FINAL

TSCA RISK-BASED DISPOSAL APPLICATION

DUWAMISH SEDIMENT OTHER AREA AND SOUTHWEST BANK CORRECTIVE MEASURE AND HABITAT PROJECT

BOEING PLANT 2

SEATTLE/TUKWILA, WASHINGTON

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List of Abbreviations and Acronyms

Abbreviation/ Acronym	Definition
Boeing	The Boeing Company
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CM	Corrective Measure
Columbia Ridge	Columbia Ridge Landfill
Corrective Measures	Duwamish Sediment Other Area Corrective Measure and Southwest Bank Corrective Measure
cy	Cubic yard
Design Report	Final Design Report
DOF	Dalton, Olmsted & Fuglevand
DSOA	Duwamish Sediment Other Area
Ecology	Washington State Department of Ecology
Final Decision Document	Final Decision and Response to Comments for Boeing Plant 2 Sediments
IM	Interim measure
Jorgensen Forge	Jorgensen Forge Company
mg/kg	Milligrams per kilogram

MLLW	Mean Lower Low Water
OAR	Oregon Administrative Rule
ODEQ	Oregon Department of Environmental Quality
Order	Administrative Order on Consent
PCB	Polychlorinated biphenyl
Plant 2	Boeing Plant 2
POTW	Publicly Owned Treatment Works
ppm	Parts per million
Project	Duwamish Sediment Other Area Corrective Measure, Southwest Bank Corrective Measure, and the habitat restoration projects
RBDA	Risk-based Disposal Application
RCRA	Resource Conservation and Recovery Act
RM	River mile
SVOC	Semivolatile organic compound
SW Bank	Southwest Bank
SWPPP	Storm Water Pollution Prevention Plan
TSCA	Toxics Substances Control Act
USACE	United Stated Army Corps of Engineers
USEPA	U.S. Environmental Protection Agency
VOC	Volatile organic compound
WM	Waste Management Disposal Services of Oregon

1.0 Introduction

This Risk-based Disposal Application (RBDA) is being submitted for Toxics Substances Control Act (TSCA) approval for the removal and management of materials that are impacted with polychlorinated biphenyls (PCBs) as described in the following sections.

1.1 PROJECT OVERVIEW

The Boeing Company (Boeing) is conducting the Duwamish Sediment Other Area (DSOA) and Southwest Bank (SW Bank) Corrective Measure (CM) at Boeing Plant 2 (Plant 2) pursuant to the Administrative Order on Consent (Order; Resource Conservation and Recovery Act [RCRA] Docket No. 1092-01-22-3008(h)) issued to Boeing in 1994 by the U.S. Environmental Protection Agency (USEPA) under authority of RCRA Section 3008(h), as amended (42 USC 6928(h)).

The DSOA CM was selected through the evaluation process described in the *Duwamish Sediment Other Area and Southwest Bank Corrective Measure Alternatives Study* (AMEC and FSI 2011). USEPA selected the preferred alternative in the *Statement of Basis for Proposed Corrective Action, DSOA and Southwest Bank* (USEPA 2011a) and subsequently issued the *Final Decision and Response to Comments for Boeing Plant 2 Sediments* (Final Decision Document; USEPA 2011b).

A Final Design Report (Design Report; AMEC, DOF, and FSI 2012a) has been submitted to USEPA as required under the RCRA Order. The Design Report package, which also includes the Construction Statement of Work (AMEC, DOF, and FSI 2012b), provides details regarding the excavation limits, material handling requirements, and post-construction monitoring. The Design Report also provides USEPA with information on the habitat restoration projects that Boeing is conducting simultaneously with the corrective measure implementation, although the habitat projects are not part of the RCRA corrective measures.

For the purposes of this document, the entire corrective measures addressed in the Design Report, including the DSOA CM and the SW Bank CM, will be referred to as the Corrective Measures. The Corrective Measures and habitat restoration projects will be referred to collectively as the Project.

The Corrective Measures will remove approximately 260,000 cubic yards (cy) of sediments, soils, debris, and structures from the waterway in front of Plant 2 and the adjacent Plant 2 shoreline. The materials are contaminated with PCBs and other constituents of concern. The Corrective Measures footprint is designed to remove soil/sediments containing PCBs at concentrations greater than 0.130 milligrams per kilogram (mg/kg) or parts per million (ppm). Three localized areas offshore of the SW Bank contain PCBs at concentrations greater than 50 ppm; they represent a total of approximately 260 cy (or less than 0.1 percent) of soil/sediment. The remaining volume of soil/sediment contains PCBs at concentrations less than 50 ppm, with an average concentration of less than 1 ppm.

1.2 SITE BACKGROUND AND SETTING

Plant 2 is located at 7755 East Marginal Way South in Seattle and Tukwila, Washington (Figure 1). Plant 2 is bounded by the Duwamish Waterway to the west; Webster Street, Slip 4,

and property owned by Crowley Marine Corporation to the north (excluding public streets and ways); the AIRGAS NOR PAC plant and East Marginal Way South to the east; and the Jorgensen Forge Company (Jorgensen Forge) to the south.

Plant 2 is composed of numerous buildings on approximately 107 contiguous acres. The areas between the buildings are mostly paved with asphalt or concrete, while some limited areas are landscaped. Sixteenth Avenue South traverses the center of Plant 2 in a north to south direction. Figure 1 shows the current layout of the Plant 2 property.

For purposes of the Corrective Measures, the project area is divided into the following three separate subareas (Figure 1):

- In-water dredging areas, consisting of the DSOA Sediment Cleanup Area and the Slip 4 Sediment Cleanup Areas
- North Shoreline Area
- South Shoreline Area, including the areas below the remaining overhanging building slabs and support pilings from the former 2-40s Buildings complex and the SW Bank

The boundary for the DSOA and SW Bank Corrective Measure is shown on Figure 1. The shaded areas on Figure 1 show the approximate boundaries where the proposed cleanup will be performed.

Soils/sediments in the three subareas of the DSOA and SW Bank have been found to be contaminated with elevated concentrations of some or all of the following: PCBs, metals (primarily cadmium, copper, lead, and zinc), volatile organic compounds (VOCs), and semivolatile organic compounds (SVOCs). A compilation of available data for sediments and soils for Plant 2 is presented in Appendix A of the Design Report.

Each of the three subareas is described in more detail below.

1.2.1 In-water Dredging Areas

The In-water Dredging Area represents the area where sediments will be removed using in-water, barge-mounted equipment. The In-water Dredging Area is contiguous to Plant 2 to the west along the Duwamish Waterway at approximately river mile (RM) 2.8 to 3.6 (Figure 2). The DSOA horizontal boundary was established in 2008 with USEPA's approval of the *Horizontal Boundary Technical Memorandum* (Geomatrix and FSI 2008).

The northern boundary of the DSOA In-water Dredging Area extends to the opening of Slip 4, while the southern boundary extends approximately 150 feet south of the Plant 2/Jorgensen Forge property line. Jorgensen Forge, under a Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Order with USEPA, is performing a cleanup action that includes the banks starting at the Plant 2/Jorgensen Forge property line and the sediments beginning at the DSOA southern boundary.

The eastern boundary of the DSOA In-water Dredging Area is the toe of the slope along the shoreline, the 2-10 Building face, and the waterward edge of the slab overhang from the former 2-40s Building complex. The limit of in-water work will generally be set at an elevation of +2 feet relative to Mean Lower Low Water (MLLW). The western boundary extends at least to the

Federal Navigation Channel along the length of the Plant 2 property. How far the DSOA extends into the Navigation Channel is a function of the depth of the dredge cut that is necessary for sediment removal at the edge of the boundary (the cut needs to be extended into the channel in order to create a stable cut slope). The configuration of the DSOA relative to the Navigation Channel is provided in the Design Report.

The in-water dredging area also includes four small areas within the Boeing-owned portion of Slip 4 (Figure 1).

Within the In-water Dredging Area are two Early Removal Areas offshore of the SW Bank with a combined volume of approximately 250 cy. These two areas contain one or more samples with PCB concentrations that exceed 50 ppm. They represent localized areas with elevated PCB concentrations that will be removed prior to the rest of the dredging action and handled separately. The SW Bank Offshore Early Removal Area is discussed in more detail in Section 2.0.

1.2.2 North Shoreline Area

The North Shoreline Area lies on the northwestern corner of the Plant 2 property adjacent to Slip 4 and Building 2-122 (Figure 2). This area does not require a TSCA approval as there was not a PCB release; however, a brief description has been included to provide a comprehensive discussion of the Project. Material will be excavated to create an embayment to serve as off-channel and riparian habitat. The design for the North Shoreline Area was optimized to address restoration goals. Although PCBs were detected in some locations in the North Shoreline Area and all PCBs greater than 0.130 ppm will be removed, the soil/sediment removal area was defined based on restoration goals and is not based on a footprint of contamination.

1.2.3 South Shoreline Area

The South Shoreline Area generally encompasses the waterfront areas from the north end of the former Buildings 2-41, 2-44, and 2-49 (collectively referred to as the 2-40s Buildings complex) to the Jorgensen Forge property line. Corrective Measures and habitat activities in the South Shoreline Area focus on the following:

- Demolition and removal of remaining building slabs, support pilings, and material in the area beneath the 2-40s Buildings complex (referred to as the Under-building Area).
- Removal of contaminated fill material from the SW Bank.
- Early removal of approximately 10 cy of sediment surrounding Outfall 12, located in the intertidal zone at the south end of Building 2-49 and adjacent to the SW Bank, which contains PCBs at concentrations greater than 50 ppm.
- Removal of material in the Shoreline Areas (refer to Figure 3) to comply with USEPA's anticipated Final Media Cleanup Levels (FMCLs).
- Habitat restoration.

In addition, Boeing will remove large concrete debris located along the shoreline between the new South Park Bridge and the south end of the 2-10 building.

1.3 PERMITS

A number of permits, approvals, and processes will be required from local, state, and federal agencies to conduct the Project. A list of anticipated permits and regulatory approvals and processes required to complete the work is presented in Table 1 of the Design Report.

The Rivers and Harbors Act of 1899 (33 CFR 321-329) gives the United Stated Army Corps of Engineers (USACE) regulatory authority over construction activities in all navigable waters of the United States. Section 10 of this act is intended to protect these waters for purposes of navigation and general public benefit. This regulation is administered through the Section 10 Permit application process. Section 404 of the Clean Water Act (33 USC 1344) prescribes procedures to be followed before dredged or fill materials can be discharged into national water resources (including wetlands) and, as such, provides regulatory guidelines and permit requirements for dredging and filling activities. Administration of the requirements of Section 404 is vested in the USACE and is handled in conjunction with the Section 10 Permit process.

When both a Section 10 Permit and a Section 404 (of the Clean Water Act) Permit are required, as is the case for the Project, they are typically considered and administered together by the USACE as a Section 10/404 Permit. Excavated materials within the Project area, regardless of construction sequencing (either dredged from barges in the Waterway or excavated with equipment from the shoreline), will be governed by the requirements of the Section 10/404 Permit and will be managed as "dredged material" per the provisions of the Section 10/404 Permit.

In practice, the shoreline excavation in most locations will begin at the toe of the slope and progress upward and inward removing contaminated bank sediments/soils. Soils along this cut are considered dredged material and will be part of the Section 10/404 Permit, as shown on Figure 2. The standard demarcation line between sediments and soil is customary high water; however, when shoreline work is being performed and the bank reshaped as described above, this definition changes as the bank topography changes. For this reason, the USACE Section 10/404 Permit includes soil, sediment, and debris that is dredged or excavated within the project footprint in its definition of dredged materials.

1.4 HEALTH AND SAFETY

The Project will be conducted in accordance with site-specific Health and Safely Plans (HASP) for Boeing, the field engineering team (AMEC and Dalton, Olmsted & Fuglevand [DOF]) and the environmental contractor. Under the HASPs, workers will wear the appropriate personal protective equipment. A daily safety briefing will be performed prior to any field work.

2.0 Site-specific Risk-based Toxics Substances Control Act Approval Request

PCBs are regulated under TSCA in addition to their regulation under other statues. Under the TSCA regulations, a RBDA approval is the best approach for cleanup of PCB remediation waste and includes PCB-contaminated sediments at Plant 2. The Project includes localized areas where PCB concentrations are greater than 50 ppm and multiple shoreline areas where the distinction between sediments and soil is not meaningful during excavation.

For these reasons, Boeing is requesting a single, project-wide risk-based approval under TSCA that would cover both the materials with PCB concentrations greater than 50 ppm and the materials with PCB concentrations less than 50 ppm, and would apply to sediment, soils, demolished structure, and incidental debris. This approval is expected to be closely tied to the Project approval from the USEPA's RCRA Group and the USACE's Section 10/404 Permit approval. The project-wide risk-based determination will rely on RCRA's process to define the removal action requirements and subsequent monitoring and to rely on the USACE process to define materials handling procedures within the project area. Boeing is requesting that TSCA provide a written risk-based determination approval to document that the overall action will also meet TSCA requirements, including disposal requirements.

From a TSCA standpoint, the Project is defined to include the following elements, which will be completed consistent with 40 CFR Part 761:

- Early removal in well-defined areas of 250 cy of PCB-contaminated soil/ sediment with concentrations greater than 50 ppm. This will occur prior to the main dredging (in-water) portion of the removal action; and represents less than 0.1 percent of the project volume of soil/ sediment.
- Dredging of sediments in front of Plant 2 beginning at approximately +2 feet MLLW. These dredged materials will consist of approximately 200,000 cy of sand and silty sand. Incidental debris is also expected to be present, consistent with sediments within an industrial waterway. This element would also include management of the return water from the dredged solids, and transportation of the sediments to a Waste Management-operated transfer facility.
- Excavation of soil/sediment and contouring the bank in the North and South Shoreline Areas. These excavated materials will consist of 50,000 to 60,000 cy of materials. This task would also consist of management of return water from the dredged/excavated solids.
- Removal of structures and construction and demolition debris.
- Transportation of the material to an approved disposal site.
- Disposal of the material with PCB concentrations less than 50 ppm at the approved disposal facility, which may include use as alternative daily cover at the landfill.

It should be noted that all of these elements also require approval from USEPA under the RCRA Order, and that all shoreline excavation and dredging actions will be completed under the Section 10/404 Permit.

A frequency of total PCBs detected in each area is included in Table 1, and a summary of total PCB concentrations in these areas is included in the Table 2 series (Tables 2a through 2g). The sample locations are shown on the Figure 3 series (includes Figures 3a through 3d). In addition, Figure 3 also includes a summary of data with PCB concentrations greater than 10 ppm and the sample depths that will be removed as part of the Corrective Measures.

3.0 Early Removal Areas (PCB Concentrations Greater than 50 ppm)

Since 1994 there have been over 20 sediment and shoreline investigations conducted at and adjacent to Plant 2. During these investigations, three locations within the overall project footprint have been identified as having PCB concentrations greater than 50 ppm: the nearshore area associated with Outfall 12 and two offshore sediment areas adjacent to the SW Bank. The Outfall 12 area is close enough to shore that an excavator can be used to remove these sediments. The two areas offshore the SW Bank with sediment PCB concentrations greater than 50 ppm are far enough from the bank they will be excavated by a barge-mounted dredge.

PCB sample results for the Early Removal Areas are summarized in Tables 2f and 2g and sample locations are shown on the Figure 3 series.

3.1 OUTFALL 12 EARLY REMOVAL AREA

Outfall 12 discharged to the intertidal zone along the bank at the south end of Building 2-49 adjacent to the SW Bank (Figure 4). An interim measure (IM) at Outfall 12 was designed to specifically remove sediments and bank soils with elevated concentrations of PCBs (Weston 1998). Prior to the completion of this IM, Weston collected two surface (0–2 inches) and two subsurface (8–12 inches) samples to pre-define the area of excavation so that the work could be done during a single low-tide period (approximately 6 hours). In addition, pre-excavation analytical sample results were compared to PCB field test kit measurements to evaluate if the test kits would be appropriate for use during excavation. The pre-sampling comparison indicated that the use of field test kits for PCBs would be appropriate based upon a relatively accurate pre-excavation correlation between the field test kits and actual analytical results for PCBs. Approximately 22 tons of sediments were removed from an area approximately 10 feet by 12 feet, to a depth of 2 to 3.5 feet. Confirmatory sediment samples were collected after the excavation reached the target depths, and field test kit results indicated that PCBs were less than 50 ppm. The excavation was subsequently lined with geotextile fabric and backfilled with clean fill (within the 6-hour tidal window for the excavation); however, a confirmatory lab sample collected in disturbed sediments at the bottom of the excavation contained concentrations greater than 50 ppm.

In June 2001, nine sediment cores were collected in the vicinity of Outfall 12, two of which were installed within the horizontal limits of the IM excavation to confirm the results of the 1998 IM (Pentec and FSM 2001). The results of these two samples indicated that PCBs were detected between 0.044 ppm and 5.5 ppm at depths between 4 and 6 feet below the mudline (just below the vertical limits of the 1998 IM excavation). One sediment sample collected at the surface (DUW99), just outside the vertical limits of the IM excavation, contained PCBs at a concentration of 51 ppm. PCB concentrations in other sediment samples collected outside the limits of the IM excavation were significantly less than 50 ppm, with an average concentration less than 10 ppm. Refer to Figure 4 for the PCB concentrations in sediment in the Outfall 12 area.

3.1.1 Early Removal Action Scope

The goal of the Early Removal Action is to remove sediments with PCB concentrations greater than 50 ppm from the area before the area is further excavated to a RCRA-approved removal

action limit of 0.130 ppm. To be conservative, sediments with PCB concentrations greater than 25 ppm in this area will be removed as part of this Early Removal Action.

This will be accomplished by removing approximately 7 cy of sediments within a single low tide cycle, using excavation equipment that will work from the shoreline. The Early Removal Area is approximately 7 feet by 8 feet, to a maximum depth of 3 feet below the mudline as shown in plan view and cross-section on Figure 4. The volume of sediment within this area is estimated to be less than 7 cy or approximately 11 tons and will require special handling. This material will be excavated and segregated from the Outfall 12 area prior to the initiation of the dredging and shoreline excavation in this area. Because the volume of sediment with PCB concentrations greater than 50 ppm is limited in this area and is located near shore, it is expected that the removal action will consist of excavation using an on-shore excavator during low tide.

The sediments will be handled as discussed in Section 3.3.

3.2 EARLY REMOVAL AREAS OFFSHORE OF THE SW BANK

Two localized areas exist within the DSOA In-water Dredging Area with PCB concentrations greater than 50 ppm. These areas are localized in the southern section of the DSOA offshore from the SW Bank as shown in Figure 5. In the vicinity of these 2 areas, approximately 100 core and grab sample locations have been sampled over a period of many years. Surface sediment samples containing total PCB concentrations greater than 50 ppm were found at two locations (SD-DUW153 and LDW-SS109), with concentrations of 108 ppm and 110 ppm, respectively. No subsurface samples have been found to contain PCBs equal to or greater than 50 ppm.

To assist in delineating the area of sediment that would need to be regulated by TSCA, a geospatial analysis was conducted using Spatial Analysis Decision Assistance software (Version 5.0) developed by the University of Tennessee Research Corporation to predict the horizontal extent of sediments that exceed 50 ppm total PCBs. The geospatial analysis used Inverse Distance Weighting using the same interpolation parameters and transformations used in the AMEC Geomatrix, Inc. and Floyd|Snider 2010 *Duwamish Sediment Other Area and Southwest Bank Corrective Measure Alternatives Study*. The interpolation parameters and transformations were found to accurately predict results that were consistent with the observed data and the conceptual site model for the DSOA. The interpolated values were contoured, and the results of the geospatial analysis showed two small areas where the interpolated surface concentration of total PCBs exceeded 50 ppm (Figure 4).

To be conservative, these areas were delineated by the 25 ppm contour. The samples with PCBs concentrations greater than 50 ppm (LDW-SS109 and SD-DUW153) were surface samples. Several cores were also collected in the area as shown on Figure 4. The first sample in most cores was at 2 to 3 feet below mudline. At this depth (2 to 3 feet below mudline) concentrations are less than 10 ppm and decreasing with depth to less that the RCRA removal action level of 0.130 ppm at 3 to 6 feet below mudline.

3.2.1 Offshore Early Removal Action Scope

The goal of the Offshore Early Removal Action is to remove sediments with PCBs greater than 50 ppm from the area offshore of the SW Bank before the area is further excavated to a RCRA-approved removal action limit of 0.130 ppm. To accomplish this, sediments in the two Early

Removal Areas shown in Figure 4 will be excavated to 2.5 feet below mudline. The area of excavation contour is designed to capture all sediment in this area with PCB concentrations greater than 25 ppm. This volume of excavated sediments is estimated to be less than 250 cy. The excavation will likely be completed using barge-mounted dredging equipment, and the sediment will be placed directly into water-proof containers on the barge. The containers will then be placed on Plant 2 property (using a crane) and handled as discussed in the next section.

3.3 HANDLING AND DISPOSAL FOR MATERIALS WITH PCBS GREATER THAN 50 PPM

The materials from the Early Removal Areas (PCB concentrations greater than 50 ppm) are expected to be handled as follows consistent with 40 CFR 761.61[1]:

- Dredged/excavated materials will be placed in water-proof containers near the work area during the removal action. This is expected to be on a pad near the demolished 2-49 Building foundation for the Outfall 12 area and on a barge for the areas offshore from the SW Bank. The containers will have closing lids that prevent rainwater intrusion, and they will be closed when not in active use.
- The containers will be placed in a bermed and lined area to capture incidental or accidental spillage when transferring the wet solids to the containers.
- Drying agents will be added to the containers and mixed with the material to stabilize the moisture content prior to shipping.
- As the solids in the closed containers settle, dredge return water may accumulate on the top of the sediments. Boeing may pump this water off the sediments prior to stabilization. If so, it will be collected, pre-treated on-site, and disposed to the Publicly Owned Treatment Works (POTW) after testing to confirm that it meets the POTW discharge requirements.[2]
- Water from the bermed area, which will be a combination of spilled dredge return water and rainfall, will also be collected, pre-treated on-site, and disposed to the POTW after testing to confirm that it meets the POTW discharge requirements.
- The solids collected during this Early Removal Action contain PCBs at concentrations greater than 50 ppm and must be disposed in a hazardous waste landfill permitted by USEPA under Section 3004 of RCRA or by a state authorized under Section 3006 of RCRA, or disposed in a PCB disposal facility approved under 40 CFR Part 761.
- Containers that hold PCB-impacted material greater than 50 ppm may be disposed of with the material in a hazardous waste landfill permitted by USEPA under Section 3004 of RCRA or by a state authorized under Section 3006 of RCRA, or disposed in a PCB disposal facility approved under this 40 CFR Part 761.

[1] This work will be completed during Year 2 of construction (2013–2014 construction season). Specific details regarding material handling will be provided to USEPA Region 10 TSCA Group at least 30 days prior to the expected start of Year 2 construction.

[2] Return water from other areas with lower PCB concentrations will be treated on-site and discharged to the waterway under the USACE permit, including Ecology's 401 Water Quality Certification. It is only the return water from the Early Removal Areas with elevated PCBs that is treated and then discharged to the POTW.

Alternatively, the containers may be decontaminated consistent with 40 CFR 761.79 and reused in accordance with 40 CFR 761.30(u).

4.0 Materials with PCB Concentrations Less than 50 ppm

Approximately 260,000 cy of material with PCB concentrations less than 50 ppm (the typical average PCB concentration is less than 1 ppm) will be removed by dredging or land-based excavation as part of this Project under the USACE Section 10/404 Permit and will be managed consistent with 40 CFR Part 761. These areas include the DSOA, Slip 4, part of the North Shoreline/Habitat Area, the former 2-40s Under-building Area, and the SW Bank. A summary of total PCB concentrations collected in these areas is included in the Table 2 series (Tables 2a–2e), and the area and sample locations are shown on Figure 3. Additionally, a frequency of total PCBs detection summary is included in Table 1.

4.1 HANDLING AND DISPOSAL FOR MATERIALS WITH PCBS LESS THAN 50 PPM

The dredged and excavated materials with PCB concentrations less than 50 ppm (the typical average concentration is less than 1 ppm) will be managed under the RCRA Order and the USACE Section 10/404 Permit in the following manner:

- Sediments from the DSOA In-water Dredge Area and the Slip 4 area will be dredged using barge-mounted dredging equipment and placed on barges consistent with requirements in the Design Report and in the USACE Section 10/404 Permit. The material will be transported via barge to a Waste Management operated transfer facility, which will be responsible for handling the materials at the facility and during rail or truck transport to Columbia Ridge Landfill (Columbia Ridge) in Arlington, Oregon where the material will be placed in the landfill as either solid waste or used for alternate daily cover.[3] Transportation to Columbia Ridge will be consistent with 40 CFR 761.61.
- Materials excavated from the shoreline may be temporarily stockpiled in a suitable location at Plant 2 prior to off-site transport, or the material may be directly loaded into trucks for transport to a transfer facility where the material will be loaded into railcars for transport to Columbia Ridge consistent with 40 CFR 761.61. Once at the disposal facility, materials may be disposed as solid waste or used as alternative daily cover at the landfill. If rail service is disrupted for any reason, the material will alternatively be transported by truck.
- If stockpiles are necessary, they will include engineering controls such as liners, covers, and/or run-off controls necessary to protect human health and the environment. Water from this stockpile will be processed through an on-site filtration system and then discharged to the waterway as return water under the USACE Section 10/404 Permit.[4]

[3] Use as alternative daily cover requires approval by ODEQ; this TSCA Risk-based Disposal Application will be submitted to them as part of the request for approval package from Waste Management.

[4] The SW Bank does contain an area with elevated metal concentrations; however, this material is being handled and disposed of separately.

4.2 DREDGED MATERIAL TRANSFER FACILITY DETAILS

Waste Management Disposal Services of Oregon (WM) has been selected by Boeing to contract with an upland transfer facility that will unload barges that contain dredged material for reload to railcars or trucks (as back up if rail service is disrupted) for transportation to Columbia Ridge. WM and Lafarge Cement Plant (Lafarge) will function as a single entity to off-load barges of dredged material.

Lafarge is a permitted facility for the handling of dredge materials located at 5400 West Marginal Way Southwest in Seattle, Washington on the west shore of the Lower Duwamish Waterway. Lafarge has an off-loading facility with built-in safety features to eliminate or reduce spills during the off-loading operations. Lafarge responsibilities include, but are not limited to, barge management at the dock, off-loading barges to the containment vault, loading railcars, amending waste if required, water management on the barge and to and from the vault, and compliance with their facility permitting requirements. Lafarge is currently in the possession of the following permits and approved plans:

- Solid Waste Permit issued by King County (permit number PR0034434)
- National Pollution Discharge Elimination System (NPDES) (permit number WA0002232) issued by the Washington State Department of Ecology (Ecology) effective January 2011 through December 30, 2015
- Storm Water Pollution Prevention Plan (SWPPP), dated June 2010, and SWPPP Amendment 2, dated July 2011; both approved by Ecology

Transfer and placement of the barges at the wharf will be performed by the tug contractor using river current and minimum thrust to minimize turbidity during movement of the barges. Dredged material from the barge will be moved to a concrete containment vault located approximately 70 feet from the east wharf and within direct reach of the waterfront crane (refer to Figure 6). The vault has a capacity of 5,600 cy (1.1 million gallons) or 8,000 tons of wet material and is constructed of 12-inch-thick reinforced concrete walls with an 18-inch–thick reinforced concrete floor to provide environmentally sound intermediate storage for the dredged material. This vault has the capacity to contain up to 5 days worth of material during this project. The waterfront crane will position the clamshell bucket over the concrete containment vault such that the dredged material discharges directly into the vault. The bucket will be lowered close to the surface of the material to control splashing during the unloading process to ensure that the contaminated material remains entirely in the vault.

Dredged material will be stabilized to remove free liquid, if needed, by adding a drying agent directly to the sediments. Preliminary studies indicate that less than 5 percent reagent (primarily cement kiln dust) will be needed; the amount will be adjusted in the field until the free water is absorbed. Stabilization will take place to eliminate the spreading of material through splash and dripping during transfer from the vault to the railcar and during material transport. Although not a requirement for receipt, the material will likely pass the paint filter test prior to transport to Columbia Ridge.[5] Entrained water associated with dredged materials will be minimized as part

[5] Columbia Ridge and Waste Management have a special condition in their permit that allows them to transport and receive wet wastes because the additional moisture is needed in the arid climate of Columbia Ridge to optimize landfill conditions and enhance biodegradation and stabilization of the waste mass.

of the dewatering and stabilization process; therefore, excess water will not be generated at the transfer facility.

A tracked excavator will be used to load the Burlington Northern Sante Fe (BNSF) railcars, which are located west of the vault. The BNSF railcars will be lined with 6 mil polyethylene sheeting prior to loading with stabilized sediments and burrito-wrapped using sandbags or other similar methods to keep the top sheeting in place during transport. The freeboard (space between the top of sediments and the top of railcar) will vary based on sediment properties, but will be at least 18 inches. The goal of the liner and wrapping is to contain any residual water that may be released from the stabilized sediments during the transportation to the landfill. The exterior of the railcars will be cleaned prior to leaving the transfer facility. The BNSF railcars will be transferred from a BNSF rail line to a Union Pacific rail line at a junction yard, but the stabilized material will remain in the BNSF railcar for the entire route.

The route between the vault and the railcars will be identified as an exclusion zone to keep other operations out of the area. Any sediment spilled any this area will be scraped up and placed back in the vault or in one of the railcars.

If rail service becomes limited or unavailable during the construction season, trucks and trailers may be used in addition to, or in place of, the railcars. If used, they will be loaded using a similar process.

At the end of transload operations, the containment vault will be scraped, shoveled, and pressure-washed to remove all remaining contaminated sediments. The wash water will be removed from the containment vault, mixed with the last batch of material, and stabilized prior to transport.

4.3 DISPOSAL OF DREDGED SEDIMENT AND ITS USE AS ALTERNATE DAILY COVER AT THE LANDFILL

As part of the Project, dredged sediments with PCB concentrations less than 50 ppm will be transported to Columbia Ridge, which is operated by Waste Management and regulated under Oregon Administrative Rule (OAR) Chapter 340. Columbia Ridge is permitted by Oregon's Department of Environmental Quality (ODEQ) Solid Waste Permit 391, which expires July 1, 2017. The landfill and its monitoring requirements were designed to comply with USEPA criteria for solid waste facilities defined in 40 CFR 258 (Subtitle D), OAR regulations for solid waste management (OAR 340 Division 94), and the OAR requirements for groundwater quality protection (OAR Division 40).

PCBs are the major contaminant in the sediments.[6] The maximum measured concentration of PCBs in the materials being shipped to Columbia Ridge is 30 ppm, the average PCB concentration is less than 1 ppm, and 95 percent of the PCB concentrations are less than 5 ppm. As described in Section 3.0, sediment with PCB concentrations greater than 50 ppm will be managed as separate early removal actions.

[6] The SW Bank does contain an area with elevated metal concentrations; however, this material is being handled and disposed of separately.

To facilitate obtaining approval from ODEQ for the use of the dredged sediments as alternative daily cover, the initial request will be limited to the material dredged during Year 1 of construction (2012–2013 construction season). In the area dredged during Year 1, PCBs are the only chemical of concern, and the maximum concentration is 11 ppm, with an average concentration of 0.7 ppm. A separate request will be prepared for Years 2 and 3 that will contain further details on how areas with elevated metals concentrations (e.g., the SW Bank), will be excluded from the material used as alternative daily cover.

The majority of the sediment that will be dredged or excavated consists of sand and silt. This makes it ideal daily cover for the solid waste cells within the landfill. For this reason, Waste Management plans on using the sediments transported from Plant 2 as part of this project as alternative daily cover at Columbia Ridge. Debris fill from the SW Bank will not be used as alternative daily cover.

As with all potential sources of alternative daily cover, ODEQ's Solid Waste Program approves the use of this material as alternative daily cover prior to it being placed. Because of the characteristics of the sediment, this approval is expected.

Alternative daily cover is used at Columbia Ridge to cover the active solid waste cell at the landfill to separate different solid waste loads, or to control the moisture content of the wastes. The alternate daily cover is handled several times per week by large equipment, with little to no direct worker contact. The material is temporarily stock-piled in a bermed and lined location within the footprint of the permitted landfill and is subsequently used within the active cell. The Project will generate approximately 4,000 to 9,000 cy of dredged material on a weekly basis, and Columbia Ridge typically uses an average of 11,000 cy of material as alternative daily cover per week. Because the material will be received damp to wet,[7] fugitive dust will not be a concern. All employees of the landfill work under a comprehensive health and safety program with routine monitoring as required at any permitted solid waste landfill.

When an active cell is filled, the material used for daily cover is included in the "closed" cell and undergoes at least 30 years of long-term monitoring as part of the long-term monitoring program. The Environmental Monitoring Plan for Columbia Ridge, which is part of their solid waste permit, is reviewed annually by the ODEQ Solid Waste Program and is periodically revised to comply with changing regulations or Waste Management corporate policies. The last change was made in April 2012 at ODEQ's request.

4.4 DISPOSAL OF EXCAVATED SOIL TO BE USED AS ALTERNATE DAILY COVER AT THE LANDFILL

Soils and sediments above +2 MLLW that are excavated from the North Habitat Project and the Underbuilding Area (or 2-40s Section) of the South Habitat Project may also be used as alternative daily cover at the landfill. All PCB concentrations in these areas are less than 50 ppm. The maximum measured concentration of PCBs is 17 ppm, the average PCB concentration is less than 1 ppm, and 95 percent of the PCB concentrations are less than 5 ppm. As described in Section 3.0, soil/sediment with PCB concentrations greater than 50 ppm

[7] Columbia Ridge and Waste Management have a special condition in their permit that allows them to transport and receive wet wastes because the additional moisture is needed in the arid climate of Columbia Ridge to optimize landfill conditions and enhance biodegradation and stabilization of the waste mass.

will be managed as separate early removal actions. Materials from the SW Bank will not be used as daily cover.

Excavated soil will be transported to Waste Management's Columbia Ridge Landfill in eastern Oregon and handled as discussed in Section 4.3. The majority of the sediment/soil that will be excavated consists of sand and silt. This makes it ideal daily cover for the solid waste cells within the landfill. For this reason, Columbia Ridge will use the material for alternative daily cover. Procedures for using and managing alternative daily cover at Columbia Ridge are described in Section 4.3.

5.0 References

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Boeing Plant 2

TSCA Risk-based Disposal Application

Tables

FINAL

Table 1
Frequency of Detection for Total PCBs by Area[1]

Area	Number of Results	Number of Detects	Percent Detects	Minimum Detected Value (ppm)	Maximum Detected Value (ppm)	Location of Maximum Detect	Date of Maximum Detect	Depth of Maximum Detect	Number of Non-detects	Percent Non-detect	Minimum Non-detected Value (ppm)	Maximum Non-detected Value (ppm)
DSOA	711	532	75%	0.014	30	SD-DUW157	8/21/2003	0-1 ft	179	25.18%	11	510
North Shoreline/ Habitat	57	17	30%	0.022	0.75	NA-DP-01	9/4/2008	9–10 ft	40	70%	0.019	0.24
Slip 4	5	5	100%	0.154	0.6	EIT066	9/26/1997	0–10 cm	0			
SW Bank	161	106	66%	0.018	23	SD-SWY03	6/13/1995	0–0.3 ft	55	34%	0.019	0.16
2-40s Underbuilding	52	15	29%	0.68	17	SD-04109	4/17/1995	0–0.3 ft	37	71%	0.03	0.084
Early Removal Area - Offshore of SW Bank	8	6	75%	0.032	110	LDW-SS109	1/25/2005	0–10 cm	2	25%	0.04	0.052
Early Removal Area - Outfall 12	2	2	100%	25	51	SD-DUW99	6/19/2001	0–0.9 ft	0			

Note:

1 Total PCB Concentrations are presented in parts per million (ppm) or milligram per killogram (mg/kg).

Abbreviations:

cm Centimeter
ft Feet
PCB Polychlorinated Biphenyl
SW Bank Southwest Bank
TSCA Toxic Substances Control Act

Table 2a
Summary of Total PCB Concentrations—DSOA Dredge Area

Sample Location	Sample Date	Sample Depth (ft bgs)	Total PCB Concentration (ppm)
CH0009	10/15/1997	0–10[1]	0.079 J
CH0014	10/10/1997	0–10[1]	4.1 J
CH0016	10/10/1997	0–10[1]	1.1 J
DR184	8/19/1998	0–10[1]	0.139 J
DR214	8/19/1998	0–10[1]	0.111 J
DR215	8/19/1998	0–10[1]	0.107 J
DR216	8/20/1998	0–10[1]	0.313
DR217	8/19/1998	0–10[1]	4.2 J
DR218	8/19/1998	0–10[1]	0.087 J
EST149	11/13/1997	0–10[1]	1.7 J
EST150	10/21/1997	0–10[1]	0.09 J
LDW-SC49a	2/6/2006	0–30[1]	0.075
LDW-SC49a	2/6/2006	30–61[1]	0.151 J
LDW-SC49a	2/6/2006	61–122[1]	0.421
LDW-SC49a	2/6/2006	122–183[1]	0.78
LDW-SC49a	2/6/2006	183–244[1]	0.81
LDW-SC49a	2/6/2006	244–305[1]	0.13
SD-01001	8/7/1995	0–0.3	2.88
SD-01001	8/7/1995	0–0.3	2.61
SD-01001	3/19/1996	0–4	2.3
SD-01001	3/19/1996	4–5.6	0.044 U
SD-01003	8/7/1995	0–0.3	0.26
SD-04401	6/15/1995	0–0.3	1.3
SD-04403	6/14/1995	0–0.3	2.3
SD-04407	6/27/1995	0–0.3	2.16
SD-04408	6/27/1995	0–0.3	1.2
SD-04409	6/27/1995	0–0.3	4.27
SD-04921	6/15/1995	0–0.3	1.5
SD-201	4/21/2004	0–1	0.338
SD-201	4/21/2004	1–2	2.5
SD-201	4/21/2004	2–3	3.44
SD-201	4/21/2004	3–4	0.319
SD-201	4/21/2004	4–5	0.217
SD-201	4/21/2004	5–5.7	0.05
SD-202	4/22/2004	0–1	0.11
SD-202	4/22/2004	1–2	0.048 J
SD-203	4/22/2004	0–1	7.1 J
SD-203	4/22/2004	1–2	6.5
SD-203	4/22/2004	2–2.9	0.038
SD-204	4/22/2004	0–1	0.125
SD-204	4/22/2004	1–2	0.243
SD-204	4/22/2004	2–3	0.281
SD-204	4/22/2004	3–4	7.57
SD-204	4/22/2004	4–5	4.8
SD-204	4/22/2004	5–6	4.74
SD-204	4/22/2004	6–6.9	2.07
SD-204	4/22/2004	7–7.8	0.542
SD-204	4/22/2004	8–8.7	0.69
SD-205	4/22/2004	0–1	0.117
SD-205	4/22/2004	1–2	0.128
SD-205D	4/23/2004	0–1	0.083
SD-205D	4/23/2004	1–2	0.158
SD-301	4/21/2004	0–1	0.548 J
SD-301	4/21/2004	1–2	1.34
SD-301	4/21/2004	2–2.8	0.024
SD-302	4/23/2004	0–1	0.073
SD-302	4/23/2004	1–2	0.15
SD-303	4/22/2004	0–1	0.101
SD-303	4/22/2004	1–2	0.126
SD-307	8/16/2004	0–0.33	2.6
SD-307	8/19/2004	1–2	0.0818
SD-307	8/19/2004	2–3	0.1621
SD-307	8/19/2004	3–4	0.0704
SD-316	8/16/2004	0–0.33	0.94
SD-316	8/19/2004	1–2	0.735
SD-316	8/19/2004	2–3	0.779
SD-316	8/19/2004	3–4	3.065
SD-321	8/16/2004	0–0.33	0.51 J
SD-321	8/16/2004	0–0.33	0.63 J
SD-321	8/18/2004	1–2	0.7515
SD-321	8/18/2004	2–3	0.3584
SD-321	8/18/2004	3–3.8	0.292
SD-341	8/26/2004	0–0.33	1.398
SD-344	8/26/2004	0–0.33	11
SD-DUW01	10/25/1995	0–0.3	0.42
SD-DUW02	10/24/1995	0–0.3	1
SD-DUW03	10/24/1995	0–0.3	0.74
SD-DUW04	10/24/1995	0–0.3	0.7

Table 2a
Summary of Total PCB Concentrations—DSOA Dredge Area

Sample Location	Sample Date	Sample Depth (ft bgs)	Total PCB Concentration (ppm)
SD-DUW04	3/19/1996	0–4	1.79
SD-DUW04	3/19/1996	4–5	0.041 U
SD-DUW05	10/24/1995	0–0.3	1.84
SD-DUW06	10/23/1995	0–0.3	2.78
SD-DUW06	3/20/1996	0–4	2.057 J
SD-DUW06	3/20/1996	4–8	0.154
SD-DUW06	3/20/1996	8–12	0.044 U
SD-DUW07	10/23/1995	0–0.3	1.1
SD-DUW07	3/19/1996	0–1.9	4.43
SD-DUW07	3/19/1996	1.9–7.1	0.51
SD-DUW07	3/19/1996	7.1–9.7	0.04 UJ
SD-DUW08	10/23/1995	0–0.3	0.82
SD-DUW09	10/24/1995	0–0.3	1.52
SD-DUW10	10/24/1995	0–0.3	3.1 J
SD-DUW107	6/7/2001	2–2.8	0.614
SD-DUW107	6/7/2001	3–3.6	0.097
SD-DUW107	6/7/2001	4–4.7	0.067
SD-DUW108	6/7/2001	2–2.8	0.132
SD-DUW108	6/7/2001	4–4.5	0.039 U
SD-DUW108	6/7/2001	6–6.6	0.037 U
SD-DUW109	6/8/2001	2–3	0.036 U
SD-DUW109	6/8/2001	4–4.7	0.036 U
SD-DUW11	10/24/1995	0–0.3	1.63
SD-DUW110	6/8/2001	2–3	0.028
SD-DUW110	6/8/2001	4–5	0.039 U
SD-DUW111	6/8/2001	2–3	0.843
SD-DUW111	6/8/2001	3–3.7	0.32
SD-DUW111	6/8/2001	4–4.7	0.04 U
SD-DUW112	6/11/2001	2–2.7	0.461 J
SD-DUW112	6/11/2001	3–3.7	0.038 U
SD-DUW112D	6/11/2001	2–3	0.86
SD-DUW112D	6/11/2001	3–3.8	0.039 U
SD-DUW112D	6/11/2001	4–5	0.039 U
SD-DUW112D	6/11/2001	6–7	0.039 U
SD-DUW112D	6/11/2001	8–8.8	0.036 U
SD-DUW113	6/8/2001	2–2.8	0.84
SD-DUW113	6/8/2001	3–3.8	0.037 U
SD-DUW113	6/8/2001	4–5	0.038 U
SD-DUW114	6/8/2001	2–2.8	0.039 U
SD-DUW114	6/8/2001	4–4.5	0.039 U
SD-DUW115	6/8/2001	2–3	3.4
SD-DUW115	6/8/2001	4–4.7	0.78
SD-DUW115	6/8/2001	5–5.3	0.17
SD-DUW115	6/8/2001	6–7	0.036 U
SD-DUW116	6/11/2001	2–3	0.024
SD-DUW116	6/11/2001	4–5	0.023
SD-DUW116	6/11/2001	6–7	0.038 U
SD-DUW116	6/11/2001	8–8.8	0.037 U
SD-DUW117	6/13/2001	2–3	14.4
SD-DUW117	6/13/2001	4–5	1.279
SD-DUW117	6/13/2001	5–5.6	0.038 U
SD-DUW117	6/13/2001	6–7	0.036 U
SD-DUW119	6/18/2001	2–2.7	0.039 U
SD-DUW119	6/18/2001	4–4.8	0.035 U
SD-DUW12	10/24/1995	0–0.3	5 J
SD-DUW120	6/14/2001	2–2.6	0.035 U
SD-DUW120	6/14/2001	4–5	0.038 U
SD-DUW121	6/14/2001	2–2.8	0.039 U
SD-DUW121	6/14/2001	4–5	0.036 U
SD-DUW121	6/14/2001	6–7	0.035 U
SD-DUW121	6/14/2001	8–9.1	0.036 U
SD-DUW122	6/7/2001	2–3	0.26
SD-DUW122	6/7/2001	3–4	0.065
SD-DUW122	6/7/2001	4–5	0.039 U
SD-DUW123	6/11/2001	2–3	1.68
SD-DUW123	6/11/2001	4–5	0.56
SD-DUW123	6/11/2001	5–5.7	0.022
SD-DUW123	6/11/2001	6–7.5	0.04 U
SD-DUW124	6/7/2001	2–2.5	29.7
SD-DUW124	6/7/2001	4–5	1.06
SD-DUW124	6/7/2001	5–6	0.113
SD-DUW124	6/7/2001	6–7	0.021
SD-DUW125	6/8/2001	2–3	0.039 U
SD-DUW125	6/8/2001	4–5	0.038 U
SD-DUW125	6/8/2001	6–7	0.034 U
SD-DUW125	6/8/2001	8–8.9	0.04 U
SD-DUW126	6/13/2001	2–3	11.5
SD-DUW126	6/13/2001	3–3.8	1.32
SD-DUW126	6/13/2001	4–4.8	0.031
SD-DUW126	6/13/2001	6–9	0.038 U

Table 2a
Summary of Total PCB Concentrations—DSOA Dredge Area

Sample Location	Sample Date	Sample Depth (ft bgs)	Total PCB Concentration (ppm)
SD-DUW127	6/13/2001	2–3	0.037 U
SD-DUW127	6/13/2001	4–5	0.04 U
SD-DUW127	6/13/2001	6–7	0.038 U
SD-DUW128	6/14/2001	2–2.6	0.81
SD-DUW128	6/14/2001	3–3.8	0.366
SD-DUW128	6/14/2001	4–5.3	0.035 U
SD-DUW128	6/14/2001	6–7	0.038 U
SD-DUW128	6/14/2001	7–7.9	0.039 U
SD-DUW128	6/14/2001	8–9.4	0.038 U
SD-DUW128D	6/14/2001	2–3	0.241
SD-DUW128D	6/14/2001	3–3.8	0.037 U
SD-DUW128D	6/14/2001	4–5	0.04 U
SD-DUW128D	6/14/2001	6–6.8	0.035 U
SD-DUW128D	6/14/2001	7–8	0.035 U
SD-DUW129	6/11/2001	2–2.8	0.58
SD-DUW129	6/11/2001	4–5	0.44
SD-DUW129	6/11/2001	5–6	0.083
SD-DUW13	10/23/1995	0–0.3	15
SD-DUW13	3/19/1996	0–4	1.78
SD-DUW13	3/19/1996	4–7.6	1.94
SD-DUW130	6/12/2001	2–2.9	0.035 U
SD-DUW130	6/12/2001	4–5.3	0.039 U
SD-DUW131	6/8/2001	2–3	0.039 U
SD-DUW131	6/8/2001	4–5	0.037 U
SD-DUW132	6/13/2001	2–3	1.18
SD-DUW132	6/13/2001	3–4	0.67
SD-DUW132	6/13/2001	4–5	0.048 J
SD-DUW132	6/13/2001	6–7	0.036 U
SD-DUW132	6/13/2001	8–9	0.037 U
SD-DUW133	6/8/2001	2–2.7	16.2
SD-DUW133	6/8/2001	4–4.9	0.31
SD-DUW133	6/8/2001	5–5.7	0.105
SD-DUW134	6/13/2001	2–3	29.4 J
SD-DUW134	6/13/2001	3–4	9.1
SD-DUW134	6/13/2001	4–5	0.409 JM
SD-DUW134	6/13/2001	6–7	0.035 U
SD-DUW135	6/14/2001	2–3	0.56 J
SD-DUW135	6/14/2001	4–5	1.72
SD-DUW135	6/14/2001	5–5.8	0.158
SD-DUW135	6/14/2001	6–6.8	0.125
SD-DUW136	6/12/2001	2–2.8	0.039 U
SD-DUW136	6/12/2001	4–4.9	0.04 U
SD-DUW137	8/12/2003	2–3	9.2 J
SD-DUW137	8/12/2003	3–3.6	0.172
SD-DUW137	8/12/2003	4–4.4	0.039 U
SD-DUW138	8/12/2003	2–2.9	0.038 U
SD-DUW139	8/15/2003	2–2.8	0.027 J
SD-DUW13D	3/20/1996	0–4	14.027 J
SD-DUW13D	3/20/1996	4–9.4	1.34
SD-DUW13D	3/20/1996	9.4–12.8	0.04 UJ
SD-DUW14	10/23/1995	0–0.3	0.75
SD-DUW140	8/13/2003	2–3	0.45
SD-DUW140	8/13/2003	3–3.5	0.014 J
SD-DUW141	8/19/2003	2–2.8	0.038 U
SD-DUW142	8/19/2003	2–2.7	0.67
SD-DUW142	8/19/2003	3–3.3	0.128
SD-DUW143	8/14/2003	2–2.8	0.048 J
SD-DUW144	8/14/2003	2–2.8	1.3
SD-DUW144	8/14/2003	3–3.5	0.168
SD-DUW144	8/14/2003	4–4.8	0.039 U
SD-DUW145	8/14/2003	2–2.6	0.76
SD-DUW145	8/14/2003	3–3.8	0.126
SD-DUW145	8/14/2003	4–4.6	0.039 U
SD-DUW146	8/15/2003	2–3	1.43 J
SD-DUW146	8/15/2003	3–3.6	0.73 J
SD-DUW146	8/15/2003	4–4.6	0.038 U
SD-DUW146D	8/15/2003	2–3	3.79
SD-DUW146D	8/15/2003	3–4	0.42
SD-DUW146D	8/15/2003	4–4.6	0.038 U
SD-DUW147	8/20/2003	2–3	2.3
SD-DUW147	8/20/2003	3–3.6	0.72
SD-DUW147	8/20/2003	4–4.1	2.3
SD-DUW-147R	4/23/2004	5–6	0.019 U
SD-DUW148	8/15/2003	2–2.4	0.038 U
SD-DUW149	8/20/2003	2–3	0.35
SD-DUW149	8/20/2003	3–4	0.038 U
SD-DUW15	10/23/1995	0–0.3	2.8
SD-DUW15	3/20/1996	0–4	8.5
SD-DUW15	3/20/1996	4–8	1.19
SD-DUW15	3/20/1996	8–9.1	0.38 J

Table 2a
Summary of Total PCB Concentrations—DSOA Dredge Area

Sample Location	Sample Date	Sample Depth (ft bgs)	Total PCB Concentration (ppm)
SD-DUW150	8/15/2003	2–2.8	0.04 U
SD-DUW152	8/19/2003	2–2.6	0.038 U
SD-DUW154	8/20/2003	0–1	0.97 J
SD-DUW154	8/20/2003	2–4	1.39
SD-DUW154	8/20/2003	4–6	1.01
SD-DUW154	8/20/2003	6–7	0.3 U
SD-DUW154	8/20/2003	7–7.8	0.038 U
SD-DUW155	8/20/2003	0–1	2.49 J
SD-DUW155	8/20/2003	2–3.7	3.1
SD-DUW155	8/20/2003	4–5	2.76
SD-DUW155	8/20/2003	6–7	0.18 U
SD-DUW155	8/20/2003	7–7.9	0.038 U
SD-DUW156	8/20/2003	0–0.8	0.83
SD-DUW156	8/20/2003	2–3	0.373 J
SD-DUW156	8/20/2003	4–4.8	1.23
SD-DUW156	8/20/2003	5–5.8	0.28
SD-DUW157	8/21/2003	0–1	30
SD-DUW157	8/21/2003	2–3	0.13 UJ
SD-DUW157	8/21/2003	3–4	0.51 U
SD-DUW157	8/21/2003	4–6	0.039 U
SD-DUW158	8/21/2003	0–1	5
SD-DUW158	8/21/2003	2–2.9	0.177
SD-DUW158	8/21/2003	4–4.9	0.039 U
SD-DUW159	8/20/2003	0–1	2.29
SD-DUW159	8/20/2003	2–2.8	0.38
SD-DUW159	8/20/2003	4–5	0.038 U
SD-DUW16	10/23/1995	0–0.3	2.51
SD-DUW16	3/20/1996	0–3.6	7.6
SD-DUW16	3/20/1996	3.6–7.6	0.039 UJ
SD-DUW160	8/21/2003	0–0.9	3.1
SD-DUW160	8/21/2003	2–3	0.39
SD-DUW160	8/21/2003	4–4.6	0.039 U
SD-DUW162	8/21/2003	0–0.8	1.58
SD-DUW162	8/21/2003	2–3	13.5
SD-DUW162	8/21/2003	4–4.6	0.66
SD-DUW163	8/22/2003	0–0.7	1.08
SD-DUW163	8/22/2003	2–2.6	0.04 U
SD-DUW163	8/22/2003	4–5.1	0.039 U
SD-DUW164	8/20/2003	0–0.6	5.21
SD-DUW164	8/20/2003	2–3	1.98
SD-DUW164	8/20/2003	3–3.7	2.37 J
SD-DUW165	8/22/2003	0–0.7	4.8
SD-DUW165	8/22/2003	2–2.7	0.037
SD-DUW165	8/22/2003	4–4.5	0.039 U
SD-DUW-166	4/23/2004	2–3	0.019 U
SD-DUW-167	4/23/2004	2–3	0.02
SD-DUW-168	4/22/2004	2–3	2.32
SD-DUW-168	4/22/2004	3–3.8	0.112
SD-DUW-168	4/22/2004	4–5	0.019 U
SD-DUW-169	4/23/2004	2–3	0.02 U
SD-DUW17	10/25/1995	0–0.3	0.54
SD-DUW18	10/25/1995	0–0.3	1.11
SD-DUW180C	4/3/2007	3–4	4.4
SD-DUW180C	4/3/2007	4–5	1.64
SD-DUW180C	4/3/2007	6–7	1.45
SD-DUW180C	4/3/2007	7–8	1.88
SD-DUW180C	4/3/2007	8–9	2.7
SD-DUW181C	7/13/2007	1–2	0.197
SD-DUW181G	4/4/2007	0–0.3	0.27
SD-DUW182G	7/13/2007	0–0.3	0.131
SD-DUW183C	4/3/2007	3–4	19.4
SD-DUW183C	4/3/2007	4–5	6.6
SD-DUW183C	4/3/2007	6–7	2.46
SD-DUW183C	4/3/2007	7–8	0.474 J
SD-DUW183C	4/3/2007	8–9	1.66
SD-DUW184C	7/13/2007	1–2	0.276
SD-DUW184G	4/3/2007	0–0.3	0.219 J
SD-DUW185G	7/13/2007	0–0.3	0.105
SD-DUW186C	4/3/2007	3–4	1.71
SD-DUW186C	4/3/2007	4–5	9.9 J
SD-DUW186C	4/3/2007	5–6	14.1
SD-DUW186C	4/3/2007	6–7	7 J
SD-DUW186C	4/3/2007	7–8	0.314
SD-DUW186C	4/3/2007	8–9	0.131 J
SD-DUW187C	4/3/2007	3–4	0.95
SD-DUW187C	4/3/2007	4–5	1.22
SD-DUW187C	4/3/2007	6–7	0.266 J
SD-DUW187C	4/3/2007	7–8	0.25
SD-DUW187C	4/3/2007	8–9	0.39
SD-DUW188C	7/13/2007	1–2	0.85 J

Table 2a
Summary of Total PCB Concentrations—DSOA Dredge Area

Sample Location	Sample Date	Sample Depth (ft bgs)	Total PCB Concentration (ppm)
SD-DUW188G	4/4/2007	0–0.3	1.62
SD-DUW19	10/25/1995	0–0.3	0.29
SD-DUW190C	4/2/2007	2–3	0.423
SD-DUW190C	4/2/2007	3–4	0.68
SD-DUW190C	4/2/2007	5–6	0.67
SD-DUW190C	4/2/2007	6–7	0.98
SD-DUW190C	4/2/2007	7–8	0.68
SD-DUW190C	4/2/2007	8–9	1.27
SD-DUW191G	4/4/2007	0–0.3	0.209
SD-DUW193C	4/2/2007	3–4	5.23 J
SD-DUW193C	4/2/2007	4–5	8.69
SD-DUW193C	4/2/2007	6–7	1.69 J
SD-DUW193C	4/2/2007	7–8	3.65
SD-DUW193C	4/2/2007	8–9	2.56
SD-DUW194G	4/4/2007	0–0.3	0.203
SD-DUW196C	4/2/2007	3–4	4.2
SD-DUW196C	4/2/2007	4–5	9.1
SD-DUW196C	4/2/2007	6–7	2.79 J
SD-DUW196C	4/2/2007	7–8	0.44
SD-DUW196C	4/2/2007	8–9	1.23 J
SD-DUW197G	4/4/2007	0–0.3	0.149
SD-DUW199C	4/2/2007	3–4	4.24
SD-DUW199C	4/2/2007	4–5	0.36
SD-DUW199C	4/2/2007	6–7	0.46 J
SD-DUW199C	4/2/2007	7–8	0.29
SD-DUW199C	4/2/2007	8–9	0.083
SD-DUW20	10/25/1995	0–0.3	0.197
SD-DUW200G	4/4/2007	0–0.3	0.17
SD-DUW202C	4/2/2007	3–4	1.9
SD-DUW202C	4/2/2007	4–5	3.77
SD-DUW202C	4/2/2007	6–7	0.057
SD-DUW203G	4/4/2007	0–0.3	0.177
SD-DUW205G	4/4/2007	0–0.3	0.128
SD-DUW21	10/25/1995	0–0.3	0.33
SD-DUW22	10/25/1995	0–0.3	2.3
SD-DUW23	10/23/1995	0–0.3	1.24
SD-DUW24	10/23/1995	0–0.3	1.45
SD-DUW25	10/25/1995	0–0.3	0.47
SD-DUW26	10/24/1995	0–0.3	13
SD-DUW26	3/20/1996	0–4	9.6
SD-DUW26	3/20/1996	4–7.2	0.043 U
SD-DUW27	10/24/1995	0–0.3	0.96
SD-DUW28	10/24/1995	0–0.3	11.3
SD-DUW28	10/24/1995	0–0.3	10.6
SD-DUW28	3/19/1996	0–1.9	13.01
SD-DUW28	3/19/1996	1.9–6.9	0.078 J
SD-DUW29	10/25/1995	0–0.3	0.64
SD-DUW30	10/25/1995	0–0.3	2.74
SD-DUW31	10/25/1995	0–0.3	0.53
SD-DUW31	10/25/1995	0–0.3	0.36
SD-DUW32	10/25/1995	0–0.3	0.55
SD-DUW33	10/25/1995	0–0.3	4
SD-DUW34	10/24/1995	0–0.3	3.4
SD-DUW34	10/24/1995	0–0.3	3.4
SD-DUW34	3/21/1996	0–1.9	11.32
SD-DUW34	3/21/1996	1.9–5.9	0.039 UJ
SD-DUW35	10/24/1995	0–0.3	0.12
SD-DUW36	10/24/1995	0–0.3	1.04
SD-DUW37	10/24/1995	0–0.3	0.56
SD-DUW38	10/24/1995	0–0.3	0.49
SD-DUW39	10/24/1995	0–0.3	3.2
SD-DUW39	3/20/1996	0–4	5.7
SD-DUW39	3/20/1996	4–8	0.04 UJ
SD-DUW40	10/24/1995	0–0.3	2.6
SD-DUW401	7/24/2008	9–10	0.66
SD-DUW401	7/24/2008	10–11	0.44
SD-DUW401	7/24/2008	11–12	0.28
SD-DUW401	7/24/2008	12–13	0.28
SD-DUW402	7/24/2008	9–10	1.56
SD-DUW402	7/24/2008	10–11	3.29
SD-DUW402	7/24/2008	11–12	0.53
SD-DUW402	7/24/2008	12–13	1.594
SD-DUW403	7/31/2008	6–7	2.6
SD-DUW403	7/31/2008	7–8	1.91
SD-DUW403	7/31/2008	8–9	1.98
SD-DUW403	7/31/2008	9–10	1.27
SD-DUW403	7/31/2008	10–11	0.54
SD-DUW403	7/31/2008	11–12	1.32
SD-DUW403	7/31/2008	12–13	0.084
SD-DUW403	7/31/2008	13–14	0.02 U

Table 2a
Summary of Total PCB Concentrations—DSOA Dredge Area

Sample Location	Sample Date	Sample Depth (ft bgs)	Total PCB Concentration (ppm)
SD-DUW403	7/31/2008	14–15	0.02 U
SD-DUW404	7/25/2008	6–7	0.82
SD-DUW404	7/25/2008	7–8	1.98
SD-DUW404	7/25/2008	8–9	3.14
SD-DUW404	7/25/2008	9–10	5.33
SD-DUW404	7/25/2008	10–11	0.51
SD-DUW404	7/25/2008	11–12	0.019 U
SD-DUW405	7/24/2008	9–10	2.53
SD-DUW405	7/24/2008	10–11	0.61
SD-DUW405	7/24/2008	11–12	2.3
SD-DUW405	7/24/2008	12–13	2.74
SD-DUW405	7/24/2008	13–14	1.19
SD-DUW405	7/24/2008	14–15	3.49
SD-DUW406	7/24/2008	9–10	0.28
SD-DUW407	7/25/2008	9–10	0.164
SD-DUW408	7/25/2008	7–8	0.46
SD-DUW408	7/25/2008	8–9	0.17
SD-DUW409	7/25/2008	8–9	0.148
SD-DUW409	7/25/2008	9–10	0.019 U
SD-DUW41	10/24/1995	0–0.3	0.83
SD-DUW410	7/25/2008	3–4	1.86
SD-DUW410	7/25/2008	4–5	0.019 U
SD-DUW42	10/23/1995	0–0.3	1.98
SD-DUW423	11/3/2009	2–3	0.86
SD-DUW423	11/3/2009	4–5	0.54
SD-DUW423	11/3/2009	5–6	0.019 U
SD-DUW423	11/3/2009	6–7	0.02 U
SD-DUW423	11/3/2009	7–8	0.019 U
SD-DUW423	11/3/2009	8–9	0.019 U
SD-DUW423	11/3/2009	9–10	0.019 U
SD-DUW423	11/3/2009	10–11	0.02 U
SD-DUW424	11/3/2009	2–3	11.1
SD-DUW424	11/3/2009	4–5	6.4
SD-DUW424	11/3/2009	6–7	1.15
SD-DUW424	11/3/2009	8–9	2.4
SD-DUW424	11/3/2009	9–10	0.63
SD-DUW424	11/3/2009	10–11	0.09
SD-DUW424	11/3/2009	11–12	0.011 U
SD-DUW424	11/3/2009	12–13	0.02 U
SD-DUW424	11/3/2009	13–14	0.02 U
SD-DUW425	11/5/2009	2–3	2.12
SD-DUW425	11/5/2009	4–5	0.78
SD-DUW425	11/5/2009	6–7	0.62
SD-DUW425	11/5/2009	7–8	0.62
SD-DUW425	11/5/2009	8–9	0.026
SD-DUW425	11/5/2009	9–10	0.02 U
SD-DUW425	11/5/2009	10–11	0.02 U
SD-DUW425	11/17/2009	11–12	0.019 U
SD-DUW426	11/5/2009	2–3	4
SD-DUW426	11/5/2009	4–5	0.154
SD-DUW426	11/5/2009	5–6	0.02 U
SD-DUW426	11/5/2009	6–7	0.02 U
SD-DUW426	11/5/2009	7–8	0.02 U
SD-DUW426	11/5/2009	8–9	0.019 U
SD-DUW426	11/5/2009	9–10	0.02 U
SD-DUW426	11/5/2009	10–11	0.02 U
SD-DUW427	11/5/2009	2–3	1.22
SD-DUW427	11/5/2009	4–5	5.1
SD-DUW427	11/5/2009	6–7	0.154
SD-DUW427	11/5/2009	8–9	1.02
SD-DUW427	11/5/2009	10–11	0.36
SD-DUW427	11/5/2009	11–12	0.02 U
SD-DUW427	11/18/2009	12–13	0.019 U
SD-DUW427	11/18/2009	13–14	0.02 U
SD-DUW427	11/18/2009	14–15	0.019 U
SD-DUW427	11/18/2009	15–16	0.02 U
SD-DUW429	11/10/2009	12–13	1.17
SD-DUW429	11/10/2009	13–14	0.104
SD-DUW429	11/10/2009	14–15	0.02 U
SD-DUW43	10/24/1995	0–0.3	1.6
SD-DUW430	11/10/2009	4–5	0.86
SD-DUW430	11/10/2009	5–6	0.02 U
SD-DUW430	11/10/2009	6–7	0.019 U
SD-DUW430	11/18/2009	7–8	0.02 U
SD-DUW430	11/18/2009	8–9	0.02 U
SD-DUW430	11/18/2009	9–10	0.019 U
SD-DUW430	11/18/2009	10–11	0.02 U
SD-DUW431	11/9/2009	4–5	2.3
SD-DUW431	11/9/2009	5–6	6
SD-DUW431	11/9/2009	6–7	0.028

Table 2a
Summary of Total PCB Concentrations—DSOA Dredge Area

Sample Location	Sample Date	Sample Depth (ft bgs)	Total PCB Concentration (ppm)
SD-DUW431	11/18/2009	7–8	0.019 U
SD-DUW431	11/18/2009	8–9	0.019 U
SD-DUW431	11/18/2009	9–10	0.02 U
SD-DUW432	11/9/2009	9–10	0.59
SD-DUW432	11/9/2009	10–11	0.065
SD-DUW432	11/9/2009	11–12	0.36
SD-DUW432	11/9/2009	12–13	0.28
SD-DUW432	11/9/2009	13–14	0.206
SD-DUW432	11/9/2009	14–15	0.52
SD-DUW432	11/9/2009	15–16	0.95
SD-DUW432	11/19/2009	16–17	0.38
SD-DUW432	11/19/2009	17–18	1.2
SD-DUW432	11/19/2009	18–19	0.03 UY
SD-DUW433	11/9/2009	9–10	0.24
SD-DUW433	11/9/2009	10–11	0.36
SD-DUW433	11/9/2009	11–12	0.252
SD-DUW433	11/9/2009	12–13	0.28
SD-DUW433	11/9/2009	13–14	0.69
SD-DUW433	11/9/2009	14–15	2.4
SD-DUW433	11/9/2009	15–16	0.3
SD-DUW433	11/9/2009	16–17	0.36
SD-DUW433	11/9/2009	17–18	0.93
SD-DUW433	11/19/2009	18–19	1.7
SD-DUW433	11/19/2009	19–20	0.51
SD-DUW434	11/10/2009	6–7	1.4
SD-DUW434	11/10/2009	8–9	1.29
SD-DUW434	11/10/2009	10–11	0.87
SD-DUW434	11/10/2009	11–12	0.56
SD-DUW434	11/10/2009	12–13	0.33
SD-DUW434	11/10/2009	13–14	2.2
SD-DUW434	11/10/2009	14–15	0.88
SD-DUW434	11/10/2009	15–16	0.019 U
SD-DUW434	11/10/2009	16–17	0.019 U
SD-DUW434	11/10/2009	17–18	0.019 U
SD-DUW434	11/10/2009	18–19	0.019 U
SD-DUW435	11/10/2009	15–16	1.3
SD-DUW435	11/10/2009	16–17	0.109
SD-DUW435	11/10/2009	17–18	0.02 U
SD-DUW435	11/10/2009	18–19	0.02 U
SD-DUW435	11/10/2009	19–20	0.019 U
SD-DUW436	11/11/2009	4–5	5.3
SD-DUW436	11/11/2009	6–7	0.6
SD-DUW436	11/11/2009	8–9	1.9
SD-DUW436	11/11/2009	10–11	4.6
SD-DUW436	11/11/2009	11–12	5.7
SD-DUW436	11/11/2009	12–13	6.2
SD-DUW436	11/11/2009	13–14	0.91
SD-DUW436	11/11/2009	14–15	2.2
SD-DUW436	11/11/2009	15–16	2.8
SD-DUW436	11/19/2009	16–17	0.038 J
SD-DUW436	11/19/2009	17–18	0.02 U
SD-DUW436	11/19/2009	18–19	0.024
SD-DUW437	11/11/2009	6–7	0.39
SD-DUW437	11/11/2009	8–9	0.79
SD-DUW437	11/11/2009	10–11	0.73
SD-DUW437	11/11/2009	11–12	1.5
SD-DUW437	11/11/2009	12–13	1.3
SD-DUW437	11/11/2009	13–14	0.55
SD-DUW437	11/11/2009	14–15	0.73
SD-DUW437	11/11/2009	15–16	0.39
SD-DUW437	11/11/2009	16–17	0.89
SD-DUW437	11/11/2009	17–18	0.039
SD-DUW437	11/19/2009	18–19	0.02 U
SD-DUW437	11/19/2009	19–20	0.02 U
SD-DUW438	11/11/2009	4–5	5.9
SD-DUW438	11/13/2009	6–7	0.87
SD-DUW438	11/13/2009	7–8	0.52
SD-DUW438	11/13/2009	8–9	0.02 U
SD-DUW438	11/13/2009	9–10	0.019 U
SD-DUW438	11/13/2009	10–11	0.02 U
SD-DUW439	11/11/2009	4–5	1.15
SD-DUW439	11/11/2009	6–7	0.78
SD-DUW439	11/11/2009	7–8	0.36
SD-DUW439	11/11/2009	8–9	0.64
SD-DUW439	11/11/2009	9–10	1.2
SD-DUW439	11/11/2009	10–11	0.1
SD-DUW439	11/11/2009	11–12	0.019 U
SD-DUW439	11/11/2009	12–13	0.019 U
SD-DUW439	11/11/2009	13–14	0.019 U
SD-DUW44	10/23/1995	0–0.3	0.94 J

Table 2a
Summary of Total PCB Concentrations—DSOA Dredge Area

Sample Location	Sample Date	Sample Depth (ft bgs)	Total PCB Concentration (ppm)
SD-DUW440	11/12/2009	6–7	2.7
SD-DUW440	11/12/2009	7–8	1.9
SD-DUW440	11/12/2009	8–9	0.02 U
SD-DUW440	11/12/2009	9–10	0.019 U
SD-DUW440	11/12/2009	10–11	0.02 U
SD-DUW440	11/12/2009	11–12	0.019 U
SD-DUW441	11/12/2009	9–10	0.19
SD-DUW441	11/12/2009	10–11	0.091
SD-DUW441	11/12/2009	11–12	0.028
SD-DUW441	11/12/2009	12–13	0.02 U
SD-DUW441	11/12/2009	13–14	0.02 U
SD-DUW442	11/5/2009	2–3	0.51
SD-DUW442	11/5/2009	4–5	1.01
SD-DUW442	11/5/2009	5–6	0.37
SD-DUW442	11/5/2009	6–7	0.115
SD-DUW442	11/5/2009	7–8	0.045
SD-DUW442	11/5/2009	8–9	0.02 U
SD-DUW442	11/5/2009	9–10	0.019 U
SD-DUW443	11/9/2009	2–3	1.01
SD-DUW443	11/9/2009	4–5	1.18
SD-DUW443	11/9/2009	6–7	2.92
SD-DUW443	11/9/2009	8–9	1.86
SD-DUW443	11/9/2009	9–10	0.53 J
SD-DUW443	11/9/2009	10–11	0.019 U
SD-DUW443	11/9/2009	11–12	0.02 U
SD-DUW443	11/20/2009	12–13	0.019 U
SD-DUW443	11/20/2009	13–14	0.019 U
SD-DUW443	11/20/2009	14–15	0.02 U
SD-DUW444	11/10/2009	2–3	2.15
SD-DUW444	11/10/2009	4–5	0.78
SD-DUW444	11/10/2009	6–7	2.56
SD-DUW444	11/10/2009	8–9	0.51
SD-DUW444	11/10/2009	9–10	0.058
SD-DUW444	11/10/2009	10–11	0.35
SD-DUW444	11/10/2009	11–12	0.88
SD-DUW444	11/10/2009	12–13	1.2
SD-DUW444	11/10/2009	13–14	3.7
SD-DUW444	11/10/2009	14–15	0.179
SD-DUW445	11/10/2009	2–3	3.22
SD-DUW445	11/10/2009	4–5	0.47
SD-DUW445	11/10/2009	5–6	0.073
SD-DUW445	11/10/2009	6–7	0.32
SD-DUW445	11/10/2009	7–8	0.12
SD-DUW445	11/10/2009	8–9	0.137
SD-DUW445	11/10/2009	9–10	0.061
SD-DUW446	11/12/2009	4–5	0.31
SD-DUW446	11/12/2009	5–6	0.19
SD-DUW446	11/12/2009	6–7	0.11
SD-DUW446	11/12/2009	7–8	0.57
SD-DUW446	11/12/2009	8–9	0.029
SD-DUW446	11/12/2009	9–10	0.21
SD-DUW446	11/12/2009	10–11	0.24
SD-DUW446	11/12/2009	11–12	0.019 U
SD-DUW446	11/12/2009	12–13	0.019 U
SD-DUW446	11/12/2009	13–14	0.02 U
SD-DUW446	11/12/2009	14–15	0.019 U
SD-DUW446	11/12/2009	15–16	0.02 U
SD-DUW446	11/12/2009	16–17	0.019 U
SD-DUW447	11/13/2009	2–3	7.5
SD-DUW447	11/13/2009	4–5	9.8
SD-DUW447	11/13/2009	5–6	14.4
SD-DUW447	12/15/2009	6–7	0.178
SD-DUW448	11/2/2009	2–3	1.22
SD-DUW448	11/2/2009	4–5	11.3 J
SD-DUW448	11/2/2009	5–6	0.39 J
SD-DUW448	11/2/2009	6–7	0.027
SD-DUW448	11/2/2009	7–8	0.137 J
SD-DUW448	11/2/2009	8–9	0.018 J
SD-DUW448	11/2/2009	9–10	0.022
SD-DUW45	10/24/1995	0–0.3	1.9 J
SD-DUW450	11/2/2009	2–3	0.42
SD-DUW450	11/2/2009	4–5	4.9
SD-DUW450	11/2/2009	6–7	0.48
SD-DUW450	11/12/2009	7–8	0.26
SD-DUW450	11/12/2009	8–9	0.02 U
SD-DUW451	11/3/2009	2–3	1.27
SD-DUW451	11/3/2009	4–5	13
SD-DUW451	11/3/2009	6–7	1.08
SD-DUW451	11/3/2009	8–9	0.341
SD-DUW451	11/3/2009	10–11	1.13

Table 2a
Summary of Total PCB Concentrations—DSOA Dredge Area

Sample Location	Sample Date	Sample Depth (ft bgs)	Total PCB Concentration (ppm)
SD-DUW451	11/3/2009	11–12	0.02 U
SD-DUW451	11/3/2009	12–13	0.019 U
SD-DUW451	11/3/2009	13–14	0.02 U
SD-DUW451	11/3/2009	14–15	0.019 U
SD-DUW451	11/3/2009	15–16	0.019 U
SD-DUW46	10/23/1995	0–0.3	0.32
SD-DUW47	10/23/1995	0–0.3	4.9 J
SD-DUW47	3/21/1996	0–4.4	0.042 U
SD-DUW47	3/21/1996	0–4.4	0.11
SD-DUW47	3/21/1996	4.4–8.4	0.038 UJ
SD-DUW47	3/21/1996	4.4–8.4	0.038 UJ
SD-DUW48	10/24/1995	0–0.3	3.9
SD-DUW49	10/23/1995	0–0.3	7.4 J
SD-DUW50	10/23/1995	0–0.3	9.2
SD-DUW51	10/23/1995	0–0.3	12
SD-DUW51	3/21/1996	0–2.6	3.5
SD-DUW51	3/21/1996	0–2.6	3.4
SD-DUW51	3/21/1996	2.6–6.6	0.041 U
SD-DUW51	3/21/1996	2.6–6.6	0.042 U
SD-DUW52	10/23/1995	0–0.3	2.05
SD-DUW52	3/19/1996	0–4	18.17
SD-DUW52	3/19/1996	4–8	0.54
SD-DUW52	3/19/1996	8–11.3	0.99
SD-DUW52	3/19/1996	11.3–14.5	0.039 UJ
SD-DUW53	10/23/1995	0–0.3	0.67
SD-DUW53	3/20/1996	0–4	3.92
SD-DUW53	3/20/1996	4–8	2.28
SD-DUW53	3/20/1996	8–12	0.41
SD-DUW53	3/20/1996	12–15.9	0.045 U
SD-DUW54	10/23/1995	0–0.3	0.86
SD-DUW55	4/2/1996	0–0.3	0.29
SD-DUW56	4/2/1996	0–0.3	0.52
SD-DUW57	4/2/1996	0–0.3	0.27
SD-DUW58	4/2/1996	0–0.3	0.37
SD-DUW59	4/2/1996	0–0.3	0.48
SD-DUW60	4/2/1996	0–0.3	0.22
SD-DUW61	4/2/1996	0–0.3	0.177
SD-DUW62	4/2/1996	0–0.3	0.44
SD-DUW63	4/2/1996	0–0.3	0.36
SD-DUW64	4/2/1996	0–0.3	0.39
SD-DUW65	4/2/1996	0–0.3	1.22
SD-DUW66	4/2/1996	0–0.3	0.57
SD-DUW67	4/3/1996	0–0.3	1.4
SD-DUW68	4/3/1996	0–0.3	0.65
SD-DUW69	4/3/1996	0–0.3	4.49 J
SD-DUW69	4/3/1996	0–0.3	0.3 J
SD-DUW70	4/3/1996	0–0.3	0.31
SD-DUW71	4/3/1996	0–0.3	0.3
SD-DUW72	4/3/1996	0–0.3	0.239
SD-DUW73	4/3/1996	0–0.3	0.386 J
SD-DUW84	4/3/1996	0–0.3	0.98
SD-DUW85	4/3/1996	0–0.3	4.36
SD-DUW86	4/3/1996	0–0.3	0.884
SD-DUW87	4/3/1996	0–0.3	0.248
SD-DUW89	4/4/1996	0–0.3	2.71
SD-SWY01	6/13/1995	0–0.3	5.2
SD-SWY05	6/12/1995	0–0.3	1.11
SD-SWY06	6/13/1995	0–0.3	6.7
SD-SWY08	6/14/1995	0–0.3	3.5
SD-SWY10	6/14/1995	0–0.3	1.45
SD-SWY11	6/14/1995	0–0.3	5.2
SD-SWY12	6/14/1995	0–0.3	1.67
SD-SWY15	9/9/2003	0–0.16	0.23
SD-SWY16	9/9/2003	0–0.16	1.4
SD-SWY19	9/12/2003	0–0.16	3.3
WES234	9/24/1997	0–10[1]	2 J
WES235	9/24/1997	0–10[1]	1.7 J
WES236	9/23/1997	0–10[1]	6.2 J
WES237	9/23/1997	0–10[1]	4.6 J
WES238	9/23/1997	0–10[1]	1.6 J
WES239	9/23/1997	0–10[1]	0.12
WES240	9/23/1997	0–10[1]	0.41
WES241	9/23/1997	0–10[1]	0.06 J
DR180	8/24/1998	0–10[1]	0.527 J
DR182	8/24/1998	0–10[1]	0.318 J
EIT066	9/26/1997	0–10[1]	0.6
EST171	10/7/1997	0–10[1]	0.19
HP-AL-33	8/21/1990	2.5–6.5	0.18 U
HP-AL-33	8/21/1990	7.5–16.5	0.21 U

Table 2a
Summary of Total PCB Concentrations—DSOA Dredge Area

Sample Location	Sample Date	Sample Depth (ft bgs)	Total PCB Concentration (ppm)
HP-AL-34	8/21/1990	2.5–6.5	0.18 U
HP-AL-34	8/21/1990	7.5–11.5	0.19 U
SG19	4/8/2004	0–10[1]	0.154

Note:

1 Measured in centimeters not feet.

Abbreviations:

DSOA Duwamish Sediment Other Area
ft bgs Feet below ground surface
PCB Polychlorinated biphenyl
ppm Parts per million

Qualifiers:

J Estimated value
JM Estimated value due to matrix interference
U Not detected at concentration greater than the laboratory method detection limit
UJ Not detected at concentration greater than the laboratory method detection limit, estimated value
UY Non-detect with an elevated reporting limit due to mixture overlap

Table 2b
Summary of Total PCB Concentrations—North Shoreline/Habitat Area

Sample Location	Sample Date	Sample Depth (ft bgs)	Total PCB Concentration (ppm)
B-29	8/15/1990	2.5–6.5	0.18 U
B-29	8/15/1990	7.5–11.5	0.19 U
B-30	8/14/1990	2.5–6.5	0.18 U
B-30	8/14/1990	7.5–11.5	0.2 U
B-32	8/17/1990	2.5–6.5	0.21 U
B-32	8/17/1990	7.5–11.5	0.23 U
EIT067	9/26/1997	0–10[1]	0.13
EIT068	11/12/1997	0–10[1]	0.082 J
HP-AL-27	8/20/1990	2.5–6.5	0.18 U
HP-AL-27	8/20/1990	7.5–11.5	0.18 U
HP-AL-28	8/21/1990	2.5–6.5	0.17 U
HP-AL-28	8/21/1990	7.5–11.5	0.21 U
HP-AL-31	8/22/1990	2.5–6.5	0.19 U
HP-AL-31	8/22/1990	11.5–13	0.24 U
NA-DP-01	9/4/2008	0–1	0.034
NA-DP-01	9/4/2008	4–5	0.144
NA-DP-01	9/4/2008	7–8	0.019 U
NA-DP-01	9/4/2008	9–10	0.75
NA-DP-02	9/4/2008	0–1	0.055
NA-DP-02	9/4/2008	4–5	0.032 U
NA-DP-02	9/4/2008	9–10	0.033 U
NA-DP-02	9/4/2008	10–11	0.046
NA-DP-02	9/4/2008	15–16	0.032 U
NA-DP-03	9/3/2008	0–1	0.03 U
NA-DP-03	9/3/2008	4–5	0.032 U
NA-DP-03	9/3/2008	9–10	0.031 U
NA-DP-04	9/3/2008	0–1	0.032 U
NA-DP-04	9/3/2008	4–5	0.032 U
NA-DP-04	9/3/2008	6–7	0.035
NA-DP-04	9/3/2008	9–10	0.033 U
NA-DP-05	9/8/2008	0–1	0.081
NA-DP-05	9/8/2008	4–5	0.033 U
NA-DP-05	9/8/2008	7–8	0.019 U
NA-DP-05	9/8/2008	9–10	0.031 U
NA-DP-06	9/4/2008	0–1	0.107
NA-DP-06	9/4/2008	2–3	0.11
NA-DP-06	9/4/2008	4–5	0.032
NA-DP-06	9/4/2008	9–10	0.033 U
NA-DP-41	9/3/2008	0–1	0.176
NA-DP-41	9/3/2008	4–5	0.03 U
NA-DP-41	9/3/2008	9–10	0.032 U
NA-DP-41	9/3/2008	9–10	0.019 U
NA-DP-42	9/3/2008	0–1	0.031 U
NA-DP-42	9/3/2008	4–5	0.032 U
NA-DP-42	9/3/2008	9–10	0.031 U
NA-DP-43	9/8/2008	0–1	0.032 U
NA-DP-43	9/8/2008	4–5	0.032 U
NA-DP-43	9/8/2008	5–6	0.02 U
NA-DP-43	9/8/2008	9–10	0.033 U
PL2-609A	9/16/2008	0–1	0.58
PL2-609A	9/16/2008	4–5	0.04
PL2-609A	9/16/2008	9–10	0.031 U
PL2-610A	9/15/2008	0–1	0.031
PL2-610A	9/15/2008	4–5	0.022
PL2-610A	9/15/2008	9–10	0.02 U
SD-DUW106	6/7/2001	2–2.4	0.039 U
SD-DUW106	6/7/2001	4–4.7	0.038 U

Note:

1 Measured in centimeters not feet.

Abbreviations:

ft bgs Feet below ground surface
PCB Polychlorinated biphenyl
ppm Parts per million

Qualifiers:

J Estimated value
U Not detected at concentration greater than the laboratory method detection limit

Table 2c
Summary of Total PCB Concentrations—Slip 4 Area

Sample Location	Sample Date	Sample Depth (ft bgs)	Total PCB Concentration (ppm)
DR180	8/24/1998	0–10[1]	0.527 J
DR182	8/24/1998	0–10[1]	0.318 J
EIT066	9/26/1997	0–10[1]	0.6
EST171	10/7/1997	0–10[1]	0.19
HP-AL-33	8/21/1990	2.5–6.5	0.18 U
HP-AL-33	8/21/1990	7.5–16.5	0.21 U
HP-AL-34	8/21/1990	2.5–6.5	0.18 U
HP-AL-34	8/21/1990	7.5–11.5	0.19 U
SG19	4/8/2004	0–10[1]	0.154

Note:

1 Measured in centimeters not feet.

Abbreviations:

ft bgs Feet below ground surface
PCB Polychlorinated biphenyl
ppm Parts per million

Qualifiers:

J Estimated value
U Not detected at concentration greater than the laboratory method detection limit

Table 2d
Summary of Total PCB Concentrations—SW Bank Area

Sample Location	Sample Date	Sample Depth (ft bgs)	Total PCB Concentration (ppm)
2-40-DP-009	7/7/2008	0–1	0.032 U
2-40-DP-009	7/7/2008	4–5	0.033 U
2-40-DP-009	7/7/2008	9–10	0.032 U
DP-4902	9/4/2002	6–6.4	0.068 U
DP-4902	9/4/2002	9–10.5	0.07 U
DP-4902	9/4/2002	13.5–14	0.082 U
DP-4903	9/4/2002	5–5.7	0.07 U
DP-4903	9/4/2002	10–11	0.075 U
DP-4903	9/4/2002	14–14.5	0.082 U
DP-4904	9/4/2002	6–6.4	0.164
DP-4904	9/4/2002	9.5–10.5	0.072 U
DP-4904	9/4/2002	13.5–14.5	0.083 U
DP-4905	9/4/2002	6–6.3	0.073 U
DP-4905	9/4/2002	9–10.3	0.071 U
DP-4905	9/4/2002	12.5–13.5	0.082 U
PL2-013B	7/31/2006	1–1	0.14
PL2-013B	7/31/2006	5–5	0.033 U
PL2-013B	7/31/2006	10–10	0.033 U
PL2-014AR	7/31/2006	1–1	0.41
PL2-014AR	7/31/2006	5–5	0.033 U
PL2-014AR	7/31/2006	10–10	0.033 U
PL2-015BR	8/1/2006	1–1	0.046 J
PL2-015BR	8/1/2006	5–5	0.22 J
PL2-015BR	8/1/2006	10–10	0.033 U
PL2-036A	10/26/1994	2–2	9.8
PL2-036A	10/26/1994	7.5–7.5	3 D
PL2-036A	10/26/1994	12.5–12.5	0.087
PL2-036B	8/2/2006	1–1	0.112
PL2-036B	8/2/2006	5–5	0.032 U
PL2-036B	8/2/2006	10–10	0.032 U
PL2-037A	10/26/1994	2–2	0.22
PL2-037A	10/26/1994	7.5–7.5	0.076
PL2-037A	10/26/1994	10–10	0.045
PL2-038A	2/20/1995	18.5–18.5	0.022 J
PL2-038A	2/20/1995	23–23	0.08
PL2C-2-60X-D-DP-S	2/27/2007	0.5–1.5	0.082 J
PL2C-2-60X-D-DP-S	2/27/2007	4–5	0.094
PL2C-2-60X-D-DP-S	2/27/2007	9–10	0.05 Y
PL2C-2-60Y-F-DP-S	2/27/2007	0.5–1.5	0.4
PL2C-2-60Y-F-DP-S	2/27/2007	4–8	1.68 J
PL2C-2-60Y-F-DP-S	2/27/2007	9–10	0.75
SB-04901	11/24/1993	2–2	0.061 J
SB-04901	11/24/1993	5–5	0.16 U
SB-04901	11/24/1993	12.5–12.5	0.16 U
SB-04901	11/24/1993	16.5–16.5	0.16 U
SB-04910	8/12/1994	5–5	0.042 J
SB-04910	8/12/1994	7.5–7.5	0.072 U
SB-04910	8/12/1994	10–10	0.08 U
SB-04914	7/20/1995	4–4	1.88
SB-04915	7/20/1995	3.5–3.5	0.035 U
SB-04915	7/20/1995	7.5–7.5	0.036 U
SB-04915	7/20/1995	10.5–10.5	0.036 U
SB-04916	8/8/1995	2.5–2.5	0.022 J
SB-04916	8/8/1995	7.5–7.5	0.468
SB-04916	8/8/1995	10–10	0.226
SB-04917	7/12/2001	5.5–7	0.023
SB-04918	7/12/2001	7–8.5	0.039 U
SB-04919	7/12/2001	10–11.5	0.018
SB-06616	8/15/1994	0.5–1.5	0.56
SB-06616	8/15/1994	3.5–4.75	0.114 J
SB-06616	8/26/1994	11–11.5	0.59
SB-06624	8/15/1994	1–1.25	0.32
SB-06624	8/15/1994	2.5–3.25	2.42
SB-06624	8/26/1994	5–5.75	0.081 J
SB-06627	7/12/2001	5.5–7	0.038 U
SB-06628	7/11/2001	13–14.5	0.089
SB-06629	7/11/2001	7–8.5	0.036 U
SB-06630	7/11/2001	9–10.5	0.037 U
SB-06631	7/11/2001	7–8.5	0.039 U
SB-06632	7/11/2001	8.5–10	0.036 U
SB-06633	7/11/2001	7–8.5	1.6
SB-06633	7/11/2001	10–11.5	1.18
SB-06633	7/11/2001	11.5–13	0.233
SB-06633	7/11/2001	13–14.5	0.44
SB-06634	7/10/2001	7–8.5	0.037 U
SB-06635	7/10/2001	7–8.5	0.037 U
SB-06636	7/10/2001	7–8.5	0.15
SB-06636	7/10/2001	8.5–10	0.13
SB-06637	7/10/2001	10–11.5	0.405
SB-06637	7/10/2001	11.5–13	0.071
SB-06638	7/10/2001	5.5–7	0.036 U
SB-06639	7/10/2001	7–8.5	0.036 U
SB-06640	7/10/2001	7–8.5	0.51
SB-06640	7/10/2001	8.5–10	0.25
SB-06640	7/10/2001	10–11.5	0.195
SB-06641	7/9/2001	8.5–10	0.184
SB-06642	7/9/2001	5.5–7	0.038 U
SB-06643	7/9/2001	7–8.5	0.037 U
SB-06644	7/9/2001	7–8.5	0.33 J

Table 2d
Summary of Total PCB Concentrations—SW Bank Area

Sample Location	Sample Date	Sample Depth (ft bgs)	Total PCB Concentration (ppm)
SB-06644	7/9/2001	8.5–10	0.102
SD-04402	6/15/1995	0–0.3	0.19
SD-04402	6/15/1995	0.3–1	0.6
SD-04404	6/14/1995	0–0.3	0.4
SD-04405	6/14/1995	0–0.3	0.173
SD-04405	6/14/1995	0.3–1.5	0.12
SD-04406	6/15/1995	0–0.3	1.1
SD-04901	2/16/1995	0–0.3	3.77
SD-04901	2/16/1995	0.3–1.5	0.35
SD-04901	2/16/1995	1.5–3	0.066 J
SD-04902	2/16/1995	0–0.3	2.1
SD-04902	2/16/1995	0.3–1.5	0.37
SD-04902	2/16/1995	1.5–3	0.25
SD-04903	2/16/1995	0–0.3	0.283
SD-04903	2/16/1995	0.3–1.5	2.96
SD-04903	2/16/1995	1.5–3	2.53
SD-04904	2/17/1995	0–0.3	10.18
SD-04904	2/17/1995	0.3–1.5	8.26
SD-04904	2/17/1995	1.5–3	10 J
SD-04904	2/17/1995	1.5–3	18 J
SD-04906	2/17/1995	0–0.3	2.8
SD-04907	2/16/1995	0–0.3	0.58
SD-04908	2/16/1995	0–0.3	2.3
SD-04909	2/17/1995	0–0.3	0.22
SD-04910	2/17/1995	0–0.3	0.46
SD-04911	2/16/1995	0–0.3	0.326
SD-04912	2/17/1995	0–0.3	0.38
SD-04913	2/17/1995	0–0.3	0.13
SD-04914	2/17/1995	0–0.3	0.5
SD-04917	2/16/1995	0–0.3	5.96 J
SD-04917	2/9/1995	18–18	0.041 U
SD-04917	2/9/1995	23–23	0.041 U
SD-04918	2/16/1995	0–0.3	0.408
SD-04919	2/9/1995	18–18	0.042 U
SD-04919	2/9/1995	23–23	0.042 U
SD-04920	6/15/1995	0–0.3	2.3
SD-04920	6/15/1995	0.3–2	0.95
SD-04922	6/15/1995	0–0.3	4.8
SD-DUW102	6/4/2001	0–0.6	1.08
SD-DUW102	6/4/2001	1–2	0.59
SD-DUW102	6/4/2001	2–3.3	0.037
SD-DUW103	6/5/2001	0–0.7	1.58
SD-DUW103	6/5/2001	1–1.7	0.61
SD-DUW103	6/5/2001	2–2.6	0.035 U
SD-DUW94	6/5/2001	4–5	5.5
SD-DUW94	6/5/2001	5–6	0.31
SD-DUW96	6/19/2001	4–5	6.4
SD-DUW96	6/19/2001	6–6.7	0.044
SD-DUW96	6/19/2001	8–8.6	0.025
SD-DUW97	6/19/2001	2–3	3.3
SD-DUW97	6/19/2001	4–5	0.035 U
SD-DUW97	6/19/2001	6–6.7	0.036 U
SD-DUW98	6/18/2001	2–3	0.036
SD-DUW98	6/18/2001	4–5	0.04 U
SD-DUW98	6/18/2001	6–7	0.039 U
SD-DUW98	6/18/2001	8–8.5	0.036 U
SD-DUW118	6/7/2001	2–2.7	0.045
SD-DUW118	6/7/2001	4–4.7	0.039 U
SD-DUW118	6/7/2001	6–6.5	0.035 U
SD-SWY02	6/13/1995	0–0.3	2.27
SD-SWY03	6/13/1995	0–0.3	23.4 J
SD-SWY04	6/13/1995	0–0.3	1.4
SD-SWY09	6/14/1995	0–0.3	2.08
SD-SWY13	6/14/1995	0–0.3	0.188
SD-UB-017	7/10/2008	1.5–3	0.046
SD-UB-017	7/10/2008	3–4.5	0.12
SD-UB-017	7/10/2008	4.5–6	0.02
SD-UB-018	7/9/2008	2–3	0.02 U
SD-UB-018	7/9/2008	3–4	0.02 U
SD-UB-018	7/9/2008	4–5	0.019 U
SS-SWY01	3/24/1995	0–0.3	0.33
SS-SWY02	3/24/1995	0–0.3	3.5
SS-SWY04	4/19/1995	0–0.3	2.1
SS-SWY05	4/19/1995	0–0.3	1.8
SS-SWY06	4/19/1995	0–0.3	1.6

Abbreviations:

ft bgs Feet below ground surface
PCB Polychlorinated biphenyl
ppm Parts per million
SW Bank Southwest Bank

Qualifiers:

D Dilution
J Estimated value
U Not detected at concentration greater than the laboratory method detection limit
Y Elevated reporting limit due to mixture overlap

Table 2e
Summary of Total PCB Concentrations—Under-building Area

Sample Location	Sample Date	Sample Depth (ft bgs)	Total PCB Concentration (ppm)
2-31-DP-50	9/9/2009	0–1	0.03 U
2-31-DP-50	9/9/2009	4–5	0.03 U
2-31-DP-50	9/9/2009	9–10	0.032 U
2-40-DP-007	7/3/2008	0–1	0.03 U
2-40-DP-007	7/3/2008	4–5	0.03 U
2-40-DP-007	7/3/2008	9–10	0.032 U
2-40-DP-008	7/3/2008	0–1	0.032 U
2-40-DP-008	7/3/2008	4–5	0.031 U
2-40-DP-008	7/3/2008	9–10	0.031 U
2-40-DP-037	5/22/2008	0–1	0.033 U
2-40-DP-037	5/22/2008	4–5	0.033 U
2-40-DP-037	5/22/2008	9–10	0.032 U
2-40-DP-040	5/15/2008	0–1	0.033 U
2-40-DP-040	5/15/2008	4–5	0.033 U
2-40-DP-040	5/15/2008	9–10	0.032 U
2-40-DP-043	5/12/2008	0–1	0.032 U
2-40-DP-043	5/12/2008	4–5	0.033 U
2-40-DP-043	5/12/2008	9–10	0.033 U
P2IM-DB-016	7/16/2010	10–10	0.032 U
P2IM-DB-018	7/16/2010	5–5	0.032 U
P2IM-DB-022	7/15/2010	12–12	0.032 U
P2IM-DB-023	7/15/2010	6–6	0.032 U
SD-04101	3/21/1995	0–0.3	1.8
SD-04102	3/21/1995	0–0.3	8
SD-04103	3/21/1995	0–0.3	1.6
SD-04104	3/21/1995	0–0.3	4.1
SD-04105	3/21/1995	0–0.3	2
SD-04109	4/17/1995	0–0.3	17.3
SD-04110	4/17/1995	0–0.3	1.3
SD-04111	4/17/1995	0–0.3	2.4
SD-04112	4/17/1995	0–0.3	1.2
SD-04113	4/17/1995	0–0.3	5.1
SD-04115	6/27/1995	0–0.3	5.3
SD-04116	6/27/1995	0–0.3	16.2
SD-04117	6/27/1995	0–0.3	3.4
SD-04121	6/14/1995	0–0.3	0.68
SD-04122	6/14/1995	0–0.3	4
SD-UB-001	6/25/2008	2–3	0.027
SD-UB-001	6/25/2008	3–4	0.02 U
SD-UB-001	6/25/2008	4–5	0.019 U
SD-UB-002	6/25/2008	2–3	0.02 UJ
SD-UB-002	6/25/2008	3–4	0.019 U
SD-UB-002	6/25/2008	4–5	0.02 U
SD-UB-003	7/9/2008	1.5–3	1.1
SD-UB-003	7/9/2008	3–4.5	4.9
SD-UB-003	7/9/2008	4.5–6	2.3 J
SD-UB-003	7/9/2008	6–7.5	0.45
SD-UB-003	7/9/2008	7.5–9	0.44
SD-UB-004	6/25/2008	2–3	0.19
SD-UB-004	6/25/2008	3–4	0.02 U
SD-UB-004	6/25/2008	4–5	0.02 U
SD-UB-005	6/25/2008	2–3	6.6
SD-UB-005	6/25/2008	3–4	0.024
SD-UB-005	6/25/2008	4–5	0.02 U
SD-UB-006	7/10/2008	1.5–3	1.47
SD-UB-006	7/10/2008	3–4.5	1.32
SD-UB-006	7/10/2008	4.5–6	0.257
SD-UB-006	7/10/2008	6–7.5	0.106
SD-UB-007	6/26/2008	2–3	0.078
SD-UB-007	6/26/2008	3–4	0.24
SD-UB-007	6/26/2008	4–5	0.166
SD-UB-008	6/26/2008	2–3	0.037
SD-UB-008	6/26/2008	3–4	0.022
SD-UB-008	6/26/2008	4–5	0.03
SD-UB-009	7/2/2008	0–1	0.171
SD-UB-009	7/2/2008	1–2	0.027
SD-UB-009	7/2/2008	2–3	0.019 U
SD-UB-009	7/2/2008	3–4	0.02 U
SD-UB-009	7/2/2008	4–5	0.019 U
SD-UB-010	7/2/2008	2–3	0.019 U
SD-UB-010	7/2/2008	3–4	0.022
SD-UB-010	7/2/2008	4–5	0.02 U
SD-UB-011	6/26/2008	2–3	0.019 U
SD-UB-011	6/26/2008	3–4	0.02 U
SD-UB-011	6/26/2008	4–5	0.02 U
SD-UB-012	7/2/2008	2–3	1.1
SD-UB-012	7/2/2008	3–4	0.02 U
SD-UB-012	7/2/2008	4–5	0.02 U
SD-UB-013	7/2/2008	2–3	0.019 U
SD-UB-013	7/2/2008	3–4	0.02 U

Table 2e
Summary of Total PCB Concentrations—Under-building Area

Sample Location	Sample Date	Sample Depth (ft bgs)	Total PCB Concentration (ppm)
SD-UB-013	7/2/2008	4–5	0.02 U
SD-UB-014	7/2/2008	2–3	0.02 U
SD-UB-014	7/2/2008	3–4	0.019 U
SD-UB-014	7/2/2008	4–5	0.02 U
SD-UB-015	7/3/2008	2–3	0.02 U
SD-UB-015	7/3/2008	3–4	0.02 U
SD-UB-015	7/3/2008	4–5	0.02 U
SD-UB-016	7/10/2008	1.5–3	3.2
SD-UB-016	7/10/2008	3–4.5	3
SD-UB-016	7/10/2008	4.5–6	1.3
SD-UB-016	7/10/2008	6–7.5	0.52
SD-UB-016	7/10/2008	7.5–9	0.12
SW-17	8/20/2002	5–6	0.071 U
SW-17	8/20/2002	11–12	0.083 U
SW-17	8/20/2002	14–15	0.081 U
SW-23	9/5/2002	4.4–4.8	0.068 U
SW-23	9/5/2002	10–11	0.072 U
SW-23	9/5/2002	13.8–14.4	0.074 U
SW-29	8/16/2002	3–4	0.067 U
SW-29	8/16/2002	8–9	0.068 U
SW-29	8/16/2002	14–15	0.084 U
SW-35	8/23/2002	3–4	0.075 U
SW-35	8/23/2002	8–9	0.073 U
SW-35	8/23/2002	14–15	0.081 U
SW-48	8/21/2002	3–4	0.071 U
SW-48	8/21/2002	11–12	0.073 U
SW-48	8/21/2002	14–15	0.083 U

Abbreviations:

ft bgs Feet below ground surface
PCB Polychlorinated biphenyl
ppm Parts per million

Qualifiers:

J Estimated value
U Not detected at concentration greater than the laboratory method detection limit
UJ Not detected at concentration greater than the laboratory method detection limit, estimated value

Table 2f
Summary of Total PCB Concentrations
Early Removal Area: Offshore of Southwest Bank

Sample Location	Sample Date	Sample Depth (ft bgs)	Total PCB Concentration (ppm)
LDW-SS109	1/25/2005	0–10[1]	110
SD-DUW153	8/21/2003	0–1	108
SD-DUW153	8/21/2003	2–4	6.2
SD-DUW153	8/21/2003	4–5	1.74
SD-DUW153	8/21/2003	5–5.8	0.052 U
SD-DUW161	8/20/2003	0–0.5	12.9
SD-DUW161	8/20/2003	2–3	0.032
SD-DUW161	8/20/2003	4–5	0.04 U
SD-DUW449	11/2/2009	2–3	1.19
SD-DUW449	11/2/2009	4–5	0.32
SD-DUW449	11/2/2009	5–6	0.27
SD-DUW449	11/2/2009	6–7	0.02 U
SD-DUW449	11/2/2009	7–8	0.019 U
SD-DUW449	11/2/2009	8–9	0.019 U
SD-DUW449	11/2/2009	9–10	0.03 J

Note:

1 Measured in centimeters not feet.

Abbreviations:

ft bgs Feet below ground surface
PCB Polychlorinated biphenyl
ppm Parts per million
TSCA Toxic Substances Control Act

Qualifiers:

J Estimated value
U Not detected at concentration greater than the laboratory method detection limit

Table 2g
Summary of Total PCB Concentrations
Early Removal Area: Outfall 12

Sample Location	Sample Date	Sample Depth (ft bgs)	Total PCB Concentration (ppm)
SD-DUW99	6/19/2001	0–0.9	51
SD-DUW99	6/19/2001	1–2.8	25

Abbreviations:

ft bgs Feet below ground surface
PCB Polychlorinated biphenyl
ppm Parts per million

Boeing Plant 2

TSCA Risk-based Disposal Application

Figures

FINAL

East Marginal Way S.

16 Ave. S.

Slip 4
Sediment Cleanup

Building 2-122

North Shoreline Area

Building 2-10

Building 2-40 Complex

South Shoreline Area

Outfall 12 Area

Federal Navigation Channel

DSOA Sediment Cleanup

2.8 2.9 3.0 3.1 3.2 3.3 3.4 3.5 3.6 3.7

EXPLANATION

- In-Water Dredge Areas
- North Shoreline Area
- South Shoreline Area: Under-Building Area (Slab/Piling Demolition and Sediment Excavation)
- South Shoreline Area Excavation
- South Shoreline Area: Southwest Bank Excavation
- Boeing Property Line
- 3.2 Duwamish River Mile

APPROXIMATE SCALE IN FEET

0 300 600

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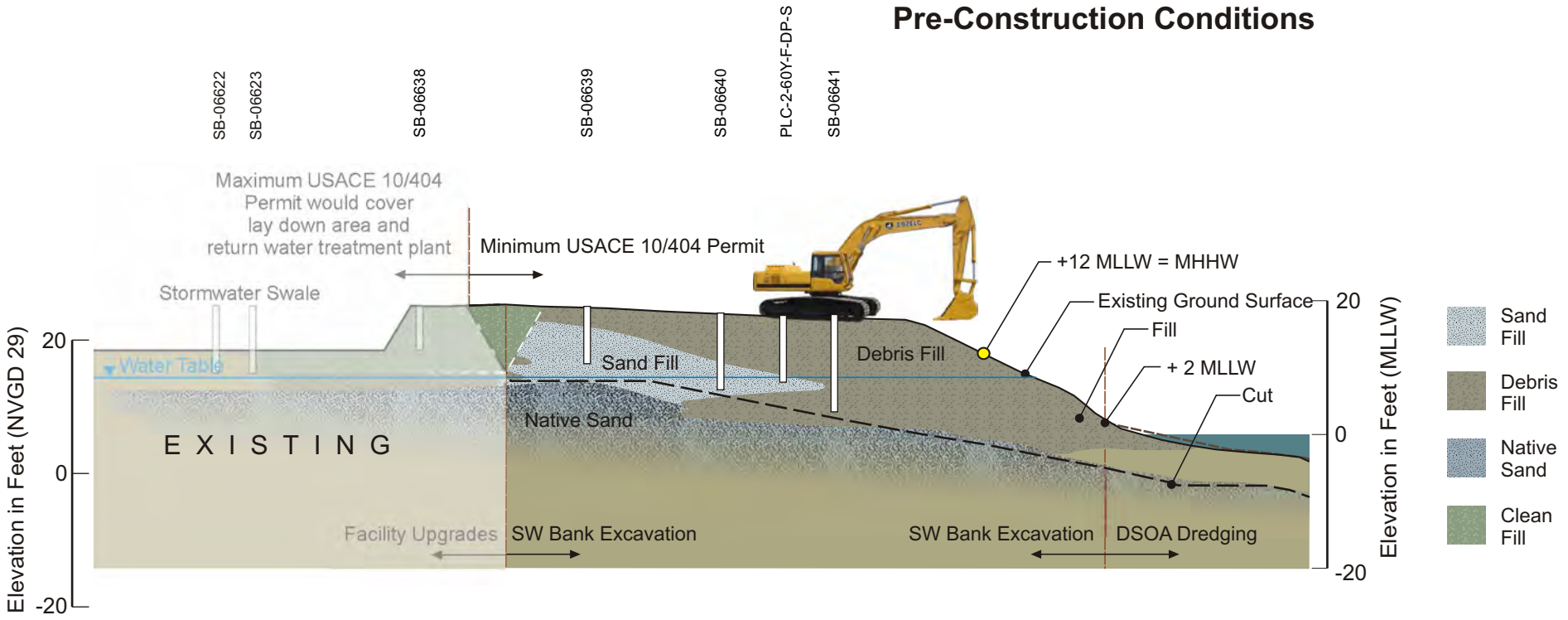
PROJECT COMPONENTS
Design Report
Duwamish Sediment Other Area and Southwest Bank Corrective Measure and Habitat Project
Boeing Plant 2
Seattle/Tukwila, Washington

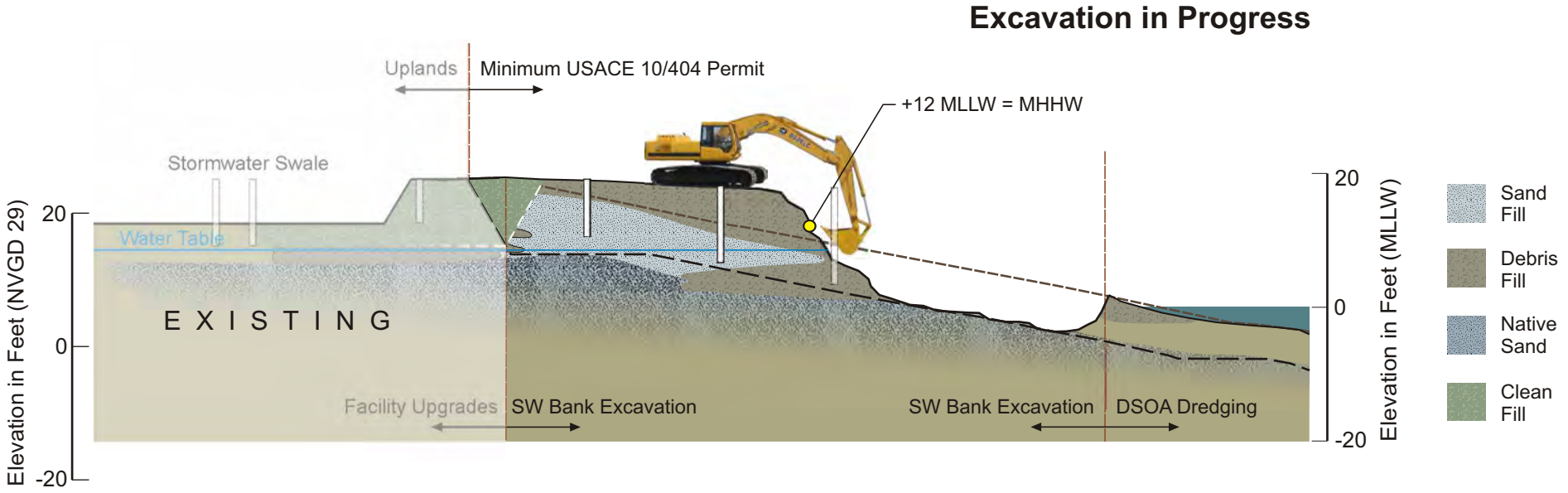
By: GSM	Date: 12-14-2011	Project No. 0131320050
		Figure 1

Plot Date: 12/14/11 - 1:56pm Plotted by: adam.stenberg
Drawing Path: S:\13132_004\DSOA Design\Design Report\ Drawing Name: Figure 2_Project Components_111811.dwg

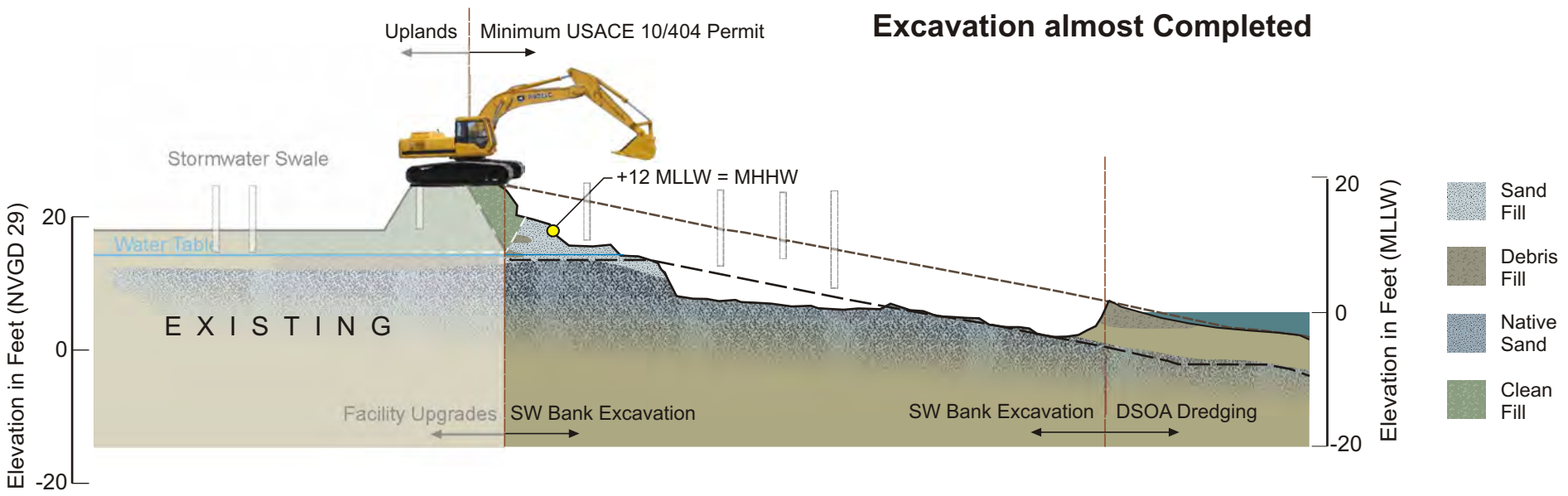
Pre-Construction Conditions



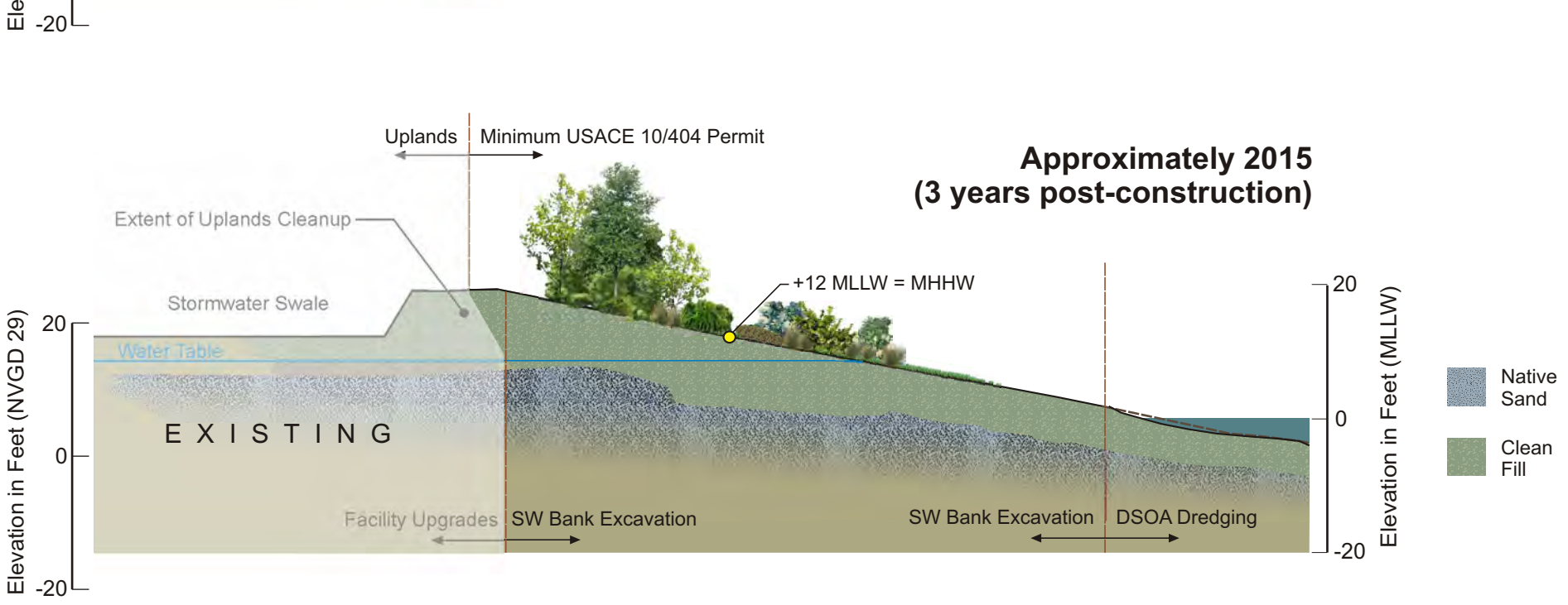
Excavation in Progress



Excavation almost Completed



Approximately 2015 (3 years post-construction)



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TSCA Risk-Based Disposal Application
Duwamish Sediment Other Area and Southwest Bank Corrective Measure and Habitat Project
Boeing Plant 2
Seattle/Tukwila, Washington

Figure **2**
Schematic of Bank Excavation

G:Project\Clients\Floyd Snider\Boeing\2011\Corel/Sections

Legend

Maximum Observed PCB Concentration mg/kg

- 0 to <1
- 1 to <10
- 10 to <25
- 25 to <50
- >=50

Areas

- Slip 4 Dredge Area
- Northern Habitat Area
- Underbuilding Area
- TSCA Areas (Early Removal)
- Southwest Bank Area
- DSOA

Notes:

- Shading in callout boxes indicates sample depth intervals that will be removed as part of the DSOA Southwest Bank Corrective Measure.
- Hybrid orthoimagery provided by USGS (2009) and David C. Smith and Associates, Inc., (2011).

Slip 4

DR180
EIT066
SG19
DR182
EST27
EIT067
PL2-609
NA-DP-01
PL2-610A
NA-DP-06
NA-DP-02
NA-DP-04
NA-DP-41
NA-DP-05
SD-DUW18
SD-DUW30
SD-DUW143
SD-DUW32
SD-DUW110
SD-DUW17
SD-DUW112
SD-DUW112D
SD-01001
SD-0100
SD-DUW139
SD-DUW108
SD-DUW137
SD-DUW87
SD-DUW107
SD-DUW84
SD-DUW01
SD-DUW140
SD-DUW142
SD-DUW111
SD-DUW29
SD-DUW02
SD-DUW31
SD-DUW86
SD-DUW85
SD-DUW425
SD-DUW426
SD-DUW423
SD-DUW424
WES240
SD-DUW56
SD-DUW427
WES241
SD-DUW55
DR215
DR214
SD-DUW442
MATCHLINE

Overview Location Map

Sample Location	Sample Date	Depth (ft bgs)	Total PCBs Conc. (mg/kg)
SD-DUW424	11/3/2009	2–3	11
	11/3/2009	4–5	6.4
	11/3/2009	6–7	1.2
	11/3/2009	8–9	2.4
	11/3/2009	9–10	0.6
	11/3/2009	10–11	0.1
	11/3/2009	11–12	0.01 U
	11/3/2009	12–13	0.02 U
	11/3/2009	13–14	0.02 U

N

0 50 100 200

Scale in Feet

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Figure 3a
PCB Distribution in Sediment/Soil in Shoreline Areas

Path: F:\projects\Boeing Plant 2 2011\06 GIS\MXD\Waste Memo 2011\Figure 3a (TSCA Risk-Based Disposal Application Frame A with CBs).mxd

Legend

Maximum Observed PCB Concentration mg/kg

- 0 to <1
- 1 to <10
- 10 to <25
- 25 to <50
- >=50

Areas

- Slip 4 Dredge Area
- Northern Habitat Area
- Underbuilding Area
- TSCA Areas (Early Removal)
- Southwest Bank Area
- DSOA

Notes:

- Shading in callout boxes indicates sample depth intervals that will be removed as part of the DSOA Southwest Bank Corrective Measure.
- Hybrid orthoimagery provided by USGS (2009) and David C. Smith and Associates, Inc., (2011).

MATCHLINE

MATCHLINE

Sample Location	Sample Date	Depth (ft bgs)	Total PCBs Conc. (mg/kg)
SD-DUW117	6/13/2001	2–3	14
	6/13/2001	4–5	1.3
	6/13/2001	5–5.6	0.04 U
	6/13/2001	6–7	0.04 U

Sample Location	Sample Date	Depth (ft bgs)	Total PCBs Conc. (mg/kg)
SD-DUW183C	4/3/2007	3–4	19
	4/3/2007	4–5	6.6
	4/3/2007	6–7	2.5
	4/3/2007	7–8	0.47 J
	4/3/2007	8–9	1.7

Overview Location Map

0 50 100 200

Scale in Feet

TSCA Risk-Based Disposal Application
Duwamish Sediment Other Area and Southwest Bank Corrective Measure and Habitat Project
Boeing Plant 2
Seattle/Tukwila, Washington

Figure 3b
PCB Distribution in Sediment/Soil in Shoreline Areas

Path: F:\projects\Boeing Plant 2 2011\06 GIS\MXD\Waste Memo 2011\Figure 3b (TSCA Risk-Based Disposal Application Frame B with CBs).mxd

Legend

Maximum Observed PCB Concentration mg/kg

- 0 to <1
- 1 to <10
- 10 to <25
- 25 to <50
- >=50

Areas

- Slip 4 Dredge Area
- Northern Habitat Area
- Underbuilding Area
- TSCA Areas (Early Removal)
- Southwest Bank Area
- DSOA
- 0–0.3 Entire Sample Interval will be Removed by Corrective Measure
- 4–7.6 A Portion of Sample Interval will be Removed by Corrective Measure

Notes:

- Shading in callout boxes indicates sample depth intervals that will be removed or partially removed as part of the DSOA Southwest Bank Corrective Measure.
- Hybrid orthoimagery provided by USGS (2009) and David C. Smith and Associates, Inc., (2011).

MATCHLINE

MATCHLINE

Sample Location	Sample Date	Depth (ft bgs)	Total PCBs Conc. (mg/kg)
SD-DUW34	10/24/1995	0–0.3	3.4
	10/24/1995	0–0.3	3.4
	3/21/1996	0–1.9	11
	3/21/1996	1.9–5.9	0.04 UJ

Sample Location	Sample Date	Depth (ft bgs)	Total PCBs Conc. (mg/kg)
SD-DUW26	10/24/1995	0–0.3	13
	3/20/1996	0–4	9.6
	3/20/1996	4–7.2	0.04 U

Sample Location	Sample Date	Depth (ft bgs)	Total PCBs Conc. (mg/kg)
SD-04109	4/17/1995	0–0.3	17

Sample Location	Sample Date	Depth (ft bgs)	Total PCBs Conc. (mg/kg)
SD-DUW28	10/24/1995	0–0.3	11
	3/19/1996	0–1.9	13
	3/19/1996	1.9–6.9	0.08 J

Sample Location	Sample Date	Depth (ft bgs)	Total PCBs Conc. (mg/kg)
SD-DUW13	10/23/1995	0–0.3	15
	3/19/1996	0–4	1.8
	3/19/1996	4–7.6	1.9

Sample Location	Sample Date	Depth (ft bgs)	Total PCBs Conc. (mg/kg)
SD-DUW13D	3/20/1996	0–4	14 J
	3/20/1996	4–9.4	1.3
	3/20/1996	9.4–12.8	0.04 UJ

Sample Location	Sample Date	Depth (ft bgs)	Total PCBs Conc. (mg/kg)
SD-04116	6/27/1995	0–0.3	16

Sample Location	Sample Date	Depth (ft bgs)	Total PCBs Conc. (mg/kg)
SD-DUW117	6/13/2001	2–3	14
	6/13/2001	4–5	1.3
	6/13/2001	5–5.6	0.04 U
	6/13/2001	6–7	0.04 U

Sample Location	Sample Date	Depth (ft bgs)	Total PCBs Conc. (mg/kg)
SD-DUW183C	4/3/2007	3–4	19
	4/3/2007	4–5	6.6
	4/3/2007	6–7	2.5
	4/3/2007	7–8	0.47 J
	4/3/2007	8–9	1.7

Sample Location	Sample Date	Depth (ft bgs)	Total PCBs Conc. (mg/kg)
SD-DUW124	6/7/2001	2–2.5	30
	6/7/2001	4–5	1.1
	6/7/2001	5–6	0.11
	6/7/2001	6–7	0.02

Sample Location	Sample Date	Depth (ft bgs)	Total PCBs Conc. (mg/kg)
SD-DUW126	6/13/2001	2–3	12
	6/13/2001	3–3.8	1.3
	6/13/2001	4–4.8	0.03
	6/13/2001	6–9	0.04 U

Sample Location	Sample Date	Depth (ft bgs)	Total PCBs Conc. (mg/kg)
SD-DUW186C	4/3/2007	3–4	1.7
	4/3/2007	4–5	10 J
	4/3/2007	5–6	14
	4/3/2007	6–7	7 J
	4/3/2007	7–8	0.31
	4/3/2007	8–9	0.13 J

Overview Location Map

0 50 100 200

Scale in Feet

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Duwamish Sediment Other Area and Southwest Bank
Corrective Measure and Habitat Project
Boeing Plant 2
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Figure 3c
PCB Distribution in Sediment/Soil
in Shoreline Areas

Path: F:\projects\Boeing Plant 2 2011\06 GIS\MXD\Waste Memo 2011\Figure 3c (TSCA Risk-Based Disposal Application Frame C with CBs).mxd

Sample Location	Sample Date	Depth (ft bgs)	Total PCBs Conc. (mg/kg)
SD-DUW99	6/19/2001	0–0.9	51
	6/19/2001	1–2.8	25

Sample Location	Sample Date	Depth (ft bgs)	Total PCBs Conc. (mg/kg)
SD-04904	2/17/1995	0–0.3	10
	2/17/1995	0.3–1.5	8
	2/17/1995	1.5–3	10 J
	2/17/1995	1.5–3	18 J

Sample Location	Sample Date	Depth (ft bgs)	Total PCBs Conc. (mg/kg)
SD-DUW447	11/13/2009	2–3	7.5
	11/13/2009	4–5	9.8
	11/13/2009	5–6	14
	12/15/2009	6–7	0.18

Sample Location	Sample Date	Depth (ft bgs)	Total PCBs Conc. (mg/kg)
SD-SWY03	6/13/1995	0–0.3	23 J

Sample Location	Sample Date	Depth (ft bgs)	Total PCBs Conc. (mg/kg)
SD-DUW134	6/13/2001	2–3	29 J
	6/13/2001	3–4	9.1
	6/13/2001	4–5	0.41 JM
	6/13/2001	6–7	0.04 U

Sample Location	Sample Date	Depth (ft bgs)	Total PCBs Conc. (mg/kg)
SD-DUW153	8/21/2003	0–1	108
	8/21/2003	2–4	6.2
	8/21/2003	4–5	1.7
	8/21/2003	5–5.8	0.05 U

Sample Location	Sample Date	Depth (ft bgs)	Total PCBs Conc. (mg/kg)
SD-DUW51	10/23/1995	0–0.3	12
	3/21/1996	0–2.6	3.5
	3/21/1996	2.6–6.6	0.04 U

Sample Location	Sample Date	Depth (ft bgs)	Total PCBs Conc. (mg/kg)
SD-DUW52	10/23/1995	0–0.3	2.1
	3/21/1996	0–4	18
	3/21/1996	4–8	0.5
	3/21/1996	8–11.3	1.0
	3/21/1996	11.3–14.5	0.04 UJ

Sample Location	Sample Date	Depth (ft bgs)	Total PCBs Conc. (mg/kg)
SD-DUW133	6/8/2001	2–2.7	16
	6/8/2001	4–4.9	0.31
	6/8/2001	5–5.7	0.11

Sample Location	Sample Date	Depth (ft bgs)	Total PCBs Conc. (mg/kg)
SD-DUW448	11/2/2009	2–3	1.2
	11/2/2009	4–5	11 J
	11/2/2009	5–6	0.4 J
	11/2/2009	6–7	0.03
	11/2/2009	7–8	0.14 J
	11/2/2009	8–9	0.02 J
	11/2/2009	9–10	0.02

Sample Location	Sample Date	Depth (ft bgs)	Total PCBs Conc. (mg/kg)
SD-DUW451	11/3/2009	2–3	1.3
	11/3/2009	4–5	13
	11/3/2009	6–7	1.1
	11/3/2009	8–9	0.3
	11/3/2009	10–11	1.1
	11/3/2009	11–12	0.02 U
	11/3/2009	12–13	0.02 U
	11/3/2009	13–14	0.02 U
	11/3/2009	14–15	0.02 U
	11/3/2009	15–16	0.02 U

Sample Location	Sample Date	Depth (ft bgs)	Total PCBs Conc. (mg/kg)
SD-344	8/26/2004	0–0.3	11

Sample Location	Sample Date	Depth (ft bgs)	Total PCBs Conc. (mg/kg)
SD-DUW162	8/21/2003	0–0.8	1.6
	8/21/2003	2–3	14
	8/21/2003	4–4.6	0.7

Sample Location	Sample Date	Depth (ft bgs)	Total PCBs Conc. (mg/kg)
SD-DUW161	8/20/2003	0–0.5	13
	8/20/2003	2–3	0.03
	8/20/2003	4–5	0.04 U

Sample Location	Sample Date	Depth (ft bgs)	Total PCBs Conc. (mg/kg)
LDW-SS109	1/25/2005	0–0.3	110

Legend

Maximum Observed PCB Concentration mg/kg

- 0 to <1
- 1 to <10
- 10 to <25
- 25 to <50
- >=50

Areas

- Slip 4 Dredge Area
- Northern Habitat Area
- Underbuilding Area
- TSCA Areas (Early Removal)
- Southwest Bank Area
- DSOA
- 2-66 Sheetpile (AMEC, April 2011)

Notes:

- Shading in callout boxes indicates sample depth intervals that will be removed as part of the DSOA Southwest Bank Corrective Measure.
- Hybrid orthoimagery provided by USGS (2009) and David C. Smith and Associates, Inc., (2011).

Overview Location Map

0 25 50 100

Scale in Feet

TSCA Risk-Based Disposal Application
Duwamish Sediment Other Area and Southwest Bank
Corrective Measure and Habitat Project
Boeing Plant 2
Seattle/Tukwila, Washington

Figure 3d
PCB Distribution in Sediment/Soil
in Shoreline Areas

Path: F:\projects\Boeing Plant 2 2011\06 GIS\MXD\Waste Memo 2011\Figure 3d (TSCA Risk-Based Disposal Application Frame D with CBs).mxd

Building 2-49

A

Outfall 12

Building Face

SD-DUW 96

1		
2		
3		
4		
5	4.0-5.0	6.4
6		na
7	6.0-6.7	0.044
8		na
9	8.0-8.6	0.025

SD-DUW103

1	0.0-0.7	1.58
2	1.0-1.7	0.61
3	2.0-2.6	0.035U
4		na
5		na
6		na

SD-DUW103

SD-DUW99

1	0.0-0.9	51
2	1.0-2.8	25

SD-DUW99

SD-DUW94

1		
2		
3		
4		
5	4.0-5.0	5.5
6	5.0-6.0	0.31

SD-DUW96

SD-04406
(1.1 ppm)

SD-DUW102

SD-DUW102

1	0.0-0.6	1.08
2	1.0-2.0	0.59
3	2.0-3.3	0.037
4		na
5		na
6		na
9		

SD-DUW98

SD-DUW98

1		na
2		na
3	2.0-3.0	0.036
4		na
5	4.0-5.0	0.04U
6		na
7	6.0-7.0	0.039U
8		na
9	8.0-8.5	0.036U

SD-DUW97

SD-DUW97

1		
2		
3	2.0-3.0	3.3
4		na
5	4.0-5.0	0.035U
6		na
7	6.0-6.7	0.036U

SD-04402
(0.19 ppm)

APPROXIMATE SCALE IN FEET

0 2.5 5 10

Elevations in Feet MLLW

A'

B8a
(5.9J ppm)

SD-DUW xx

1	0.0-0.9	51
2	1.0-2.8	25
3		
4		
5	4.0-5.0	6.4
6		na
7	6.0-6.7	0.044
8		na
9	8.0-8.6	0.025

Sample Interval | Total PCBs as ppm dwt

>50 ppm dwt
>25 and <50 ppm dwt
>0.13 and < 25 ppm dwt
<0.13 ppm dwt

Outfall 12 Cores

Surface Sample
(Total PCB in ppm dwt)

SD-04406
(1.1 ppm)

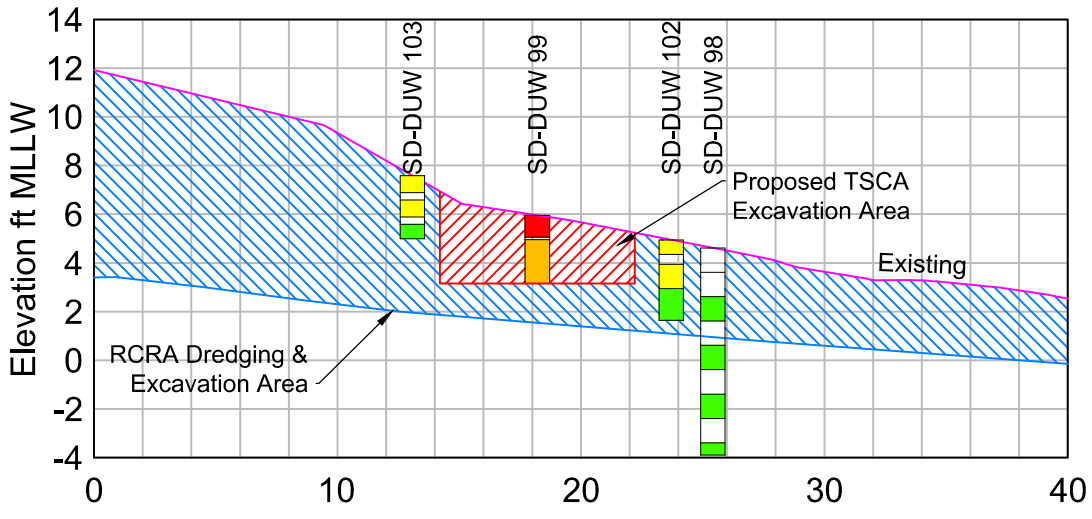
Approximate Footprint of Historical Outfall 12 Interim Measure

Approximate Footprint of Proposed Excavation

Location of Cross Section A-A'

Notes:
dwt = Dry Weight
J = Estimated Value
MLLW = Mean Lower Low Water
PCBs = Polychlorinated Biphenyls
ppm = Parts per Million
U = Undetected at Reporting Limit

Section A-A'



>50 ppm Dry Weight
>25 and <50 ppm Dry Weight
>0.13 and <25 ppm Dry Weight
<0.13 ppm Dry Weight

Volume to be removed as part of Early Removal Action

Volume to be removed as South Shoreline and DSOA Corrective Measure

PCB CONCENTRATIONS IN THE OUTFALL 12 EARLY REMOVAL AREA
TSCA Risk-Based Disposal Application
Duwamish Sediment Other Area and Southwest Bank Corrective Measure and Habitat Project

By: GSM	Date: 6/26/2012	Project No: 0131320070

Figure 4

Plot Date: 06/26/12 - 1:18pm, Plotted by: gary.maxwell
Drawing Path: P:\BOEING\DESIGN\CAD\Upland Shoreline Coordination\TSCA figures\, Drawing Name: Figure 3 PCBs in Outfall 12 Early Removal Area.dwg

0 25 50 Feet

N

SD-DUW132

1		
2		na
3	2.0-3.0	1.18
4	3.0-4.0	0.67
5	4.0-5.0	0.548
6		na
7	6.0-7.0	0.035U
8		na
9	8.0-9.0	0.037U
10		na

SD-DUW447

1		
2		
3	2.0-3.0	7.5
4		na
5	4.0-5.0	9.8
6	5.0-6.0	14.4
7	6.0-7.0	0.178

SD-DUW488

1		
2		
3	2.0-3.0	4.3
4		na
5	4.0-5.0	10.7
6	5.0-6.0	1.44

SD-DUW448

1		
2		
3	2.0-3.0	1.22
4		na
5	4.0-5.0	11.3
6	5.0-6.0	0.39
7	6.0-7.0	0.027
8	7.0-8.0	0.137
9	8.0-9.0	0.018
10	9.0-10.0	0.022

SD-DUW134

1		
2		na
3	2.0-3.0	29.4
4	3.0-4.0	9.1
5	4.0-5.0	0.409
6		na
7	6.0-7.0	0.035U

SD-DUW153

1	0.0-1.0	108
2		na
3	2.0-4.0	6.2
4		
5	4.0-5.0	1.74
6	5.0-5.8	0.052U
7		na
8		na

SD-DUW135

1		
2		na
3	2.0-3.0	0.56
4		na
5	4.0-5.0	1.72
6	5.0-5.8	0.158
7	6.0-6.8	0.125
8		na
9		na
10		na
11		na

SD-DUW154

1	0.0-1.0	0.97
2		na
3	2.0-4.0	1.39
4		
5	4.0-6.0	1.01
6		
7	6.0-7.0	0.3U
8	7.0-7.8	0.038U

SD-DUW155

1	0.0-1.0	2.49
2		na
3	2.0-3.7	3.1
4		
5	4.0-5.0	2.76
6		na
7	6.0-7.0	0.18U
8	7.0-7.9	0.038U

SD-DUW156

1	0.0-0.8	0.83
2		na
3	2.0-3.1	0.373
4		na
5	4.0-4.8	1.23
6	5.0-5.8	0.28
7		na
8		na

SD-DUW158

1	0.0-1.0	5
2		na
3	2.0-2.9	0.177
4		na
5	4.0-4.9	0.035U
6		na
7		na
8		na

SD-DUW157

1	0.0-1.0	30
2		na
3	2.0-3.0	0.13U
4	3.0-4.0	0.51U
5	4.0-6.0	0.039U
6		
7		na
8		na

SD-DUW157D

1	0.0-1.0	37
2		na
3	2.0-3.1	0.489
4	3.0-4.0	0.33U
5	4.0-6.0	0.038U
6		
7		na
8		na

SD-DUW160

1	0.0-0.9	3.1
2		na
3	2.0-3.0	0.39
4		na
5	4.0-4.6	0.039U
6		na
7		na

SD-DUW161

1	0.0-0.5	12.9
2		na
3	2.0-3.0	0.052
4		na
5	4.0-5.0	0.04U

SD-DUW163

1	0.0-0.7	1.08
2		na
3	2.0-2.6	0.04U
4		na
5	4.0-5.1	0.038U

SD-DUW199C

1		
2		
3		
4	3.0-4.0	4.24
5	4.0-5.0	0.36
6		na
7	6.0-7.0	0.46
8	7.0-8.0	0.29
9	8.0-9.0	0.083

SD-DUW439

1		
2		
3		na
4		na
5	4.0-5.0	1.15
6		na
7	6.0-7.0	0.78
8	7.0-8.0	0.36
9	8.0-9.0	0.64
10	9.0-10.0	1.2
11	10.0-11.0	0.1
12	11.0-12.0	0.019U
13	12.0-13.0	0.019U
14	13.0-14.0	0.019U

SD-DUW487

1		
2		
3		na
4		na
5	4.0-5.0	1.49
6		na
7	6.0-7.0	0.46
8	7.0-8.0	0.44
9	8.0-9.0	0.55
10	9.0-10.0	0.036
11	10.0-11.0	0.76
12	11.0-12.0	0.019U
13	12.0-13.0	0.26
14	13.0-14.0	0.051

SD-DUW133

1		
2		na
3	2.0-2.7	16.2
4		
5	4.0-4.9	0.31
6	5.0-5.7	0.105
7		na

SD-DUW202C/SD-DUW408

1		
2		
3		
4	3.0-4.0	1.9
5	4.0-5.0	3.77
6		na
7	6.0-7.0	0.317
8	7.0-8.0	0.46
9	8.0-9.0	0.17
10		na
11		na
12		na
13		na
14		na

SD-DUW440

1		
2		
3		na
4		na
5		na
6	5.0-6.0	na
7	6.0-7.0	2.7
8	7.0-8.0	1.9
9	8.0-9.0	0.02U
10	9.0-10.0	0.019U
11	10.0-11.0	0.03U
12	11.0-12.0	0.019U
13		na
14		na

SD-DUW449

1		
2		
3	2.0-3.0	1.19
4		na
5	4.0-5.0	0.32
6	5.0-6.0	0.27
7	6.0-7.0	0.02U
8	7.0-8.0	0.019U
9	8.0-9.0	0.019U
10	9.0-10.0	0.03

SD-201

1	0.0-1.0	0.338
2	1.0-2.0	2.5
3	2.0-3.0	3.44
4	3.0-4.0	0.319
5	4.0-5.0	0.217
6	5.0-5.7	8.05
7		na
8		na
9		na

SD-301

1	0.0-1.0	0.539
2	1.0-2.0	1.34
3	2.0-2.8	0.024
4		na
5		na
6		na

SD-DUW450

1		
2		
3	2.0-3.0	0.42
4		na
5	4.0-5.0	4.9
6		na
7	6.0-7.0	0.48
8	7.0-8.0	0.26
9	8.0-9.0	0.02

SD-DUW451

1		
2		
3	2.0-3.0	1.27
4		na
5	4.0-5.0	13
6		na
7	6.0-7.0	1.08
8		na
9	8.0-9.0	0.341
10		na
11	10.0-11.0	1.13
12	11.0-12.0	0.02U
13	12.0-13.0	0.19U
14	13.0-14.0	0.02U
15	14.0-15.0	0.19U
16	15.0-16.0	0.19U

SD-DUW159

1	0.0-1.0	2.29
2		na
3	2.0-2.8	0.38
4		na
5	4.0-5.0	0.038U
6		na

SD-203

1	0.0-1.0	7.1
2	1.0-2.0	6.5
3	2.0-2.9	0.038
4		na
5		na
6		na
7		na
8		na

SD-DUW162

1	0.0-0.8	1.58
2		na
3	2.0-3.0	13.5
4		na
5	4.0-4.6	0.66

(2.1 ppm) (1.8 ppm) (2.3 ppm) (2.1 ppm) (1.6 ppm) (1.45 ppm) (23 J ppm) (5.2 ppm) (1.4 ppm) (1.67 ppm) (3.5 ppm) (0.33 ppm) (34 ppm) (1.11 ppm) (6.7 ppm) (0.23 ppm) (3.3 ppm) (2.7 ppm) (1.4 ppm) (2.6 ppm) (1.4 ppm) (0.19 ppm) (1.7 J ppm) (12.9 ppm) (110 ppm) (2.5 ppm) (11 ppm) (0.75 ppm) (2.8 ppm) (0.67 ppm) (0.46 ppm) (0.94 ppm) (0.09 J ppm) (0.8 ppm) (0.075 ppm) (0.68 J ppm) (0.139 J ppm) (0.7 ppm) (0.57 ppm) (0.28 ppm) (0.61 J ppm) (0.146 J p (0.3 ppm) (2 J ppm) (0.24 ppm) (0.39 J ppm) (0.17 ppm) (0.177 ppm) (0.57 J ppm) (0.13 ppm)

1 ppm 5 ppm 10 ppm 25 ppm 50 ppm 0.5 ppm

LDW-SS109

Notes:
Geospatial interpolation performed using total PCBs on a dry weight basis using inverse distance weighting of log N transformed data (0-1 foot or less). A power of 4 was used in the interpolation using a 200 by 75 feet search ellipse oriented parallel to the river channel. A minimum of 2 neighbors and a maximum of 8 neighbors were used in the interpolation.

WES234 (0.1J ppm) Surface Grab Sample Location (includes RFI samples)

SD-DUW154 Core Location with Surface Sample (0 to1 ft or less)

SD-DUW133 Core Location w/o Surface Sample

Surface Sample Locations

- <0.13 ppm dwt
- >0.13 and <25 ppm dwt
- >25 and < 50 ppm dwt
- >50 ppm dwt

Cores (Post RFI)

SD-DUW xx

1	0.0-0.9	51
2	1.0-2.8	25
3		
4		
5	4.0-5.0	6.4
6		na
7	6.0-6.7	0.044
8		na
9	8.0-8.6	0.025

sample interval — ppm dwt

>50 ppm dwt
>25 and <50 ppm dwt
>0.13 and <25 ppm dwt
<0.13 ppm dwt

Geospatial Interpolation

- >50 ppm dwt
- >25 and <50 ppm dwt
- >0.13 and <25 ppm dwt
- <0.13 ppm dwt

Proposed Excavation

Notes:
dwt = dry weight
J = Estimated
ppm = Parts per Million
RFI = Remedial Feasibility Investigation
U = Undetected at reporting limit

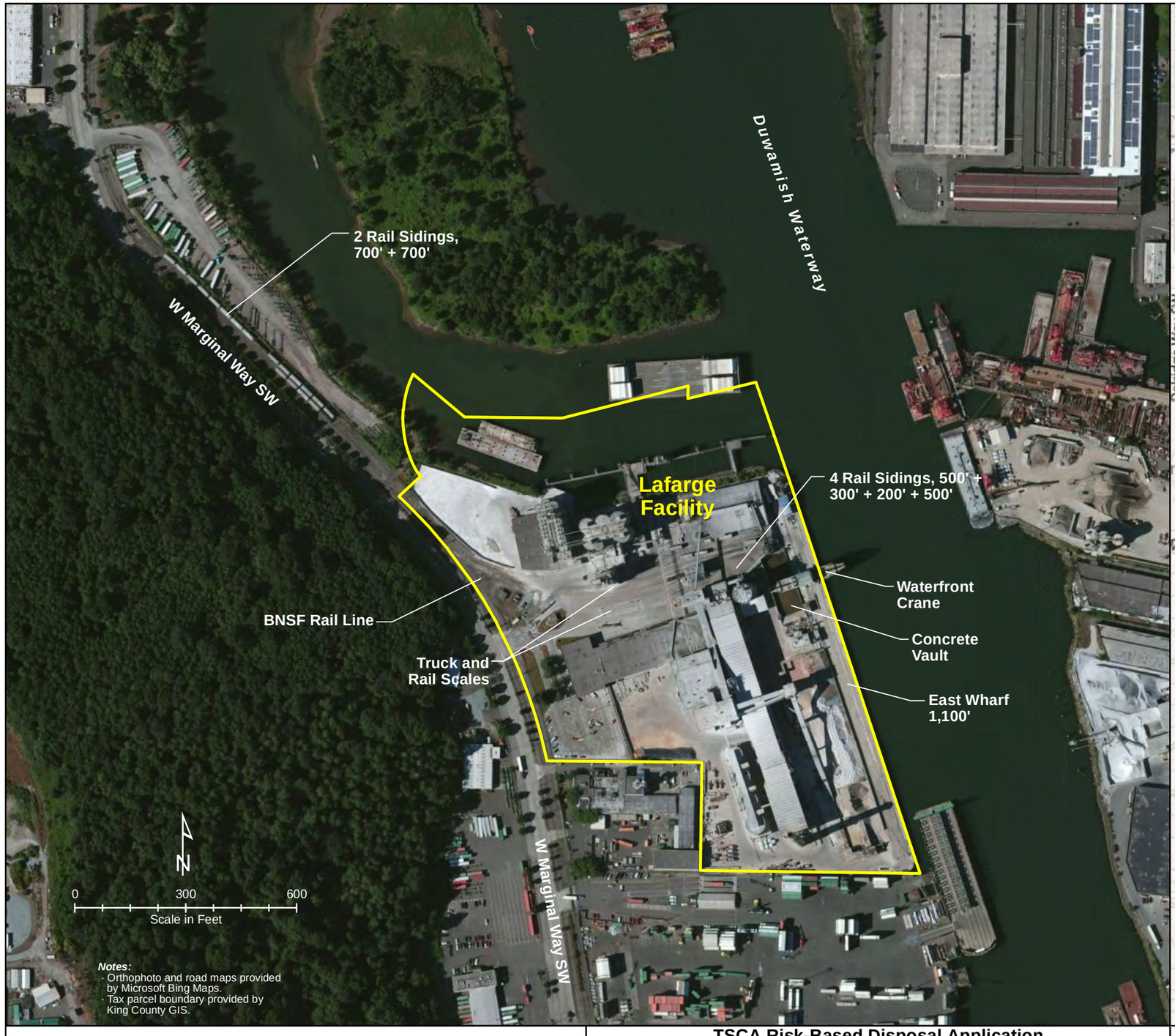
BOEING

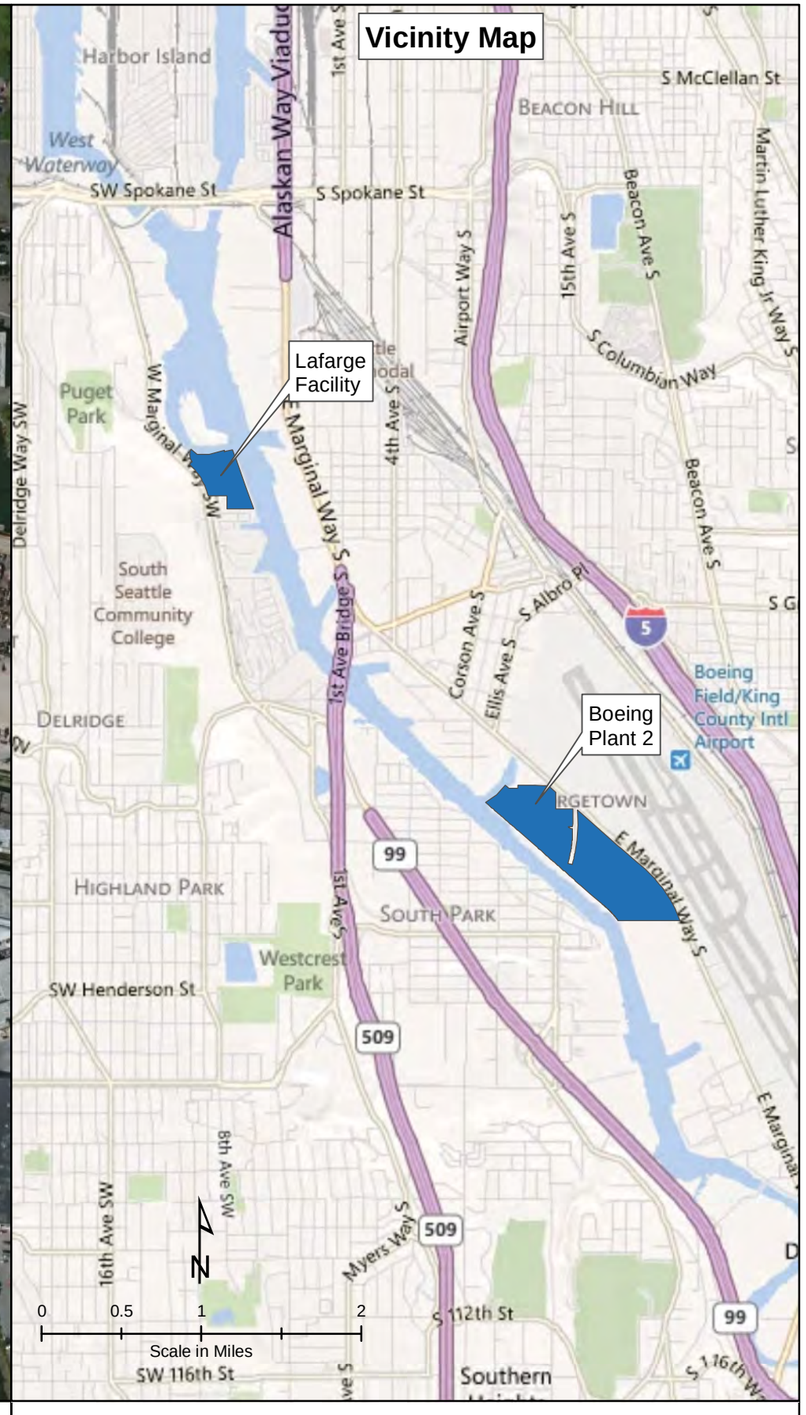
PCB CONCENTRATIONS IN THE EARLY REMOVAL AREAS OFFSHORE OF THE SW BANK

TSCA Risk-Based Disposal Application
Duwamish Sediment Other Area and Southwest Bank Corrective Measure and Habitat Project

By: RHG	Date: 6/26/2012	Project No. 0131320070
		Figure 5

File path: P:\BOEING\DES\GIS\DATA\Waste desination\Revised Figure 4 Geospatial and proposed excavations PCBs.mxd





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TSCA Risk-Based Disposal Application
Duwamish Sediment Other Area and Southwest Bank Corrective Measure and Habitat Project
Boeing Plant 2
Seattle/Tukwila, Washington

Figure 6
Lafarge Facility Map and Detail

F:\projects\Boeing Plant 2 2011\06 GIS\MXD\Waste Memo 2011\Figure 6 (LaFarge Facility Map and Detail).mxd
9/18/2012