.5 ft | 2-3 ft | 4-5 ft | 0-0.8 ft | 2-3 ft | 4-4.6 ft | 0-0.7 ft |
| **Conventionals** | | | | | | | | | | | | | |
| Total solids (%) | -- | -- | -- | -- | **59.5** | **76.8** | **60** | **77.9** | **81** | **57.3** | **79.9** | **84.1** | **71.1** |
| TOC (%) | -- | -- | -- | -- | **4.3** | **0.14** | **2** | **0.94** | **0.16** | **1.6** | **1.9** | **0.45** | **1.6** |
| **Metals (mg/kg)** | | | | | | | | | | | | | |
| Aluminum | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Antimony | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Arsenic | 57 | 93 | 57 | 93 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Barium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Beryllium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Cadmium | 5.1 | 6.7 | 5.1 | 6.7 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Calcium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Chromium | 260 | 270 | 260 | 270 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Cobalt | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Copper | 390 | 390 | 390 | 390 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Iron | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Lead | 450 | 530 | 450 | 530 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Magnesium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Manganese | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Mercury | 0.41 | 0.59 | 0.41 | 0.59 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Nickel | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Potassium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Selenium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Silver | 6.1 | 6.1 | 6.1 | 6.1 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Sodium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Thallium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Tin | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Vanadium | -- | -- | | | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Zinc | 410 | 960 | 410 | 960 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| **PCBs (µg/kg)** | | | | | | | | | | | | | |
| Total PCBs | -- | -- | 130 | 1000 | **390 *** | 39 U | **12900 * #** | **32** | 40 U | **1580 * #** | **13500 * #** | **660 *** | **1080 * #** |
| Total PCBs (field) | -- | -- | 130 | 1000 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| **PCBs (mg/kg-OC)** | | | | | | | | | | | | | |
| Total PCBs | 12 | 65 | -- | -- | **9.06** | 27.85 U | **645 * #** | **3.4** | 25 U | **98.75 * #** | **711 * #** | **147 * #** | **67.5 * #** |
| Total PCBs (field) | 12 | 65 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |

## Appendix E
## Existing Lower Duwamish Waterway Surface and Subsurface Sediment Results - Vicinity of Jorgensen Facility

| Location ID | | | | | SD-DUW163 | SD-DUW163 | SD-DUW164 | SD-DUW164 | SD-DUW165 | SD-DUW165 | SD-DUW165 | SD-DUW206 | SD-DUW207A |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample ID | | | | | SD-DUW163-0020 | SD-DUW163-0040 | SD-DUW164-0000 | SD-DUW164-0020 | SD-DUW165-0000 | SD-DUW165-0020 | SD-DUW165-0040 | SD-206-0000-04 | SD-207-0000-04 |
| Sample Date | SMS Criteria | | | | 8/22/2003 | 8/22/2003 | 8/20/2003 | 8/20/2003 | 8/22/2003 | 8/22/2003 | 8/22/2003 | 8/26/2004 | 8/26/2004 |
| Depth Interval | SQS | CSL | LAET | 2LAET | 2-2.6 ft | 4-5.1 ft | 0-0.6 ft | 2-3 ft | 0-0.7 ft | 2-2.7 ft | 4-4.5 ft | 0-10 cm | 0-10 cm |
| **Conventionals** | | | | | | | | | | | | | |
| Total solids (%) | -- | -- | -- | -- | **81** | **78.5** | **51.4** | **81.2** | **64.3** | **77** | **78.1** | -- | -- |
| TOC (%) | -- | -- | -- | -- | **0.057** | **1** | **1.9** | **0.33** | **2.4** | **0.081** | **0.08** | **2.34** | **2.11** |
| **Metals (mg/kg)** | | | | | | | | | | | | | |
| Aluminum | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Antimony | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Arsenic | 57 | 93 | 57 | 93 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Barium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Beryllium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Cadmium | 5.1 | 6.7 | 5.1 | 6.7 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Calcium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Chromium | 260 | 270 | 260 | 270 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Cobalt | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Copper | 390 | 390 | 390 | 390 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Iron | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Lead | 450 | 530 | 450 | 530 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Magnesium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Manganese | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Mercury | 0.41 | 0.59 | 0.41 | 0.59 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Nickel | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Potassium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Selenium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Silver | 6.1 | 6.1 | 6.1 | 6.1 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Sodium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Thallium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Tin | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Vanadium | -- | -- | | | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Zinc | 410 | 960 | 410 | 960 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| **PCBs (µg/kg)** | | | | | | | | | | | | | |
| Total PCBs | -- | -- | 130 | 1000 | 40 U | 39 U | **5210 * #** | **1980 * #** | **4800 * #** | **37** | 39 U | **280 *** | **146 *** |
| Total PCBs (field) | -- | -- | 130 | 1000 | -- | -- | -- | -- | -- | -- | -- | **298 *** | **259 *** |
| **PCBs (mg/kg-OC)** | | | | | | | | | | | | | |
| Total PCBs | 12 | 65 | -- | -- | 70.17 U | 3.9 U | **274 * #** | **600 * #** | **200 * #** | **45.67 *** | 48.75 U | **11.96** | **6.91** |
| Total PCBs (field) | 12 | 65 | -- | -- | -- | -- | -- | -- | -- | -- | -- | **12.74 *** | **12.27 *** |

## Appendix E
## Existing Lower Duwamish Waterway Surface and Subsurface Sediment Results - Vicinity of Jorgensen Facility

| Location ID | | | | | SD-DUW207A | SD-DUW208 | SD-DUW209 | SD-DUW210 | SD-DUW211 | SD-DUW212 | SD-DUW213 | SD-DUW214 | SD-DUW215 | SD-DUW216 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample ID | | | | | SD-433-0000 | SD-208-0000-04 | SD-209-0000-04 | SD-210-0000-04 | SD-211-0000-04 | SD-212-0000-04 | SD-213-0000-04 | SD-214-0000-04 | SD-215-0000-04 | SD-216-0000-04 |
| Sample Date | SMS Criteria | | | | 8/26/2004 | 8/26/2004 | 8/26/2004 | 8/27/2004 | 8/27/2004 | 8/27/2004 | 8/27/2004 | 8/27/2004 | 8/27/2004 | 8/26/2004 |
| Depth Interval | SQS | CSL | LAET | 2LAET | 0-10 cm | 0-10 cm | 0-10 cm | 0-10 cm | 0-10 cm | 0-10 cm | 0-10 cm | 0-10 cm | 0-10 cm | 0-10 cm |
| **Conventionals** | | | | | | | | | | | | | | |
| Total solids (%) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| TOC (%) | -- | -- | -- | -- | **1.56** | **1.46** | **2.71** | **2.65** | **2.16** | **2.33** | **2.17** | **2.78** | **1.64** | **2.02** |
| **Metals (mg/kg)** | | | | | | | | | | | | | | |
| Aluminum | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Antimony | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Arsenic | 57 | 93 | 57 | 93 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Barium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Beryllium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Cadmium | 5.1 | 6.7 | 5.1 | 6.7 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Calcium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Chromium | 260 | 270 | 260 | 270 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Cobalt | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Copper | 390 | 390 | 390 | 390 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Iron | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Lead | 450 | 530 | 450 | 530 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Magnesium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Manganese | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Mercury | 0.41 | 0.59 | 0.41 | 0.59 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Nickel | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Potassium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Selenium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Silver | 6.1 | 6.1 | 6.1 | 6.1 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Sodium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Thallium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Tin | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Vanadium | -- | -- | | | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Zinc | 410 | 960 | 410 | 960 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| **PCBs (µg/kg)** | | | | | | | | | | | | | | |
| Total PCBs | -- | -- | 130 | 1000 | 97 U | **341 *** | **77.7** | **130 *** | **610 *** | **68.9** | **610 *** | **9** | **880 *** | **360 *** |
| Total PCBs (field) | -- | -- | 130 | 1000 | **256 *** | **443 *** | **210 *** | **187 *** | **248 *** | **204 *** | **291 *** | **165 *** | **515 *** | **195 *** |
| **PCBs (mg/kg-OC)** | | | | | | | | | | | | | | |
| Total PCBs | 12 | 65 | -- | -- | 6.21 U | **23.35 *** | **2.86** | **4.9** | **28.24 *** | **2.95** | **28.11 *** | **0.32** | **53.65 *** | **17.82 *** |
| Total PCBs (field) | 12 | 65 | -- | -- | **16.41 *** | **30.34 *** | **7.75** | **7.06** | **11.48** | **8.76** | **13.41 *** | **5.94** | **31.4 *** | **9.65** |

## Appendix E
## Existing Lower Duwamish Waterway Surface and Subsurface Sediment Results - Vicinity of Jorgensen Facility

| Location ID | | | | | SD-DUW217 | SD-DUW52 | SD-DUW52 | SD-DUW52 | SD-DUW52 | SD-DUW52 | SD-DUW53 | SD-DUW53 | SD-DUW53 | SD-DUW53 | SD-DUW53 | SD-DUW71 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample ID | | | | | SD-217-0000-04 | DUW52-0000 | DUW52-0000C | DUW52-0040 | DUW52-0080 | DUW52-0113 | DUW53-0000 | DUW53-0000C | DUW53-0040 | DUW53-0080 | DUW53-0120 | DUW71-0000 |
| Sample Date | SMS Criteria | | | | 8/26/2004 | 10/23/1995 | 3/19/1996 | 3/19/1996 | 3/19/1996 | 3/19/1996 | 10/23/1995 | 3/20/1996 | 3/20/1996 | 3/20/1996 | 3/20/1996 | 4/3/1996 |
| Depth Interval | SQS | CSL | LAET | 2LAET | 0-10 cm | 0-10 cm | 0-4 ft | 4-8 ft | 8-11.3 ft | 11.3-14.5 ft | 0-10 cm | 0-4 ft | 4-8 ft | 8-12 ft | 12-15.6 ft | 0-10 cm |
| **Conventionals** | | | | | | | | | | | | | | | | |
| Total solids (%) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| TOC (%) | -- | -- | -- | -- | **1.84** | **2** | **2** | **1.9** | **2.6** | **0.29** | **1.4** | **2** | **1.9** | **1.8** | **1.4** | **1.8** |
| **Metals (mg/kg)** | | | | | | | | | | | | | | | | |
| Aluminum | -- | -- | -- | -- | -- | **23000** | -- | -- | -- | -- | **16000** | **20000** | **23000** | **20000** | **14000** | -- |
| Antimony | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 8 UJ | 8 UJ | 8 UJ | 7 UJ | -- |
| Arsenic | 57 | 93 | 57 | 93 | -- | **10** | -- | -- | -- | -- | **14** | **10** | **13** | **31** | **20** | -- |
| Barium | -- | -- | -- | -- | -- | **79** | -- | -- | -- | -- | **76** | **170** | **150** | **110** | **95** | -- |
| Beryllium | -- | -- | -- | -- | -- | **0.4** | -- | -- | -- | -- | **0.2** | **0.4** | **0.4** | **0.4** | **0.3** | -- |
| Cadmium | 5.1 | 6.7 | 5.1 | 6.7 | -- | **1** | -- | -- | -- | -- | **1.1** | **3.7 J** | **2.4 J** | **2.6 J** | **0.9 J** | -- |
| Calcium | -- | -- | -- | -- | -- | **6300 J** | -- | -- | -- | -- | **9200 J** | **5900** | **6500** | **6000** | **4700** | -- |
| Chromium | 260 | 270 | 260 | 270 | -- | **41** | -- | -- | -- | -- | **52** | **95 J-** | **98 J-** | **54 J-** | **28 J-** | -- |
| Cobalt | -- | -- | -- | -- | -- | **8.8** | -- | -- | -- | -- | **6.8** | **9.2** | **9.7** | **8.2** | **6.9** | -- |
| Copper | 390 | 390 | 390 | 390 | -- | **77** | -- | -- | -- | -- | **82** | **84** | **50** | **44** | **29** | -- |
| Iron | -- | -- | -- | -- | -- | **27000** | -- | -- | -- | -- | **23000** | **27000** | **27000** | **24000** | **17000** | -- |
| Lead | 450 | 530 | 450 | 530 | -- | **58** | -- | -- | -- | -- | **77** | **170** | **86** | **56** | **30** | -- |
| Magnesium | -- | -- | -- | -- | -- | **7200** | -- | -- | -- | -- | **5000** | **5900** | **6200** | **5600** | **4000** | -- |
| Manganese | -- | -- | -- | -- | -- | **260** | -- | -- | -- | -- | **280** | **300** | **340** | **240** | **150** | -- |
| Mercury | 0.41 | 0.59 | 0.41 | 0.59 | -- | **0.14** | -- | -- | -- | -- | **0.24** | **0.84 J+ * #** | **0.2 J+** | **0.16 J+** | **0.17 J+** | -- |
| Nickel | -- | -- | -- | -- | -- | **28** | -- | -- | -- | -- | **24** | **35** | **23** | **22** | **17** | -- |
| Potassium | -- | -- | -- | -- | -- | **2900** | -- | -- | -- | -- | **1700** | **2000** | **2200** | **2000** | **1300** | -- |
| Selenium | -- | -- | -- | -- | -- | 9 U | -- | -- | -- | -- | 7 U | 8 U | 8 U | 8 U | 7 U | -- |
| Silver | 6.1 | 6.1 | 6.1 | 6.1 | -- | **0.7** | -- | -- | -- | -- | **0.7** | **2.7** | **2.4** | **1.1** | **0.6** | -- |
| Sodium | -- | -- | -- | -- | -- | **11000** | -- | -- | -- | -- | **6600** | **7100** | **7600** | **6500** | **3300** | -- |
| Thallium | -- | -- | -- | -- | -- | 9 U | -- | -- | -- | -- | 7 U | 8 U | 8 U | 8 U | 7 U | -- |
| Tin | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Vanadium | -- | -- | | | -- | **67** | -- | -- | -- | -- | **57** | **69** | **67** | **61** | **54** | -- |
| Zinc | 410 | 960 | 410 | 960 | -- | **180** | -- | -- | -- | -- | **580 *** | **1600 * #** | **290** | **170** | **59** | -- |
| **PCBs (µg/kg)** | | | | | | | | | | | | | | | | |
| Total PCBs | -- | -- | 130 | 1000 | **293 *** | **2050 * #** | **18170 * #** | **540 *** | **990 *** | 39 U | **670 *** | **3920 * #** | **2280 * #** | **410 *** | 45 U | **300 *** |
| Total PCBs (field) | -- | -- | 130 | 1000 | **705 *** | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| **PCBs (mg/kg-OC)** | | | | | | | | | | | | | | | | |
| Total PCBs | 12 | 65 | -- | -- | **15.92 *** | **103 * #** | **908.5 * #** | **28.42 *** | **38.07 *** | 13.44 U | **47.85 *** | **196 * #** | **120 * #** | **22.77 *** | 3.21 U | **16.66 *** |
| Total PCBs (field) | 12 | 65 | -- | -- | **38.32 *** | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |

## Appendix E
## Existing Lower Duwamish Waterway Surface and Subsurface Sediment Results - Vicinity of Jorgensen Facility

| Location ID | | | | | SD-DUW72 | SD-DUW73 | SD-DUW83 | SD-DUW89 | SD-DUW90 | SD-DUW91 | SD-DUW92 | SD-DUW93 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample ID | | | | | DUW72-0000 | DUW73-0000 | DUW83-0000 | DUW89-0000 | DUW90-0000 | DUW91-0000 | DUW92-0000 | DUW93-0000 |
| Sample Date | SMS Criteria | | | | 4/3/1996 | 4/3/1996 | 4/3/1996 | 4/4/1996 | 4/4/1996 | 4/2/1996 | 4/2/1996 | 4/2/1996 |
| Depth Interval | SQS | CSL | LAET | 2LAET | 0-10 cm | 0-10 cm | 0-10 cm | 0-10 cm | 0-10 cm | 0-10 cm | 0-10 cm | 0-10 cm |
| **Conventionals** | | | | | | | | | | | | |
| Total solids (%) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| TOC (%) | -- | -- | -- | -- | **2.7** | **2.1** | **2** | **2.2** | **2.3** | **1.8** | **2.1** | **1.8** |
| **Metals (mg/kg)** | | | | | | | | | | | | |
| Aluminum | -- | -- | -- | -- | **31000** | **29000** | **28000** | **23000** | **19000** | **27000** | **28000** | **23000** |
| Antimony | -- | -- | -- | -- | -- | **9 J-** | -- | **12 J-** | **11 J-** | -- | -- | -- |
| Arsenic | 57 | 93 | 57 | 93 | 10 U | **10** | 9 U | **16** | **16** | **10** | **12** | **19** |
| Barium | -- | -- | -- | -- | **98** | **93** | **88** | **94** | **75** | **110** | **110** | **88** |
| Beryllium | -- | -- | -- | -- | **0.6** | **0.5** | **0.5** | **0.5** | **0.4** | **0.5** | **0.6** | **0.4** |
| Cadmium | 5.1 | 6.7 | 5.1 | 6.7 | **0.7** | **0.5** | **0.8** | **1.8** | **0.7** | **0.5** | **0.9** | **0.9** |
| Calcium | -- | -- | -- | -- | **7600** | **7500** | **7400** | **7100** | **7400** | **7300** | **7900** | **7500** |
| Chromium | 260 | 270 | 260 | 270 | **38 J** | **38 J** | **34 J** | **82 J** | **110 J** | **49 J** | **89 J** | **140 J** |
| Cobalt | -- | -- | -- | -- | **11** | **10** | **11** | **14** | **13** | **12** | **14** | **11** |
| Copper | 390 | 390 | 390 | 390 | **59 J** | **53 J** | **46 J** | **98 J** | **97 J** | **45 J** | **70 J** | **81 J** |
| Iron | -- | -- | -- | -- | **36000** | **33000** | **32000** | **58000** | **55000** | **34000** | **41000** | **39000** |
| Lead | 450 | 530 | 450 | 530 | **39** | **42** | **31** | **420** | **1300 * #** | **37** | **150** | **100** |
| Magnesium | -- | -- | -- | -- | **9300** | **8700** | **8400** | **7400** | **7000** | **8500** | **8400** | **7300** |
| Manganese | -- | -- | -- | -- | **420** | **350** | **360** | **1700** | **1000** | **540** | **830** | **840** |
| Mercury | 0.41 | 0.59 | 0.41 | 0.59 | **0.17** | **0.2** | **0.12** | **0.09** | **0.07** | **0.12** | **0.16** | **0.12** |
| Nickel | -- | -- | -- | -- | **29** | **26** | **27** | **170** | **75** | **40** | **74** | **130** |
| Potassium | -- | -- | -- | -- | **3800** | **3500** | **3300** | **2100** | **1700** | **2500** | **2600** | **2400** |
| Selenium | -- | -- | -- | -- | 10 U | 9 U | 9 U | 8 U | 8 U | 8 U | 9 U | 9 U |
| Silver | 6.1 | 6.1 | 6.1 | 6.1 | **0.7** | **0.6** | **0.6** | **1.4** | 0.5 U | 0.5 U | **0.9** | **1** |
| Sodium | -- | -- | -- | -- | **14000** | **13000** | **12000** | **5200** | **3700** | **7900** | **7200** | **8100** |
| Thallium | -- | -- | -- | -- | 10 U | 9 U | 9 U | **11** | **10** | 8 U | 9 U | 9 U |
| Tin | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Vanadium | -- | -- | | | **81** | **76** | **78** | **85** | **67** | **75** | **81** | **76** |
| Zinc | 410 | 960 | 410 | 960 | **130** | **120** | **100** | **3500 * #** | **280** | **88** | **210** | **180** |
| **PCBs (µg/kg)** | | | | | | | | | | | | |
| Total PCBs | -- | -- | 130 | 1000 | **239 *** | **386 *** | **138 *** | **2710 * #** | **7480 * #** | **200 *** | **1470 * #** | **600 *** |
| Total PCBs (field) | -- | -- | 130 | 1000 | -- | -- | -- | -- | -- | -- | -- | -- |
| **PCBs (mg/kg-OC)** | | | | | | | | | | | | |
| Total PCBs | 12 | 65 | -- | -- | **8.85** | **18.38 *** | **6.9** | **123 * #** | **325.21 * #** | **11.11** | **70 * #** | **33.33 *** |
| Total PCBs (field) | 12 | 65 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |

## Existing Lower Duwamish Waterway Surface and Subsurface Sediment Results - Vicinity of Jorgensen Facility

| Location ID | SMS Criteria | | | | CH0009 | SD-DUW307 | SD-DUW307 | SD-DUW307 | SD-DUW309 | SD-DUW309 | SD-DUW309 | SD-DUW309 | SD-DUW310 | SD-DUW310 | SD-DUW310 | SD-DUW310 | SD-DUW311 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample ID | | | | | SD-307-0000 | SD-307-0001 | SD-307-0002 | SD-307-0003 | SD-309-0000 | SD-309-0001 | SD-309-0002 | SD-309-0003 | SD-310-0000 | SD-310-0001 | SD-310-0002 | SD-310-0003 | SD-311-0000 |
| Sample Date | | | | | 8/16/2004 | 8/19/2004 | 8/19/2004 | 8/19/2004 | 8/16/2004 | 8/19/2004 | 8/19/2004 | 8/19/2004 | 8/16/2004 | 8/19/2004 | 8/19/2004 | 8/19/2004 | 8/16/2004 |
| Depth Interval | SQS | CSL | LAET | 2LAET | 0-10 cm | 1-2 ft | 2-3 ft | 3-4 ft | 0-10 cm | 1-2 ft | 2-3 ft | 3-4 ft | 0-10 cm | 1-2 ft | 2-3 ft | 3-4 ft | 0-10 cm |
| **Conventionals** | | | | | | | | | | | | | | | | | |
| Total solids (%) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| TOC (%) | -- | -- | -- | -- | **2.2** | **0.8** | **0.226** | **0.317** | **2.21** | **1.77** | **1.32** | **0.941** | **1.98** | **1.54** | **1.5** | **0.986** | **1.84** |
| **Metals (mg/kg)** | | | | | | | | | | | | | | | | | |
| Aluminum | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Antimony | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Arsenic | 57 | 93 | 57 | 93 | **15** | **5.2** | -- | -- | **14** | **11** | -- | -- | **12** | **18** | -- | -- | **13** |
| Barium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Beryllium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Cadmium | 5.1 | 6.7 | 5.1 | 6.7 | **1.76** | 0.5 U | -- | -- | **1.3** | **1.2** | -- | -- | **1.1** | **1.65** | -- | -- | **1** |
| Calcium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Chromium | 260 | 270 | 260 | 270 | **43.2** | **11.7** | -- | -- | **81.7** | **35.2** | -- | -- | **59.9** | **34.3** | -- | -- | **69.7** |
| Cobalt | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Copper | 390 | 390 | 390 | 390 | **45.9** | **12.1** | -- | -- | **58** | **55.1** | -- | -- | **52.5** | **43.4** | -- | -- | **60.3** |
| Iron | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Lead | 450 | 530 | 450 | 530 | **209** | **2.8** | -- | -- | **108** | **44.8** | -- | -- | **287** | **26.7** | -- | -- | **169** |
| Magnesium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Manganese | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Mercury | 0.41 | 0.59 | 0.41 | 0.59 | **0.09 J** | -- | -- | -- | **0.24 J** | -- | -- | -- | **0.14 J** | -- | -- | -- | **0.11 J** |
| Nickel | -- | -- | -- | -- | **50** | **9.07** | -- | -- | **48.3** | **29.5** | -- | -- | **37.9** | **22.8** | -- | -- | **58** |
| Potassium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Selenium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Silver | 6.1 | 6.1 | 6.1 | 6.1 | 1 U | 1 U | -- | -- | 0.99 U | 1 U | -- | -- | 0.99 U | 1 U | -- | -- | 0.99 U |
| Sodium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Thallium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Vanadium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Zinc | 410 | 960 | 410 | 960 | **1380 * #** | **298** | -- | -- | **157** | **127** | -- | -- | **142** | **157** | -- | -- | **160** |
| **PCBs (µg/kg)** | | | | | | | | | | | | | | | | | |
| Total PCBs | -- | -- | 130 | 1000 | **2600 * #** | **81.8** | **162 *** | **70.4** | **570 *** | **253 *** | **539 *** | **127** | **560 *** | -- | -- | **85.2** | **3300 J * #** |
| Total PCBs (field) | -- | -- | 130 | 1000 | **2615 * #** | 56 U | **97 J** | **191 *** | **420 *** | **682 *** | **486 *** | **173 *** | **889 *** | **365 *** | **200 *** | 73 U | **461 *** |
| **PCBs (mg/kg-OC)** | | | | | | | | | | | | | | | | | |
| Total PCBs | 12 | 65 | -- | -- | **118 * #** | **10.22** | **73.63 * #** | **22.7 *** | **25.79 *** | **14.29 *** | **40.83 *** | **13.51 *** | **28.28 *** | -- | -- | **8.69** | **179 J * #** |
| Total PCBs (field) | 12 | 65 | -- | -- | **119 * #** | 7 U | **42.92 J *** | **60.25 *** | **19 *** | **38.53 *** | **36.82 *** | **18.38 *** | **44.9 *** | **23.7 *** | **13.33 *** | 7.4 U | **25.05 *** |

# Appendix E
## Existing Lower Duwamish Waterway Surface and Subsurface Sediment Results - Vicinity of Jorgensen Facility

| Location ID | | | | | SD-DUW311 | SD-DUW311 | SD-DUW311 | SD-DUW312 | SD-DUW312 | SD-DUW312 | SD-DUW312 | SD-DUW313 | SD-DUW313 | SD-DUW313 | SD-DUW313 | SD-DUW314A | SD-DUW314A |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample ID | | | | | SD-311-0001 | SD-311-0002 | SD-311-0003 | SD-312-0000 | SD-312-0001 | SD-312-0002 | SD-312-0003 | SD-313-0000 | SD-313-0001 | SD-313-0002 | SD-313-0003 | SD-314-0000 | SD-325-0000 |
| Sample Date | SMS Criteria | | | | 8/19/2004 | 8/19/2004 | 8/19/2004 | 8/16/2004 | 8/19/2004 | 8/19/2004 | 8/19/2004 | 8/16/2004 | 8/19/2004 | 8/19/2004 | 8/19/2004 | 8/17/2004 | 8/17/2004 |
| Depth Interval | SQS | CSL | LAET | 2LAET | 1-2 ft | 2-3 ft | 3-4 ft | 0-10 cm | 1-2 ft | 2-3 ft | 3-4 ft | 0-10 cm | 1-2 ft | 2-3 ft | 3-4 ft | 0-10 cm | 0-10 cm |
| **Conventionals** | | | | | | | | | | | | | | | | | |
| Total solids (%) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| TOC (%) | -- | -- | -- | -- | 1.06 | 1.45 | 0.725 | 2.58 | 1.09 | 0.134 | 0.13 | 2.22 | 1.81 | 0.947 | 1.18 | 1.66 | 1.73 |
| **Metals (mg/kg)** | | | | | | | | | | | | | | | | | |
| Aluminum | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Antimony | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Arsenic | 57 | 93 | 57 | 93 | 15 | -- | -- | 24.5 | 26.7 | -- | -- | 37 | 13 | -- | -- | 24 | -- |
| Barium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Beryllium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Cadmium | 5.1 | 6.7 | 5.1 | 6.7 | 1.87 | -- | -- | 1.56 | 2.29 | -- | -- | 2.5 U | 0.9 | -- | -- | 0.75 | -- |
| Calcium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Chromium | 260 | 270 | 260 | 270 | 69.2 | -- | -- | 78.7 | 64 | -- | -- | 584 * # | 23.3 | -- | -- | 108 | -- |
| Cobalt | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Copper | 390 | 390 | 390 | 390 | 79.5 | -- | -- | 71 | 71.1 | -- | -- | 128 | 38.4 | -- | -- | 72 | -- |
| Iron | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Lead | 450 | 530 | 450 | 530 | 500 * | -- | -- | 196 | 514 * | -- | -- | 637 * # | 13.9 | -- | -- | 81.8 | -- |
| Magnesium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Manganese | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Mercury | 0.41 | 0.59 | 0.41 | 0.59 | -- | -- | -- | 0.2 J | -- | -- | -- | 0.39 J | 0.16 J | -- | -- | 0.23 J | 0.2 J |
| Nickel | -- | -- | -- | -- | 51.1 | -- | -- | 53.1 | 28.4 | -- | -- | 129 | 19 | -- | -- | 47.6 | -- |
| Potassium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Selenium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Silver | 6.1 | 6.1 | 6.1 | 6.1 | 1 U | -- | -- | 1 U | 0.99 U | -- | -- | 5 U | 1 U | -- | -- | 0.99 U | -- |
| Sodium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Thallium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Vanadium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Zinc | 410 | 960 | 410 | 960 | 216 | -- | -- | 174 | 457 * | -- | -- | 529 * | 67.1 | -- | -- | 217 | -- |
| **PCBs (µg/kg)** | | | | | | | | | | | | | | | | | |
| Total PCBs | -- | -- | 130 | 1000 | 1586 * # | 5789 * # | 4446 * # | 1200 * # | 1869 * # | 6 J | 1 J | 1150 J * # | 64.2 | 12 U | 120 U | 670 * | 850 * |
| Total PCBs (field) | -- | -- | 130 | 1000 | 1200 * # | 5072 * # | 2000 * # | 510 * | 761 * | 66.3 U | 14 U | 432 * | 75 J | 33 U | 17 U | 505 * | 459 * |
| **PCBs (mg/kg-OC)** | | | | | | | | | | | | | | | | | |
| Total PCBs | 12 | 65 | -- | -- | 150 * # | 399 * # | 618 * # | 46.51 * | 171 * # | 4.47 J | 0.76 J | 51.8 J * | 3.54 | 1.26 U | 10.16 U | 40.36 * | 49.13 * |
| Total PCBs (field) | 12 | 65 | -- | -- | 113 * # | 350 * # | 276 * # | 19.77 * | 69.82 * # | 49.48 U | 10.77 U | 19.46 * | 4.14 J | 3.48 U | 1.44 U | 30.42 * | 26.53 * |

## Appendix E
## Existing Lower Duwamish Waterway Surface and Subsurface Sediment Results - Vicinity of Jorgensen Facility

| Location ID | SMS Criteria | | | | SD-DUW314A | SD-DUW314A | SD-DUW314A | SD-DUW315 | SD-DUW315 | SD-DUW315 | SD-DUW315 | SD-DUW316 | SD-DUW316 | SD-DUW316 | SD-DUW316 | SD-DUW317 | SD-DUW317 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample ID | | | | | SD-314-0001 | SD-314-0002 | SD-314-0003 | SD-315-0000 | SD-315-0001 | SD-315-0002 | SD-315-0003 | SD-316-0000 | SD-316-0001 | SD-316-0002 | SD-316-0003 | SD-317-0000 | SD-317-0001 |
| Sample Date | | | | | 8/18/2004 | 8/18/2004 | 8/18/2004 | 8/17/2004 | 8/19/2004 | 8/19/2004 | 8/19/2004 | 8/16/2004 | 8/19/2004 | 8/19/2004 | 8/19/2004 | 8/16/2004 | 8/19/2004 |
| Depth Interval | SQS | CSL | LAET | 2LAET | 1-2 ft | 2-3 ft | 3-3.3 ft | 0-10 cm | 1-2 ft | 2-3 ft | 3-4 ft | 0-10 cm | 1-2 ft | 2-3 ft | 3-4 ft | 0-10 cm | 1-2 ft |
| **Conventionals** | | | | | | | | | | | | | | | | | |
| Total solids (%) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| TOC (%) | -- | -- | -- | -- | 2.44 | 0.237 | 0.428 | 1.57 | 0.218 | 0.305 | 0.183 | 2.25 | 1.66 | 1.87 | 1.53 | 2.58 | 2 |
| **Metals (mg/kg)** | | | | | | | | | | | | | | | | | |
| Aluminum | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Antimony | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Arsenic | 57 | 93 | 57 | 93 | 4.5 U | -- | -- | 12 | 4.5 U | -- | -- | 14 | 12 | -- | -- | 15 | 13 |
| Barium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Beryllium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Cadmium | 5.1 | 6.7 | 5.1 | 6.7 | 0.5 U | -- | -- | 0.54 | 0.5 U | -- | -- | 0.8 | 1.2 | -- | -- | 1.1 | 1.5 |
| Calcium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Chromium | 260 | 270 | 260 | 270 | 11.7 | -- | -- | 77.7 | 9.96 | -- | -- | 39.7 | 35.4 | -- | -- | 44.2 | 35.9 |
| Cobalt | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Copper | 390 | 390 | 390 | 390 | 9.53 | -- | -- | 68.8 | 7.32 | -- | -- | 52.3 | 56.1 | -- | -- | 59.6 | 67.4 |
| Iron | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Lead | 450 | 530 | 450 | 530 | 2.5 U | -- | -- | 67.6 | 2.5 U | -- | -- | 59 | 57.5 | -- | -- | 69.1 | 81.7 |
| Magnesium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Manganese | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Mercury | 0.41 | 0.59 | 0.41 | 0.59 | -- | -- | -- | 0.09 J | -- | -- | -- | 0.15 J | -- | -- | -- | 0.1 J | -- |
| Nickel | -- | -- | -- | -- | 8.39 | -- | -- | 57.5 | 6.92 | -- | -- | 28.7 | 27 | -- | -- | 27.6 | 26.1 |
| Potassium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Selenium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Silver | 6.1 | 6.1 | 6.1 | 6.1 | 1 U | -- | -- | 0.99 U | 0.99 U | -- | -- | 1 U | 0.99 U | -- | -- | 1 U | 1 U |
| Sodium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Thallium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Vanadium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Zinc | 410 | 960 | 410 | 960 | 23.9 | -- | -- | 133 | 20.2 | -- | -- | 211 | 150 | -- | -- | 175 | 172 |
| **PCBs (µg/kg)** | | | | | | | | | | | | | | | | | |
| Total PCBs | -- | -- | 130 | 1000 | 20 U | 580 U | 224 J * | 260 J * | 11.3 U | 91 U | 67 U | 940 * | 735 * | 779 * | 3065 * # | 800 * | 1529 * # |
| Total PCBs (field) | -- | -- | 130 | 1000 | 12 U | 6.3 U | 3.3 U | 183 * | 0.27 U | 2.5 U | 0.041 U | 405 * | 564 * | 671 * | 3089 * # | 349 * | 823 * |
| **PCBs (mg/kg-OC)** | | | | | | | | | | | | | | | | | |
| Total PCBs | 12 | 65 | -- | -- | 0.81 U | 245 U | 52.33 J * | 16.56 J * | 5.38 U | 29.83 U | 36.61 U | 41.77 * | 44.27 * | 41.65 * | 200 * # | 31 * | 76.45 * # |
| Total PCBs (field) | 12 | 65 | -- | -- | 0.49 U | 2.66 U | 0.77 U | 11.66 | 0.12 U | 0.82 U | 0.022 U | 18 * | 33.98 * | 35.88 * | 202 * # | 13.53 * | 41.15 * |

# Appendix E
## Existing Lower Duwamish Waterway Surface and Subsurface Sediment Results - Vicinity of Jorgensen Facility

| Location ID | SMS Criteria | | | | SD-DUW317 | SD-DUW317 | SD-DUW318 | SD-DUW318 | SD-DUW319 | SD-DUW319 | SD-DUW319 | SD-DUW319 | SD-DUW320 | SD-DUW320 | SD-DUW320 | SD-DUW320 | SD-DUW320a |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample ID | | | | | SD-317-0002 | SD-317-0003 | SD-318-0000 | SD-318-0001 | SD-319-0000 | SD-319-0001 | SD-319-0002 | SD-319-0003 | SD-320-0000 | SD-320-0001 | SD-320-0002 | SD-320-0003 | SD-328-0003 |
| Sample Date | | | | | 8/19/2004 | 8/19/2004 | 8/16/2004 | 8/18/2004 | 8/16/2004 | 8/18/2004 | 8/18/2004 | 8/18/2004 | 8/16/2004 | 8/19/2004 | 8/19/2004 | 8/19/2004 | 8/19/2004 |
| Depth Interval | SQS | CSL | LAET | 2LAET | 2-3 ft | 3-4 ft | 0-10 cm | 0-1.5 ft | 0-10 cm | 1-2 ft | 2-3 ft | 3-4 ft | 0-10 cm | 1-2 ft | 2-3 ft | 3-4 ft | 3-4 ft |
| **Conventionals** | | | | | | | | | | | | | | | | | |
| Total solids (%) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| TOC (%) | -- | -- | -- | -- | 2.11 | 0.816 | 2.05 | 0.824 | 1.74 | 1.8 | 2.22 | 1.81 | 1.62 | 2.24 | 2.39 | 1.83 | 1.72 |
| **Metals (mg/kg)** | | | | | | | | | | | | | | | | | |
| Aluminum | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Antimony | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Arsenic | 57 | 93 | 57 | 93 | -- | -- | 13 | 5.9 | 13 | 21 | -- | -- | 20 | 20 | -- | -- | -- |
| Barium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Beryllium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Cadmium | 5.1 | 6.7 | 5.1 | 6.7 | -- | -- | 0.57 | 0.5 U | 0.71 | 1.1 | -- | -- | 0.78 | 2.02 | -- | -- | -- |
| Calcium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Chromium | 260 | 270 | 260 | 270 | -- | -- | 54.1 | 11.4 J | 42.5 | 30.5 | -- | -- | 87.1 J | 86.1 J | -- | -- | -- |
| Cobalt | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Copper | 390 | 390 | 390 | 390 | -- | -- | 56.4 | 10.7 | 48.9 | 39.1 | -- | -- | 72.7 | 86.1 | -- | -- | -- |
| Iron | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Lead | 450 | 530 | 450 | 530 | -- | -- | 82.6 | 2.5 U | 204 | 23.6 | -- | -- | 211 | 433 | -- | -- | -- |
| Magnesium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Manganese | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Mercury | 0.41 | 0.59 | 0.41 | 0.59 | -- | -- | 0.1 J | -- | 0.16 J | -- | -- | -- | 0.21 J | -- | -- | -- | -- |
| Nickel | -- | -- | -- | -- | -- | -- | 35.9 | 7.79 | 25.5 | 20.3 | -- | -- | 48.9 | 35.5 | -- | -- | -- |
| Potassium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Selenium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Silver | 6.1 | 6.1 | 6.1 | 6.1 | -- | -- | 0.99 U | 1 U | 0.99 U | 0.99 U | -- | -- | 1.1 | 1.3 | -- | -- | -- |
| Sodium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Thallium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Vanadium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Zinc | 410 | 960 | 410 | 960 | -- | -- | 153 | 21 | 162 | 133 | -- | -- | 237 | 351 | -- | -- | -- |
| **PCBs (µg/kg)** | | | | | | | | | | | | | | | | | |
| Total PCBs | -- | -- | 130 | 1000 | 10438 * # | 1635 * # | 930 J * | 13 U | 3100 * # | 120 | 133 * | 13 U | 8200 * # | 1481 * # | 1234 * # | 239 * | 551 * |
| Total PCBs (field) | -- | -- | 130 | 1000 | 6485 * # | 898 * | 408 * | 15.7 U | 1754 * # | 167 * | 128 J | 109 J | 2143 * # | 745 * | 368 * | 116 J | 149 J * |
| **PCBs (mg/kg-OC)** | | | | | | | | | | | | | | | | | |
| Total PCBs | 12 | 65 | -- | -- | 495 * # | 202 * # | 45.36 J * | 1.57 U | 178 * # | 6.66 | 5.99 | 0.71 U | 506 * # | 66.11 * # | 51.63 * # | 13.06 * # | 32.03 * |
| Total PCBs (field) | 12 | 65 | -- | -- | 307 * # | 110 * # | 19.9 * | 1.91 U | 101 * # | 9.28 | 5.77 J | 6.02 J | 132 * # | 33.26 * | 15.4 * | 6.34 J | 8.66 J |

## Existing Lower Duwamish Waterway Surface and Subsurface Sediment Results - Vicinity of Jorgensen Facility

| Location ID | | | | | SD-DUW321 | SD-DUW321a | SD-DUW321 | SD-DUW321 | SD-DUW321 | SD-DUW322 | SD-DUW322 | SD-DUW322 | SD-DUW322 | SD-DUW322 | SD-DUW322 | SD-DUW323 | SD-DUW323 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample ID | | | | | SD-321-0000 | SD-324-0000 | SD-321-0001 | SD-321-0002 | SD-321-0003 | SD-322-0000 | SD-322-0001 | SD-322-0002 | SD-322-0003 | SD-322-0004 | SD-322-0005 | SD-323-0000 | SD-323-0001 |
| Sample Date | SMS Criteria | | | | 8/16/2004 | 8/16/2004 | 8/18/2004 | 8/18/2004 | 8/18/2004 | 8/16/2004 | 8/18/2004 | 8/18/2004 | 8/18/2004 | 8/18/2004 | 8/18/2004 | 8/17/2004 | 8/19/2004 |
| Depth Interval | SQS | CSL | LAET | 2LAET | 0-10 cm | 0-10 cm | 1-2 ft | 2-3 ft | 3-3.8 ft | 0-10 cm | 1-2 ft | 2-3 ft | 3-4 ft | 4-5 ft | 5-6 ft | 0-10 cm | 1-2 ft |
| **Conventionals** | | | | | | | | | | | | | | | | | |
| Total solids (%) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| TOC (%) | -- | -- | -- | -- | 2.25 | 2.23 | 1.69 | 1.96 | 1.74 | 2.02 | 1.9 | 2.63 | 2.72 | 1.44 | 0.852 | 2.49 | 1.65 |
| **Metals (mg/kg)** | | | | | | | | | | | | | | | | | |
| Aluminum | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Antimony | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Arsenic | 57 | 93 | 57 | 93 | 12 | -- | 13 | -- | -- | 14 | 12 | -- | -- | -- | -- | 32 | 22.8 |
| Barium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Beryllium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Cadmium | 5.1 | 6.7 | 5.1 | 6.7 | 0.58 | -- | 1.1 | -- | -- | 0.5 U | 0.78 | -- | -- | -- | -- | 2.5 U | 0.51 |
| Calcium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Chromium | 260 | 270 | 260 | 270 | 32.1 | -- | 23.3 | -- | -- | 30.1 | 27.9 | -- | -- | -- | -- | 1070 * # | 32 |
| Cobalt | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Copper | 390 | 390 | 390 | 390 | 53.1 | -- | 29.2 | -- | -- | 53.1 | 46.2 | -- | -- | -- | -- | 123 | 53.7 |
| Iron | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Lead | 450 | 530 | 450 | 530 | 28 | -- | 14 | -- | -- | 25.5 | 37.7 | -- | -- | -- | -- | 2350 * # | 171 |
| Magnesium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Manganese | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Mercury | 0.41 | 0.59 | 0.41 | 0.59 | 0.18 J | 0.2 J | -- | -- | -- | 0.14 J | -- | -- | -- | -- | -- | 0.2 J | -- |
| Nickel | -- | -- | -- | -- | 23.2 | -- | 16.6 | -- | -- | 22 | 19.8 | -- | -- | -- | -- | 144 | 31 |
| Potassium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Selenium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Silver | 6.1 | 6.1 | 6.1 | 6.1 | 0.99 U | -- | 0.99 U | -- | -- | 0.99 U | 0.99 U | -- | -- | -- | -- | 5 U | 0.99 U |
| Sodium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Thallium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Vanadium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Zinc | 410 | 960 | 410 | 960 | 112 | -- | 120 | -- | -- | 115 | 110 | -- | -- | -- | -- | 1590 * # | 189 |
| **PCBs (µg/kg)** | | | | | | | | | | | | | | | | | |
| Total PCBs | -- | -- | 130 | 1000 | 510 J * | 630 J * | 752 * | 358 * | 292 * | 9400 J * # | 963 * | 2773 * # | 1391 * # | 126 | 232 * | 285 * | -- |
| Total PCBs (field) | -- | -- | 130 | 1000 | 217 * | 287 * | 425 * | 224 * | 145 J * | 186 * | 583 * | 1273 * # | 514 * | 138 J * | 81 J | 2043 * # | 266 * |
| **PCBs (mg/kg-OC)** | | | | | | | | | | | | | | | | | |
| Total PCBs | 12 | 65 | -- | -- | 22.66 J * | 28.25 J * | 44.49 * | 18.26 * | 16.78 * | 465 J * # | 50.68 * | 105 * # | 51.13 * | 8.75 | 27.29 * | 11.44 | -- |
| Total PCBs (field) | 12 | 65 | -- | -- | 9.64 | 12.87 * | 25.15 * | 11.43 | 8.33 J | 9.21 | 30.68 * | 48.4 * | 18.9 * | 9.58 J | 9.51 J | 82.05 * | 16.12 * |

## Appendix E
## Existing Lower Duwamish Waterway Surface and Subsurface Sediment Results - Vicinity of Jorgensen Facility

| Location ID | SMS Criteria | | | | SD-DUW323 | SD-DUW323 | SD-DUW323a | SD-DUW330 | SD-DUW331 | SD-DUW332 | SD-DUW333 | SD-DUW333a | SD-DUW334 | SD-DUW335 | SD-DUW337 | SD-DUW338A | SD-DUW338A |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample ID | | | | | SD-323-0002 | SD-323-0003 | SD-326-0001 | SD-330-0000 | SD-331-0000 | SD-332-0000 | SD-333-0000 | SD-431-0000 | SD-334-0000 | SD-335-0000 | SD-337-0000 | SD-338-0000 | SD-432-0000 |
| Sample Date | | | | | 8/19/2004 | 8/19/2004 | 8/19/2004 | 8/27/2004 | 8/27/2004 | 8/26/2004 | 8/27/2004 | 8/27/2004 | 8/26/2004 | 8/27/2004 | 8/27/2004 | 8/26/2004 | 8/26/2004 |
| Depth Interval | SQS | CSL | LAET | 2LAET | 2-3 ft | 3-4 ft | 1-2 ft | 0-10 cm | 0-10 cm | 0-10 cm | 0-10 cm | 0-10 cm | 0-10 cm | 0-10 cm | 0-10 cm | 0-10 cm | 0-10 cm |
| **Conventionals** | | | | | | | | | | | | | | | | | |
| Total solids (%) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| TOC (%) | -- | -- | -- | -- | **2.21** | **1.31** | **1.58** | **2.15** | **2.43** | **2.24** | **2.5** | **2.24** | **1.55** | **1.98** | **1.92** | **1.81** | **1.92** |
| **Metals (mg/kg)** | | | | | | | | | | | | | | | | | |
| Aluminum | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Antimony | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Arsenic | 57 | 93 | 57 | 93 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Barium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Beryllium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Cadmium | 5.1 | 6.7 | 5.1 | 6.7 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Calcium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Chromium | 260 | 270 | 260 | 270 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Cobalt | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Copper | 390 | 390 | 390 | 390 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Iron | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Lead | 450 | 530 | 450 | 530 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Magnesium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Manganese | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Mercury | 0.41 | 0.59 | 0.41 | 0.59 | -- | -- | -- | -- | -- | -- | **0.1 J** | -- | -- | -- | -- | -- | -- |
| Nickel | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Potassium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Selenium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Silver | 6.1 | 6.1 | 6.1 | 6.1 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Sodium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Thallium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Vanadium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Zinc | 410 | 960 | 410 | 960 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| **PCBs (µg/kg)** | | | | | | | | | | | | | | | | | |
| Total PCBs | -- | -- | 130 | 1000 | **4 J** | **1 J** | **971 *** | **680 J *** | -- | **361 *** | **1000 * #** | **303 *** | **290 *** | **400 *** | **1238 * #** | **430 *** | **800 *** |
| Total PCBs (field) | -- | -- | 130 | 1000 | 63 U | 43 U | **275 *** | **359 *** | **446 *** | **425 *** | **783 *** | **554 *** | **305 *** | **238 *** | **1200 * #** | **393 *** | **310 *** |
| **PCBs (mg/kg-OC)** | | | | | | | | | | | | | | | | | |
| Total PCBs | 12 | 65 | -- | -- | **0.18 J** | **0.07 J** | **61.45 *** | **31.62 J *** | -- | **16.11 *** | **40 *** | **13.52 *** | **18.7 *** | **20.2 *** | **64.47 *** | **23.75 *** | **41.66 *** |
| Total PCBs (field) | 12 | 65 | -- | -- | 2.85 U | 3.28 U | **17.41 *** | **16.7 *** | **18.35 *** | **18.97 *** | **31.32 *** | **24.73 *** | **19.68 *** | **12.02 *** | **62.5 *** | **21.71 *** | **16.15 *** |

## Existing Lower Duwamish Waterway Surface and Subsurface Sediment Results - Vicinity of Jorgensen Facility

| Location ID | | | | | SD-DUW339 | SD-DUW340 | SD-DUW341 | SD-DUW342 | SD-DUW343 | SD-DUW344 | SD-DUW345 | SD-SWY03 | SD-SWY04 | SD-SWY05 | SD-SWY06 | SD-SWY07 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample ID | | | | | SD-339-0000 | SD-340-0000 | SD-341-0000 | SD-342-0000 | SD-343-0000 | SD-344-0000 | SD-345-0000 | SWY03-0000-6/13/1995 | SWY04-0000 | SWY05-0000 | SWY06-0000 | SWY07-0000 |
| Sample Date | SMS Criteria | | | | 8/26/2004 | 8/26/2004 | 8/26/2004 | 8/27/2004 | 8/27/2004 | 8/26/2004 | 8/26/2004 | 6/13/1995 | 6/13/1995 | 6/12/1995 | 6/13/1995 | 6/13/1995 |
| Depth Interval | SQS | CSL | LAET | 2LAET | 0-10 cm | 0-10 cm | 0-10 cm | 0-10 cm | 0-10 cm | 0-10 cm | 0-10 cm | 0-10 cm | 0-10 cm | 0-10 cm | 0-10 cm | 0-10 cm |
| **Conventionals** | | | | | | | | | | | | | | | | |
| Total solids (%) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| TOC (%) | -- | -- | -- | -- | 1.7 | 1.61 | 2.68 | 1.45 | 1.96 | 2.58 | 1.24 | 3.1 | 2.6 | 2.2 | 3.4 | 2.5 |
| **Metals (mg/kg)** | | | | | | | | | | | | | | | | |
| Aluminum | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 17000 | 15000 | 25000 | 20000 | 13000 |
| Antimony | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 8 J- | 6 J- | 110 J | -- | -- |
| Arsenic | 57 | 93 | 57 | 93 | -- | -- | -- | -- | -- | -- | -- | 29 | 16 | 21 | 20 | 8 |
| Barium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 1300 | 72 | 340 J+ | 74 | 44 |
| Beryllium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0.1 | 0.1 | 0.6 J | 0.3 | 0.2 |
| Cadmium | 5.1 | 6.7 | 5.1 | 6.7 | -- | -- | -- | -- | -- | -- | -- | 4.6 | 1.2 | 21 J * # | 1.6 | 0.4 |
| Calcium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 6200 | 5400 | 5400 J+ | 7200 | 5800 |
| Chromium | 260 | 270 | 260 | 270 | -- | -- | -- | -- | -- | -- | -- | 190 | 42 | 170 J+ | 56 | 37 |
| Cobalt | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 12 | 8.7 | 14 | 9 | 5.3 |
| Copper | 390 | 390 | 390 | 390 | -- | -- | -- | -- | -- | -- | -- | 240 | 170 | 2500 J * # | 85 | 28 |
| Iron | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 30000 | 25000 | 49000 | 34000 | 30000 |
| Lead | 450 | 530 | 450 | 530 | -- | -- | -- | -- | -- | -- | -- | 470 * | 140 | 3500 J+ * # | 170 | 39 |
| Magnesium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 6400 | 5100 | 4800 J+ | 8200 | 5100 |
| Manganese | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 690 | 460 | 1100 J | 370 | 450 |
| Mercury | 0.41 | 0.59 | 0.41 | 0.59 | -- | -- | R | -- | -- | -- | -- | 0.56 J * | 0.15 J | 0.06 | 0.2 J | 0.06 J |
| Nickel | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 77 | 26 | 170 J+ | 39 | 21 |
| Potassium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 1400 | 1400 | 1100 | 2300 | 1400 |
| Selenium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 7 U | 6 U | 7 U | 8 U | 6 U |
| Silver | 6.1 | 6.1 | 6.1 | 6.1 | -- | -- | -- | -- | -- | -- | -- | 17 * # | 1.4 | 7.2 J * # | 1.2 | 0.4 |
| Sodium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 5400 | 5500 | 4100 J+ | 7700 | 5200 |
| Thallium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 13 | 10 | 7 | 9 | 10 |
| Vanadium | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 51 | 48 | 56 | 72 | 57 |
| Zinc | 410 | 960 | 410 | 960 | -- | -- | -- | -- | -- | -- | -- | 1100 * # | 920 * | 1100 J * # | 850 * | 100 |
| **PCBs (µg/kg)** | | | | | | | | | | | | | | | | |
| Total PCBs | -- | -- | 130 | 1000 | 480 * | 230 J * | -- | 1418 * # | 260 J * | 11000 * # | 182 * | 23400 * # | 1400 * # | 1110 * # | 6700 * # | 318 * |
| Total PCBs (field) | -- | -- | 130 | 1000 | 263 * | 415 * | 3186 * # | 704 * | 761 * | 216 * | 526 * | -- | -- | -- | -- | -- |
| **PCBs (mg/kg-OC)** | | | | | | | | | | | | | | | | |
| Total PCBs | 12 | 65 | -- | -- | 28.23 * | 14.28 J * | -- | 97.79 * # | 13.26 J * | 426 * # | 14.67 * | 755 * # | 53.84 * | 50.45 * | 197 * # | 12.72 * |
| Total PCBs (field) | 12 | 65 | -- | -- | 15.47 * | 25.78 * | 119 * # | 48.55 * | 38.83 * | 8.37 | 42.42 * | -- | -- | -- | -- | -- |

## Appendix E
## Existing Lower Duwamish Waterway Surface and Subsurface Sediment Results - Vicinity of Jorgensen Facility

| Location ID | | | | | SD-SWY10 | SD-SWY11 | SD-SWY12 | SD-SWY13 | SD-SWY14 | SD-SWY15 | SD-SWY16 | SD-SWY17 | SD-SWY19 | SS-1 | SS-2 | SS-3 | SS-3 | SS-4 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample ID | | | | | SWY10-0000 | SWY11-0000 | SWY12-0000 | SWY13-0000 | SD-SWY14 | SD-SWY15 | SD-SWY16 | SD-SWY17 | SD-SWY19 | SS-1 | SS-2 | SS-3 | SS-3-DUP | SS-4 |
| Sample Date | SMS Criteria | | | | 6/14/1995 | 6/14/1995 | 6/14/1995 | 6/14/1995 | 9/9/2003 | 9/9/2003 | 9/9/2003 | 9/9/2003 | 9/12/2003 | 8/18/1993 | 8/18/1993 | 8/18/1993 | 8/18/1993 | 8/18/1993 |
| Depth Interval | SQS | CSL | LAET | 2LAET | 0-10 cm | 0-10 cm | 0-10 cm | 0-10 cm | 0-1 ft | 0-1 ft | 0-1 ft | 0-1 ft | 0-1 ft | 0-5 cm | 0-5 cm | 0-5 cm | 0-5 cm | 0-5 cm |
| **Conventionals** | | | | | | | | | | | | | | | | | | |
| Total solids (%) | -- | -- | -- | -- | -- | -- | -- | -- | 67.5 | 79.6 | 72.2 | 76.5 | 74.1 | 47.3 | 60.3 | 47.5 | 49 | 49.7 |
| TOC (%) | -- | -- | -- | -- | 2.4 J | 2.6 J | 2.9 J | 1.7 J | 5.5 | 1 | 3.2 | 3.1 | 2.9 | 1.9 | 2.74 | 2.35 | 1.96 | 1.54 |
| **Metals (mg/kg)** | | | | | | | | | | | | | | | | | | |
| Aluminum | -- | -- | -- | -- | 10000 | 17000 | 46000 | 24000 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Antimony | -- | -- | -- | -- | -- | -- | 13 J- | 12 J- | -- | -- | -- | -- | -- | 3.1 J | 120 J | 5 J | 4.1 J | 29 |
| Arsenic | 57 | 93 | 57 | 93 | 8 | 21 | 28 | 14 | -- | -- | -- | -- | -- | 41 | 1130 * # | 75 * | 57 | 140 * # |
| Barium | -- | -- | -- | -- | 54 | 470 | 610 | 420 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Beryllium | -- | -- | -- | -- | 0.1 U | 0.2 U | 0.2 | 0.1 | -- | -- | -- | -- | -- | 0.4 | 0.7 | 0.4 | 0.5 | 0.7 |
| Cadmium | 5.1 | 6.7 | 5.1 | 6.7 | 2.5 | 2.5 | 11 * # | 9.2 * # | -- | -- | -- | -- | -- | 0.7 | 3.5 | 0.6 | 0.8 | 1.5 |
| Calcium | -- | -- | -- | -- | 4300 | 5900 | 6700 | 7200 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Chromium | 260 | 270 | 260 | 270 | 94 | 98 | 140 | 230 | -- | -- | -- | -- | -- | 44 | 145 | 51 | 48 | 53 |
| Cobalt | -- | -- | -- | -- | 5.9 | 10 | 17 | 12 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Copper | 390 | 390 | 390 | 390 | 74 | 140 | 2500 * # | 1900 * # | -- | -- | -- | -- | -- | 361 J | 1970 J * # | 507 J * # | 519 J * # | 372 |
| Iron | -- | -- | -- | -- | 26000 | 34000 | 49000 | 41000 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Lead | 450 | 530 | 450 | 530 | 66 | 160 | 1900 * # | 3900 * # | -- | -- | -- | -- | -- | 109 J | 854 J * # | 144 J | 103 J | 134 |
| Magnesium | -- | -- | -- | -- | 3200 | 7100 | 6600 | 5500 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Manganese | -- | -- | -- | -- | 150 | 380 | 2600 | 790 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Mercury | 0.41 | 0.59 | 0.41 | 0.59 | 0.24 J | 0.27 J | 1.1 J * # | 0.05 UJ | -- | -- | -- | -- | -- | 0.27 | 0.35 | 0.3 | 0.54 * | 0.26 |
| Nickel | -- | -- | -- | -- | 61 | 51 | 110 | 110 | -- | -- | -- | -- | -- | 31 | 59 | 32 | 32 | 37 |
| Potassium | -- | -- | -- | -- | 950 | 1700 | 1700 | 1200 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Selenium | -- | -- | -- | -- | 6 U | 9 U | 8 U | 6 U | -- | -- | -- | -- | -- | 0.2 U | 0.9 | 0.2 U | 0.2 U | 0.2 |
| Silver | 6.1 | 6.1 | 6.1 | 6.1 | 0.8 | 1.6 | 5.4 | 7.9 * # | -- | -- | -- | -- | -- | 0.6 U | 1 U | 0.6 U | 0.6 U | 0.6 U |
| Sodium | -- | -- | -- | -- | 4900 | 7200 | 8900 | 4200 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Thallium | -- | -- | -- | -- | 11 | 16 | 22 | 24 | -- | -- | -- | -- | -- | 1 U | 0.8 U | 1 U | 1 U | 1 U |
| Vanadium | -- | -- | -- | -- | 43 | 55 | 60 | 43 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Zinc | 410 | 960 | 410 | 960 | 230 | 610 * | 1800 * # | 4200 * # | -- | -- | -- | -- | -- | 335 J | 4400 J * # | 418 J * | 416 J * | 750 * |
| **PCBs (µg/kg)** | | | | | | | | | | | | | | | | | | |
| Total PCBs | -- | -- | 130 | 1000 | 1450 * # | 5200 * # | 1670 * # | 188 * | 34000 * # | 230 * | 1400 * # | 460 * | 3300 * # | -- | -- | -- | -- | -- |
| Total PCBs (field) | -- | -- | 130 | 1000 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| **PCBs (mg/kg-OC)** | | | | | | | | | | | | | | | | | | |
| Total PCBs | 12 | 65 | -- | -- | 60.41 * | 200 * # | 57.58 * | 11.05 | 618 * # | 23 * | 43.75 * | 14.83 * | 114 * # | -- | -- | -- | -- | -- |
| Total PCBs (field) | 12 | 65 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |

## Appendix E
## Existing Lower Duwamish Waterway Surface and Subsurface Sediment Results - Vicinity of Jorgensen Facility

| Location ID | | | | | SS-SWY01 | SS-SWY02 | SS-SWY03 | SS-SWY06 | WES234 | WIT265 | WIT267 | WST318 | WST319 | WST320 | WST323 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample ID | | | | | SWY01-0000-SS | SWY02-0000-3/24/1995 | SWY03-0000-3/24/1995 | SS-SWY06 | WEST01 | WIT07-01 | WIT07-02 | WST08-01 | WST08-02 | WST08-03 | WST09-02 |
| Sample Date | SMS Criteria | | | | 3/24/1995 | 3/24/1995 | 3/24/1995 | 4/19/1995 | 9/24/1997 | 10/16/1997 | 10/16/1997 | 10/2/1997 | 10/2/1997 | 10/2/1997 | 10/21/1997 |
| Depth Interval | SQS | CSL | LAET | 2LAET | 0-10 cm | 0-10 cm | 0-10 cm | 0-10 cm | 0-10 cm | 0-10 cm | 0-10 cm | 0-10 cm | 0-10 cm | 0-10 cm | 0-10 cm |
| **Conventionals** | | | | | | | | | | | | | | | |
| Total solids (%) | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| TOC (%) | -- | -- | -- | -- | **2.2** | **3.3** | -- | **8.3** | **1.9** | **0.31** | **0.67** | **1.51** | **1.6** | **2.08** | **1.93** |
| **Metals (mg/kg)** | | | | | | | | | | | | | | | |
| Aluminum | -- | -- | -- | -- | **110000** | **110000** | **9800** | **20000** | -- | -- | -- | -- | -- | -- | -- |
| Antimony | -- | -- | -- | -- | 31 UJ | **59 J** | 28 UJ | **110 J-** | -- | -- | -- | -- | -- | -- | -- |
| Arsenic | 57 | 93 | 57 | 93 | 31 U | **57** | 28 U | **30** | -- | -- | -- | -- | -- | -- | -- |
| Barium | -- | -- | -- | -- | **3500** | **1800** | **210** | **580** | -- | -- | -- | -- | -- | -- | -- |
| Beryllium | -- | -- | -- | -- | 0.6 U | 0.7 U | 0.6 U | 0.3 U | -- | -- | -- | -- | -- | -- | -- |
| Cadmium | 5.1 | 6.7 | 5.1 | 6.7 | **120 * #** | **55 * #** | **16 * #** | **54 * #** | -- | -- | -- | -- | -- | -- | -- |
| Calcium | -- | -- | -- | -- | **9100** | **7700** | **12000** | **5000 J+** | -- | -- | -- | -- | -- | -- | -- |
| Chromium | 260 | 270 | 260 | 270 | **750 J * #** | **590 J * #** | **270 J *** | **1100 J+ * #** | -- | -- | -- | -- | -- | -- | -- |
| Cobalt | -- | -- | -- | -- | **31** | **33** | **24** | **37 J** | -- | -- | -- | -- | -- | -- | -- |
| Copper | 390 | 390 | 390 | 390 | **12000 J * #** | **12000 J * #** | **310 J** | **2300 J+ * #** | -- | -- | -- | -- | -- | -- | -- |
| Iron | -- | -- | -- | -- | **68000** | **120000** | **110000** | **160000** | -- | -- | -- | -- | -- | -- | -- |
| Lead | 450 | 530 | 450 | 530 | **4100 * #** | **23000 * #** | **560 * #** | **3000 J+ * #** | -- | -- | -- | -- | -- | -- | -- |
| Magnesium | -- | -- | -- | -- | **6100** | **5000** | **3600** | **5100 J+** | -- | -- | -- | -- | -- | -- | -- |
| Manganese | -- | -- | -- | -- | **2600** | **3300** | **770** | **1700** | -- | -- | -- | -- | -- | -- | -- |
| Mercury | 0.41 | 0.59 | 0.41 | 0.59 | **0.23** | **2 * #** | **0.68 * #** | **0.54 *** | -- | -- | -- | -- | -- | -- | -- |
| Nickel | -- | -- | -- | -- | **460** | **370** | **180** | **910** | -- | -- | -- | -- | -- | -- | -- |
| Potassium | -- | -- | -- | -- | **1000** | **1100** | **730** | **800** | -- | -- | -- | -- | -- | -- | -- |
| Selenium | -- | -- | -- | -- | 31 U | 34 U | 28 U | **20** | -- | -- | -- | -- | -- | -- | -- |
| Silver | 6.1 | 6.1 | 6.1 | 6.1 | **97 * #** | **270 * #** | **8 * #** | **8 * #** | -- | -- | -- | -- | -- | -- | -- |
| Sodium | -- | -- | -- | -- | **2000** | **2900** | **580** | **2100** | -- | -- | -- | -- | -- | -- | -- |
| Thallium | -- | -- | -- | -- | 31 U | 34 U | **29** | **30** | -- | -- | -- | -- | -- | -- | -- |
| Vanadium | -- | -- | -- | -- | **58** | **50** | **46** | **69** | -- | -- | -- | -- | -- | -- | -- |
| Zinc | 410 | 960 | 410 | 960 | **9700 * #** | **6400 * #** | **1100 * #** | **2800 J+ * #** | -- | -- | -- | -- | -- | -- | -- |
| **PCBs (µg/kg)** | | | | | | | | | | | | | | | |
| Total PCBs | -- | -- | 130 | 1000 | **330 *** | **3500 * #** | -- | **1600 * #** | -- | -- | -- | -- | -- | -- | -- |
| Total PCBs (field) | -- | -- | 130 | 1000 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| **PCBs (mg/kg-OC)** | | | | | | | | | | | | | | | |
| Total PCBs | 12 | 65 | -- | -- | **15** | **106 * #** | -- | **19.27 *** | **72.49 * #** | **603 * #** | **66.86 * #** | **1.46** | **1.93** | **2.32** | **316 * #** |
| Total PCBs (field) | 12 | 65 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |

**Cell:** A1
**Comment:** Ryan Barth:
Notes:
Per the SMS regulations, TOC normalization of Total PCBs concentrations is not conducted if the TOC results are less than 0.5%. In cases where the TOC< 0.5%, the dry weight Total PCB concentrations were compared to the LAET Marine 1988 (130 mg/kg) and 2LAET Marine 1988 (1000 mg/kg) criteria.

U = not detected
J = estimated
UJ = not detected at an estimated detection limit

BOLD: Detected results
* (shaded): Result exceeds SMS SQS criteria
# (shaded): Result exceeds SMS CSL criteria

Notes:
a: Sample was collected as a field duplicate

# APPENDIX F
# THIRD PHASE INVESTIGATION DATA VALIDATION REPORT

FINAL INVESTIGATION DATA SUMMARY REPORT
Jorgensen Forge Facility
8531 East Marginal Way South
Seattle, Washington
U.S. EPA Docket No. CERCLA 10-2003-0111

Farallon PN: 831-003

# Jorgensen Forge Facility
# Seattle, WA

# Full Data Validation Report
# Third Phase Investigation Activities

Dates of Sampling: May 2, 5, 6, and 19, 2005;

Sample Matrix Type: Sediments, Liquids & Soilds

Contract Laboratory: Severn Trent Laboratory

Contract Laboratory Sample Data Group or Report ID: 127730, 127674, 127740 and 127982

**Prepared By**

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**Date of Validation Report**

**June 24, 2005**

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## INTRODUCTION

This report summarizes the review of analytical results for sediment, solids and liquid samples collected at the Jorgensen Forge site in Seattle, Washington on May 2, 5, 6, and 19, 2005. Samples were collected by Anchor Environmental, L.L.C. (Anchor) and submitted to Severn Trent Laboratory (STL) Seattle laboratory located in Fife, Washington. A total of 20 sediment samples, thirty-seven solids and four liquids were submitted to STL for analysis. The samples were analyzed for the following parameters and methods (USEPA 1983, 1986):

- Polychlorinated Biphenyl (PCB) by USEPA Method 8082
- Total metals by USEPA Method 6020 and 7471
- Total solids (TS) in percent by USEPA Method 160.3 (modified for sediments)
- Total organic carbon (TOC) by USEPA Method 9060
- Atterburg Limits by ASTM Method D4318
- Grain size by Puget Sound Estuary Program methodologies

Table 1 represents the cross-reference of sample versus lab identification for STL sample data group numbers 127730, 127674, 127982 and 127740 a total of 1753 pages were reviewed.

**Table 1**
**Sample Reference Table**

| Sample ID | Location | Lab ID | Matrix | Analysis Requested |
|---|---|---|---|---|
| AJF-07SD-A | 07SD | 127730-1 | Sediment | Grain size[1], TOC, TS, PCB, Total metals and Atterburg[1] limits |
| AJF-07SD-B | 07SD | 127730-2 | Sediment | Grain size, TOC, TS, PCB, Total metals and Atterburg limits[1] |
| AJF-07SD-C | 07SD | 127730-3 | Sediment | Grain size, TOC, TS, PCB, Total metals |
| AJF-07SD-D | 07SD | 127730-4 | Sediment | Grain size, TOC, TS, PCB, Total metals and Atterburg limits |
| AJF-07SD-E | 07SD | 127730-5 | Sediment | Grain size, TOC, TS, PCB, Total metals |
| AJF-07SD-F | 07SD | 127730-6 | Sediment | Grain size, TOC, TS, PCB, Total metals and Atterburg limits |
| AJF-07SD-G | 07SD | 127730-7 | Sediment | Grain size, TOC, TS, PCB, Total metals |
| AJF-11SD-A | 11SD | 127730-8 | Sediment | Grain size, TOC, TS, PCB, Total metals and Atterburg limits |
| AJF-11SD-B | 11SD | 127730-9 | Sediment | Grain size, TOC, TS, PCB, Total metals and Atterburg limits |
| AJF-11SD-C | 11SD | 127730-10 | Sediment | Grain size, TOC, TS, PCB, Total metals |
| AJF-11SD-D | 11SD | 127730-11 | Sediment | Grain size, TOC, TS, PCB, Total metals and Archive sample |
| AJF-11SD-E | 11SD | 127730-12 | Sediment | Grain size, TOC, TS, PCB, Total metals and Archive sample |
| AJF-11SD-F | 11SD | 127730-13 | Sediment | Grain size, TOC, TS, PCB, Total metals and Archive sample |
| AJF-61SD-C | 11SD | 127730-14 | Sediment | TOC, TS, PCB, Total metals |
| AJF-14SD-A | 14SD | 127730-15 | Sediment | Grain size, TOC, TS, PCB, Total metals and Atterburg limits |
| AJF-14SD-B | 14SD | 127730-16 | Sediment | Grain size, TOC, TS, PCB, Total metals and Atterburg limits |
| AJF-14SD-C | 14SD | 127730-17 | Sediment | Grain size, TOC, TS, PCB, Total metals and Archive sample |
| AJF-14SD-D | 14SD | 127730-18 | Sediment | Grain size, TOC, TS, PCB, Total metals and Archive sample |
| AJF-14SD-E | 14SD | 127730-19 | Sediment | Grain size, TOC, TS, PCB, Total metals and Archive sample |
| AJF-64SD-D | 14SD | 127730-20 | Sediment | TOC, TS, PCB, Total metals |
| AJF-02SW-050519 | 02SW | 127982-1 | Liquid | TSS, pH, Total metals, Dissolved metals, PCB |

**Table 1**
**Sample Reference Table**

| Sample ID | Location | Lab ID | Matrix | Analysis Requested |
|---|---|---|---|---|
| AJF-03SW-050519 | 03SW | 127982-2 | Liquid | TSS, pH, Total metals, Dissolved metals, PCB |
| AJF-SWFB-050519 | | 127982-3 | Liquid | Dissolved metals |
| AJF-01SD | 01SD | 127674-1 | Solid | Grainsize, Total metals, PCB's, T. Solids, TOC, and Archive sample |
| AJF-02SD | 02SD | 127674-2 | Solid | Grainsize, Total metals, PCB's, T. Solids, TOC, and Archive sample |
| AJF-03SD | 03SD | 127674-3 | Solid | Grainsize, Total metals, PCB's, T. Solids, TOC, and Archive sample |
| AJF-04SD | 04SD | 127674-4 | Solid | Grainsize, Total metals, PCB's, T. Solids, TOC, and Archive sample |
| AJF-05SD | 05SD | 127674-5 | Solid | Grainsize, Total metals, PCB's, T. Solids, TOC, and Archive sample |
| AJF-06SD | 06SD | 127674-6 | Solid | Grainsize, Total metals, PCB's, T. Solids, and TOC |
| AJF-07SD | 07SD | 127674-7 | Solid | Grainsize, Total metals, PCB's, T. Solids, TOC, and Atterberg limits |
| AJF-08SD | 08SD | 127674-8 | Solid | Grainsize, Total metals, PCB's, T. Solids, TOC, and Archive sample |
| AJF-09SD | 09SD | 127674-9 | Solid | Grainsize, Total metals, PCB's, T. Solids, TOC, and Archive sample |
| AJF-10SD | 10SD | 127674-10 | Solid | Grainsize, Total metals, PCB's, T. Solids, TOC, and Archive sample |
| AJF-11SD | 11SD | 127674-11 | Solid | Grainsize, Total metals, PCB's, T. Solids, TOC, and Atterberg limits |
| AJF-59SD | | 127674-12 | Solid | Grainsize, Total metals, PCB's, T. Solids, and TOC |
| AJF-SDFB | | 127674-13 | Liquid | Total metals and PCB's |
| AJF-SDRFB | | 127674-14 | Liquid | Total metals and PCB's |
| AJF-12SD-A | 12SD-A | 127740-1 | Solid | Metals, PCB, TS, TOC, Grainsize, Atterburg Limits |
| AJF-12SD-B | 12SD-B | 127740-2 | Solid | Metals, PCB, TS, TOC, Grainsize, Atterburg Limits |
| AJF-12SD-C | 12SD-C | 127740-3 | Solid | Metals, PCB, TS, TOC, Grainsize, and Achieve |
| AJF-12SD-D | 12SD-D | 127740-4 | Solid | Metals, PCB, TS, TOC, Grainsize, and Achieve |

**Table 1**
**Sample Reference Table**

| Sample ID | Location | Lab ID | Matrix | Analysis Requested |
|---|---|---|---|---|
| AJF-12SD-E | 12SD-E | 127740-5 | Solid | Metals, PCB, TS, TOC, Grainsize, and Achieve |
| AJF-12SD-F | 12SD-F | 127740-6 | Solid | Metals, PCB, TS, TOC, Grainsize, Atterburg Limits |
| AJF-13SD-A | 13SD-A | 127740-7 | Solid | Metals, PCB, TS, TOC, Grainsize, Atterburg Limits |
| AJF-13SD-B | 13SD-B | 127740-8 | Solid | Metals, PCB, TS, TOC, Grainsize, Atterburg Limits |
| AJF-13SD-C | 13SD-C | 127740-9 | Solid | Metals, PCB, TS, TOC, Grainsize, Atterburg Limits |
| AJF-13SD-D | 13SD-D | 127740-10 | Solid | Metals, PCB, TS, TOC, Grainsize, and Achieve |
| AJF-13SD-E | 13SD-E | 127740-11 | Solid | Metals, PCB, TS, TOC, Grainsize, and Achieve |
| AJF-13SD-F | 13SD-F | 127740-12 | Solid | Metals, PCB, TS, TOC, Grainsize, and Achieve |
| AJF-15SD-A | 15SD-A | 127740-13 | Solid | Metals, PCB, TS, TOC, Grainsize, Atterburg Limits |
| AJF-15SD-B | 15SD-B | 127740-14 | Solid | Metals, PCB, TS, TOC, Grainsize, Atterburg Limits |
| AJF-15SD-C | 15SD-C | 127740-15 | Solid | Metals, PCB, TS, TOC, Grainsize, Atterburg Limits |
| AJF-15SD-D | 15SD-D | 127740-16 | Solid | Metals, PCB, TS, TOC, Grainsize, and Achieve |
| AJF-15SD-E | 15SD-E | 127740-17 | Solid | Metals, PCB, TS, TOC, Grainsize, |
| AJF-15SD-F | 15SD-F | 127740-18 | Solid | Metals, PCB, TS, TOC, Grainsize, |
| AJF-65SD-E | 15SD-E | 127740-19 | Solid | Metals, PCB, TS, TOC |
| AJF-16SD-A | 16SD-A | 127740-20 | Solid | Metals, PCB, TS, TOC, Grainsize, Atterburg Limits |
| AJF-16SD-B | 16SD-B | 127740-21 | Solid | Metals, PCB, TS, TOC, Grainsize, Atterburg Limits |
| AJF-16SD-C | 16SD-C | 127740-22 | Solid | Metals, PCB, TS, TOC, Grainsize, and Achieve |
| AJF-16SD-D | 16SD-D | 127740-23 | Solid | Metals, PCB, TS, TOC, Grainsize, and Achieve |
| AJF-16SD-E | 16SD-E | 127740-24 | Solid | Metals, PCB, TS, TOC, Grainsize, and Achieve |

**Table 1**
**Sample Reference Table**

| Sample ID | Location | Lab ID | Matrix | Analysis Requested |
|---|---|---|---|---|
| AJF-16SD-F | 16SD-F | 127740-25 | Solid | Metals, PCB, TS, TOC, Grainsize, and Achieve |
| AJF-SDRB-050506 | | 127740-26 | Liquid | Metals, PCB |
| AJF-SDFB-050506 | | 127740-27 | Liquid | Metals, PCB |

Notes: [1] Grainsize and Atterburg limits were subcontracted to STL Burlington

Remaining sample volumes and archived sample volumes were archived at the time of receipt or after completion of the sample analysis.

## Sample Receipt

Samples were received by the STL laboratory on May 4, 6, 9, and 20, 2005. The cooler temperatures were within the designated temperature of $4^{\circ}\pm2^{\circ}$C. Sample receipt forms indicated samples were received in good condition.

The following deviations were noted at the time of sample receipt:

- All samples were bagged as a sample set rather than individually.

## Preliminary Data Package Review

The data packages were checked for completion by reviewing the following records:

- Sampling and Analysis Plan (QAPP; Anchor 2005)
- Subcontract
- COC form
- Cooler receipt forms
- Data package pagination
- Reviewer signatures and approvals
- Appropriate detailed case narrative

No deviations were noted by the validation reviewer.

## DATA VALIDATION AND QUALIFICATIONS

The following comments refer to the laboratory's performance in meeting the quality assurance/quality control (QA/QC) guidelines outlined in the data quality objective section of the QAPP (Anchor 2005). Laboratory results were reviewed by following USEPA guidelines (USEPA 1999, 2004). Unless noted as a deviation in this report, laboratory results for the samples listed above were within QC criteria. For each analytical section, the following items were evaluated:

- Holding times (extraction and analytical where applicable)
- Instrument tune criteria
- Initial calibration criteria per method
- Second source verification performed and within method criteria
- Continuing calibration criteria per method
- Internal standard recoveries in samples, standards, and spikes per method criteria
- Surrogate(s) percent recovery (%R), where applicable, met QAPP-specified control limits
- Method blank contamination
- Matrix duplicate/triplicate relative percent differences (RPDs) or relative standard deviations (RSDs) met SAP-specified control limits
- Matrix spike/matrix spike duplicate, %R, and RPD met SAP-specified control limits
- Laboratory control sample(s) (LCS) %R and RPD, where applicable, met SAP-specified control limits (the term "blank spike/blank spike duplicate" can be substituted for "LCS")
- Sample identification and reported detection limits were correct; accounted for dilutions, extract weights, calculations; and were reported as dry weight
- Post digestion spikes were performed in metals analyses
- Sample calculations were verified

The above noted criteria have been evaluated for each parameter analyzed. Any deviations to the QAPP have been documented in this report.

# DATA REVIEW BY SECTION

## Total Percent Solids

The field duplicates and laboratory duplicates were within QAPP criteria.

## Total Organic Carbon (TOC)

The relative percent difference (RPD) for field duplicates for AJF-14SD-D and AJF-64SD-D was outside QAPP criteria at 68%. Qualify the associated detected results, as estimated with a "J" flag.

The relative percent difference for laboratory triplicates for AJF-13SD-D was outside QAPP criteria at 38.6%. Qualify the associated detected results, as estimated with a "J" flag.

The relative percent difference for field duplicates AJF-15SD-E and AJF-65SD-E were outside QAPP criteria at 44%. Qualify the associated detected results, as estimated with a "J" flag.

The matrix spike duplicate for AJF-01SD was outside QAPP control limits low. The matrix spike recovery was within criteria. It appears the matrix spike duplicate was not spiked. No qualification to data was made.

No other deviations were noted.
Observations:

- The raw data for the TOC was not discernable for all samples. Where the data was not readable the calculations were not checked.
- The matrix spike duplicate was spiked at a different level from the matrix spike for TOC on sample AJF-12SD-A. Data report sheet is incorrect. MS/MSD within compliance when calculated from the raw data.

## PH

No deviations were identified.

## Total Suspended solids

No deviations were identified.

## Polychlorinated Biphenyls (PCBs)

The surrogate tetrachlorometaxylene recovery and the decachlorobiphenyl recovery was outside the QAPP specified control limit in samples AJF-07SD-G and AJF-14SD-C. Both samples were reported from a 10x dilution. As there was no data reported from the undiluted samples all detectable results should be qualified as estimated with a "J" flag.

The matrix spikes performed on AJF-14SD-A was outside QAPP control limits for the matrix spike duplicate on Aroclor 1260. Since the other three spikes were with in control limits, it appears the sample may not be homogeneous. No data was qualified based on this result.

The surrogate tetrachlorometaxylene recovery and the decachlorobiphenyl recovery was outside the QAPP specified control limit in samples AJF-01SD, AJF-02SD, AJF-06SD, AJF-08SD, AJF-09SD and AJF-59SD. The samples were reported from either a 10x, 50x and 100x dilutions. As there was no data reported from the undiluted samples all detectable results should be qualified as estimated with a "J" flag.

No matrix spike was performed on the samples contained in the data group 127674.

Three continuing calibration 5375.D, 5385.D and 5397.D for Aroclor 1260 were above the QC criteria of 15% and 5385.D also had one peak out for Aroclor 1242. As there was at least three peaks and the mean average was within criteria no qualifications were made based on these deviations.

The surrogate tetrachlorometaxylene recovery and the decachlorobiphenyl recovery was outside the QAPP specified control limit in samples AJF-12SD-A, AJF-12SD-B, AJF-12SD-C, and AJF-16SD-C. The samples were reported from either a 5x, 10x, and 20x dilutions. As there was no data reported from the undiluted samples all detectable results should be qualified as estimated with a "J" flag.

For sample AJF-13SD-B (127740-8) the peak pattern is not discernable. The sample should have been diluted or analyzed by an alternative method to verify the lack of aroclor activity. If samples had been frozen according to request, they would have been within holding time for re-extraction and re-analysis with additional clean-ups. Qualify the non-detected values as estimated.

The blank spike DPBW0339 has the percent recoveries for aroclor's 1242 & 1260 within QAPP recovery limits. The blank spike duplicate recovery for the surrogates Tetrachloro-m-xylene and Decachlorobiphenyl were outside QAPP control limits high. As the associated matrix spike pairs were both within QAPP criteria no data were qualified based on these results. Two matrix spike pairs were performed.

Continuing calibration 5540.D for aroclor 1260 second column confirmation analysis had one peak outside the method criteria of 15% RSD. As the four remaining peaks were acceptable, no qualification of data was made

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Continuing calibration 5563.D for aroclor 1260 second column confirmation analysis had one peak outside the method criteria of 15% RSD. As the four remaining peaks were acceptable, no qualification of data was made.

Continuing calibration 5575.D for aroclor 1260 second column confirmation analysis had one peak outside the method criteria of 15% RSD. As the four remaining peaks were acceptable, no qualification of data was made.

Continuing calibration 5652.D for aroclor 1260 second column confirmation analysis had one peak outside the method criteria of 15% RSD. As the four remaining peaks were acceptable, no qualification of data was made.

No other deviations were noted.

Observations:

- The reporting limit for PCB aroclor's exceeded the QAPP-specified reporting limit.
- There was no SRM results report per QAPP QA/QC specifications.

- Sample AJF-13SD-F (127740-12) the chromatogram for aroclor 1254 was not submitted in the data package.
- No matrix spike was performed on the liquid samples.

### Metals

The method blank SP1210 contained chromium, copper and lead above the MDL and below the reporting limit. All sediment sample contained metals concentrations greater than ten times the blank contamination level. No data were qualified.

| Metal | MDL | Blank Concentration (mg/kg) | Action Limit (mg/kg) |
|---|---|---|---|
| Chromium | 0.00835 | 0.0225 | 0.225 |
| Copper | 0.00367 | 0.069 | 0.69 |
| Lead | 0.0005 | 0.0008 | 0.008 |

The field duplicate for AJF-14SD-D and AJF-64SD-D was outside QAPP criteria (35% RPD) for copper (52% RPD) and silver (65% RPD). The field duplicate for AJF-14SD-D and AJF-64SD-D was outside QAPP criteria for lead (62%RPD). Qualify any detected results with a "J" to indicate the reported values are estimates. Qualify and non-detected results as "UJ" to indicated the values reported are undetected estimates.

A duplicate analysis was performed on sample AJF-03SW-050519. Cadmium and silver had RPD's that exceeded the QAPP criteria ±20%. The detected amount of both analytes was below the reporting limit but above the MDL. Therefore the results were qualified as "UJ".

The method blank SP1211 was prepared on 5/11/05 and analyzed on 5/11/05 contained analytes detected below the reporting limit but above the MDL. An action limit of ten times the blank concentration was established. All sediment sample contained metals concentrations greater than ten times the blank contamination level. No data were qualified.

| Metal | MDL | Blank Concentration (mg/kg) | Action Limit (mg/kg) |
|---|---|---|---|
| Copper | 0.00367 | 0.0049 | 0.049 |
| Lead | 0.0005 | 0.001 | 0.01 |

The method blank TP1209 was prepared on 5/11/05 and analyzed on 5/11/05 contained analytes detected below the reporting limit but above the MDL. An action limit of ten times the blank concentration was established.

| Metal | MDL | Blank Concentration (mg/kg) | Action Limit (mg/kg) |
|---|---|---|---|
| Chromium | 0.00004 | 0.000188 | 0.00188 |
| Copper | 0.0000167 | 0.00004 | 0.0004 |
| Lead | 0.00000333 | 0.000005 | 0.00005 |
| Silver | 0.000004 | 0.000005 | 0.00005 |

All results below the reporting limit but above the MDL were considered non-detects and "U" flagged. Chromium results were above the reporting limit and above the action limit. Therefore no qualification was made to this result.

A duplicate analysis was performed on sample AJF-SDRB-050506. Zinc had an RPD that exceeded the QAPP criteria ±20%. Qualify the zinc results associated with this RPD as estimated with the "J" flag.

The method blank SP1212 was prepared on 5/11/05 and analyzed on 5/11/05 contained analytes detected below the reporting limit but above the MDL. An action limit of ten times the blank concentration was established.

| Metal | MDL | Blank Concentration (mg/kg) | Action Limit (mg/kg) |
|---|---|---|---|
| Chromium | 0.00835 | 0.0176 | 0.176 |
| Copper | 0.00367 | 0.0061 | 0.061 |
| Lead | 0.0005 | 0.0044 | 0.044 |
| Zinc | 0.0144 | 0.015 | 0.15 |

All samples contained these metals well above the action limit. No qualifications were made based on the blank contamination.

The method blank TP1202 was prepared on 5/10/05 and analyzed on 5/10/05 contained analytes detected below the reporting limit but above the MDL. An action limit of ten times the blank concentration was established.

| Metal | MDL | Blank Concentration (mg/L) | Action Limit (mg/L) |
|---|---|---|---|
| Chromium | 0.00004 | 0.000091 | 0.00091 |
| Copper | 0.0000167 | 0.000056 | 0.00056 |
| Lead | 0.00000333 | 0.000004 | 0.00004 |
| Nickel | 0.000011 | 0.000052 | 0.00052 |

All results below the reporting limit but above the MDL were considered non-detects and "U" flagged. Chromium results were above the reporting limit and above the action limit. Therefore no qualification was made to this result.

The matrix spike and matrix spike duplicate performed on sample AJF-59SD had chromium and nickel recoveries outside the QAPP specified recovery of 75-125%. As most the metal spike recoveries were within limits, qualify the associated sample only as estimated high for these metals "J+". (Note this MS/MSD was also batched with samples from 127740).

The duplicate analysis performed on sample AJF-SDFB had the RPD outside criteria for the following metals: Lead (26%), Nickel (26%), Silver (57%), Zinc (200%). As the results for the two samples were below the reporting limit or very close to the reporting limit which prevents accurate RPD calculation. Thus, no qualification was made based on these results.

Observations:

- Several samples had metals reported below the reporting limit and above the MDL. These metals were "J" flagged by the laboratory to indicate the values reported are estimates.
- No tune criteria was provide in the raw data section of this report.
- No mass calibration and resolution $\leq$ 0.1 amu from true information provided. Method calls for MCR standard to be analyzed and the instrument to be checked for.
- RPD were reported with negative values, this implies the laboratory doesn't understand the definition of RPD.
- MDL's seem to be adjusted to sample volume rather than a stationary lab produced data point.

## Grain Size Analysis

No deviations were noted.  However, in several instances the grainsize totals for all fractions exceeded 100%.

## Atterburg Limits

No deviations were noted

## OVERALL ASSESSMENT

The data are judged to be acceptable for their intended use as qualified.

### Precision, Accuracy, and Completeness

| | |
|---|---|
| Precision: | All precision goals were met. |
| Accuracy: | All accuracy goals were met. |
| Completeness: | Completeness was 100 percent, all data are useable as qualified. |

Susan Snyder    8/31/05

Signature of reviewer    Date

## DATA QUALIFIERS

The following tables show a tabulation of qualifiers for laboratory sample data groups 127730, 127674, 127740 and 127982.

**Table 2**
**Laboratory Sample Data Group: 127730**

| Sample ID | Test Method | Parameter | Result | Qualifier | Comment |
|---|---|---|---|---|---|
| AJF-14SD-D | 9060 | Total organic carbon | 6870 | 6870 J | Field duplicates RPD out |
| AJF-07SD-G | 8082 | Aroclor 1260 | 1.04 | 1.04 J | No surrogate recovery |
| AJF-14SD-C | 8082 | Aroclor 1254 | 1.38 | 1.38 J | No surrogate recovery |
| | | Aroclor 1260 | 0.888 | 0.888 J | No surrogate recovery |

**Table 3**
**Laboratory Sample Data Group: 127674**

| Sample ID | Test Method | Parameter | Result | Qualifier | Comment |
|---|---|---|---|---|---|
| AJF-01SD | 8082 | Aroclor 1254 | 2.11 | 2.11 J | No surrogate recovery |
| AJF-02SD | 8082 | Aroclor 1254 | 18.4 | 18.4 J | No surrogate recovery |
| AJF-06SD | 8082 | Aroclor 1254 | 8.71 | 8.71 J | No surrogate recovery |
| AJF-08SD | 8082 | Aroclor 1254 | 2.59 | 2.59 J | No surrogate recovery |
| AJF-09SD | 8082 | Aroclor 1254 | 4.25 | 4.25 J | No surrogate recovery |
| AJF-59SD | 8082 | Aroclor 1254 | 4.98 | 4.98 J | No surrogate recovery |
| AJF-59SD | 6020 | Chromium | 144 | 144 J | MS/MSD %R outside criteria |
| | | Nickel | 175 | 175 J | MS/MSD %R outside criteria |
| AJF-SDFB | 6020 | Copper | 0.00029 | 0.00029 UJ | Blank Contamination |
| | | Lead | 0.00005 | 0.00005 UJ | Blank Contamination |
| | | Nickel | 0.000435 | 0.000435 UJ | Blank Contamination |
| AJF-SDRB | 6020 | Chromium | 0.00183 | 0.00183 UJ | Blank Contamination |
| | | Lead | 0.000355 | 0.000355 UJ | Blank Contamination |
| | | Nickel | 0.00178 | 0.00178UJ | Blank Contamination |

**Table 4**
**Laboratory Sample Data Group: 127740**

| Sample ID | Test Method | Parameter | Result | Qualifier | Comment |
|---|---|---|---|---|---|
| AJF-12SD-A | 8082 | Aroclor 1254 | 10 | 10 J | No surrogate recovery |
| AJF-12SD-B | 8082 | Aroclor 1254 | 1.67 | 1.67 J | No surrogate recovery |

| | | | | | |
|---|---|---|---|---|---|
| AJF-12SD-C | 8082 | Aroclor 1254 | 1.8 | 1.8 J | No surrogate recovery |
| AJF-16SD-C | 8082 | Aroclor 1254 | 1.24 | 1.24 J | No surrogate recovery |
| AJF-13SD-B | 8082 | Aroclor 1016 | U | U J | Poor chromatography |
| | | Aroclor 1221 | U | U J | Poor chromatography |
| | | Aroclor 1232 | U | U J | Poor chromatography |
| | | Aroclor 1242 | U | U J | Poor chromatography |
| | | Aroclor 1248 | U | U J | Poor chromatography |
| | | Aroclor 1254 | U | U J | Poor chromatography |
| | | Aroclor 1260 | U | U J | Poor chromatography |
| AJF-13SD-D | 9060 | TOC | 4610 | 4610 J | Duplicate recovery RPD out |
| AJF-15SD-E | 9060 | TOC | 33100 | 33100 J | Field duplicate RPD out |
| AJF-65SD-E | 9060 | TOC | 21100 | 21100 J | Field duplicate RPD out |
| AJF-SDRB-050506 | 200.8 | Copper | 0.000242 | 0.000242UJ | Blank Contamination |
| | | Lead | 0.000048 | 0.000048UJ | Blank Contamination |
| | | Silver | 0.000011 | 0.000011UJ | Blank Contamination |
| | | Zinc | 0.0034 | 0.0034 J | Duplicate recovery RPD out |
| AJF-SDFB | 200.8 | Copper | 0.000124 | 0.000124UJ | Blank Contamination |
| | | Lead | 0.000016 | 0.000016UJ | Blank Contamination |
| | | Silver | 0.000014 | 0.000014UJ | Blank Contamination |

**Table 5**
**Laboratory Sample Data Group: 127982**

| Sample ID | Test Method | Parameter | Result | Qualifier | Comment |
|---|---|---|---|---|---|
| AJF-03SW-050519 | 200.8 | Cadmium | 0.000046 | 0.000046 UJ | Duplicate RPD >20% |
| | | Silver | 0.000005 | 0.0000005 UJ | Duplicate RPD >20% |

## REFERENCES

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