# Final Remedial Investigation Report
## BCA Everett Plant
## Everett, Washington

## Volume 1A Report

Submitted to:
## The Boeing Company

November 4, 2011

URS

Landau Associates

Job No. 33762736

# FINAL REMEDIAL INVESTIGATION REPORT

## VOLUME 1A REPORT

Sections 1.0 to 16.0

BCA EVERETT PLANT
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# 1.0 INTRODUCTION

Presented in this report are the results of the Remedial Investigation (RI) of selected areas within the Boeing Commercial Airplanes plant (Everett Plant or the plant) located in Everett, Snohomish County, Washington. The Everett Plant is situated in the south half of Section 10 and the north half of Section 15, Township 28N, Range 4E, Willamette Meridian, as shown on Figure 1-1. The plant consists of the North Complex located north of Highway 526, and the South Complex and BOMARC Business Park located south of Highway 526 (Figure 1-2). The objective of this RI report is to document the scope, pertinent field observations and measurements, and laboratory analysis and testing results for the RI of selected Solid Waste Management Units/Areas of Concerns (SWMUs/AOCs) at the Everett Plant pursuant to the Agreed Order No. DE 96HS-N274 between The Boeing Company ("Boeing") and the State of Washington Department of Ecology ("Ecology"), effective date February 12, 1997 as amended on October 22, 1998, July 26, 2004, July 12, 2006, January 24, 2008 and December, 2010 (in progress). The RI is also intended to satisfy, in part, the corrective action requirements of the Washington Dangerous Waste Regulations (WAC 173-303-646). This report presents results of the RI for 16 of 18 SWMUs/AOCs listed in Attachment 5 of the Agreed Order. In addition, investigation of 10 of the 11 SWMUs/AOCs listed in Attachment 6, five SWMUs/AOCs listed in Attachment 7 of the Agreed Order, and SWMUs/AOCs not included in the order are also addressed in this report. In 2004, the Agreed Order was amended to include investigation of a new SWMU/AOC, trichloroethene (TCE) in Esperance Sand aquifer groundwater and Powder Mill Creek (SWMU/AOC No. 180). Revision 4.0 of this draft RI report presents the results of the RI including the data collected from 2003 through June 2010 for the TCE investigation in Powder Mill Gulch. As specified in the Agreed Order, the RI addressed SWMUs/AOCs where Ecology has determined that investigation was needed. The SWMUs/AOCs investigated and discussed in this report are summarized in Table 1-1.

The results of the RI for two of the 18 Attachment 5 SWMUs/AOCs, Powder Mill Gulch Pond (SWMU/AOC No. 135) and Japanese Gulch ponds and creek and Boeing Lake (SWMU/AOC No. 103) were previously presented in a separate RI report originally issued in October 2001, revised in 2006, and is anticipated to be revised again in 2011. In the 2004 Agreed Order revision, an additional SWMU/AOC No. 181 (polychlorinated biphenyls [PCBs] in joint compound on the Flightline, within the storm water system, and Powder Mill Creek and associated wetlands, sediments, and surface water) was specified. This SWMU/AOC was investigated and the results were incorporated into the 2006 revision of the October 2001 report. The results associated with these SWMUs/AOCs will not be discussed further in this RI report.

This RI was conducted in general accordance with the requirements specified in: (1) the Agreed Order as modified, (2) the applicable sections of the Washington Model Toxics Control Act (MTCA), Washington Administrative Code (WAC) 173-340-350, (3) the Remedial Investigation Work Plan (RIWP) for the 18 Attachment 5 and four Attachment 7 SWMUs/AOCs, (4) the Interim Action Work Plan (IAWP) for 10 Attachment 6 SWMUs/AOCs and one Attachment 7 SWMU/AOC (No. 090), and multiple subsequent Supplemental RIWPs and IAWPs for individual SWMUs/AOCs. A total of 39 SWMUs/AOCs were investigated for the soil and groundwater RI and associated interim actions, and UST assessments. Groundwater monitoring only was performed at five SWMUs/AOCs. The RIWP and IAWP were prepared by Dames & Moore (1997a, b) for Boeing and were approved by Ecology as revised to address Ecology’s comments. Additional (supplemental) remedial investigation was conducted based on the results obtained from implementing the RIWP and IAWP presented in the *Draft Remedial Investigation Report* for the

Everett Plant dated August 20, 1999 (Dames & Moore, 1999). The data collected from the supplemental investigations were incorporated in Revision 2.1 of the *Draft Remedial Investigation Report* (URS, 2002c).

Additional field investigation of SWMU/AOC No. 180 and downgradient within Powder Mill Gulch was conducted following the submittal of Revision 2.1 of the draft RI report to Ecology, primarily associated with continued investigation of TCE in Esperance Sand groundwater and Powder Mill Creek. The scope of the investigations conducted was described in numerous work plans approved by Ecology (URS 2003a, 2004a, b, c, d, e, f, 2005 and Landau, 2005, 2006a,b, 2007a,b,c, 2008a and 2009a,b,c). Deviations from the work plans were either approved in advance by Ecology, reported in bimonthly status reports to Ecology, or are documented herein as appropriate.

Additional field investigations or interim actions were performed at SWMU/AOCs No. 100 (including BOMARC Building 45-70 [No. 11] as well as activities at Former Gun Club Areas A, B, and C), 135, 180, 165, and Building 40-02 (Nos. 003, 005, 149, 169, 170). The scope of the investigations conducted was described in numerous work plans approved by Ecology (URS, 2006, 2007, 2008a, b, and 2009a,b,c). Deviations from the work plans were either approved in advance by Ecology, or were reported as they occurred during the work, approved by Ecology, and then documented in completion or status reports submitted to Ecology. Data were also generated and reported to Ecology under the Agreed Order as a result of construction support activities at Building 40-22 and a gasoline release at UST EV-48-1. The results of the additional field investigations and interim actions are integrated into this Revision 4.0 of the RI, along with changes based on Ecology's comments on Revision 3.0 (URS, 2006).

The results of the Supplemental RI were integrated with the results of the original RI (Dames & Moore, 1999) and the appropriate text sections, tables and figures were revised and incorporated in the 2001 revised Draft RI Report (Revision 1.0, URS 2001c). Response to Ecology's comments on the 2001 Draft RI, the results of the 2002 Supplemental RI of the Building 40-56 area, and Ecology's comments on Revision 2.0 of the Draft RI (URS, 2002b) were incorporated in Revision 2.1 of the Draft RI. In Revision 3.0 (URS, 2006) of the draft RI Report new sections 21.0 and 22.0 were added. Section 21.0 described the results of the investigation of TCE and other volatile organic compounds (VOCs) in Esperance Sand groundwater and surface water in Powder Mill Creek. Section 22.0 presented the results of a soil investigation in the area of a former pistol range in Powder Mill Gulch. In this Revision 4.0 of the RI Report, new Section 23.0 presents the results of soil sampling and analysis associated with the removal of the Building 45-52 Fuel Farm USTs EV-26 through EV-29 (SWMU NO. 165) and associated upgrades of the fueling system. Section 21.0 was revised to include the completed Powder Mill Gulch trichloroethylene (TCE) contaminated groundwater investigation on Boeing property and off Boeing property. In addition, sections of the RI report that include groundwater monitoring data are updated through the April 2010 quarterly groundwater sampling event.

During the implementation of the Supplemental RI, Dames & Moore was acquired by URS Corporation (URS). Consequently, URS is used when describing investigations conducted after the formal name change and the figures and tables in the body of the RI Report have been revised to reflect the change. In addition, Landau Associates (Landau) assumed responsibility for completing the investigation of SWMU/AOC No. 180 in August 2005. Therefore, Section 21.0 incorporates the results of Landau's RI of this SWMU/AOC with the prior data obtained by URS. Additional boring logs, chain-of-custody forms, laboratory analytical reports, and data validation reports from the Supplemental RI are provided in Supplemental Appendices to the revised Draft RI Report.

The RI was of adequate technical quality and detail to determine which SWMUs/AOCs warrant a Feasibility Study (FS), and to support the evaluation of remedial alternatives in the FS which will be conducted subsequent to completion and approval of the RI by Ecology. The FS will also address specific SWMUs/AOCs where Interim Actions and/or groundwater monitoring were conducted under the Agreed Order, but which did not warrant additional remedial investigation (Building 40-56 Former Solvent Recycling Unit No. 067 and EV-153 Former Silkscreen UST No. 068 and Sump No. 071; Building 45-52 Fuel Farm No. 165; and former underground storage tanks (USTs) EV-12 No. 087 and EV-13 No. 107). In addition, Ecology requested that several additional SWMUs/AOCs also be addressed in the FS (Ecology letter to Boeing dated March 17, 1997 and subsequent correspondence). These were listed in Attachments 7 and /or 7A of the Agreed Order, or were identified as having a release after initiation of the RI. These SWMUs/AOCs include: South Fire Pit, No. 068; former UST EV-15, No. 083; Building 40-53 former Mock-up Vapor Degreaser, No. 098; former Building 40-31 Bluestreak Area Vapor Degreaser No.171, and petroleum hydrocarbons releases at UST EV-48-1 and Building 40-32. The SWMUs/AOCs that did not require additional investigation are discussed in Sections 2.6 (Building 40-31 Blue Streak Area Vapor Degreaser), 5.3 (UST EV-48-1), 16.2 (Building 40-56 Former Solvent Recycling Unit and EV-153 Former Silkscreen UST and Sump), 23.0 (Building 45-52 Fuel Farm), and 25.0 (Building 40-53 Former Mock-up Vapor Degreaser; former diesel fuel UST EV-15; former South Fire Pit; former UST EV-12 and oil/water separator EV-13, and Building 40-32).

## 1.1 LOCATION OF SWMUS/AOCS

The general locations of the Attachment 5, Attachment 6, and Attachment 7 SWMUs/AOCs investigated and/or with ongoing interim actions within the Everett plant are shown on Figure 1-2. For the purpose of this report, the SWMUs/AOCs investigated (except Boeing Lake, PCBs and constituents other than VOCs in Powder Mill Gulch, and Japanese Gulch) are grouped into 21 areas based on their locations within the plant as outlined by report section number in Table 1-1. Many of these areas are identified by the Boeing building number for the building that the SWMUs/AOCs are located in or adjacent to. Some of these buildings are free-standing structures, while others are sections of the final assembly building (Figure 1-2). Buildings located in the North Complex are identified by a building number starting with 40 (e.g., Building 40-56), whereas buildings on the South Complex have a number starting with 45 (e.g., Building 45-01). Fourteen of the 21 areas are located in the North Complex, five are located on the South Complex, one (BOMARC) is located adjacent to the South Complex, and one (Esperance Sand) underlies both complexes.

## 1.2 HYDROGEOLOGIC SETTING

### 1.2.1 Regional Groundwater Occurrence and Flow

Localized groundwater within the region has been identified within fill overlying dense glacial till (Vashon till) and within lenses of coarse-grained deposits within the Vashon till. The uppermost regional aquifer occurs within the Esperance Sand. Groundwater occurs in this aquifer at a depth of approximately 200 feet below ground surface (bgs) in the vicinity of the Everett Plant. Within Powder Mill Gulch, uppermost groundwater occurs at the ground surface at gaining reaches of the creek and as deep as 40 feet bgs in the headwater portion of the gulch and away from the creek. Each of these groundwater occurrences is described in further detail below.

#### 1.2.1.1 Perched Groundwater

The Vashon till is relatively impermeable and has little or no water-bearing capacity (Newcomb, 1952). Some perched water occurs locally at the boundary between the surficial fill soils and the surface of the less-permeable till (E&E Services/Sweet-Edwards/EMCON, 1991). The location and elevation of perched water is variable within the till and cannot be determined without specific subsurface investigations. However, perched groundwater is often found in less dense surficial layers, including fill and alluvium, or within lenses of coarse-grained deposits in the till. Perched water levels within fill, alluvium and the till are dependent on local recharge of surficial runoff from precipitation, and vary seasonally. The flow of perched groundwater to wells is typically very limited; wells completed in these perched zones are adequate only for small domestic supplies and often go dry in the summer months (Newcomb, 1952). Most on-site groundwater monitoring wells in the upland area of the Everett Plant are screened within the perched groundwater within fill materials overlying glacial till and yield groundwater year round.

The flow direction of perched groundwater is primarily controlled by gravity and generally follows local topography. Local stratigraphic discontinuities such as lenses, or man-made features such as cut-and-fill areas or utility trenches, may collect and retain surface recharge and influence perched groundwater flow. These perched layers are hydraulically separated from the regional groundwater occurring within the underlying Esperance Sand by the thick sequence of Vashon till. Some perched groundwater zones are intercepted by depressions or drainages incised in the till surface, and thus provide a limited amount of storage or recharge to surface waters. The hydraulic conductivity of the till is low, and has been estimated to be between $5.9 \times 10^{-6}$ to $8.7 \times 10^{-7}$ centimeters/second (cm/s) or 0.017 to 0.0025 ft/day (CH2M Hill, 1991). Laboratory testing of discrete till soil samples from the Everett Plant suggests higher ($10^{-4}$ to $10^{-6}$ cm/s) hydraulic conductivity values. The test results are presented in subsequent sections of this report and are summarized in Appendix S.

#### 1.2.1.2 Regional Groundwater

The uppermost regional groundwater occurs in the Esperance Sand. Water-table, or unconfined, conditions exist in most places in the vicinity of the plant. However, this groundwater may be confined locally beneath the overlying till in other locations within the region. Recharge is primarily controlled by infiltration of precipitation through the overlying till. The plant is considered to be an area of low surficial recharge to the Esperance Sand Aquifer (E&E Services/Sweet-Edwards/EMCON). Only 2 to 3 inches of the approximately 37 inches of average annual precipitation received by the area ultimately recharges the Esperance Sand (CH2M Hill, 1991). Because of this, groundwater levels in the Esperance Sand often display a ‘lag’ from seasonal precipitation, and are sensitive to periods of low precipitation (Newcomb, 1952). Groundwater in the Esperance Sand discharges laterally to tributary drainages to Possession Sound or the Snohomish River bordering the Intercity Plateau and seeps downward to recharge the underlying glacial deposits.

The regional groundwater flow within the Esperance Sand is northwest toward Possession Sound (Figure 1-3). The groundwater surface within the sand has an average gradient of about 25 feet/mile (0.0047). However, the gradient steepens to upwards of 50 feet/mile (0.009) or more near points of discharge, such as the banks of Possession Sound and Puget Sound (Newcomb, 1952; E&E Services/Sweet-Edwards/EMCON, 1991) and incised drainages such as Powder Mill Gulch. The Esperance Sand overlies low-permeability glaciolacustrine sediments, which restrict downward flow of water below the sand. A line of springs and seeps can typically be observed in sea cliffs and walls of drainage channels where the base of the sand is exposed on top of fine-grained sediments. This usually occurs at an elevation of about 100 feet MSL. Discharge from these springs/seeps is also a source of local recharge to streams and drainages. The hydraulic conductivity of the Esperance Sand is typically on the order of $10^{-2}$ to $10^{-1}$ cm/sec (28 to 285 ft/day) (CH2M Hill, 1991; U.S. Geological Survey, 1997). Aquifer performance testing conducted as part of this RI indicates that the horizontal hydraulic conductivity of the Esperance Sand in the Powder Mill Gulch area is 4.0 - 38 ft/day (Section 21.4.3).

### 1.2.2 Regional Groundwater Quality

Regional groundwater quality data indicate that groundwater of the Esperance Sand aquifer is good quality. It is typically low in dissolved solids and soft to moderately hard (Newcomb, 1952 and U.S. Geological Survey, 1984, 1997). Dissolved iron concentrations are present in some areas. High iron concentrations can give an objectionable taste to drinking water, can stain fixtures and laundry, but do not constitute a health issue.

The perched groundwater occurring in the fill and upper Vashon till is discontinuous and susceptible to local surface processes and impacts. Data on quality of perched groundwater in the region has limited, if any, bearing on the quality of perched groundwater beneath the plant. In some areas of the region, water quality in the perched groundwater has been affected by such influences as underground storage tanks (petroleum hydrocarbons), surface drainage, and industrial processes. As discussed above, the perched groundwater is typically separated from the regional Esperance Sand aquifer by the low permeability of the overlying Vashon till.

### 1.2.3 Site Geology

The geologic units which directly underlie the plant are a combination of natural and fill soils. Prior to construction of the Everett Plant at the site, the geologic materials exposed at the surface consisted primarily of weathered Vashon till. Alluvial and swamp (peat) deposits were present in the former drainages and depressions. Plant development has included cutting and filling of drainages and depressions in the original topography for the construction of buildings, vehicle roadways, parking areas, and aircraft access areas. Cut-and-fill areas of the plant are shown on Figure 1-4.

In general, fill at the Everett Plant is less than 15 feet thick and is underlain by dense glacial deposits of the Vashon till. Most geological/environmental borings drilled prior to this RI at the plant are 60 feet or less in depth and completed in the till. In the deepest boring completed in the north-central portion of the plant near Building 40-56 (Dames & Moore, 1994), the till extended to a depth of approximately 85 feet below ground surface (bgs) (elevation 545 to 550 feet NGCVD29) before encountering Esperance Sand. Deep geotechnical borings in other areas of the north portion of the plant (e.g., in Building 40-22) encountered up to 90 feet of till bgs.

A test well drilled in 1938 at Paine Field (28N/04E-22B1), located approximately 1.1 miles south of the southern boundary of the Everett Plant (Figure 1-5), encountered approximately 180 feet of till (approximate elevation 580 feet MSL) as shown on Figure 1-7 (Newcomb, 1952). This test well penetrated 130 feet of Esperance Sand (Figure 1-7) before encountering underlying fine-grained deposits (Newcomb, 1952). Prior to the RI, Esperance Sand was encountered in monitoring well boring EGW040 and several geotechnical borings previously completed in the uplands portion at the plant. The Esperance Sand encountered during drilling of EGW040 at Building 40-56 consists of brown silty fine to coarse sand with some gravel. During the RI, four additional monitoring wells located on the uplands were installed in the Esperance Sand (see Sections 6.5 and 14.0). This unit extends to a depth of at least 222 feet bgs (elevation 543 feet MSL), the maximum depth of drilling performed to date on the uplands potion of the site. Esperance Sand also underlies the portion of Powder Mill Gulch on Boeing property (see Section 21.0), and is exposed locally on the slopes of the gulch and along the banks of Powder Mill Creek.

### 1.2.4 Groundwater Occurrence

Based on numerous previous geotechnical and environmental subsurface investigations at the Everett Plant, groundwater occurs beneath the plant in three ways: (1) as discontinuous zones of perched water within fill and weathered till overlying the dense glacial till, (2) discontinuous perched zones within the till, and (3) unconfined groundwater within the Esperance Sand.

The perched groundwater level within the fill and weathered till is generally less than 20 feet bgs. The flow direction of water through the fill/weathered till is primarily controlled by gravity and typically follows local topography. However, local variations in stratigraphic conditions and man-made features such as cut-and-fill areas or utility trenches may influence perched groundwater flow. The various perched groundwater zones detected at the site are hydraulically isolated from each other. These perched zones are also hydraulically isolated from the regional groundwater occurring within the underlying Esperance Sand by the thick sequence of dense glacial till which is present beneath the plant. However, the FS will further evaluate the migration of contaminants from the upper contaminated zones to the Esperance Sand Aquifer through the determination of soil cleanup levels protective of groundwater cleanup levels.

The glacial till is relatively impermeable and generally does not contain groundwater. Local lenses of sand and gravel within the till encountered in a few previous geotechnical borings contained perched groundwater. Regionally, there are local areas where there is sufficient groundwater in the till to supply single domestic wells.

Groundwater within the Esperance Sand is unconfined, with the upper portion of the sand typically unsaturated. Unconfined groundwater within the Esperance Sand occurs at a depth of approximately 215 to 200 feet bgs (approximately 345 to 340 feet NGVD29) from south to north beneath the upland portion of the site, based on water levels from five onsite monitoring wells. Groundwater was encountered at a similar elevation in the Paine Field test well (Newcomb, 1952), as well as in four wells completed during this RI. Previous regional groundwater elevation maps (Newcomb, 1952; E&E Services/Sweet-Edwards/EMCON, 1991; U.S. Geological Survey, 1997) indicate the regional flow direction beneath the Everett Plant is to the northwest towards Possession Sound. Within Powder Mill Gulch, Esperance Sand groundwater occurs at depths ranging from approximately 45 to 50 feet bgs near the southern portion of the stormwater detention basin and perennial groundwater discharge to the creek occurs near PMG SW-108 (approximately 290 ft downstream of the detention basin spillway). At this location the low-permeability glaciolacustrine unit underlying the Esperance Sand aquifer daylights and the Esperance Sand groundwater is intercepted by the Powder Mill Creek bed, resulting in perennial flow within the creek.

## 1.3 REMEDIAL INVESTIGATION

The RI at each of the areas listed in Table 1-1, except for the Esperance Sand, principally consisted of sampling and laboratory analysis of subsurface soils. The Esperance Sand hydrogeology was investigated by installing an additional four groundwater monitoring wells into this unit on the upland portion of the Everett Plant as well as numerous monitoring wells installed in Powder Mill Gulch on and off Boeing property. Groundwater samples were collected and analyzed from these wells. Physical testing of soils and installation of shallow (less than 30 feet bgs) groundwater monitoring wells were implemented, if appropriate, per the rationale specified in Section 3.0 of the RIWP. Groundwater samples were collected and analyzed if monitoring wells were installed.

The RI for Boeing Lake and Japanese Gulch and Powder Mill Gulch included sampling and analysis of sediments and surface water in these areas, and accumulated solids in stormwater detention basins and selected catch basins and oil/water separators of the storm sewer system. The surface water and sediment investigation will be submitted in a separate RI report subsequent to this soil and groundwater RI Report.

Sampling and analysis of soil, surface water, accumulated solids, and groundwater was conducted in general accordance with the Sampling and Analysis Plans (SAPs) included as Appendix A of the RIWP and Appendix B of the IAWP, as appropriate. The SAPs meet the applicable requirements specified in WAC 173-340-820. Appendix D of the RIWP is the SAP used for sampling and analysis of sediments in Boeing Lake, Powder Mill Creek, and Japanese Gulch Creek. This sediment SAP (SSAP) meets the applicable requirements of Ecology's "Sediment Sampling and Analysis Plan Appendix" (Ecology, 1995) and other guidance as outlined in Appendix D of the RIWP.

The hollow stem auger drilling (HSA) method was the principal method used because it results in less disturbance to the soils being drilled and easier identification of zones of perched groundwater relative to other methods. Soil and shallow groundwater samples were collected with hydraulic driven probes (e.g., Geoprobe™ or StrataProbe™) in areas underlain by fill or weathered glacial till soils. Borings in areas inaccessible to truck mounted or portable HSA drilling or hydraulic equipment were completed using a hand-auger or electric hammer-driven probes. In areas where these methods could not adequately penetrate the soils to the necessary depths, a portable rotary HSA drill (Salisbury & Associates, Inc. (SAI) modified Winkie drill) was used to obtain soil samples. This method required use of water to facilitate removal of cuttings. Deep borings in dense glacial till for installation of groundwater monitoring wells in the Esperance Sand were completed using a truck-mounted air rotary or sonic drill. Sonic and HSA drill rigs were used to install monitoring wells in the Esperance Sand in Powder Mill Gulch.

The "focused sampling" approach (Ecology, 1995) was used to determine the planned soil boring locations and planned depth of discrete subsurface soil samples for the RI of all the SWMUs/AOCs except the Concrete Slurry Pit (SWMU/AOC No. 172). Because of the nature of the known release in this area and the available analytical data, a systematic approach was used to locate the trenches excavated and composite soil samples collected from discrete depths in each trench. The systematic approach was also used to collect soil samples from borings and test pits to delineate the area and depth of planned excavation for the Former Gun Club Area A IA and for post-excavation samples for this IA and the soil removal IA on the BOMARC Building 45-70 property.

Soil samples were collected for visual examination and classification, chemical analysis, and physical testing. Soil samples collected during HSA or rotary drilling were collected with a Dames & Moore U-Type or similar split-barrel sampler equipped with a minimum of three 3-inch-long, clean stainless steel sample rings. These samplers are designed to retrieve undisturbed samples of unconsolidated or semi-consolidated soils. Previous experience gained from drilling at the Everett Plant indicates that due to the very dense nature of the unweathered glacial till soils at the site, a heavy duty sampler such as the Dames & Moore U-Type is the most effective method to obtain relatively undisturbed samples. During drilling with the Salisbury drill rig, soil samples were collected using the smaller, 2-inch-diameter Standard Penetration Test (SPT) split-barrel sampler. Soil samples obtained using the hydraulic or hammer-driven sampling probes (e.g., Geoprobe™ or StrataProbe™) were collected using small (1 to 2-inch) diameter split-barrel samplers. Disturbed soil samples collected using an SPT sampler, split-barrel sampler, or hand auger were placed directly into laboratory prepared glass sample jars equipped with Teflon lined lids. Soil samples collected during sonic drilling were extruded into plastic sample core bags. A clean stainless steel spoon or knife was used to extract and transfer the soil from the samplers to the sample jars.

Soil samples for chemical analysis and/or physical testing were visually examined for evidence of dangerous constituents and classified in accordance with the Unified Soil Classification System (ASTM D 2487-93). All soil samples were field screened for organic vapors with a PID (typically a MiniRae or Thermo Environmental Systems OVM 580 equipped with a 10.6 eV lamp). Soil samples from areas where acids or bases were used or stored in a SWMU/AOC were field screened for pH.

The principal deviations to the planned scope of the RI were revised locations or depths of borings pre-approved by Ecology. In some areas, a planned boring could not be completed or was moved due to access restrictions or the presence of subsurface utilities or concrete structures. These deviations are noted in the specific section for the area where the deviation occurred. Other deviations include terminating a boring at a shallower than planned depth due to drilling refusal and inability to recover a sufficient soil sample at a planned sampling depth. These deviations are noted on the soil borings logs in Appendices A1 through Q1, T1 and U1 to this report.

Deviations from planned laboratory analyses due to laboratory or field personnel errors in documentation or exceedance of holding times have been detailed in bimonthly status reports to Ecology and are noted on the data validation and laboratory reports in Appendices A2 through Q2, T2 and U2, A3 through Q3, T3 and U3 respectively. Consequently, these deviations are not specified in this report unless it has a significant impact on the results and conclusions. Laboratory reports and associated data review reports for RI data collected from Powder Mill Gulch from 2003 through 2010, groundwater monitoring, and additional investigations and interim actions since Revision 3.0 of the RI have been provided in previous reports and data submittals to Ecology and are not appended to this revision of the draft RI report.

The amount of physical testing was less than planned. Samples were selected for physical testing after laboratory testing for chemical constituents was completed. The remaining samples were visually inspected to assess whether or not these were undisturbed and suitable for physical testing. Because of the dense nature of the glacial till soils underlying the site, it is difficult to obtain undisturbed samples. Consequently, the amount of suitable samples was insufficient to perform the number of tests specified in the RIWP. However, sufficient testing was conducted to characterize the nature of the soils beneath much of the site.

The physical testing laboratory reports are presented in Appendix S and briefly discussed in the sections of this report that correspond to the areas where the samples were collected.

## 1.4 INTERIM ACTIONS

In addition to the RI, on-going interim actions are being implemented pursuant to the Agreed Order and the IAWP. Interim actions have also been completed, or are on-going, since Revision 3.0 of the RI pursuant to amendments to the Agreed Order. Interim actions include:

1. Maintenance and operation of four pumps used for dewatering perched groundwater in fill adjacent to underground utilities and underground storage tanks (USTs) since 1997. The four dewatering pumps are located near Building 40-56 (two pumps at EGW043 and EGW044), the oil/water separator near Building 40-11 (EGW046), and at the Fuel Farm near Building 45-52 (until EGW045 was removed in conjunction with the UST removal interim action in 2008).

2. Semiannual and quarterly groundwater monitoring of the existing monitoring wells at the Everett Plant and offsite in Powder Mill Gulch (1997-2010),

3. Removal of light non-aqueous phase liquid (LNAPL) and dense non-aqueous phase liquid (DNAPL) when at least 2.5 inches (0.2 foot) of LNAPL or DNAPL has accumulated in a well (1997-2010).

4. Removal of former UST EV-43-1 and soil containing silkscreen solvent constituents south of Building 40-56 (1997)

5. Source area treatment of TCE in groundwater in PMG by in-situ Electric Resistance Heating and bioremediation (2006-2010)

6. Excavation and disposal of soil containing elevated concentrations of lead, arsenic, or PAHs, at Area A of the Former Gun Club (SWMU/AOC 100) and the northwest parking lot at BOMARC Building 45-70 (2008).

7. Excavation and disposal of soil containing petroleum hydrocarbons from within the Building 45-52 Fuel Farm UST basin (SWMU/AOC 165) during removal of four USTs and removal of one dewatering well (see 1. above) (2007-2008).

Table 1-2 lists areas with Interim Actions SWMUs/AOCs where groundwater monitoring was implemented. These areas are located as shown on Figure 1-2. LNAPL is present intermittently in three wells near Building 40-24 and three wells near Building 40-56. More detailed descriptions of the interim actions are presented in the IAWPs and completion reports prepared for each IA.

## 1.5 REGULATORY LEVELS AND BACKGROUND CONCENTRATIONS

MTCA establishes procedures for developing cleanup levels at sites where releases of hazardous substances pose a potential threat to human health or the environment. In order to assess whether the concentrations of dangerous constituents detected in soils and groundwater at the Everett Plant (site) may be potentially significant, the analytical results are compared to current applicable MTCA Method A and B cleanup levels.

These cleanup levels are used as screening levels for comparative purposes only to determine when the RI of a SWMU/AOC is complete and which SWMUs/AOCs will be further evaluated during the FS. The actual cleanup levels used for cleanup actions at the Everett Plant will be discussed with Ecology based on the results of this RI and the subsequent FS.

MTCA Method A involves comparing measured concentrations of a detected compound to a prescribed cleanup level specified in tables (Ecology, 1996a, 2001a, 2007). Method A cleanup levels are established for a limited number of common hazardous substances and are intended for use at sites undergoing routine cleanup actions or for sites with a limited number of indicator hazardous substances, all of which must be listed in the Method A tables.

MTCA Method B cleanup levels are commonly used for sites with multiple hazardous substances including substances not listed under Method A. Method B cleanup levels for individual compounds are developed using applicable state and federal laws or algorithms as specified in WAC-173-340-720 through 173-340-750 (Ecology 1996a, 2001a, 2007). As described in WAC 173-340-705, Method B cleanup levels must be as stringent as concentrations established under applicable state and federal laws and concentrations protective of aquatic and terrestrial ecological receptors. For hazardous substances for which sufficiently protective health-based criteria have not been established, procedures for determining concentrations protective of human health are specified: for individual potentially carcinogenic substances, cleanup levels are based on the upper bound of the estimated excess lifetime cancer risk of one in one million (1.0E-06); for individual non-carcinogenic substances, cleanup levels are set at concentrations that are expected to result in no acute or chronic toxic effects to human health. Ecology has calculated Method B cleanup levels using the formulas specified in MTCA, the most recent available reference doses and carcinogenic potency factors, and standard exposure parameters established by Ecology (https://fortress.wa.gov/ecy/clarc/CLARCHome.aspx). In addition, revised parameters for calculating Method B and C cleanup levels for Total Petroleum Hydrocarbon (TPH) mixtures were published by Ecology in January 2006 (https://fortress.wa.gov/ecy/clarc/FocusSheets/tph%20guidance.pdf). In accordance with MTCA [WAC-173-340-705 (6)], soil screening levels for selected metals with calculated MTCA Method B cleanup levels that are less than natural background conditions (i.e. arsenic) were adjusted upward to natural background levels, based on published regional (Ecology, 1994) background soil concentrations.

The RI data collection started in 1997 and has continued into 2010. Applicable screening levels specified in the RIWP and IAWP were based on the 1996 MTCA cleanup levels. MTCA was revised in 2001 and 2007 and the latest modifications took effect November 2007. Modifications since 1996 included revised MTCA Method A cleanup levels, additional methods to calculate site-specific TPH cleanup levels, and a revised method for comparing PAH concentrations to cleanup levels (Ecology, 2007). Ecology updated the published Method B cleanup levels in November 2001 (Ecology, 2001b). Initially, the 2001 values were not incorporated as screening levels in revised versions of the 1999 draft RI Report completed in 2001 and 2002 (Revision 2.0 and 2.1, respectively) because minimal additional data had been collected and it was assumed that the RI would be complete in 2002. MTCA Method B cleanup levels are now continuously updated in Ecology's CLARC database, with the latest values available through Ecology's website (https://fortress.wa.gov/ecy/clarc/CLARCHome.aspx).

References to the 1996 MTCA cleanup levels have been removed from text and data and are screened against the current, applicable MTCA Method A and Method B cleanup levels. However, the 1996 screening levels are maintained in data tables where data was collected and the RI was completed prior to 2001 so that the sequence of decisions made during the course of the RI will be understood; specifically, those areas where a determination was previously made by Ecology that additional data collection or action was not required because the 1996 screening levels were not exceeded. The MTCA cleanup levels and methods, as updated on the current version of CLARC, will be used, as appropriate, during the FS and discussion of final cleanup standards between Ecology and Boeing.

For the majority of data collected during the RI (prior to 2001), concentrations of dangerous constituents in groundwater were originally compared to screening levels based on applicable MTCA Method A and/or B groundwater cleanup levels established at the time the RI was initiated in 1997. Protection of surface water quality standards was also an applicable groundwater cleanup standard at that time. Soil concentrations were originally compared to screening levels based on the applicable Method A or B cleanup levels in 1997 as indicated below:

- Method B cleanup level for direct contact with soil is the primary level for constituents listed in Ecology's CLARC II update (Ecology, 1996b)
- Method B soil cleanup level based on 100 times (100x) the Method B groundwater cleanup level is the secondary level and is based on protection of groundwater (Ecology, 1996b)
- MTCA Method A soil cleanup levels of 100 mg/kg and 200 mg/kg, respectively, for TPH concentrations in the gasoline range (TPH-G), diesel range (TPH-D), and oil range (TPH-O)
- MTCA Method A soil cleanup levels for lead at residential and industrial sites because there are no Method B levels established for direct contact to soil containing lead.
- Regional (Puget Sound) background soil concentrations for arsenic (7.30 mg/kg) and nickel (47.8 mg/kg) because these concentrations are greater than the 1996 Method B 100x groundwater (nickel and arsenic) and Method B direct contact (arsenic) cleanup levels. The Puget Sound concentrations are the 90th percentile values published by Ecology (1994).

The RI report was revised in 2006 and 2007 (Revisions 3.0 and 3.1) to address Ecology's comments on Revisions 2.0 and 2.1 of the RI report, to incorporate subsequent RI and monitoring data collected, and to use the current applicable MTCA cleanup levels as screening levels. The schedule for completion of this RI report was extended to 2010 to include these revisions and to complete interim actions and remedial investigations of chlorinated solvent constituents in Powder Mill Creek and the Esperance Sand aquifer.

In Revision 4.0 of the draft RI report, the RI data are compared to screening levels consisting of currently applicable MTCA cleanup levels (WAC 173-340-700, Ecology 2007). Depending on the constituent, the soil screening levels consist of the lowest of either the current MTCA Method A soil cleanup level (WAC 173-340-900) for unrestricted land uses or the MTCA Method B cleanup level developed using information published in the on-line CLARC database (https://fortress.wa.gov/ecy/clarc/CLARCHome.aspx). RI soil data for metals are also compared to regional natural background concentrations, and instances where the background concentrations are greater than the MTCA cleanup levels are noted in the text. Concentrations of dangerous constituents in groundwater and surface water are compared to the current, applicable MTCA Method A and/or B groundwater and surface water cleanup levels or concentrations established under applicable Federal, State, or local laws. Concentrations of chemical constituents in soil are compared to the applicable Method A or B cleanup levels as indicated below and as summarized in Table 1-3:

- MTCA Method B soil cleanup levels for direct contact with soil per WAC 173-340-740, as applicable for each SWMU/AOC, are the primary level for constituents listed in Ecology's CLARC (https://fortress.wa.gov/ecy/clarc/CLARCHome.aspx) as of June 2010.
- MTCA Method A unrestricted soil cleanup levels of 30 mg/kg (if benzene present) or 100 mg/kg (benzene not present) for gasoline range (TPH-G) and 2,000 mg/kg for diesel range (TPH-D) and oil range (TPH-O) are used to assess TPH concentrations.
- MTCA Method A soil cleanup level for lead (250 mg/kg) for unrestricted land uses because there are no Method B levels established for direct contact to soil containing lead. The Method A industrial site cleanup level for lead (1,000 mg/kg) is also included for reference only and is not used to determine if a SWMU/AOC is exempt for the FS process.
- Soil cleanup levels protective of groundwater calculated in accordance with WAC 173-340-747 and using the default parameters supplied by Ecology in the CLARC database. Table 1-3 summarizes the soil cleanup levels protective of groundwater calculated using both MTCA Method A and MTCA Method B groundwater cleanup levels as the target groundwater cleanup level. For soil cleanup levels notated in the Method A table (MTCA Table 740-1) as protective of groundwater, Table 1-3 restates the MTCA Table 740-1 soil cleanup level in the Method A "protection of groundwater" column.
- Regional (Puget Sound) background soil concentration for arsenic (7.30 mg/kg) and chromium (48.2 mg/kg) because these concentrations are greater than the MTCA Method B direct contact cleanup level for arsenic and the MTCA Method A soil cleanup level for hexavalent chromium. The Puget Sound concentration is the 90th percentile value published by Ecology (1994).

The November 2007 revision to MTCA required that, when any cPAH compound is detected in soil or groundwater, the total concentration of the cPAH compounds (benzo[a]pyrene, indeno[1,2,3-cd]pyrene, dibenzo[a,h]anthracene, chrysene, benzo[k]fluoranthene, benzo[b]fluoranthene, and benzo[a]anthracene) be compared to the Method A and B cleanup levels using the Toxicity Equivalency Factor methodology of WAC 173-340-708(8). This revised approach for screening cPAH compounds has been integrated into the text and tables of this Revision 4.0 of the RI.

In addition to screening analytical data against the cleanup levels listed above, each SWMU/AOC was evaluated against Ecology's Draft *Guidance for Evaluating Soil Vapor Intrusion in Washington State: Investigation and Remedial Action*, Publication No. 09-09-047, dated October 2009. The Preliminary Assessment and Tier I Assessment steps described in this guidance were applied to each SWMU/AOC, except that the collection of subslab or soil vapor data included under the Tier I Assessment was applied only at Building 40-02 and BOMARC Building 45-70. Applicable MTCA indoor air cleanup levels were used as screening levels for indoor air samples and the applicable Ecology (2009) draft soil gas screening levels for potential vapor intrusion were used for sub-slab soil gas samples collected in Building 40-02.

Assessment of all exposure pathways and receptors was conducted or assumed in the selection of the RI screening levels based on unrestricted Method A or Method B media cleanup levels. Additional assessment (if needed) of all exposure pathways and receptors required under MTCA, including (for example) terrestrial ecological receptors, the soil to groundwater pathway, and the vapor intrusion pathway will be evaluated in the FS and will be included in final cleanup levels established in the cleanup action plan (CAP), as appropriate. The terrestrial ecological evaluation can be ended at the screening level for nearly all of the SWMUs/AOCs at the facility using the procedure under WAC 173-340-7492(2)(a)(ii) because most of the SWMUs/AOCs are not within 500 feet of undeveloped land, and are located on the industrial portion of the property. Further terrestrial ecological evaluation is warranted under the FS for SWMU 100 – Former Gun Club, Powder Mill Gulch (including the Former Pistol Range) and wetland 3A adjacent to the BOMARC Building 45-70 property. These SWMUs are located on undeveloped land at the periphery of the facility. This further terrestrial ecological evaluation will be part of the determination of final cleanup standards in the CAP for these SWMUs.

The FS will be based on SWMUs/AOCs that exceed the screening criteria based on the applicable MTCA cleanup levels available at the time of final printing of this RI. Boeing may propose cleanup levels for the various constituents, environmental media, and exposure pathways at the Everett Plant during the FS process. Ecology will establish the site cleanup levels in the Ecology draft cleanup action plan.

## 1.6 RI REPORT ORGANIZATION

The RI briefly describes the pertinent available information regarding each SWMU/AOC, including physical descriptions and dangerous constituents used in the operations at each SWMU/AOC. More detailed information on these items, such as the hydrologic and geologic setting of the Everett Plant, the subsurface soils, occurrence and quality of shallow groundwater, and other pertinent information regarding each area are presented in the RIWP and IAWP. The planned scope of investigation, including general field methods and laboratory tests and analyses, are presented for each SWMU/AOC in the RIWP, IAWP, and associated appendices. Sections 2.0 through 23.0 of this RI report present a summary of the RI and results of analyses for each SWMU/AOC area investigated at the plant as outlined in Table 1-1. The RI for Attachment 5 and Attachment 6 SWMUs/AOCs in the same geographic areas are addressed in the same section of the RI report. Section 24.0 provides information on air, land use, natural resources and ecology in the vicinity of the plant as required by WAC 173-340-350 and required by Section VI of the Agreed Order. Section 25.0 discusses additional areas to be included in the FS that were investigated prior to the RI. Summary and conclusions are presented in Section 26.0.

## 1.7 CHEMICAL QUALITY ASSURANCE

Chemical analysis of samples were performed by Analytical Resources, Inc. (ARI) of Seattle, Washington, except for a limited number of analyses performed by Sound Analytical Services, Inc. of Tacoma, Washington, under subcontract to ARI, field analyses performed by a mobile laboratory during the Powder Mill Gulch groundwater investigation and BOMARC Building 45-70 investigation, and air sample analyses performed by either Libby Environmental Laboratories in Lacey, Washington, or Air Toxics, Inc. of Folsom, California. These laboratories are accredited by Ecology for all the chemical analyses performed by each laboratory for analysis where accreditation is available. In addition, Air Toxics is a specialty laboratory certified by the National Environmental Laboratory Accreditation Conference (NELAC). NELAC is an association of the USEPA, State, and other Federal agencies formed to establish and promote mutually acceptable performance standards for the inspection and operation of environmental laboratories. NELAC standards include specifications contained in ISO/IEC 17025 by the International Organization for Standardization. The analytical methods used are in accordance with those specified in the IAWP and RIWP. EPA methods were used for volatile organic compounds (VOCs) (EPA 8260, 8260 SIM, and TO-15), non-halogenated semi-volatile organic compounds (SVOCs) (EPA 8015 modified), phenols (EPA 8270), polynuclear aromatic hydrocarbons (PAHs) (EPA 8270 SIM), volatile aromatic compounds (EPA 8020), and metals (EPA 6000/7000 series). Ecology's Northwest methods were used for analyses for total petroleum hydrocarbons (TPH) as diesel and Jet A (NWTPH-Dx), gasoline (NWTPH-Gx), and oil (NWTPH-Dx extended).

A summary of analytical results reported above the method reporting limit for each area are presented in tables in the appropriate sections of the report. Laboratory reports for each area are presented in Appendices A3 through Q3, T3, U3, and V. Laboratory reports with data collected as part of interim actions (groundwater monitoring, PMG groundwater treatment, and soil excavation actions) and during additional investigations such as the 2003-2010 TCE groundwater investigation in Powder Mill Gulch have been provided in quarterly or interim submittals following completion of supplemental investigations, groundwater sampling, or interim actions. The laboratory analytical data was validated in accordance with the Quality Assurance Project Plan (QAPP) presented in Appendix B of the RIWP and subsequent revisions to the QAPP. Trip blanks and field rinsate (decontamination) blanks were analyzed per the QAPP in addition to the standard laboratory quality control samples (e.g., duplicate analysis, matrix spike, surrogates, etc.). These data were used to assess the laboratory data and add appropriate qualifiers to data. These qualifiers include flagging compounds reported as detected above the reporting limits as undetected where the compounds are due to laboratory contamination. In addition, some values were qualified as an estimated value, principally due to analyses being performed after the applicable holding time for the method. These are shown on the summary data tables and discussed in the data validation reports/memoranda where appropriate.

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## TABLE 1-1
## SUMMARY OF REMEDIAL INVESTIGATION SWMUs/AOCs

| RI Report Section | Agreed Order Attachment 5, 6* or 7** Areas | SWMU/AOC No. | Location | SWMU/AOC Name |
|---|---|---|---|---|
| 2.0 | 1 | No. 051 | Building 40-31 | Bluestreak containment trench |
| | | No. 070 | Building 40-31 | EV-153, Former underground clarifying single wall steel tank |
| | | No. 134 | Building 40-31 | Plating waste storage containers |
| | | No. 150 | Building 40-31 | Zyglo penetrant concrete sump |
| | | No. 156 | Building 40-31 | EV-115, 116, 117 Bluestreak sumps |
| | | No, 171 | Building 40-31 | Former Bluestreak rea vapor degreaser |
| 3.0 | 2 | No. 054 | Building 40-51 | Former wastewater AST |
| | | No. 065 | Building 40-51 | Former paint stripping tankline |
| | | No. 151 | Building 40-51 | Sumps and trenches; EV-119 through 123, EV-112 through 114 |
| | 7** | No. 069 | Building 40-51 | Former traveling paint booth |
| | | No. 090 | Building 40-51 | EV-11; Former waste MEK UST |
| 4.0 | 3 | No. 093 | Building 45-01 | Former MEK and toluene USTs EV-18, 19, 20, 54 |
| | | No. 142 | Building 45-01 | EV-136, wastewater sump and flume |
| 5.0 | 4 | No. 097 | Building 40-11 | Former facility degreaser |
| | 4* | No. 112 | Building 40-11 | EV-51 Auto steam cleaning area oil/water separator |
| | NA | | Building 40-11 | EV-48-1, gasoline UST |
| 6.0 | 6 | No. 121 | Building 40-02 | EV-103, hydraulic jack stand oil/water separator |
| 7.0 | 7 | No. 145 | Building 40-33 | EV-200, wastewater sump for 767 wing stub CST&P |
| 8.0 | 8 | No. 154 | Building 40-37 | 777 CST&P wastewater sumps from the CST&P cell and CIC cell |
| 9.0 | 9 | No. 157 | Building 45-03 | EV-124, 125, 129, paint hangar and wastewater sumps and delivery trenches |
| 10.0 | 9 | No. 167 | Building 45-06 | Wastewater USTs EV-21, 22, 23 |
| 11.0 | 26** | No. 144 | Building 40-23 | 747 wing stub CST&P |
| 12.0 | 25** | No. 143 | Building 40-22 | 747 wing stub CST&P |
| 13.0 | 32** | No. 172 | North Complex | Concrete slurry pit |
| 14.0 | NA | NA | NA | Esperance Sand |
| 15.0 | 1* | No. 055 | Building 40-24 | EV-75-1, EV-76-1; Former central hydraulic system waste tank system |
| | | No. 168 | Building 40-24 | Utility sumps and trenches |
| 16.0 | 2* | No. 067 | Building 40-56 | Former solvent recycling unit |
| | | No. 071 | Building 40-56 | EV-153; Former silkscreen UST and sump |
| | | No. 086 | Building 40-56 | EV-41; Former waste acid UST |
| | | N0. 089 | Building 40-56 | EV-42; Former waste silkscreen UST |
| | | No. 094 | Building 40-56 | EV-43; Former silkscreen product UST |
| 17.0 | 3* | No. 100 | Former Gun Club | Former Paine Field Sports (Gun) Club |
| 18.0 | 6* | No. 166 | Building 45-53 | EV-110-1; Former UST jet fuel overfill |
| 19.0 | 3* | No. 100 | BOMARC | Former Paine Field Sports (Gun) Club |
| 20.0 | NA | No. 177<br>No. 178 | Building 40-25<br>Building 40-26 | Utility vault<br>Utility vault |
| 21.0 | NA | No. 180 | Powder Mill Gulch | TCE in Esperance Sand aquifer groundwater and Powder Mill Creek surface water |
| 22.0 | NA | NA | Powder Mill Gulch | Former pistol range |
| 23.0 | 5* | No. 165 | Building 45-52 | EV-26 through EV-29; Former Fuel Farm USTs and Fueling Positions |
| 24.0 | NA | NA | Everett Plant | NA – Air, Land Use, Natural Resources and Ecology |
| 25.0 | 21** | No. 098 | Building 40-53 | Former Mock vapor degreaser |

| | | | | |
|---|---|---|---|---|
| | 17** | No. 083 | Flightline Stall 104 | EV-15, former diesel fuel UST |
| | 6** | No. 68 | Building 45-18 | South Fire Pit |
| | 18** | No. 087<br>No. 107 | NW Yard | EV-12, Former waste fuel UST<br>EV-13, Former oil/water separator |
| See Note A | NA | No. 103 | Japanese Gulch | Japanese Gulch ponds and creek and Boeing Lake |
| See Note A | NA | No. 135 | Powder Mill Gulch | Powder Mill Gulch Detention Basin |
| See Note A | NA | No. 181 | NA | PCBs in joint compound on the Flightline within the stormwater system and Powder Mill Creek and associated wetlands, sediments, and surface water |

* = Attachment 6 SWMU/AOC
** = Attachment 7 SWMU/AOC
NA = Not applicable
Note A = Data associated with these areas will be presented in a separate RI report.

**TABLE 1-2**
**SUMMARY OF INTERIM ACTION SWMUs/AOCs**
**WITH GROUNDWATER MONITORING**

| Agreed Order (Attachment 6 or 7 Area) | IAWP Section No. | SWMU/AOC No. | Location | SWMU/AOC Name |
|---|---|---|---|---|
| 1 | 3 | No. 055 | Building 40-24 | EV-175-1, EV-76-1; Former central hydraulic system waste tank system |
| | | No. 168 | Building 40-24 | Utility sumps and trenches |
| 2 | 4 | No. 067 | Building 40-56 | Former solvent recycling unit |
| | | No. 071 | Building 40-56 | EV-153; Former silkscreen UST and sump |
| | | No. 086 | Building 40-56 | EV-41; Former waste acid UST |
| | | No. 089 | Building 40-56 | EV-42; Former waste silkscreen UST |
| | | No. 094 | Building 40-56 | EV-43; Former silkscreen product UST |
| 3 | 5 | No. 100 | Former Gun Club | Former Paine Field Sports (Gun) Club |
| 4 | 6 | No. 112 | Building 40-11 | EV-51; Auto steam cleaning area o/w separator |
| 5 | 7 | No. 165 | Building 45-52 | EV-26 through 29; Jet fuel UST |
| 6 | 8 | No. 166 | Building 45-53 | EV-110-1; UST jet fuel overfill |
| 7* | 9 | No. 090 | Building 40-51 | EV-11; Former waste MEK UST |
| 18* | 10 | No. 087 | NW of F-1 | EV-12; Former waste fuel UST (terminated in 1998) |
| 24* | 10 | No. 107 | NW of F-1 | EV-13; Oil/water separator (terminated in 2002) |
| 3 | NA | No. 100 | BOMARC Building 45-70 | Former Paine Field Sports (Gun) Club (initiated in 2010) |
| NA | NA | No. 180 | Powder Mill Gulch | Powder Mill Creek (initiated in 2003) |

= Attachment 7 SWMU/AOC

NA = Not applicable

**Table 1-3**
**Potential Cleanup Levels**
**Boeing Everett Facility**
**Everett, Washington**

| Analyte | Potential Groundwater Cleanup Levels | | | | | Potential Soil Cleanup Levels | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Direct Contact (ingestion only) | | | | | | Protection of GW | | NBSM | |
| | MTCA Method A | MTCA Method B | | MTCA Method C | | MTCA Method A (Industrial) | MTCA Method A (Unrestricted) | MTCA Method B | | MTCA Method C | | MTCA Method A | MTCA Method B | State Wide | Puget Sound |
| | | Carcinogen | Non-Carcinogen | Carcinogen | Non-Carcinogen | | | Carcinogen | Non-Carcinogen | Carcinogen | Non-Carcinogen | | | | |
| **TPH** | **mg/L** | **mg/L** | **mg/L** | **mg/L** | **mg/L** | **mg/kg** | **mg/kg** | **mg/kg** | **mg/kg** | **mg/kg** | **mg/kg** | **mg/kg** | **mg/kg** | **mg/kg** | **mg/kg** |
| TPH - diesel range | 0.5 | NE | NE | NE | NE | 2,000 | 2,000 | NE | NE | NE | NE | NC | NE | NA | NA |
| TPH - gasoline range | 0.8/1.0 [a] | NE | NE | NE | NE | 30/100 [a] | 30/100 [a] | NE | NE | NE | NE | 30/100 [a] | NE | NA | NA |
| TPH - motor oil range | 0.5 | NE | NE | NE | NE | 2,000 | 2,000 | NE | NE | NE | NE | NC | NE | NA | NA |
| TPH - mineral oil range | 1.0 | NE | NE | NE | NE | 4,000 | 4,000 | NE | NE | NE | NE | NC | NE | NA | NA |
| TPH - Jet A-range | 0.5 | NE | NE | NE | NE | 2,000 | 2,000 | NE | NE | NE | NE | NC | NE | NA | NA |
| **VOCs** | **ug/L** | **ug/L** | **ug/L** | **ug/L** | **ug/L** | **ug/kg** | **ug/kg** | **ug/kg** | **ug/kg** | **ug/kg** | **ug/kg** | **ug/kg** | **ug/kg** | **ug/kg** | **ug/kg** |
| acetone | NE | NE | 800 | NE | 1,750 | NE | NE | NE | 8,000,000 | NE | 350,000,000 | NE | 3,211 | NA | NA |
| benzene | 5 | 0.795 | 32 | 7.95 | 70 | 30 | 30 | 18,182 | 320,000 | 2,386,364 | 14,000,000 | 30 | 4.5 | NA | NA |
| bromobenzene | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NA | NA |
| bromoform | NE | 5.5 | 160 | 55 | 350 | NE | NE | 126,582 | 1,600,000 | 16,613,924 | 70,000,000 | NE | 36 | NA | NA |
| bromomethane | NE | NE | 11 | NE | 25 | NE | NE | NE | 112,000 | NE | 4,900,000 | NE | 52 | NA | NA |
| 2-butanone | NE | NE | 4,800 | NE | 10,500 | NE | NE | NE | 48,000,000 | NE | 2,100,000,000 | NE | 19,200 | NA | NA |
| n-butylbenzene | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NA | NA |
| sec-butylbenzene | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NA | NA |
| tert-butylbenzene | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NA | NA |
| carbon disulfide | NE | NE | 800 | NE | 1,750 | NE | NE | NE | 8,000,000 | NE | 350,000,000 | NE | 5,651 | NA | NA |
| carbon tetrachloride | NE | 0.34 | 5.6 | 3.4 | 12 | NE | NE | 7,692 | 56,000 | 1,009,615 | 2,450,000 | NE | 3.1 | NA | NA |
| chlorobenzene | NE | NE | 160 | NE | 350 | NE | NE | NE | 1,600,000 | NE | 70,000,000 | NE | 1,399 | NA | NA |
| chloroethane | NE | 15 | 3,200 | 151 | 7,000 | NE | NE | 345,000 | 32,000,000 | 45,300,000 | 1,400,000,000 | NE | 60 | NA | NA |
| chloroform | NE | 7.2 | 80 | 72 | 175 | NE | NE | 163,934 | 800,000 | 21,516,393 | 35,000,000 | NE | 38 | NA | NA |
| chloromethane | NE | 3.4 | NE | 34 | NE | NE | NE | 76,923 | NE | 10,096,154 | NE | NE | 13.9 | NA | NA |
| 2-chlorotoluene | NE | NE | 160 | NE | 350 | NE | NE | NE | 1,600,000 | NE | 70,000,000 | NE | 640 | NA | NA |
| 4-chlorotoluene | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NA | NA |
| cyclohexanone | NE | NE | 40,000 | NE | 87,500 | NE | NE | NE | 400,000,000 | NE | 17,500,000,000 | NE | 160,000 | NA | NA |
| 1,2-dichlorobenzene | NE | NE | 720 | NE | 1,575 | NE | NE | NE | 7,200,000 | NE | 315,000,000 | NE | 8,435 | NA | NA |
| 1,3-dichlorobenzene | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NA | NA |
| 1,4-dichlorobenzene | NE | 1.8 | NE | 18 | NE | NE | NE | 41,667 | NE | 5,468,750 | NE | NE | 30 | NA | NA |
| 1,1-dichloroethane | NE | NE | 1,600 | NE | 3,500 | NE | NE | NE | 16,000,000 | NE | 700,000,000 | NE | 8,734 | NA | NA |
| 1,1-dichloroethene | NE | NE | 400 | NE | 875 | NE | NE | NE | 4,000,000 | NE | 175,000,000 | NE | 2,862 | NA | NA |
| 1,2-dichloroethane | 5 | 0.48 | 160 | 4.8 | 350 | NE | NE | 10,989 | 1,600,000 | 1,442,308 | 70,000,000 | 24 | 2 | NA | NA |
| cis-1,2-dichloroethene | NE | NE | 80 | NE | 175 | NE | NE | NE | 800,000 | NE | 35,000,000 | NE | 400 | NA | NA |
| 1,1-dichloropropene | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NA | NA |
| dichlorodifluoromethane | NE | NE | 1,600 | NE | 3,500 | NE | NE | NE | 16,000,000 | NE | 700,000,000 | NE | 6,400 | NA | NA |
| trans-1,2-dichloroethene | NE | NE | 160 | NE | 350 | NE | NE | NE | 1,600,000 | NE | 70,000,000 | NE | 868 | NA | NA |
| ethylbenzene | 700 | NE | 800 | NE | 1,750 | 6,000 | 6,000 | NE | 8,000,000 | NE | 350,000,000 | 6,000 | 6,912 | NA | NA |
| hexachlorobutadiene | NE | 0.56 | 1.6 | 5.6 | 3.5 | NE | NE | 12,821 | 16,000 | 1,682,692 | 700,000 | NE | 605 | NA | NA |
| 2-hexanone | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NA | NA |
| isopropylbenzene (cumene) | NE | NE | 800 | NE | 1,750 | NE | NE | NE | 8,000,000 | NE | 350,000,000 | NE | 3,200 | NA | NA |
| 4-isopropyltoluene | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NA | NA |

**Table 1-3**
**Potential Cleanup Levels**
**Boeing Everett Facility**
**Everett, Washington**

| Analyte | Potential Groundwater Cleanup Levels | | | | | Potential Soil Cleanup Levels | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Direct Contact (ingestion only) | | | | | | Protection of GW | | NBSM | |
| | MTCA Method A | MTCA Method B | | MTCA Method C | | MTCA Method A | MTCA Method A | MTCA Method B | | MTCA Method C | | MTCA Method A | MTCA Method B | | |
| | | Carcinogen | Non-Carcinogen | Carcinogen | Non-Carcinogen | (Industrial) | (Unrestricted) | Carcinogen | Non-Carcinogen | Carcinogen | Non-Carcinogen | | | State Wide | Puget Sound |
| 4-methyl-2-pentanone | NE | NE | 640 | NE | 1,400 | NE | NE | NE | 6,400,000 | NE | 280,000,000 | NE | 2,560 | NA | NA |
| methylene chloride | 5 | 5.8 | 480 | 58 | 1,050 | 20 | 20 | 133,333 | 4,800,000 | 17,500,000 | 210,000,000 | 20 | 25 | NA | NA |
| n-propylbenzene | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NA | NA |
| styrene | NE | 1.5 | 1,600 | 15 | 3,500 | NE | NE | 33,333 | 16,000,000 | 4,375,000 | 700,000,000 | NE | 33 | NA | NA |
| 1,1,2,2-tetrachloroethane | NE | 0.22 | NE | 2.2 | NE | NE | NE | 5,000 | NE | 656,250 | NE | NE | 1.2 | NA | NA |
| tetrachloroethene | 5 | 0.08 | 80 | 0.8 | 175 | 50 | 50 | 1,850 | 800,000 | 243,000 | 35,000,000 | 50 | 0.86 | NA | NA |
| toluene | 1,000 | NE | 640 | NE | 1,400 | 7,000 | 7,000 | NE | 6,400,000 | NE | 280,000,000 | 7,000 | 4,654 | NA | NA |
| 1,1,1-trichloroethane | 200 | NE | 16,000 | NE | 35,000 | 2,000 | 2,000 | NE | 160,000,000 | NE | 7,000,000,000 | 2,000 | 126,752 | NA | NA |
| trichloroethene | 5 | 0.49 | 2.4 | 5 | 5.3 | 30 | 30 | 11,000 | 24,000 | 1,475,000 | 1,050,000 | 30 | 3.2 | NA | NA |
| trichlorofluoromethane | NE | NE | 2,400 | NE | 5,250 | NE | NE | NE | 24,000,000 | NE | 1,050,000,000 | NE | 9,600 | NA | NA |
| 1,1,2-trichloro-1,2,2-trifluoroethane | NE | NE | 240,000 | NE | 525,000 | NE | NE | NE | 2,400,000,000 | NE | 105,000,000,000 | NE | 960,000 | NA | NA |
| 1,2,4-trimethylbenzene | NE | NE | 400 | NE | 875 | NE | NE | NE | 4,000,000 | NE | 175,000,000 | NE | 1,600 | NA | NA |
| 1,3,5-trimethylbenzene | NE | NE | 400 | NE | 875 | NE | NE | NE | 4,000,000 | NE | 175,000,000 | NE | 1,600 | NA | NA |
| m,p-xylene | NE | NE | 16,000 [b] | NE | 35,000 [b] | NE | NE | NE | 160,000,000 [b] | NE | 7,000,000,000 [b] | NE | 135,068 | NA | NA |
| o-xylene | NE | NE | 16,000 | NE | 35,000 | NE | NE | NE | 160,000,000 | NE | 7,000,000,000 | NE | 147,027 | NA | NA |
| total xylenes | 1,000 | NE | 1,600 | NE | 3,500 | 9,000 | 9,000 | NE | 16,000,000 | NE | 700,000,000 | 9,000 | 14,630 | NA | NA |
| vinyl chloride | 0.2 | 0.03 | 24 | 0.29 | 53 | NE | NE | 667 | 240,000 | 87,500 | 10,500,000 | 1.26 | 0.18 | NA | NA |
| **VPHs** | **ug/L** | **ug/L** | **ug/L** | **ug/L** | **ug/L** | **ug/kg** | **ug/kg** | **ug/kg** | **ug/kg** | **ug/kg** | **ug/kg** | **ug/kg** | **ug/kg** | **ug/kg** | **ug/kg** |
| methyl tert-butyl ether | 20 | 24.3 | 6,860 | 243 | 15,000 | 100 | 100 | 556,000 | 68,600,000 | 72,900,000 | 3,000,000,000 | 100 | 103 | NA | NA |
| n-decane | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NA | NA |
| n-dodecane | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NA | NA |
| n-hexane | NE | NE | 480 | NE | 1,050 | NE | NE | NE | 4,800,000 | NE | 210,000,000 | NE | 96,224 | NA | NA |
| n-octane | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NA | NA |
| n-pentane | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NA | NA |
| **Solvent Stabilizers** | **ug/L** | **ug/L** | **ug/L** | **ug/L** | **ug/L** | **ug/kg** | **ug/kg** | **ug/kg** | **ug/kg** | **ug/kg** | **ug/kg** | **ug/kg** | **ug/kg** | **ug/kg** | **ug/kg** |
| 1,4-dioxane | NE | 3.98 | NE | 40 | NE | NE | NE | 90,909 | NE | 11,931,818 | NE | NE | 16 | NA | NA |
| **Non-Halogenated VOCs** | **ug/L** | **ug/L** | **ug/L** | **ug/L** | **ug/L** | **ug/kg** | **ug/kg** | **ug/kg** | **ug/kg** | **ug/kg** | **ug/kg** | **ug/kg** | **ug/kg** | **ug/kg** | **ug/kg** |
| ethylene glycol | NE | NE | 16,000 | NE | 35,000 | NE | NE | NE | 160,000,000 | NE | 7,000,000,000 | NE | 64,000 | NA | NA |
| n-butyl alcohol (n-butanol) | NE | NE | 800 | NE | 1,750 | NE | NE | NE | 8,000,000 | NE | 350,000,000 | NE | 3,311 | NA | NA |
| **SVOCs** | **ug/L** | **ug/L** | **ug/L** | **ug/L** | **ug/L** | **ug/kg** | **ug/kg** | **ug/kg** | **ug/kg** | **ug/kg** | **ug/kg** | **ug/kg** | **ug/kg** | **ug/kg** | **ug/kg** |
| acenaphthene | NE | NE | 960 | NE | 2,100 | NE | NE | NE | 4,800,000 | NE | 210,000,000 | NE | 97,892 | NA | NA |
| acenaphthylene | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NA | NA |
| anthracene | NE | NE | 4,800 | NE | 10,500 | NE | NE | NE | 24,000,000 | NE | 1,050,000,000 | NE | 2,274,550 | NA | NA |
| benzo(a)anthracene | NE | See Note c | NE | See Note c | NE | NE | NE | See Note c | NE | See Note c | NE | 715 | 86 | NA | NA |
| benzo(a)pyrene | 0.1 | 0.012 | NE | 0.012 | NE | 2,000 | 100 | 137 | NE | 17,979 | NE | 100 | 232 | NA | NA |
| benzo(b)fluoranthene | NE | See Note c | NE | See Note c | NE | NE | NE | See Note c | NE | See Note c | NE | 2,460 | 295 | NA | NA |
| benzo(k)fluoranthene | NE | See Note c | NE | See Note c | NE | NE | NE | See Note c | NE | See Note c | NE | 2,460 | 295 | NA | NA |
| benzo(g,h,i)perylene | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NA | NA |
| butylbenzyl phthalate | NE | NE | 3,200 | NE | 7,000 | NE | NE | NE | 16,000,000 | NE | 700,000,000 | NE | 892,544 | NA | NA |
| carbazole | NE | 4.4 | NE | 44 | NE | NE | NE | 50,000 | NE | 6,562,500 | NE | NE | 314 | NA | NA |
| chrysene | NE | See Note c | NE | See Note c | NE | NE | NE | See Note c | NE | See Note c | NE | 796 | 95 | NA | NA |
| cyclohexanol | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NA | NA |
| dibenzo(a,h)anthracene | NE | See Note c | NE | See Note c | NE | NE | NE | See Note c | NE | See Note c | NE | 3,579 | 429 | NA | NA |

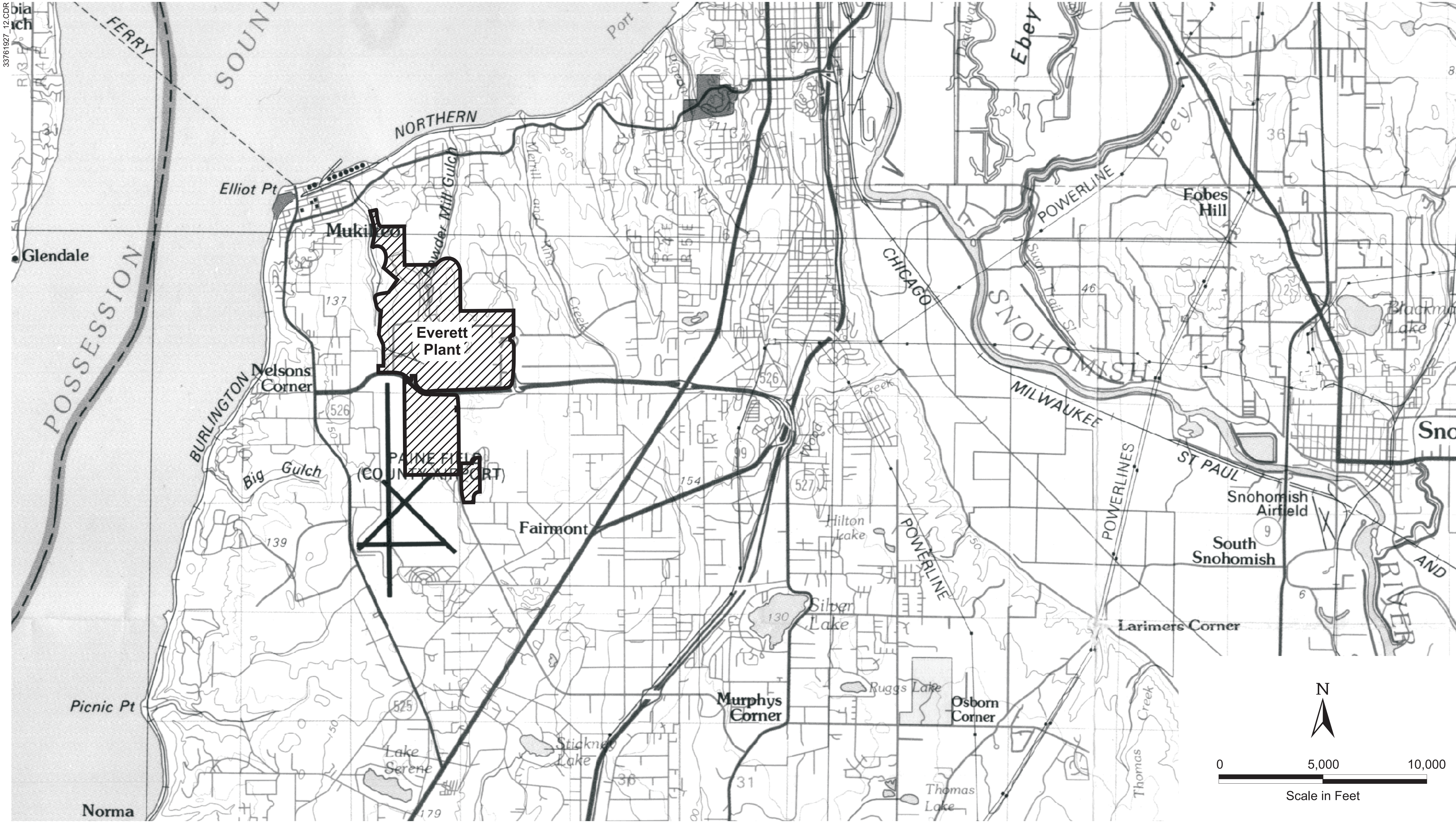
**Table 1-3**
**Potential Cleanup Levels**
**Boeing Everett Facility**
**Everett, Washington**

| Analyte | Potential Groundwater Cleanup Levels | | | | | Potential Soil Cleanup Levels | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Direct Contact (ingestion only) | | | | | | Protection of GW | | NBSM | |
| | MTCA Method A | MTCA Method B | | MTCA Method C | | MTCA Method A (Industrial) | MTCA Method A (Unrestricted) | MTCA Method B | | MTCA Method C | | MTCA Method A | MTCA Method B | | |
| | | Carcinogen | Non-Carcinogen | Carcinogen | Non-Carcinogen | | | Carcinogen | Non-Carcinogen | Carcinogen | Non-Carcinogen | | | State Wide | Puget Sound |
| dibenzofuran | NE | NE | 32 | NE | 70 | NE | NE | NE | 160,000 | NE | 7,000,000 | NE | 128 | NA | NA |
| diethylphthalate | NE | NE | 12,800 | NE | 28,000 | NE | NE | NE | 64,000,000 | NE | 2,800,000,000 | NE | 72,192 | NA | NA |
| dimethylphthalate | NE | NE | 16,000 | NE | 35,000 | NE | NE | NE | 80,000,000 | NE | 3,500,000,000 | NE | 64,000 | NA | NA |
| 2,6-dinitrotoluene | NE | NE | 16 | NE | 35 | NE | NE | NE | 80,000 | NE | 3,500,000 | NE | 86 | NA | NA |
| di-n-butylphthalate (dibutylphthalate) | NE | NE | 1,600 | NE | 3,500 | NE | NE | NE | 8,000,000 | NE | 350,000,000 | NE | 56,544 | NA | NA |
| bis(2-ethylhexyl) phthalate | NE | 6.25 | 320 | 62.5 | 700 | NE | NE | 71,428,571 | 1,600,000 | 9,375,000 | 70,000,000 | NE | 13,915 | NA | NA |
| fluoranthene | NE | NE | 640 | NE | 1,400 | NE | NE | NE | 3,200,000 | NE | 140,000,000 | NE | 630,990 | NA | NA |
| fluorene | NE | NE | 640 | NE | 1,400 | NE | NE | NE | 3,200,000 | NE | 140,000,000 | NE | 101,212 | NA | NA |
| indeno[1,2,3-cd]pyrene | NE | See Note c | NE | See Note c | NE | NE | NE | See Note c | NE | See Note c | NE | 6,940 | 832 | NA | NA |
| 4-methylphenol (p-cresol) | NE | NE | 40 | NE | 88 | NE | NE | NE | 400,000 | NE | 17,500,000 | NE | 160 | NA | NA |
| 1-methylnaphthalene | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NA | NA |
| 2-methylnaphthalene | NE | NE | 32 | NE | 70 | NE | NE | NE | 320,000 | NE | 14,000,000 | NE | 128 | NA | NA |
| naphthalene | 160 | NE | 160 | NE | 350 | 5,000 | 5,000 | NE | 1,600,000 | NE | 70,000,000 | 5,000 | 4,457 | NA | NA |
| phenanthrene | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NA | NA |
| phenol | NE | NE | 4,800 | NE | 10,500 | NE | NE | NE | 48,000,000 | NE | 2,100,000,000 | NE | 21,965 | NA | NA |
| pyrene | NE | NE | 480 | NE | 1,050 | NE | NE | NE | 2,400,000 | NE | 105,000,000 | NE | 654,644 | NA | NA |
| **PCBs** | **ug/L** | **ug/L** | **ug/L** | **ug/L** | **ug/L** | **ug/kg** | **ug/kg** | **ug/kg** | **ug/kg** | **ug/kg** | **ug/kg** | **ug/kg** | **ug/kg** | **ug/kg** | **ug/kg** |
| Aroclor 1016 | NE | NE | 1.1 | NE | 2.5 | NE | NE | NE | 5,600 | NE | 245,000 | NE | 2,408 | NA | NA |
| Aroclor 1242 | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NA | NA |
| Aroclor 1248 | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NA | NA |
| Aroclor 1254 | NE | NE | 0.32 | NE | 0.7 | NE | NE | NE | 1,600 | NE | 70,000 | NE | 1.3 | NA | NA |
| Aroclor 1260 | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NA | NA |
| Aroclor 1221 | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NA | NA |
| Aroclor 1232 | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NA | NA |
| Total PCBs | 0.1 | 0.04 | NE | 0.44 | NE | 10,000 | 1,000 | 500 | NE | 65,600 | NE | 618 | 271 | NA | NA |
| **Phosphate Compounds** | **ug/L** | **ug/L** | **ug/L** | **ug/L** | **ug/L** | **ug/kg** | **ug/kg** | **ug/kg** | **ug/kg** | **ug/kg** | **ug/kg** | **ug/kg** | **ug/kg** | **ug/kg** | **ug/kg** |
| butylated hydroxytoluene (BHT) | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NA | NA |
| butyl diphenyl phosphate | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NA | NA |
| dibutyl phenyl phosphate | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NA | NA |
| tributyl phosphate | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NA | NA |
| triphenyl phosphate | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NA | NA |
| **Metals** | **mg/L** | **mg/L** | **mg/L** | **mg/L** | **mg/L** | **mg/kg** | **mg/kg** | **mg/kg** | **mg/kg** | **mg/kg** | **mg/kg** | **mg/kg** | **mg/kg** | **mg/kg** | **mg/kg** |
| antimony | NE | NE | 0.0064 | NE | 0.014 | NE | NE | NE | 32 | NE | 1,400 | NE | 5.8 | NE | NE |
| arsenic | 0.005 | 0.000058 | 0.0048 | 0.00058 | 0.0105 | 20 | 20 | 0.67 | 24 | 87.5 | 1,050 | 20 | 0.03 | 7 | 7 |
| barium | NE | NE | 3.2 | NE | 7 | NE | NE | NE | 16,000 | NE | 700,000 | NE | 2,637 | NE | NE |
| beryllium | NE | NE | 0.032 | NE | 0.07 | NE | NE | NE | 160 | NE | 7,000 | NE | 506 | 2 | 0.6 |
| cadmium | 0.005 | NE | 0.008 | NE | 0.018 | 2 | 2 | NE | 80 | NE | 3,500 | 2 | 1.1 | 1 | 1 |
| chromium III | NE | NE | 24 | NE | 53 | 2,000 | 2,000 | NE | 120,000 | NE | 5,250,000 | 2,000 | 480,096 | NE | NE |
| chromium VI | NE | NE | 0.048 | NE | 0.105 | 19 | 19 | NE | 240 | NE | 10,500 | 19 | 18 | NE | NE |
| chromium (total) | 0.05 | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NA | NA | 42 | 48 |
| cobalt | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NE | NA | NA |

**Table 1-3**
**Potential Cleanup Levels**
**Boeing Everett Facility**
**Everett, Washington**

| Analyte | Potential Groundwater Cleanup Levels | | | | | Potential Soil Cleanup Levels | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Direct Contact (ingestion only) | | | | | | Protection of GW | | NBSM | |
| | MTCA Method A | MTCA Method B | | MTCA Method C | | MTCA Method A (Industrial) | MTCA Method A (Unrestricted) | MTCA Method B | | MTCA Method C | | MTCA Method A | MTCA Method B | State Wide | Puget Sound |
| | | Carcinogen | Non-Carcinogen | Carcinogen | Non-Carcinogen | | | Carcinogen | Non-Carcinogen | Carcinogen | Non-Carcinogen | | | | |
| copper | NE | NE | 0.59 | NE | 1.3 | NE | NE | NE | 2,960 | NE | 129,500 | NE | 263 | 36 | 36 |
| cyanide | NE | NE | NE | NE | NE | NE | NE | NE | 1,600 | NE | 70,000 | NE | NE | NE | NE |
| hydrogen cyanide | NE | NE | 0.16 | NE | 0.35 | NE | NE | NE | 1,600 | NE | 70,000 | NE | 0.64 | NE | NE |
| lead | 0.015 | NE | NE | NE | NE | 1,000 | 250 | NE | NE | NE | NE | 250 | NE | 17 | 24 |
| mercury | 0.002 | NE | 0.0048 | NE | 0.01 | 2 | 2 | NE | 24 | NE | 1,050 | 2 | 5.02 | 0.07 | 0.07 |
| nickel | NE | NE | 0.32 [d] | NE | 0.7 [d] | NE | NE | NE | 1,600 [d] | NE | 70,000 [d] | NE | 417 | 38 | 48 |
| selenium | NE | NE | 0.08 | NE | 0.18 | NE | NE | NE | 400 | NE | 17,500 | NE | 8.3 | NE | NE |
| silver | NE | NE | 0.08 | NE | 0.18 | NE | NE | NE | 400 | NE | 17,500 | NE | 13.6 | NE | NE |
| strontium | NE | NE | 9.6 | NE | 21 | NE | NE | NE | 48,000 | NE | 2,100,000 | NE | 38.4 | NE | NE |
| tin | NE | NE | 9.6 | NE | 21 | NE | NE | NE | 48,000 | NE | 2,100,000 | NE | 38.4 | NE | NE |
| zinc | NE | NE | 4.8 | NE | 11 | NE | NE | NE | 24,000 | NE | 1,050,000 | NE | 5,971 | 86 | 85 |

**Notes:**
**Bolded** values indicate the selected Preliminary Cleanup Level for each analyte
GW - groundwater
MTCA - Model Toxics Control Act
TEE - terrestrial ecological evaluation
NBSM - Natural Background Soil Metals Concentrations in Washington State, Puget Sound Region 90th Percentile Value, October 1994.
TPH - total petroleum hydrocarbons
VOCs - volatile organic compounds
VPHs - volatile petroleum hydrocarbons
SVOCs - semivolatile organic compounds
TTEC - total toxicity equivalent concentration
PCBs - polychlorinated biphenyls
NA - not applicable
NC - not calculated. Petroleum fraction analytical data are not available for this site to allow calculation of protection of groundwater values for most TPH fractions. Method A soil cleanup levels for gasoline are protective of groundwater.
NE - not established
mg/L - milligrams per liter
mg/kg - milligrams per kilogram
ug/L - micrograms per liter
ug/kg - micrograms per kilogram
[a] gasoline mixtures with benzene/gasoline mixtures without benzene
[b] Value for m-xylene used in calculation, p-xylene value is NE
[c] Carcinogenic PAH (cPAH) cleanup levels under MTCA are based on the calculated total toxicity of the mixture using the Toxicity Equivalency Methodology in WAC 173-340-708 (8).
The mixture of cPAHs shall be considered a single hazardous substance and compared to the applicable MTCA Method B cleanup level for benzo(a)pyrene.
[d] For nickel, value is for soluble salts



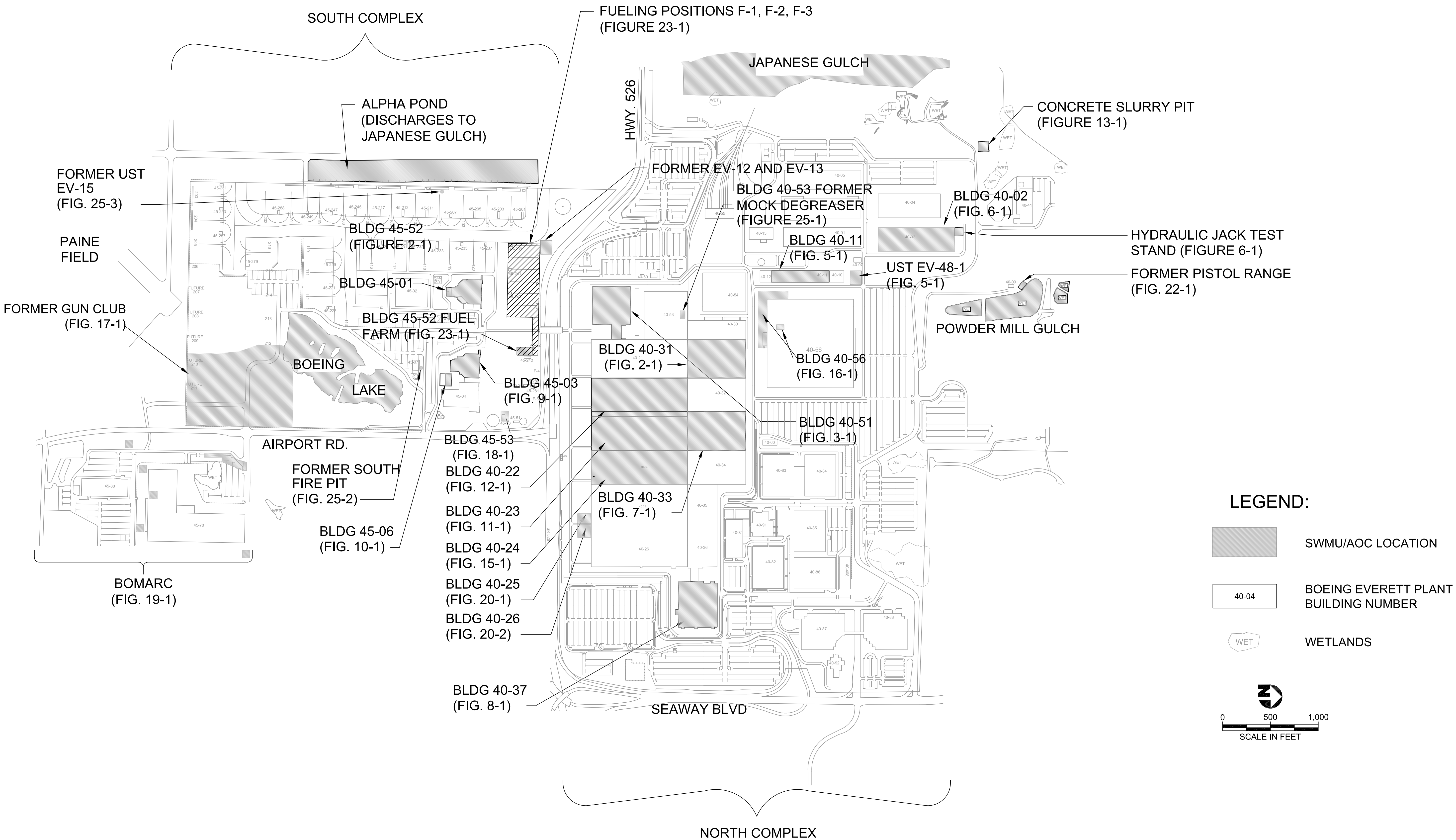

SOURCE: USGS 1:100,000 topographic map, Seattle, Washington, dated 1975

Job No. 33761927

**Figure 1-1**
**SITE LOCATION MAP**

URS

Boeing Commercial Airplanes, Everett Plant
REMEDIAL INVESTIGATION REPORT



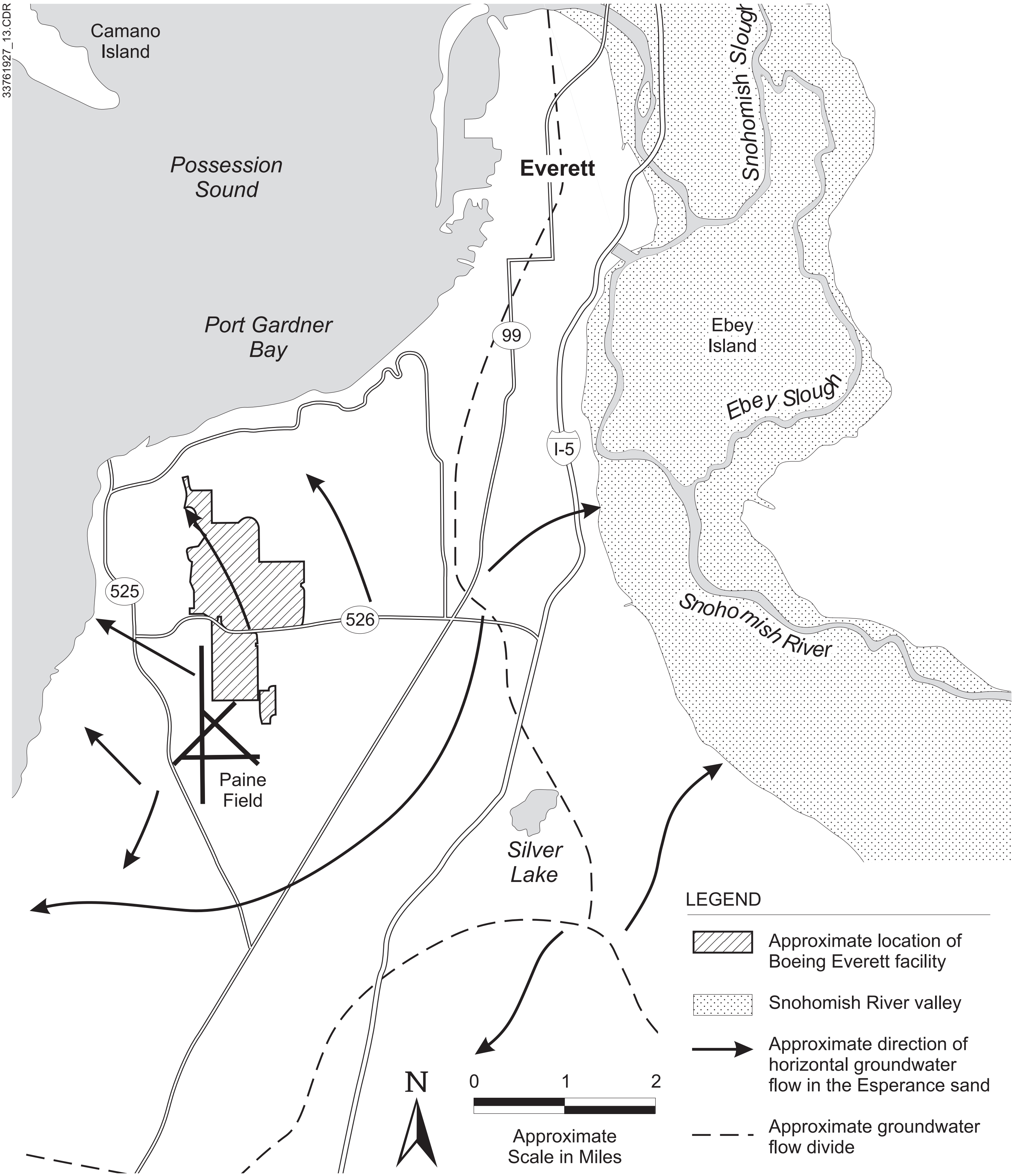

Job No. 33761927

URS

Q:\geo\Boeing\Everett\RI\2010\Fig 1-2.dwg
Mod: 11/16/2010, 13:45 | Plotted: 11/16/2010, 14:23 | john_knobbs

Figure 1-2
**SITE PLAN**

Boeing Commercial Airplanes, Everett Plant
REMEDIAL INVESTIGATION REPORT




SOURCE: *After Newcomb, 1952, CH2M Hill, 1991, and USGS, 1997.*

**Figure 1-3**

## GENERALIZED REGIONAL GROUNDWATER FLOW IN THE ESPERANCE SAND

Job No. 33761927

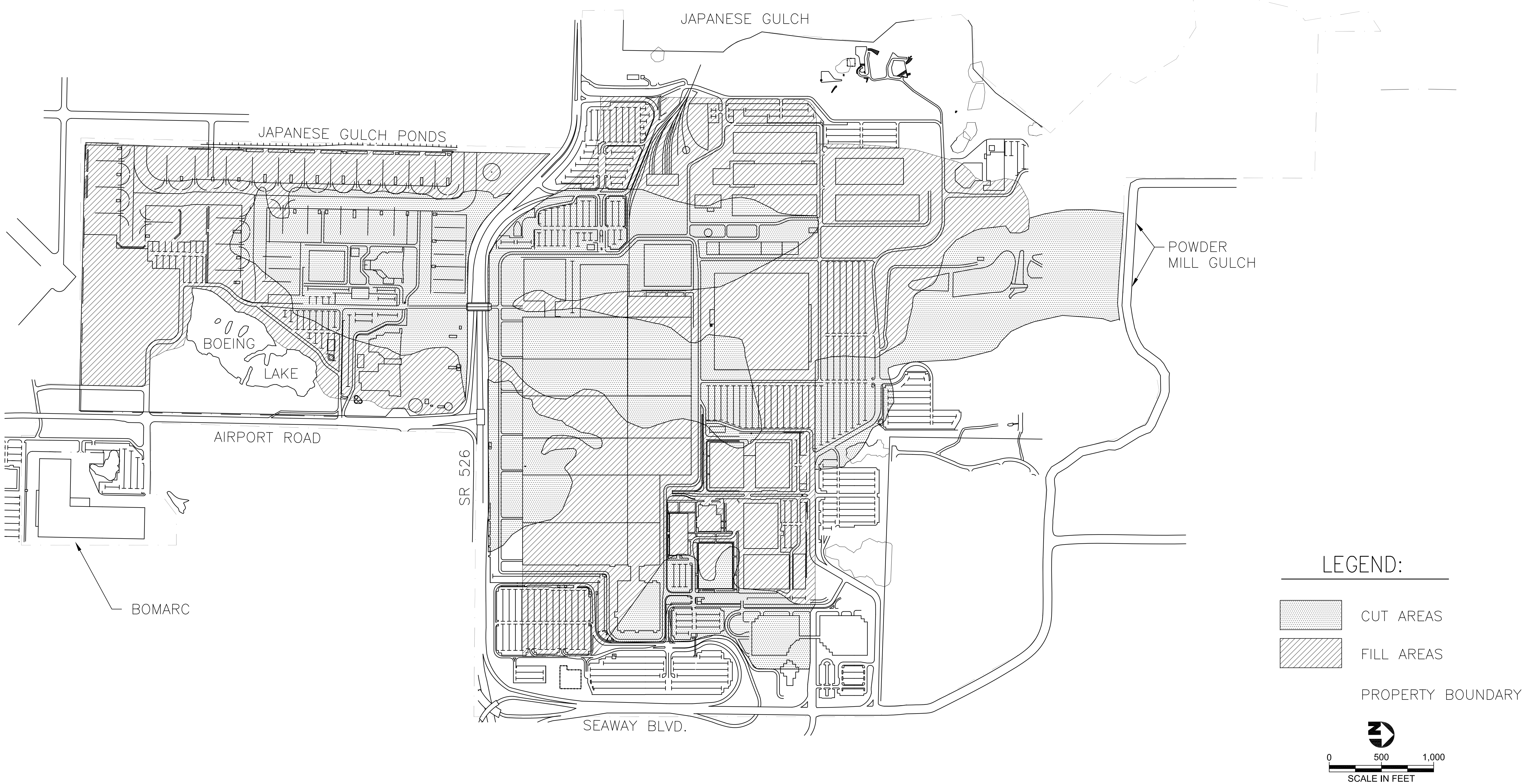
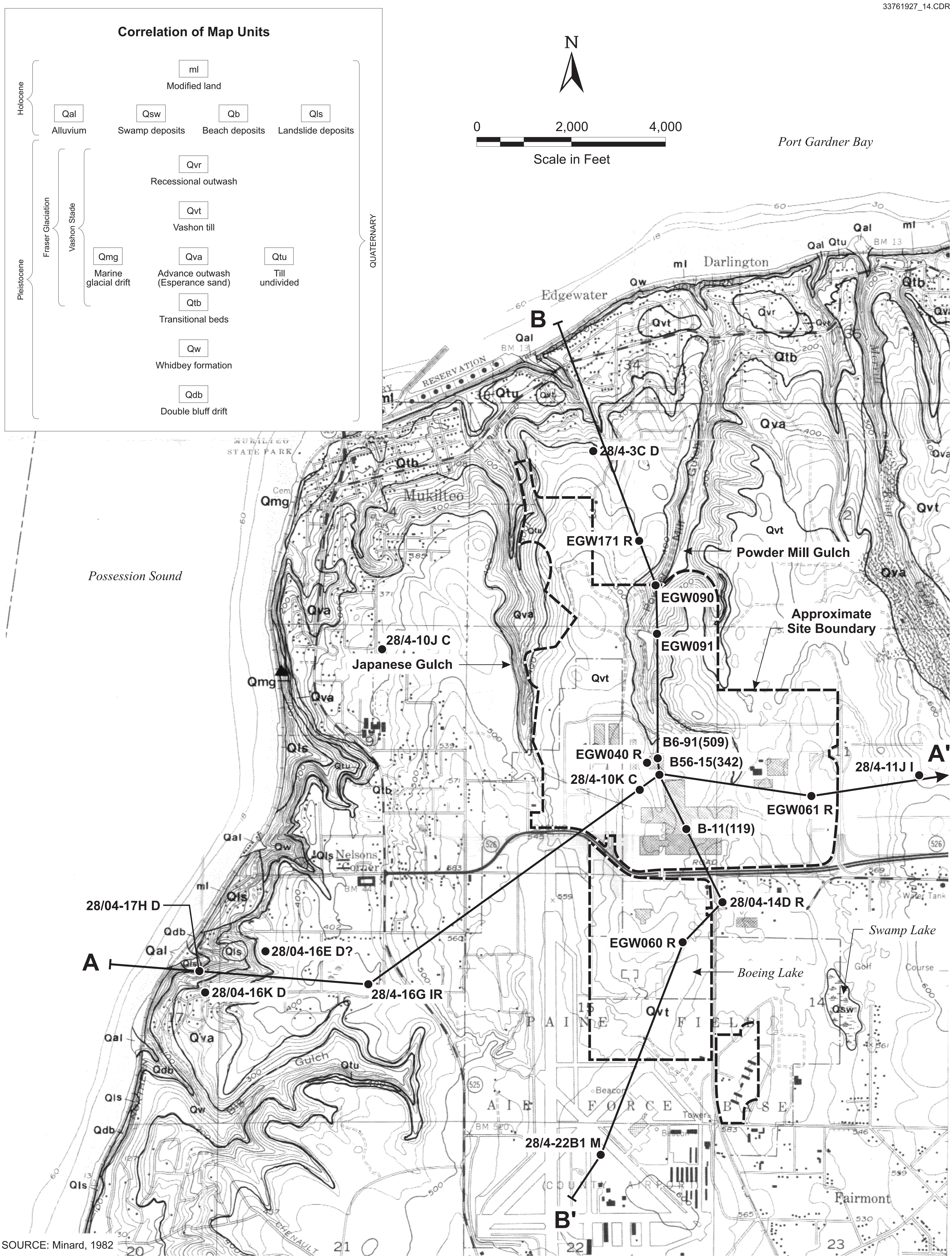



**Figure 1-4**
**EXISTING CUT AND FILL AREAS**

URS
Q:\geo\Boeing\Everett\RI\2010\Fig 1-4 Exist Cut_Fill.dwg
Mod: 09/22/2010, 14:11 | Plotted: 09/22/2010, 14:12 | john_knobbs

Boeing Commercial Airplanes, Everett Plant
REMEDIAL INVESTIGATION REPORT




LEGEND

A A' Line of geologic cross section (Figures 14-5 and 14-6)

?● Well/soil boring location (locations approximate, queried where uncertain):

**B1(119)** Dames & Moore soil boring (job number)

**28/04-14D** Ecology state well number

**EGW040** Boeing well number

Line of contact between geologic map units

Property boundary

REPORTED WELL USE

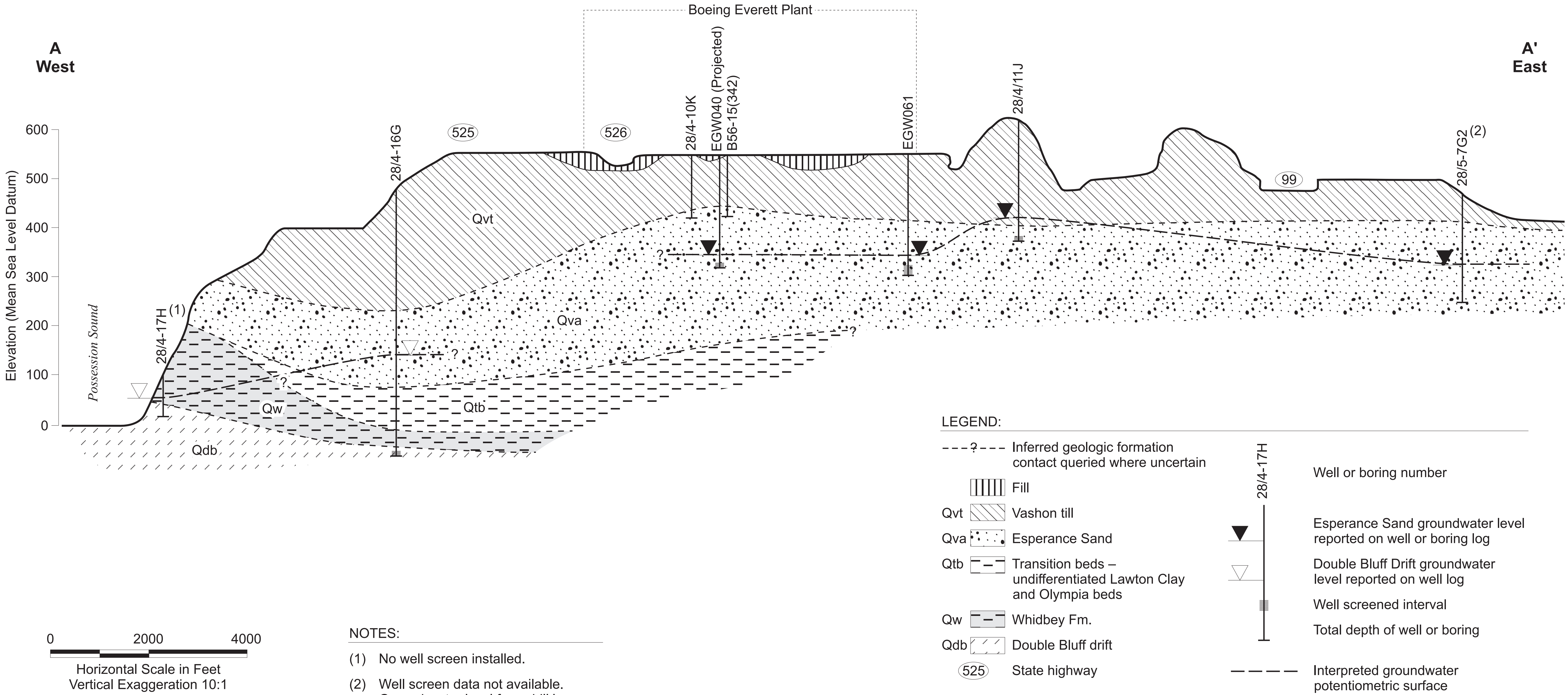
**M** Municipal well
**C** Cathodic protection well
**R** Resource protection or test well
**I** Industrial well
**D** Domestic well
**IR** Irrigation well

Job No. 33761927

**Figure 1-5**
**REGIONAL TOPOGRAPHY AND GEOLOGY**

URS

Boeing Commercial Airplanes, Everett Plant
Remedial Investigation Report




NOTES:

(1) No well screen installed.

(2) Well screen data not available. Ground water level from drill log.

*Modified after CH2M Hill, 1991, Minard, 1982 and USGS 1997.*

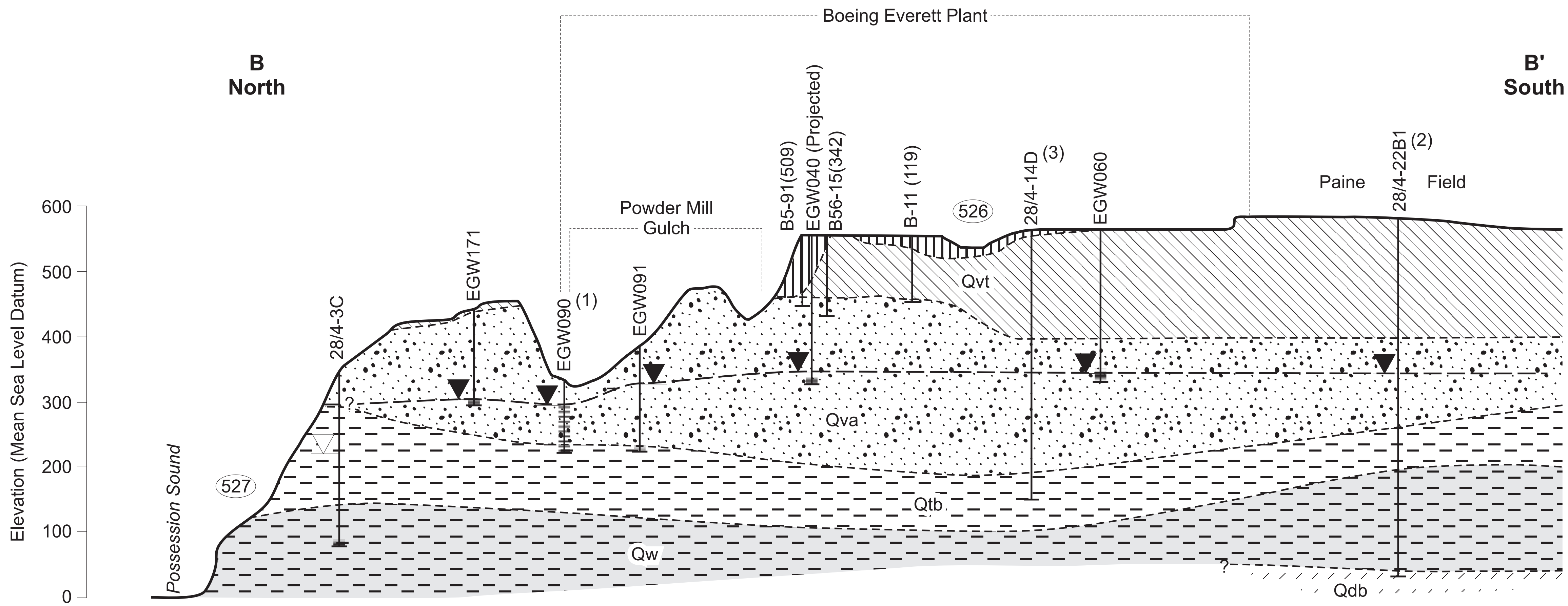
Job No. 33762736

**Figure 1-6**

**HYDROGEOLOGIC CROSS-SECTION A-A'**

URS

33762736_28.cdr




NOTES:

(1) EGW090 has five discrete, 6 ft screened intervals between depth of 37 ft and 103 ft below ground surface.

(2) Well screen data not available. Groundwater level in Esperance Sand from well log.

(3) Well screen and groundwater level data not available.

LEGEND:

- - - ? - - - Inferred geologic formation contact queried where uncertain

Fill

Qvt Vashon till

Qva Esperance Sand

Qtb Transition beds – undifferentiated Lawton Clay and Olympia beds

Qw Whidbey Fm.

Qdb Double Bluff drift

525 State highway

28/4-17H Well or boring number

Esperance Sand groundwater level reported on well or boring log

Whidbey Fm. groundwater level reported on well log

Well screened interval

Total depth of well or boring

Interpreted groundwater potentiometric surface

0 2000 4000

Horizontal Scale in Feet
Vertical Exaggeration 10:1

*Modified after CH2M Hill, 1991, Minard, 1982 and USGS 1997.*

Job No. 33762736

**Figure 1-7**
**HYDROGEOLOGIC CROSS SECTION B-B'**

URS

Boeing Commercial Airplanes, Everett Plant
Remedial Investigation Report

# 2.0 BUILDING 40-31

Presented in this section is documentation of the subsurface investigation of five Attachment 5 SWMUs/AOCs located in or near Building 40-31 at the Everett Plant (Figure 2-1). These SWMUs/AOCs include:

- No. 051 - Bluestreak Containment Trench
- No. 070 - Former Clarifier UST
- No. 134 – Former Plating Waste Storage Container Area
- No. 150 – Zyglo Penetrant Sump
- No. 156 – Bluestreak Pit

The subsurface conditions, prior investigations, and description of these SWMUs/AOCs are presented in Section 4.0 of the RIWP. This investigation was performed in accordance with Section 4.9 of the RIWP. A summary of borings to investigate these SWMUs/AOCs is presented in Table 2-1. In addition, this section discusses SWMU/AOC No. 171, Former Bluestreak Area Vapor Degreaser, where a previous investigation was performed but no new samples were collected as part of this investigation.

## 2.1 SWMU/AOC NO. 051 BLUESTREAK CONTAINMENT TRENCH AND SWMU/AOC NO. 134 PLATING WASTE STORAGE AREA

SWMU/AOC No. 051 and SWMU/AOC No. 134 are located on the north side of Building 40-31 (Figure 2-1). SWMU/AOC No. 134 is a concrete pad used to temporarily stage containers and trucks of plating waste from the Bluestreak Area plating operations prior to shipment to a treatment facility. SWMU/AOC No. 051 consists of a containment trench situated north of the concrete pad adjacent to a main access road. The trench serves as a secondary containment system for containing accidental spills onto the concrete pad that may have occurred when waste was transferred from the Bluestreak tank line to trucks and tanks on the concrete pad. Two portable steel tanks associated with SWMU/AOC No. 134 were formerly located on the concrete pad between the building and the containment trench. These portable tanks were used to contain cyanide-bearing wastes generated in the Bluestreak plating shop. Full portable tanks were transported off site for proper disposal of the contents. The tanks were removed from service between 1991 and 1993. Potential dangerous constituents that may be present in waste possibly spilled onto the concrete pad and containment trench include cyanide, various acids and caustic solutions (bases), and metals such as chromium, cadmium, nickel and copper originating from the Bluestreak plating shop. There have been no previous investigations of this area. Further details on SWMUs/AOCs No. 051 and No. 134 are presented in Section 4.0 of the RIWP.

### 2.1.1 Purpose and Scope

The purpose of the investigation was to assess whether potential dangerous constituents are present in the glacial till or fill soil beneath the concrete pad and containment trench. The investigation of the concrete pad was focused on locations where there is evidence of concrete corrosion, particularly where the corroded area crosses joints or cracks in the concrete. The scope of investigation performed was in general accordance with Sections 4.9.1 and 4.9.3 of the RIWP and included the following:

- Completed 10 probe borings to depths ranging from 6 feet to 12 feet bgs using a truck-mounted Geoprobe rig
- Collected soil samples at prescribed depth intervals
- Field screened samples for organic vapors and pH
- Submitted selected soil samples for analysis for the eight RCRA metals, copper, nickel, cyanide, and pH
- There were no deviations from the planned scope of investigation. Additional soil samples collected from borings ESB1314, ESB1317, and ESB1318 were analyzed to provide analytical data at the maximum depth of the borings.

#### 2.1.2 Documentation of Drilling and Sampling

On July 30, 1998, Dames & Moore monitored the advancement of 10 probe borings (ESB1310 through ESB1319) in the Bluestreak Containment Trench and Plating Waste Container Storage Area as shown on Figure 2-2. Four probe borings (ESB1316 through ESB1319) were completed to depths ranging from 9 feet to 9½ feet bgs adjacent to the containment trench and six probes (ESB1310 through ESB1315) were completed to depths ranging from 6 feet to 12 feet bgs beneath the concrete pad. Samples were retrieved using a SPT split spoon sampler. The samples were transferred from the sampler to laboratory prepared glassware using a clean stainless steel spoon. After sampling was completed, the borings were backfilled with hydrated bentonite chips and capped with concrete. Drilling techniques and sampling procedures utilized were in general accordance with the SAP presented in Appendix A of the RIWP.

#### 2.1.3 Field Observations and Sample Analysis Results

Presented in this section are the field observations and sample results associated with probe borings ESB1310 through ESB1319. Geologic logs of the probe borings are presented in Appendix A1. The chain of custody forms and analytical laboratory reports are presented in Appendix A2. Data validation reports are in Appendix A3. Analytical results are summarized in Tables 2-2 and 2-3.

##### 2.1.3.1 Field Observations

The area investigated is covered with approximately 8-inch-thick concrete pavement. A 3-inch-thick layer of asphalt was encountered directly below the concrete in several of the borings. Underlying the concrete and asphalt is fill soil consisting of fine to medium sand and silty sand 5½ feet to 12 feet (the maximum depth investigated) thick. Native glacial till consisting of very dense silty sand was encountered in borings ESB1316 through ESB1319 at depths ranging from 5½ feet to 8 feet bgs. Groundwater was not encountered to the maximum depth investigated of 12 feet bgs.

Staining or other visual indications of dangerous constituents were not observed. PID readings did not indicate organic vapors significantly elevated above background ambient levels in the soil samples. Field measurements of soil pH indicated a pH range of 5.6 S.U. to 10.0 S.U., with most values between 6.3 S.U. and 8.0 S.U. One sample from a depth of 1 feet bgs in boring ESB1315 had a slightly elevated field pH of 10.0 S.U. Staining or other visual indications of dangerous constituents were not observed.

#### 2.1.3.2 Sample Analytical Results

Selected soil samples from depths ranging from 1 foot to 11 feet bgs were submitted for analysis per the sample selection criteria specified on Figure A-3 in the SAP (Appendix A of the RIWP). Table 2-2 summarizes the analytical results for RCRA and other metals and Table 2-3 summarizes analytical results for cyanide and pH. These tables also list the applicable MTCA Method A and B cleanup levels. The analytical results indicate that cyanide and metals, with the exception of arsenic, cadmium, and chromium, were either not detected at concentrations above the method reporting limits, or were detected at concentrations below the applicable MTCA Method A or B soil cleanup levels, including the most conservative preliminary soil cleanup level protective of groundwater. Laboratory measurements of soil pH ranged from 5.9 S.U. to 9.1 S.U. and are consistent with the typical range (5 to 9 S.U.) for soils (Birkeland, 1984).

Arsenic concentrations (1.0 mg/kg to 4.2 mg/kg) in most of the samples analyzed are above the MTCA Method B soil cleanup level of 0.667 mg/kg and the most conservative preliminary soil cleanup level protective of groundwater (0.03 mg/kg). However, all the detected arsenic concentrations are less than the Puget Sound background concentration of 7.30 mg/kg (Ecology, 1994) and the MTCA Method A soil cleanup level protective of groundwater (20 mg/kg).

Cadmium was detected in two soil samples at concentrations of 0.9 mg/kg and 2.6 mg/kg. The 2.6 mg/kg detection is above the MTCA Method A soil cleanup level (2.0 mg/kg) and the most conservative preliminary soil cleanup level protective of groundwater (1.1 mg/kg). Cadmium was not detected above the 0.2 mg/kg reporting limit in any of the other 20 soil samples collected.

Total chromium concentrations (27.9 mg/kg to 54.5 mg/kg) are below the MTCA Method A and B soil cleanup levels (2,000 mg/kg and 120,000 mg/kg, respectively) for trivalent chromium and the Method B soil cleanup level for hexavalent chromium (240 mg/kg). These concentrations are greater than the MTCA Method A soil cleanup level for hexavalent chromium (19 mg/kg); however, with one exception, the concentrations are below the Puget Sound background concentration (48.2 mg/kg) for total chromium (Ecology, 1994).

Evaluation of the vapor intrusion (VI) pathway for these SWMUs/AOCs is not recommended for the FS. Screening of the VI pathway was performed in this RI using Ecology's review draft *Guidance for Evaluating Soil Vapor Intrusion in Washington State: Investigation and Remedial Action*, dated October 2009 (VI guidance). Applying the Preliminary Assessment step of the VI guidance to this SWMU shows that chemicals present in soil beneath the SWMU are not sufficiently volatile to be a potential VI source. The focus of the investigation was plating waste, which is not typically a source of volatile contaminants. Groundwater was not encountered beneath these SWMUs/AOCs to a depth of 12 feet bgs. In addition, PID readings taken during field sampling did not indicate organic vapors significantly elevated above background ambient levels in the soil samples.

## 2.2 SWMU/AOC NO. 070 FORMER CLARIFIER UST

The Former Clarifier UST (SWMU/AOC No. 070) was located outside the northwest corner of Building 40-31 (Figure 2-1). It was connected by buried pipe to sump EV-117 located within the Bluestreak plating shop. This UST was removed in 1987. Potential dangerous constituents that may have been present in wastewater stored in the former UST include ammonia, VOCs from solvent rag wash water, cyanide, copper, chromium, cadmium, nickel, and various acids and caustic solutions (bases) originating from the Bluestreak plating shop. There have been no previous investigations of this UST. Further details on SWMU/AOC No. 070 are presented in Section 4.0 of the RIWP.

### 2.2.1 Purpose and Scope

The purpose of the investigation was to assess whether potential dangerous constituents in liquids contained in the Former Clarifier UST are present in the fill soil and underlying glacial till soil. The scope of investigation performed in this area was in general accordance with Sections 4.9.2 and 4.9.5 of the RIWP and included the following:

- Drilled three borings to a depth of 15½ feet bgs adjacent to the Former Clarifier UST using truck-mounted and limited access, hollow-stem auger drill rigs
- Collected soil samples at prescribed depth intervals
- Field screened samples for organic vapors and pH
- Submitted selected soil samples for analysis for the eight RCRA metals, copper, nickel, pH, cyanide, cyclohexanol, and VOCs

There were no deviations from the planned scope of investigation.

### 2.2.2 Documentation of Drilling and Sampling

On March 26 and April 29, 1998, Dames & Moore monitored drilling of three soil borings (ESB1156, ESB1157, and ESB1200) in this area as shown on Figure 2-2. The borings were drilled to a depth of 15½ feet adjacent to the Former Clarifier UST. Samples were retrieved using a Dames & Moore U-type sampler fitted with stainless steel rings or a SPT split spoon sampler. Samples collected with the SPT sampler were transferred from the sampler to laboratory prepared glassware using a clean stainless steel spoon. After sampling was completed, the borings were backfilled with hydrated bentonite chips and capped with concrete. Drilling techniques and sampling procedures utilized were in general accordance with the SAP presented in Appendix A of the RIWP.

### 2.2.3 Field Observations and Sample Analysis Results

Presented in this section are the field observations and sample results associated with soil borings ESB1156, ESB1157, and ESB1200. The location of the borings and a geologic cross section of this area are shown on Figure 2-2. The cross section is presented on Figure 2-3. Geologic logs of the soil borings are presented in Appendix A1. The chain of custody forms and analytical laboratory reports are presented in Appendix A2. Data validation reports are in Appendix A3. Analytical results are summarized in Tables 2-4 and 2-5.

#### 2.2.3.1 Field Observations

The area investigated is covered with approximately 10-inch-thick concrete pavement. Underlying the concrete is fill soil consisting of fine to medium sand and silty sand to a depth of about 11 feet bgs. Native glacial till consisting of very dense silty sand was encountered below the fill in all three borings. Glacial till extends to the maximum depth investigated of 15½ feet bgs. Groundwater was not encountered to the depth investigated of 15½ feet bgs.

Staining or other visual indications of dangerous constituents were not observed. PID readings did not indicate organic vapors significantly elevated above background ambient levels in the soil samples. Field measurements of soil pH indicated a normal pH range of 7.1 S.U. to 7.6 S.U.

#### 2.2.3.2 Sample Analytical Results

Selected soil samples were submitted for analysis per the sample selection criteria specified on Figure A-4 in the SAP (Appendix A of the RIWP). Six soil samples at depths ranging from 7½ feet to 12½ feet bgs were submitted for analysis. A duplicate sample collected from soil boring ESB1157 (7½ feet) was also analyzed. Table 2-4 summarizes the analytical data for cyanide, pH, VOCs and cyclohexanol. Table 2-5 summarizes the analytical data for RCRA metals, copper, and nickel. These tables also list the applicable MTCA Method A and B cleanup levels.

The analytical results summarized in Table 2-4 indicate that cyanide was not detected above method reporting limits. A low level of cyclohexanol (7.7 mg/kg) was detected in only one of seven samples analyzed. Cleanup levels for cyclohexanol have not been established by Ecology. A low level of TCE was detected in only one sample (3.0 μg/kg) and was well below the MTCA Method A (30 μg/kg) and B (2,500 μg/kg) soil cleanup level, including the most conservative preliminary soil cleanup level protective of groundwater (3.2 μg/kg). Laboratory measurements of soil pH ranged from 7.6 S.U. to 8.4 S.U. and generally are within the typical range (5 to 9 S.U.) for soil (Birkeland, 1984).

The analytical results summarized in Table 2-5 indicate metals, with the exception of arsenic and chromium, were either not detected at concentrations above the reporting limits, or were detected at concentrations below the applicable MTCA Method A or B soil cleanup levels, including the most conservative preliminary soil cleanup levels protective of groundwater.

Arsenic concentrations (0.6 mg/kg to 3.1 mg/kg) in most of the samples analyzed are above the MTCA Method B soil cleanup level of 0.667 mg/kg and the most conservative preliminary soil cleanup level protective of groundwater (0.03 mg/kg). However, all the detected concentrations are less than the Puget Sound background concentration of 7.30 mg/kg (Ecology, 1994) and the MTCA Method A soil cleanup level protective of groundwater (20 mg/kg).

Total chromium concentrations (38.4 mg/kg to 45.0 mg/kg) are below the MTCA Method A and B soil cleanup levels for trivalent chromium (2,000 mg/kg and 120,000 mg/kg, respectively) and the Method B soil cleanup level for hexavalent chromium (240 mg/kg). These concentrations are greater than the MTCA Method A soil cleanup level (19 mg/kg) and the most conservative preliminary soil cleanup level protective of groundwater (18 mg/kg) for hexavalent chromium; however, the concentrations were below the Puget Sound background concentration (48.2 mg/kg) for total chromium (Ecology, 1994).

Evaluation of the vapor intrusion (VI) pathway for this SWMU/AOC is not recommended for the FS. Screening of the VI pathway was performed in this RI using Ecology's review draft *Guidance for Evaluating Soil Vapor Intrusion in Washington State: Investigation and Remedial Action*, dated October 2009 (VI guidance). Applying the Preliminary Assessment step of the VI guidance to this SWMU shows that one chemical present in soil beneath the SWMU, TCE in the 12½-foot sample from ESB1157, is sufficiently volatile to be a potential VI source. However, this detection of TCE is not considered to be a potential source for VI at this location for the following reasons:

- In accordance with WAC 173-340-740(3)(b)(iii)(C)(III), the TCE concentration detected (3.0 µg/kg) is less than the most conservative protection of groundwater soil cleanup level (3.2 µg/kg) calculated based on the MTCA Method A or B groundwater cleanup levels.

- TCE was not detected above 1.1 µg/kg in the shallower (7½-foot) soil sample from this same boring

- The TCE concentration in the soil sample at 12½ feet bgs in ESB1157 (3.0 µg/kg) is an order of magnitude below the lowest soil screening level of 30 µg/kg.

- PID readings taken during field sampling did not indicate organic vapors significantly elevated above background ambient levels in the soil samples.

Groundwater was not encountered beneath this SWMU/AOC to a depth of 15½ feet bgs.

## 2.3 SWMU/AOC NO. 156 AIR SCRUBBER PITS

The Air Scrubber Pits are considered part of SWMU/AOC No. 156 (Bluestreak Pit) and are also listed as SWMU/AOC No. 007 on Attachment 7 of the Agreed Order. The Air Scrubber Pits are located on the north side of Building 40-31 (Figure 2-1) and are connected to the Bluestreak Pit. Potential dangerous constituents that may have been in wastewater in the Air Scrubber Pits include non-halogenated SVOCs (cyclohexanol), RCRA metals, copper, nickel, cyanide, and acids and bases. There have been no previous investigations of these pits. Further details on SWMUs/AOCs No. 070 and No. 156 are presented in Section 4.0 of the RIWP.

### 2.3.1 Purpose and Scope

The purpose of the investigation was to assess whether potential dangerous constituents in liquids contained in the Air Scrubber Pits are present in the fill soil and underlying glacial till soil. The scope of investigation performed in this area was in general accordance with Sections 4.9.2 and 4.9.5 of the RIWP and included the following:

- Drilled five borings to a depth of 30½ feet bgs adjacent to the Air Scrubber Pits using truck-mounted and limited access, hollow-stem auger drill rigs
- Collected soil samples at prescribed depth intervals
- Field screened samples for organic vapors and pH
- Submitted selected soil samples for analysis for the eight RCRA metals, copper, nickel, pH, cyanide, and cyclohexanol

There were no deviations from the planned scope of investigation.

### 2.3.2 Documentation of Drilling and Sampling

On March 25 and 26, 1998, Dames & Moore monitored drilling of five soil borings (ESB1151 through ESB1155) in this area as shown on Figure 2-2. The soil borings were drilled to a depth of 30½ feet adjacent to the Air Scrubber Pits. Samples were retrieved using a Dames & Moore U-type sampler fitted with stainless steel rings or a SPT split spoon sampler. Samples collected with the SPT sampler were transferred from the sampler to laboratory prepared glassware using a clean stainless steel spoon. After sampling was completed, the borings were backfilled with hydrated bentonite chips and capped with concrete. Drilling techniques and sampling procedures utilized were in general accordance with the SAP presented in Appendix A of the RIWP.

### 2.3.3 Field Observations and Sample Analysis Results

Presented in this section are the field observations and sample results associated with soil borings ESB1151 through ESB1155. The location of the borings and a geologic cross section of this area are shown on Figure 2-2. The cross section is presented on Figure 2-3. Geologic logs of the soil borings are presented in Appendix A1. The chain of custody forms and analytical laboratory reports are presented in Appendix A2. Data validation reports are in Appendix A3. Analytical results are summarized in Tables 2-6 and 2-7.

#### 2.3.3.1 Field Observations

The area investigated is covered with approximately 10-inch-thick concrete pavement. Underlying the concrete is fill soil consisting of fine to medium sand and silty sand to a depth of about 7 to 13 feet bgs. Native glacial till consisting of very dense silty sand was encountered below the fill in all five borings. Glacial till extends to the maximum depth investigated of 30½ feet bgs. Groundwater was not encountered to the depth investigated of 30½ feet bgs.

Staining or other visual indications of dangerous constituents were not observed. PID readings did not indicate organic vapors significantly elevated above background ambient levels in the soil samples. Field measurements of soil pH indicated a normal pH range of 7.1 S.U. to 9.5 S.U.

Groundwater was not encountered to the depth investigated of 30½ feet bgs. A 2-foot-thick layer of sand that was encountered only in boring ESB1151 at a depth of 17 feet to 19 feet bgs contained perched water. Due to the limited extent of this water, a monitoring well was not installed.

#### 2.3.3.2 Sample Analytical Results

Selected soil samples were submitted for analysis per the sample selection criteria specified on Figure A-5 in the SAP (Appendix A of the RIWP). Fifteen soil samples from depths ranging from 12½ feet to 30 feet bgs were submitted for analysis. A duplicate sample collected from soil boring ESB1153 (12½ feet) was also analyzed. Table 2-6 summarizes the analytical data for cyanide, pH, and cyclohexanol. Table 2-7 summarizes the analytical data for RCRA metals, copper, and nickel. These tables also list the applicable MTCA Method A and B cleanup levels.

The analytical results summarized in Table 2-6 indicate that cyanide was not detected above method reporting limits. A relatively low level of cyclohexanol (7.1 mg/kg to 28.0 mg/kg) was detected in seven of

16 samples analyzed. Cleanup levels for cyclohexanol have not been established by Ecology. Laboratory measurements of soil pH ranged from 8.4 S.U. to 9.4 S.U. and generally are consistent with the typical range (5 to 9 S.U.) for soil (Birkeland, 1984).

The analytical results summarized in Table 2-7 indicate metals, with the exception of arsenic and chromium, were either not detected at concentrations above the reporting limits, or were detected at concentrations below the applicable MTCA Method A or B soil cleanup levels.

Arsenic concentrations (1.2 mg/kg to 4.4 mg/kg) in most of the samples analyzed are above the applicable MTCA Method B soil cleanup level of 0.667 mg/kg and the most conservative preliminary soil cleanup level protective of groundwater (0.03 mg/kg). However, all the detected concentrations are less than the Puget Sound background concentration of 7.30 mg/kg (Ecology, 1994) and the MTCA Method A soil cleanup level protective of groundwater (20 mg/kg).

Total chromium concentrations (31.1 mg/kg to 45.9 mg/kg) are below the MTCA Method A and B soil cleanup levels for trivalent chromium (2,000 mg/kg and 120,000 mg/kg, respectively) and the Method B soil cleanup level for hexavalent chromium (240 mg/kg). These concentrations are greater than the MTCA Method A soil cleanup level (19 mg/kg) and the most conservative preliminary soil cleanup level protective of groundwater (18 mg/kg) for hexavalent chromium; however, the concentrations are below the Puget Sound background concentration (48.2 mg/kg) for total chromium (Ecology, 1994).

Evaluation of the vapor intrusion (VI) pathway for this SWMU/AOC is not recommended for the FS. Screening of the VI pathway was performed in this RI using Ecology's review draft *Guidance for Evaluating Soil Vapor Intrusion in Washington State: Investigation and Remedial Action*, dated October 2009 (VI guidance). Applying the Preliminary Assessment step of the VI guidance to this SWMU shows that chemicals present in soil beneath the SWMU are not sufficiently volatile to be a potential VI source. Groundwater was not encountered beneath these SWMUs/AOCs to a depth of 30½ feet bgs. In addition, PID readings taken during field sampling did not indicate organic vapors significantly elevated above background ambient levels in the soil samples.

## 2.4 SWMU/AOC NO. 156 BLUESTREAK AREA

SWMU/AOC No. 156 includes the Bluestreak Area pit, three sumps (EV-115, EV-116 and EV-117), four shallow basins located south and west of the pit, and three trenches located west of the pit. Three air scrubber pits (also listed as SWMU/AOC No. 007 on Attachment 7) located north of the building are also part of SWMU/AOC No. 156 as previously discussed in Section 2.3 above. The potential dangerous constituents that may have been in wastewater in these units include non-halogenated SVOCs (cyclohexanol), cyanide, acid and base solutions, RCRA metals, nickel, and copper. There have been no previous investigations of this area. Further details regarding this SWMU/AOC are presented in Section 4.0 of the RIWP. The tank line was decommissioned in 2003; the pits, basins trenches and sumps were decontaminated, filled with controlled density fill and capped with a floor slab. There is currently a machine shop in this area.

### 2.4.1 Purpose and Scope

The purpose of the investigation was to assess whether potential dangerous constituents in liquids contained in the Bluestreak Area units are present in the fill and underlying glacial till soil. The scope of investigation performed was in general accordance with Section 4.9.1 of the RIWP and included the following:

- Drilled 12 soil borings to a depth of approximately 25½ feet bgs and 10 borings to depths ranging from 2½ feet to 10½ feet using a limited access, hollow-stem auger drill rig and hand auger (one boring)
- Collected soil samples at prescribed depth intervals
- Field screened samples for organic vapors and pH
- Submitted selected soil samples for analysis for RCRA metals, nickel, copper, pH, cyanide and cyclohexanol (Sump EV-117 and Basin 3 only).

There were several deviations from the planned scope of investigation. One planned boring adjacent to Tankline C of the Bluestreak pit was not drilled and one boring adjacent to EV-115 (ESB1185) was terminated due to the presence of underground utilities and insufficient access to relocate these borings. A sample was not collected from a depth shallower than 8 feet bgs in boring ESB1189 to avoid puncturing an adjacent subgrade drainline. Boring ESB1192 was terminated at 2½ feet bgs due to refusal.

### 2.4.2 Documentation of Drilling and Sampling

Between April 21 and April 29, 1998, Dames & Moore monitored drilling of 22 soil borings adjacent to the Bluestreak Area pit, and associated basins and trenches as shown on Figure 2-2. Twelve soil borings (ESB1183, ESB1184, ESB1186 through ESB1189, and ESB1194 through ESB1199) were drilled to depths of approximately 25½ feet bgs near the Bluestreak pit and sumps. Ten borings (ESB1190 through ESB1193 and ESB1201 through ESB1205) were drilled to depths ranging from 2½ feet to 10 feet bgs adjacent to the basins and trenches. Samples were retrieved using a Dames & Moore U-type sampler fitted with stainless steel rings and a SPT split spoon sampler. Samples collected with the SPT sampler were transferred from the sampler to laboratory prepared glassware using a cleaned stainless spoon. After sampling was completed, the borings were backfilled with hydrated bentonite chips and capped with concrete. Drilling techniques and sampling procedures utilized were in general accordance with the SAP presented in Appendix A of the RIWP.

### 2.4.3 Field Observations and Sample Analysis Results

Presented in this section are the field observations and sample results associated with soil borings ESB1183 through ESB1199 and ESB1201 through ESB1205. The location of the borings and two geologic cross-sections of this area are shown on Figure 2-2. The cross-sections are presented on Figures 2-4 and 2-5. Geologic logs of the soil borings are presented in Appendix A1. The chain of custody forms and analytical laboratory reports are presented in Appendix A2. Data validation reports are in Appendix A3. Analytical results are summarized in Tables 2-8 and 2-9.

#### 2.4.3.1 Field Observations

The area investigated is covered with approximately 12-inch-thick concrete pavement. Three-inch-thick remnants of asphalt pavement were encountered within one foot of the concrete floor slab in many of the soil borings. Underlying the concrete and asphalt is fill soil consisting of fine to medium sand and silty sand to depths ranging from 2 feet to 10½ feet bgs. Native glacial till consisting of very dense silty sand was encountered beneath the fill. In some of the borings, glacial till was encountered directly below the asphalt remnant. Glacial till extends to the maximum depth investigated of 25½ feet bgs. Groundwater was not encountered to the maximum depth investigated of 25½ feet bgs.

Staining or other visual indications of dangerous constituents were not observed. PID readings did not indicate organic vapors elevated above background ambient levels in the soil samples. Field measurements of soil pH indicated a normal pH range of 7.3 S.U. to 8.8 S.U.

#### 2.4.3.2 Sample Analytical Results

Selected soil samples were submitted for analysis per the sample selection criteria specified on Figures A-3 (borings adjacent to trenches and basins) and Figure A-5 (borings adjacent to the Bluestreak pit and sumps) in the SAP (Appendix A of the RIWP). Fifty-three soil samples from depths ranging from 1½ feet to 25 feet bgs were analyzed. In addition, two duplicate samples collected from soil borings ESB1194 (17½ feet) and ESB1205 (6½ feet) were analyzed. Table 2-8 summarizes the analytical data for cyanide and pH in all the soil samples analyzed, and for cyclohexanol in 13 samples analyzed from only soil borings ESB1187 through ESB1190 (Sump EV-117) and ESB1202 (Basin 3). Table 2-9 summarizes the analytical data for RCRA metals, nickel, and copper. These tables also list the appropriate 2001 MTCA Method A and B cleanup levels.

The analytical results summarized in Table 2-8 indicate that cyclohexanol was not detected above method reporting limits in the 13 samples analyzed for this compound. Cyanide was detected in only four of the 55 samples analyzed and the concentrations (0.21 mg/kg to 0.42 mg/kg) are well below the MTCA Method B soil cleanup level (1,600 mg/kg). Laboratory measurements of soil pH ranged from 7.4 S.U. to 9.5 S.U. and are generally consistent with the typical range (5 to 9 S.U.) for soil (Birkeland, 1984).

The analytical results summarized in Table 2-9 indicate metals, with the exception of arsenic and chromium, were either not detected at concentrations above the reporting limits, or were detected at concentrations below the applicable MTCA Method A or B soil cleanup levels. Arsenic concentrations (1.1 mg/kg to 3.1 mg/kg) in most of the samples analyzed are above the MTCA Method B soil cleanup level of 0.667 mg/kg and the most conservative preliminary soil cleanup level protective of groundwater (0.03 mg/kg). However, all the detected concentrations are less than the Puget Sound background concentration of 7.30 mg/kg (Ecology, 1994) and the MTCA Method A soil cleanup level protective of groundwater (20 mg/kg).

Total chromium concentrations (26.7 mg/kg to 59.4 mg/kg) are below the MTCA Method A and B soil cleanup levels for trivalent chromium (2,000 mg/kg and 120,000 mg/kg, respectively) and the Method B soil cleanup level for hexavalent chromium (240 mg/kg). These concentrations are greater than the MTCA

Method A soil cleanup level (19 mg/kg) and the most conservative preliminary soil cleanup level protective of groundwater (18 mg/kg) for hexavalent chromium; however, with two exceptions, the concentrations are below the Puget Sound background concentration (48.2 mg/kg) for total chromium (Ecology, 1994). Based on the lack of elevated concentrations of other metals and constituents analyzed for in these and other samples from these borings, these concentrations are not considered to be indicative of a release.

Evaluation of the vapor intrusion (VI) pathway for this SWMU/AOC is not recommended for the FS. Screening of the VI pathway was performed in this RI using Ecology's review draft *Guidance for Evaluating Soil Vapor Intrusion in Washington State: Investigation and Remedial Action*, dated October 2009 (VI guidance). Applying the Preliminary Assessment step of the VI guidance to this SWMU shows that chemicals present in soil beneath the SWMU are not sufficiently volatile to be a potential VI source. Groundwater was not encountered beneath these SWMUs/AOCs to a depth of 25½ feet bgs. In addition, PID readings taken during field sampling did not indicate organic vapors significantly elevated above background ambient levels in the soil samples.

## 2.5 SWMU/AOC NO. 150: ZYGLO PENETRANT WASTEWATER SUMP AND CATCH BASIN

SWMU/AOC No. 150 is located within the northwest portion of Building 40-31 and is comprised of a concrete sump and two catch basins (Figure 2-1). The sump receives wastewater from the Zyglo Penetrant unit (via subgrade piping) and catch basins, and discharges to the sanitary sewer. The purpose of the catch basins is to only contain liquid in the event of a spill. Potential dangerous constituents which may have been present in liquids in the catch basins and sump include diesel range TPH (mineral oil) and cadmium, copper, and zinc. There have been no previous investigations of this area. Further details on SWMU/AOC No. 150 can be obtained from Section 4.0 of the RIWP.

### 2.5.1 Purpose and Scope

The purpose of the investigation was to assess whether liquids contained in the Zyglo sump are present in the fill and underlying glacial till soil. The scope of investigation performed was in general accordance with Sections 4.9.4 of the RIWP and included the following:

- Drilled one soil boring to a depth of approximately 13 feet using a Salisbury limited access, portable drill rig
- Collected soil samples at prescribed depth intervals
- Field screened samples for organic vapors and pH
- Submitted selected soil samples for analysis for TPH-D (as diesel and mineral oil) and selected metals (cadmium, zinc, and copper)

There were no deviations from the planned scope of investigation.

### 2.5.2 Documentation of Drilling and Sampling

On April 6, 1998, Dames & Moore monitored drilling of one soil boring (ESB1158) adjacent to the Zyglo penetrant sump (Figure 2-2). The soil boring was drilled to a depth of approximately 13 feet bgs. Samples were retrieved using a SPT split spoon sampler. The samples were transferred from the sampler to laboratory prepared glassware using a cleaned stainless spoon. After sampling was completed, the boring was backfilled with hydrated bentonite chips and capped with concrete. Drilling techniques and sampling procedures utilized were in general accordance with the SAP presented in Appendix A of the RIWP.

### 2.5.3 Field Observations and Sample Analysis Results

Presented in this section are the field observations and sample results associated with soil boring ESB1158. Geologic logs of the soil borings are presented in Appendix A1. The chain of custody forms and analytical laboratory reports are presented in Appendix A2. Data validation reports are in Appendix A3. Analytical results are summarized in Table 2-10.

#### 2.5.3.1 Field Observations

The boring was located within the shallow catch basin next to the Zyglo sump. The basin is depressed approximately one foot below the surrounding floor grade. The base of the basin consists of approximately 12-inch-thick concrete. Underlying the concrete is fill soil consisting of silty fine to medium sand to a depth of 5 feet bgs. Underlying the fill is native glacial till consisting of very dense, silty fine to medium sand with gravel. Glacial till extends to the maximum depth investigated of 13 feet bgs. Groundwater was not encountered in this boring.

Staining or other visual indications of dangerous constituents were not observed. PID readings did not indicate organic vapors elevated above background ambient levels in the soil samples. Field measurements of soil pH indicated a normal pH range of 7.6 S.U. to 8.7 S.U.

#### 2.5.3.2 Sample Analysis Results

Selected soil samples were submitted for analysis per the sample selection criteria specified on Figure A-3 in the SAP (Appendix A of the RIWP). Two soil samples from depths of 7½ feet and 10 feet bgs and a duplicate sample from 7½ feet were analyzed. Table 2-10 summarizes the analytical data for TPH-D and metals. This table also lists the applicable MTCA Method A and B cleanup levels.

Diesel range TPH was detected in only one sample at a depth of 10 feet at a concentration (8.3 mg/kg) which is below the MTCA Method A cleanup level (2,000 mg/kg). The laboratory indicated that the chromatographic pattern did not match a typical diesel or mineral oil range TPH pattern.

The metals analyzed were cadmium, copper, and zinc. These metals were either not detected at concentrations above the reporting limits, or were at concentrations below the applicable MTCA Method B soil cleanup levels, the Puget Sound background concentrations (Table 2-10), and the most conservative preliminary soil cleanup levels protective of groundwater.

Evaluation of the vapor intrusion (VI) pathway for this SWMU/AOC is not recommended for the FS. Screening of the VI pathway was performed in this RI using Ecology's review draft *Guidance for Evaluating Soil Vapor Intrusion in Washington State: Investigation and Remedial Action*, dated October 2009 (VI guidance). Applying the Preliminary Assessment step of the VI guidance to this SWMU shows that chemicals present in soil beneath the SWMU are not sufficiently volatile to be a potential VI source.

The one detection of TPH-D in soil (8.3 mg/kg) is well below the VI screening level for this compound (10,000 mg/kg, WAC 173-340-740[3][iii][C][II]). Groundwater was not encountered beneath these SWMUs/AOCs to a depth of 13 feet bgs. In addition, PID readings taken during field sampling did not indicate organic vapors significantly elevated above background ambient levels in the soil samples.

## 2.6 SWMU/AOC NO. 171 FORMER BLUESTREAK AREA VAPOR DEGREASER

The former Bluestreak Area Vapor Degreaser (Figure 2-6) was in operation from 1968 until 1994 when it was decommissioned and replaced with a new smaller vapor degreaser requiring a smaller pit. The pit was located south of the Bluestreak Area shown in Figure 2-1. The former degreaser was located in a subgrade concrete pit, which was lined with stainless steel in the late 1980s. Trichloroethylene (TCE) and 1,1,1-trichlorethane (TCA) were used as degreaser solvents in the unit. Soil samples were collected from the base and sidewalls after removal of the concrete pit and excavation for the new, larger degreaser. Analytical results for these samples indicated that residual concentrations of TCE ranging from 0.013 mg/kg to 11 mg/kg are present in the soils underlying the new vapor degreaser (SECOR, 1995). These concentrations are greater than the applicable MTCA soil cleanup level of 0.030 mg/kg (30 ug/kg); therefore, this area is recommended for inclusion in the FS, including assessment of the VI pathway. Ecology determined that further investigation of these soils was not warranted during the RI. The degreaser installed in 1994 was subsequently removed in 1997 and the pit filled with controlled density fill and capped with a concrete floor.

## 2.7 PHYSICAL TESTING RESULTS

Thirteen samples of glacial till soils and six samples of sand fill collected from adjacent to and below the air scrubber sumps were tested for one or more physical parameters including moisture content, effective porosity, percent saturation, and hydraulic conductivity. The laboratory reports are presented in Appendix S and pertinent results are described below. The porosity of the soils from depths of 10 to 25 feet bgs is on the order of 32% to 38%. The moisture content (5% to 13% dry weight) and percent saturation (44% to 60% volume) are relatively consistent in the samples tested. These results support the interpretation that the chemical analysis results indicate there has not been leakage from the air scrubber sumps. Vertical hydraulic conductivity values for one fill sample and three samples of glacial till soils range from $4.01 \times 10^{-5}$ for the fill sample and $5.76 \times 10^{-5}$ to $3.31 \times 10^{-4}$ cm/sec (0.11 to 0.94 ft/ day). Horizontal hydraulic conductivity values for one sample of fill and one sample of glacial till soils are $2.50 \times 10^{-5}$ and $6.38 \times 10^{-4}$ cm/sec (0.07 and 1.8 ft/day), respectively (Appendix S).

## 2.8 CONCLUSIONS

The results of drilling beneath and adjacent to the five SWMUs/AOCs in and adjacent to Building 40-31 indicate the presence of fill to depths ranging from 2 feet to 13 feet bgs. The fill is underlain by very dense glacial till to the maximum depth investigated of 30½ feet bgs. Groundwater or perched groundwater was not encountered in the fill and shallow glacial till soils to the depth of 30½ bgs, except for a minor zone of wet soil detected at a depth of 17 feet to 19 feet bgs in one soil boring (ESB1151), adjacent to an Air Scrubber Pit.

The soil analytical results presented in previous sections indicate that if there have been spills or leaks in the past from the five SWMUs/AOCs at Building 40-31 investigated during the RI, these have not resulted in dangerous constituent concentrations in soil above the applicable soil cleanup levels. This conclusion is supported by:

- Cyanide, cyclohexanol, and VOCs were either not detected above analytical method reporting limits or were detected at low concentrations well below the applicable MTCA Method B soil cleanup levels.
- Metals, with the exception of arsenic and chromium, were either (1) not equal to or detected at concentrations above the reporting limits, or (2) detected at concentrations equal to or below the applicable MTCA Method A or B soil cleanup levels.
- Arsenic concentrations are all less than the Puget Sound background concentration of 7.30 mg/kg; consequently these concentrations are considered to be within the range of naturally occurring concentrations.
- Total chromium concentrations are below the Puget Sound background concentration of 48.2 mg/kg with three exceptions. The exceptions are below the MTCA Method A and B cleanup levels for trivalent chromium and the Method B level for hexavalent chromium. Based on the lack of elevated concentrations of other metals and constituents analyzed for in these and other samples from the borings, these chromium concentrations are not considered indicative of a release.
- Field and laboratory pH values for soil samples were within or only slightly above the typical range (5 to 9 S.U.) for soils.
- TPH-D concentrations detected in soil adjacent to the Zyglo sump are well below the MTCA Method A soil cleanup level.

Based on the analytical results, no further investigation and remedial action are warranted for the five SWMUs/AOCs located in the Building 40-31 area that were investigated during the RI. Therefore none of these SWMUs/AOCs are recommended for inclusion in the FS. The plating shop was closed in 2003. Subsequent to the RI, the Bluestreak Area pit and associated sumps and air scrubbers (No. 156) were filled with controlled density fill (CDF) following the closure. The containment storage area (No. 134) north of the building was converted to a storage area for nonhazardous materials.

Based on the data evaluated, SWMU No. 171 is included in the FS for soils and potentially contaminated groundwater, and assessment of the VI pathway. At this time, concentrations of contaminants detected in soil are not known to be protective of groundwater quality.

## 2.9 REFERENCES

Birkeland, P.W., 1984, Soils and Geomorphology, Oxford University Press, 372 p.

SECOR, 1995, Environmental Assessment Report, Decommissionng of a Vapor Degreaser, 40-31Building, Boeing Commercial Aircraft group facility, Everett, Washington, February 27, 1995.

Washington State Department of Ecology (Ecology), 1994, Natural Background Soil Metals in Washington State, Publication #94-115.

# TABLE 2-1
# SUMMARY OF BORINGS AND SWMUs/AOCs

| SWMU/AOC Number and Name | Boring Numbers[1] |
|---|---|
| 151 Bluestreak Containment Trench | ESB1316, 1317, 1318, 1319 |
| 134 Plating Waste Container Storage Area | ESB1310, 1311, 1312, 1313, 1314, 1315 |
| 070 Former Clarifier UST | ESB1156, 1157, 1200 |
| 156 Air Scrubber Sump | ESB1151, 1152, 1153, 1154, 1155 |
| 156 Sump EV-115 | ESB1183, 1184, 1185 |
| 156 Sump EV-116 | ESB1185, 1186 |
| 156 Sump EV-117 | ESB1187, 1188, 1189 |
| 156 Bluestreak Pit | ESB1157, 1152, 1183, 1184, 1185, 1186, 1187, 1188, 1189, 1194, 1195, 1196, 1197, 1198, 1199 |
| 156 Basin 1 | ESB1193, 1199 |
| 156 Basin 2 | ESB1191, 1205 |
| 156 Trench 1 | ESB1184, 1185, 1205 |
| 156 Trench 2 | ESB1186, 1187, 1204 |
| 156 Trench 3 | ESB1188, 1189, 1203 |
| 156 Basin 3 | ESB1190, 1202 |
| 156 Basin 4 | ESB1192, 1201 |
| 150 Zyglo Penetrant Sump | ESB1158 |

1 = Some borings were used to assess more than one SWMU/AOC.

**Table 2-2**
**Summary of Soil Sample Analytical Results for Metals, (mg/kg)**
**Building 40-31 Waste Container Storage Area and Containment Trench**
**Boeing Everett Plant Remedial Investigation**

| Sample ID/Date | | Arsenic | Barium | Cadmium | Chromium | Copper | Lead | Nickel | Selenium |
|---|---|---|---|---|---|---|---|---|---|
| 1996 MTCA Method A or B Soil Cleanup Level | | 1.67 (B) | 5,600 (B) | 80 (B) | 100 (A)<br>500 (AI) | 2,960 (B) | 250 (A)<br>1,000 (AI) | 1,600 (B) | 400 (B) |
| 1996 MTCA Method B 100x GW Soil Cleanup Level | | 0.00583 | 112 | 1.6 | 1,600 ($Cr^{+3}$) | 59.2 | NE | 32.0 | 8.0 |
| 2001 MTCA Method A or B Soil Cleanup Level | | 20 (A)<br>0.667 (B) | 5,600 (B)<br>16,000 (B*) | 2 (A)<br>80 (B) | 2,000 ($Cr^{+3}$) / 19 ($Cr^{+6}$) (A)<br>120,000 ($Cr^{+3}$) / 240 ($Cr^{+6}$) (B) | 2,960 (B) | 250 (A)<br>1,000 (AI) | 1,600 (B) | 400 (B) |
| MTCA Method A or B Protection of Groundwater | | 20 (A)<br>0.03 (B) | 2,637 (B) | 2 (A)<br>1.1 (B) | 2,000 ($Cr^{+3}$) / 19 ($Cr^{+6}$) (A)<br>480,096 ($Cr^{+3}$) / 18 ($Cr^{+6}$) (B) | 263 (B) | 250 (A) | 417 (B) | 8.3 (B) |
| WA Department of Ecology - Puget Sound Regional Background Concentration | | 7.30 | NE | 0.8 | 48.2 | 36.4 | 24.0 | 47.8 | NE |
| ESB1310-1' | 07/30/98 | **1.3** | 42.3 | **2.6** | **45.5 J** | 16.9 | 3 | 64 | 0.1 U |
| ESB1310-6' | 07/30/98 | **1.0** | 47.0 | 0.2 U | **43.6 J** | 17.4 | 2 | 71 | 0.1 U |
| ESB1311-1 1/2' | 07/30/98 | **1.8** | 53.3 | 0.2 U | **38.1 J** | 15.3 | 3 | 54 | 0.1 U |
| ESB1311-5' | 07/30/98 | **1.9** | 54.3 | 0.2 U | **39.9 J** | 16.2 | 3 | 49 | 0.1 U |
| ESB1312-1' | 07/30/98 | **2.2** | 67.6 | 0.2 U | **42.5 J** | 19.0 | 3 | 54 | 0.1 U |
| ESB1312-5' | 07/30/98 | **2.8** | 63.4 | 0.2 U | **43.8 J** | 16.8 | 3 | 51 | 0.1 U |
| ESB1313-3' | 07/30/98 | **3.2** | 89.6 | 0.2 U | **43.2 J** | 22.4 | 4 | 57 | 0.1 U |
| ESB1313-5' | 07/30/98 | **4.2** | 80.7 | 0.2 U | **45.5 J** | 18.0 | 3 | 54 | 0.1 U |
| ESB1314-1' | 07/30/98 | **2.0** | 49.5 | 0.2 U | **34.8 J** | 15.5 | 3 | 61 | 0.1 U |
| ESB1314-5' | 07/30/98 | **1.8** | 45.8 | 0.2 U | **37.4 J** | 15.7 | 2 U | 61 | 0.1 U |
| ESB1314-11' | 07/30/98 | **1.9** | 48.0 | 0.2 U | **40.0 J** | 16.2 | 3 | 68 | 0.1 U |
| ESB1315-1' | 07/30/98 | **2.7** | 72.0 | 0.2 U | **43.0 J** | 20.9 | 3 | 52 | 0.1 U |
| ESB1315-5' | 07/30/98 | **2.6** | 37.6 | 0.2 U | **27.9 J** | 10.0 | 3 | 45 | 0.1 U |
| ESB1316-2' | 07/30/98 | **3.8** | 66.6 | 0.2 U | **38.4 J** | 18.4 | 4 | 51 | 0.1 U |
| ESB1316-6' | 07/30/98 | **3.4** | 56.9 | 0.2 U | **34.9 J** | 15.8 | 3 | 54 | 0.1 U |
| ESB1316-6' (DUP) | 07/30/98 | **2.8** | 60.2 | 0.2 U | **34.4 J** | 18.6 | 3 | 47 | 0.1 |
| ESB1317-2' | 07/30/98 | **3.5** | 74.4 | 0.2 U | **43.2 J** | 21.6 | 3 | 56 | 0.1 U |
| ESB1317-8' | 07/30/98 | **2.3** | 59.9 | 0.2 U | **43.3 J** | 16.1 | 3 | 43 | 0.1 U |
| ESB1318-2' | 07/30/98 | **2.8** | 65.2 | 0.9 | **54.5 J** | 19.7 | 3 | 55 | 0.2 U |
| ESB1318-8' | 07/30/98 | **2.2** | 69.7 | 0.2 U | **47.9 J** | 15.2 | 3 | 54 | 0.1 U |
| ESB1319-2' | 07/30/98 | **2.7** | 56.4 | 0.2 U | **41.4 J** | 15.9 | 3 | 51 | 0.2 U |
| ESB1319-5 1/2' | 07/30/98 | **3.0** | 60.6 | 0.2 U | **40.9 J** | 17.3 | 3 | 56 | 0.1 U |

**Notes:**
MTCA - Model Toxics Control Act
(A) - MTCA Method A soil cleanup level for unrestricted land use
(AI) - MTCA Method A soil cleanup level for industrial property
(B) - MTCA Method B soil cleanup level
(B*) Revised 2001 MTCA Method B value from Ecology website CLARC tables downloaded June 2010 (https://fortress.wa.gov/ecy/clarc/reporting/CLARCReporting.aspx).
1996 - Indicates MTCA soil cleanup levels, published 1996.
2001 - Indicates MTCA version 3.1 soil cleanup levels, published 2001.
(DUP) - Field duplicate
NE - Not established
J - Estimated value
U - Compound was analyzed for but not detected above the reporting limit shown.
Samples were analyzed for silver and mercury, but these metals were not detected in any of the samples.
Numbers in **bold** font indicate that the results reported exceed the most current MTCA cleanup level as of June 2010.

**Table 2-3**
**Summary of Soil Sample Analytical Results for Conventional Analyses**
**Building 40-31 Waste Container Storage Area and Containment Trench**
**Boeing Everett Plant Remedial Investigation**

| Sample ID/Date | | Total Cyanide (mg/kg) | pH |
|---|---|---|---|
| 1996 MTCA Method B Soil Cleanup Level | | 1,600 | NE |
| 1996 MTCA Method B 100x GW Soil Cleanup Level | | 32 | NE |
| 2001 MTCA Method B Soil Cleanup Level | | 1,600 | NE |
| ESB1310-1' | 07/30/98 | 0.21 U | 5.9 J |
| ESB1310-6' | 07/30/98 | 0.21 U | 6.7 J |
| ESB1311-1 1/2' | 07/30/98 | 0.21 U | 7.9 J |
| ESB1311-5' | 07/30/98 | 0.22 U | 8.2 J |
| ESB1312-1' | 07/30/98 | 0.22 U | 8.0 J |
| ESB1312-5' | 07/30/98 | 0.22 U | 8.0 J |
| ESB1313-3' | 07/30/98 | 0.22 U | 8.2 J |
| ESB1313-5' | 07/30/98 | 0.22 U | 7.2 J |
| ESB1314-1' | 07/30/98 | 0.21 U | 6.3 J |
| ESB1314-5' | 07/30/98 | 0.21 U | 7.9 J |
| ESB1314-11' | 07/30/98 | 0.22 U | 7.6 J |
| ESB1315-1' | 07/30/98 | 0.22 U | 7.9 J |
| ESB1315-5' | 07/30/98 | 0.23 U | 7.3 J |
| ESB1316-2' | 07/30/98 | 0.23 U | 7.9 J |
| ESB1316-6' | 07/30/98 | 0.22 U | 7.9 J |
| ESB1316-6' (DUP) | 07/30/98 | 0.21 U | 8.0 J |
| ESB1317-2' | 07/30/98 | 0.23 U | 8.7 J |
| ESB1317-8' | 07/30/98 | 0.22 U | 7.6 J |
| ESB1318-2' | 07/30/98 | 0.24 U | 8.2 J |
| ESB1318-8' | 07/30/98 | 0.22 U | 8.9 J |
| ESB1319-2' | 07/30/98 | 0.21 U | 9.1 J |
| ESB1319-5 1/2' | 07/30/98 | 0.22 U | 8.0 J |

**Notes:**
MTCA - Model Toxics Control Act
1996 - Indicates MTCA soil cleanup levels, published 1996.
2001 - Indicates MTCA version 3.1 soil cleanup levels, published 2001.
(DUP) - Field duplicate
J - Estimated value
NE - Not established
U - Compound was analyzed for but not detected above the reporting limit shown.

**Table 2-4**
**Summary of Soil Sample Analytical Results for Non-halogenated SVOCs, VOCs, and Conventional Analyses**
**Building 40-31 Outside: Former Clarifier UST**
**Boeing Everett Plant Remedial Investigation**

| Sample ID/Date | | Non-halogenated SVOCs (mg/kg) | Volatile Organic Compounds (μg/kg) | | | Conventional Analyses | |
|---|---|---|---|---|---|---|---|
| | | Cyclohexanol | Acetone | Methylene Chloride | Trichloroethene | Total Cyanide (mg/kg) | pH |
| 1996 MTCA Method B Soil Cleanup Level | | NE | 8,000,000 | 133,000 | 90,900 | 1,600 | NE |
| 1996 MTCA Method B 100x GW Soil Cleanup Level | | NE | 80,000 | 583 | 398 | 32 | NE |
| 2001 MTCA Method A or B Soil Cleanup Level | | NE | 8,000,000 (B) | 20 (A)<br>133,000 (B) | 30 (A)<br>90,900 (B)<br>11,000 (B*) | 1,600 (B) | NE |
| MTCA Method A or B Protection of Groundwater | | NE | 3,211 (B) | 20 (A)<br>25 (B) | 30 (A)<br>3.2 (B) | NE | NE |
| ESB1156-7 1/2' | 03/26/98 | 7.7 | 9.8 U* | 2.2 U | 1.1 U | 0.20 U | 8.2 J |
| ESB1156-10' | 03/26/98 | 5.0 U | 14.0 U* | 2.2 U | 1.1 U | 0.22 U | 8.0 J |
| ESB1157-7 1/2' | 03/26/98 | 5.0 U | 8.6 U* | 2.2 U | 1.1 U | 0.20 U | 7.6 J |
| ESB1157-7 1/2' (DUP) | 03/26/98 | 5.0 U | 12.0 U* | 2.6 U* | 1.1 U | 0.22 U | 8.4 J |
| ESB1157-12 1/2' | 03/26/98 | 5.0 U | 8.7 U* | 2.2 U | 3.0 | 0.22 U | 7.7 J |
| ESB1200-7 1/2' | 04/29/98 | 5.0 U | 10.0 U* | 2.2 U | 1.1 U | 0.22 U | 8.4 J |
| ESB1200-10' | 04/29/98 | 5.0 U | 11.0 U* | 2.1 U | 1.1 U | 0.22 U | 8.3 J |

**Notes:**
MTCA - Model Toxics Control Act.
(A) - MTCA Method A soil cleanup level for unrestricted land use
(B) - MTCA Method B soil cleanup level
(B*) Revised 2001 MTCA Method B value from Ecology website CLARC tables downloaded June 2010 (https://fortress.wa.gov/ecy/clarc/reporting/CLARCReporting.aspx).
1996 - Indicates MTCA soil cleanup levels, published 1996.
2001 - Indicates MTCA version 3.1 soil cleanup levels, published 2001.
(DUP) - Field duplicate
J - Estimated value
NE - Not established
U - Compound was analyzed for but not detected above the reporting limit shown.
* Result was qualified as not detected during validation due to method blank, trip blank, or rinsate blank results.

**Table 2-5**
**Summary of Soil Sample Analytical Results for Metals, (mg/kg)**
**Building 40-31 Outside: Former Clarifier UST**
**Boeing Everett Plant Remedial Investigation**

| Sample ID/Date | | Arsenic | Barium | Chromium | Copper | Lead | Nickel | Selenium | Silver |
|---|---|---|---|---|---|---|---|---|---|
| 1996 MTCA Method A or B Soil Cleanup Level | | 1.67 (B) | 5,600 (B) | 100 (A)<br>500 (AI) | 2,960 (B) | 250 (A)<br>1,000 (AI) | 1,600 (B) | 400 (B) | 400 (B) |
| 1996 MTCA Method B 100x GW Soil Cleanup Level | | 0.00583 | 112 | 1,600 ($Cr^{+3}$) | 59.2 | NE | 32.0 | 8.0 | 8.0 |
| 2001 MTCA Method A or B Soil Cleanup Level | | 20 (A)<br>0.667 (B) | 5,600 (B)<br>16,000 (B*) | 2,000 ($Cr^{+3}$) / 19 ($Cr^{+6}$) (A)<br>120,000 ($Cr^{+3}$) / 240 ($Cr^{+6}$) (B) | 2,960 (B) | 250 (A)<br>1,000 (AI) | 1,600 (B) | 400 (B) | 400 (B) |
| MTCA Method A or B Protection of Groundwater | | 20 (A)<br>0.03 (B) | 2,637 (B) | 2,000($Cr^{+3}$) / 19 ($Cr^{+6}$) (A)<br>480,096 ($Cr^{+3}$) / 18 ($Cr^{+6}$) (B) | 263 (B) | 250 (A) | 417 (B) | 8.3 (B) | 13.6 (B) |
| WA Department of Ecology - Puget Sound Regional Background Concentration | | 7.30 | NE | 48.2 | 36.4 | 24.0 | 47.8 | NE | NE |
| ESB1156-7 1/2' | 03/26/98 | **3.1** | 55.3 | **43.7** | 18.7 | 3 | 48.0 | 0.1 U | 0.3 U |
| ESB1156-10' | 03/26/98 | **2.9** | 65.0 | **40.4** | 27.9 | 4 | 54.0 | 0.2 U | 0.3 U |
| ESB1157-7 1/2' | 03/26/98 | **2.8** | 54.5 | **38.4** | 16.8 | 2 | 47.0 | 0.1 U | 0.3 U |
| ESB1157-7 1/2' (DUP) | 03/26/98 | **2.1** | 60.3 | **40.5** | 18.0 | 3 | 52.0 | 0.1 U | 0.3 U |
| ESB1157-12 1/2' | 03/26/98 | **0.6** | 45.8 | **40.9** | 19.4 | 2 U | 41.0 | 5.2 | 0.3 U |
| ESB1200-7 1/2' | 04/29/98 | **2.6** | 67.6 | **45.0** | 19.0 | 3 | 52.0 | 0.1 U | 0.3 U |
| ESB1200-10' | 04/29/98 | **2.4** | 60.9 | **41.4** | 16.9 | 3 | 52.0 | 0.1 U | 0.3 U |

**Notes:**
MTCA - Model Toxics Control Act.
(A) - MTCA Method A soil cleanup level for unrestricted land use
(AI) - MTCA Method A soil cleanup level for industrial property
(B) - MTCA Method B soil cleanup level
(B*) Revised 2001 MTCA Method B value from Ecology website CLARC tables downloaded June 2010 (https://fortress.wa.gov/ecy/clarc/reporting/CLARCReporting.aspx).
1996 - Indicates MTCA soil cleanup levels, published 1996.
2001 - Indicates MTCA version 3.1 soil cleanup levels, published 2001.
(DUP) - Field duplicate
NE - Not established
J - Estimated value
U - Compound was analyzed for but not detected above the reporting limit shown.
Samples were analyzed for cadmium and mercury, but these metals were not detected in any of the samples.
Numbers in **bold** font indicate that the results reported exceed the most current MTCA cleanup level as of June 2010.
Numbers in grey shading indicate results that exceed the MTCA Protection of Groundwater levels, but do not exceed the most current MTCA cleanup levels.

**Table 2-6**
**Summary of Soil Sample Analytical Results for Non-halogenated SVOCs and Conventional Analyses**
**Building 40-31 Outside: Air Scrubber Pits**
**Boeing Everett Plant Remedial Investigation**

| Sample ID/Date | | Non-halogenated SVOCs (mg/kg) | Conventional Analyses | |
|---|---|---|---|---|
| | | Cyclohexanol | Total Cyanide (mg/kg) | pH |
| 1996 MTCA Method B Soil Cleanup Level | | NE | 1,600 | NE |
| 1996 MTCA Method B 100x GW Soil Cleanup Level | | NE | 32 | NE |
| 2001 MTCA Method B Soil Cleanup Level | | NE | 1,600 | NE |
| ESB1151-12 1/2' | 03/25/98 | 9.4 | 0.21 U | 8.8 J |
| ESB1151-20' | 03/25/98 | 5.0 U | 0.22 U | 8.7 J |
| ESB1151-30' | 03/25/98 | 5.0 U | 0.22 U | 8.8 J |
| ESB1152-12 1/2' | 03/26/98 | 7.1 | 0.23 U | 8.6 J |
| ESB1152-20' | 03/26/98 | 28.0 | 0.20 U | 9.0 J |
| ESB1152-30' | 03/26/98 | 15.0 | 0.20 U | 9.2 J |
| ESB1153-12 1/2' | 03/26/98 | 5.0 U | 0.20 U | 8.4 J |
| ESB1153-12 1/2' (DUP) | 03/26/98 | 5.0 U | 0.21 U | 8.5 J |
| ESB1153-20' | 03/26/98 | 9.0 | 0.22 U | 9.2 J |
| ESB1153-30' | 03/26/98 | 11.0 | 0.21 U | 9.0 J |
| ESB1154-12 1/2' | 03/26/98 | 5.0 U | 0.21 U | 8.5 J |
| ESB1154-20' | 03/26/98 | 10.0 | 0.21 U | 9.1 J |
| ESB1154-30' | 03/26/98 | 5.0 U | 0.21 U | 9.0 J |
| ESB1155-12 1/2' | 03/26/98 | 5.0 U | 0.20 U | 9.1 J |
| ESB1155-20' | 03/26/98 | 5.0 U | 0.20 U | 8.9 J |
| ESB1155-30' | 03/26/98 | 5.0 U | 0.23 U | 9.4 J |

**Notes:**
MTCA - Model Toxics Control Act.
1996 - Indicates MTCA soil cleanup levels, published 1996.
2001 - Indicates MTCA version 3.1 soil cleanup levels, published 2001.
(DUP) - Field duplicate
J - Estimated value
NE - Not established
U - Compound was analyzed for but not detected above the reporting limit shown.

**Table 2-7**
**Summary of Soil Sample Analytical Results for Metals, (mg/kg)**
**Building 40-31 Outside: Air Scrubber Pits**
**Boeing Everett Plant Remedial Investigation**

| Sample ID/Date | | Arsenic | Barium | Chromium | Copper | Lead | Nickel | Selenium | Silver |
|---|---|---|---|---|---|---|---|---|---|
| 1996 MTCA Method A or B Soil Cleanup Level | | 1.67 (B) | 5,600 (B) | 100 (A)<br>500 (AI) | 2,960 (B) | 250 (A)<br>1,000 (AI) | 1,600 (B) | 400 (B) | 400 (B) |
| 1996 MTCA Method B 100x GW Soil Cleanup Level | | 0.00583 | 112 | 1,600 ($Cr^{+3}$) | 59.2 | NE | 32.0 | 8.0 | 8.0 |
| 2001 MTCA Method A or B Soil Cleanup Level | | 20 (A)<br>0.667 (B) | 5,600 (B)<br>16,000 (B*) | 2,000 ($Cr^{+3}$) / 19 ($Cr^{+6}$) (A)<br>120,000 ($Cr^{+3}$) / 240 ($Cr^{+6}$) (B) | 2,960 (B) | 250 (A)<br>1,000 (AI) | 1,600 (B) | 400 (B) | 400 (B) |
| MTCA Method A or B Protection of Groundwater | | 20 (A)<br>0.03 (B) | 2,637 (B) | 2,000 ($Cr^{+3}$) / 19 ($Cr^{+6}$) (A)<br>480,096 ($Cr^{+3}$) / 18 ($Cr^{+6}$) (B) | 263 (B) | 250 (A) | 417 (B) | 8.3 (B) | 13.6 (B) |
| WA Department of Ecology - Puget Sound Regional Background Concentration | | 7.30 | NE | 48.2 | 36.4 | 24.0 | 47.8 | NE | NE |
| ESB1151-12 1/2' | 03/25/98 | **4.4** | 68.1 | **45.9 J** | 19.3 | 3 | 57.0 | 0.1 U | 0.3 U |
| ESB1151-20' | 03/25/98 | **3.9** | 70.8 | **40.3 J** | 17.2 | 3 | 52.0 | 0.2 U | 0.3 U |
| ESB1151-30' | 03/25/98 | **2.9** | 51.1 | **31.8 J** | 16.4 | 2 | 49.0 | 0.1 U | 0.3 U |
| ESB1152-12 1/2' | 03/26/98 | **3.2** | 80.3 | **36.7** | 27.0 | 2 U | 47.0 | 0.2 U | 0.5 |
| ESB1152-20' | 03/26/98 | **2.7** | 76.6 | **44.0** | 24.6 | 3 | 58.0 | 0.1 U | 0.5 |
| ESB1152-30' | 03/26/98 | **3.2** | 78.1 | **41.3** | 23.4 | 3 | 55.0 | 0.2 U | 0.3 U |
| ESB1153-12 1/2' | 03/26/98 | **1.5** | 52.9 | **31.3** | 17.1 | 3 | 45.0 | 0.4 | 0.3 U |
| ESB1153-12 1/2' (DUP) | 03/26/98 | **2.8** | 57.4 | **38.1** | 18.5 | 3 | 52.0 | 0.1 U | 0.3 U |
| ESB1153-20' | 03/26/98 | **1.7** | 50.2 | **31.1** | 15.6 | 2 U | 51.0 | 0.1 U | 0.3 U |
| ESB1153-30' | 03/26/98 | **3.1** | 72.6 | **35.9** | 19.1 | 2 U | 45.0 | 0.1 U | 0.5 |
| ESB1154-12 1/2' | 03/26/98 | **1.2** | 59.1 | **43.7** | 18.7 | 3 | 51.0 | 0.1 U | 0.3 U |
| ESB1154-20' | 03/26/98 | **2.8** | 53.1 | **34.5** | 19.7 | 3 | 47.0 | 0.2 U | 0.3 U |
| ESB1154-30' | 03/26/98 | **2.6** | 63.4 | **38.4** | 26.7 | 4 | 50.8 | 0.2 U | 0.3 U |
| ESB1155-12 1/2' | 03/26/98 | **2.5** | 66.1 | **35.2** | 18.7 | 3 | 47.0 | 0.2 U | 0.3 U |
| ESB1155-20' | 03/26/98 | **3.7** | 59.4 | **33.9** | 26.3 | 3 | 51.0 | 0.2 U | 0.3 U |
| ESB1155-30' | 03/26/98 | **2.7** | 69.7 | **40.9** | 19.8 | 2 | 55.0 | 0.1 U | 0.3 U |

**Notes:**
MTCA - Model Toxics Control Act.
(A) - MTCA Method A soil cleanup level for unrestricted land use
(AI) - MTCA Method A soil cleanup level for industrial property
(B) - MTCA Method B soil cleanup level
(B*) Revised 2001 MTCA Method B value from Ecology website CLARC tables downloaded June 2010 (https://fortress.wa.gov/ecy/clarc/reporting/CLARCReporting.aspx).
1996 - Indicates MTCA soil cleanup levels, published 1996.
2001 - Indicates MTCA version 3.1 soil cleanup levels, published 2001.
(DUP) - Field duplicate
NE - Not established
J - Estimated value
U - Compound was analyzed for but not detected above the reporting limit shown.
Samples were analyzed for cadmium and mercury, but these metals were not detected in any of the samples.
Numbers in **bold** font indicate that the results reported exceed the most current MTCA cleanup level as of June 2010.

**Table 2-8**
**Summary of Soil Sample Analytical Results for Non-halogenated SVOCs and Conventional Analyses**
**Building 40-31 Inside: Blue Streak Area**
**Boeing Everett Plant Remedial Investigation**

| Sample ID/Date | | Non-halogenated SVOCs | Conventional Analyses | |
|---|---|---|---|---|
| | | Cyclohexanol (mg/kg) | pH | Total Cyanide (mg/kg) |
| 1996 MTCA Method B Soil Cleanup Level | | NE | - | 1,600 |
| 1996 MTCA Method B 100x GW Soil Cleanup Level | | NE | - | 32 |
| 2001 MTCA Method B Soil Cleanup Level | | NE | NE | 1,600 |
| ESB1183-15 1/2' | 04/22/98 | NA | 9.5 J | 0.22 U |
| ESB1183-17 1/2' | 04/22/98 | NA | 9.1 J | 0.21 U |
| ESB1183-25' | 04/22/98 | NA | 9 J | 0.22 U |
| ESB1184-15' | 04/22/98 | NA | 8.9 J | 0.22 U |
| ESB1184-17 1/2' | 04/22/98 | NA | 8.9 J | 0.22 U |
| ESB1184-25' | 04/22/98 | NA | 8.9 J | 0.22 U |
| ESB1186-15' | 04/23/98 | NA | 8.9 J | 0.22 U |
| ESB1186-17 1/2' | 04/23/98 | NA | 8.9 J | 0.21 U |
| ESB1186-25' | 04/23/98 | NA | 8.9 J | 0.22 U |
| ESB1187-15' | 04/24/98 | 5 U | 8.8 J | 0.22 U |
| ESB1187-17 1/2" | 04/24/98 | 5 U | 8.8 J | 0.21 U |
| ESB1187-25' | 04/24/98 | 5 U | 8.9 J | 0.22 U |
| ESB1188-15' | 04/24/98 | 5 U | 8.8 J | 0.22 U |
| ESB1188-17 1/2' | 04/24/98 | 5 U | 8.9 J | 0.21 U |
| ESB1188-25' | 04/24/98 | 5 U | 8.9 J | 0.22 U |
| ESB1189-15' | 04/24/98 | 5 U | 8.9 J | 0.22 U |
| ESB1189-18' | 04/24/98 | 5 U | 8.8 J | 0.21 |
| ESB1189-25' | 04/24/98 | 5 U | 8.7 J | 0.22 U |
| ESB1190-1 1/2' | 04/24/98 | 5 U | 7.4 J | 0.42 |
| ESB1190-3 1/2' | 04/24/98 | 5 U | 7.9 J | 0.21 |
| ESB1191-1 1/2' | 04/24/98 | NA | 8 J | 0.21 U |
| ESB1191-3 1/2' | 04/24/98 | NA | 8.1 J | 0.21 U |
| ESB1192-2' | 04/24/98 | NA | 8 J | 0.22 |
| ESB1193-1 1/2' | 04/27/98 | NA | 8.1 J | 0.21 U |
| ESB1193-5 1/2' | 04/27/98 | NA | 8.2 J | 0.22 U |
| ESB1194-13 1/2' | 04/27/98 | NA | 9 J | 0.21 U |
| ESB1194-17 1/2' | 04/27/98 | NA | 9 J | 0.22 U |
| ESB1194-17 1/2' (DUP) | 04/27/98 | NA | 9 J | 0.22 U |
| ESB1194-25' | 04/27/98 | NA | 9 J | 0.22 U |
| ESB1195-12 1/2' | 04/27/98 | NA | 8.9 J | 0.22 U |
| ESB1195-17 1/2' | 04/27/98 | NA | 9 J | 0.22 U |
| ESB1195-25' | 04/27/98 | NA | 9 J | 0.22 U |
| ESB1196-12 1/2' | 04/28/98 | NA | 8.7 J | 0.21 U |
| ESB1196-17 1/2' | 04/28/98 | NA | 8.8 J | 0.21 U |
| ESB1196-25' | 04/28/98 | NA | 8.8 J | 0.21 U |
| ESB1197-12 1/2' | 04/28/98 | NA | 8.7 J | 0.21 U |
| ESB1197-17 1/2' | 04/28/98 | NA | 8.8 J | 0.22 U |
| ESB1197-25' | 04/28/98 | NA | 8.5 J | 0.22 U |
| ESB1198-13' | 04/28/98 | NA | 8.7 J | 0.22 U |
| ESB1198-17 1/2' | 04/28/98 | NA | 8.4 J | 0.22 U |
| ESB1198-25' | 04/28/98 | NA | 8.8 J | 0.22 U |
| ESB1199-12 1/2' | 04/28/98 | NA | 8.8 J | 0.21 U |
| ESB1199-17 1/2' | 04/28/98 | NA | 8.7 J | 0.22 U |
| ESB1199-25' | 04/28/98 | NA | 8.8 J | 0.22 U |
| ESB1201-2 1/2' | 04/29/98 | NA | 7.4 J | 0.21 U |
| ESB1201-10' | 04/29/98 | NA | 8.4 J | 0.21 U |
| ESB1202-1 1/2' | 04/29/98 | 5 U | 8.5 J | 0.2 U |
| ESB1202-5 1/2' | 04/29/98 | 5 U | 8.2 J | 0.22 U |
| ESB1203-2 1/2' | 04/29/98 | NA | 8 J | 0.21 U |
| ESB1203-4 1/2' | 04/29/98 | NA | 8 J | 0.21 U |
| ESB1204-2 1/2' | 04/29/98 | NA | 7.8 J | 0.21 U |
| ESB1204-4 1/2' | 04/29/98 | NA | 7.9 J | 0.21 U |
| ESB1205-2 1/2' | 04/29/98 | NA | 8.1 J | 0.2 U |
| ESB1205-6 1/2' | 04/29/98 | NA | 8.2 J | 0.22 U |
| ESB1205-6 1/2' (DUP) | 04/29/98 | NA | 8.2 J | 0.21 U |

**Notes:**
MTCA - Model Toxics Control Act.
1996 - Indicates MTCA soil cleanup levels, published 1996.
2001 - Indicates MTCA version 3.1 soil cleanup levels, published 2001.
(DUP) - Field duplicate
NA - Not analyzed
NE - Not established
J - Estimated value
U - Compound was analyzed for but not detected above the reporting limit shown.

**Table 2-9**
**Summary of Soil Sample Analytical Results for Metals, (mg/kg)**
**Building 40-31 Inside: Blue Streak Area**
**Boeing Everett Plant Remedial Investigation**

| Sample ID/Date | | Arsenic | Barium | Cadmium | Chromium | Copper | Lead | Mercury | Nickel | Selenium | Silver |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1996 MTCA Method A or B Soil Cleanup Level | | 1.67 (B) | 5,600 (B) | 80 (B) | 100 (A)<br>500 (AI) | 2,960 (B) | 250 (A)<br>1,000 (AI) | 24 (B) | 1,600 (B) | 400 (B) | 400 (B) |
| 1996 MTCA Method B 100x GW Soil Cleanup Level | | 0.00583 | 112 | 1.6 | 1,600 (Cr+3) | 59.2 | NE | 0.48 | 32.0 | 8.0 | 8.0 |
| 2001 MTCA Method A or B Soil Cleanup Level | | 20 (A)<br>0.667 (B) | 5,600 (B)<br>16,000 (B*) | 2 (A)<br>80 (B) | 2,000($Cr^{+3}$) / 19 ($Cr^{+6}$) (A)<br>120,000($Cr^{+3}$) / 240 ($Cr^{+6}$) (B) | 2,960 (B) | 250 (A)<br>1,000 (AI) | 2 (A)<br>24 (B) | 1,600 (B) | 400 (B) | 400 (B) |
| MTCA Method A or B Protection of Groundwater | | 20 (A)<br>0.03 (B) | 2,637 (B) | 2 (A)<br>1.1 (B) | 2,000 ($Cr^{+3}$) / 19 ($Cr^{+6}$) (A)<br>480,096 ($Cr^{+3}$) / 18 ($Cr^{+6}$) (B) | 263 (B) | 250 (A) | 2 (A)<br>5.02 (B) | 417 (B) | 8.3 (B) | 13.6 (B) |
| WA Department of Ecology - Puget Sound Regional Background Concentration | | 7.30 | NE | 0.8 | 48.2 | 36.4 | 24.0 | 0.07 | 47.8 | NE | NE |
| ESB1183-15 1/2' | 04/22/98 | **2.4 J** | 67.4 | 0.2 U | **42.2** | 17.3 | 3 | 0.05 U | 58.0 | 8.0 | 0.5 |
| ESB1183-17 1/2' | 04/22/98 | **2.0 J** | 54.2 | 0.2 U | **41.7** | 17.0 | 4 | 0.05 U | 51.0 | 5.0 U | 0.5 |
| ESB1183-25' | 04/22/98 | **1.9 J** | 57.2 | 0.2 U | **59.4** | 17.2 | 4 | 0.06 | 55.0 | 5.0 U | 0.4 |
| ESB1184-15' | 04/22/98 | **2.4 J** | 64.5 | 0.2 U | **40.2** | 18.4 | 5 | 0.05 U | 49.0 | 8.0 | 0.5 |
| ESB1184-17 1/2' | 04/22/98 | **2.5 J** | 57.0 | 0.2 U | **37.8** | 16.1 | 4 | 0.05 U | 54.0 | 5.0 U | 0.5 |
| ESB1184-25' | 04/22/98 | **1.8 J** | 56.4 | 0.2 U | **40.2** | 19.9 | 5 | 0.04 U | 59.0 | 6.0 U | 0.6 |
| ESB1186-15' | 04/23/98 | **2.5** | 67.4 | 0.2 U | **36.6** | 18.8 | 4 | 0.05 U | 52.0 | 0.1 U | 0.3 U |
| ESB1186-17 1/2' | 04/23/98 | **2.1** | 62.7 | 0.2 U | **33.1** | 14.5 | 4 | 0.05 U | 47.0 | 0.1 U | 0.3 U |
| ESB1186-25' | 04/23/98 | **2.6** | 64.9 | 0.2 U | **36.4** | 18.1 | 5 | 0.05 U | 52.0 | 0.1 U | 0.3 U |
| ESB1187-15' | 04/24/98 | **1.3** | 48.5 | 0.2 U | **34.1** | 16.2 | 4 | 0.05 U | 51.0 | 0.1 U | 0.3 U |
| ESB1187-17 1/2" | 04/24/98 | **1.1** | 33.7 | 0.2 U | **26.7** | 9.1 | 4 | 0.05 U | 43.0 | 0.1 U | 0.3 U |
| ESB1187-25' | 04/24/98 | **2.2** | 63.0 | 0.2 U | **39.9** | 16.8 | 6 | 0.05 U | 48.0 | 0.1 U | 0.4 |
| ESB1188-15' | 04/24/98 | **1.8** | 72.9 | 0.2 U | **38.0** | 16.5 | 3 | 0.05 U | 50.0 | 0.1 U | 0.4 |
| ESB1188-17 1/2' | 04/24/98 | **2.8** | 45.6 | 0.2 U | **38.2** | 13.3 | 4 | 0.05 U | 47.0 | 0.1 U | 0.4 |
| ESB1188-25' | 04/24/98 | **2.0** | 54.1 | 0.2 U | **34.2** | 16.1 | 4 | 0.04 U | 48.0 | 0.1 U | 0.5 |
| ESB1189-15' | 04/24/98 | **2.4** | 66.3 | 0.2 U | **38.8** | 17.9 | 4 | 0.05 U | 53.0 | 0.1 U | 0.5 |
| ESB1189-18' | 04/24/98 | **2.1** | 54.5 | 0.2 U | **37.7** | 14.2 | 4 | 0.04 U | 52.0 | 0.1 U | 0.3 U |
| ESB1189-25' | 04/24/98 | **2.6** | 50.6 | 0.2 U | **33.6** | 14.1 | 4 | 0.05 U | 49.0 | 0.1 U | 0.4 |
| ESB1190-1 1/2' | 04/24/98 | **1.8** | 43.3 | 0.2 U | **44.0** | 15.7 | 4 | 0.05 U | 52.0 | 0.1 U | 0.3 |
| ESB1190-3 1/2' | 04/24/98 | **2.2** | 44.9 | 0.2 U | **47.0** | 15.2 | 4 | 0.04 U | 48.2 | 0.1 U | 0.3 |
| ESB1191-1 1/2' | 04/24/98 | **2.1** | 52.0 | 0.2 U | **38.0** | 16.9 | 3 | 0.05 U | 51.0 | 0.1 U | 0.6 |
| ESB1191-3 1/2' | 04/24/98 | **2.0** | 57.5 | 0.2 U | **32.3** | 16.9 | 3 | 0.05 U | 48.0 | 0.1 U | 0.3 |
| ESB1192-2' | 04/24/98 | **1.9** | 53.7 | 0.2 U | **46.6** | 19.0 | 3 | 0.05 U | 60.0 | 0.1 U | 0.5 |
| ESB1193-1 1/2' | 04/27/98 | **1.7** | 45.9 | 0.2 U | **31.3** | 13.4 | 3 | 0.05 U | 51.0 | 0.1 U | 0.3 U |
| ESB1193-5 1/2' | 04/27/98 | **2.4** | 51.7 | 0.2 U | **33.7** | 13.8 | 3 | 0.05 U | 49.0 | 0.1 | 0.3 U |
| ESB1194-13 1/2' | 04/27/98 | **2.6** | 53.6 | 0.2 U | **32.2** | 15.0 | 4 | 0.05 U | 48.0 | 0.1 U | 0.3 U |
| ESB1194-17 1/2' | 04/27/98 | **2.8** | 61.0 | 0.2 U | **44.4** | 18.0 | 4 | 0.05 U | 55.0 | 0.1 U | 0.3 U |
| ESB1194-17 1/2' (DUP) | 04/27/98 | **2.3** | 61.6 | 0.2 U | **47.3** | 18.6 | 5 | 0.05 U | 54.0 | 0.1 U | 0.3 U |
| ESB1194-25' | 04/27/98 | **2.5** | 56.5 | 0.2 U | **36.6** | 14.6 | 2 | 0.05 U | 50.0 | 0.1 U | 0.3 U |
| ESB1195-12 1/2' | 04/27/98 | **2.2** | 53.6 | 0.2 U | **34.1** | 15.4 | 3 | 0.05 U | 50.0 | 0.1 U | 0.3 U |
| ESB1195-17 1/2' | 04/27/98 | **1.7** | 53.6 | 0.2 U | **34.1** | 14.8 | 3 | 0.05 U | 53.0 | 0.1 U | 0.3 U |
| ESB1195-25' | 04/27/98 | **2.4** | 54.7 | 0.2 U | **31.7** | 16.0 | 3 | 0.05 U | 53.0 | 0.1 U | 0.3 U |
| ESB1196-12 1/2' | 04/28/98 | **3.0** | 67.4 | 0.2 U | **50.4 J** | 18.5 | 4 | 0.05 U | 61.0 | 0.1 U | 0.3 U |
| ESB1196-17 1/2' | 04/28/98 | **2.9** | 52.9 | 0.2 U | **40.6 J** | 15.5 | 3 | 0.05 U | 57.0 | 0.1 U | 0.3 U |
| ESB1196-25' | 04/28/98 | **2.7** | 63.8 | 0.2 U | **36.5 J** | 17.6 | 4 | 0.05 U | 56.0 | 0.1 U | 0.3 U |

**Table 2-9**
**Summary of Soil Sample Analytical Results for Metals, (mg/kg)**
**Building 40-31 Inside: Blue Streak Area**
**Boeing Everett Plant Remedial Investigation**

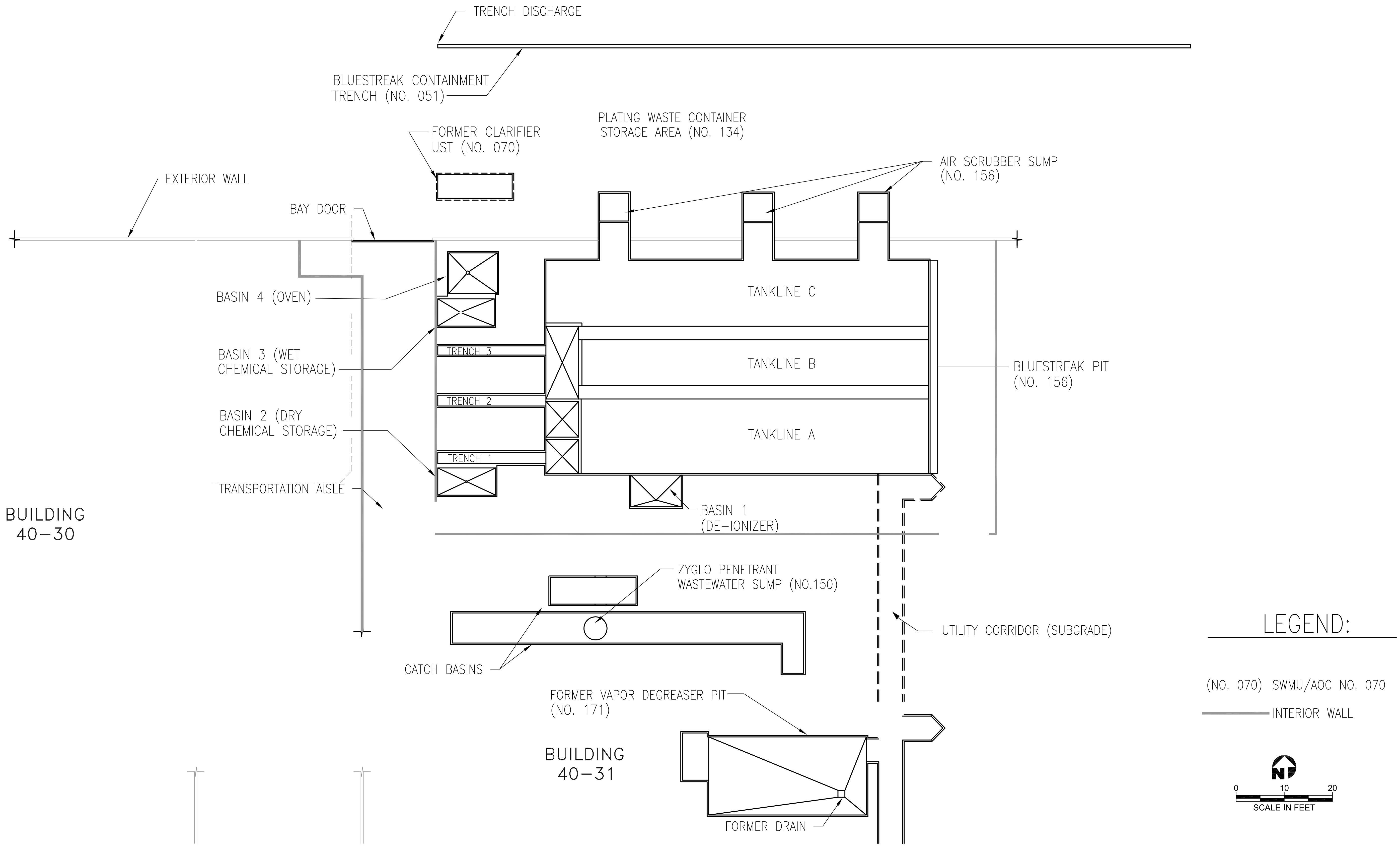
| Sample ID/Date | | Arsenic | Barium | Cadmium | Chromium | Copper | Lead | Mercury | Nickel | Selenium | Silver |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1996 MTCA Method A or B Soil Cleanup Level | | 1.67 (B) | 5,600 (B) | 80 (B) | 100 (A)<br>500 (AI) | 2,960 (B) | 250 (A)<br>1,000 (AI) | 24 (B) | 1,600 (B) | 400 (B) | 400 (B) |
| 1996 MTCA Method B 100x GW Soil Cleanup Level | | 0.00583 | 112 | 1.6 | 1,600 (Cr+3) | 59.2 | NE | 0.48 | 32.0 | 8.0 | 8.0 |
| 2001 MTCA Method A or B Soil Cleanup Level | | 20 (A)<br>0.667 (B) | 5,600 (B)<br>16,000 (B*) | 2 (A)<br>80 (B) | 2,000($Cr^{+3}$) / 19 ($Cr^{+6}$) (A)<br>120,000($Cr^{+3}$) / 240 ($Cr^{+6}$) (B) | 2,960 (B) | 250 (A)<br>1,000 (AI) | 2 (A)<br>24 (B) | 1,600 (B) | 400 (B) | 400 (B) |
| MTCA Method A or B Protection of Groundwater | | 20 (A)<br>0.03 (B) | 2,637 (B) | 2 (A)<br>1.1 (B) | 2,000 ($Cr^{+3}$) / 19 ($Cr^{+6}$) (A)<br>480,096 ($Cr^{+3}$) / 18 ($Cr^{+6}$) (B) | 263 (B) | 250 (A) | 2 (A)<br>5.02 (B) | 417 (B) | 8.3 (B) | 13.6 (B) |
| WA Department of Ecology - Puget Sound Regional Background Concentration | | 7.30 | NE | 0.8 | 48.2 | 36.4 | 24.0 | 0.07 | 47.8 | NE | NE |
| ESB1197-12 1/2' | 04/28/98 | **2.0** | 49.0 | 0.2 U | **37.9 J** | 12.9 | 3 | 0.04 U | 46.3 | 0.1 U | 0.3 U |
| ESB1197-17 1/2' | 04/28/98 | **2.5** | 60.0 | 0.2 U | **37.9 J** | 15.3 | 3 | 0.05 U | 54.0 | 0.1 U | 0.3 U |
| ESB1197-25' | 04/28/98 | **2.1** | 57.9 | 0.2 U | **36.9 J** | 15.5 | 4 | 0.05 U | 60.0 | 0.1 U | 0.3 U |
| ESB1198-13' | 04/28/98 | **2.1** | 57.9 | 0.2 U | **35.6 J** | 15.2 | 4 | 0.05 U | 56.0 | 0.1 U | 0.3 U |
| ESB1198-17 1/2' | 04/28/98 | **2.0** | 57.4 | 0.2 U | **35.7 J** | 16.0 | 4 | 0.05 U | 60.0 | 0.1 U | 0.3 U |
| ESB1198-25' | 04/28/98 | **3.1** | 62.8 | 0.2 U | **39.7 J** | 16.1 | 3 | 0.04 U | 63.0 | 0.1 U | 0.3 U |
| ESB1199-12 1/2' | 04/28/98 | **2.3** | 69.7 | 0.2 U | **44.3 J** | 18.7 | 4 | 0.05 U | 58.0 | 0.1 U | 0.4 |
| ESB1199-17 1/2' | 04/28/98 | **2.7** | 62.4 | 0.2 U | **43.4 J** | 19.8 | 7 | 0.05 U | 52.0 | 0.1 U | 0.3 |
| ESB1199-25' | 04/28/98 | **2.6** | 64.3 | 0.2 U | **37.6 J** | 17.8 | 4 | 0.05 U | 66.0 | 0.1 U | 0.3 U |
| ESB1201-2 1/2' | 04/29/98 | **1.6** | 52.6 | 0.2 U | **31.7** | 15.5 | 3 | 0.05 U | 46.0 | 0.1 U | 0.3 U |
| ESB1201-10' | 04/29/98 | **1.7** | 50.3 | 0.2 U | **43.0** | 17.8 | 3 | 0.05 U | 66.0 | 0.1 U | 0.3 U |
| ESB1202-1 1/2' | 04/29/98 | **1.8** | 47.0 | 0.2 U | **39.9** | 16.2 | 3 | 0.05 U | 56.9 | 0.1 U | 0.3 U |
| ESB1202-5 1/2' | 04/29/98 | **2.3** | 47.3 | 0.2 U | **36.2** | 13.7 | 2 U | 0.05 U | 57.0 | 0.1 U | 0.3 U |
| ESB1203-2 1/2' | 04/29/98 | **2.0** | 52.5 | 0.2 U | **36.8** | 15.9 | 3 | 0.04 U | 49.0 | 0.1 U | 0.3 U |
| ESB1203-4 1/2' | 04/29/98 | **2.4** | 50.4 | 0.2 U | **32.8** | 13.7 | 2 | 0.05 U | 47.0 | 0.1 U | 0.3 U |
| ESB1204-2 1/2' | 04/29/98 | **2.9** | 51.8 | 0.3 | **39.3** | 15.6 | 3 | 0.05 U | 52.0 | 0.1 U | 0.3 U |
| ESB1204-4 1/2' | 04/29/98 | **2.5** | 61.9 | 0.2 U | **36.7** | 16.0 | 3 | 0.05 U | 48.0 | 0.1 U | 0.3 U |
| ESB1205-2 1/2' | 04/29/98 | **2.2** | 39.1 | 0.2 U | **34.7** | 13.8 | 3 | 0.05 U | 46.0 | 0.1 U | 0.3 U |
| ESB1205-6 1/2' | 04/29/98 | **2.1** | 54.4 | 0.2 U | **31.3** | 16.2 | 3 | 0.04 U | 50.0 | 0.1 U | 0.3 U |
| ESB1205-6 1/2' (DUP) | 04/29/98 | **2.6** | 58.8 | 0.2 U | **41.7** | 15.7 | 4 | 0.05 U | 51.0 | 0.1 U | 0.3 U |

**Notes:**
MTCA - Model Toxics Control Act.
(A) - MTCA Method A soil cleanup level for unrestricted land use
(AI) - MTCA Method A soil cleanup level for industrial property
(B) - MTCA Method B soil cleanup level
(B*) Revised 2001 MTCA Method B value from Ecology website CLARC tables downloaded June 2010 (https://fortress.wa.gov/ecy/clarc/reporting/CLARCReporting.aspx).
1996 - Indicates MTCA soil cleanup levels, published 1996.
2001 - Indicates MTCA version 3.1 soil cleanup levels, published 2001.
(DUP) - Field duplicate
NE - Not established
J - Estimated value
U - Compound was analyzed for but not detected above the reporting limit shown.
Numbers in **bold** font indicate that the results reported exceed the most current MTCA cleanup level as of June 2010.

**Table 2-10**
**Summary of Soil Sample Analytical Results for TPH and Metals, (mg/kg)**
**Building 40-31 (Zyglo Penetrant Sump)**
**Boeing Everett Plant Remedial Investigation**

| Sample ID/Date | | Total Petroleum Hydrocarbons | | Metals** | |
|---|---|---|---|---|---|
| | | Diesel Range | Mineral Oil Range | Copper | Zinc |
| 1996 MTCA Method A or B Soil Cleanup Level | | 200 (A) | 200 (A) | 2,960 (B) | 24,000 (B) |
| 1996 MTCA Method B 100x GW Soil Cleanup Level | | NE | NE | 59.2 | 480 |
| 2001 MTCA Method A or B Soil Cleanup Level | | 2,000 (A) | 4,000 (A) | 2,960 (B) | 24,000 (B) |
| MTCA Method A or B Protection of Groundwater | | NC | NC | 263 (B) | 5,971 (B) |
| WA Department of Ecology - Puget Sound Regional Background Concentration | | - | - | 36.4 | 85.1 |
| ESB1158-7 1/2' | 04/06/98 | 5.5 U | 11 U | 18.4 | 35.8 |
| ESB1158-7 1/2' (DUP) | 04/06/98 | 5.5 U | 11 U | 20.3 | 37.4 |
| ESB1158-10' | 04/06/98 | 8.3 * | 11 U | 29.6 | 36.3 |

**Notes:**
MTCA - Model Toxics Control Act.
(A) - MTCA Method A soil cleanup level for unrestricted land use
(B) - MTCA Method B soil cleanup level
1996 - Indicates MTCA soil cleanup levels, published 1996.
2001 - Indicates MTCA version 3.1 soil cleanup levels, published 2001.
(DUP) - Field duplicate
NE - Not established
NC - Not calculated
TPH - Total Petroleum Hydrocarbons; Diesel range fractions were quantitated using NWTPH-Dx and oil range fractions were quantitated using NWTPH-Dx extended.
U - Compound was analyzed for but not detected above the reporting limit shown.
* Pattern profile of sample does not match a typical diesel or mineral oil pattern.
** Samples were analyzed for cadmium, but cadmium was not detected in the samples analyzed.




Job No. 33761927

**Figure 2-1**
**BUILDING 40-31 PLAN**

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Boeing Commercial Airplanes, Everett Plant
REMEDIAL INVESTIGATION REPORT

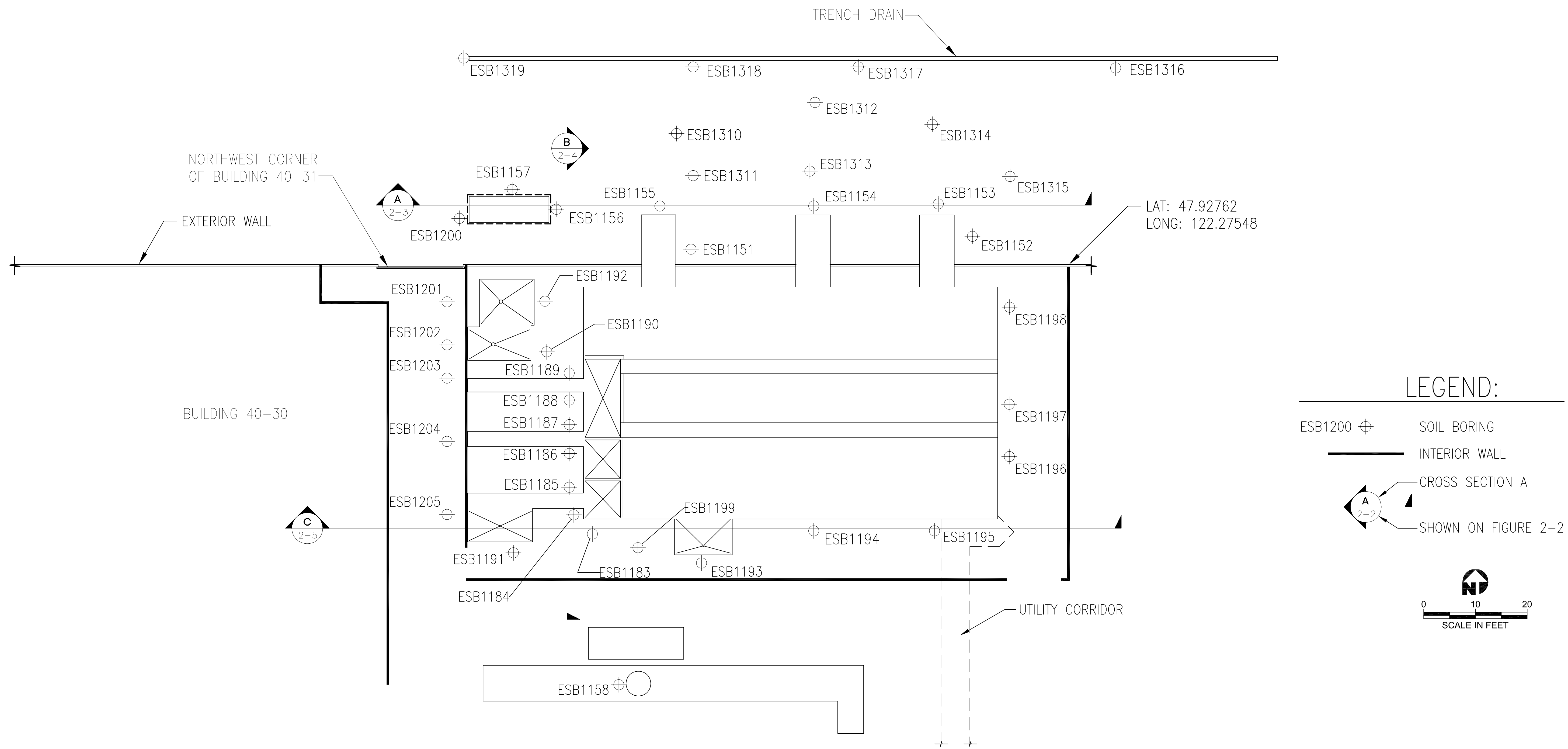


Figure 2-2
**BUILDING 40-31 SOIL BORING LOCATIONS**

Job No. 33761927

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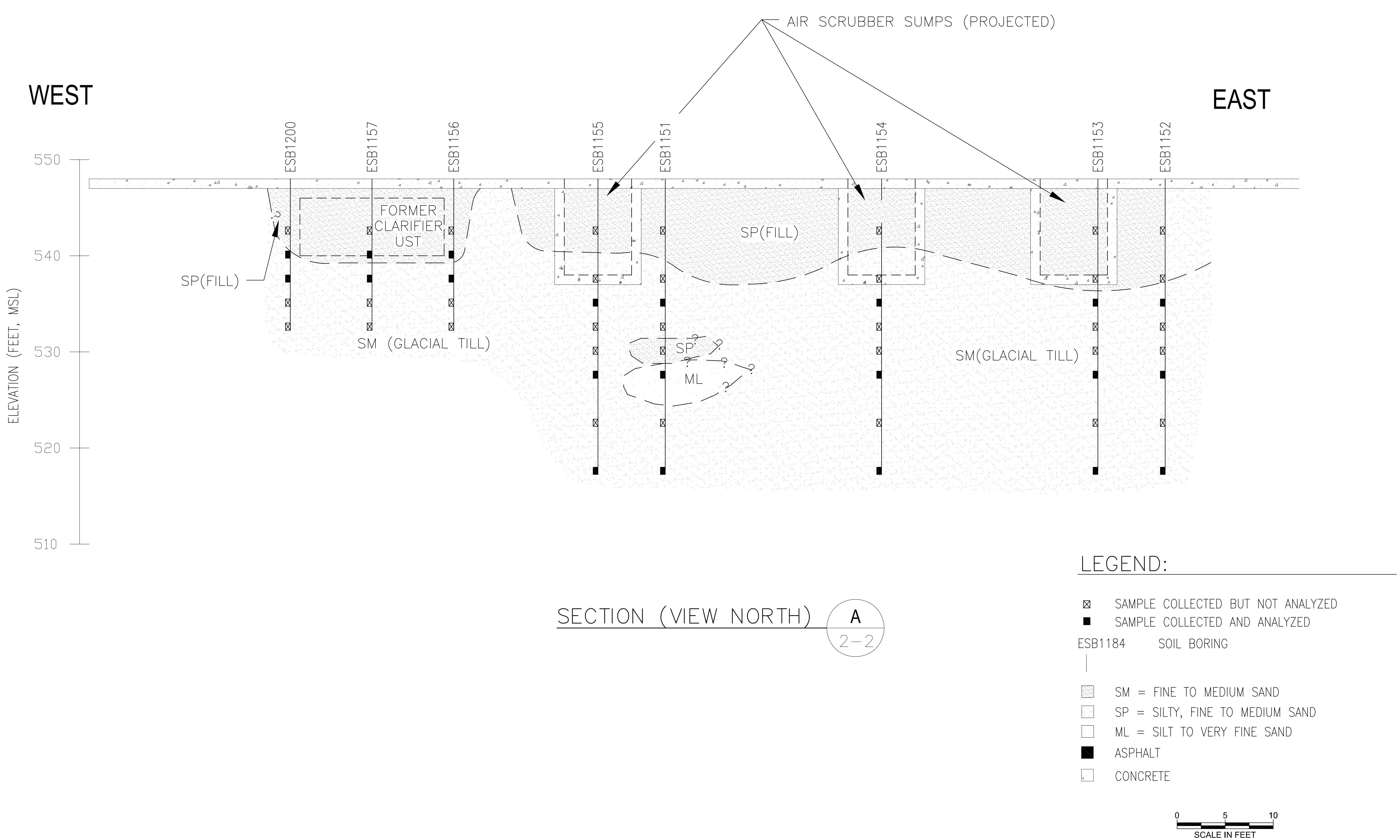
Boeing Commercial Airplanes, Everett Plant
REMEDIAL INVESTIGATION REPORT




Job No. 33761927

Figure 2-3

**BUILDING 40-31 CROSS SECTION A**

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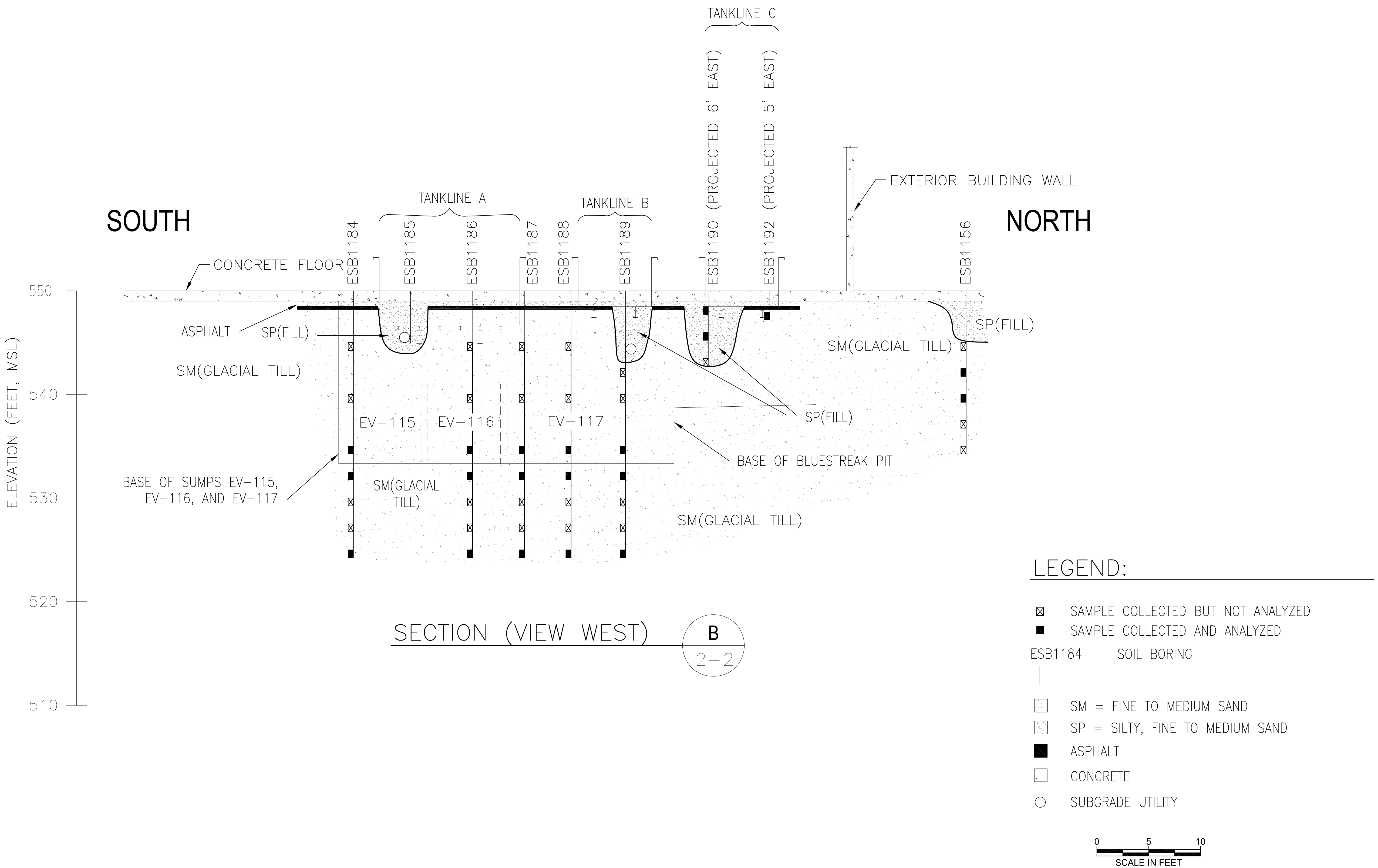
Boeing Commercial Airplanes, Everett Plant
REMEDIAL INVESTIGATION REPORT




Job No. 33761927

**Figure 2-4**

**BUILDING 40-31 CROSS SECTION B**

Boeing Commercial Airplanes, Everett Plant
REMEDIAL INVESTIGATION REPORT

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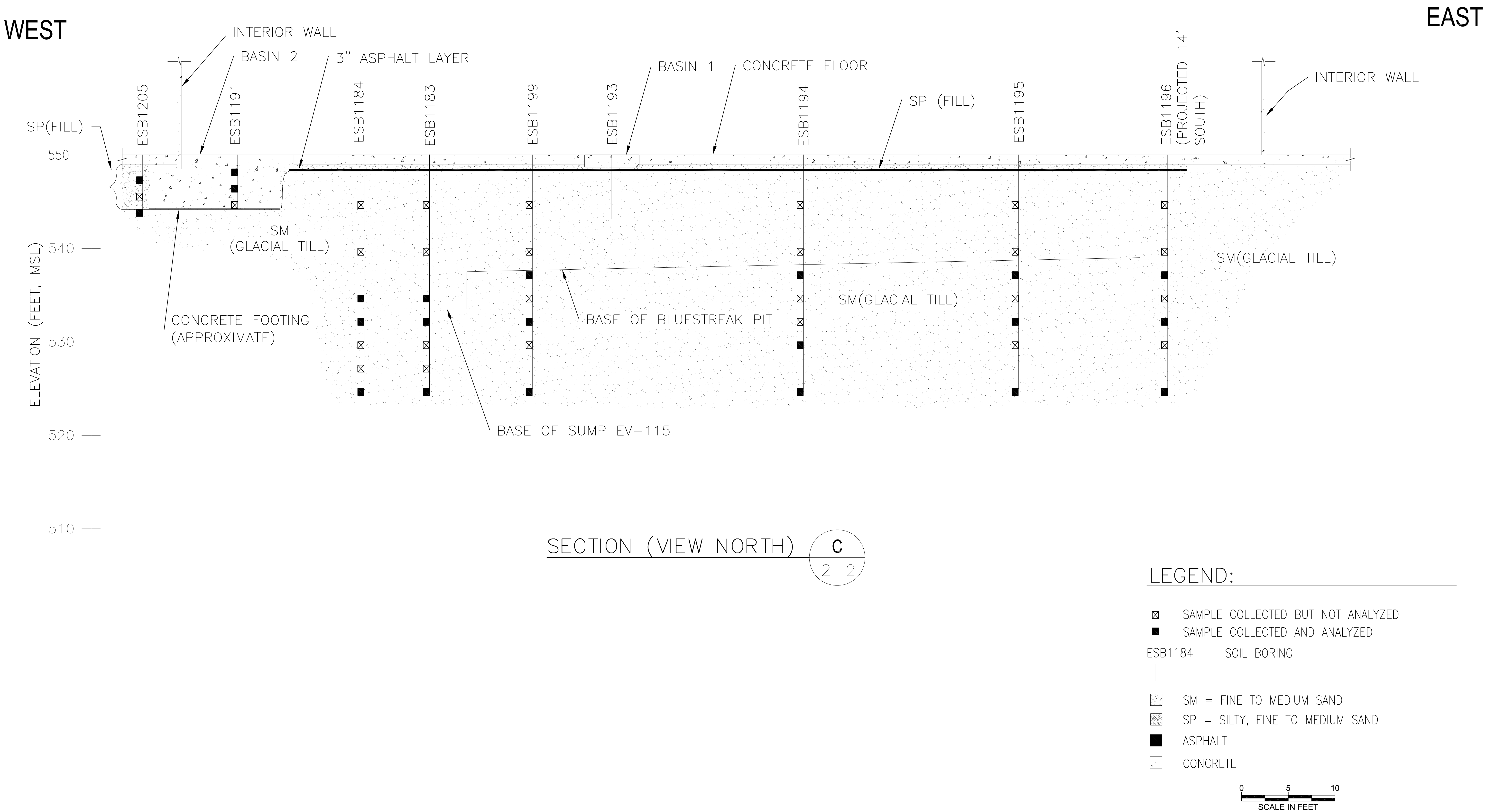


Job No. 33761927

**Figure 2-5**

**BUILDING 40-31 CROSS SECTION C**

Boeing Commercial Airplanes, Everett Plant
REMEDIAL INVESTIGATION REPORT

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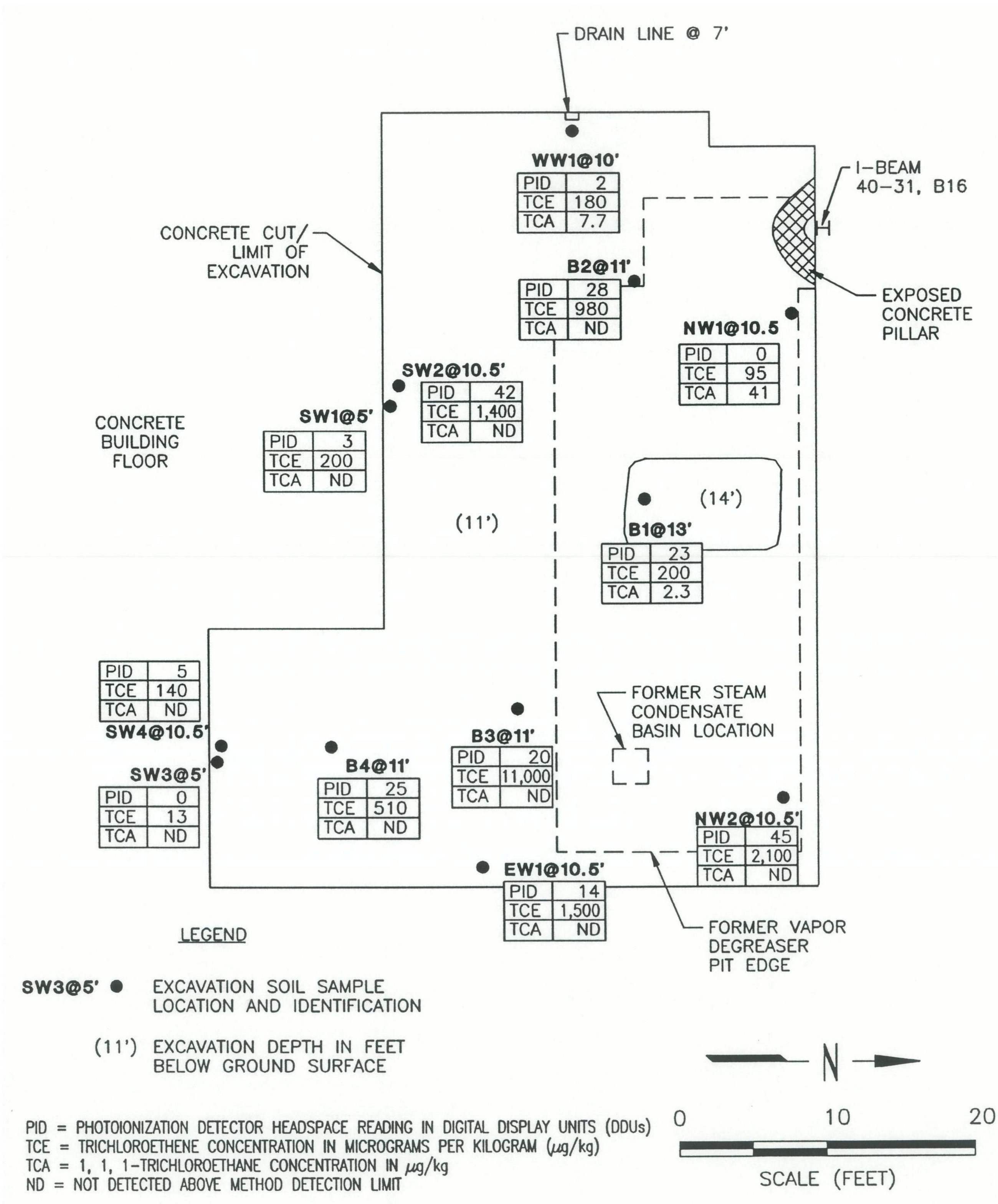



*Source: SEACOR, 1995.*

Figure 2-6

**Building 40-31 Former Bluestreak Degreaser Post-Excavation Soil Sample Analytical Results**

Job No. 33761927

# 3.0 BUILDING 40-51

This section presents the results of the subsurface investigation performed at three Attachment 5 SWMUs/AOCs and two Attachment 7 SWMUs/AOCs located in or near Building 40-51 at the Everett Plant (Figure 3-1). This investigation was performed in accordance with Section 5.5 of the RIWP, Section 9.4 of the IAWP, and Section 3.2 of the Supplemental RIWP. The SWMUs/AOCs investigated include:

- No. 054 – Former Wastewater AST
- No. 065 – Former Paint Stripping Tankline
- No. 069 – East Traveling Paint Booth Sump (EV-114)
- No. 090 – Former UST EV-11
- No. 151 – Fuselage Area Southern Air Scrubber Trenches

  Southern Air Scrubber Sumps (EV-112 and EV-119)

  Wing Area Southern Air Scrubber Trenches

  Northern Air Scrubber Trenches and Sump (EV-113)

  Cure Area

## 3.1 SWMU/AOC NO. 054 FORMER WASTEWATER AST

SWMU/AOC No. 054 consists of a former aboveground storage tank (AST) that was located approximately 60 feet east of the northeast corner of Building 40-51 (Figure 3-1). It was used to contain wastewater from Building 40-51 air scrubber sumps from 1969 to 1988. The former wastewater AST was constructed of steel. The dimensions of this 25,000-gallon AST were 43 feet long and 9 feet in diameter. The tank was situated above a concrete slab with spill containment walls around it. A blind sump was located in the northeast corner of the containment area. The tank received wastewater from the Building 40-51 sumps and discharged the wastewater to the sanitary sewer via buried piping. There is no specific information on the depth of the buried piping, but it is assumed to have been at least 2 feet below grade. The operation of the tank was discontinued in 1988 when it was cleaned and removed from the area.

Potentially dangerous constituents which may have been present within the wastewater discharged from the air scrubber sumps to the AST include metals, non-halogenated SVOCs, phenol, TPH-G, TPH-D, and VOCs associated with products used in the cleaning, sealing, priming and painting processes. There have been no previous investigations of this area. Further details on SWMU/AOC No. 054 are presented in Section 5.0 of the RIWP.

### 3.1.1 Purpose and Scope

The purpose of the investigation was to assess whether potentially dangerous constituents in wastewater in the former AST and associated piping are present in the fill and glacial till soil beneath the location of the former unit and piping. The scope of investigation performed was in general accordance with Section 5.5.1 of the RIWP and included the following:

- Completed three borings to depths ranging from 9 feet to 11 feet bgs using a truck-mounted Geoprobe rig
- Collected soil samples at prescribed depth intervals
- Field screened samples for organic vapors
- Submitted selected soil samples for analysis for VOCs, non-halogenated SVOCs, phenol, TPH-G, TPH-D, and 8 RCRA metals plus strontium

There were no deviations from the planned scope of investigation.

### 3.1.2 Documentation of Drilling and Sampling

On July 30, 1998, Dames & Moore monitored the completion of three soil probe borings (ESB1307, ESB1308, and ESB1309) in the area of the former wastewater AST as shown on Figure 3-2. Two soil probes (ESB1307, ESB1308) were completed to a depth of 9 feet bgs in the area of the AST and one probe (ESB1309) was completed to a depth of 11 feet bgs near the underground piping associated with the AST. Soil samples were retrieved using SPT split spoon and Geoprobe samplers. The samples were transferred to laboratory prepared glassware using a cleaned stainless spoon. After sampling was completed, the borings were backfilled with hydrated bentonite chips and capped with concrete. Drilling techniques and sampling procedures utilized were in general accordance with the SAP presented in Appendix A of the RIWP.

### 3.1.3 Field Observations and Sample Analysis Results

Presented in this section are the field observations and sample results associated with soil probe borings ESB1307 through ESB1309 as shown on Figure 3-2. Geologic logs of the borings are presented in Appendix B1. The chain of custody forms and analytical laboratory reports are presented in Appendix B2. Data validation reports are in Appendix B3. Analytical results are summarized in Tables 3-1, 3-2, and 3-3.

#### 3.1.3.1 Field Observations

The area investigated is covered with approximately 8-inch-thick concrete pavement. Underlying the concrete is fill soil consisting of fine to medium sand and gravelly sand overlying silty fine to medium sand to depths ranging from 6 feet to 11 feet bgs, the maximum depth investigated. Native glacial till consisting of very dense silty sand was only encountered in boring ESB1307 at a depth of 6 feet bgs.

Staining or other visual indications of dangerous constituents were not observed. PID readings indicate organic vapors slightly (up to 72 ppmv) above background ambient levels in fill soil samples from borings ESB1308 and ESB1309.

Minor perched water was encountered in fill soil in sand layers at a depth of 7½ feet bgs in probe ESB1308 and 9 feet bgs in probe ESB1309. The glacial till soil in boring ESB1307 was dry to damp. A water sample was collected from ESB1308 but not analyzed because surface water runoff from rainfall entered the probe hole and likely affected the integrity of the sample. Analytical results from this sample would not have been representative of perched water only.

#### 3.1.3.2 Sample Analysis Results

Six soil samples from depths ranging from 1 foot to 9 feet bgs were submitted for analysis per the sample selection criteria specified on Figure A-3 in the SAP (Appendix A of the RIWP). Table 3-1 summarizes the analytical data for VOCs. Table 3-2 summarizes the analytical data for non-halogenated SVOCs, phenol, gasoline and diesel range TPH. Table 3-3 summarizes the analytical data for RCRA metals plus strontium. These tables also list the applicable MTCA Method A and B soil cleanup levels.

The analytical results (Table 3-1) indicate VOCs were either not detected at concentrations above the method reporting limits or were detected at concentrations below the applicable MTCA Method B cleanup levels with the exception of trichloroethene (TCE) and methylene chloride. TCE was detected in boring ESB1308 at 1 foot bgs at a concentration of 140 μg/kg. TCE was also detected in boring ESB1309 at concentrations of 1,200 μg/kg and 510 μg/kg in soil samples collected from depths of 3 feet and 9 feet bgs, respectively. These concentrations are below the applicable MTCA Method B soil cleanup level (11,000 μg/kg), but are above the MTCA Method A unrestricted soil cleanup level (30 μg/kg), as well as the most conservative preliminary soil cleanup level protective of groundwater (3.2 μg/kg). The concentration of TCE in the 8 ½ foot bgs sample from ESB1308 was 5.7 μg/kg, which exceeds the most conservative preliminary soil cleanup level protective of groundwater (3.2 μg/kg), but does not exceed the MTCA Method A soil cleanup level (30 μg/kg) protective of both direct contact and groundwater. Methylene chloride was detected in boring ESB1309 at concentrations of 41 μg/kg and 23 μg/kg at depths of 3 feet and 9 feet bgs, respectively. These concentrations are above the MTCA Method A unrestricted soil cleanup level (20 μg/kg) and the most conservative preliminary soil cleanup level protective of groundwater (20 μg/kg), but below the applicable MTCA Method B soil cleanup level of 133,000 μg/kg.

Non-halogenated SVOCs, TPH-D, TPH-G, and phenol were not detected at concentrations above the method reporting limits (Table 3-2).

The analytical results indicate RCRA metals and strontium were either not detected at concentrations above the method reporting limits or were detected at concentrations below the applicable MTCA soil cleanup levels, with the exception of arsenic, chromium, and strontium (Table 3-3). Arsenic concentrations (1.7 mg/kg to 2.9 mg/kg) in all the samples analyzed are above the applicable MTCA Method B soil cleanup level (0.667 mg/kg) and the most conservative preliminary soil cleanup level protective of groundwater (0.03 mg/kg). However, all the detected concentrations are less than the Puget Sound background concentration of 7.30 mg/kg (Ecology, 1994) and the MTCA Method A soil cleanup level protective of groundwater (20 mg/kg).

Total chromium concentrations ranged from 39.5 mg/kg to 46.0 mg/kg, and are below the applicable MTCA Method A and B soil cleanup levels for trivalent chromium (2,000 mg/kg and 120,000 mg/kg, respectively) and the Method B level for hexavalent chromium (240 mg/kg). These concentrations are above the MTCA Method A soil cleanup level (19 mg/kg) and the most conservative preliminary soil cleanup level protective of groundwater (18 mg/kg) for hexavalent chromium, but are below the Puget Sound soil background concentration of 48.2 mg/kg for total chromium (Ecology, 1994).

Concentrations of strontium ranged from 32.4 mg/kg to 45.9 mg/kg, with four of the six samples exhibiting strontium concentrations exceeding the most conservative preliminary soil cleanup level protective of groundwater (38.4 mg/kg), and all are below the MTCA Method B soil cleanup level protective of direct contact (48,000 mg/kg).

Evaluation of the vapor intrusion (VI) and soil to groundwater pathways for TCE in soil near this SWMU/AOC is recommended for the FS in addition to the direct contact pathway. Screening of the VI pathway was performed in this RI using Ecology's review draft *Guidance for Evaluating Soil Vapor Intrusion in Washington State: Investigation and Remedial Action*, dated October 2009 (VI guidance). Applying the Preliminary Assessment step of the VI guidance to this SWMU/AOC shows that the chemicals present in soil beneath the SWMU/AOC are sufficiently volatile to be a potential VI source. In particular, TCE was detected in soil at a concentration (1,200 µg/kg) "significantly exceeding" the protection of groundwater soil cleanup level (3.2 µg/kg) calculated based on the MTCA Method B groundwater cleanup level, in accordance with the screening criteria of WAC 173-340-740(3)(b)(iii)(C)(III). This TCE concentration was detected in soil from a depth of 3 feet bgs within 100 feet of an existing building and PID readings taken during field sampling indicated organic vapors slightly elevated above background ambient levels in some of the soil samples.

Metals detected in soil near this SWMU/AOC are not recommended as constituents for further evaluation in the FS because:

- All the detected soil metal concentrations are within the typical range detected in native soils at the Boeing Everett site

- There is no indication of a chemical release at this SWMU/AOC other than TCE; there would be other constituents with noticeably elevated concentrations other than just TCE if there were releases of wastewater containing elevated metals concentrations based on the known use of chemical products and waste streams generated that were stored in the former wastewater AST

- All detected metals concentrations are below the applicable MTCA A and/or B soil cleanup levels for direct contact and/or regional background concentrations

Minor perched water was encountered in fill soil in sand layers at depths of 7½ to 9 feet bgs and known groundwater (Esperance Sand) occurs at a depth of approximately 200 feet bgs.

## 3.2 SWMU/AOC NO. 065 FORMER PAINT STRIPPING TANKLINE

A former paint stripping tankline was located in the northwest corner of Building 40-51 (Figure 3-1). The tank line was installed in 1970 and operated until 1975 when the system was closed. The tankline consisted of seven tanks, a drip pan, a lime pit, and a sump within a subgrade concrete containment structure, and an emergency dump UST below the containment floor. Potentially dangerous constituents contained in SWMU/AOC No. 065 included an alkaline cleaner, chromic acid, nitric acid, methylene chloride, phenol, MEK, MIBK, and lime. This area is currently covered by a storage building. There were no previous investigations of the former paint stripping tankline. Further details on SWMU/AOC No. 065 can be obtained from Section 5.0 of the RIWP.

### 3.2.1 Purpose and Scope

The purpose of the investigation was to assess whether potentially dangerous constituents in liquids contained in the former paint stripping tank line are present in the underlying fill and glacial till soil. The scope of investigation performed was in general accordance with Section 5.5.2 of the RIWP and included the following:

- Drilled five soil borings to depths ranging from 4 feet to 18½ feet bgs using a limited access, hollow-stem auger drill rig
- Collected soil samples at prescribed depth intervals
- Field screened samples for organic vapors and pH
- Submitted selected soil samples for analysis for RCRA metals, pH, and VOCs

There were no deviations from the planned scope of investigation. Soil boring ESB1104 was terminated at a depth of 4 feet bgs due to an obstruction and replaced by boring ESB1105 which was completed at the planned depth.

### 3.2.2 Documentation of Drilling and Sampling

On August 9 and 11, 1997, Dames & Moore monitored drilling of five soil borings (ESB1101 through ESB1105) in the area of the former tank line, as shown on Figure 3-2. The borings were drilled to depths ranging from 4 feet to 18½ feet bgs. Samples were collected using a Dames & Moore U-type sampler fitted with stainless steel rings. After sampling was completed, the borings were backfilled with hydrated bentonite chips and capped with concrete. Drilling techniques and sampling procedures utilized were in general accordance with the SAP presented in Appendix A of the RIWP.

### 3.2.3 Field Observations and Sample Analysis Results

Presented in this section are the field observations and sample results associated with soil borings ESB1101 through ESB1105. The location of the borings and a geologic cross section in this area are shown on Figure 3-2. The geologic cross section is presented on Figure 3-3. Geologic logs of the borings are presented in Appendix B1. The chain of custody forms and analytical laboratory reports are presented in Appendix B2. Data validation reports are in Appendix B3. Analytical results are summarized in Tables 3-4 and 3-5.

#### 3.2.3.1 Field Observations

The area investigated is covered with 7-inch- to 10-inch-thick concrete pavement. An 8-inch-thick concrete slab that is the base of the former containment structure was encountered at depths of 3½ feet and 5 feet bgs within soil borings ESB1103 and ESB1102, respectively. The fill encountered above this subgrade concrete slab was brown medium to coarse sand. Glacial till was encountered beneath this slab in boring ESB1102, and fill consisting of fine to medium sand was encountered below this slab to a depth of 10 feet bgs in boring ESB1103 (Figure 3-3). At borings ESB1101, ESB1104, and ESB1105 fill soil consisting of fine to coarse sand was encountered to depths ranging from 3½ feet to 10 feet bgs. Glacial till soil consisting of very dense silty fine to medium sand with some gravel was encountered beneath the fill soil to the maximum depth explored of 18½ feet bgs.

Groundwater was not encountered to the maximum depth explored of 18½ feet bgs. A thin (½ foot thick) zone of saturated fill soil above the subgrade concrete slab was encountered in boring ESB1102. This water is interpreted to be residual liquid left in the containment structure during in-place closure of this unit. Fill soil outside the containment structure was damp to moist with minor wet soil encountered at the fill/glacial till interface at soil boring ESB1103.

Staining or other visual indications of dangerous constituents were not observed. PID readings did not indicate organic vapors above ambient background in the soil samples screened, except for 306 ppmv in wet fill above the subgrade concrete slab in boring ESB1102. Field measurements of soil pH indicated a pH range of 7.4 S.U. to 9.2 S.U. that is within the normal range for soil.

#### 3.2.3.2 Sample Analysis Results

Selected soil samples were submitted for analysis per the sample selection criteria specified on Figures A-4 and A-5 in the SAP (Appendix A of the RIWP). Twelve soil samples from depths ranging from 5 feet to 18 feet bgs were submitted for analysis. A duplicate sample from 5 feet bgs in soil boring ESB1101 was also analyzed. Table 3-4 summarizes the analytical data for VOCs. Table 3-5 summarizes the analytical data for RCRA metals and pH. These tables also list the applicable MTCA Method A and B cleanup levels.

Analytical results summarized in Table 3-4 indicate that detected VOCs were at concentrations below the applicable MTCA Method A and B soil cleanup levels for direct contact and the most conservative preliminary soil cleanup levels protective of groundwater except for the concentration of benzene (11 mg/kg) in one sample of fill soil from 5 feet bgs in boring ESB1102. This concentration exceeds the most conservative preliminary soil cleanup level protective of groundwater (4.5 mg/kg) but is below the MTCA Method A soil cleanup level protective of both direct contact and groundwater (30 mg/kg). Benzene was not detected in the two deeper native soil samples (6 feet and 10 feet bgs) from this boring.

Metals were either not detected at concentrations above the method reporting limits or were at concentrations below the applicable MTCA cleanup levels, with the exception of cadmium, chromium, and lead in one soil sample of fill soil from 5 feet bgs in boring ESB1102 (Table 3-5). The total chromium concentrations of the remaining samples ranged from 32.6 mg/kg to 48.9 mg/kg, and are below the applicable MTCA Method A and B soil cleanup levels for trivalent chromium (2,000 mg/kg and 120,000 mg/kg, respectively) and the Method B soil cleanup level for hexavalent chromium (240 mg/kg). Chromium concentrations in these samples were above the MTCA Method A soil cleanup level (19 mg/kg) and the most conservative preliminary soil cleanup level protective of groundwater (18 mg/kg) for hexavalent chromium. All detected chromium concentrations were below the Puget Sound soil background level of 48.2 mg/kg (Ecology, 1994) except sample ESB1102 at 5 feet bgs (described below) and sample ESB1101 at 5 feet bgs. The ESB1101 sample had a concentration (48.9 mg/kg) slightly above background, but the field duplicate of this sample (38.3 mg/kg) was below background.

The sample collected from 5 feet bgs in boring ESB1102, which contains elevated concentrations of benzene and several metals, is a sample of backfill soil completely contained within the filled, subgrade concrete containment structure that is capped by the concrete floor slab. In this sample, cadmium was detected at a concentration (43.6 mg/kg) below the applicable MTCA Method B soil cleanup level (80 mg/kg), but above the Method A unrestricted soil cleanup level (2 mg/kg). Total chromium was detected at a concentration (1,840 mg/kg) above the MTCA Method A and B soil cleanup level for hexavalent chromium (19 mg/kg and 240 mg/kg), but below the applicable Method A and B soil cleanup levels for trivalent chromium (2,000 mg/kg and 120,000 mg/kg). The detected concentration is below the MTCA Method A soil cleanup level protective of groundwater (2,000 mg/kg) for trivalent chromium, but exceeds the most conservative preliminary soil cleanup level protective of groundwater (18 mg/kg) for hexavalent chromium. Lead was detected at a concentration (912 mg/kg) above the MTCA Method A unrestricted soil cleanup level (250 mg/kg), which is also the soil cleanup level protective of groundwater. Selenium was detected in this sample at a concentration of 20 mg/kg, which exceeds the most conservative preliminary soil cleanup level protective of groundwater (8.3 mg/kg) but is below the MTCA Method B soil cleanup level protective of direct contact (400 mg/kg). The 5-foot bgs sample was collected just above the top of the subgrade concrete slab that is the base of the former containment structure. Metal concentrations detected in two deeper soil samples in ESB1102, including soil directly below the containment structure at a depth of 6 feet bgs and at 10 feet bgs, are below the applicable MTCA cleanup levels, including those for protection of groundwater, and Puget Sound background levels. These results indicate that the affected soils are contained within the closed-in-place concrete containment structure and there has not been migration of dangerous constituents outside the containment.

Arsenic was not detected above the method reporting limit. The method reporting limit for arsenic (5 mg/kg) for these soil samples was elevated above the typical arsenic concentrations detected in the Everett Plant soils and the applicable MTCA Method B cleanup level. However, the reporting limit was below the Puget Sound background concentration of 7.30 mg/kg (Ecology, 1994) with the exception of one sample (ESB1102 at a depth of 5 feet). This sample analysis had a reporting limit of 10 mg/kg. The detection limit for arsenic exceeded the most conservative preliminary soil cleanup level protective of groundwater (0.03 mg/kg), but is below the MTCA Method A soil cleanup level protective of both direct contact and groundwater (20 mg/kg). Therefore, arsenic is not recommended for evaluation in the FS for this SWMU/AOC.

Laboratory pH measurements of soil samples ranged from 7.8 S.U. to 8.8 S.U and are within the normal range for soil.

Evaluation of the vapor intrusion (VI) pathway for this SWMU/AOC is not recommended for the FS. Screening of the VI pathway was performed in this RI using Ecology's review draft *Guidance for Evaluating Soil Vapor Intrusion in Washington State: Investigation and Remedial Action*, dated October 2009 (VI guidance). Applying the Preliminary Assessment step of the VI guidance to this SWMU/AOC shows that five chemicals present in soil beneath the SWMU/AOC (benzene, chlorobenzene, ethylbenzene, toluene, and xylenes, Table 3-4) are sufficiently volatile to be a potential VI source. However, these detections of volatile chemicals are in one sample of backfill soil and are not considered to be a potential source for VI at this location for the following reasons:

- In accordance with WAC 173-340-740(3)(b)(iii)(C)(III), the concentrations of volatile chemicals detected are less than the protection of groundwater soil cleanup levels calculated based on the MTCA Method A groundwater cleanup levels (or Method B where no Method A value is available).

- The volatile chemical concentrations in the soil sample are generally at least an order of magnitude below the lowest soil screening level.

- PID readings taken during field sampling generally did not indicate organic vapors significantly elevated above background ambient levels in the soil sample.

Evaluation of the direct contact pathway for cadmium, chromium, and lead in the backfill soil contained within this SWMU/AOC is recommended for the FS. Other metals in the backfill soil and metals in native soil near this SWMU/AOC are not recommended as constituents for further evaluation in the FS with respect to protection of groundwater because:

- All the elevated soil metal concentrations are within backfill soil that is totally contained within concrete

- There is no indication of a chemical release to the native soils underlying this SWMU/AOC

- All detected metals concentrations in native soils are below the applicable MTCA A and/or B soil cleanup levels for protection of groundwater and direct contact and/or regional background concentrations

Groundwater was not encountered beneath this SWMU/AOC to a depth of 18½ feet bgs and known groundwater (Esperance Sand) occurs at a depth of approximately 200 feet bgs.

## 3.3 SWMU/AOC NO. 151 FUSELAGE AREA SOUTHERN AIR SCRUBBER TRENCHES

Six air scrubber trenches are located in the fuselage area in the southeast portion of Building 40-51 (Figure 3-1). These trenches serve cleaning and painting operations of the aircraft fuselage sections. The potentially dangerous constituents that may be present in wastewater circulated through and discharged from these trenches include VOCs, non-halogenated SVOCs, RCRA metals, strontium, phenol, and TPH. There have been no previous investigations of this area. Further details regarding this SWMU/AOC are presented in Section 5.0 of the RIWP.

### 3.3.1 Purpose and Scope

The purpose of the investigation was to assess whether dangerous constituents in water circulated in the fuselage area air scrubber trenches is present in the surrounding fill and underlying glacial till soil. The scope of investigation performed was in general accordance with Section 5.5.3 of the RIWP and included the following:

- Drilled nine soil borings to depths ranging from 5½ feet to 16 feet bgs using a limited access hollow-stem auger drill rig, Salisbury portable drill rig, and hand auger
- Collected soil samples at prescribed depth intervals
- Field screened samples for organic vapors
- Physical testing of one soil sample

- Submitted selected soil samples for analysis for VOCs, phenol, non-halogenated SVOCs, eight RCRA metals, strontium, and TPH-D and TPH-G

Deviations from the planned scope of investigation included terminating two hand auger soil borings (ESB1303 and ESB1304) at a depth of approximately 5 feet to 6½ feet bgs due to drilling refusal. In addition, two soil borings were terminated at a depth of 10½ feet (ESB1280) and 13 feet bgs (ESB1208) due to drilling refusal using a limited access rig.

### 3.3.2 Documentation of Drilling and Sampling

On May 2, 7, 8, June 27, and July 6, 7, and 31, 1998, Dames & Moore monitored drilling of nine soil borings (ESB1207, ESB1208, ESB1214, ESB1215, ESB1270, ESB1279, ESB1280, ESB1303, and ESB1304) adjacent to the fuselage area trenches as shown on Figure 3-2. The borings were drilled to depths ranging from approximately 6 feet to 16 feet bgs. Samples were retrieved using a Dames & Moore U-type sampler fitted with stainless steel rings, a SPT split spoon sampler, and a hand auger as appropriate. Samples collected with the SPT split spoon sampler and hand auger were transferred to laboratory prepared glassware using a cleaned stainless spoon. After sampling was completed, the borings were backfilled with hydrated bentonite chips and capped with concrete. Drilling techniques and sampling procedures utilized were in general accordance with the SAP presented in Appendix A of the RIWP.

### 3.3.3 Field Observations and Sample Analysis Results

Presented in this section are the field observations and sample results associated with soil borings ESB1207, ESB1208, ESB1214, ESB1215, ESB1270, ESB1279, ESB1280, ESB1303, and ESB1304. The location of the borings and a geologic cross section of this area are presented on Figure 3-2. The cross section is presented on Figure 3-4. Geologic logs of the borings are presented in Appendix B1. The chain of custody forms and analytical laboratory reports are presented in Appendix B2. Data validation reports are in Appendix B3. Analytical results are summarized in Tables 3-6, 3-7, and 3-8.

#### 3.3.3.1 Field Observations

The area investigated is covered with a 6-inch- to 10-inch-thick concrete floor slab. Fill soil consisting of fine to coarse sand and silty sand with gravel was encountered to depths ranging from 4 feet to 8½ feet bgs. Glacial till soil consisting of very dense silty fine to medium sand with some gravel was encountered beneath the fill soil to the maximum depth explored (16 feet bgs).

Staining or other visual indications of dangerous constituents were not observed. PID readings did not indicate organic vapors elevated above background ambient levels in the soil samples.

Groundwater was not encountered. The fill soil was typically dry to moist. Minor wet soil was encountered at the fill/glacial till interface in one boring (ESB1303). The glacial till encountered was typically damp to moist.

#### 3.3.3.2 Sample Analysis Results

Soil samples were submitted for analysis per the sample selection criteria specified on Figure A-3 in the SAP (Appendix A of the RIWP). Nineteen soil samples from depths ranging from 2½ feet to 10 feet bgs were analyzed. Table 3-6 summarizes the analytical data for VOCs. Table 3-7 summarizes the analytical data for non-halogenated SVOCs, phenol, and TPH-D and TPH-G. Table 3-8 summarizes the analytical data for RCRA metals plus strontium. These tables also list the applicable MTCA Method A and B cleanup levels.

VOCs, non-halogenated SVOCs, phenol, and TPH-G and TPH-D were either not detected at concentrations above the method reporting limits or were detected at concentrations below the applicable MTCA cleanup levels, including the most conservative preliminary soil cleanup level protective of groundwater. The metals analyzed for were either not detected at concentrations above the reporting limits or were at concentrations below the applicable MTCA soil cleanup levels with the exception of arsenic, chromium, and strontium.

Arsenic concentrations (1.6 mg/kg to 4.0 mg/kg) in all of the samples analyzed were above the applicable MTCA Method B soil cleanup level (0.667 mg/kg) and the most conservative preliminary soil cleanup level protective of groundwater (0.03 mg/kg). However, concentrations of arsenic in all of the samples are less than the Puget Sound background concentration of 7.30 mg/kg (Ecology, 1994) and the MTCA Method A soil cleanup level protective of groundwater (20 mg/kg). Therefore, arsenic is not recommended for evaluation in the FS for this SWMU/AOC.

Total chromium concentrations ranged from 26.4 mg/kg to 76.9 mg/kg and are below applicable MTCA Method A and B soil cleanup levels for trivalent chromium (2,000 mg/kg and 120,000 mg/kg, respectively) and the Method B level for hexavalent chromium (240 mg/kg). These concentrations are above the MTCA Method A soil cleanup level (19 mg/kg) and the most conservative preliminary soil cleanup level protective of groundwater (18 mg/kg) for hexavalent chromium. However, fourteen of the nineteen samples analyzed had total chromium concentrations that are below the Puget Sound background concentration of 48.2 mg/kg (Ecology, 1994). Concentrations of other metals and organic compounds analyzed for were not elevated in any of the samples. Therefore, the elevated chromium concentrations above background are not considered to be indicative of a release and chromium is not recommended for evaluation in the FS for this SWMU/AOC.

Concentrations of strontium ranged from 20.9 mg/kg to 44.7 mg/kg, with five of the 19 samples exhibiting strontium concentrations exceeding the most conservative preliminary soil cleanup level protective of groundwater (38.4 mg/kg). All are well below the MTCA Method B soil cleanup level protective of direct contact (48,000 mg/kg) and are consistent with strontium concentrations detected across the Everett facility. Therefore, the detected strontium concentrations are not considered indicative of a release and strontium is not recommended for evaluation in the FS for this SWMU/AOC.

Evaluation of the vapor intrusion (VI) pathway for this SWMU/AOC is not recommended for the FS. Screening of the VI pathway was performed in this RI using Ecology's review draft *Guidance for Evaluating Soil Vapor Intrusion in Washington State: Investigation and Remedial Action,* dated October 2009 (VI guidance). Applying the Preliminary Assessment step of the VI guidance to this SWMU/AOC shows that five chemicals present in soil beneath the SWMU/AOC (carbon disulfide, methylene chloride and TPH as diesel, Tables 3-6 and 3-7), are sufficiently volatile to be a potential VI source. However, these detections of volatile chemicals are not considered to be a potential source for VI at this location for the following reasons:

- The one detection of TPH-D in soil (37 mg/kg) is well below the VI screening level for this compound (10,000 mg/kg, WAC 173-340-740[3][iii][C][II]).

- In accordance with WAC 173-340-740(3)(b)(iii)(C)(III), the concentrations of carbon disulfide and methylene chloride are less than the protection of groundwater soil cleanup levels calculated based on the MTCA Method A or Method B groundwater cleanup levels.

- The volatile chemical concentrations in the soil samples are at least four orders of magnitude below the lowest soil screening level.

- PID readings taken during field sampling did not indicate organic vapors significantly elevated above background ambient levels in the soil samples.

Groundwater was not encountered beneath this SWMU/AOC to a depth of 16 feet bgs and known groundwater (Esperance Sand) occurs at a depth of approximately 200 feet bgs.

## 3.4 SWMU/AOC NO. 151 SOUTHERN AIR SCRUBBER SUMPS

The southern air scrubber sumps, EV-112 and EV-119, are located within the southeast portion of Building 40-51 (Figure 3-1). Sump EV-112 is uncoated and sump EV-119 is steel-lined. These sumps receive wastewater and sludge from Building 40-51 clean, seal, and paint operations. Potentially dangerous constituents which may have been present in wastewater in these sumps include VOCs, non-halogenated SVOCs, phenol, TPH-G, TPH-D, RCRA metals, and strontium. There have been no previous investigations of this area. Further details on the southern air scrubber sumps can be obtained from Section 5.0 of the RIWP.

### 3.4.1 Purpose and Scope

The purpose of the investigation was to assess whether potentially dangerous constituents in wastewater in the southern air scrubber sumps are present in the surrounding fill and underlying glacial till soil. The scope of investigation performed was in general accordance with Section 5.5.3 of the RIWP and included the following:

- Drilled one soil boring adjacent to sump EV-119 to a depth of approximately 16 feet bgs using a Salisbury limited access portable drill rig
- Drilled two hand auger borings to depths of approximately 3 feet bgs (one adjacent to sump EV-119 and one in the adjacent utility tunnel)
- Drilled five soil borings to depths ranging from 17 feet to 25½ feet bgs using truck-mounted and limited access hollow-stem auger drill rigs
- Completed three borings as monitoring wells
- Collected soil samples at prescribed depth intervals
- Field screened samples for organic vapors
- Collected groundwater samples from two monitoring wells and one soil boring

- Submitted the groundwater samples and selected soil samples for analysis for VOCs, non-halogenated SVOCs, phenol, TPH-G and TPH-D, eight RCRA metals, and strontium

Deviations from the planned scope of investigation included terminating soil boring ESB1269 at a depth of 17 bgs feet due to drilling refusal, terminating hand auger soil boring ESB1213 at a depth of 3½ feet bgs (sump floor) due to caving sand, and terminating hand auger soil boring ESB1285 at a depth of 2¾ feet bgs (utility trench floor) due to hand auger drilling refusal. The flowing sand condition caused sand to enter the borehole from the surrounding soils, thus preventing further hand auger drilling.

### 3.4.2 Documentation of Drilling and Sampling

On March 4, May 4, June 25 and 26, and July 1 and 14, 1998, Dames & Moore monitored drilling of eight soil borings in the area of the southern air scrubber sumps as shown on Figure 3-2. Samples were retrieved using a Dames & Moore U-type sampler fitted with stainless steel rings, a SPT split spoon sampler, and a hand auger. Where the SPT split spoon sampler or hand auger was used, the samples were transferred to laboratory prepared glassware using a cleaned stainless spoon. After sampling was completed, the boring was backfilled with hydrated bentonite chips and capped with concrete except where monitoring wells were installed (EGW057, EGW058, and EGW059 on Figure 3-2). Drilling techniques, well installation and development procedures, and sampling procedures utilized were in general accordance with the SAP presented in Appendix A of the RIWP.

### 3.4.3 Field Observations and Sample Analysis Results

Presented in this section are the field observations and sample results associated with soil borings ESB1121, ESB1212, ESB1213, ESB1267, ESB1268, ESB1269, ESB1274, and ESB1285. The locations of the borings and a geologic cross section of the area is presented on Figure 3-2. The cross section of this area is presented on Figure 3-5. Geologic logs of the borings are presented in Appendix B1. The chain of custody forms and analytical laboratory reports are presented in Appendix B2. Data validation reports are in Appendix B3. Soil analytical results are summarized in Tables 3-9 through 3-11. Groundwater analytical results are summarized in Tables 3-12 through 3-15.

#### 3.4.3.1 Field Observations

Soil borings ESB1121, ESB1267, ESB1268, ESB1269, and ESB1274 were drilled from the finished floor of the building. The southern air scrubber sump floor, where borings ESB1212 and ESB1213 were completed, is approximately 10 feet below finished floor elevation. The floor of the adjacent utility tunnel where soil boring ESB1285 was completed is approximately 8 feet below finished floor elevation.

The concrete floor at the boring locations is 8 inches to 14 inches thick. Fill soil consisting of fine to medium sand and silty sand surrounds the southern air scrubber sump EV-112 to a depth of 11 feet to 14 feet bgs. Fill soil consisting of fine to medium sand was encountered adjacent to sump EV-119 to a depth of approximately 4 feet. Fill soil was not encountered beneath the base of the utility tunnel. Glacial till soil consisting of very dense and occasionally cemented silty sand with occasional gravel and cobbles was encountered beneath the fill, and the base of the utility tunnel to the maximum depth explored (26 feet below finished floor elevation).

Staining or other visual indications of dangerous constituents were not observed. PID readings did not indicate organic vapors above ambient background levels in the soil samples screened.

Perched water was encountered in fill soils in borings ESB1267, ESB1268, ESB1269, and ESB1274 at depths ranging from 7 feet to 10½ feet bgs. Perched water in borings ESB1212 and ESB1214 was present directly below the concrete slab and rose to a depth of ½ foot bgs (i.e., 10½ feet below finished floor elevation). The underlying glacial till soil appeared damp to moist. Soil borings ESB1267, ESB1268, and ESB1274 were completed as monitoring wells EGW057, EGW058, and EGW059, respectively. The well construction details are presented on the geologic logs (Appendix B1) of the borings.

#### 3.4.3.2 Sample Analysis Results

**Soil**

Soil samples were submitted for analysis per the sample selection criteria specified on Figure A-5 in the SAP (Appendix A of the RIWP). Nineteen soil samples from depths of 1 feet to 25 feet bgs were analyzed. In addition, duplicate samples collected at ESB1212 (5 feet) and ESB1268 (12 ½ feet) were analyzed. Table 3-9 summarizes the analytical data for VOCs. Table 3-10 summarizes the analytical data for non-halogenated SVOCs, phenol, and TPH-G and TPH-D. Table 3-11 summarizes the analytical data for RCRA metals plus strontium. These tables also list the applicable MTCA Method A and B cleanup levels.

Except for TCE in one soil sample, VOCs, non-halogenated SVOCs, phenol, TPH-G and TPH-D in soil were either not detected at concentrations above the method reporting limits or were detected at concentrations below the applicable MTCA cleanup levels, including the most conservative preliminary soil cleanup level protective of groundwater. The concentration of TCE in the 12½ foot bgs sample from ESB1212 was 18 µg/kg, which exceeds the most conservative preliminary soil cleanup level protective of groundwater (3.2 µg/kg), but does not exceed the MTCA Method A cleanup level (30 µg/kg) protective of both direct contact and groundwater. Therefore TCE in soil is not recommended for evaluation in the FS for this SWMU/AOC.

Metals analyzed for in soil were either not detected at concentrations above the reporting limits or were at concentrations below the applicable MTCA A and B cleanup levels, with the exception of arsenic, chromium, and strontium. Arsenic concentrations (0.03 mg/kg to 13.1 mg/kg) in soil samples analyzed are above the applicable MTCA Method B soil cleanup level (0.667 mg/kg) and/or the most conservative preliminary soil cleanup level protective of groundwater (0.03 mg/kg). However, the detected arsenic concentrations are less than the MTCA Method A soil cleanup level protective of direct contact and groundwater (20 mg/kg) and the Puget Sound background concentration of 7.30 mg/kg (Ecology, 1994), except for one sample from ESB1267 at 10 feet bgs (13.1 mg/kg). Therefore, arsenic is not recommended for evaluation in the FS for this SWMU/AOC.

Total chromium concentrations ranged from 3.96 mg/kg to 50.7 mg/kg, and are below applicable MTCA Method A and B soil cleanup levels for trivalent chromium (2,000 mg/kg and 120,000 mg/kg, respectively) and the Method B level for hexavalent chromium (240 mg/kg). Except for the soil sample collected from ESB1212 at 1 foot bgs, the total chromium concentrations are above the MTCA Method A soil cleanup level (19 mg/kg) for direct contact and the most conservative preliminary soil cleanup level protective of groundwater (18 mg/kg) for hexavalent chromium. With one exception, these concentrations are below the Puget Sound background concentration for total chromium of 48.2 mg/kg (Ecology, 1994). Concentrations of other metals and organic compounds analyzed for were not elevated in any of the samples. Therefore, the elevated chromium concentrations above background are not considered to be indicative of a release and chromium is not recommended for evaluation in the FS for this SWMU/AOC.

Concentrations of strontium ranged from 3.94 mg/kg to 48.8 mg/kg, with eight of the 21 samples exhibiting strontium concentrations exceeding the most conservative preliminary soil cleanup level protective of groundwater (38.4 mg/kg). All are well below the MTCA Method B soil cleanup level protective of direct contact (48,000 mg/kg) and are consistent with strontium concentrations detected across the Everett facility. Therefore, the detected strontium concentrations are not considered indicative of a release and strontium is not recommended for evaluation in the FS for this SWMU/AOC.

**Groundwater**

Groundwater samples were collected from boring ESB1212 and monitoring wells EGW057 and EGW058. Well EGW059 did not have sufficient water to collect a sample. Table 3-12 summarizes the analytical data for VOCs, non-halogenated SVOCs, phenol, TPH-G, TPH-D, and metals in the groundwater grab sample from boring ESB1212 at 1 foot bgs. Groundwater data from wells EGW057 and EGW058 from 1998 through April 2010 are summarized in Tables 3-13, 3-14, and 3-15. Table 3-13 summarizes the analytical data for VOCs in groundwater samples from EGW057 and EGW058. Table 3-14 summarizes the analytical data for non-halogenated SVOCs, phenol, TPH-G and TPH-D in wells EGW057 and EGW058. Table 3-15 summarizes analytical data for total and dissolved RCRA metals plus strontium in wells EGW057 and EGW058. These tables also list the applicable MTCA Method A and B cleanup levels.

VOCs, non-halogenated SVOCs, TPH-G, and TPH-D were either not detected at concentrations above the method reporting limits or were detected at concentrations below the applicable MTCA cleanup levels (Tables 3-12, 3-13and 3-14), except for TCE, vinyl chloride, and/or bis (2-ethylhexyl phthalate. TCE has been detected at EGW057 continuously since sampling started in 1998 at concentrations ranging from 0.0011 mg/L to 0.0056 mg/L. These concentrations are above the applicable MTCA Method B groundwater cleanup level of 0.00049 mg/L but generally below the applicable MTCA Method A cleanup level of 0.005 mg/L. TCE was detected in samples from EGW058 at concentrations ranging from 0.000029 to 0.004 mg/L. Concentrations were intermittently above the applicable MTCA Method B groundwater cleanup level, but all detected concentrations at this well are below the applicable MTCA Method A level.

Vinyl chloride was detected at a concentration (0.000037 mg/L) above the applicable MTCA Method B cleanup level (0.0000292 mg/L) in one sample from well EGW058, but below the applicable MTCA Method A cleanup level (0.0002 mg/L). Bis (2-ethylhexyl) phthalate was detected at a concentration (0.046 mg/L) above the applicable MTCA Method B cleanup level (0.00625 mg/L) in one sample from well EGW057.

Total (unfiltered) metals concentrations in a grab sample of perched groundwater from boring ESB1212 that were detected above applicable MTCA A or B groundwater cleanup levels include arsenic (0.030 mg/L), barium (7.94 mg/L), chromium (3.96 mg/L), and lead (0.8 mg/L). Total metals detected above applicable MTCA Method A and/or B groundwater cleanup levels in one or more groundwater samples from wells

EGW057 and EGW058 include arsenic (0.004 to 0.050 mg/L), chromium (0.052 to 0.642 mg/L), and lead (0.011 to 0.57 mg/L). Dissolved arsenic also exceeds the MTCA A and/or B groundwater cleanup levels in groundwater samples from these wells. The elevated lead and chromium concentrations in samples from wells EGW057 and EGW058 were only detected intermittently in samples collected in 1998-2000, and Ecology approved deleting these from the groundwater analytes starting with for samples collected in 2010. It is the opinion of URS Corporation that the elevated barium, chromium and lead concentrations in the ESB1212 sample are largely due to suspended soil particles in this unfiltered grab water sample and the samples from EGW059 are most representative of perched groundwater in fill surrounding sump EV-119. Ecology requires the chemical analysis of unfiltered groundwater samples unless it can be shown that a filtered sample is more representative of groundwater quality, and has not yet made the determination that the analyses of filtered groundwater samples are appropriate in this area.

The persistence of total and dissolved arsenic concentrations at or greater than the MTCA Method A groundwater cleanup level and detection of TCE in groundwater samples from both wells EGW057 and EGW058, is indicative of a past release to the perched water in backfill surrounding the South Air Scrubber Sumps. Therefore, this SWMU is recommended for evaluation in the FS for arsenic, TCE, 1,2-dichloroethenes (DCE), and vinyl chloride in perched groundwater, soil and the VI pathway.

Evaluation of the vapor intrusion (VI) pathway for this SWMU/AOC is recommended for the FS. Screening of the VI pathway was performed in this RI using Ecology's review draft *Guidance for Evaluating Soil Vapor Intrusion in Washington State: Investigation and Remedial Action,* dated October 2009 (VI guidance). Applying the Preliminary Assessment step of the VI guidance to this SWMU shows that six chemicals present in soil and groundwater beneath the SWMU (1,1,2-trichloro-1,2,2-triflouroethane, 2-butanone, carbon disulfide, methylene chloride, toluene, and TCE, Table 3-9), are sufficiently volatile to be a potential VI source. The most recent detection of TCE in groundwater (1.3 µg/L) exceeds the VI guidance screening criterion (0.42 µg/L).

However, the detected concentrations of volatile compounds in soil are not considered to pose a potential VI problem for the following reasons

- In accordance with WAC 173-340-740(3)(b)(iii)(C)(III), the concentrations of volatile chemicals in soil are below the protection of groundwater soil cleanup levels calculated based on the MTCA Method A groundwater cleanup levels (or Method B where Method A is not available).

- PID readings taken during field sampling did not indicate organic vapors significantly elevated above background ambient levels in the soil samples.

#### 3.4.3.3 Physical Testing Results

Due to the dense nature of soils and methods of drilling and sampling used in this area, only one sample of re-compacted till fill was suitable for physical testing. This sample, collected from 5 feet bgs in boring ESB1121, was tested for various physical parameters including moisture content, effective porosity, percent saturation, and hydraulic conductivity. The laboratory report is presented in Appendix S and pertinent results are described below. The moisture content (8.7% dry weight), effective porosity (35.4% volume), and percent saturation (43.4% volume) are similar to those obtained for glacial till and re-compacted till fill in other areas of the site. The vertical hydraulic conductivity value for this sample, 5.12 x $10^{-5}$ cm/sec (0.15 ft/ day), is also similar.

### 3.5 SWMU/AOC NO. 151 CURE AREA

Four trenches (EV-120, EV-121, EV-122, EV-123) are located in the vertical paint booths in the cure area (Figure 3-1). The trenches are used to collect liquids used for cleaning, sealing, and painting of airplane wing panels. Potentially dangerous constituents that may have been present in wastewater in the trenches include VOCs, non-halogenated SVOCs, phenol, TPH-G and TPH-D, RCRA metals, and strontium. There have been no previous investigations of this area. Further details on the cure area can be obtained from Section 5.0 of the RIWP.

#### 3.5.1 Purpose and Scope

The purpose of the investigation was to assess whether potentially dangerous constituents in waste water contained in the cure area trenches are present in the underlying fill and glacial till soil. The scope of investigation performed was in general accordance with Section 5.5.3 of the RIWP and included the following:

- Drilled three soil borings to a depth of approximately 21 feet bgs using truck-mounted and limited access hollow-stem auger drill rigs
- Collected soil samples at prescribed depth intervals
- Field screened samples for organic vapors
- Submitted selected soil samples for analysis for VOCs, non-halogenated SVOCs, phenol, TPH-G and TPH-D, RCRA metals, and strontium

There were no deviations from the planned scope of the investigation.

#### 3.5.2 Documentation of Drilling and Sampling

On June 23, July 1 and 2, 1998 Dames & Moore monitored drilling of three soil borings (ESB1263, ESB1275, and ESB1276) in the cure area as shown on Figure 3-2. The soil borings were drilled to a depth of approximately 21 feet bgs. Samples were retrieved using a Dames & Moore U-type sampler fitted with stainless steel rings and a SPT split spoon sampler. Where the SPT split spoon sampler was used, the samples were transferred to laboratory prepared glassware using a cleaned stainless steel spoon. After sampling was completed, the boring was backfilled with hydrated bentonite chips and capped with concrete. Drilling techniques and sampling procedures utilized were in general accordance with the SAP presented in Appendix A of the RIWP.

#### 3.5.3 Field Observations and Sample Analysis Results

Presented in this section are the field observations and sample results associated with soil borings ESB1263, ESB1275, and ESB1276 (Figure 3-2). Geologic logs of the soil borings are presented in Appendix B1. The chain of custody forms and analytical laboratory reports are presented in Appendix B2. Data validation reports are in Appendix B3. Analytical results are summarized in Tables 3-16 through 3-18.

#### 3.5.3.1 Field Observations

The concrete floor in the area investigated is 8 inches to 10 inches thick. Fill soil consisting of sand and gravel was encountered to depths of between 2 feet to 4 feet bgs. Glacial till soil consisting of very dense silty sand with occasional gravel and cobbles was encountered beneath the fill to the maximum depth investigated of 21 feet bgs. Groundwater was not encountered.

Staining or other visual indications of dangerous constituents were not observed. PID readings did not indicate organic vapors above ambient background levels in the soil samples with the exception of soil boring ESB1263 at a depth of 7½ feet (144 ppmv).

#### 3.5.3.2 Sample Analytical Results

Soil samples were submitted for analysis per the sample selection criteria specified on Figure A-3 in the SAP (Appendix A of the RIWP). Nine soil samples from depths ranging from 5 feet to 20 feet were analyzed. A duplicate sample collected from soil boring ESB1276 at a depth of 5 feet was also analyzed. Table 3-16 summarizes the analytical data for VOCs. Table 3-17 summarizes the analytical data for non-halogenated SVOCs, phenol, and TPH-G and TPH-D. Table 3-18 summarizes the analytical data for RCRA metals plus strontium. These tables also list the applicable MTCA Method A and B cleanup levels.

VOCs, non-halogenated SVOCs, phenol, TPH-G and TPH-D were either not detected at concentrations above the method reporting limits or were detected at concentrations below the applicable MTCA cleanup levels, including the most conservative preliminary soil cleanup levels protective of groundwater, with the exception of methylene chloride from ESB1263. Methylene chloride was detected at concentrations of 24 μg/kg and 21 μg/kg at 10 feet and 20 feet bgs, which are slightly above the applicable MTCA Method A level of 20 μg/kg but well below the applicable MTCA Method B level of 133,000 μg/kg. RCRA metals and strontium were either not detected at concentrations above the method reporting limits or were at concentrations below the applicable MTCA cleanup levels, with the exception of arsenic, chromium, and strontium.

Arsenic concentrations (1.1 mg/kg to 3.4 mg/kg) in the samples analyzed are above the applicable MTCA Method B soil cleanup level (0.667 mg/kg) and the most conservative preliminary soil cleanup level protective of groundwater (0.03 mg/kg). However, these concentrations are less than the Puget Sound background concentration of 7.30 mg/kg (Ecology, 1994) and the MTCA Method A soil cleanup level protective of groundwater (20 mg/kg). Therefore, arsenic is not recommended for evaluation in the FS for this SWMU/AOC.

Total chromium concentrations ranged from 31.7 mg/kg to 42.6 mg/kg, and are below the applicable MTCA Method A and B soil cleanup levels for trivalent chromium (2,000 mg/kg and 120,000 mg/kg, respectively) and the Method B level for hexavalent chromium (240 mg/kg). These concentrations are above the applicable MTCA Method A soil cleanup level (19 mg/kg) and the most conservative preliminary soil cleanup level protective of groundwater (18 mg/kg) for hexavalent chromium, but below the Puget Sound soil background concentration for total chromium of 48.2 mg/kg (Ecology, 1994). Therefore, chromium is not recommended for evaluation in the FS for this SWMU/AOC.

Concentrations of strontium ranged from 26.2 mg/kg to 47.4 mg/kg, with five of the 10 samples exhibiting strontium concentrations exceeding the most conservative preliminary soil cleanup level protective of groundwater (38.4 mg/kg). All are well below the MTCA Method B soil cleanup level protective of direct contact (48,000 mg/kg) and are consistent with strontium concentrations detected across the Everett facility. Therefore, the detected strontium concentrations are not considered indicative of a release and strontium is not recommended for evaluation in the FS for this SWMU/AOC.

Evaluation of the vapor intrusion (VI) pathway for this SWMU/AOC is not planned for the FS. Screening of the VI pathway was performed in this RI using Ecology's review draft *Guidance for Evaluating Soil Vapor Intrusion in Washington State: Investigation and Remedial Action*, dated October 2009 (VI guidance). Application of the Preliminary Assessment step of the VI guidance to this SWMU shows that two chemicals present in soil beneath the SWMU (carbon disulfide and methylene chloride Table 3-16), are sufficiently volatile to be a potential VI source. However, these detections of volatile chemicals are not considered to be a potential source of VI at this location for the following reasons:

- In accordance with WAC 173-340-740(3)(b)(iii)(C)(III), the concentrations of carbon disulfide and methylene chloride are not "significantly higher" than the protection of groundwater soil cleanup levels calculated based on the MTCA Method A or Method B groundwater cleanup levels.

- PID readings taken during field sampling generally did not indicate organic vapors significantly elevated above background ambient levels in the soil samples.

Groundwater was not encountered beneath this SWMU/AOC to a depth of 21 feet bgs and known groundwater (Esperance Sand) occurs at a depth of approximately 200 feet bgs.

## 3.6 SWMU/AOC NO. 151 WING AREA SOUTHERN AIR SCRUBBER TRENCHES

Six shallow trenches associated with the air scrubber system are located in the southwest portion of Building 40-51 (Figure 3-1). The trenches are used to collect wastewater generated during cleaning and painting of airplane wings. Potentially dangerous constituents that may have been present in the wastewater include VOCs, non-halogenated SVOCs, phenol, TPH-G and TPH-D, RCRA metals, and strontium. There have been no previous investigations of this area. Further details on the wing area southern air scrubber trenches can be obtained from Section 5.0 of the RIWP.

### 3.6.1 Purpose and Scope

The purpose of the investigation was to assess whether liquids contained in the wing area trenches are present in the surrounding fill and underlying glacial till soil. The scope of investigation performed was in general accordance with Section 5.5.3 of the RIWP and included the following:

- Drilled eight soil borings to a depth of approximately 21 feet bgs using limited access hollow-stem auger and Salisbury limited access portable drill rigs
- Collected soil samples at prescribed depth intervals
- Field screened samples for organic vapors

- Submitted selected soil samples for analysis for VOCs, non-halogenated SVOCs, phenol, TPH-G and TPH-D, RCRA metals, and strontium

There were no deviations from the planned scope of the investigation.

#### 3.6.2 Documentation of Drilling and Sampling

On May 2 and 3, and June 23, 24, and 25, 1998, Dames & Moore monitored drilling of eight soil borings (ESB1206, ESB1209, ESB1210, ESB1211, ESB1262, ESB1264, ESB1265, and ESB1266) adjacent to the wing area trenches as shown on Figure 3-2. The soil borings were drilled to a depth of approximately 13 feet bgs. Samples were retrieved using a Dames & Moore U-type sampler fitted with stainless steel rings, SPT split spoon sampler, and hand auger. Where the SPT split spoon sampler or hand auger was used, the samples were transferred to laboratory-prepared glassware using a cleaned stainless steel spoon. After sampling was completed, the boring was backfilled with hydrated bentonite chips and capped with concrete. Drilling techniques and sampling procedures utilized were in general accordance with the SAP presented in Appendix A of the RIWP.

#### 3.6.3 Field Observations and Sample Analysis Results

Presented in this section are the field observations and sample results associated with soil borings ESB1206, ESB1209, ESB1210, ESB1211, ESB1262, ESB1264, ESB1265, and ESB1266. The locations of the borings and geologic cross section are presented on Figure 3-2. The cross section of this area is presented on Figure 3-6. Geologic logs of the soil borings are presented in Appendix B1. The chain of custody forms and analytical laboratory reports are presented in Appendix B2. Data validation reports are in Appendix B3. Analytical results are summarized in Tables 3-19 through 3-21.

##### 3.6.3.1 Field Observations

The concrete floor in the area investigated is 9 inches to 12 inches thick. Fill soil consisting of sand and silty sand with occasional gravel was encountered to depths ranging from 3 feet to 6½ feet bgs. The fill material at boring ESB1262 contained concrete and cobbles at a depth of 4 feet. A 2-inch-thick layer of concrete was encountered at the base of the fill soil in soil boring ESB1211 at a depth of 5 feet bgs. Glacial till soil consisting of very dense silty sand with occasional gravel and cobbles was encountered beneath the fill to the maximum depth investigated of 13 feet bgs. Groundwater was not encountered.

Staining or other visual indications of dangerous constituents were not observed. PID readings did not indicate elevated organic vapors above ambient background levels in the soil samples screened.

##### 3.6.3.2 Sample Analytical Results

Soil samples were submitted for analysis per the sample selection criteria specified on Figure A-3 in the SAP (Appendix A of the RIWP). Sixteen soil samples from depths ranging from 2½ feet to 9 feet bgs were analyzed. Table 3-19 summarizes the analytical data for VOCs. Table 3-20 summarizes the analytical data for non-halogenated VOCs, phenol, gasoline and diesel range TPH. Table 3-21 summarizes the analytical data for RCRA metals plus strontium. These tables also list the applicable MTCA Method A and B cleanup levels.

VOCs, non-halogenated SVOCs, phenol, TPH-G and TPH-D were either not detected at concentrations above the method reporting limits or were detected at concentrations below the applicable MTCA cleanup levels, including the most conservative preliminary soil cleanup levels protective of groundwater, with the exception of methylene chloride. Methylene chloride was detected in samples from borings ESB1262, ESB1264, and ESB1265 at concentrations ranging from 22 μg/kg to 32 μg/kg, which are slightly above the MTCA Method A soil cleanup level of 20 μg/kg, but well below the applicable MTCA Method B cleanup level of 133,000 μg/kg. RCRA metals and strontium were either not detected at concentrations above the method reporting limits, or were detected at concentrations below the applicable MTCA cleanup levels, with the exception of arsenic, chromium, and strontium.

Arsenic concentrations (1.3 mg/kg to 13.8 mg/kg) in samples analyzed are above the applicable MTCA Method B soil cleanup level (0.667 mg/kg) and the most conservative preliminary soil cleanup level protective of groundwater (0.03 mg/kg). However, these concentrations are less than the Puget Sound background concentration of 7.30 mg/kg (Ecology, 1994), with the exception of sample ESB1262 (13.8 mg/kg at a depth of 5 feet bgs), and the MTCA Method A soil cleanup level protective of groundwater (20 mg/kg). Therefore, arsenic is not recommended for evaluation in the FS for this SWMU/AOC.

Total chromium concentrations ranged from 32.0 mg/kg to 48.4 mg/kg, and are below the applicable MTCA Method A and B soil cleanup levels for trivalent chromium (2,000 mg/kg and 120,000 mg/kg, respectively) and the Method B level for hexavalent chromium (240 mg/kg). These concentrations are above the MTCA Method A soil cleanup level (19 mg/kg) and the most conservative preliminary soil cleanup level protective of groundwater (18 mg/kg) for hexavalent chromium but, with one exception (ESB1206 at 3 feet bgs, 48.4 mg/kg), are below the Puget Sound soil background concentration for total chromium of 48.2 mg/kg (Ecology, 1994). The chromium concentration at ESB1206 is only slightly above the background concentration and not considered indicative of a release and chromium is not recommended for evaluation in the FS for this SWMU/AOC.

Concentrations of strontium ranged from 22.7 mg/kg (estimated) to 58.0 mg/kg, with three of the 16 samples exhibiting strontium concentrations exceeding the most conservative preliminary soil cleanup level protective of groundwater (38.4 mg/kg). All are well below the MTCA Method B soil cleanup level protective of direct contact (48,000 mg/kg) and are consistent with strontium concentrations detected across the Everett facility. Therefore, the detected strontium concentrations are not considered indicative of a release and strontium is not recommended for evaluation in the FS for this SWMU/AOC.

Evaluation of the vapor intrusion (VI) pathway for this SWMU/AOC is not recommended for the FS. Screening of the VI pathway was performed in this RI using Ecology's review draft *Guidance for Evaluating Soil Vapor Intrusion in Washington State: Investigation and Remedial Action*, dated October 2009 (VI guidance). Applying the Preliminary Assessment step of the VI guidance to this SWMU shows that four chemicals present in soil beneath the SWMU (2-butanone, naphthalene, methylene chloride, and TPH as diesel Tables 3-19 and 3-20), are sufficiently volatile to be a potential VI source. However, these detections of volatile chemicals are not considered to be a potential source of VI at this location for the following reasons:

- The one detection of TPH-D in soil (12 mg/kg) is well below the VI screening level for this compound (10,000 mg/kg, WAC 173-340-740[3][iii][C][II]).

- In accordance with WAC 173-340-740(3)(b)(iii)(C)(III), the concentrations of 2-butanone, carbon disulfide, and methylene chloride are not “significantly higher” than the protection of groundwater soil cleanup levels calculated based on the MTCA Method A or Method B groundwater cleanup levels.

- PID readings taken during field sampling generally did not indicate organic vapors significantly elevated above background ambient levels in the soil samples.

Groundwater was not encountered beneath this SWMU/AOC to a depth of 13 feet bgs and known groundwater (Esperance Sand) occurs at a depth of approximately 200 feet bgs.

## 3.7 SWMU/AOC NO. 151 NORTHERN AIR SCRUBBER TRENCHES AND SUMP EV-113

The northern air scrubber trenches and associated sump EV-113 are located in the northern portion of Building 40-51 (Figure 3-1). This air scrubber trench system collects wastewater generated during cleaning and painting wings. Potentially dangerous constituents that may have been present in the wastewater include VOCs, non-halogenated SVOCs, phenol, TPH-G and TPH-D, RCRA metals, and strontium. There have been no previous investigations of this area. Further details on the northern air scrubber trenches and sump can be obtained from Section 5.0 of the RIWP.

### 3.7.1 Purpose and Scope

The purpose of the investigation was to assess whether potentially dangerous constituents in wastewater contained in the northern air scrubber trenches and sump are present in the surrounding fill and underlying glacial till soil. The scope of investigation performed was in general accordance with Section 5.5.3 of the RIWP and included the following:

- Drilled two borings to depths of 25 feet and 30 feet bgs, and six soil borings to depths of approximately 15 feet to 20 feet bgs using truck-mounted and limited access hollow-stem auger drill rigs
- Drilled one hand auger boring, located in a utility tunnel east of sump EV-113, to a depth of 5½ feet below the floor of the utility tunnel
- Collected soil samples at prescribed depth intervals
- Field screened samples for organic vapors
- Submitted selected soil samples for analysis for VOCs, non-halogenated SVOCs, phenol, TPH-G and TPH-D, RCRA metals, and strontium

Deviations from the planned scope of the investigation included completion of six soil borings to a depth of 20 feet bgs rather than the originally planned and Ecology approved depth of 30 feet. One hand auger soil boring completed in the utility tunnel was terminated at a depth of 5½ feet rather than the planned depth of 15 feet below the base of the tunnel due to hand auger drilling refusal.

### 3.7.2 Documentation of Drilling and Sampling

On June 30, July 2, 7, 10 and 14, and August 16, 1998, Dames & Moore monitored drilling of nine soil borings (ESB1271, ESB1277, ESB1278, ESB1281, ESB1282, ESB1283, ESB1284, ESB1305, and ESB1306) in the area of the northern air scrubber trenches and sump EV-113, as shown on Figure 3-2. Eight borings were drilled to depths ranging from 20 feet to 30 feet bgs. One soil boring (ESB1284) drilled inside a utility tunnel was completed to a depth of 5½ feet below the tunnel floor. The tunnel floor is approximately 8 feet below the building floor. Samples were retrieved using a Dames & Moore U-type sampler fitted with stainless steel rings, SPT split spoon sampler, and hand auger. Where the SPT split spoon sampler or hand auger was used, the samples were transferred to laboratory prepared glassware using a cleaned stainless spoon. After sampling was completed, the boring was backfilled with hydrated bentonite chips and capped with concrete. Drilling techniques and sampling procedures utilized were in general accordance with the SAP presented in Appendix A of the RIWP.

### 3.7.3 Field Observations and Sample Analysis Results

Presented in this section are the field observations and sample results associated with soil borings ESB1271, ESB1277, ESB1278, ESB1281, ESB1282, ESB1283, ESB1284, ESB1305, and 1306. The location of the borings and a geologic cross section in this area are presented on Figure 3-2. The cross section is presented on Figure 3-7. Geologic logs of the soil borings are presented in Appendix B1. The chain of custody forms and analytical laboratory reports are presented in Appendix B2. Data validation reports are in Appendix B3. Analytical results are summarized in Tables 3-22 through 3-24.

#### 3.7.3.1 Field Observations

The concrete floor in the area investigated is 8 inches to 16 inches thick. Fill soil consisting of sand and silt with occasional gravel was encountered to depths ranging from 10 feet to 15 feet bgs at soil borings ESB1277, ESB1282, ESB1283, ESB1305, and ESB1306. At soil boring ESB1278, the fill extended to a depth of 2 feet. Fill soil consisting of fine to medium sand extended to a depth of approximately 15 feet in soil borings ESB1271 and ESB1281 located adjacent to sump EV-113. At soil boring ESB1284, fill soil consisting of sand with gravel was encountered to a depth of 5½ feet beneath the floor of the utility tunnel, the maximum depth explored by this boring. With the exception of soil boring ESB1284, glacial till soil consisting of very dense silty sand with occasional gravel and silt was encountered beneath the fill to the maximum depth explored of 30 feet bgs. Groundwater was not encountered.

Staining or other visual indications of dangerous constituents were not observed. PID readings did not indicate organic vapors elevated above background ambient levels in the soil samples screened.

#### 3.7.3.2 Sample Analytical Results

Soil samples were submitted for analysis per the sample selection criteria specified on Figures A-4 and A-5 in the SAP (Appendix A of the RIWP). Twenty six soil samples from depths ranging from 2½ feet to 25 feet bgs were analyzed. Table 3-22 summarizes the analytical data for VOCs. Table 3-23 summarizes the analytical data for non-halogenated VOCs, phenol, TPH-G and TPH-D. Table 3-24 summarizes the analytical data for RCRA metals plus strontium. These tables also list the applicable MTCA Method A and B cleanup levels.

VOCs, non-halogenated SVOCs, phenol, TPH-G and TPH-D were either not detected at concentrations above the method reporting limits or were detected at concentrations below the applicable MTCA cleanup levels, including the most conservative preliminary soil cleanup levels protective of groundwater. RCRA metals and strontium were either not detected at concentrations above the method reporting limits or were detected at concentrations below the applicable MTCA cleanup levels, with the exception of arsenic, chromium, and strontium.

Arsenic concentrations (0.9 mg/kg to 7.5 mg/kg) in samples analyzed are above the applicable MTCA Method B soil cleanup level (0.667 mg/kg) and the most conservative preliminary soil cleanup level protective of groundwater (0.03 mg/kg). However, these concentrations are less than the Puget Sound background concentration (7.30 mg/kg, Ecology, 1994), with the exception of one sample (7.5 mg/kg ESB1305 at a depth of 10 feet bgs), and the MTCA Method A soil cleanup level protective of groundwater (20 mg/kg). Therefore, arsenic is not recommended for evaluation in the FS for this SWMU/AOC.

Total chromium concentrations ranged from 28.2 mg/kg to 66.6 mg/kg, and are below the applicable MTCA Method A and B soil cleanup levels for trivalent chromium (2,000 mg/kg and 120,000 mg/kg, respectively) and the Method B level for hexavalent chromium (240 mg/kg). These concentrations are above the MTCA Method A soil cleanup level (19 mg/kg) and the most conservative preliminary soil cleanup level protective of groundwater (18 mg/kg) for hexavalent chromium. With one exception (66.6 mg/kg in ESB1281 at 25 feet bgs), the detected chromium concentrations in soil are below the Puget Sound soil background concentration for total chromium of 48.2 mg/kg (Ecology, 1994). Based on the lack of elevated concentrations of other metals or organic compounds analyzed for in this sample and the chromium concentrations below Puget Sound background in shallower samples from boring ESB1281, the elevated chromium concentration is not considered indicative of a release and chromium is not recommended for evaluation in the FS for this SWMU/AOC.

Concentrations of strontium ranged from 24.2 mg/kg to 40.7 mg/kg, with four of the 26 samples exhibiting strontium concentrations exceeding the most conservative preliminary soil cleanup level protective of groundwater (38.4 mg/kg). All are below the MTCA Method B soil cleanup level protective of direct contact (48,000 mg/kg) and are consistent with strontium concentrations detected across the Everett facility. Therefore, the detected strontium concentrations are not considered indicative of a release and strontium is not recommended for evaluation in the FS for this SWMU/AOC.

Evaluation of the vapor intrusion (VI) pathway for this SWMU/AOC is not planned for the FS. Screening of the VI pathway was performed in this RI using Ecology's review draft *Guidance for Evaluating Soil Vapor Intrusion in Washington State: Investigation and Remedial Action*, dated October 2009 (VI guidance). Applying the Preliminary Assessment step of the VI guidance to this SWMU shows that three chemicals present in soil beneath the SWMU (naphthalene, toluene, and TPH as diesel Tables 3-22 and 3-23), are sufficiently volatile to be a potential VI source. However, these detections of volatile chemicals are not considered to be a potential source of VI at this location for the following reasons:

- The one detection of TPH-D in soil (5.7 mg/kg) is below the VI screening level for this compound (10,000 mg/kg, WAC 173-340-740[3][iii][C][II]).

- In accordance with WAC 173-340-740(3)(b)(iii)(C)(III), the concentrations of toluene and naphthalene are lower than the protection of groundwater soil cleanup levels calculated based on the MTCA Method A or Method B groundwater cleanup levels.

- PID readings taken during field sampling generally did not indicate organic vapors significantly elevated above background ambient levels in the soil samples.

Groundwater was not encountered beneath this SWMU/AOC to a depth of 30 feet bgs and known groundwater (Esperance Sand) occurs at a depth of approximately 200 feet bgs.

## 3.8 SWMU/AOC NO. 069 EAST TRAVELING PAINT BOOTH SUMP EV-114

The sump EV-114 is located in the northern portion of Building 40-51 (Figure 3-1) and is associated with the former east traveling paint booth. Sump EV-114 was installed in 1970 and is currently inactive. Potentially dangerous constituents that may have been present in wastewater in the sump include VOCs, non-halogenated SVOCs, phenol, TPH-G and TPH-D, RCRA metals, and strontium. There have been no previous investigations of this sump. Further details on the sump and former traveling paint booth can be obtained from Section 5.0 of the RIWP.

### 3.8.1 Purpose and Scope

The purpose of the investigation was to assess whether potentially dangerous constituents in wastewater contained in sump EV-114 are present in the surrounding fill and underlying glacial till soil. The scope of investigation performed was in general accordance with Section 5.5.3 of the RIWP and included the following:

- Drilled two borings to depths of approximately 15 feet bgs using a truck-mounted hollow-stem auger drill rig
- Collected soil samples at prescribed depth intervals
- Field screened samples for organic vapors
- Submitted selected soil samples for analysis for VOCs, non-halogenated SVOCs, phenol, TPH-G and TPH-D, RCRA metals, and strontium

There were no deviations from the planned scope of the investigation for this area.

### 3.8.2 Documentation of Drilling and Sampling

On June 30, 1998 Dames & Moore monitored drilling of two soil borings (ESB1272 and ESB1273) adjacent to sump EV-114 (Figure 3-2) to a depth of approximately 15 feet bgs. Samples were retrieved using a Dames & Moore U-type sampler fitted with stainless steel rings. After sampling was completed, the boring was backfilled with hydrated bentonite chips and capped with concrete. Drilling techniques and sampling procedures utilized were in general accordance with the SAP presented in Appendix A of the RIWP.

### 3.8.3 Field Observations and Sample Analysis Results

Presented in this section are the field observations and sample analysis results associated with soil borings ESB1272 and ESB1273. The locations of the soil borings are shown on Figure 3-2. Geologic logs of the borings are presented in Appendix B1. The chain of custody forms and analytical laboratory reports are presented in Appendix B2. Data validation reports are in Appendix B3. Analytical results are summarized in Tables 3-25 through 3-27.

#### 3.8.3.1 Field Observations

The concrete floor in the area investigated is 8 inches thick. Fill soil consisting of sand and silty sand with gravel was encountered to depths ranging from 5 feet to 7 feet bgs. Glacial till soil consisting of very dense silty sand with occasional gravel was encountered beneath the fill to the maximum depth explored of 15½ feet bgs. Groundwater was not encountered.

Staining or other visual indications of dangerous constituents were not observed. PID readings did not indicate elevated organic vapors above ambient background in the soil samples screened.

#### 3.8.3.2 Sample Analysis Results

Soil samples were submitted for analysis per the sample selection criteria specified on Figure A-4 in the SAP (Appendix A of the RIWP). Five soil samples from depths ranging from 5½ feet to 10 feet bgs were analyzed. Table 3-25 summarizes the analytical data for VOCs. Table 3-26 summarizes the analytical data for non-halogenated SVOCs, phenol, TPH-G and TPH-D. Table 3-27 summarizes the analytical data for RCRA metals plus strontium. These tables also list the applicable MTCA Method A and B cleanup levels.

VOCs, non-halogenated SVOCs, phenol, TPH-G and TPH-D were either not detected at concentrations above the method reporting limits or were detected at concentrations below the applicable MTCA cleanup levels, including the most conservative preliminary soil cleanup levels protective of groundwater. RCRA metals and strontium were either not detected at concentrations above the method reporting limits or were at concentrations below the applicable MTCA cleanup levels, with the exception of arsenic, chromium, and strontium.

Arsenic concentrations (2.2 mg/kg to 2.9 mg/kg) in all five samples analyzed are above the applicable MTCA Method B soil cleanup level (0.667 mg/kg) and the most conservative preliminary soil cleanup level protective of groundwater (0.03 mg/kg). However, these concentrations are less than the Puget Sound background concentration of 7.30 mg/kg (Ecology, 1994) and the MTCA Method A soil cleanup level protective of groundwater (20 mg/kg); therefore, arsenic is not recommended for evaluation in the FS for this SWMU/AOC.

Total chromium concentrations ranged from 38.0 mg/kg to 45.6 mg/kg and are below the applicable MTCA Method A and B soil cleanup levels for trivalent chromium (2,000 mg/kg and 120,000 mg/kg, respectively) and the Method B level for hexavalent chromium (240 mg/kg). These concentrations are above the MTCA Method soil cleanup A level (19 mg/kg) and the most conservative preliminary soil cleanup level protective of groundwater (18 mg/kg) for hexavalent chromium, but below the Puget Sound soil background concentration for total chromium of 48.2 mg/kg (Ecology, 1994); therefore, chromium is not recommended for evaluation in the FS for this SWMU/AOC.

Concentrations of strontium ranged from 27.5 mg/kg to 41.7 mg/kg, with one of the five samples exhibiting strontium concentrations exceeding the most conservative preliminary soil cleanup level protective of groundwater (38.4 mg/kg). All are well below the MTCA Method B soil cleanup level protective of direct contact (48,000 mg/kg) and are consistent with strontium concentrations detected across the Everett facility. Therefore, the detected strontium concentrations are not considered indicative of a release and strontium is not recommended for evaluation in the FS for this SWMU/AOC.

Evaluation of the vapor intrusion (VI) pathway for this SWMU/AOC is not recommended for the FS. Screening of the VI pathway was performed in this RI using Ecology's review draft *Guidance for Evaluating Soil Vapor Intrusion in Washington State: Investigation and Remedial Action,* dated October 2009 (VI guidance). Applying the Preliminary Assessment step of the VI guidance to this SWMU shows that TCE is present in soil beneath the SWMU is are sufficiently volatile to be a potential VI source. However, these detections of volatile chemicals are not considered to be a potential source of VI at this location for the following reasons:

- In accordance with WAC 173-340-740(3)(b)(iii)(C)(III), the maximum concentration of TCE (2.9 µg/kg) is lower than the protection of groundwater soil cleanup levels calculated based on the MTCA Method A or Method B groundwater cleanup levels.

- PID readings taken during field sampling did not indicate organic vapors significantly elevated above background ambient levels in the soil samples.

Groundwater was not encountered beneath this SWMU/AOC to a depth of 15 ½ feet bgs and known groundwater (Esperance Sand) occurs at a depth of approximately 200 feet bgs.

## 3.9 SWMU/AOC NO. 090 FORMER UST EV-11

The former UST EV-11 was located near the southwest corner of Building 40-51 (Figure 3-1) and was formerly used to contain waste methyl ethyl ketone (MEK) and other solvents. The UST was removed in 1986. Potentially dangerous constituents that may have been present in the UST include VOCs. The results of previous investigations indicate VOCs are present in a limited amount of soil and perched groundwater in fill in the former tank excavation and along subsurface utilities adjacent to former UST EV-11. Since 1995, groundwater samples have been collected from three monitoring wells adjacent to the former UST (EGW030, EGW031, and EGW032 on Figure 3-2). Further details on former UST EV-11 can be obtained from Section 9.0 of the IAWP.

### 3.9.1 Purpose and Scope

The purpose of the investigation was to assess whether VOCs previously detected in soil and perched groundwater near former UST EV-11 had migrated to the north along the utility backfill soil. The scope of investigation performed was in general accordance with Sections 9.4 of the IAWP and included the following:

- Completed three probe borings to depths ranging from 6 feet to 8 feet using a truck-mounted Geoprobe rig
- Collected soil and groundwater samples at prescribed depth intervals
- Field screened soil samples for organic vapors
- Submitted groundwater samples for analysis for VOCs

There were no deviations from the planned scope of the investigation for this area.

Based on the results of the initial investigation, further investigation of perched groundwater north of former UST EV-11 was warranted. The scope of the supplemental investigation performed was in general accordance with Section 2.0 of the Supplemental RIWP (Dames and Moore, 2000; URS, 2000), and included the following:

- Completed six probe borings north of the prior RI borings to depths of 6 to 7 feet bgs
- Collected soil and groundwater samples in a similar manner as in the initial RI
- Field-screened soil samples for organic vapors
- Submitted split groundwater samples for organic analysis for VOCs by TEG's mobile laboratory and ARI's fixed laboratory
- Completed two monitoring wells north of UST EV-11, based on analytical results for groundwater samples from supplemental probe borings

### 3.9.2 Documentation of Drilling and Sampling

On August 7, 1998, Dames & Moore monitored completion of three soil probe borings (ESB1320, ESB1321, and ESB1322) into utility backfill soil in the area to the north of former UST EV-11 and west of Building 40-51 as shown on Figure 3-8. Three soil borings were completed to depths of 6 feet to 8 feet bgs. Soil samples were retrieved using an SPT split spoon sampler. Groundwater samples were retrieved using a peristaltic pump. After sampling was completed, the borings were backfilled with hydrated bentonite chips and capped with concrete. Drilling techniques and sampling procedures utilized were in general accordance with the SAP presented in Appendix A of the RIWP.

The supplemental six probe borings (ESB1368, ESB1369, ESB1370, ESB1371, ESB1372, and ESB1373) were completed north of the prior RI soil borings (ESB1320 to ESB1322) on April 4, 2000 (Figure 3-8). URS monitored the completion of the probe borings. Sampling procedures and drilling techniques were in general accordance with the SAP of the RIWP and IAWP. The six borings were completed to depths between 6 and 7 feet bgs. Samples were collected with a split spoon sampler for soil, and peristaltic pump for water. All borings were backfilled with hydrated bentonite, after completion of the boring.

On June 13, 2000, URS monitored the completion of two monitoring wells, EGW065, located at boring ESB1372, and EGW066, located between borings ESB1322 and ESB1373 (Figure 3-8). These monitoring wells were completed to 10 feet bgs and were installed in general accordance with Section 2.7 of the Supplemental RIWP and Section A.6.1.2. of the RIWP.

### 3.9.3 Field Observations and Sample Analysis Results

Presented in this section are the field observations and sample results associated with probe borings ESB1320 through ESB1322 and ESB1368 through ESB1373. The locations of the borings are shown on Figure 3-8. The geologic logs of the borings are presented in Appendix B1. The chain of custody forms and analytical laboratory reports are presented in Appendix B2. Data validation reports are in Appendix B3. Laboratory analytical data reports for groundwater samples from monitoring wells EGW030, EGW031, EGW032, EGW065, and EGW066 have been submitted to Ecology separate from this report. Groundwater analytical results for VOCs in the soil borings are summarized in Table 3-28. Groundwater analytical results from the monitoring wells are summarized in Table 3-29.

#### 3.9.3.1 Field Observations

The concrete pavement at the boring locations is approximately 12 inches thick. Fill soil consisting of sand and silty sand was encountered to depths ranging from 1½ feet to 7 feet bgs. Glacial till soil consisting of very dense silty sand was encountered beneath the fill to the maximum depth explored (8 feet bgs). The fill soil encountered appeared damp to wet. Perched groundwater was encountered in the fill at a depth of approximately 3¼ feet to 3¾ feet bgs, except in borings ESB1368 through ESB1371. These borings did not encounter fill soils of sufficient thickness to contain perched groundwater.

Staining or other visual indications of dangerous constituents in soil were not observed. PID readings did not indicate organic vapors above ambient background in the soil samples screened.

#### 3.9.3.2 Sample Analysis Results

Groundwater samples collected from probe borings ESB1320, ESB1321, ESB1322, ESB1372, and ESB1373, and monitoring wells EG030, EG031, EG032, EGW065, and EGW066 were submitted for analysis. A duplicate water sample collected from probe boring ESB1320 was also analyzed. Groundwater samples from ESB1372 and ESB1373 were analyzed in the field by TEG Northwest’s mobile laboratory using EPA Method 8021B in order to assess whether additional probe borings were warranted. Split samples from these two probe borings were also analyzed for VOCs by ARI. Per the sample selection criteria specified in Section 9.4 of the IAWP, soil samples were not analyzed. Table 3-28 summarizes analytical results for the probe boring samples. Table 3-29 summarizes the analytical data for VOCs in the groundwater samples from the new and existing monitoring wells from 1995 through April 2010. These tables also list the applicable MTCA Method A and B cleanup levels.

VOCs were either not detected at concentrations above the method reporting limits or were detected at concentrations below the applicable MTCA cleanup levels with the exception of TCE, vinyl chloride, cis-1,2-dichloroethene, and/or tetrachloroethylene (PCE) in groundwater samples from probe borings ESB1320, ESB1321, and ESB1322 and wells EGW030, EGW031, EGW032, EGW065, and EGW066. VOCs were not detected at concentrations above the method reporting limits or were detected at concentrations below the applicable MTCA groundwater cleanup levels in samples from probe borings ESB1372 and ESB1373, which are located north (downgradient) of the prior RI soil borings.

Cis-1,2-dichloroethene concentrations ranging from 0.0002 to 11 have been detected in samples collected from all wells except EGW065. All detected concentrations are below the Method B groundwater cleanup level (0.08 mg/L) except one sample collected from EGW030; therefore cis-1,2-dichloroethene in groundwater is not recommended for evaluation in the FS for this SWMU/AOC.

PCE concentrations ranging from 0.000028 mg/L to 0.000085 mg/L have been detected in samples collected from wells EGW065 and EGW066. The concentrations in well EGW065 are below the Method A and Method B groundwater cleanup levels. The concentrations in four samples collected from well EGW066 are above the Method B groundwater cleanup level (0.000081 mg/L); however, the concentrations of all of the samples collected from well EGW066 are below the Method A groundwater cleanup level (0.005 mg/L). PCE was not detected at the site until mid 2006 when the method reporting limit decreased by an order of magnitude. It was likely present at the site prior to this, but the concentrations were too low to detect. PCE has only been detected in the downgradient wells EGW065 and EGW066, and not in the wells immediately adjacent to the former UST location; therefore, the source of the PCE may not be former UST EV-11. Concentrations detected since October 2008 have been below the Method A and B cleanup levels; therefore PCE in groundwater is not recommended for evaluation in the FS for this SWMU/AOC.

TCE concentrations ranging from 0.00037 mg/L to 0.023 mg/L have been detected in samples from wells EGW030, EGW031, EGW032, EGW065, and EGW066. The maximum TCE groundwater concentration of 0.023 mg/L was detected in EGW031 in 1995. The detected concentrations are generally above the applicable MTCA Method B groundwater cleanup level of 0.00049 mg/L. The concentrations in EGW032, EGW065, and EGW066 are generally below the applicable MTCA Method A cleanup level of 0.005 mg/L, and the concentrations in EGW030 and EGW031 have generally been below the applicable MTCA Method A cleanup level of 0.005 mg/L since early 2006. Therefore, TCE in groundwater is recommended for evaluation in the FS for this SWMU/AOC.

Vinyl chloride concentrations ranging from 0.000021 mg/L to 0.0041 mg/L have been detected in samples collected from wells EGW030, EGW031, EGW032, EGW065, and EGW066. The concentrations are generally above the Method B cleanup level (0.0000292 mg/L). The concentrations in EGW065 are below the applicable MTCA Method A groundwater cleanup level (0.0002 mg/L). The concentrations in EGW032 and EGW066 have generally been below the MTCA Method A groundwater cleanup level since 2006. The concentrations in EGW030 and EGW031 are generally above the applicable MTCA Method A groundwater cleanup level; therefore, vinyl chloride in groundwater is recommended for evaluation in the FS for this SWMU/AOC.

These results suggest that perched groundwater containing TCE and vinyl chloride has migrated north from the location of former UST EV-11 along the coarse fill soils backfilled along the subgrade utility pipe(s). Concentrations of TCE and vinyl chloride have either remained relatively stable within a concentration range or decreased over time. TCE, 1,2- cis-DCE, PCE, vinyl chloride, and arsenic (reduced groundwater) in groundwater are recommended for evaluation in the FS for this SWMU.

Evaluation of the vapor intrusion (VI) pathway for this SWMU/AOC is recommended for the FS. Screening of the VI pathway was performed in this RI using Ecology's review draft *Guidance for Evaluating Soil Vapor Intrusion in Washington State: Investigation and Remedial Action*, dated October 2009 (VI guidance). Applying the Preliminary Assessment step of the VI guidance to this SWMU shows that four chemicals present in groundwater beneath the SWMU (1,1-dichloroethene, cis-1,2-dichloroethene, TCE, and vinyl chloride, Tables 3-28 and 3-29), are sufficiently volatile to pose a potential VI problem. The most recent detections of vinyl chloride and TCE in groundwater are considered to be potential sources of VI because the maximum recent concentrations detected (0.5 µg/L and 2.7 µg/L, respectively) exceed the VI guidance screening criterion of 0.35 µg/L and 0.42 µg/L, respectively).

## 3.10 REFERENCES

Dames & Moore, 1998, 1997 Groundwater Monitoring, Boeing Commercial Airplane Group, Everett Plant, Everett, Washington, May 28, 1998.

Dames & Moore, 2000, Supplemental Remedial Investigation Work Plan, BCAG Everett Plant, March 31, 2000.

URS, 2000, Supplemental Remedial Investigation Work Plan, Monitoring Well Installation Addendum, BCAG Everett Plant, May 30, 2000.

Washington State Department of Ecology, 1994, Natural Background Soil Metals in Washington State, Publication #94-115.

Washington State Department of Ecology, 2007, *Ecology Response to the Boeing Company's February 8, 2007 Letter*, Letter to the Boeing Company dated July 6, 2007.

**Table 3-1**
**Summary of Soil Sample Analytical Results for Volatile Organic Compounds, (ug/kg)**
**Building 40-51, Former Wastewater AST**
**Boeing Everett Plant Remedial Investigation**

| Sample ID | Sample Date | 1,1,2-Trichloro-1,2,2-trifluoroethane | Acetone | Methylene Chloride | Trichloroethene |
|---|---|---|---|---|---|
| 1996 MTCA Method B Soil Cleanup Level | | NE | 8,000,000 | 133,000 | 90,900 |
| 1996 MTCA Method B 100x GW Soil Cleanup Level | | NE | 80,000 | 583 | 398 |
| 2001 MTCA Method A or B Soil Cleanup Level | | 2,400,000,000 (B*) | 8,000,000 (B) | 20 (A)<br>133,000 (B) | 30 (A)<br>90,900 (B)<br>11,000 (B*) |
| MTCA Method A or B Protection of Groundwater | | 960,000 (B) | 3,211 (B) | 20 (A)<br>25 (B) | 30 (A)<br>3.2 (B) |
| ESB1307-5' | 7/30/1998 | 2.2 U | 11 U* | 2.5 U* | 3.1 |
| ESB1307-8' | 7/30/1998 | 2.2 U | 5.5 U | 2.3 U* | 1.1 U |
| ESB1308-1' | 7/30/1998 | 2.2 U | 5.5 U | 2.2 U | **140** |
| ESB1308-8 1/2' | 7/30/1998 | 2.1 U | 8.8 U* | 2.1 U | 5.7 |
| ESB1309-3' | 7/30/1998 | 22 | 48 U | **41** | **1,200** |
| ESB1309-9' | 7/30/1998 | 32 | 49 U | **23** | **510** |

**Notes:**
MTCA - Model Toxics Control Act
(A) - MTCA Method A soil cleanup level for unrestricted land use
(B) MTCA Method B soil cleanup level
(B*) Revised 2001 MTCA Method B value from Ecology website CLARC tables downloaded June 2010
(https://fortress.wa.gov/ecy/clarc/reporting/CLARCReporting.aspx).
1996 - Indicates MTCA soil cleanup levels, published 1996.
2001 - Indicates MTCA version 3.1 soil cleanup levels, published 200
NE - Not established
U - Compound was analyzed for but not detected above the reporting limit shown.
* Value was qualified as not detected due to method blank or rinsate blank results.
Numbers in **bold** font indicate that the result reported exceeds the most current MTCA cleanup level as of June 201
Numbers in grey shading indicate results that exceed a MTCA protection of groundwater level, but do not exceed the current lowest MTCA soil cleanup level protective of direct contact.

**Table 3-2**
**Summary of Soil Sample Analytical Results for TPH, Non-halogenated SVOCs and Phenol**
**Building 40-51, Former Wastewater AST**
**Boeing Everett Plant Remedial Investigation**

| Sample ID | Sample Date | Total Petroleum Hydrocarbons (mg/kg) | | Non-halogenated SVOCs (mg/kg) | Phenol (ug/kg) |
|---|---|---|---|---|---|
| | | Diesel-Range Hydrocarbons | Gasoline-Range Hydrocarbons | | |
| 1996 MTCA Method B Soil Cleanup Level | | 200 (A) | 100 (A) | - | 48,000,000 (B) |
| 1996 MTCA Method B 100x GW Soil Cleanup Level | | NE | NE | - | 960,000 |
| 2001 MTCA Method A or B Soil Cleanup Level | | 2,000 (A) | 30 / 100* (A) | - | 48,000,000 (B) |
| MTCA Method A or B Protection of Groundwater | | NC | 30 / 100* (A) | - | 21,965 (B) |
| ESB1307-5' | 7/30/1998 | 5.4 U | 5.6 U | ND | 150 U |
| ESB1307-8' | 7/30/1998 | 5.5 U | 5.3 U | ND | 150 U |
| ESB1308-1' | 7/30/1998 | 5.6 U | 5.4 U | ND | 150 U |
| ESB1308-8 1/2' | 7/30/1998 | 5.6 U | 5.6 U | ND | 150 U |
| ESB1309-3' | 7/30/1998 | 5.6 U | 5.4 U | ND | 150 U |
| ESB1309-9' | 7/30/1998 | 5.5 U | 5.7 U | ND | 150 U |

**Notes:**
MTCA - Model Toxics Control Act
(A) - MTCA Method A soil cleanup level for unrestricted land use
(B) - MTCA Method B soil cleanup level
1996 - Indicates MTCA soil cleanup levels, published 1996.
2001 - Indicates MTCA version 3.1 soil cleanup levels, published 2001.
NC - Not calculated
ND - Not detected
NE - Not established
U - Compound was analyzed for but not detected above the reporting limit shown.
*gasoline mixtures with benzene/gasoline mixtures without benzene

**Table 3-3**
**Summary of Soil Sample Analytical Results for Metals, (mg/kg)**
**Building 40-51, Former Wastewater AST**
**Boeing Everett Plant Remedial Investigation**

| Sample ID | Sample Date | Arsenic | Barium | Cadmium | Chromium | Lead | Silver | Strontium |
|---|---|---|---|---|---|---|---|---|
| 1996 MTCA Method A, AI, or B Soil Cleanup Level | | 1.67 (B) | 5,600 (B) | 80 (B) | 100 (A)<br>500 (AI) | 250 (A)<br>1,000 (AI) | 400 (B) | 48,000 (B) |
| 1996 MTCA Method B 100x GW Soil Cleanup Level | | 0.00583 | 112 | 1.6 | 1,600 ($Cr^{+3}$) | NE | 8.0 | 960 |
| 2001 MTCA Method A, AI, or B Soil Cleanup Level | | 20 (A)<br>0.667 (B) | 5,600 (B)<br>16,000 (B*) | 2 (A)<br>80 (B) | 2,000($Cr^{+3}$) / 19 ($Cr^{+6}$) (A)<br>120,000($Cr^{+3}$) / 240 ($Cr^{+6}$) (B) | 250 (A)<br>1,000 (AI) | 400 (B) | 48,000 (B) |
| MTCA Method A or B Protection of Groundwater | | 20 (A)<br>0.03 (B) | 2,637 (B) | 2 (A)<br>1.1 (B) | 2,000 ($Cr^{+3}$) / 19 ($Cr^{+6}$) (A)<br>480,096 ($Cr^{+3}$) / 18 ($Cr^{+6}$) (B) | 250 (A) | 13.6 (B) | 38.4 (B) |
| WA Department of Ecology - Puget Sound Regional Background Concentration | | 7.30 | NE | 0.8 | 48.2 | 24.0 | NE | NE |
| ESB1307-5' | 7/30/1998 | **2.1** | 62.6 | 0.2 U | **39.5 J** | 2 U | 0.3 | 42.4 |
| ESB1307-8' | 7/30/1998 | **2.9** | 70.8 | 0.2 U | **45.3 J** | 3 | 0.3 | 45.9 |
| ESB1308-1' | 7/30/1998 | **2.1** | 63.3 | 0.2 U | **39.5 J** | 2 | 0.3 U | 32.4 |
| ESB1308-8 1/2' | 7/30/1998 | **2.9** | 67.7 | 0.2 U | **42.4 J** | 3 | 0.3 U | 38.6 |
| ESB1309-3' | 7/30/1998 | **1.7** | 68.1 | 0.2 U | **45.0 J** | 3 | 0.3 U | 38.7 |
| ESB1309-9' | 7/30/1998 | **2.0** | 63.0 | 0.2 U | **46.0 J** | 3 | 0.3 U | 34.1 |

**Notes:**
MTCA - Model Toxics Control Act
(A) - MTCA Method A soil cleanup level for unrestricted land use
(AI) - MTCA Method A soil cleanup level for industrial property
(B) - MTCA Method B soil cleanup level
(B*) Revised 2001 MTCA Method B value from Ecology website CLARC tables downloaded June 2010 (https://fortress.wa.gov/ecy/clarc/reporting/CLARCReporting.aspx).
1996 - Indicates MTCA soil cleanup levels, published 1996.
2001 - Indicates MTCA version 3.1 soil cleanup levels, published 2001.
J - Estimated value
NE - Not established
U - Compound was analyzed for but not detected above the reporting limit shown.
Samples were analyzed for mercury and selenium, but these metals were not detected in any of the samples.
Numbers in **bold** font indicate that the result reported exceeds the most current MTCA cleanup level as of June 2010.
Numbers in grey shading indicate results that exceed a MTCA protection of groundwater level, but do not exceed the current lowest MTCA soil cleanup level protective of direct contact.

**Table 3-4**
**Summary of Soil Sample Analytical Results for Volatile Organic Compounds, (ug/kg)**
**Building 40-51, Former Paint Stripping Tank Line**
**Boeing Everett Plant Remedial Investigation**

| Sample ID | Sample Date | Acetone | Benzene | 2-Butanone | Chlorobenzene | Ethylbenzene | Toluene | Xylenes |
|---|---|---|---|---|---|---|---|---|
| 1996 MTCA Method B Soil Cleanup Level | | 8,000,000 | 34,500 | 48,000,000 | 1,600,000 | 8,000,000 | 16,000,000 | 160,000,000 |
| 1996 MTCA Method B 100x GW Soil Cleanup Level | | 80,000 | 151 | 480,000 | 16,000 | 80,000 | 160,000 | 1,600,000 |
| 2001 MTCA Method A or B Soil Cleanup Level | | 8,000,000 (B) | 30 (A)<br>18,200 (B) | 48,000,000 (B) | 1,600,000 (B) | 6,000 (A)<br>8,000,000 (B) | 7,000 (A)<br>16,000,000 (B)<br>6,400,000 (B*) | 9,000 (A)<br>160,000,000 (B) |
| MTCA Method A or B Protection of Groundwater | | 3,211 (B) | 30 (A)<br>4.5 (B) | 19,200 (B) | 1,399 (B) | 6,000 (A)<br>6,912 (B) | 7,000 (A)<br>4,654 (B) | 9,000 (A)<br>14,630 (B) |
| ESB1101-5' | 08/09/97 | 5.1 U | 1.0 U | 5.1 U | 1.0 U | 1.0 U | 1.0 U | 1.0 U |
| ESB1101-5' (DUP) | 08/09/97 | 5.2 U | 1.0 U | 5.2 U | 1.0 U | 1.0 U | 1.0 U | 1.0 U |
| ESB1101-10' | 08/09/97 | 7.9 | 1.1 U | 5.3 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U |
| ESB1101-12 1/2' | 08/09/97 | 7.3 | 1.0 U | 5.1 U | 1.0 U | 1.0 U | 1.0 U | 1.0 U |
| ESB1102-5 | 08/09/97 | 120 | 11 | 61 | 62 | 43 | 130 | 340 |
| ESB1102-6 | 08/09/97 | 7.0 | 1.1 U | 5.4 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U |
| ESB1102-10 | 08/09/97 | 16 | 1.1 U | 5.4 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U |
| ESB1103-7' | 08/09/97 | 5.6 U | 1.1 U | 5.6 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U |
| ESB1103-10' | 08/09/97 | 9.0 | 1.1 U | 5.6 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U |
| ESB1103-15' | 08/09/97 | 8.4 | 1.1 U | 5.3 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U |
| ESB1105-8' | 08/11/97 | 12 J | 1.1 UJ | 5.4 UJ | 1.1 UJ | 1.1 UJ | 1.1 UJ | 1.1 UJ |
| ESB1105-13' | 08/11/97 | 14 J | 1.0 UJ | 5.2 UJ | 1.0 UJ | 1.0 UJ | 1.0 UJ | 1.0 UJ |
| ESB1105-18' | 08/11/97 | 9.8 J | 1.0 UJ | 5.2 UJ | 1.0 UJ | 1.0 UJ | 1.0 UJ | 1.0 UJ |

**Notes:**
MTCA - Model Toxics Control Act
(A) - MTCA Method A soil cleanup level for unrestricted land use
(B) MTCA Method B soil cleanup level
(B*) Revised 2001 MTCA Method B value from Ecology website CLARC tables downloaded June 2010 (https://fortress.wa.gov/ecy/clarc/reporting/CLARCReporting.aspx).
1996 - Indicates MTCA soil cleanup levels, published 1996.
2001 - Indicates MTCA version 3.1 soil cleanup levels, published 2001.
(DUP) - Field duplicate
J - Estimated value
U - Compound was analyzed for but not detected above the reporting limit shown.
UJ - Compound was analyzed for but not detected above the reporting limit shown. Reporting limit is an estimated value.
Numbers in grey shading indicate results that exceed a MTCA protection of groundwater level, but do not exceed the current lowest MTCA soil cleanup level protective of direct contact.

**Table 3-5**
**Summary of Soil Sample Analytical Results for Metals (mg/kg) and pH (S.U.)**
**Building 40-51, Former Paint Stripping Tank Line**
**Boeing Everett Plant Remedial Investigation**

| Sample ID | Sample Date | Arsenic | Barium | Cadmium | Chromium | Lead | Mercury | Selenium | Silver | pH |
|---|---|---|---|---|---|---|---|---|---|---|
| 1996 MTCA Method A, AI, or B Soil Cleanup Level | | 1.67 (B) | 5,600 (B) | 80 (B) | 100 (A)<br>500 (AI) | 250 (A)<br>1,000 (AI) | 24 (B) | 400 (B) | 400 (B) | - |
| 1996 MTCA Method B 100x GW Soil Cleanup Level | | 0.00583 | 112 | 1.6 | 1,600 ($Cr^{+3}$) | NE | 0.48 | 8.0 | 8.0 | - |
| 2001 MTCA Method A, AI, or B Soil Cleanup Level | | 20 (A)<br>0.667 (B) | 5,600 (B)<br>16,000 (B*) | 2 (A)<br>80 (B) | 2,000($Cr^{+3}$) / 19 ($Cr^{+6}$) (A)<br>120,000($Cr^{+3}$) / 240 ($Cr^{+6}$) (B) | 250 (A)<br>1,000 (AI) | 2 (A)<br>24 (B) | 400 (B) | 400 (B) | NE |
| MTCA Method A or B Protection of Groundwater | | 20 (A)<br>0.03 (B) | 2,637 (B) | 2 (A)<br>1.1 (B) | 2,000 (Cr+3) / 19 (Cr+6) (A)<br>480,096 (Cr+3) / 18 (Cr+6) (B) | 250 (A) | 2 (A)<br>5.02 (B) | 8.3 (B) | 13.6 (B) | - |
| WA Department of Ecology - Puget Sound Regional Background Concentration | | 7.30 | NE | 0.8 | 48.2 | 24.0 | 0.07 | NE | NE | - |
| ESB1101-5' | 08/09/97 | 5 U | 51.6 | 0.2 J | **48.9** | 5 | 0.05 UJ | 5 U | 0.3 U | 8.8 J |
| ESB1101-5' (DUP) | 08/09/97 | 5 U | 58.2 | 0.2 UJ | **38.3** | 6 | 0.05 UJ | 5 U | 0.3 U | 8.2 J |
| ESB1101-10' | 08/09/97 | 5 U | 60.3 | 0.2 UJ | **35.4** | 4 | 0.05 UJ | 6 | 0.3 U | 8.6 J |
| ESB1101-12 1/2' | 08/09/97 | 5 U | 72.0 | 0.2 UJ | **39.3** | 4 | 0.05 UJ | 5 U | 0.3 U | 8.5 J |
| ESB1102-5 | 08/09/97 | 10 U | 70.4 | **43.6** | **1,840** | **912** | 0.27 | 20.0 | 0.7 U | 8.5 J |
| ESB1102-6 | 08/09/97 | 5 U | 60.5 | 0.7 J | **48.2** | 16 | 0.05 UJ | 7 | 0.3 U | 8.6 J |
| ESB1102-10 | 08/09/97 | 5 U | 75.8 | 0.2 UJ | **42.2** | 5 | 0.05 UJ | 7 | 0.3 U | 8.2 J |
| ESB1103-7' | 08/09/97 | 5 U | 43.8 | 0.2 UJ | **42.9** | 4 | 0.05 UJ | 5 U | 0.3 U | 7.9 J |
| ESB1103-10' | 08/09/97 | 5 U | 57.6 | 0.2 UJ | **33.9** | 4 | 0.05 UJ | 6 | 0.3 U | 8.3 J |
| ESB1103-15' | 08/09/97 | 5 U | 69.9 | 0.2 UJ | **39.1** | 5 | 0.05 UJ | 5 U | 0.3 U | 8.6 J |
| ESB1105-8' | 08/11/97 | 5 U | 52.1 | 0.2 U | **32.6** | 4 | 0.05 U | 5 U | 0.3 U | 7.8 J |
| ESB1105-13' | 08/11/97 | 5 U | 65.3 | 0.2 U | **44.6** | 5 | 0.05 U | 5 U | 0.3 U | 8.2 J |
| ESB1105-18' | 08/11/97 | 5 U | 65.9 | 0.2 U | **40.7** | 5 | 0.05 U | 6 | 0.3 U | 8.4 J |

**Notes:**
MTCA - Model Toxics Control Act
(A) - MTCA Method A soil cleanup level for unrestricted land use
(AI) - MTCA Method A soil cleanup level for industrial property
(B) - MTCA Method B soil cleanup level
(B*) Revised 2001 MTCA Method B value from Ecology website CLARC tables downloaded June 2010 (https://fortress.wa.gov/ecy/clarc/reporting/CLARCReporting.aspx).
1996 - Indicates MTCA soil cleanup levels, published 1996.
2001 - Indicates MTCA version 3.1 soil cleanup levels, published 2001.
(DUP) - Field duplicate
J - Estimated value
NE - Not established
U - Compound was analyzed for but not detected above the reporting limit shown.
UJ - Compound was analyzed for but not detected above the reporting limit shown. Reporting limit is an estimated value.
Numbers in **bold** font indicate that the result reported exceeds the most current MTCA cleanup level as of June 2010
Numbers in grey shading indicate results or reporting limits that exceed a MTCA protection of groundwater level, but do not exceed the current MTCA soil cleanup level protective of direct contact.

**Table 3-6**
**Summary of Soil Sample Analytical Results for Volatile Organic Compounds, (ug/kg)**
**Building 40-51, Southern Air Scrubber Trenches (Fuselage Area)**
**Boeing Everett Plant Remedial Investigation**

| Sample ID | Sample Date | 2-Butanone | Acetone | Carbon Disulfide | Methylene Chloride |
|---|---|---|---|---|---|
| 1996 MTCA Method B Soil Cleanup Level | | 48,000,000 | 8,000,000 | 8,000,000 | 133,000 |
| 1996 MTCA Method B 100x GW Soil Cleanup Level | | 480,000 | 80,000 | 80,000 | 583 |
| 2001 MTCA Method A or B Soil Cleanup Level | | 48,000,000 (B) | 8,000,000 (B) | 8,000,000 (B) | 20 (A)<br>133,000 (B) |
| MTCA Method A or B Protection of Groundwater | | 19,200 (B) | 3,211 (B) | 5,651 (B) | 20 (A)<br>25 (B) |
| ESB1207-4 1/2' | 05/02/98 | 5.0 U | 54 U* | 1.0 U | 2.0 U |
| ESB1207-7 1/2' | 05/02/98 | 5.4 U | 9.3 U* | 1.1 U | 2.1 U |
| ESB1208-5' | 05/02/98 | 5.2 U | 7.5 U* | 1.0 U | 2.1 U |
| ESB1208-6' | 05/02/98 | 13.0 U* | 27 U* | 1.4 U* | 2.2 U |
| ESB1214-5' | 05/07/98 | 5.2 U | 9 U* | 1.0 U | 4.4 |
| ESB1214-7 1/2' | 05/08/98 | 5.4 U | 22 U* | 2.1 | 4.7 |
| ESB1215-4' | 05/08/98 | 5.0 U | 10 U* | 1.0 U | 7.2 |
| ESB1215-5' | 05/08/98 | 5.4 U | 10 U* | 1.1 U | 10.0 |
| ESB1270-2 1/2' | 06/27/98 | 5.2 U | 5.2 U | 1.0 U | 2.1 U |
| ESB1270-7 1/2' | 06/27/98 | 5.5 U | 9.5 U* | 1.1 U | 2.2 U |
| ESB1270-10' | 06/27/98 | 5.5 U | 10 U* | 1.1 U | 2.2 U |
| ESB1279-7 1/2' | 07/07/98 | 5.2 U | 5.2 U | 1.0 U | 2.1 U |
| ESB1279-10' | 07/07/98 | 5.3 U | 10 | 1.1 U | 2.1 U |
| ESB1280-5' | 07/07/98 | 5.2 U | 5.2 U | 1.0 U | 2.1 U |
| ESB1280-7 1/2' | 07/07/98 | 5.5 U | 5.5 U | 1.1 U | 2.2 U |
| ESB1303-5' | 07/30/98 | 5.2 U | 7.3 U* | 1.0 U | 2.1 U* |
| ESB1303-6' | 07/30/98 | 5.7 U | 7.6 U* | 1.1 U | 2.5 U* |
| ESB1304-2 1/2' | 07/31/98 | 5.3 U | 7.5 U* | 1.1 U | 2.1 U |
| ESB1304-4 1/2' | 07/31/98 | 5.4 U | 7.5 U* | 1.1 U | 2.2 U |

**Notes:**
MTCA - Model Toxics Control Act
(A) - MTCA Method A soil cleanup level for unrestricted land use
(B) - MTCA Method B soil cleanup level
1996 - Indicates MTCA soil cleanup levels, published 1996.
2001 - Indicates MTCA version 3.1 soil cleanup levels, published 2001.
U - Compound was analyzed for but not detected above the reporting limit shown.
* Result qualified as not detected based on method blank contamination.

**Table 3-7**
**Summary of Soil Sample Analytical Results for TPH, Non-halogenated SVOCs, and Phenol**
**Building 40-51, Southern Air Scrubber Trenches (Fuselage Area)**
**Boeing Everett Plant Remedial Investigation**

| Sample ID | Sample Date | Total Petroleum Hydrocarbons (mg/kg) | | Non-halogenated SVOCs (mg/kg) | Phenol (ug/kg) |
|---|---|---|---|---|---|
| | | Diesel-Range Hydrocarbons | Gasoline-Range Hydrocarbons | | |
| 1996 MTCA Method A or B Soil Cleanup Level | | 200 (A) | 100 (A) | - | 48,000,000 (B) |
| 1996 MTCA Method B 100x GW Soil Cleanup Level | | NE | NE | - | 960,000 |
| 2001 MTCA Method A or B Soil Cleanup Level | | 2,000 (A) | 30 / 100*** (A) | - | 48,000,000 (B) |
| MTCA Method A or B Protection of Groundwater | | NC | 30 / 100*** (A) | - | 21,965 (B) |
| ESB1207-4 1/2' | 05/02/98 | 37.0** | 5.3 U | ND | 150 U |
| ESB1207-7 1/2' | 05/02/98 | 6.2 U | 5.7 U | ND | 170 U |
| ESB1208-5' | 05/02/98 | 5.9 U | 5.4 U | ND | 160 U |
| ESB1208-6' | 05/02/98 | 5.4 U | 5.6 U | ND | 150 U |
| ESB1214-5' | 05/07/98 | 15 U* | 5.3 U | ND | 140 U |
| ESB1214-7 1/2' | 05/08/98 | 23 U* | 5.4 U | ND | 150 U |
| ESB1215-4' | 05/08/98 | 14 U* | 5.2 U | ND | 140 U |
| ESB1215-5' | 05/08/98 | 18 U* | 5.6 U | ND | 170 U |
| ESB1270-2 1/2' | 06/27/98 | 5.2 U | 5.2 U | ND | 140 U |
| ESB1270-7 1/2' | 06/27/98 | 5.4 U | 5.3 U | ND | 140 U |
| ESB1270-10' | 06/27/98 | 5.4 U | 5.4 U | ND | 140 U |
| ESB1279-7 1/2' | 07/07/98 | 5.2 U | 5.2 U | ND | 140 U |
| ESB1279-10' | 07/07/98 | 5.3 U | 5.3 U | ND | 140 U |
| ESB1280-5' | 07/07/98 | 5.4 U | 5.2 U | ND | 140 U |
| ESB1280-7 1/2' | 07/07/98 | 5.5 U | 5.4 U | ND | 150 U |
| ESB1303-5' | 07/30/98 | 5.4 U | 5.3 U | ND | 140 U |
| ESB1303-6' | 07/30/98 | 5.3 U | 5.4 U | ND | 140 U |
| ESB1304-2 1/2' | 07/31/98 | 5.7 U | 5.2 U | ND | 150 U |
| ESB1304-4 1/2' | 07/31/98 | 5.2 U | 5.2 U | ND | 140 U |

**Notes:**
MTCA - Model Toxics Control Act
(A) - MTCA Method A soil cleanup level for unrestricted land use
(B) - MTCA Method B soil cleanup level
1996 - Indicates MTCA soil cleanup levels, published 1996.
2001 - Indicates MTCA version 3.1 soil cleanup levels, published 2001.
NC - Not calculated
ND - Not detected
NE - Not established
U - Compound was analyzed for but not detected above the reporting limit shown.
U* - Result qualified as not detected based on method blank contamination.
** Pattern profile does not match a typical diesel pattern.
****gasoline mixtures with benzene/gasoline mixtures without benzene

**Table 3-8**
**Summary of Soil Sample Analytical Results for Metals, (mg/kg)**
**Building 40-51, Southern Air Scrubber Trenches (Fuselage Area)**
**Boeing Everett Plant Remedial Investigation**

| Sample ID | Sample Date | Arsenic | Barium | Cadmium | Chromium | Lead | Silver | Strontium |
|---|---|---|---|---|---|---|---|---|
| 1996 MTCA Method A, AI, or B Soil Cleanup Level | | 1.67 (B) | 5,600 (B) | 80 (B) | 100 (A)<br>500 (AI) | 250 (A)<br>1,000 (AI) | 400 (B) | 48,000 (B) |
| 1996 MTCA Method B 100x GW Soil Cleanup Level | | 0.00583 | 112 | 1.6 | 1,600 ($Cr^{+3}$) | NE | 8.0 | 960 |
| 2001 MTCA Method A, AI, or B Soil Cleanup Level | | 20 (A)<br>0.667 (B) | 5,600 (B)<br>16,000 (B*) | 2 (A)<br>80 (B) | 2,000($Cr^{+3}$) / 19 ($Cr^{+6}$) (A)<br>120,000($Cr^{+3}$) / 240 ($Cr^{+6}$) (B) | 250 (A)<br>1,000 (AI) | 400 (B) | 48,000 (B) |
| MTCA Method A or B Protection of Groundwater | | 20 (A)<br>0.03 (B) | 2,637 (B) | 2 (A)<br>1.1 (B) | 2,000 (Cr+3) / 19 (Cr+6) (A)<br>480,096 (Cr+3) / 18 (Cr+6) (B) | 250 (A) | 13.6 (B) | 38.4 (B) |
| WA Department of Ecology - Puget Sound Regional Background Concentration | | 7.30 | NE | 0.8 | 48.2 | 24.0 | NE | NE |
| ESB1207-4 1/2' | 05/02/98 | **2.4** | 60.0 | 0.2 U | **52.9** | 10 | 0.3 U | 33.9 |
| ESB1207-7 1/2' | 05/02/98 | **2.8** | 64.9 | 0.2 U | **38.2** | 4 | 0.3 U | 35.7 |
| ESB1208-5' | 05/02/98 | **2.5** | 62.5 | 0.2 U | **49.4** | 14 | 0.3 U | 24.9 |
| ESB1208-6' | 05/02/98 | **4.0** | 71.7 | 0.2 U | **40.1** | 4 | 0.3 U | 44.7 |
| ESB1214-5' | 05/07/98 | **2.8 J** | 66.2 | 0.2 U | **42.0** | 4 | 0.3 U | 20.9 |
| ESB1214-7 1/2' | 05/08/98 | **3.0 J** | 69.8 | 0.2 U | **42.7** | 5 | 0.3 U | 42.1 |
| ESB1215-4' | 05/08/98 | **2.0 J** | 78.3 | 0.2 U | **53.3** | 4 | 0.3 U | 27.4 |
| ESB1215-5' | 05/08/98 | **4.0 J** | 83.1 | 0.2 | **53.1** | 6 | 0.3 U | 44.7 |
| ESB1270-2 1/2' | 06/27/98 | **2.0** | 64.3 | 0.2 | **31.6** | 5 | 0.3 U | 30.1 J |
| ESB1270-7 1/2' | 06/27/98 | **1.8** | 63.6 | 0.2 | **33.4** | 5 | 0.3 U | 39.6 J |
| ESB1270-10' | 06/27/98 | **2.5** | 61.3 | 0.2 | **35.9** | 5 | 0.3 U | 33.7 J |
| ESB1279-7 1/2' | 07/07/98 | **1.9** | 52.6 | 0.2 U | **40.3 J** | 7 | 0.3 U | 29.3 |
| ESB1279-10' | 07/07/98 | **1.9** | 60.0 | 0.3 | **44.5 J** | 7 | 0.3 U | 40.8 |
| ESB1280-5' | 07/07/98 | **1.8** | 48.6 | 0.2 | **47.6 J** | 20 | 0.3 U | 36.4 |
| ESB1280-7 1/2' | 07/07/98 | **2.2** | 66.1 | 0.2 U | **41.5 J** | 14 | 0.3 U | 37.9 |
| ESB1303-5' | 07/30/98 | **1.6** | 46.3 | 0.2 U | **38.3 J** | 3 | 0.3 U | 25.9 |
| ESB1303-6' | 07/30/98 | **1.7** | 51.3 | 0.2 U | **76.9 J** | 20 | 0.3 U | 32.6 |
| ESB1304-2 1/2' | 07/31/98 | **1.6** | 50.3 | 0.2 U | **36.2 J** | 2 U | 0.3 U | 26.5 |
| ESB1304-4 1/2' | 07/31/98 | **1.6** | 43.3 | 0.2 U | **26.4 J** | 2 | 0.3 | 23.7 |

**Notes:**
MTCA - Model Toxics Control Act
(A) - MTCA Method A soil cleanup level for unrestricted land use
(AI) - MTCA Method A soil cleanup level for industrial property
(B) - MTCA Method B soil cleanup level
(B*) Revised 2001 MTCA Method B value from Ecology website CLARC tables downloaded June 2010 (https://fortress.wa.gov/ecy/clarc/reporting/CLARCReporting.aspx).
1996 - Indicates MTCA soil cleanup levels, published 1996.
2001 - Indicates MTCA version 3.1 soil cleanup levels, published 2001.
NE - Not established
J - Estimated value
U - Compound was analyzed for but not detected above the reporting limit shown.
Samples were analyzed for mercury and selenium, but these metals were not detected in any of the samples.
Numbers in **bold** font indicate that the result reported exceeds the most current MTCA cleanup level as of June 2010.
Numbers in grey shading indicate results that exceed a MTCA protection of groundwater level, but do not exceed the current lowest MTCA soil cleanup level protective of direct contact.

**Table 3-9**
**Summary of Soil Sample Analytical Results for Volatile Organic Compounds, (ug/kg)**
**Building 40-51, Southern Air Scrubber Sumps (EV-112 and EV-119)**
**Boeing Everett Plant Remedial Investigation**

| Sample ID | Sample Date | 1,1,2-Trichloro-1,2,2-trifluoroethane | 2-Butanone | Acetone | Carbon Disulfide | cis-1,2-Dichloroethene | Methylene Chloride | Toluene | Trichloroethene |
|---|---|---|---|---|---|---|---|---|---|
| 1996 MTCA Method B Soil Cleanup Level | | NE | 48,000,000 | 8,000,000 | 8,000,000 | 800,000 | 133,000 | 16,000,000 | 90,900 |
| 1996 MTCA Method B 100x GW Soil Cleanup Level | | NE | 480,000 | 80,000 | 80,000 | 8,000 | 583 | 160,000 | 398 |
| 2001 MTCA Method A or B Soil Cleanup Level | | 2,400,000,000 (B*) | 48,000,000 (B) | 8,000,000 (B) | 8,000,000 (B) | 8,000,000 (B) | 20 (A)<br>133,000 (B) | 7,000 (A)<br>16,000,000 (B)<br>6,400,000 (B*) | 30 (A)<br>90,900 (B)<br>11,000 (B*) |
| MTCA Method A or B Protection of Groundwater | | 960,000 (B) | 19,200 (B) | 3,211 (B) | 5,651 (B) | 400 (B) | 20 (A)<br>25 (B) | 7,000 (A)<br>4,654 (B) | 30 (A)<br>3.2 (B) |
| ESB1121-12.5' | 03/04/98 | 2.2 U | 5.4 U | 8.8 | 1.1 U | 1.7 | 2.2 U | 1.1 U | 18 |
| ESB1121-15' | 03/04/98 | 2.2 U | 6 | 9.7 | 1.1 U | 1.1 U | 2.2 U | 1.1 U | 1.1 U |
| ESB1121-22.5' | 03/04/98 | 2.1 U | 5.2 U | 11 U* | 1 U | 1 U | 3 U* | 1.8 | 1 U |
| ESB1212-1' | 05/04/98 | 2.0 U | 85 | 5 U | 1.0 U | 1.0 U | 2.0 U | 1.0 U | 2 U |
| ESB1212-5' | 05/04/98 | 2.2 U | 5.4 U | 41 U* | 1.1 U | 1 U | 4.6 U* | 1.1 U | 1.1 U |
| ESB1212-5' (DUP) | 05/04/98 | 2.1 U | 5.2 U | 48 U* | 1 U | 1.1 U | 2.8 U* | 1 U | 1.0 U |
| ESB1212-7 1/2' | 05/04/98 | 2.1 U | 5.3 U | 45 U* | 1.1 U | 1 U | 5.2 | 1.1 U | 1.1 U |
| ESB1213-2 1/2' | 05/04/98 | 2.8 | 16.0 | 8.4 U* | 1.2 U | 1.1 U | 2.8 U* | 1.2 U | 1.2 U |
| ESB1267-10' | 06/25/98 | 2.6 U | 6.6 U | 6.6 U | 1.3 U | 1.2 U | 2.6 U | 1.3 U | 1.3 U |
| ESB1267-15' | 06/26/98 | 2.1 U | 5.3 U | 15 U* | 1.8 | 1.3 U | 2.1 U | 1.1 U | 1.5 |
| ESB1267-22 1/2' | 06/26/98 | 2.2 U | 5.5 U | 9 U* | 1.1 U | 1.1 U | 2.2 U | 1.1 U | 1.1 U |
| ESB1268-12 1/2' | 06/26/98 | 2.2 U | 5.5 U | 13 U* | 1.1 U | 1.1 U | 2.2 U | 1.1 U | 1.1 U |
| ESB1268-12 1/2' (DUP) | 06/26/98 | 2.2 U | 16 U* | 14 U* | 1.1 U | 1.1 U | 2.2 U | 1.2 U* | 1.1 U |
| ESB1268-15' | 06/27/98 | 2.2 U | 5.5 U | 13 U* | 1.1 U | 1.1 U | 2.2 U | 1.1 U | 1.1 U |
| ESB1268-22 1/2' | 06/27/98 | 2.2 U | 5.5 U | 12 U* | 1.1 U | 1.1 U | 2.2 U | 2.6 U* | 1.1 U |
| ESB1269-10' | 06/26/98 | 2.3 U | 5.8 U | 11 U* | 1.2 U | 1.2 U | 2.3 U | 1.2 U | 1.2 U |
| ESB1269-15' | 06/26/98 | 2.2 U | 5.5 U | 11 U* | 1.1 U | 1.1 U | 2.2 U | 1.1 U | 1.1 U |
| ESB1274-12 1/2' | 07/01/98 | 2.2 UJ | 5.6 UJ | 8.9 UJ | 1.1 UJ | 1.1 UJ | 2.2 UJ | 1.1 UJ | 1.1 UJ |
| ESB1274-15' | 07/01/98 | 2.2 U | 5.4 U | 6 U* | 1.1 U | 1.1 U | 2.2 U | 1.1 U | 1.1 U |
| ESB1274-25' | 07/01/98 | 2.2 U | 5.4 U | 12.0 U* | 1.1 U | 1.1 U | 2.2 U | 1.1 U | 1.1 U |
| ESB1285-2 1/2' | 07/14/98 | 2.4 U | 6.0 U | 18 | 1.2 U | 1.2 U | 3.5 U* | 1.2 U | 1.2 U |

**Notes:**
MTCA - Model Toxics Control Act
(A) - MTCA Method A soil cleanup level for unrestricted land use
(B) - MTCA Method B soil cleanup level
(B*) Revised 2001 MTCA Method B value from Ecology website CLARC tables downloaded June 2010 (https://fortress.wa.gov/ecy/clarc/reporting/CLARCReporting.aspx).
1996 - Indicates MTCA soil cleanup levels, published 1996.
2001 - Indicates MTCA version 3.1 soil cleanup levels, published 2001.
(DUP) - Field duplicate
NE - Not established
U - Compound was analyzed for but not detected above the reporting limit shown.
UJ - Compound was analyzed for but not detected above the reporting limit shown. Reporting limit is an estimated value.
* Value was qualified as not detected due to method blank or rinsate blank results.
Numbers in grey shading indicate results that exceed a MTCA protection of groundwater level, but do not exceed the current lowest MTCA soil cleanup level protective of direct contact.

**Table 3-10**
**Summary of Soil Sample Analytical Results for TPH, Non-halogenated SVOCs and Phenol**
**Building 40-51, Southern Air Scrubber Sumps (EV-112 and EV-119)**
**Boeing Everett Plant Remedial Investigation**

| Sample ID | Sample Date | Total Petroleum Hydrocarbons (mg/kg) | | Non-halogenated SVOCs (mg/kg) | Phenol (ug/kg) |
|---|---|---|---|---|---|
| | | Diesel-Range Hydrocarbons | Gasoline-Range Hydrocarbons | | |
| 1996 MTCA Method A or B Soil Cleanup Level | | 200 (A) | 100 (A) | - | 48,000,000 (B) |
| 1996 MTCA Method B 100x GW Soil Cleanup Level | | NE | NE | - | 960,000 |
| 2001 MTCA Method A or B Soil Cleanup Level | | 2,000 (A) | 30 / 100** (A) | - | 48,000,000 (B) |
| MTCA Method A or B Protection of Groundwater | | NC | 30 / 100** (A) | - | 21,965 (B) |
| ESB1121-12.5' | 03/04/98 | 5.4 U | 5.3 U | ND | 150 U |
| ESB1121-15' | 03/04/98 | 5.4 U | 5.6 U | ND | 150 U |
| ESB1121-22.5' | 03/04/98 | 5.4 U | 5.3 U | ND | 150 U |
| ESB1212-1' | 05/04/98 | 0.25 U | 0.25 U | ND | 150 U |
| ESB1212-5' | 05/04/98 | 5.4 UJ | 5.2 U | ND | 150 U |
| ESB1212-5' (DUP) | 05/04/98 | 16.0* | 5.4 U | ND | 140 U |
| ESB1212-7 1/2' | 05/04/98 | 5.6 U | 5.6 U | ND | 150 U |
| ESB1213-2 1/2' | 05/04/98 | 5.7 U | 6 U | ND | 150 U |
| ESB1267-10' | 06/25/98 | 14 * | 6.6 U | ND | 200 U |
| ESB1267-15' | 06/26/98 | 5.6 U | 5.4 U | ND | 150 U |
| ESB1267-22 1/2' | 06/26/98 | 5.4 U | 5.4 U | ND | 140 U |
| ESB1268-12 1/2' | 06/26/98 | 5.5 U | 5.4 U | ND | 150 U |
| ESB1268-12 1/2' (DUP) | 06/26/98 | 5.6 U | 5.6 U | ND | 150 U |
| ESB1268-15' | 06/27/98 | 5.5 U | 5.6 U | ND | 150 U |
| ESB1268-22 1/2' | 06/27/98 | 5.6 U | 5.6 U | ND | 150 U |
| ESB1269-10' | 06/26/98 | 5.6 U | 5.8 U | ND | 150 U |
| ESB1269-15' | 06/26/98 | 5.6 U | 5.4 U | ND | 150 U |
| ESB1274-12 1/2' | 07/01/98 | 8.4* | 5.6 U | ND | 150 U |
| ESB1274-15' | 07/01/98 | 5.4 U | 5.6 U | ND | 140 U |
| ESB1274-25' | 07/01/98 | 5.4 U | 5.3 U | ND | 140 U |
| ESB1285-2 1/2' | 07/14/98 | 5.6 UJ | 6.1 U | ND | 150 U |

**Notes:**
MTCA - Model Toxics Control Act
(A) - MTCA Method A soil cleanup level for unrestricted land use
(B) - MTCA Method B soil cleanup level
1996 - Indicates MTCA soil cleanup levels, published 1996.
2001 - Indicates MTCA version 3.1 soil cleanup levels, published 2001.
(DUP) - Field duplicate
NC - Not calculated
ND - Not detected
NE - Not established
J - Estimated value
U - Compound was analyzed for but not detected above the reporting limit shown.
UJ - Compound was analyzed for but not detected above the reporting limit shown.  Reporting limit is an estimated value.
* Pattern profile does not match typical diesel profile.
***gasoline mixtures with benzene/gasoline mixtures without benzene

**Table 3-11**
**Summary of Soil Sample Analytical Results for Metals, (mg/kg)**
**Building 40-51, Southern Air Scrubber Sumps (EV-112 and EV-119)**
**Boeing Everett Plant Remedial Investigation**

| Sample ID | Sample Date | Arsenic | Barium | Cadmium | Chromium | Lead | Mercury | Selenium | Silver | Strontium |
|---|---|---|---|---|---|---|---|---|---|---|
| 1996 MTCA Method A, AI, or B Soil Cleanup Level | | 1.67 (B) | 5,600 (B) | 80 (B) | 100 (A)<br>500 (AI) | 250 (A)<br>1,000 (AI) | 24 (B) | 400 (B) | 400 (B) | 48,000 (B) |
| 1996 MTCA Method B 100x GW Soil Cleanup Level | | 0.00583 | 112 | 1.6 | 1,600 ($Cr^{+3}$) | NE | 0.48 | 8.0 | 8.0 | 960 |
| 2001 MTCA Method A, AI, or B Soil Cleanup Level | | 20 (A)<br>0.667 (B) | 5,600 (B)<br>16,000 (B*) | 2 (A)<br>80 (B) | 2,000($Cr^{+3}$) / 19 ($Cr^{+6}$) (A)<br>120,000($Cr^{+3}$) / 240 ($Cr^{+6}$) (B) | 1,000 (AI)<br>250 (A) | 2 (A)<br>24 (B) | 400 (B) | 400 (B) | 48,000 (B) |
| MTCA Method A or B Protection of Groundwater | | 20 (A)<br>0.03 (B) | 2,637 (B) | 2 (A)<br>1.1 (B) | 2,000 ($Cr^{+3}$) / 480,096 ($Cr^{+6}$) (A)<br>19 ($Cr^{+3}$) / 18 ($Cr^{+6}$) (B) | 250 (A) | 2 (A)<br>5.02 (B) | 8.3 (B) | 13.6 (B) | 38.4 (B) |
| WA Department of Ecology - Puget Sound Regional Background Concentration | | 7.30 | NE | 0.8 | 48.2 | 24.0 | 0.07 | NE | NE | NE |
| ESB1121-12.5' | 03/04/98 | **3.4** | 66.2 | 0.2 | **40.5** | 3 | 0.05 U | 0.1 U | 0.5 | 46.7 |
| ESB1121-15' | 03/04/98 | **3.7** | 80.6 | 0.2 U | **43.8** | 3 | 0.06 | 0.1 U | 0.6 | 44.7 |
| ESB1121-22.5' | 03/04/98 | **1.2** | 60 | 0.2 U | **37.7** | 2 U | 0.05 U | 0.1 | 0.5 | 32.9 |
| ESB1212-5' | 05/04/98 | **2.7** | 68 | 0.2 U | **40.9** | 6 | 0.05 U | 0.5 U | 0.3 U | 38.6 J |
| ESB1212-5' (DUP) | 05/04/98 | **2.6** | 63.7 | 0.2 U | **39.1** | 5 | 0.05 U | 0.5 U | 0.3 U | 33.5 J |
| ESB1212-7 1/2' | 05/04/98 | **2.9** | 67.2 | 0.2 U | **41.0** | 6 | 0.05 U | 1.0 U | 0.3 U | 36.5 J |
| ESB1213-2 1/2' | 05/04/98 | **1.5** | 44.6 | 0.2 U | **36.9** | 5 | 0.06 U | 1.0 U | 0.3 U | 21.4 J |
| ESB1267-10 | 06/25/98 | **13.1** | 59.6 | 0.3 U | **39.2** | 11 | 0.06 U | 0.1 U | 0.4 U | 48.8 J |
| ESB1267-15' | 06/26/98 | **2.7** | 73.5 | 0.2 U | **38.1** | 5 | 0.05 U | 0.1 U | 0.3 U | 39.4 J |
| ESB1267-22 1/2' | 06/26/98 | **1.9** | 57.8 | 0.2 U | **34.8** | 5 | 0.05 U | 0.1 U | 0.3 U | 33.3 J |
| ESB1268-12 1/2' | 06/26/98 | **4.1** | 43.2 | 0.2 U | **29.8** | 6 | 0.05 U | 0.2 U | 0.3 U | 32.4 J |
| ESB1268-12 1/2' (DU | 06/26/98 | **3.8** | 62.2 | 0.2 U | **42.6** | 7 | 0.05 U | 0.5 U | 0.3 U | 44.6 J |
| ESB1268-15' | 06/27/98 | **2.8** | 64.5 | 0.2 U | **39.6** | 5 | 0.05 U | 0.2 U | 0.3 U | 37.9 J |
| ESB1268-22 1/2' | 06/27/98 | **1.8** | 66.9 | 0.2 U | **37.2** | 5 | 0.05 U | 0.2 U | 0.3 U | 32.3 J |
| ESB1269-10' | 06/26/98 | **4.2** | 68.0 | 0.2 U | **40.5** | 7 | 0.05 U | 0.5 U | 0.3 U | 42.0 J |
| ESB1269-15' | 06/26/98 | **2.7** | 68.4 | 0.2 | **36.4** | 5 | 0.05 U | 0.5 U | 0.3 U | 39.4 J |
| ESB1274-12 1/2' | 07/01/98 | **2.1 J** | 42.3 | 0.2 U | **37.6** | 4 | 0.05 U | 0.1 U | 0.3 U | 21.2 |
| ESB1274-15' | 07/01/98 | **2.5 J** | 69.4 | 0.2 U | **47.5** | 5 | 0.19 | 0.1 U | 0.3 U | 32.1 |
| ESB1274-25' | 07/01/98 | **2.1 J** | 55.0 | 0.2 U | **50.7** | 5 | 0.04 U | 0.1 U | 0.3 U | 30.5 |
| ESB1285-2 1/2' | 07/14/98 | **3.4** | 62.8 | 0.6 | **37.7 J** | 7 | 0.05 U | 0.2 | 0.3 U | 33.1 J |

**Notes:**
MTCA - Model Toxics Control Act
(A) - MTCA Method A soil cleanup level for unrestricted land use
(AI) - MTCA Method A soil cleanup level for industrial property
(B) - MTCA Method B soil cleanup level
(B*) Revised 2001 MTCA Method B value from Ecology website CLARC tables downloaded June 2010 (https://fortress.wa.gov/ecy/clarc/reporting/CLARCReporting.aspx).
1996 - Indicates MTCA soil cleanup levels, published 1996.
2001 - Indicates MTCA version 3.1 soil cleanup levels, published 2001.
(DUP) - Field duplicate
NE - Not Established
J - Estimated value
U - Compound was analyzed for but not detected above the reporting limit shown.
Numbers in **bold** font indicate that the result reported exceeds the most current MTCA cleanup level as of June 2010.
Numbers in grey shading indicate results that exceed a MTCA protection of groundwater level, but do not exceed the current lowest MTCA soil cleanup level protective of direct contact.

**Table 3-12**
**Summary of Groundwater Sample Analytical Results for Total Metals, VOCs, Non-halogenated SVOCs, TPH, and Pheno**
**Building 40-51, Southern Air Scrubber Sump (EV-119)**
**Boeing Everett Plant Remedial Investigation**

| Analyte/Sample ID | ESB1212-1' (05/04/98) | 1996 MTCA Method A or B Groundwater Cleanup Level | 2001 MTCA Method A Groundwater Cleanup Level | 2001 MTCA Method B Groundwater Cleanup Level |
|---|---|---|---|---|
| **Total Metals, (mg/L)** | | | | |
| Arsenic | **0.03** | 0.0000583 (B) | 0.005 | 0.0000583 |
| Barium | **7.94** | 1.12 (B) | NE | 0.56 / 3.2 (B*) |
| Cadmium | **0.02** | 0.008 (B) | 0.005 | 0.008 |
| Chromium | **3.96** | 0.05 (A) | 0.05 | 24 ($Cr^{+3}$) / 0.048 ($Cr^{+6}$) |
| Lead | **0.8** | 0.005 (A) | 0.015 | NE |
| Mercury | **0.0037** | 0.0048 (B) | 0.002 | 0.0048 |
| Selenium | 0.02 U | 0.08 (B) | NE | 0.08 |
| Silver | 0.02 U | 0.08 (B) | NE | 0.08 |
| Strontium | 3.94 | 9.6 (B) | NE | 9.6 |
| **Volatile Organic Compounds, (ug/L)** | | | | |
| 1,1,2-Trichloro-1,2,2-trifluoroethane | 2.0 U | NE | NE | 240,000 (B*) |
| 2-Butanone | 85 | 4,800 (B) | NE | 4,800 |
| Acetone | 5 U | 800 (B) | NE | 800 |
| Methylene Chloride | 2 U | 5.83 (B) | 5 | 5.83 |
| **Total Petroleum Hydrocarbons, (mg/L)** | | | | |
| Diesel-Range Hydrocarbons | 0.25 U | 1.0 (A) | 0.5 | NE |
| Gasoline-Range Hydrocarbons | 0.25 U | 1.0 (A) | 0.8 / 1.0* | NE |
| **Non-halogenated Semi-VOCs (mg/L)** | ND | - | - | - |
| **Phenol, (ug/L)** | 2 U | 9,600 (B) | NE | 9,600 / 4,800 (B*) |

**Notes:**
MTCA - Model Toxics Control Act
(A) - MTCA Method A groundwater cleanup level
(B) - MTCA Method B groundwater cleanup level
(B*) Revised 2001 MTCA Method B value from Ecology website CLARC tables, 2001 download.
1996 - Indicates MTCA groundwater cleanup levels, published 1996.
2001 - Indicates MTCA version 3.1 groundwater cleanup levels, published 2001.
ND - Not detected
NE - Not established
U - Compound was analyzed for but not detected above the reporting limit shown.
*In soil, the cleanup level is 100 mg/kg if benzene is not present, and the total of ethylbenzene, toluene, and xylenes is less than 1% of the gasoline mixture. The cleanup other gasoline mixtures is 30 mg/kg.
**gasoline mixtures with benzene/gasoline mixtures without benzene
Numbers in **bold** font indicate that the result reported exceeds the most current MTCA cleanup level as of June 201

**Table 3-13**
**Summary of Groundwater Analytical Results for Volatile Organic Compounds, (mg/L)**
**Building 40-51, Southern Air Scrubber Sump (EV-119)**
**Boeing Everett Plant**

| Well ID | Sample Date | Chloromethane | Vinyl Chloride | Acetone | 1,1-DCE | Chloroform | 2-Butanone | Trichloroethene | Toluene | Ethylbenzene | Total Xylenes |
|---|---|---|---|---|---|---|---|---|---|---|---|
| MTCA Method A or B Groundwater Screening Level | | 0.00337 (B) | 0.0002 (A)<br>0.0000292 (B) | 0.8 (B) | 0.4 (B) | 0.00717 (B) | 4.8 (B) | 0.005 (A)<br>0.00049 (B) | 1 (A)<br>0.64 (B) | 0.7 (A)<br>0.8 (B) | 1 (A)<br>1.6 (B) |
| **EGW057** | 08/12/98 | 0.002 U | 0.002 U | 0.005 U | 0.001 U | 0.001 U | 0.005 U | **0.0044** | 0.001 U | 0.001 U | 0.001 U |
| | 11/16/98 | 0.002 U | 0.002 U | 0.005 U | 0.001 U | 0.001 U | 0.005 U | **0.0056** | 0.001 U | 0.001 U | 0.001 U |
| | 02/03/99 | 0.002 U | 0.000010 U | 0.005 U | 0.001 U | 0.001 U | 0.005 U | **0.0039 J** | 0.001 U | 0.001 U | 0.001 U |
| | 05/12/99 | 0.001 U | 0.00002 U | 0.005 U | 0.001 U | 0.001 U | 0.005 U | **0.0038** | 0.001 U | 0.001 U | 0.001 U |
| | 08/04/99 | 0.001 U | 0.00002 U | 0.005 U | 0.001 U | 0.001 U | 0.005 U | **0.0036** | 0.001 U | 0.001 U | 0.001 U |
| | 11/10/99 | 0.001 U | 0.00002 U | 0.005 U | 0.001 U | 0.001 U | 0.005 U | **0.0040** | 0.001 U | 0.001 U | 0.001 U |
| | 02/09/00 | 0.001 U | 0.00002 U | 0.005 U | 0.001 U | 0.001 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U |
| | 05/03/00 | 0.001 U | 0.00002 U | 0.005 U | 0.001 U | 0.001 U | 0.005 U | **0.0035** | 0.001 U | 0.001 U | 0.001 U |
| | 08/02/00 | 0.001 U | 0.00002 U | 0.005 U | 0.001 U | 0.001 U | 0.005 U | **0.0028** | 0.001 U | 0.001 U | 0.001 U |
| | 11/15/00 | 0.001 U | 0.00002 U | 0.005 U | 0.001 U | 0.001 U | 0.005 U | **0.0029** | 0.001 U | 0.001 U | 0.001 U |
| | 02/06/01 | 0.001 U | 0.00002 U | 0.005 U | 0.001 U | 0.001 U | 0.005 U | **0.0035** | 0.001 U | 0.001 U | 0.001 U |
| | 05/04/01 | 0.001 U | 0.00002 U | 0.005 U | 0.001 U | 0.001 U | 0.005 U | **0.0032** | 0.001 U | 0.001 U | 0.001 U |
| | 08/09/01 | 0.001 U | 0.00002 U | 0.005 U | 0.001 U | 0.001 U | 0.005 U | **0.0033** | 0.001 U | 0.001 U | 0.001 U |
| | 11/14/01 | 0.001 U | 0.00002 U | 0.005 U | 0.001 U | 0.001 U | 0.005 U | **0.0042** | 0.001 U | 0.001 U | 0.001 U |
| | 02/06/02 | 0.0002 U | 0.00002 U | 0.001 U | 0.00002 U | 0.0002 U | 0.001 U | **0.0031** | 0.0002 U | 0.0002 U | 0.0004 U |
| | 05/07/02 | 0.0002 U | 0.00002 U | 0.001 U | 0.00002 U | 0.0002 U | 0.001 U | **0.0039** | 0.0002 U | 0.0002 U | 0.0004 U |
| | 11/15/02 | 0.0002 U | 0.00002 U | 0.001 U | 0.00002 U | 0.0002 U | 0.001 U | **0.0035** | 0.0002 U | 0.0002 U | 0.0004 U |
| | 05/07/03 | 0.0002 U | 0.00002 U | 0.0014 U | 0.00002 U | 0.0002 U | 0.001 U | **0.0034** | 0.0002 U | 0.0002 U | 0.0004 |
| | 11/05/03 | 0.0002 U | 0.00002 U | 0.001 U | 0.00002 U | 0.0002 U | 0.001 U | **0.0043** | 0.0002 U | 0.0002 | 0.0011 |
| | 04/15/04 | 0.0002 U | 0.00002 U | 0.001 U | 0.00002 U | 0.0002 U | 0.001 U | **0.0044** | 0.0002 U | 0.0002 U | 0.0004 U |
| | 10/05/04 | 0.0002 U | 0.00002 U | 0.0016 U | 0.00002 U | 0.0002 U | 0.001 U | **0.0043** | 0.0002 U | 0.0002 U | 0.0004 U |
| | 03/29/05 | 0.0002 U | 0.00002 U | 0.001 U | 0.00002 U | 0.0002 U | 0.001 U | **0.0044** | 0.0002 U | 0.0002 U | 0.0004 U |
| | 10/18/05 | 0.0002 U | 0.00002 U | 0.0016 | 0.00002 U | 0.0002 U | 0.001 U | **0.0046** | 0.0002 U | 0.0002 U | 0.0004 U |
| | 04/17/06 | 0.0002 U | 0.00002 U | 0.001 U | 0.00002 U | 0.0002 U | 0.001 U | **0.0034** | 0.0002 U | 0.0002 U | 0.0004 U |
| | 10/19/06 | 0.0002 U | 0.00002 U | 0.003 U | 0.00002 | 0.0009 | 0.001 U | **0.0042** | 0.0002 U | 0.0002 U | 0.0004 U |
| | 04/04/07 | 0.0002 U | 0.00002 U | 0.003 U | 0.00002 U | 0.0002 | 0.001 U | **0.0034** | 0.0002 U | 0.0002 U | 0.0007 |
| | 10/26/07 | 0.0002 U | 0.00002 U | 0.003 U | 0.000025 | 0.0002 U | 0.001 U | **0.0036** | 0.0002 U | 0.0002 U | 0.0004 U |
| | 04/03/08 | 0.0002 U | 0.00002 U | 0.003 U | 0.00002 U | 0.0002 U | 0.0025 U | **0.0030** | 0.0002 U | 0.0002 U | 0.0004 U |
| | 10/08/08 | 0.0002 U | 0.00002 U | 0.003 U | 0.00002 U | 0.0002 U | 0.0025 U | **0.0030** | 0.0002 U | 0.0002 U | 0.0004 U |
| | 04/07/09 | 0.0002 U | 0.00002 UJ | 0.0025 U | 0.00002 UJ | 0.0002 U | 0.0025 U | **0.0030 J** | 0.0002 U | 0.0002 U | 0.0004 U |
| | 10/28/09 | 0.0005 U | 0.00002 U | 0.0054 | 0.00002 U | 0.0002 U | 0.005 U | **0.0011** | 0.0002 U | 0.0002 U | 0.0004 U |
| | 04/07/10 | 0.0005 U | 0.00002 U | 0.005 U | 0.00002 U | 0.0002 U | 0.005 U | **0.0013** | 0.0002 U | 0.0002 U | 0.0004 U |

**Table 3-13**
**Summary of Groundwater Analytical Results for Volatile Organic Compounds, (mg/L)**
**Building 40-51, Southern Air Scrubber Sump (EV-119)**
**Boeing Everett Plant**

| Well ID | Sample Date | Chloromethane | Vinyl Chloride | Acetone | 1,1-DCE | Chloroform | 2-Butanone | Trichloroethene | Toluene | Ethylbenzene | Total Xylenes |
|---|---|---|---|---|---|---|---|---|---|---|---|
| MTCA Method A or B Groundwater Screening Level | | 0.00337 (B) | 0.0002 (A)<br>0.0000292 (B) | 0.8 (B) | 0.4 (B) | 0.00717 (B) | 4.8 (B) | 0.005 (A)<br>0.00049 (B) | 1 (A)<br>0.64 (B) | 0.7 (A)<br>0.8 (B) | 1 (A)<br>1.6 (B) |
| **EGW058** | 08/13/98 | 0.002 U | 0.002 U | 0.013 | 0.001 U | 0.001 U | 0.010 | 0.001 U | 0.001 U | 0.001 U | 0.001 U |
| | 11/17/98 | 0.002 U | 0.002 U | 0.005 U | 0.001 U | 0.001 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U |
| | 02/03/99 | 0.002 U | **0.000037** | 0.005 U | 0.001 U | 0.001 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U |
| | 05/12/99 | 0.001 U | 0.00002 U | 0.005 U | 0.001 U | 0.001 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U |
| | 08/04/99 | 0.001 U | 0.00002 U | 0.005 U | 0.001 U | 0.001 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U |
| | 11/10/99 | 0.001 U | 0.00002 U | 0.005 U | 0.001 U | 0.001 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U |
| | 02/09/00 | 0.001 U | 0.00002 U | 0.005 U | 0.001 U | 0.001 U | 0.005 U | **0.0036** | 0.001 U | 0.001 U | 0.001 U |
| | 05/03/00 | 0.001 U | 0.00002 U | 0.005 U | 0.001 U | 0.001 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U |
| | 08/02/00 | 0.001 U | 0.00002 U | 0.005 U | 0.001 U | 0.001 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U |
| | 11/15/00 | 0.001 U | 0.00002 U | 0.005 U | 0.001 U | 0.001 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U |
| | 02/06/01 | 0.001 U | 0.00002 U | 0.005 U | 0.001 U | 0.001 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U |
| | 05/04/01 | 0.001 U | 0.00002 U | 0.005 U | 0.001 U | 0.001 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U |
| | 08/09/01 | 0.001 U | 0.00002 U | 0.005 U | 0.001 U | 0.001 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U |
| | 11/14/01 | 0.001 U | 0.00002 U | 0.005 U | 0.001 U | 0.001 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U |
| | 02/06/02 | 0.0002 U | 0.00002 U | 0.001 U | 0.00002 U | 0.0002 U | 0.001 U | **0.0040** | 0.0002 U | 0.0002 U | 0.0004 U |
| | 05/07/02 | 0.0002 U | 0.00002 U | 0.001 U | 0.00002 U | 0.0002 U | 0.001 U | **0.0004** | 0.0002 U | 0.0002 U | 0.0004 U |
| | 11/15/02 | 0.0002 U | 0.00002 U | 0.001 U | 0.00002 U | 0.0002 U | 0.001 U | **0.0003** | 0.0002 U | 0.0002 U | 0.0004 U |
| | 05/07/03 | 0.0002 U | 0.00002 U | 0.0017 U | 0.00002 U | 0.0002 U | 0.001 U | **0.0004** | 0.0002 U | 0.0002 U | 0.0004 U |
| | 11/05/03 | 0.0002 | 0.00002 U | 0.001 U | 0.00002 U | 0.0002 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0038 | 0.0185 |
| | 04/15/04 | 0.0002 U | 0.00002 U | 0.0015 | 0.00002 U | 0.0002 U | 0.0016 J | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U |
| | 10/05/04 | 0.0002 U | 0.00002 U | 0.0024 U | 0.00002 U | 0.0002 U | 0.001 U | **0.0004** | 0.0002 U | 0.0002 U | 0.0004 U |
| | 03/29/05 | 0.0002 U | 0.00002 U | 0.001 U | 0.00002 U | 0.0002 U | 0.001 U | **0.0003** | 0.0002 U | 0.0002 U | 0.0004 U |
| | 10/18/05 | 0.0002 U | 0.00002 U | 0.001 U | 0.00002 U | 0.0002 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U |
| | 04/17/06 | 0.0002 U | 0.00002 U | 0.0014 | 0.00002 U | 0.0002 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U |
| | 10/19/06 | 0.0002 U | 0.00002 U | 0.0030 U | 0.00002 U | 0.0002 U | 0.001 U | 0.000062 | 0.0002 U | 0.0002 U | 0.0004 U |
| | 04/04/07 | 0.0002 U | 0.00002 U | 0.0030 U | 0.00002 U | 0.0002 U | 0.001 U | 0.000072 | 0.0002 U | 0.0002 U | 0.0006 |
| | 10/26/07 | 0.0002 U | 0.00002 U | 0.0030 U | 0.00002 U | 0.0002 U | 0.001 U | 0.000037 | 0.0002 U | 0.0002 U | 0.0004 U |
| | 04/03/08 | 0.0002 U | 0.00002 U | 0.0030 U | 0.00002 U | 0.0002 U | 0.0025 U | 0.000053 | 0.0002 | 0.0010 | 0.0125 |
| | 10/08/08 | 0.0002 U | 0.00002 U | 0.0030 U | 0.00002 U | 0.0002 U | 0.0025 U | 0.000060 | 0.0002 U | 0.0002 U | 0.0004 U |
| | 04/07/09 | 0.0002 U | 0.00002 U | 0.0025 U | 0.00002 U | 0.0002 U | 0.0025 U | 0.000046 | 0.0002 U | 0.0002 U | 0.0004 U |
| | 10/28/09 | 0.0005 U | 0.00002 U | 0.005 U | 0.00002 U | 0.0002 U | 0.005 U | 0.000044 | 0.0002 U | 0.0002 U | 0.0004 U |
| | 04/07/10 | 0.0005 U | 0.00002 U | 0.005 U | 0.00002 U | 0.0002 U | 0.005 U | 0.000029 | 0.0002 U | 0.0002 U | 0.0004 U |

**Notes:**
Values in **bold** font indicate that the result reported exceeds the most current MTCA levels based on the Ecology website.
Model Toxics Control Act (MTCA) Cleanup Regulation, WAC 173-340. MTCA Method A and B values are from Ecology website CLARC tables downloaded June 2010. (https://fortress.wa.gov/ecy/clarc/reporting/CLARCReporting.aspx).
(A) - MTCA Method A
(B) - MTCA Method B
J = Estimated value
NA = Not analyzed
U = Compound was analyzed for but not detected above the reporting limit shown.
1,1-DCE = 1,1-dichloroethene

**Table 3-14**
**Summary of Groundwater Analytical Results for TPH, SVOCs, and Pheno**
**Building 40-51,Southern Air Scrubber Sump (EV-119)**
**Boeing Everett Plant Remedial Investigation**

| **Well ID** | **Sample Date** | **Total Petroleum Hydrocarbons (mg/L)** | | | **Semivolatile Organic Compounds (mg/L)** | |
|---|---|---|---|---|---|---|
| | | **Diesel-Range** | **Gasoline-Range** | **Motor-Range** | **bis (2-ethylhexyl) phthalate** | **Phenol** |
| 1996 MTCA Method A or B Groundwater Cleanup Level | | 1.0 (A) | 1.0 (A) | 1.0 (A) | 0.00625 (B) | 9.6 (B) |
| 2001 MTCA Method A or B Groundwater Cleanup Level | | 0.5 (A) | 0.8 / 1.0 ** (A) | 0.5 (A) | 0.00625 (B) | 9.6 (B)<br>4.8 (B*) |
| **EGW057** | 08/12/98 | 0.25 U | 0.25 U | NA | NA | 0.002 U |
| | 11/16/98 | 0.25 U | 0.25 U | NA | 0.001 U | 0.002 U |
| | 02/02/99 | 0.25 U | 0.25 U | 0.5 U | **0.046** | 0.002 U |
| | 05/12/99 | 0.25 U | 0.25 U | 0.5 U | NA | NA |
| | 08/04/99 | 0.25 U | 0.25 U | NA | NA | NA |
| | 11/10/99 | 0.25 U | 0.25 U | NA | NA | NA |
| | 02/09/00 | 0.25 U | 0.25 U | NA | NA | NA |
| | 05/03/00 | 0.25 U | 0.25 U | 0.50 U | NA | NA |
| | 08/02/00 | 0.25 U | 0.25 U | 0.50 U | NA | NA |
| | 11/15/00 | 0.25 U | 0.25 U | 0.50 U | NA | NA |
| | 02/06/01 | 0.25 U | 0.25 U | 0.50 U | NA | NA |
| | 05/04/01 | 0.25 U | 0.25 U | 0.50 U | NA | NA |
| | 08/09/01 | 0.25 U | 0.25 U | 0.50 U | NA | NA |
| | 11/14/01 | 0.25 U | 0.25 U | 0.50 U | NA | NA |
| | 02/06/02 | 0.25 U | 0.25 U | 0.50 U | NA | NA |
| | 05/07/02 | 0.25 U | 0.25 U | 0.50 U | NA | NA |
| **EGW058** | 08/13/98 | 0.25 U | 0.25 U | NA | NA | 0.002 U |
| | 11/17/98 | 0.25 U | 0.25 U | NA | 0.0018 | 0.002 U |
| | 02/02/99 | 0.25 U | 0.25 U | 0.5 U | 0.0014 U* | 0.002 U |
| | 05/12/99 | 0.25 U | 0.25 U | 0.5 U | NA | NA |
| | 08/04/99 | 0.25 U | 0.25 U | NA | NA | NA |
| | 11/10/99 | 0.25 U | 0.25 U | NA | NA | NA |
| | 02/09/00 | 0.25 U | 0.25 U | NA | NA | NA |
| | 05/03/00 | 0.25 U | 0.25 U | 0.50 U | NA | NA |
| | 08/02/00 | 0.25 U | 0.25 U | 0.50 U | NA | NA |
| | 11/15/00 | 0.25 U | 0.25 U | 0.50 U | NA | NA |
| | 02/06/01 | 0.25 U | 0.25 U | 0.50 U | NA | NA |
| | 05/04/01 | 0.25 U | 0.25 U | 0.50 U | NA | NA |
| | 08/09/01 | 0.25 U | 0.25 U | 0.50 U | NA | NA |
| | 11/14/01 | 0.25 U | 0.25 U | 0.50 U | NA | NA |
| | 02/06/02 | 0.25 U | 0.25 U | 0.50 U | NA | NA |
| | 05/07/02 | 0.25 U | 0.25 U | 0.50 U | NA | NA |

**Notes:**
MTCA - Model Toxics Control Act
(A) MTCA Method A groundwater cleanup level
(B) MTCA Method B groundwater cleanup level
(B*) Revised 2001 MTCA Method B value from Ecology website CLARC tables, 2010 download.
1996 - Indicates MTCA groundwater cleanup levels, published 1996.
2001 - Indicates MTCA version 3.1 groundwater cleanup levels, published 2001.
NA - Not analyzed
NC - Not calculated
NE - Not established
U - Compound was analyzed for but not detected above the reporting limit shown.
U* - Qualified as not detected during data validation due to method blank contamination.
Numbers in **bold** font indicate that the result reported exceeds the most current MTCA cleanup level as of June 2010
**gasoline mixtures with benzene/gasoline mixtures without benzene

**Table 3-15**
**Summary of Groundwater Analytical Results for Metals, (mg/L)**
**Building 40-51, Southern Air Scrubber Sump (EV-119)**
**Boeing Everett Plant**

| Well or Boring ID | Sample Date | Arsenic | | Barium | | Cadmium | | Chromium | | Lead | | Mercury | | Selenium | | Silver | | Strontium | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | **Total** | **Dissolved** | **Total** | **Dissolved** | **Total** | **Dissolved** | **Total** | **Dissolved** | **Total** | **Dissolved** | **Total** | **Dissolved** | **Total** | **Dissolved** | **Total** | **Dissolved** | **Total** | **Dissolved** |
| MTCA Method A or B Groundwater Screening Level | | 0.005 (A)<br>0.0000583 (B) | | 3.2 (B) | | 0.005 (A)<br>0.008 (B) | | 0.05 (A)<br>24 ($Cr^{+3}$) (B)<br>0.048 ($Cr^{+6}$) (B) | | 0.015 (A) | | 0.002 (A)<br>0.0048 (B) | | 0.080 (B) | | 0.080 (B) | | 9.6 (B) | |
| **ESB1212-1'** | 5/2/1998 | **0.03** | NA | **7.94** | NA | 0.2 U | NA | **3.96** | NA | **0.8** | NA | 0.05 U | NA | 0.1 U | NA | 0.3 U | NA | 3.94 | NA |
| **EGW057** | 08/12/98 | **0.014** | NA | 0.139 | NA | 0.002 U | NA | **0.055** | NA | **0.035** | NA | 0.0001 U | NA | 0.001 U | NA | 0.003 U | NA | NA | NA |
| | 11/16/98 | **0.014** | **0.008** | 0.265 | 0.008 | 0.002 U | 0.002 U | **0.115** | 0.005 U | **0.011** | 0.001 U | 0.0001 U | 0.0001 U | 0.005 U | 0.001 | 0.003 U | 0.003 U | NA | NA |
| | 02/03/99 | **0.007** | **0.006** | 0.064 | 0.422 R | 0.002 U | 0.002 U | 0.025 | 0.005 U | 0.003 | 0.001 U | 0.0001 U | 0.0001 U | 0.002 U | 0.001 U | 0.003 U | 0.003 U | 0.227 | 0.195 |
| | 05/12/99 | **0.005** | **0.005** | 0.012 | 0.009 | 0.002 U | 0.002 U | 0.005 U | 0.005 U | 0.001 U | 0.001 U | 0.0001 U | 0.0001 U | 0.002 | 0.001 | 0.003 U | 0.003 U | 0.180 | 0.170 |
| | 08/04/99 | **0.006** | **0.005** | 0.013 | 0.011 | 0.002 U | 0.002 U | 0.005 U | 0.005 U | 0.001 U | 0.001 U | 0.0002 U | 0.0001 U | 0.001 | 0.001 U | 0.003 U | 0.003 U | 0.204 | 0.202 |
| | 11/10/99 | **0.005** | **0.005** | 0.012 | 0.013 | 0.002 U | 0.002 U | 0.005 U | 0.005 U | 0.001 U | 0.001 U | 0.0001 U | 0.0001 U | 0.002 U | 0.002 U | 0.003 U | 0.003 U | 0.174 | 0.168 |
| | 02/09/00 | **0.006** | **0.006** | 0.012 | 0.012 | 0.002 U | 0.002 U | 0.005 U | 0.005 U | 0.001 | 0.001 U | 0.0001 U | 0.0001 U | 0.003 | 0.003 | 0.003 U | 0.003 U | 0.180 | 0.192 |
| | 05/03/00 | **0.007** | **0.006** | 0.013 | 0.01 | 0.002 U | 0.002 U | 0.005 U | 0.005 U | 0.001 U | 0.001 U | 0.0001 U | 0.0001 U | 0.002 U | 0.002 U | 0.003 U | 0.003 U | 0.178 | 0.177 |
| | 08/02/00 | **0.006** | **0.005** | 0.012 | 0.013 | 0.002 U | 0.002 U | 0.005 U | 0.005 U | 0.001 U | 0.001 U | 0.0001 U | 0.0001 U | 0.002 | 0.002 U | 0.003 U | 0.003 U | 0.181 | 0.195 |
| | 11/15/00 | **0.007** | **0.006** | 0.014 | 0.012 | 0.002 U | 0.002 U | 0.005 U | 0.005 U | 0.001 U | 0.001 U | 0.0001 U | 0.0001 U | 0.002 U | 0.002 U | 0.003 U | 0.003 U | 0.179 | 0.178 |
| | 02/06/01 | **0.007** | **0.006** | 0.011 | 0.011 | 0.002 U | 0.002 U | 0.005 U | 0.005 U | 0.001 U | 0.001 U | 0.0001 U | 0.0001 U | 0.002 U | 0.002 U | 0.003 U | 0.003 U | 0.149 | 0.165 |
| | 05/04/01 | **0.006** | **0.005** | 0.010 | 0.010 | 0.002 U | 0.002 U | 0.005 U | 0.005 U | 0.001 U | 0.001 U | 0.0001 U | 0.0001 U | 0.002 U | 0.002 | 0.003 U | 0.003 U | 0.157 | 0.167 |
| | 08/09/01 | **0.005** | **0.005** | 0.011 | 0.010 | 0.002 U | 0.002 U | 0.005 U | 0.005 U | 0.001 U | 0.001 U | 0.0001 U | 0.0001 U | 0.002 U | 0.002 U | 0.003 U | 0.003 U | 0.158 | 0.167 |
| | 11/14/01 | **0.005** | **0.005** | 0.009 | 0.009 | 0.002 U | 0.002 U | 0.005 U | 0.005 U | 0.001 U | 0.001 U | 0.0001 U | 0.0001 U | 0.05 U | 0.05 U | 0.003 U | 0.003 U | 0.145 | 0.150 |
| | 02/06/02 | **0.006** | **0.006** | 0.010 | 0.005 | 0.002 U | 0.002 U | 0.015 | 0.013 | 0.002 | 0.001 U | 0.0001 U | 0.0001 U | 0.05 U | 0.05 U | 0.003 U | 0.003 U | 0.114 | 0.109 |
| | 05/07/02 | **0.005** | **0.005** | 0.009 | 0.010 | 0.002 U | 0.002 U | 0.009 | 0.008 | 0.001 U | 0.001 U | 0.0001 U | 0.0001 U | 0.05 U | 0.05 U | 0.003 U | 0.003 U | 0.135 | 0.149 |
| | 11/15/02 | **0.005** | **0.005** | NA | NA | NA | NA | 0.007 | 0.006 | 0.001 U | 0.001 U | NA | NA | NA | NA | NA | NA | NA | NA |
| | 05/07/03 | **0.005** | **0.004** | NA | NA | NA | NA | 0.009 | 0.010 | 0.001 U | 0.001 U | NA | NA | NA | NA | NA | NA | NA | NA |
| | 11/05/03 | **0.005** | **0.005** | NA | NA | NA | NA | 0.008 | 0.006 | 0.001 U | 0.001 U | NA | NA | NA | NA | NA | NA | NA | NA |
| | 04/15/04 | **0.004** | **0.005** | NA | NA | NA | NA | 0.005 U | 0.005 U | 0.001 U | 0.001 U | NA | NA | NA | NA | NA | NA | NA | NA |
| | 10/05/04 | **0.006** | **0.006** | NA | NA | NA | NA | 0.005 U | 0.005 U | 0.001 | 0.001 U | NA | NA | NA | NA | NA | NA | NA | NA |
| | 03/29/05 | **0.005** | **0.005** | NA | NA | NA | NA | 0.005 U | 0.005 U | 0.001 U | 0.001 U | NA | NA | NA | NA | NA | NA | NA | NA |
| | 10/18/05 | **0.005** | **0.005** | NA | NA | NA | NA | 0.005 U | 0.005 U | 0.001 | 0.001 U | NA | NA | NA | NA | NA | NA | NA | NA |
| | 04/17/06 | **0.005** | **0.005** | NA | NA | NA | NA | 0.005 U | 0.005 U | 0.001 | 0.001 U | NA | NA | NA | NA | NA | NA | NA | NA |
| | 10/19/06 | **0.007** | **0.007** | NA | NA | NA | NA | 0.005 U | 0.005 U | 0.001 U | 0.001 U | NA | NA | NA | NA | NA | NA | NA | NA |
| | 04/04/07 | **0.005** | **0.005** | NA | NA | NA | NA | 0.006 | 0.006 | 0.001 U | 0.001 U | NA | NA | NA | NA | NA | NA | NA | NA |
| | 10/26/07 | **0.013** | **0.06**[a] | NA | NA | NA | NA | 0.005 U | 0.005 U | 0.001 U | 0.001 U | NA | NA | NA | NA | NA | NA | NA | NA |
| | 04/03/08 | **0.006** | **0.006** | NA | NA | NA | NA | 0.005 U | 0.005 U | 0.001 U | 0.001 U | NA | NA | NA | NA | NA | NA | NA | NA |
| | 10/08/08 | **0.007** | **0.006** | NA | NA | NA | NA | 0.005 U | 0.005 U | 0.001 U | 0.001 U | NA | NA | NA | NA | NA | NA | NA | NA |
| | 04/07/09 | **0.0054** | **0.0052** | NA | NA | NA | NA | 0.006 | 0.005 U | 0.001 U | 0.001 U | NA | NA | NA | NA | NA | NA | NA | NA |
| | 10/28/09 | **0.0069** | **0.0072** | NA | NA | NA | NA | 0.010 | 0.011 | 0.001 U | 0.001 U | NA | NA | NA | NA | NA | NA | NA | NA |
| | 04/07/10 | **0.0084** | **0.0083** | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |

**Table 3-15**
**Summary of Groundwater Analytical Results for Metals, (mg/L)**
**Building 40-51, Southern Air Scrubber Sump (EV-119)**
**Boeing Everett Plant**

| Well or Boring ID | Sample Date | Arsenic | | Barium | | Cadmium | | Chromium | | Lead | | Mercury | | Selenium | | Silver | | Strontium | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | **Total** | **Dissolved** | **Total** | **Dissolved** | **Total** | **Dissolved** | **Total** | **Dissolved** | **Total** | **Dissolved** | **Total** | **Dissolved** | **Total** | **Dissolved** | **Total** | **Dissolved** | **Total** | **Dissolved** |
| MTCA Method A or B Groundwater Screening Level | | 0.005 (A) 0.0000583 (B) | | 3.2 (B) | | 0.005 (A) 0.008 (B) | | 0.05 (A) 24 ($Cr^{+3}$) (B) 0.048 ($Cr^{+6}$) (B) | | 0.015 (A) | | 0.002 (A) 0.0048 (B) | | 0.080 (B) | | 0.080 (B) | | 9.6 (B) | |
| **EGW058** | 08/13/98 | **0.050** | NA | 1.17 | NA | 0.002 | NA | **0.642** | NA | **0.057** | NA | 0.0002 | NA | 0.005 U | NA | 0.003 | NA | NA | NA |
| | 11/17/98 | **0.024** | **0.019** | 0.714 | 0.431 | 0.002 U | 0.002 U | **0.398** | 0.005 | **0.025** | 0.001 U | 0.0002 U | 0.0001 U | 0.005 U | 0.001 U | 0.003 U | 0.003 U | NA | NA |
| | 02/03/99 | **0.021** | **0.018** | 0.246 | 0.401 R | 0.002 U | 0.002 U | **0.118** | 0.005 | 0.009 | 0.001 U | 0.0001 U | 0.0001 U | 0.005 U | 0.001 U | 0.003 U | 0.003 U | 0.247 | 0.075 |
| | 05/12/99 | **0.018** | **0.014** | 0.190 | 0.009 | 0.002 U | 0.002 U | **0.099** | 0.005 U | 0.007 | 0.001 U | 0.0001 U | 0.0001 U | 0.005 U | 0.001 U | 0.003 U | 0.003 U | 0.186 | 0.064 |
| | 08/04/99 | **0.021** | **0.014** | 0.278 | 0.011 | 0.002 U | 0.002 U | **0.144** | 0.005 U | 0.008 | 0.001 U | 0.0002 U | 0.0001 U | 0.005 U | 0.001 U | 0.003 U | 0.003 U | 0.265 | 0.068 |
| | 11/10/99 | **0.019** | **0.018** | 0.166 | 0.329 | 0.002 U | 0.002 U | **0.073** | 0.005 U | 0.006 | 0.001 U | 0.0001 U | 0.0001 U | 0.01 U | 0.002 U | 0.003 U | 0.003 U | 0.169 | 0.066 |
| | 02/09/00 | **0.019** | **0.021** | 0.090 | 0.370 | 0.002 U | 0.002 U | 0.041 | 0.005 U | 0.005 | 0.002 | 0.0001 U | 0.0001 U | 0.002 U | 0.002 U | 0.003 U | 0.003 U | 0.141 | 0.082 |
| | 05/03/00 | **0.021** | **0.018** | 0.085 | 0.012 | 0.002 U | 0.002 U | 0.031 | 0.005 U | 0.002 | 0.001 U | 0.0001 U | 0.0001 U | 0.01 U | 0.002 U | 0.003 U | 0.003 U | 0.124 | 0.074 |
| | 08/02/00 | **0.021** | **0.016** | 0.125 | 0.014 | 0.002 U | 0.002 U | **0.052** | 0.005 U | 0.005 | 0.001 | 0.0001 U | 0.0001 U | 0.01 U | 0.002 U | 0.003 U | 0.003 U | 0.146 | 0.082 |
| | 11/15/00 | **0.017** | **0.016** | 0.084 | 0.013 | 0.002 U | 0.002 U | 0.027 | 0.005 U | 0.002 | 0.001 U | 0.0001 U | 0.0001 U | 0.004 U | 0.002 U | 0.003 U | 0.003 U | 0.148 | 0.102 |
| | 02/06/01 | **0.018** | **0.017** | 0.084 | 0.012 | 0.002 U | 0.002 U | 0.032 | 0.005 U | 0.001 U | 0.001 U | 0.0001 U | 0.0001 U | 0.01 U | 0.002 U | 0.003 U | 0.003 U | 0.134 | 0.092 |
| | 05/04/01 | **0.016** | **0.017** | 0.072 | 0.010 | 0.002 U | 0.002 U | 0.026 | 0.005 U | 0.002 | 0.001 U | 0.0001 U | 0.0001 U | 0.004 U | 0.002 U | 0.003 U | 0.003 U | 0.134 | 0.082 |
| | 08/09/01 | **0.023** | **0.015** | 0.312 | 0.011 | 0.002 U | 0.002 U | **0.109** | 0.005 U | 0.01 | 0.001 U | 0.0001 | 0.0001 U | 0.004 U | 0.002 U | 0.003 U | 0.003 U | 0.34 | 0.102 |
| | 11/14/01 | **0.018** | **0.016** | 0.083 | 0.011 | 0.002 U | 0.002 U | 0.030 | 0.005 U | 0.003 | 0.001 U | 0.0001 U | 0.0001 U | 0.05 U | 0.05 U | 0.003 U | 0.003 U | 0.152 | 0.100 |
| | 02/06/02 | **0.020** | **0.014** | 0.145 | 0.012 | 0.002 U | 0.002 U | **0.068** | 0.005 U | 0.007 | 0.001 U | 0.0001 U | 0.0001 U | 0.05 U | 0.05 U | 0.003 U | 0.003 U | 0.244 | 0.131 |
| | 05/07/02 | **0.020** | **0.014** | 0.080 | 0.012 | 0.002 U | 0.002 U | 0.027 | 0.005 U | 0.004 | 0.001 U | 0.0001 U | 0.0001 U | 0.05 U | 0.05 U | 0.003 U | 0.003 U | 0.158 | 0.114 |
| | 11/15/02 | **0.020** | **0.021** | NA | NA | NA | NA | 0.007 | 0.005 U | 0.001 U | 0.001 U | NA | NA | NA | NA | NA | NA | NA | NA |
| | 05/07/03 | **0.014** | **0.014** | NA | NA | NA | NA | 0.005 U | 0.005 U | 0.001 U | 0.001 U | NA | NA | NA | NA | NA | NA | NA | NA |
| | 11/05/03 | **0.022** | **0.022** | NA | NA | NA | NA | 0.005 U | 0.005 U | 0.001 U | 0.001 U | NA | NA | NA | NA | NA | NA | NA | NA |
| | 04/15/04 | **0.026** | **0.024** | NA | NA | NA | NA | 0.006 | 0.005 U | 0.001 U | 0.001 U | NA | NA | NA | NA | NA | NA | NA | NA |
| | 10/05/04 | **0.016** | **0.016** | NA | NA | NA | NA | 0.005 U | 0.005 U | 0.001 U | 0.001 U | NA | NA | NA | NA | NA | NA | NA | NA |
| | 03/29/05 | **0.014** | **0.015** | NA | NA | NA | NA | 0.005 U | 0.005 U | 0.001 U | 0.001 U | NA | NA | NA | NA | NA | NA | NA | NA |
| | 10/18/05 | **0.025** | **0.025** | NA | NA | NA | NA | 0.005 U | 0.005 U | 0.001 U | 0.001 U | NA | NA | NA | NA | NA | NA | NA | NA |
| | 04/17/06 | **0.021** | **0.022** | NA | NA | NA | NA | 0.005 U | 0.005 U | 0.001 U | 0.001 U | NA | NA | NA | NA | NA | NA | NA | NA |
| | 10/19/06 | **0.024** | **0.024** | NA | NA | NA | NA | 0.005 U | 0.005 U | 0.001 U | 0.001 U | NA | NA | NA | NA | NA | NA | NA | NA |
| | 04/04/07 | **0.021** | **0.021** | NA | NA | NA | NA | 0.005 U | 0.005 U | 0.001 U | 0.001 U | NA | NA | NA | NA | NA | NA | NA | NA |
| | 10/26/07 | **0.005** | **0.006** | NA | NA | NA | NA | 0.024 | 0.005 U | 0.001 U | 0.001 U | NA | NA | NA | NA | NA | NA | NA | NA |
| | 04/03/08 | **0.018** | **0.021** | NA | NA | NA | NA | 0.005 U | 0.005 U | 0.001 U | 0.001 U | NA | NA | NA | NA | NA | NA | NA | NA |
| | 10/08/08 | **0.021** | **0.023** | NA | NA | NA | NA | 0.005 U | 0.005 U | 0.001 U | 0.001 U | NA | NA | NA | NA | NA | NA | NA | NA |
| | 04/07/09 | **0.0214** | **0.0206** | NA | NA | NA | NA | 0.005 U | 0.005 U | 0.001 U | 0.001 U | NA | NA | NA | NA | NA | NA | NA | NA |
| | 10/28/09 | **0.0206** | **0.0212** | NA | NA | NA | NA | 0.005 U | 0.005 U | 0.001 U | 0.001 U | NA | NA | NA | NA | NA | NA | NA | NA |
| | 04/07/10 | **0.0218** | **0.0214** | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |

**Notes:**

Values in **bold** font indicate that the result reported exceeds the most current MTCA levels based on the Ecology website.

Model Toxics Control Act (MTCA) Cleanup Regulation, WAC 173-340. MTCA Method A and B values are from Ecology website CLARC tables, 2010 download.

(A) - MTCA Method A

(B) - MTCA Method B

NA - Not analyzed

R - Data rejected during validation. Dissolved result substantially greater than total result.

U - Parameter was analyzed for but not detected above the reporting limit shown.

ESB1212-1' = Unfiltered grab sample from perched water at 1 foot depth in probe boring ESB1212

[a] The result appears anomalous but a specific error was not identified.

**Table 3-16**
**Summary of Soil Sample Analytical Results for Volatile Organic Compounds, (ug/kg)**
**Building 40-51, Cure Area**
**Boeing Everett Plant Remedial Investigation**

| Sample ID | Sample Date | 2-Butanone | Acetone | Carbon Disulfide | Methylene Chloride |
|---|---|---|---|---|---|
| 1996 MTCA Method B Soil Cleanup Level | | 48,000,000 | 8,000,000 | 8,000,000 | 133,000 |
| 1996 MTCA Method B 100x GW Soil Cleanup Level | | 480,000 | 80,000 | 80,000 | 583 |
| 2001 MTCA Method A or B Soil Cleanup Level | | 48,000,000 (B) | 8,000,000 (B) | 8,000,000 (B) | 20 (A)<br>133,000 (B) |
| MTCA Method A or B Protection of Groundwater | | 19,200 (B) | 3,211 (B) | 5,651 (B) | 20 (A)<br>25 (B) |
| ESB1263-7 1/2' | 06/23/98 | 5.3 U | 5.3 U | 1.1 U | 8.5 |
| ESB1263-10' | 06/23/98 | 5.5 U | 8.0 | 1.1 U | **24** |
| ESB1263-20' | 06/23/98 | 5.2 U | 9.1 | 1.0 U | **21** |
| ESB1275-5' | 07/01/98 | 5.1 U | 6.2 U* | 1.0 U | 2.0 U |
| ESB1275-10' | 07/01/98 | 47.0 U* | 27 U* | 1.3 | 2.2 U |
| ESB1275-20' | 07/01/98 | 40.0 U* | 26 U* | 1.1 U | 2.2 U |
| ESB1276-5' | 07/02/98 | 5.3 U | 5.3 U | 1.1 U | 2.1 U |
| ESB1276-10' | 07/02/98 | 5.3 U | 42 U | 1.1 U | 2.1 U |
| ESB1276-20' | 07/02/98 | 5.4 U | 34 U | 1.1 U | 2.2 U |

**Notes:**
MTCA - Model Toxics Control Act
(A) - MTCA Method A soil cleanup level for unrestricted land use
(B) MTCA Method B soil cleanup level
1996 - Indicates MTCA soil cleanup levels, published 1996.
2001 - Indicates MTCA version 3.1 soil cleanup levels, published 2001.
U - Compound was analyzed for but not detected above the reporting limit shown.
* Value was qualified as not detected due to method blank or rinsate blank results.

**Table 3-17**
**Summary of Soil Sample Analytical Results for TPH, Non-halogenated SVOCs, and Phenol**
**Building 40-51, Cure Area**
**Boeing Everett Plant Remedial Investigation**

| Sample ID | Sample Date | Total Petroleum Hydrocarbons (mg/kg) | | Non-halogenated SVOCs (mg/kg) | Phenol (ug/kg) |
|---|---|---|---|---|---|
| | | Diesel-Range Hydrocarbons | Gasoline-Range Hydrocarbons | | |
| 1996 MTCA Method A or B Soil Cleanup Level | | 200 (A) | 100 (A) | - | 48,000,000 (B) |
| 1996 MTCA Method B 100x GW Soil Cleanup Level | | NE | NE | - | 960,000 |
| 2001 MTCA Method A or B Soil Cleanup Level | | 2,000 (A) | 30 / 100* (A) | - | 48,000,000 (B) |
| MTCA Method A or B Protection of Groundwater | | NC | 30/ 100* (A) | - | 21,965 (B) |
| ESB1263-7 1/2' | 06/23/98 | 5.4 U | 5.3 U | ND | 140 U |
| ESB1263-10' | 06/23/98 | 5.4 U | 5.4 U | ND | 140 U |
| ESB1263-20' | 06/23/98 | 5.3 U | 5.3 U | ND | 140 U |
| ESB1275-5' | 07/01/98 | 5.5 U | 5.2 U | ND | 150 U |
| ESB1275-10' | 07/01/98 | 5.5 U | 5.3 U | ND | 150 U |
| ESB1275-20' | 07/01/98 | 5.4 U | 5.3 U | ND | 140 U |
| ESB1276-5' | 07/02/98 | 5.5 U | 5.6 U | ND | 150 U |
| ESB1276-10' | 07/02/98 | 5.4 U | 5.3 U | ND | 140 U |
| ESB1276-20' | 07/02/98 | 5.3 U | 5.3 U | ND | 140 U |

**Notes:**
MTCA - Model Toxics Control Act
(A) - MTCA Method A soil cleanup level for unrestricted land use
(B) - MTCA Method B soil cleanup level
1996 - Indicates MTCA soil cleanup levels, published 1996.
2001 - Indicates MTCA version 3.1 soil cleanup levels, published 2001.
NC - Not calculated
ND - Not detected
NE - Not established
U - Compound was analyzed for but not detected above the reporting limit shown.
**gasoline mixtures with benzene/gasoline mixtures without benzene

**Table 3-18**
**Summary of Soil Sample Analytical Results for Metals, (mg/kg)**
**Building 40-51, Cure Area**
**Boeing Everett Plant Remedial Investigation**

| Sample ID | Sample Date | Arsenic | Barium | Cadmium | Chromium | Lead | Selenium | Strontium |
|---|---|---|---|---|---|---|---|---|
| 1996 MTCA Method A, AI, or B Soil Cleanup Level | | 1.67 (B) | 5,600 (B) | 80 (B) | 100 (A)<br>500 (AI) | 250 (A)<br>1,000 (AI) | 400 (B) | 48,000 (B) |
| 1996 MTCA Method B 100x GW Soil Cleanup Level | | 0.00583 | 112 | 1.6 | 1,600 ($Cr^{+3}$) | NE | 8.0 | 960 |
| 2001 MTCA Method A, AI, or B Soil Cleanup Level | | 20 (A)<br>0.667 (B) | 5,600 (B)<br>16,000 (B*) | 2 (A)<br>80 (B) | 2,000($Cr^{+3}$) / 19 ($Cr^{+6}$) (A)<br>120,000($Cr^{+3}$) / 240 ($Cr^{+6}$) (B) | 250 (A)<br>1,000 (AI) | 400 (B) | 48,000 (B) |
| MTCA Method A or B Protection of Groundwater | | 20 (A)<br>0.03 (B) | 2,637 (B) | 2 (A)<br>1.1 (B) | 2,000 (Cr+3) / 19 (Cr+6) (A)<br>480,096 (Cr+3) / 18 (Cr+6) (B) | 250 (A) | 8.3 (B) | 38.4 (B) |
| WA Department of Ecology - Puget Sound Regional Background Concentration | | 7.30 | NE | 0.8 | 48.2 | 24.0 | NE | NE |
| ESB1263-7 1/2' | 06/23/98 | **1.3** | 63.7 | 0.2 U | **40 J** | 5 | 0.2 | 34.1 |
| ESB1263-10' | 06/23/98 | **1.4** | 59.3 | 0.2 U | **36.1 J** | 5 | 0.1 U | 37.5 |
| ESB1263-20' | 06/23/98 | **1.1** | 44.7 | 0.2 U | **31.7 J** | 5 | 0.1 U | 26.2 |
| ESB1275-5' | 07/01/98 | **2.8 J** | 74.8 | 0.2 U | **42.6** | 5 | 0.1 U | 40.9 |
| ESB1275-10' | 07/01/98 | **3.1 J** | 64.4 | 0.2 U | **42.4** | 5 | 0.1 U | 33.4 |
| ESB1275-20' | 07/01/98 | **1.8 J** | 54.7 | 0.2 U | **35.5** | 5 | 0.1 U | 30.6 |
| ESB1276-5' | 07/02/98 | **2.9** | 77.7 | 0.2 | **41.2** | 6 | 0.1 U | 45.4 |
| ESB1276-5' (DUP) | 07/02/98 | **3.4** | 82 | 0.2 U | **42.6** | 6 | 0.1 U | 47.4 |
| ESB1276-10' | 07/02/98 | **3.3** | 69.2 | 0.2 U | **40.4** | 5 | 0.1 U | 38.6 |
| ESB1276-20' | 07/02/98 | **1.6** | 62.4 | 0.2 U | **40.1** | 5 | 0.1 U | 42.8 |

**Notes:**
MTCA - Model Toxics Control Act
(A) - MTCA Method A soil cleanup level for unrestricted land use
(AI) - MTCA Method A soil cleanup level for industrial property
(B) - MTCA Method B soil cleanup level
(B*) Revised 2001 MTCA Method B value from Ecology website CLARC tables downloaded June 2010 (https://fortress.wa.gov/ecy/clarc/reporting/CLARCReporting.aspx).
1996 - Indicates MTCA soil cleanup levels, published 1996.
2001 - Indicates MTCA version 3.1 soil cleanup levels, published 2001.
J - Estimated value
NE - Not established
U - Compound was analyzed for but not detected above the reporting limit shown.
Samples were analyzed for mercury and silver, but these metals were not detected in any of the samples.
Numbers in **bold** font indicate that the result reported exceeds the most current MTCA cleanup level as of June 2010.
Numbers in grey shading indicate results that exceed a MTCA protection of groundwater level, but do not exceed the current lowest MTCA soil cleanup level protective of direct contact.

**Table 3-19**
**Summary of Soil Sample Analytical Results for Volatile Organic Compounds, (ug/kg**
**Building 40-51, Southern Air Scrubber Trenches (Wing Area)**
**Boeing Everett Plant Remedial Investigation**

| Sample ID | Sample Date | 2-Butanone | 4-Methyl-2-Pentanone (MIBK) | Acetone | Methylene Chloride | Naphthalene |
|---|---|---|---|---|---|---|
| 1996 MTCA Method B Soil Cleanup Level | | 48,000,000 | 6,400,000 | 8,000,000 | 133,000 | 3,200,000 |
| 1996 MTCA Method B 100x GW Soil Cleanup Level | | 480,000 | 64,000 | 80,000 | 583 | 32,000 |
| 2001 MTCA Method A or B Soil Cleanup Level | | 48,000,000 (B) | 6,400,000 (B) | 8,000,000 (B) | 20 (A)<br>133,000 (B) | 5,000 (A)<br>1,600,000 (B) |
| MTCA Method A or B Protection of Groundwater | | 19,200 (B) | 2,560 (B) | 3,211 (B) | 20 (A)<br>25 (B) | 5,000 (A)<br>4,457 (B) |
| ESB1206-3' | 05/02/98 | 5.1 U | 5.1 U | 6.7 U* | 2.0 U | 5.1 U |
| ESB1206-5' | 05/02/98 | 5.4 U | 5.4 U | 6.7 U* | 2.1 U | 5.4 U |
| ESB1209-2 1/2' | 05/03/98 | 5.0 U | 5 U | 5.7 U* | 2.0 U | 5.0 U |
| ESB1209-5' | 05/03/98 | 5.4 U | 5.4 U | 13 U* | 2.2 U | 5.4 U |
| ESB1210-2 1/2' | 05/03/98 | 5.1 U | 5.1 U | 6.1 U* | 2.0 U | 5.1 U |
| ESB1210-5' | 05/03/98 | 5.3 U | 5.3 U | 17 U* | 2.1 U | 5.3 U |
| ESB1211-2 1/2' | 05/03/98 | 36.0 U* | 5 U | 17 U* | 2.0 U | 5 UJ |
| ESB1211-7 1/2' | 05/03/98 | 5.5 U | 5.5 U | 15 U* | 2.8 U* | 5.5 U |
| ESB1262-5' | 06/23/98 | 5.3 U | 5.3 U | 15 | **22** | 5.3 U |
| ESB1262-7 1/2' | 06/23/98 | 5.5 U | 5.5 U | 22 | 7.8 | 5.5 U |
| ESB1264-5' | 06/24/98 | 7.9 | 5.5 U | 5.5 U | **31** | 5.5 U |
| ESB1264-7 1/2' | 06/24/98 | 6.3 U | 6.3 U | 11.0 | **32** | 6.3 U |
| ESB1265-5' | 06/24/98 | 5.4 U | 5.4 U | 7.7 | **22** | 5.4 U |
| ESB1265-9' | 06/24/98 | 5.4 U | 5.4 U | 6.4 | 11 | 5.4 U |
| ESB1266-2 1/2' | 06/25/98 | 37 UJ | 5 U | 22 UJ | 2.0 U | 5.0 U |
| ESB1266-5' | 06/25/98 | 160 | 18.0 | 64 U | 2.1 U | 12 |

**Notes:**
MTCA - Model Toxics Control Act
(A) - MTCA Method A soil cleanup level for unrestricted land use
(B) - MTCA Method B soil cleanup level
1996 - Indicates MTCA soil cleanup levels, published 1996.
2001 - Indicates MTCA version 3.1 soil cleanup levels, published 2001.
U - Compound was analyzed for but not detected above the reporting limit shown.
UJ - Compound was analyzed for but not detected above the reporting limit shown.  Reporting limit is an estimated value.
* Value was qualified as not detected due to method blank or rinsate blank results.

**Table 3-19**
**Summary of Soil Sample Analytical Results for Volatile Organic Compounds, (ug/kg**
**Building 40-51, Southern Air Scrubber Trenches (Wing Area)**
**Boeing Everett Plant Remedial Investigation**

| **Sample ID** | **Sample Date** | **2-Butanone** | **4-Methyl-2-Pentanone (MIBK)** | **Acetone** | **Methylene Chloride** | **Naphthalene** |
|---|---|---|---|---|---|---|
| 1996 MTCA Method B Soil Cleanup Level | | 48,000,000 | 6,400,000 | 8,000,000 | 133,000 | 3,200,000 |
| 1996 MTCA Method B 100x GW Soil Cleanup Level | | 480,000 | 64,000 | 80,000 | 583 | 32,000 |
| 2001 MTCA Method A or B Soil Cleanup Level | | 48,000,000 (B) | 6,400,000 (B) | 8,000,000 (B) | 20 (A)<br>133,000 (B) | 5,000 (A)<br>1,600,000 (B) |
| MTCA Method A or B Protection of Groundwater | | 19,200 (B) | 2,560 (B) | 3,211 (B) | 20 (A)<br>25 (B) | 5,000 (A)<br>4,457 (B) |
| ESB1206-3' | 05/02/98 | 5.1 U | 5.1 U | 6.7 U* | 2.0 U | 5.1 U |
| ESB1206-5' | 05/02/98 | 5.4 U | 5.4 U | 6.7 U* | 2.1 U | 5.4 U |
| ESB1209-2 1/2' | 05/03/98 | 5.0 U | 5 U | 5.7 U* | 2.0 U | 5.0 U |
| ESB1209-5' | 05/03/98 | 5.4 U | 5.4 U | 13 U* | 2.2 U | 5.4 U |
| ESB1210-2 1/2' | 05/03/98 | 5.1 U | 5.1 U | 6.1 U* | 2.0 U | 5.1 U |
| ESB1210-5' | 05/03/98 | 5.3 U | 5.3 U | 17 U* | 2.1 U | 5.3 U |
| ESB1211-2 1/2' | 05/03/98 | 36.0 U* | 5 U | 17 U* | 2.0 U | 5 UJ |
| ESB1211-7 1/2' | 05/03/98 | 5.5 U | 5.5 U | 15 U* | 2.8 U* | 5.5 U |
| ESB1262-5' | 06/23/98 | 5.3 U | 5.3 U | 15 | **22** | 5.3 U |
| ESB1262-7 1/2' | 06/23/98 | 5.5 U | 5.5 U | 22 | 7.8 | 5.5 U |
| ESB1264-5' | 06/24/98 | 7.9 | 5.5 U | 5.5 U | **31** | 5.5 U |
| ESB1264-7 1/2' | 06/24/98 | 6.3 U | 6.3 U | 11.0 | **32** | 6.3 U |
| ESB1265-5' | 06/24/98 | 5.4 U | 5.4 U | 7.7 | **22** | 5.4 U |
| ESB1265-9' | 06/24/98 | 5.4 U | 5.4 U | 6.4 | 11 | 5.4 U |
| ESB1266-2 1/2' | 06/25/98 | 37 UJ | 5 U | 22 UJ | 2.0 U | 5.0 U |
| ESB1266-5' | 06/25/98 | 160 | 18.0 | 64 U | 2.1 U | 12 |

**Notes:**
MTCA - Model Toxics Control Act
(A) - MTCA Method A soil cleanup level for unrestricted land use
(B) - MTCA Method B soil cleanup level
1996 - Indicates MTCA soil cleanup levels, published 1996.
2001 - Indicates MTCA version 3.1 soil cleanup levels, published 2001.
U - Compound was analyzed for but not detected above the reporting limit shown.
UJ - Compound was analyzed for but not detected above the reporting limit shown.  Reporting limit is an estimated value.
* Value was qualified as not detected due to method blank or rinsate blank results.

**Table 3-20**
**Summary of Soil Sample Analytical Results for TPH, Non-halogenated SVOCs and Phenol**
**Building 40-51, Southern Air Scrubber Trenches (Wing Area)**
**Boeing Everett Plant Remedial Investigation**

| Sample ID | Sample Date | Total Petroleum Hydrocarbons (mg/kg) | | Non-halogenated SVOCs (mg/kg) | Phenol (ug/kg) |
|---|---|---|---|---|---|
| | | Diesel-Range Hydrocarbons | Gasoline-Range Hydrocarbons | | |
| 1996 MTCA Method A or B Soil Cleanup Level | | 200 (A) | 100 (A) | - | 48,000,000 (B) |
| 1996 MTCA Method B 100x GW Soil Cleanup | | NE | NE | - | 960,000 |
| 2001 MTCA Method A or B Soil Cleanup Level | | 2,000 (A) | 30 / 100** (A) | - | 48,000,000 (B) |
| MTCA Method A or B Protection of Groundwater | | NC | 30 / 100** (A) | - | 21,965 (B) |
| ESB1206-3' | 05/02/98 | 5.1 U | 5.1 U | ND | 140 U |
| ESB1206-5' | 05/02/98 | 5.3 U | 5.4 U | ND | 140 U |
| ESB1209-2 1/2' | 05/03/98 | 5.2 U | 5.3 U | ND | 140 U |
| ESB1209-5' | 05/03/98 | 5.5 U | 5.6 U | ND | 150 U |
| ESB1210-2 1/2' | 05/03/98 | 5.2 U | 5.1 U | ND | 140 U |
| ESB1210-5' | 05/03/98 | 5.5 U | 5.4 U | ND | 150 U |
| ESB1211-2 1/2' | 05/03/98 | 12.0* | 5.2 U | ND | 140 U |
| ESB1211-7 1/2' | 05/03/98 | 5.4 U | 5.4 U | ND | 150 U |
| ESB1262-5' | 06/23/98 | 5.3 U | 5.2 U | ND | 140 UJ |
| ESB1262-7 1/2' | 06/23/98 | 5.4 U | 5.3 U | ND | 140 U |
| ESB1264-5' | 06/24/98 | 5.4 U | 5.4 U | ND | 150 U |
| ESB1264-7 1/2' | 06/24/98 | 6.2 U | 6.2 U | ND | 160 U |
| ESB1265-5' | 06/24/98 | 5.4 U | 5.3 U | ND | 140 U |
| ESB1265-9' | 06/24/98 | 5.5 U | 5.4 U | ND | 150 U |
| ESB1266-2 1/2' | 06/25/98 | 5.1 U | 5.1 U | ND | 130 U |
| ESB1266-5' | 06/25/98 | 5.3 U | 5.3 U | ND | 140 U |

**Notes:**
MTCA - Model Toxics Control Act
(A) - MTCA Method A soil cleanup level for unrestricted land use
(B) MTCA Method B soil cleanup level
1996 - Indicates MTCA soil cleanup levels, published 1996.
2001 - Indicates MTCA version 3.1 soil cleanup levels, published 2001.
NC - Not calculated
ND - Not detected
NE - Not established
U - Compound was analyzed for but not detected above the reporting limit shown.
UJ - Compound was analyzed for but not detected above the reporting limit shown. Reporting limit is an estimated value.
* Pattern profile does not match typical diesel pattern.
**gasoline mixtures with benzene/gasoline mixtures without benzene

**Table 3-21**
**Summary of Soil Sample Analytical Results for Metals, (mg/kg)**
**Building 40-51, Southern Air Scrubber Trenches (Wing Area)**
**Boeing Everett Plant Remedial Investigation**

| Sample ID | Sample Date | Arsenic | Barium | Cadmium | Chromium | Lead | Mercury | Selenium | Strontium |
|---|---|---|---|---|---|---|---|---|---|
| 1996 MTCA Method A, AI, or B Soil Cleanup Level | | 1.67 (B) | 5,600 (B) | 80 (B) | 100 (A)<br>500 (AI) | 250 (A)<br>1,000 (AI) | 24 (B) | 400 (B) | 48,000 (B) |
| 1996 MTCA Method B 100x GW Soil Cleanup Level | | 0.00583 | 112 | 1.6 | 1,600 ($Cr^{+3}$) | NE | 0.48 | 8.0 | 960 |
| 2001 MTCA Method A, AI, or B Soil Cleanup Level | | 20 (A)<br>0.667 (B) | 5,600 (B)<br>16,000 (B*) | 2 (A)<br>80 (B) | 2,000($Cr^{+3}$) / 19 ($Cr^{+6}$) (A)<br>120,000($Cr^{+3}$) / 240 ($Cr^{+6}$) (B) | 250 (A)<br>1,000 (AI) | 2 (A)<br>24 (B) | 400 (B) | 48,000 (B) |
| MTCA Method A or B Protection of Groundwater | | 20 (A)<br>0.03 (B) | 2,637 (B) | 2 (A)<br>1.1 (B) | 2,000 (Cr+3) / 19 (Cr+6) (A)<br>480,096 (Cr+3) / 18 (Cr+6) (B) | 250 (A) | 2 (A)<br>5.02 (B) | 8.3 (B) | 38.4 (B) |
| WA Department of Ecology - Puget Sound Regional Background Concentration | | 7.30 | NE | 0.8 | 48.2 | 24.0 | 0.07 | NE | NE |
| ESB1206-3' | 05/02/98 | **2.9** | 55.2 | 0.2 U | **48.4** | 4 | 0.04 U | 0.1 U | 31.9 |
| ESB1206-5' | 05/02/98 | **2.5** | 64.3 | 0.2 U | **42.2** | 3 | 0.05 U | 0.1 U | 38.3 |
| ESB1209-2 1/2' | 05/03/98 | **2.3** | 41.3 | 0.2 U | **38.6** | 4 | 0.05 U | 0.1 U | 25.0 |
| ESB1209-5' | 05/03/98 | **2.9** | 63.6 | 0.2 | **39.0** | 4 | 0.05 U | 0.5 U | 39.5 |
| ESB1210-2 1/2' | 05/03/98 | **2.4** | 43.8 | 0.2 U | **42.6** | 3 | 0.05 U | 0.5 U | 22.9 |
| ESB1210-5' | 05/03/98 | **2.4** | 55.2 | 0.2 U | **34.7** | 3 | 0.05 U | 0.1 U | 37.2 |
| ESB1211-2 1/2' | 05/03/98 | **2.1** | 51.5 | 0.2 U | **45.6** | 5 | 0.05 U | 0.5 U | 26.7 |
| ESB1211-7 1/2' | 05/03/98 | **2.2** | 61.4 | 0.2 U | **40.6** | 4 | 0.05 U | 0.5 U | 35.9 |
| ESB1262-5' | 06/23/98 | **13.8** | 59.6 | 0.2 | **40.0 J** | 11 | 0.05 U | 0.1 U | 45.6 |
| ESB1262-7 1/2' | 06/23/98 | **1.6** | 61.2 | 0.2 U | **35.7 J** | 5 | 0.05 U | 0.1 U | 37.2 |
| ESB1264-5' | 06/24/98 | **1.7** | 57.0 | 0.2 U | **34.6 J** | 3 | 0.05 U | 0.1 U | 30.1 |
| ESB1264-7 1/2' | 06/24/98 | **1.3** | 60.0 | 0.2 U | **35.9 J** | 2 | 0.05 U | 0.1 U | 37.9 |
| ESB1265-5' | 06/24/98 | **1.4** | 78.0 | 0.2 U | **39.9 J** | 2 U | 0.15 | 0.2 | 58.0 |
| ESB1265-9' | 06/24/98 | **1.5** | 61.9 | 0.2 U | **47.1 J** | 3 | 0.05 U | 0.1 U | 33.5 |
| ESB1266-2 1/2' | 06/25/98 | **1.8** | 49.5 | 0.2 U | **32.0** | 4 | 0.04 U | 0.5 U | 22.7 J |
| ESB1266-5' | 06/25/98 | **2.9** | 58.4 | 0.2 U | **33.3** | 5 | 0.05 U | 0.1 U | 32.1 J |

**Notes:**
MTCA - Model Toxics Control Act
(A) - MTCA Method A soil cleanup level for unrestricted land use
(AI) - MTCA Method A soil cleanup level for industrial property
(B) - MTCA Method B soil cleanup level
(B*) Revised 2001 MTCA Method B value from Ecology website CLARC tables downloaded June 2010 (https://fortress.wa.gov/ecy/clarc/reporting/CLARCReporting.asp
1996 - Indicates MTCA soil cleanup levels, published 1996
2001 - Indicates MTCA version 3.1 soil cleanup levels, published 2001.
J - Estimated value
NE - Not established
U - Compound was analyzed for but not detected above the reporting limit shown.
Samples were analyzed for silver, but it was not detected in any of the samples.
Numbers in **bold** font indicate that the result reported exceeds the most current MTCA cleanup level as of June 201(
Numbers in grey shading indicate results that exceed a MTCA protection of groundwater level, but do not exceed the current lowest MTCA soil cleanup level protective of direct contact.

**Table 3-22**
**Summary of Soil Sample Analytical Results for Volatile Organic Compounds, (ug/kg)**
**Building 40-51, Northern Air Scrubber Trenches and Sump (EV-113)**
**Boeing Everett Plant Remedial Investigation**

| Sample ID | Sample Date | 1,1,2-Trichloro-1,2,2-trifluoroethane | Acetone | Methylene Chloride | Naphthalene | Toluene |
|---|---|---|---|---|---|---|
| 1996 MTCA Method A or B Soil Cleanup Level | | NE | 8,000,000 (B) | 133,000 (B) | 3,200,000 (B) | 40,000 (A)<br>16,000,000 (B) |
| 1996 MTCA Method B 100x GW Soil Cleanup Level | | NE | 80,000 | 583 | 32,000 | 160,000 |
| 2001 MTCA Method A or B Soil Cleanup Level | | 2,400,000,000 (B*) | 8,000,000 (B) | 20 (A)<br>133,000 (B) | 5,000 (A)<br>1,600,000 (B) | 7,000 (A)<br>16,000,000 (B)<br>6,400,000 (B*) |
| MTCA Method A or B Protection of Groundwater | | 960,000 (B) | 3,211 (B) | 20 (A)<br>25 (B) | 5,000 (A)<br>4,457 (B) | 7,000 (A)<br>4,654 (B) |
| ESB1271-12 1/2' | 06/30/98 | 2.1 U | 5.3 U | 2.1 U | 5.3 U | 1.1 U |
| ESB1271-15' | 06/30/98 | 2.1 U | 6.3 U** | 2.1 U | 5.3 U | 1.1 U |
| ESB1271-20' | 06/30/98 | 2.2 UJ | 21.0 UJ | 2.2 UJ | 5.5 UJ | 1.1 UJ |
| ESB1277-10' | 07/02/98 | 2.1 U | 5.2 U | 2.1 U | 5.2 U | 1.0 U |
| ESB1277-12 1/2' | 07/02/98 | 2.1 U | 9.1 U** | 2.1 U | 5.3 U | 1.1 U |
| ESB1277-15' | 07/02/98 | 2.1 UJ | 13 U** | 2.1 UJ | 5.3 U | 1.1 UJ |
| ESB1278-10' | 07/02/98 | 2.1 UJ | 5.3 UJ | 2.1 UJ | 5.3 UJ | 1.3 J |
| ESB1278-12 1/2' | 07/02/98 | 2.2 UJ | 5.4 UJ | 2.2 UJ | 5.4 UJ | 1.1 UJ |
| ESB1278-20' | 07/02/98 | 2.1 UJ | 19 U** | 2.1 UJ | 5.3 UJ | 1.1 UJ |
| ESB1281-15' | 07/07/98 | 2.2 U | 13 | 2.2 U | 5.4 U | 1.1 U |
| ESB1281-20' | 07/07/98 | 2.2 U | 20 | 2.2 U | 5.6 U | 1.1 U |
| ESB1281-25' | 07/07/98 | 2.1 U | 39 | 2.1 U | 5.3 U | 1.1 U |
| ESB1282-7 1/2' | 07/10/98 | 2.1 UJ | 5.3 U | 2.1 U | 5.3 U | 1.1 U |
| ESB1282-12 1/2' | 07/10/98 | 2.1 U | 5.3 U | 2.1 U | 5.3 U | 1.1 U |
| ESB1282-20' | 07/10/98 | 2.1 U | 6 U** | 2.1 U | 5.4 U | 1.2 |
| ESB1283-7 1/2' | 07/10/98 | 2.2 U | 5.4 U | 2.2 U | 5.4 U | 2.2 |
| ESB1283-10' | 07/10/98 | 2.2 U | 5.4 U | 2.2 U | 5.4 U | 1.7 |
| ESB1283-20' | 07/10/98 | 2.1 U | 9.1 U** | 2.1 U | 7.4 J | 1.2 |
| ESB1284-2 1/2' | 07/14/98 | 2.1 UJ | 5.2 U | 2.1 U | 5.2 U | 1.0 U |
| ESB1284-5' | 07/14/98 | 2.1 U | 5.3 U | 2.1 U | 5.3 U | 1.1 U |
| ESB1305-10' | 08/16/98 | 2.1 U | 5.3 U | 2.1 U | 5.3 U | 1.1 U |
| ESB1305-12 1/2' | 08/16/98 | 2.0 U | 9.6 | 2.0 U | 5.1 U | 1.0 U |
| ESB1305-20' | 08/16/98 | 2.2 UJ | 28 | 2.2 U | 5.4 U | 1.1 U |
| ESB1306-10' | 08/16/98 | 2.2 U | 5.7 | 3.0 | 5.4 U | 1.1 U |
| ESB1306-12 1/2' | 08/16/98 | 2.2 | 7.7 | 2.2 | 5.4 U | 1.1 U |
| ESB1306-20' | 08/16/98 | 2.1 U | 20 | 2.7 | 5.4 U | 1.1 U |

**Notes:**
MTCA - Model Toxics Control Act
(A) - MTCA Method A soil cleanup level for unrestricted land use
(B) - MTCA Method B soil cleanup level
(B*) Revised 2001 MTCA Method B value from Ecology website CLARC tables downloaded June 2010 (https://fortress.wa.gov/ecy/clarc/reporting/CLARCReporting.aspx).
1996 - Indicates MTCA soil cleanup levels, published 1996.
2001 - Indicates MTCA version 3.1 soil cleanup levels, published 2001.
NE - Not established
J - Estimated value
U - Compound was analyzed for but not detected above the reporting limit shown.
UJ - Compound was analyzed for but not detected above the reporting limit shown. Reporting limit is an estimated value.
**Value was qualified as not detected due to method blank or rinsate blank results.

**Table 3-23**
**Summary of Soil Sample Analytical Results for TPH, Non-halogenated SVOCs and Pheno**
**Building 40-51, Northern Air Scrubber Trenches and Sump (EV-113)**
**Boeing Everett Plant Remedial Investigation**

| Sample ID | Sample Date | Total Petroleum Hydrocarbons (mg/kg) | | Non-halogenated SVOCs | Phenol (ug/kg) |
|---|---|---|---|---|---|
| | | Diesel-Range Hydrocarbons | Gasoline-Range Hydrocarbons | | |
| 1996 MTCA Method A or B Soil Cleanup Level | | 200 (A) | 100 (A) | - | 48,000,000 (B) |
| 1996 MTCA Method B 100x GW Soil Cleanup Level | | NE | NE | - | 960,000 |
| 2001 MTCA Method A or B Soil Cleanup Level | | 2,000 (A) | 30 / 100** (A) | - | 48,000,000 (B) |
| MTCA Method A or B Protection of Groundwater | | NC | 30 / 100** (A) | - | 21,965 (B) |
| ESB1271-12 1/2' | 06/30/98 | 5.7 U | 5.3 U | ND | 150 U |
| ESB1271-15' | 06/30/98 | 5.5 U | 5.4 U | ND | 150 U |
| ESB1271-20' | 06/30/98 | 5.5 U | 5.3 U | ND | 150 U |
| ESB1277-10' | 07/02/98 | 5.3 U | 5.3 U | ND | 140 U |
| ESB1277-12 1/2' | 07/02/98 | 5.4 U | 5.3 U | ND | 140 U |
| ESB1277-15' | 07/02/98 | 5.4 U | 5.3 U | ND | 140 U |
| ESB1278-10' | 07/02/98 | 5.4 U | 5.3 U | ND | 140 U |
| ESB1278-12 1/2' | 07/02/98 | 5.4 U | 5.6 U | ND | 140 U |
| ESB1278-20' | 07/02/98 | 5.4 U | 5.4 U | ND | 140 U |
| ESB1281-15' | 07/07/98 | 5.5 U | 5.4 U | ND | 150 U |
| ESB1281-20' | 07/07/98 | 5.5 U | 5.4 U | ND | 150 U |
| ESB1281-25' | 07/07/98 | 5.4 U | 5.4 U | ND | 150 U |
| ESB1282-7 1/2' | 07/10/98 | 5.3 U | 5.2 U | ND | 140 U |
| ESB1282-12 1/2' | 07/10/98 | 5.4 U | 5.3 U | ND | 140 U |
| ESB1282-20' | 07/10/98 | 5.4 U | 5.4 U | ND | 140 U |
| ESB1283-7 1/2' | 07/10/98 | 5.3 U | 5.3 U | ND | 140 U |
| ESB1283-10' | 07/10/98 | 5.4 U | 5.4 U | ND | 140 U |
| ESB1283-20' | 07/10/98 | 5.4 U | 5.4 U | ND | 150 U |
| ESB1284-2 1/2' | 07/14/98 | 5.8 UJ | 5.3 U | ND | 160 U |
| ESB1284-5' | 07/14/98 | 7.7 UJ | 5.3 U | ND | 140 U |
| ESB1305-10' | 08/16/98 | 5.4 U | 5.2 U | ND | 140 U |
| ESB1305-12 1/2' | 08/16/98 | 5.4 U | 5.3 U | ND | 140 U |
| ESB1305-20' | 08/16/98 | 5.4 U | 5.3 U | ND | 140 U |
| ESB1306-10' | 08/16/98 | 5.3 U | 5.4 U | ND | 140 U |
| ESB1306-12 1/2' | 08/16/98 | 5.7 * | 5.3 U | ND | 140 U |
| ESB1306-20' | 08/16/98 | 5.4 U | 5.4 U | ND | 140 U |

**Notes:**
MTCA - Model Toxics Control Act
(A) - MTCA Method A soil cleanup level for unrestricted land use
(B) - MTCA Method B soil cleanup level
1996 - Indicates MTCA soil cleanup levels, published 1996.
2001 - Indicates MTCA version 3.1 soil cleanup levels, published 2001.
J - Estimated value
NC - Not calculated
ND - Not detected
NE - Not established
*Pattern profile does not match a typical diesel pattern.
**gasoline mixtures with benzene/gasoline mixtures without benzene
U - Compound was analyzed for but not detected above the reporting limit shown.
UJ - Compound was analyzed for but not detected above the reporting limit shown. Reporting limit is an estimated value.

**Table 3-24**
**Summary of Soil Sample Analytical Results for Metals, (mg/kg)**
**Building 40-51, Northern Air Scrubber Trenches and Sump (EV-113)**
**Boeing Everett Plant Remedial Investigation**

| Sample ID | Sample Date | Arsenic | Barium | Cadmium | Chromium | Lead | Selenium | Silver | Strontium |
|---|---|---|---|---|---|---|---|---|---|
| 1996 MTCA Method A, AI, or B Soil Cleanup Level | | 1.67 (B) | 5,600 (B) | 80 (B) | 100 (A)<br>500 (AI) | 250 (A)<br>1,000 (AI) | 400 (B) | 400 (B) | 48,000 (B) |
| 1996 MTCA Method B 100x GW Soil Cleanup Level | | 0.00583 | 112 | 1.6 | 1,600 ($Cr^{+3}$) | NE | 8.0 | 8.0 | 960 |
| 2001 MTCA Method A, AI, or B Soil Cleanup Level | | 20 (A)<br>0.667 (B) | 5,600 (B)<br>16,000 (B*) | 2 (A)<br>80 (B) | 2,000($Cr^{+3}$) / 19 ($Cr^{+6}$) (A)<br>120,000($Cr^{+3}$) / 240 ($Cr^{+6}$) (B) | 250 (A)<br>1,000 (AI) | 400 (B) | 400 (B) | 48,000 (B) |
| MTCA Method A or B Protection of Groundwater | | 20 (A)<br>0.03 (B) | 2,637 (B) | 2 (A)<br>1.1 (B) | 2,000 (Cr+3) / 19 (Cr+6) (A)<br>480,096 (Cr+3) / 18 (Cr+6) (B) | 250 (A) | 8.3 (B) | 13.6 (B) | 38.4 (B) |
| WA Department of Ecology - Puget Sound Background Concentration | | 7.30 | NE | 0.8 | 48.2 | 24.0 | NE | NE | NE |
| ESB1271-12 1/2' | 06/30/98 | **2.8 J** | 57.3 | 0.2 U | **39.4** | 5 | 0.1 U | 0.3 U | 26.0 |
| ESB1271-15' | 06/30/98 | **3.1 J** | 82.8 | 0.2 U | **43.5** | 6 | 0.1 U | 0.3 U | 39.6 |
| ESB1271-20' | 06/30/98 | **2.7 J** | 62.0 | 0.2 U | **37.2** | 5 | 0.1 U | 0.3 U | 32.7 |
| ESB1277-10' | 07/02/98 | **3.2** | 50.9 | 0.2 U | **35.2** | 5 | 0.1 U | 0.3 U | 28.6 |
| ESB1277-12 1/2' | 07/02/98 | **2.1** | 49.7 | 0.2 U | **33.1** | 5 | 0.1 | 0.3 U | 33.2 |
| ESB1277-15' | 07/02/98 | **1.5** | 50.5 | 0.2 U | **31.9** | 4 | 0.1 U | 0.3 U | 33.4 |
| ESB1278-10' | 07/02/98 | **1.7** | 56.3 | 0.2 U | **34.3** | 4 | 0.1 U | 0.3 U | 35.1 |
| ESB1278-12 1/2' | 07/02/98 | **2.7** | 55.8 | 0.2 U | **35.9** | 5 | 0.1 U | 0.3 U | 37.6 |
| ESB1278-20' | 07/02/98 | **1.5** | 38.1 | 0.2 U | **28.2** | 4 | 0.1 U | 0.3 U | 32.6 |
| ESB1281-15' | 07/07/98 | **2.2** | 73.8 | 0.2 U | **42.0 J** | 6 | 0.2 U | 0.3 U | 36.9 |
| ESB1281-20' | 07/07/98 | **2.3** | 63.0 | 0.2 U | **36.0 J** | 5 | 0.1 U | 0.3 U | 40.7 |
| ESB1281-25' | 07/07/98 | **2.1** | 62.1 | 0.2 U | **66.6 J** | 5 | 0.1 U | 0.3 U | 33.6 |
| ESB1282-7 1/2' | 07/10/98 | **1.7** | 46.9 | 0.2 U | **37.9 J** | 5 | 0.1 U | 0.3 U | 25.7 |
| ESB1282-12 1/2' | 07/10/98 | **2.0** | 45.6 | 0.2 | **42.8 J** | 7 | 0.1 U | 0.3 U | 26.1 |
| ESB1282-20' | 07/10/98 | **1.7** | 52.8 | 0.2 U | **36 J** | 6 | 0.1 U | 0.3 U | 31.9 |
| ESB1283-7 1/2' | 07/10/98 | **1.8** | 52.6 | 0.2 U | **45.7 J** | 7 | 0.1 U | 0.3 U | 24.7 |
| ESB1283-10' | 07/10/98 | **2.3** | 69.5 | 0.2 U | **33.3 J** | 6 | 0.1 U | 0.3 U | 39 |
| ESB1283-20' | 07/10/98 | **0.9** | 52.6 | 0.2 U | **34.4 J** | 4 | 0.1 U | 0.3 U | 31.4 |
| ESB1284-2 1/2' | 07/14/98 | **2.8** | 47.9 | 0.4 | **38.9 J** | 8 | 0.1 U | 0.3 U | 25.4 J |
| ESB1284-5' | 07/14/98 | **2.8** | 49.6 | 0.2 U | **32.9 J** | 5 | 0.1 | 1.0 | 24.2 J |
| ESB1305-10' | 08/16/98 | **7.5** | 60.7 J | 0.2 U | **43.9** | 6 | 0.2 U | 0.3 U | 40.5 |
| ESB1305-12 1/2' | 08/16/98 | **1.3** | 53.2 J | 0.2 U | **46.5** | 4 | 0.2 U | 0.3 U | 30.7 |
| ESB1305-20' | 08/16/98 | **2.5** | 47.4 J | 0.2 U | **40.5** | 3 | 0.2 U | 0.3 U | 26.9 |
| ESB1306-10' | 08/16/98 | **5.1** | 78.3 J | 0.2 U | **39.4** | 6 | 0.2 U | 0.3 U | 29.8 |
| ESB1306-12 1/2' | 08/16/98 | **2.9** | 48.4 J | 0.2 U | **40.1** | 3 | 0.2 U | 0.3 U | 28.9 |
| ESB1306-20' | 08/16/98 | **1.2** | 127 J | 0.2 U | **32.4** | 3 | 0.2 U | 0.3 U | 27.6 |

**Notes:**
MTCA - Model Toxics Control Act
(A) - MTCA Method A soil cleanup level for unrestricted land use
(AI) - MTCA Method A soil cleanup level for industrial property
(B) - MTCA Method B soil cleanup level
(B*) Revised 2001 MTCA Method B value from Ecology website CLARC tables downloaded June 2010 (https://fortress.wa.gov/ecy/clarc/reporting/CLARCReporting.aspx).
1996 - Indicates MTCA soil cleanup levels, published 1996.
2001 - Indicates MTCA version 3.1 soil cleanup levels, published 2001.
J - Estimated value
NE - Not established
U - Compound was analyzed for but not detected above the reporting limit shown.
Samples were analyzed for mercury, but it was not detected in any of the samples.
Numbers in **bold** font indicate that the result reported exceeds the most current MTCA cleanup level as of June 2010.
Numbers in grey shading indicate results that exceed a MTCA protection of groundwater level, but do not exceed the current lowest MTCA soil cleanup level protective of direct contact.

**Table 3-25**
**Summary of Soil Sample Analytical Results for Volatile Organic Compounds, (ug/kg)**
**Building 40-51, East Traveling Paint Booth Sump (EV-114)**
**Boeing Everett Plant Remedial Investigation**

| Sample ID | Sample Date | Acetone | Trichloroethene |
|---|---|---|---|
| 1996 MTCA Method B Soil Cleanup Level | | 8,000,000 | 90,900 |
| 1996 MTCA Method B 100x GW Soil Cleanup Level | | 80,000 | 398 |
| 2001 MTCA Method A or B Soil Cleanup Level | | 8,000,000 (B) | 30 (A)<br>90,900 (B)<br>11,000 (B*) |
| MTCA Method A or B Protection of Groundwater | | 3,211 (B) | 30 (A)<br>3.2 (B) |
| ESB1272-5 1/2' | 06/30/98 | 6.2 U* | 1.1 U |
| ESB1272-7 1/2' | 06/30/98 | 5.2 U | 1.0 U |
| ESB1272-10' | 06/30/98 | 16 U* | 1.1 U |
| ESB1273-5 1/2' | 06/30/98 | 14 U* | 2.0 J |
| ESB1273-7 1/2' | 06/30/98 | 13 U* | 2.9 J |

**Notes:**
MTCA - Model Toxics Control Act
(A) - MTCA Method A soil cleanup level for unrestricted land use
(B) - MTCA Method B soil cleanup level
(B*) Revised 2001 MTCA Method B value from Ecology website CLARC tables
downloaded June 2010 (https://fortress.wa.gov/ecy/clarc/reporting/CLARCReporting.aspx).
1996 - Indicates MTCA soil cleanup levels, published 1996.
2001 - Indicates MTCA version 3.1 soil cleanup levels, published 2001.
J - Estimated value
U - Compound was analyzed for but not detected above the reporting limit shown.
* Value was qualified as not detected due to method blank or rinsate blank results.

**Table 3-26**
**Summary of Soil Sample Analytical Results for TPH, Non-halogenated SVOCs and Phenol**
**Building 40-51, East Traveling Paint Booth Sump (EV-114)**
**Boeing Everett Plant Remedial Investigation**

| Sample ID | Sample Date | Total Petroleum Hydrocarbons (mg/kg) | | Non-halogenated SVOCs | Phenol (ug/kg) |
|---|---|---|---|---|---|
| | | Diesel-Range Hydrocarbons | Gasoline-Range Hydrocarbons | | |
| 1996 MTCA Method B Soil Cleanup Level | | 200 (A) | 100 (A) | - | 48,000,000 (B) |
| 1996 MTCA Method B 100x GW Soil Cleanup Level | | NE | NE | - | 960,000 |
| 2001 MTCA Method A or B Soil Cleanup Level | | 2,000 (A) | 30 / 100* (A) | - | 48,000,000 (B) |
| MTCA Method A or B Protection of Groundwater | | NC | 30 / 100* (A) | - | 21,965 (B) |
| ESB1272-5 1/2' | 06/30/98 | 5.3 U | 5.4 U | ND | 140 U |
| ESB1272-7 1/2' | 06/30/98 | 5.6 U | 5.3 U | ND | 150 U |
| ESB1272-10' | 06/30/98 | 5.7 U | 5.3 U | ND | 150 U |
| ESB1273-5 1/2' | 06/30/98 | 5.5 U | 5.4 U | ND | 150 U |
| ESB1273-7 1/2' | 06/30/98 | 6.1 U | 5.6 U | ND | 160 U |

**Notes:**
MTCA - Model Toxics Control Act
(A) - MTCA Method A soil cleanup level for unrestricted land use
(B) - MTCA Method B soil cleanup level
1996 - Indicates MTCA soil cleanup levels, published 1996.
2001 - Indicates MTCA version 3.1 soil cleanup levels, published 2001.
J - Estimated value
NC - Not calculated
ND - Not detected
NE - Not established
U - Compound was analyzed for but not detected above the reporting limit shown.
*gasoline mixtures with benzene/gasoline mixtures without benzene

**Table 3-27**
**Summary of Soil Sample Analytical Results for Metals, (mg/kg)**
**Building 40-51, East Traveling Paint Booth Sump (EV-114)**
**Boeing Everett Plant Remedial Investigation**

| Sample ID | Sample Date | Arsenic | Barium | Chromium | Lead | Strontium |
|---|---|---|---|---|---|---|
| 1996 MTCA Method A, AI, or B Soil Cleanup Level | | 1.67 (B) | 5,600 (B) | 100 (A)<br>500 (AI) | 250 (A)<br>1,000 (AI) | 48,000 (B) |
| 1996 MTCA Method B 100x GW Soil Cleanup Level | | 0.00583 | 112 | 1,600 ($Cr^{+3}$) | NE | 960 |
| 2001 MTCA Method A, AI, or B Soil Cleanup Level | | 20 (A)<br>0.667 (B) | 5,600 (B)<br>16,000 (B*) | 2,000($Cr^{+3}$) / 19 ($Cr^{+6}$) (A)<br>120,000($Cr^{+3}$) / 240 ($Cr^{+6}$) (B) | 250 (A)<br>1,000 (AI) | 48,000 (B) |
| MTCA Method A or B Protection of Groundwater | | 20 (A)<br>0.03 (B) | 2,637 (B) | 2,000 (Cr+3) / 19 (Cr+6) (A)<br>480,096 (Cr+3) / 18 (Cr+6) (B) | 250 (A) | 38.4 (B) |
| WA Department of Ecology - Puget Sound Regional Background Concentration | | 7.30 | NE | 48.2 | 24.0 | NE |
| ESB1272-5 1/2' | 06/30/98 | **2.4 J** | 60.5 | **38.5** | 7 | 41.7 |
| ESB1272-7 1/2' | 06/30/98 | **2.2 J** | 59.0 | **38.3** | 6 | 27.5 |
| ESB1272-10' | 06/30/98 | **2.8 J** | 62.0 | **38.0** | 5 | 34.3 |
| ESB1273-5 1/2' | 06/30/98 | **2.8 J** | 66.2 | **45.6** | 5 | 37.7 |
| ESB1273-7 1/2' | 06/30/98 | **2.9 J** | 70.2 | **42.2** | 6 | 37.7 |

**Notes:**
MTCA - Model Toxics Control Act. Method A, AI, and B values shown are reported with the same concentration units as the sample results.
(A) - MTCA Method A soil cleanup level for unrestricted land use
(AI) - MTCA Method A soil cleanup level for industrial property
(B) - MTCA Method B soil cleanup level
(B*) Revised 2001 MTCA Method B value from Ecology website CLARC tables downloaded June 2010 (https://fortress.wa.gov/ecy/clarc/reporting/CLARCReporting.aspx).
1996 - Indicates MTCA soil cleanup levels, published 1996.
2001 - Indicates MTCA version 3.1 soil cleanup levels, published 2001.
J - Estimated value
NE - Not established
U - Compound was analyzed for but not detected above the reporting limit shown.
Samples were analyzed for cadmium, mercury, selenium, and silver but these were not detected in any of the samples.
Numbers in **bold** font indicate that the result reported exceeds the most current MTCA cleanup level as of June 2010.
Numbers in grey shading indicate results that exceed a MTCA protection of groundwater level, but do not exceed the current lowest MTCA soil cleanup level protective of direct contact.

**Table 3-28**
**Summary of Groundwater Analytical Results for Volatile Organic Compounds, (mg/L)**
**Building 40-51, Former UST EV-11 Area Probe Borings**
**Boeing Everett Plant Remedial Investigation**

| Sample ID | Sample Date | Acetone | cis-1,2-Dichloroethene | Trichloroethene | Vinyl Chloride |
|---|---|---|---|---|---|
| 1996 MTCA Method A or B Groundwater Cleanup Level | | 0.8 (B) | 0.080 (B) | 0.005 (A)<br>0.00398 (B) | 0.0002 (A)<br>0.000023 (B) |
| 2001 MTCA Method A or B Groundwater Cleanup Level | | 0.8 (B) | 0.08 (B) | 0.005 (A)<br>0.00398 (B)<br>0.00049 (B*) | 0.0002 (A)<br>0.0000292 (B) |
| **ESB1320-4'** | 08/07/98 | 0.005 U | 0.0076 | **0.006** | **0.0043** |
| **ESB1320-4'** | 8/7/98 (DUP) | 0.005 U | 0.0067 | **0.0051** | **0.0035** |
| **ESB1321-4'** | 08/07/98 | 0.024 | 0.005 | **0.0039** | **0.0011** |
| **ESB1322-4 1/2'** | 08/07/98 | 0.005 | 0.0012 | **0.0046** | **0.00032** |
| **ESB1372-W** | 04/04/00 | 0.005 U | 0.001 U | 0.001 U | 0.00002 U |
| | 04/04/00 ** | NA | 0.001 U | 0.001 U | 0.005 U |
| **ESB1373-W** | 04/04/00 | 0.0058 | 0.001 U | 0.001 U | 0.00002 U |
| | 04/04/00 ** | NA | 0.001 U | 0.001 U | 0.005 U |

**Notes:**
MTCA - Model Toxics Control Act
(A) MTCA Method A groundwater cleanup level
(B) MTCA Method B groundwater cleanup level
(B*) Revised 2001 MTCA Method B value from Ecology website CLARC tables downloaded June 2010 (https://fortress.wa.gov/ecy/clarc/reporting/CLARCReporting.aspx).
1996 - Indicates MTCA groundwater cleanup levels, published 1996.
2001 - Indicates MTCA version 3.1 groundwater cleanup levels, published 2001.
(DUP) - Field duplicate
U - Compound was analyzed for but not detected above the reporting limit shown.
Numbers in **bold** font indicate that the result reported exceeds the most current MTCA cleanup level as of June 2010.
** Probe samples analyzed by TEG mobile laboratory using EPA Method 8021B.

**Table 3-29**
**Summary of Groundwater Analytical Results for Volatile Organic Compounds, (mg/L)**
**Building 40-51, Former UST EV-11 Monitoring Wells**
**Boeing Everett Plant**

| Well ID | Sample Date | Chloromethane | Vinyl Chloride | Acetone | 1,1-DCE | cis-1,2-Dichloroethene | Chloroform | 2-Butanone | Trichloroethene | Tetrachloroethene | Toluene | Ethylbenzene | 1,1,2-Trichloro-1,2,2-trifluoroethane | Total Xylenes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MTCA Method A or B Groundwater Screening Level | | 0.00337 (B) | 0.0002 (A) 0.0000292 (B) | 0.8 (B) | 0.4 (B) | 0.08 (B) | 0.00717 (B) | 4.8 (B) | 0.005 (A) 0.00049 (B) | 0.005 (A) 0.000081 (B) | 1 (A) 0.64 (B) | 0.7 (A) 0.8 (B) | 240 (B) | 1 (A) 1.6 (B) |
| **EGW030** | 01/26/95 | NA | 0.002 U | NA | NA | 0.001 U | NA | NA | **0.0046** | NA | NA | NA | NA | NA |
| | 05/02/95 | NA | 0.002 U | NA | NA | 0.0012 | NA | NA | **0.0051** | NA | NA | NA | NA | NA |
| | 08/02/95 | NA | 0.002 U | NA | NA | 0.0015 | NA | NA | **0.0074** | NA | NA | NA | NA | NA |
| | 11/08/95 | NA | 0.002 U | NA | NA | 0.0016 | NA | NA | **0.0069** | NA | NA | NA | NA | NA |
| | 02/27/96 | NA | 0.002 U | NA | NA | 0.001 U | NA | NA | **0.0045** | NA | NA | NA | NA | NA |
| | 05/29/96 | NA | 0.002 U | NA | NA | 0.001 | NA | NA | **0.0065** | NA | NA | NA | NA | NA |
| | 08/21/96 | NA | **0.0021** | NA | NA | **11** | NA | NA | **0.0081** | NA | NA | NA | NA | NA |
| | 08/21/96 (DUP) | NA | **0.0021** | NA | NA | 0.0016 | NA | NA | **0.0082** | NA | NA | NA | NA | NA |
| | 11/25/96 | NA | 0.002 U | NA | NA | 0.001 U | NA | NA | **0.0058** | NA | NA | NA | NA | NA |
| | 03/05/97 | NA | 0.002 U | NA | NA | 0.001 U | NA | NA | **0.0042** | NA | NA | NA | NA | NA |
| | 03/05/97 (DUP) | NA | 0.002 U | NA | NA | 0.001 U | NA | NA | **0.0041** | NA | NA | NA | NA | NA |
| | 05/28/97 | NA | **0.0016** | NA | NA | 0.0012 | NA | NA | **0.0058** | NA | NA | NA | NA | NA |
| | 08/14/97 | NA | **0.0013** | NA | NA | 0.0015 | NA | NA | **0.0077** | NA | NA | NA | NA | NA |
| | 11/18/97 | NA | **0.0015** | NA | NA | 0.0016 | NA | NA | **0.0091** | NA | NA | NA | NA | NA |
| | 03/11/98 | 0.001 U | **0.00033** | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | **0.0043** | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.002 U |
| | 05/13/98 | 0.002 U | **0.0013** | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | **0.0062** | 0.001 U | 0.001 U | 0.001 U | 0.002 U | 0.0012 |
| | 08/12/98 | 0.002 U | 0.002 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | **0.0060** | 0.001 U | 0.001 U | 0.001 U | 0.002 U | 0.001 U |
| | 11/10/98 | 0.002 U | **0.0031** | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | **0.0065** | 0.001 U | 0.001 U | 0.001 U | 0.002 U | 0.001 U |
| | 02/03/99 | 0.002 U | **0.00023** | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | **0.0037 J** | 0.001 U | 0.001 U | 0.001 U | 0.002 U | 0.001 U |
| | 02/03/99 (DUP) | 0.002 U | **0.00039** | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | **0.0032 J** | 0.001 U | 0.001 U | 0.001 U | 0.002 U | 0.001 U |
| | 05/12/99 | 0.001 U | **0.00037** | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | **0.0043** | 0.001 U | 0.001 U | 0.001 U | 0.002 U | 0.001 U |
| | 05/12/99 (DUP) | 0.001 U | **0.00047** | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | **0.0014** | 0.001 U | 0.001 U | 0.001 U | 0.002 U | 0.001 U |
| | 08/04/99 | 0.001 U | **0.00039** | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | **0.0054** | 0.001 U | 0.001 U | 0.001 U | 0.002 U | 0.001 U |
| | 11/10/99 | 0.001 U | **0.00031 J** | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | **0.0045** | 0.001 U | 0.001 U | 0.001 U | 0.002 U | 0.001 U |
| | 02/01/00 | 0.001 U | **0.00041** | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | **0.0043** | 0.001 U | 0.001 U | 0.001 U | 0.002 U | 0.001 U |
| | 05/03/00 | 0.001 U | **0.00073** | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | **0.0036** | 0.001 U | 0.001 U | 0.001 U | 0.002 U | 0.001 U |
| | 08/01/00 | 0.001 U | **0.00049** | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | **0.0043** | 0.001 U | 0.001 U | 0.001 U | 0.002 U | 0.001 U |
| | 11/15/00 | 0.001 U | **0.00055** | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | **0.0044** | 0.001 U | 0.001 U | 0.001 U | 0.002 U | 0.001 U |
| | 02/06/01 | 0.001 U | **0.00037** | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | **0.0038** | 0.001 U | 0.001 U | 0.001 U | 0.002 U | 0.001 U |
| | 05/3/01[A] | 0.001 U | **0.00073** | 0.0077 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | **0.0040** | 0.001 U | 0.001 U | 0.001 U | 0.002 U | 0.001 U |
| | 08/09/01 | 0.001 U | **0.00044 J** | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | **0.0045** | 0.001 U | 0.001 U | 0.001 U | 0.002 U | 0.001 U |
| | 11/13/01 | 0.001 U | **0.00024 J** | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | **0.0041** | 0.001 U | 0.001 U | 0.001 U | 0.002 U | 0.001 U |
| | 02/06/02 | 0.0002 U | **0.00028 J** | 0.001 U | 0.000028 | 0.0004 | 0.0002 U | 0.001 U | **0.0034** | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U |
| | 05/07/02 | 0.0002 U | **0.00033** | 0.001 U | 0.000035 | 0.0004 | 0.0002 U | 0.001 U | **0.0029** | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U |
| | 08/07/02 | 0.0002 U | **0.0006** | 0.001 U | 0.0002 U | 0.0006 | 0.0002 U | 0.001 U | **0.0047** | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U |
| | 11/15/02 | 0.0002 U | **0.00034** | 0.001 U | 0.000046 | 0.0004 | 0.0002 U | 0.001 U | **0.0041** | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U |
| | 02/05/03 | 0.0002 U | **0.00057 J** | 0.001 U | 0.000044 J | 0.0004 | 0.0002 U | 0.001 U | **0.0033** | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U |
| | 05/07/03 | 0.0002 U | **0.00046** | 0.0014 U | 0.000051 | 0.0004 | 0.0002 U | 0.001 U | **0.0036** | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U |
| | 07/23/03 | 0.0002 U | **0.00099** | 0.001 U | 0.000081 | 0.0006 | 0.0002 U | 0.001 U | **0.0045** | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U |
| | 11/05/03 | 0.0002 U | **0.00041** | 0.001 U | 0.000042 | 0.0004 | 0.0002 U | 0.001 U | **0.0046** | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U |
| | 01/19/04 | 0.0002 U | **0.00036** | 0.001 U | 0.000033 | 0.0003 | 0.0002 U | 0.001 U | **0.0037** | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U |
| | 04/18/04 | 0.0002 U | **0.00045** | 0.001 U | 0.000044 | 0.0005 | 0.0002 U | 0.0012 J | **0.0036** | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U |
| | 07/14/04 | 0.0002 U | **0.00074** | 0.0012 J | 0.000078 | 0.0007 | 0.0002 U | 0.001 U | **0.0053** | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U |
| | 7/14/04 (DUP) | 0.0002 U | **0.00062** | 0.001 U | 0.000062 | 0.0006 | 0.0002 U | 0.001 U | **0.0051** | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U |
| | 10/06/04 | 0.0002 U | **0.00068** | 0.001 U | 0.000050 | 0.0006 | 0.0002 U | 0.001 U | **0.0052** | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U |
| | 01/13/05 | 0.0002 U | **0.00028** | 0.001 U | 0.00002 U | 0.0002 | 0.0002 U | 0.001 U | **0.0035** | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U |
| | 04/09/05 | 0.0002 U | **0.000094** | 0.001 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.001 U | **0.0033** | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U |
| | 10/18/05 | 0.0002 U | **0.00018** | 0.001 U | 0.000024 | 0.0003 | 0.0002 U | 0.001 U | **0.0055** | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0009 |
| | 04/18/06 | 0.0002 U | **0.00019** | 0.001 U | 0.000028 | 0.0004 | 0.0002 U | 0.001 U | **0.0036** | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U |
| | 10/18/06 | 0.0002 U | **0.00035 J** | 0.003 U | 0.000058 | 0.0005 | 0.0002 U | 0.001 U | **0.0047** | 0.00002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U |
| | 10/18/06 (DUP) | 0.0002 U | **0.00020 J** | 0.003 U | 0.000045 | 0.0006 | 0.0002 U | 0.001 U | **0.0048** | 0.00002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U |
| | 04/04/07 | 0.0002 U | **0.00074** | 0.003 U | 0.000058 | 0.0005 | 0.0002 U | 0.001 U | **0.0034** | 0.00002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U |
| | 10/26/07 | 0.0002 U | **0.00071** | 0.003 U | 0.000046 | 0.0004 | 0.0002 U | 0.001 U | **0.0045** | 0.00002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U |
| | 10/26/07 (DUP) | 0.0002 U | **0.00066** | 0.003 U | 0.000052 | 0.0005 | 0.0002 U | 0.001 U | **0.0043** | 0.00002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U |
| | 04/03/08 | 0.0002 U | **0.0010** | 0.003 U | 0.000054 | 0.0005 | 0.0002 U | 0.0025 U | **0.0032** | 0.00002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U |
| | 10/08/08 | 0.0002 U | **0.00040** | 0.003 U | 0.000040 | 0.0005 | 0.0002 U | 0.0025 U | **0.0041** | 0.00002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U |
| | 04/07/09 | 0.0002 U | **0.00010** | 0.0025 U | 0.000021 | 0.0002 | 0.0002 U | 0.0025 U | **0.0027** | 0.00002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U |
| | 10/28/09 | 0.0005 U | 0.000029 | 0.0093 | 0.00002 U | 0.0004 | 0.0004 | 0.005 U | **0.0050** | 0.00002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U |
| | 04/07/10 | 0.0005 UJ | **0.00018 J** | 0.005 UJ | 0.000034 | 0.0002 | 0.0002 U | 0.005 U | **0.0027** | 0.00002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U |

**Table 3-29**
**Summary of Groundwater Analytical Results for Volatile Organic Compounds, (mg/L)**
**Building 40-51, Former UST EV-11 Monitoring Wells**
**Boeing Everett Plant**

| Well ID | Sample Date | Chloromethane | Vinyl Chloride | Acetone | 1,1-DCE | cis-1,2-Dichloroethene | Chloroform | 2-Butanone | Trichloroethene | Tetrachloroethene | Toluene | Ethylbenzene | 1,1,2-Trichloro-1,2,2-trifluoroethane | Total Xylenes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MTCA Method A or B Groundwater Screening Level | | 0.00337 (B) | 0.0002 (A) 0.0000292 (B) | 0.8 (B) | 0.4 (B) | 0.08 (B) | 0.00717 (B) | 4.8 (B) | 0.005 (A) 0.00049 (B) | 0.005 (A) 0.000081 (B) | 1 (A) 0.64 (B) | 0.7 (A) 0.8 (B) | 240 (B) | 1 (A) 1.6 (B) |
| **EGW031** | 01/26/95 | NA | 0.002 U | NA | NA | 0.014 | NA | NA | **0.022** | NA | NA | NA | NA | NA |
| | 01/26/95 (DUP) | NA | 0.002 U | NA | NA | 0.012 | NA | NA | **0.023** | NA | NA | NA | NA | NA |
| | 05/02/95 | NA | 0.002 U | NA | NA | 0.011 | NA | NA | **0.019** | NA | NA | NA | NA | NA |
| | 08/02/95 | NA | 0.002 U | NA | NA | 0.015 | NA | NA | **0.020** | NA | NA | NA | NA | NA |
| | 11/08/95 | NA | 0.002 U | NA | NA | 0.014 | NA | NA | **0.017** | NA | NA | NA | NA | NA |
| | 02/27/96 | NA | **0.0027** | NA | NA | 0.0086 | NA | NA | **0.010** | NA | NA | NA | NA | NA |
| | 05/29/96 | NA | 0.002 U | NA | NA | 0.013 | NA | NA | **0.012** | NA | NA | NA | NA | NA |
| | 08/21/96 | NA | **0.0025** | NA | NA | 0.018 | NA | NA | **0.018** | NA | NA | NA | NA | NA |
| | 11/25/96 | NA | 0.002 U | NA | NA | 0.012 | NA | NA | **0.010** | NA | NA | NA | NA | NA |
| | 03/05/97 | NA | 0.002 U | NA | NA | 0.011 | NA | NA | **0.0095** | NA | NA | NA | NA | NA |
| | 05/28/97 | NA | **0.0014** | NA | NA | 0.015 | NA | NA | **0.016** | NA | NA | NA | NA | NA |
| | 08/14/97 | NA | **0.0012 J** | NA | NA | 0.023 | NA | NA | **0.021** | NA | NA | NA | NA | NA |
| | 11/18/97 | NA | **0.0041** | NA | NA | 0.023 | NA | NA | **0.019** | NA | NA | NA | NA | NA |
| | 03/11/98 | 0.001 U | **0.0014** | 0.005 U | 0.001 U | 0.015 | 0.001 U | 0.005 U | **0.013** | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.002 U |
| | 05/13/98 | 0.002 U | **0.0028** | 0.005 U | 0.001 U | 0.016 | 0.001 U | 0.005 U | **0.011** | 0.001 U | 0.001 U | 0.001 U | 0.002 U | 0.0013 |
| | 05/13/98 (DUP) | 0.002 U | **0.0028** | 0.005 U | 0.001 U | 0.016 | 0.001 U | 0.005 U | **0.011** | 0.001 U | 0.001 U | 0.001 U | 0.002 U | 0.001 |
| | 08/12/98 | 0.002 U | **0.0026** | 0.005 U | 0.001 U | 0.021 | 0.001 U | 0.005 U | **0.013** | 0.001 U | 0.001 U | 0.001 U | 0.002 U | 0.001 U |
| | 11/10/98 | 0.002 U | **0.00033** | 0.005 U | 0.001 U | 0.021 | 0.001 U | 0.005 U | **0.014** | 0.001 U | 0.001 U | 0.001 U | 0.002 U | 0.001 U |
| | 02/03/99 | 0.002 U | **0.0037 J** | 0.005 U | 0.001 U | 0.011 | 0.001 U | 0.005 U | **0.0085** | 0.001 U | 0.001 U | 0.001 U | 0.002 U | 0.001 U |
| | 05/12/99 | 0.001 U | **0.0017** | 0.005 U | 0.001 U | 0.010 | 0.001 U | 0.005 U | **0.0085** | 0.001 U | 0.001 U | 0.001 U | 0.002 U | 0.001 U |
| | 08/04/99 | 0.001 U | **0.0024** | 0.005 U | 0.001 U | 0.016 | 0.001 U | 0.005 U | **0.014** | 0.001 U | 0.001 U | 0.001 U | 0.002 U | 0.001 U |
| | 08/04/99 (DUP) | 0.001 U | **0.0022** | 0.005 U | 0.001 U | 0.016 | 0.001 U | 0.005 U | **0.013** | 0.001 U | 0.001 U | 0.001 U | 0.002 U | 0.001 U |
| | 11/10/99 | 0.001 U | **0.00069** | 0.005 U | 0.001 U | 0.014 | 0.001 U | 0.005 U | **0.010** | 0.001 U | 0.001 U | 0.001 U | 0.002 U | 0.001 U |
| | 02/01/00 | 0.001 U | **0.002** | 0.005 U | 0.001 U | 0.013 | 0.001 U | 0.005 U | **0.0086** | 0.001 U | 0.001 U | 0.001 U | 0.002 U | 0.0016 |
| | 05/03/00 | 0.001 U | **0.0014** | 0.005 U | 0.001 U | 0.0075 | 0.001 U | 0.005 U | **0.0077** | 0.001 U | 0.001 U | 0.001 U | 0.002 U | 0.001 U |
| | 08/01/00 | 0.001 U | **0.0017** | 0.005 U | 0.001 U | 0.0110 | 0.001 U | 0.005 U | **0.0086** | 0.001 U | 0.001 U | 0.001 U | 0.002 U | 0.001 U |
| | 11/15/00 | 0.001 U | **0.0023** | 0.005 U | 0.001 U | 0.0180 | 0.001 U | 0.005 U | **0.0090** | 0.001 U | 0.001 U | 0.001 U | 0.002 U | 0.001 U |
| | 02/06/01 | 0.001 U | **0.0015** | 0.005 U | 0.001 U | 0.013 | 0.001 U | 0.005 U | **0.0089** | 0.001 U | 0.001 U | 0.001 U | 0.002 U | 0.001 U |
| | 05/3/01[A] | 0.001 U | **0.0013** | 0.007 U | 0.001 U | 0.0068 | 0.001 U | 0.005 U | **0.0092** | 0.001 U | 0.001 U | 0.001 U | 0.002 U | 0.001 U |
| | 08/09/01 | 0.001 U | **0.0022** | 0.0052 [B] | 0.001 U | 0.012 | 0.001 U | 0.005 U | **0.011** | 0.001 U | 0.001 U | 0.001 U | 0.002 U | 0.001 U |
| | 11/13/01 | 0.001 U | **0.00032** | 0.005 U | 0.001 U | 0.01 | 0.001 U | 0.005 U | **0.0089** | 0.001 U | 0.001 U | 0.001 U | 0.002 U | 0.001 U |
| | 02/06/02 | 0.0002 U | **0.0015** | 0.001 U | 0.000089 | 0.010 | 0.0002 U | 0.001 U | **0.011** | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U |
| | 05/07/02 | 0.0002 U | **0.00075** | 0.001 U | 0.000032 | 0.00053 | 0.0002 U | 0.001 U | **0.0089** | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U |
| | 08/07/02 | 0.0002 U | **0.0018** | 0.001 U | 0.0002 U | 0.0085 | 0.0002 U | 0.001 U | **0.011** | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U |
| | 11/15/02 | 0.0002 U | **0.0013** | 0.001 U | 0.00014 | 0.014 | 0.0002 U | 0.001 U | **0.0078** | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U |
| | 02/05/03 | 0.0002 U | **0.0018 J** | 0.001 U | 0.00012 J | 0.012 | 0.0002 U | 0.001 U | **0.0069** | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U |
| | 05/07/03 | 0.0002 U | **0.00085** | 0.001 U | 0.000071 | 0.0073 | 0.0002 U | 0.001 U | **0.0072** | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U |
| | 07/23/03 | 0.0002 U | **0.0014** | 0.001 U | 0.000083 | 0.0073 | 0.0002 U | 0.001 U | **0.0063** | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U |
| | 11/05/03 | 0.0002 U | **0.0019** | 0.001 U | 0.00010 | 0.012 | 0.0002 U | 0.001 U | **0.0060** | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U |
| | 01/19/04 | 0.0002 U | **0.00057** | 0.001 U | 0.000067 | 0.0073 | 0.0002 U | 0.001 U | **0.0055** | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U |
| | 04/18/04 | 0.0002 U | **0.0014** | 0.001 U | 0.000082 | 0.0074 | 0.0002 U | 0.001 U | **0.0069** | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U |
| | 4/18/04 (DUP) | 0.0002 U | **0.0015** | 0.001 U | 0.000084 | 0.0073 | 0.0002 U | 0.001 U | **0.0069** | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U |
| | 07/14/04 | 0.0002 U | **0.0021** | 0.001 U | 0.00013 | 0.0130 | 0.0002 U | 0.001 U | **0.0074** | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U |
| | 10/06/04 | 0.0002 U | **0.0016** | 0.0011 | 0.00007 | 0.0081 | 0.0002 U | 0.001 U | **0.0052** | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U |
| | 01/13/05 | 0.0002 U | **0.00094** | 0.001 U | 0.000074 | 0.0110 | 0.0002 U | 0.001 U | **0.0050** | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U |
| | 04/09/05 | 0.0002 U | **0.00089** | 0.001 U | 0.000049 | 0.0051 | 0.0002 U | 0.001 U | **0.0052** | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U |
| | 10/18/05 | 0.0002 U | **0.0040** | 0.001 U | 0.00017 | 0.0120 | 0.0002 U | 0.001 U | **0.0037** | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U |
| | 04/18/06 | 0.0002 U | **0.0014** | 0.001 U | 0.000099 | 0.0079 | 0.0002 U | 0.001 U | **0.0021** | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U |
| | 10/18/06 | 0.0002 U | **0.00061** | 0.003 U | 0.000072 | 0.0077 | 0.0002 U | 0.001 U | **0.0016** | 0.00002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U |
| | 04/04/07 | 0.0002 U | **0.0012** | 0.003 U | 0.00011 | 0.0079 | 0.0002 U | 0.001 U | **0.0023** | 0.00002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0006 |
| | 10/26/07 | 0.0002 U | **0.0012** | 0.003 U | 0.000091 | 0.0075 | 0.0002 U | 0.001 U | **0.0016** | 0.00002 U | 0.0002 U | 0.0003 | 0.0002 U | 0.0004 |
| | 04/03/08 | 0.0002 U | **0.00089** | 0.003 U | 0.000077 | 0.0056 | 0.0002 U | 0.0025 U | **0.0015** | 0.00002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U |
| | 10/08/08 | 0.0002 U | **0.0021 J** | 0.003 U | 0.00015 J | 0.010 | 0.0002 U | 0.0025 U | **0.00083 J** | 0.00002 UJ | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U |
| | 04/07/09 | 0.0002 U | **0.00083** | 0.0025 U | 0.000039 | 0.0025 | 0.0002 U | 0.0025 U | **0.0011** | 0.00002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U |
| | 10/28/09 | 0.0005 U | **0.0010** | 0.0064 | 0.000094 | 0.0078 | 0.0002 U | 0.005 U | **0.0008** | 0.00002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U |
| | 04/07/10 | 0.0005 UJ | **0.0005** | 0.005 UJ | 0.000058 | 0.0029 | 0.0002 U | 0.005 U | **0.00058** | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U |

**Table 3-29**
**Summary of Groundwater Analytical Results for Volatile Organic Compounds, (mg/L)**
**Building 40-51, Former UST EV-11 Monitoring Wells**
**Boeing Everett Plant**

| Well ID | Sample Date | Chloromethane | Vinyl Chloride | Acetone | 1,1-DCE | cis-1,2-Dichloroethene | Chloroform | 2-Butanone | Trichloroethene | Tetrachloroethene | Toluene | Ethylbenzene | 1,1,2-Trichloro-1,2,2-trifluoroethane | Total Xylenes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MTCA Method A or B Groundwater Screening Level | | 0.00337 (B) | 0.0002 (A) 0.0000292 (B) | 0.8 (B) | 0.4 (B) | 0.08 (B) | 0.00717 (B) | 4.8 (B) | 0.005 (A) 0.00049 (B) | 0.005 (A) 0.000081 (B) | 1 (A) 0.64 (B) | 0.7 (A) 0.8 (B) | 240 (B) | 1 (A) 1.6 (B) |
| **EGW032** | 11/25/95 | NA | 0.002 U | NA | NA | 0.001 U | NA | NA | **0.0021** | NA | NA | NA | NA | NA |
| | 05/02/95 | NA | 0.002 U | NA | NA | 0.001 U | NA | NA | **0.0017** | NA | NA | NA | NA | NA |
| | 08/02/95 | NA | 0.002 U | NA | NA | 0.001 U | NA | NA | **0.0029** | NA | NA | NA | NA | NA |
| | 11/08/95 | NA | 0.002 U | NA | NA | 0.001 U | NA | NA | **0.0020** | NA | NA | NA | NA | NA |
| | 02/27/96 | NA | 0.002 U | NA | NA | 0.001 U | NA | NA | **0.0020** | NA | NA | NA | NA | NA |
| | 05/29/96 | NA | 0.002 U | NA | NA | 0.001 U | NA | NA | **0.0030** | NA | NA | NA | NA | NA |
| | 05/29/96 (DUP) | NA | 0.002 U | NA | NA | 0.001 U | NA | NA | **0.0027** | NA | NA | NA | NA | NA |
| | 08/21/96 | NA | 0.002 U | NA | NA | 0.001 U | NA | NA | **0.0033** | NA | NA | NA | NA | NA |
| | 11/25/96 | NA | 0.002 U | NA | NA | 0.001 U | NA | NA | **0.0024** | NA | NA | NA | NA | NA |
| | 11/25/96 (DUP) | NA | 0.002 U | NA | NA | 0.001 U | NA | NA | **0.0024** | NA | NA | NA | NA | NA |
| | 03/05/97 | NA | 0.002 U | NA | NA | 0.001 U | NA | NA | **0.0021** | NA | NA | NA | NA | NA |
| | 05/28/97 | NA | **0.00096** | NA | NA | 0.001 U | NA | NA | **0.0026** | NA | NA | NA | NA | NA |
| | 05/28/97 (DUP) | NA | **0.00089** | NA | NA | 0.001 U | NA | NA | **0.0026** | NA | NA | NA | NA | NA |
| | 08/14/97 | NA | **0.00081** | NA | NA | 0.001 U | NA | NA | **0.0030** | NA | NA | NA | NA | NA |
| | 11/18/97 | NA | **0.00058** | NA | NA | 0.001 U | NA | NA | **0.0027** | NA | NA | NA | NA | NA |
| | 03/11/98 | 0.001 U | **0.0003** | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | **0.0026** | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.002 U |
| | 03/11/98 (DUP) | 0.001 U | **0.00033** | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | **0.0021** | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.002 U |
| | 05/13/98 | 0.002 U | **0.00057** | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | **0.0012** | 0.001 U | 0.001 U | 0.001 U | 0.002 U | 0.0018 |
| | 08/12/98 | 0.002 U | 0.002 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | **0.0011** | 0.001 U | 0.001 U | 0.001 U | 0.002 U | 0.001 U |
| | 08/12/98 (DUP) | 0.002 U | 0.002 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | **0.0010** | 0.001 U | 0.001 U | 0.001 U | 0.002 U | 0.001 U |
| | 11/10/98 | 0.002 U | 0.00001 UJ | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | **0.0016** | 0.001 U | 0.001 U | 0.001 U | 0.002 U | 0.001 U |
| | 11/10/98 (DUP) | 0.002 U | **0.0003 J** | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | **0.0015** | 0.001 U | 0.001 U | 0.001 U | 0.002 U | 0.001 U |
| | 02/03/99 | 0.002 U | **0.0002** | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | **0.0018** | 0.001 U | 0.001 U | 0.001 U | 0.002 U | 0.001 U |
| | 05/12/99 | 0.001 U | **0.00048** | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | **0.0014** | 0.001 U | 0.001 U | 0.001 U | 0.002 U | 0.001 U |
| | 08/04/99 | 0.001 U | **0.00065** | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | **0.0016** | 0.001 U | 0.001 U | 0.001 U | 0.002 U | 0.001 U |
| | 11/10/99 | 0.001 U | **0.00024** | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | **0.001** | 0.001 U | 0.001 U | 0.001 U | 0.002 U | 0.001 U |
| | 11/10/99 (DUP) | 0.001 U | **0.00032** | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | **0.001** | 0.001 U | 0.001 U | 0.001 U | 0.002 U | 0.001 U |
| | 02/01/00 | 0.001 U | **0.00023** | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | **0.0017** | 0.001 U | 0.001 U | 0.001 U | 0.002 U | 0.001 U |
| | 02/01/00 (DUP) | 0.001 U | **0.00022** | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | **0.0019** | 0.001 U | 0.001 U | 0.001 U | 0.002 U | 0.001 U |
| | 05/03/00 | 0.001 U | **0.00065** | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | **0.0012** | 0.001 U | 0.001 U | 0.001 U | 0.002 U | 0.001 U |
| | 08/01/00 | 0.001 U | **0.00072** | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | **0.0011** | 0.001 U | 0.001 U | 0.001 U | 0.002 U | 0.001 U |
| | 11/15/00 | 0.001 U | **0.00018** | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | **0.0017** | 0.001 U | 0.001 U | 0.001 U | 0.002 U | 0.001 U |
| | 02/06/01 | 0.001 U | **0.00028** | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | **0.0014** | 0.001 U | 0.001 U | 0.001 U | 0.002 U | 0.001 U |
| | 05/3/01[A] | 0.001 U | **0.00071** | 0.0057 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | **0.0015** | 0.001 U | 0.001 U | 0.001 U | 0.002 U | 0.001 U |
| | 08/09/01 | 0.001 U | **0.00060** | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | **0.0013** | 0.001 U | 0.001 U | 0.001 U | 0.002 U | 0.001 U |
| | 08/09/01 (DUP) | 0.001 U | **0.00066** | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | **0.0016** | 0.001 U | 0.001 U | 0.001 U | 0.002 U | 0.001 U |
| | 11/13/01 | 0.001 U | **0.00013** | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | **0.0016** | 0.001 U | 0.001 U | 0.001 U | 0.002 U | 0.001 U |
| | 02/06/02 | 0.0002 U | 0.00002 U | 0.001 U | 0.0002 U | 0.0002 | 0.0002 U | 0.001 U | **0.0018** | 0.0002 U | 0.0002 U | 0.0002 U | 0.00025 | 0.0004 U |
| | 05/07/02 | 0.0002 U | **0.00021** | 0.001 U | 0.0002 U | 0.0003 | 0.0002 U | 0.001 U | **0.0016** | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U |
| | 08/07/02 | 0.0002 U | **0.00100** | 0.001 U | 0.0002 U | 0.0003 | 0.0002 U | 0.001 U | **0.0014** | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U |
| | 11/15/02 | 0.0002 U | **0.00062** | 0.001 U | 0.0002 U | 0.0003 | 0.0002 U | 0.001 U | **0.001** | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U |
| | 02/05/03 | 0.0002 U | 0.00002 UJ | 0.001 U | 0.00002 UJ | 0.0002 U | 0.0002 U | 0.001 U | **0.0017** | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U |
| | 05/07/03 | 0.0002 U | 0.000021 | 0.0011 U | 0.00002 U | 0.0002 | 0.0002 U | 0.001 U | **0.0022** | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U |
| | 07/23/03 | 0.0002 U | **0.00077** | 0.001 U | 0.00002 U | 0.0004 | 0.0002 U | 0.001 U | **0.0017** | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U |
| | 07/23/03 (DUP) | 0.0002 U | **0.00064** | 0.001 U | 0.00002 U | 0.0004 | 0.0002 U | 0.001 U | **0.0016** | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U |
| | 11/05/03 | 0.0002 | **0.00025** | 0.0016 U | 0.00002 U | 0.0003 | 0.0002 U | 0.001 U | **0.0016** | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U |
| | 11/05/03 (DUP) | 0.0002 U | **0.00019** | 0.001 U | 0.00002 U | 0.0003 | 0.0002 U | 0.001 U | **0.0017** | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U |
| | 01/19/04 | 0.0002 U | 0.00002 U | 0.001 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.001 U | **0.0021** | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U |
| | 04/18/04 | 0.0002 U | **0.000074** | 0.001 U | 0.00002 U | 0.0002 | 0.0002 U | 0.001 U | **0.0023** | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 | 0.0004 U |
| | 07/14/04 | 0.0002 U | **0.00056** | 0.001 U | 0.00002 U | 0.0003 | 0.0002 U | 0.001 U | **0.0014** | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U |
| | 10/06/04 | 0.0002 U | **0.00068** | 0.002 | 0.00002 U | 0.0003 | 0.0002 U | 0.001 U | **0.0016** | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U |
| | 01/13/05 | 0.0002 U | 0.00002 U | 0.001 U | 0.00002 U | 0.0002 | 0.0002 U | 0.001 U | **0.0020** | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 | 0.0004 U |
| | 04/09/05 | 0.0002 U | 0.00002 U | 0.001 U | 0.00002 U | 0.0002 | 0.0002 U | 0.001 U | **0.0019** | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U |
| | 10/18/05 | 0.0002 U | **0.000025** | 0.001 U | 0.00002 U | 0.0003 | 0.0002 U | 0.001 U | **0.0037** | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 | 0.0004 U |
| | 10/18/05 (DUP) | 0.0002 U | **0.000025** | 0.0017 U | 0.00002 U | 0.0003 | 0.0002 U | 0.001 U | **0.0036** | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 | 0.0004 U |
| | 04/18/06 | 0.0002 U | 0.00002 U | 0.0015 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.001 U | **0.0022** | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 | 0.0004 U |
| | 10/18/06 | 0.0002 U | **0.00047** | 0.003 U | 0.00002 U | 0.0002 | 0.0002 U | 0.001 U | **0.0016** | 0.00002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U |
| | 04/04/07 | 0.0002 U | 0.000022 | 0.003 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.001 U | **0.0018** | 0.00002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.001 |
| | 10/26/07 | 0.0002 U | 0.00019 | 0.003 U | 0.00002 U | 0.0003 | 0.0002 U | 0.001 U | **0.0023** | 0.00002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U |
| | 04/03/08 | 0.0002 U | 0.00002 U | 0.003 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.0025 U | **0.0017** | 0.00002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U |
| | 10/08/08 | 0.0002 U | **0.00017** | 0.003 U | 0.00002 U | 0.0003 | 0.0002 U | 0.0025 U | **0.0017** | 0.00002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U |
| | 04/07/09 | 0.0002 U | 0.000024 | 0.0025 U | 0.00002 U | N | 0.0002 U | 0.0025 U | **0.0018** | 0.00002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U |
| | 10/28/09 | 0.0005 U | 0.00002 U | 0.005 U | 0.00002 U | 0.0006 | 0.0002 U | 0.005 U | **0.0026** | 0.00002 U | 0.0002 U | 0.0002 U | 0.0003 | 0.0004 U |
| | 04/07/10 | 0.0005 UJ | **0.000048** | 0.005 UJ | 0.00002 U | 0.0002 | 0.0002 U | 0.005 U | **0.0015** | 0.00002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U |

**Table 3-29**
**Summary of Groundwater Analytical Results for Volatile Organic Compounds, (mg/L)**
**Building 40-51, Former UST EV-11 Monitoring Wells**
**Boeing Everett Plant**

| Well ID | Sample Date | Chloromethane | Vinyl Chloride | Acetone | 1,1-DCE | cis-1,2-Dichloroethene | Chloroform | 2-Butanone | Trichloroethene | Tetrachloroethene | Toluene | Ethylbenzene | 1,1,2-Trichloro-1,2,2-trifluoroethane | Total Xylenes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MTCA Method A or B Groundwater Screening Level | | 0.00337 (B) | 0.0002 (A) 0.0000292 (B) | 0.8 (B) | 0.4 (B) | 0.08 (B) | 0.00717 (B) | 4.8 (B) | 0.005 (A) 0.00049 (B) | 0.005 (A) 0.000081 (B) | 1 (A) 0.64 (B) | 0.7 (A) 0.8 (B) | 240 (B) | 1 (A) 1.6 (B) |
| **EGW065** | 06/27/00 | 0.001 U | 0.00002 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.002 U | 0.001 U |
| | 08/01/00 | 0.001 U | 0.00002 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.002 U | 0.001 U |
| | 11/15/00 | 0.001 U | 0.00002 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | **0.0013** | 0.001 U | 0.001 U | 0.001 U | 0.002 U | 0.001 U |
| | 02/06/01 | 0.001 U | 0.00002 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | **0.001** | 0.001 U | 0.001 U | 0.001 U | 0.002 U | 0.001 U |
| | 05/3/01[A] | 0.001 U | 0.00002 U | 0.0061 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | **0.0011** | 0.001 U | 0.001 U | 0.001 U | 0.002 U | 0.001 U |
| | 08/09/01 | 0.001 U | 0.00002 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | **0.0015** | 0.001 U | 0.001 U | 0.001 U | 0.002 U | 0.001 U |
| | 11/13/01 | 0.001 U | 0.00002 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.002 U | 0.001 U |
| | 02/06/02 | 0.0002 U | 0.00002 U | 0.001 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.001 U | **0.0005** | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U |
| | 05/07/02 | 0.0002 U | 0.00002 U | 0.001 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.001 U | **0.0006** | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U |
| | 08/07/02 | 0.0002 U | 0.0002 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.001 U | **0.0013** | 0.0002 U | 0.0004 | 0.0002 U | 0.0002 U | 0.0004 U |
| | 08/07/02 (DUP) | 0.0002 U | 0.0002 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.001 U | **0.0013** | 0.0002 U | 0.0003 | 0.0002 U | 0.0002 U | 0.0004 U |
| | 11/15/02 | 0.0002 U | **0.00003** | 0.001 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.001 U | **0.0009** | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U |
| | 02/05/03 | 0.0002 U | 0.00002 UJ | 0.001 U | 0.00002 UJ | 0.0002 U | 0.0002 U | 0.001 U | **0.0007** | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U |
| | 05/07/03 | 0.0002 U | 0.00002 U | 0.0019 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.001 U | 0.001 | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U |
| | 07/23/03 | 0.0002 U | 0.00002 U | 0.001 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.001 U | **0.0012** | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U |
| | 11/05/03 | 0.0002 U | 0.00002 U | 0.001 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.001 U | **0.0018** | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U |
| | 01/19/04 | 0.0002 U | 0.00002 U | 0.001 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.001 U | **0.0008** | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U |
| | 1/19/04 (DUP) | 0.0002 U | 0.00002 U | 0.001 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.001 U | **0.0008** | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U |
| | 04/18/04 | 0.0002 U | 0.00002 U | 0.0013 J | 0.00002 U | 0.0002 U | 0.0002 U | 0.001 U | **0.0011** | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U |
| | 07/14/04 | 0.0002 U | 0.00002 U | 0.001 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.001 U | **0.0018** | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U |
| | 10/06/04 | 0.0002 U | 0.00002 U | 0.001 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.001 U | **0.0016** | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U |
| | 10/06/04 (DUP) | 0.0002 U | 0.00002 U | 0.0017 | 0.00002 U | 0.0002 U | 0.0002 U | 0.001 U | **0.0016** | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U |
| | 01/13/05 | 0.0002 U | 0.00002 U | 0.001 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.001 U | **0.0009** | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U |
| | 1/13/05 (DUP) | 0.0002 U | 0.00002 U | 0.0014 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.001 U | **0.0009** | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U |
| | 04/09/05 | 0.0002 U | 0.00002 U | 0.001 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.001 U | **0.0006** | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U |
| | 10/18/05 | 0.0002 U | 0.00002 U | 0.0018 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.001 U | **0.0013** | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U |
| | 04/18/06 | 0.0002 U | 0.00002 U | 0.0010 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.001 U | **0.0007** | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U |
| | 4/18/06 (DUP) | 0.0002 U | 0.00002 U | 0.0015 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.001 U | **0.0007** | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U |
| | 10/18/06 | 0.0002 U | 0.00002 U | 0.003 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.001 U | **0.00099** | 0.000052 | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U |
| | 04/04/07 | 0.0002 U | 0.00002 U | 0.003 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.001 U | **0.00051** | 0.000040 | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U |
| | 10/26/07 | 0.0002 U | 0.00002 U | 0.003 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.001 U | **0.00071** | 0.000038 | 0.0002 U | 0.0002 U | 0.0002 U | 0.0005 |
| | 04/03/08 | 0.0002 U | 0.00002 U | 0.003 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.0025 U | **0.00054** | 0.000034 | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U |
| | 4/3/08 (DUP) | 0.0002 U | 0.00002 U | 0.003 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.0025 U | **0.00055** | 0.000035 | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U |
| | 10/08/08 | 0.0002 U | 0.00002 U | 0.003 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.0025 U | **0.00096** | 0.000045 | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U |
| | 10/8/08 (DUP) | 0.0002 U | 0.00002 U | 0.003 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.0025 U | **0.00098** | 0.000047 | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U |
| | 04/07/09 | 0.0002 U | 0.00002 U | 0.0025 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.0025 U | 0.00037 | 0.00003 | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U |
| | 10/28/09 | 0.0005 U | 0.00002 U | 0.0054 | 0.00002 U | 0.0002 U | 0.0002 U | 0.005 U | **0.00070** | 0.000028 | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U |
| | 04/07/10 | 0.0005 UJ | 0.00002 U | 0.005 UJ | 0.00002 U | 0.0002 U | 0.0002 U | 0.005 U | 0.00044 | 0.000029 | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U |

**Table 3-29**
**Summary of Groundwater Analytical Results for Volatile Organic Compounds, (mg/L)**
**Building 40-51, Former UST EV-11 Monitoring Wells**
**Boeing Everett Plant**

| Well ID | Sample Date | Chloromethane | Vinyl Chloride | Acetone | 1,1-DCE | cis-1,2-Dichloroethene | Chloroform | 2-Butanone | Trichloroethene | Tetrachloroethene | Toluene | Ethylbenzene | 1,1,2-Trichloro-1,2,2-trifluoroethane | Total Xylenes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MTCA Method A or B Groundwater Screening Level | | 0.00337 (B) | 0.0002 (A) 0.0000292 (B) | 0.8 (B) | 0.4 (B) | 0.08 (B) | 0.00717 (B) | 4.8 (B) | 0.005 (A) 0.00049 (B) | 0.005 (A) 0.000081 (B) | 1 (A) 0.64 (B) | 0.7 (A) 0.8 (B) | 240 (B) | 1 (A) 1.6 (B) |
| **EGW066** | 06/27/00 | 0.001 U | **0.00023** | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.002 U | 0.001 U |
| | 08/01/00 | 0.001 U | **0.00019** | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.002 U | 0.001 U |
| | 08/01/00 (DUP) | 0.001 U | **0.00021** | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.002 U | 0.001 U |
| | 11/15/00 | 0.001 U | **0.00034** | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.002 U | 0.001 U |
| | 11/15/00 (DUP) | 0.001 U | **0.00035** | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.002 U | 0.001 U |
| | 02/06/01 | 0.001 U | **0.00017** | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.002 U | 0.001 U |
| | 05/3/01[A] | 0.001 U | **0.00013** | 0.0073 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.002 U | 0.001 U |
| | 05/03/01[A] (DUP) | 0.001 U | **0.00015** | 0.0064 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | **0.001** | 0.001 U | 0.001 U | 0.001 U | 0.002 U | 0.001 U |
| | 08/09/01 | 0.001 U | **0.00016** | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.002 U | 0.001 U |
| | 11/13/01 | 0.001 U | **0.00013** | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.002 U | 0.001 U |
| | 11/13/01 (DUP) | 0.001 U | **0.00011** | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.002 U | 0.001 U |
| | 02/06/02 | 0.0002 U | **0.000066** | 0.001 U | 0.00002 U | 0.0003 | 0.0002 U | 0.001 U | **0.0007** | 0.0002 U | 0.0002 U | 0.0003 | 0.0002 U | 0.0019 |
| | 05/07/02 | 0.0002 U | **0.00016** | 0.001 U | 0.00002 U | 0.0002 | 0.0002 U | 0.001 U | 0.0004 | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U |
| | 08/07/02 | 0.0002 U | **0.00040** | 0.001 | 0.0002 U | 0.0004 | 0.0002 U | 0.001 U | **0.0009** | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0006 |
| | 11/15/02 | 0.0002 U | **0.0004** | 0.001 U | 0.00006 | 0.0002 | 0.0002 U | 0.001 U | **0.0006** | 0.0002 U | 0.0002 | 0.0002 U | 0.0002 U | 0.0004 U |
| | 11/15/02 (DUP) | 0.0002 U | **0.00037** | 0.001 U | 0.00005 | 0.0002 | 0.0002 U | 0.001 U | **0.0005** | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U |
| | 02/05/03 | 0.0002 U | **0.000041 J** | 0.0012 J | 0.00002 UJ | 0.0002 U | 0.0002 U | 0.001 U | **0.0008** | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U |
| | 02/05/03 (DUP) | 0.0002 U | **0.00005 J** | 0.001 U | 0.00002 UJ | 0.0002 U | 0.0002 U | 0.001 U | **0.0009** | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U |
| | 05/07/03 | 0.0002 U | **0.000044** | 0.0014 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.001 U | **0.0008** | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U |
| | 05/07/03 (DUP) | 0.0002 U | **0.000054** | 0.001 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.001 U | **0.0008** | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U |
| | 07/23/03 | 0.0002 U | **0.00030** | 0.001 U | 0.000031 | 0.0002 | 0.0002 U | 0.001 U | **0.0009** | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U |
| | 11/05/03 | 0.0002 U | 0.00002 U | 0.0015 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.001 U | **0.0017** | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 |
| | 01/19/04 | 0.0002 U | 0.00002 U | 0.001 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.001 U | **0.0014** | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U |
| | 04/18/04 | 0.0002 U | 0.000024 | 0.0012 J | 0.00002 U | 0.0002 | 0.0002 U | 0.001 U | **0.0012** | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U |
| | 07/14/04 | 0.0002 U | **0.00052** | 0.001 U | 0.00002 U | 0.0003 | 0.0002 U | 0.001 U | **0.0016** | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U |
| | 10/06/04 | 0.0002 U | **0.00018** | 0.0019 | 0.000023 | 0.0002 | 0.0002 U | 0.001 U | **0.001** | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U |
| | 01/13/05 | 0.0002 U | **0.000051** | 0.001 U | 0.00002 U | 0.0002 | 0.0002 U | 0.001 U | **0.0008** | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U |
| | 04/09/05 | 0.0002 U | **0.000099** | 0.001 U | 0.00002 U | 0.0003 | 0.0002 U | 0.001 U | **0.0008** | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U |
| | 4/9/05 (DUP) | 0.0002 U | **0.000086** | 0.001 U | 0.00002 U | 0.0003 | 0.0002 U | 0.001 U | **0.0008** | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U |
| | 10/18/05 | 0.0002 U | **0.00022** | 0.0011 U | 0.00003 | 0.0002 U | 0.0002 U | 0.001 U | **0.0008** | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U |
| | 04/18/06 | 0.0002 U | **0.000054** | 0.0013 U | 0.00002 U | 0.0002 | 0.0002 U | 0.001 U | **0.0007** | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U |
| | 10/18/06 | 0.0002 U | **0.00013** | 0.003 U | 0.000028 | 0.0002 U | 0.0002 U | 0.001 U | **0.00062** | **0.000081** | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U |
| | 04/04/07 | 0.0002 U | **0.000043** | 0.003 U | 0.00002 U | 0.0002 | 0.0002 U | 0.001 U | **0.00072** | **0.000081** | 0.0002 U | 0.0002 U | 0.0002 U | 0.0007 |
| | 4/4/07 (DUP) | 0.0002 U | **0.000039** | 0.003 U | 0.00002 U | 0.0002 | 0.0002 U | 0.001 U | **0.00068** | **0.000085** | 0.0002 U | 0.0002 U | 0.0002 U | 0.0007 |
| | 10/26/07 | 0.0002 U | **0.00004** | 0.003 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.001 U | **0.00069** | 0.000079 | 0.0002 U | 0.0002 U | 0.0002 U | 0.001 |
| | 04/03/08 | 0.0002 U | **0.000052** | 0.003 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.0025 U | **0.00055** | 0.000077 | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U |
| | 10/08/08 | 0.0002 U | **0.00012** | 0.003 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.0025 U | **0.00059** | **0.00012** | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U |
| | 04/07/09 | 0.0002 U | **0.000026** | 0.0025 U | 0.00002 U | 0.0002 | 0.0002 U | 0.0025 U | **0.00056** | 0.000071 | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U |
| | 4/7/09 (DUP) | 0.0002 U | **0.000026** | 0.0025 U | 0.00002 U | 0.0002 | 0.0002 U | 0.0025 U | **0.00059** | 0.000074 | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U |
| | 10/28/09 | 0.0005 U | 0.00002 U | 0.005 U | 0.00002 U | 0.0002 | 0.0002 U | 0.005 U | **0.00080** | 0.000062 | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U |
| | 10/28/09 (DUP) | 0.0005 U | 0.00002 U | 0.0083 | 0.00002 U | 0.0002 | 0.0002 U | 0.005 U | **0.00080** | 0.000066 | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U |
| | 04/07/10 | 0.0005 UJ | **0.000041** | 0.005 UJ | 0.00002 U | 0.0002 U | 0.0002 U | 0.005 U | 0.00046 | 0.000075 | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U |
| | 4/7/10 (DUP) | 0.0005 UJ | **0.000037** | 0.005 UJ | 0.00002 U | 0.0002 U | 0.0002 U | 0.005 U | 0.00045 | 0.000066 | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U |

**Notes:**

Values in **bold** font indicate that the result reported exceeds the most current MTCA levels based on the Ecology website.
Model Toxics Control Act (MTCA) Cleanup Regulation, WAC 173-340. MTCA Method A and B values are from Ecology website CLARC tables, 2010 download.

(A) - MTCA Method A

(B) - MTCA Method B

(DUP) - Field duplicate

NA - Not available, the 1995-1997 data predated the RI.

J - Estimated value

U - Compound was analyzed for but not detected above the reporting limit shown.

UJ - Compound was analyzed for but not detected above the reporting limit shown. Reporting limit is an estimated value.

[A] Acetone was detected in samples collected on 5/3/01 at concentrations ranging from 0.0057 to 0.0077 mg/L and in the Trip Blank at 0.0055 mg/L. The acetone results were qualified as not detected during data review based on the Trip Bla

[B] Suspected laboratory contaminant

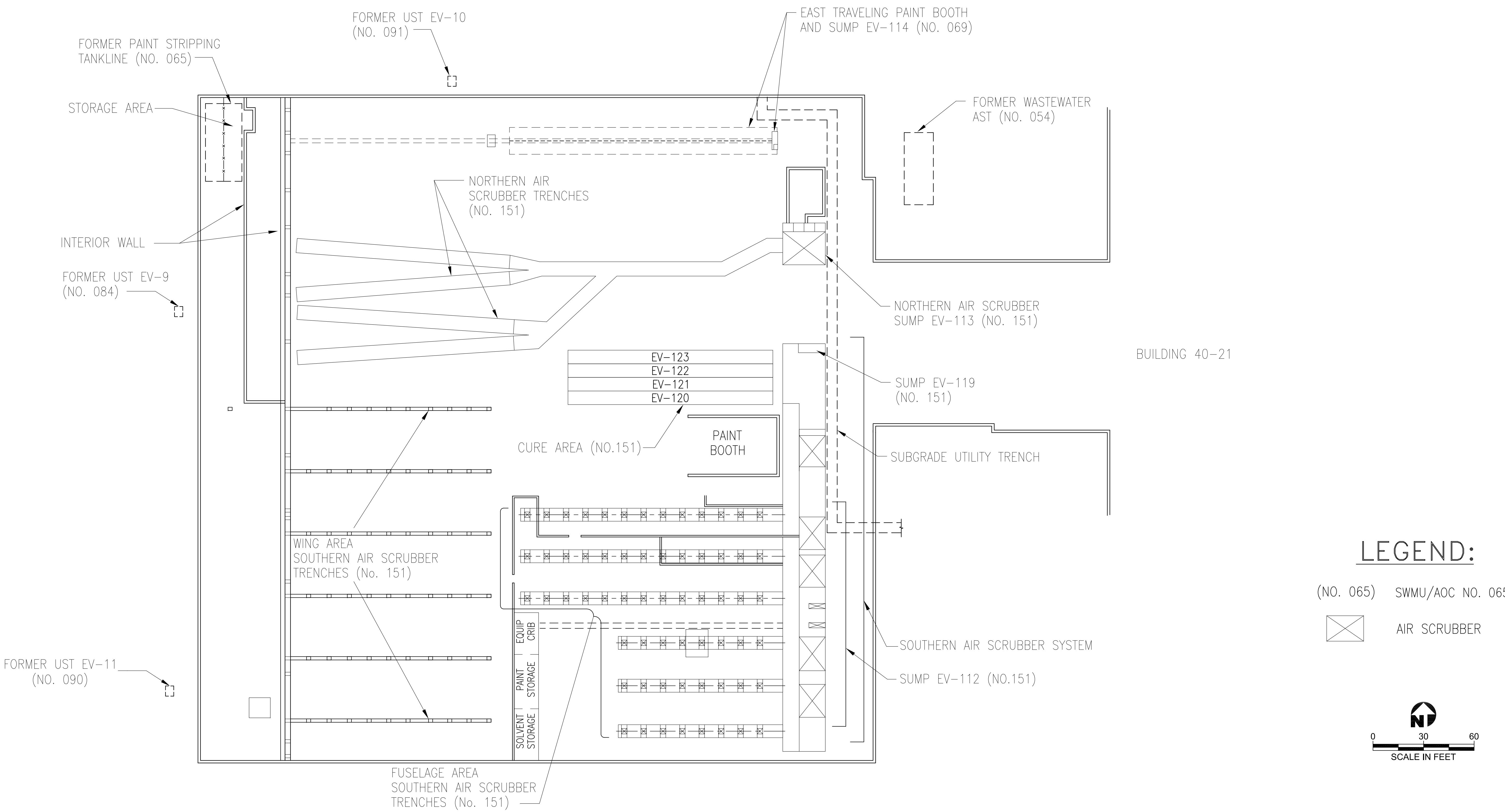



**Figure 3-1**

**BUILDING 40-51 PLAN AND SWMU/AOC LOCATIONS**

Boeing Commercial Airplanes, Everett Plant
REMEDIAL INVESTIGATION REPORT

URS
Q:\geo\Boeing\Everett\RI\2010\Fig 3-1.dwg
Mod: 12/10/2010, 13:41 | Plotted: 12/10/2010, 13:42 | john_knobbs

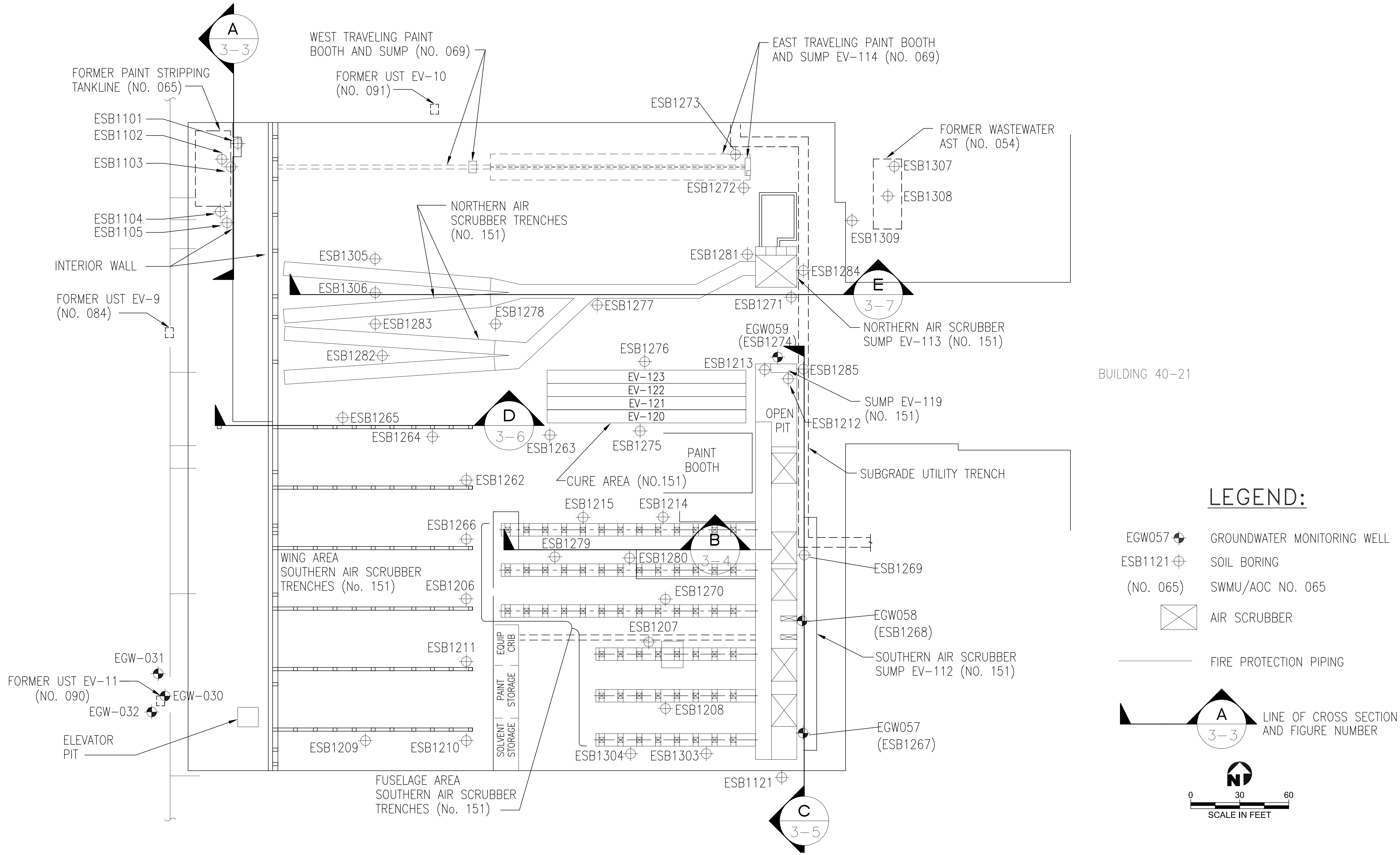
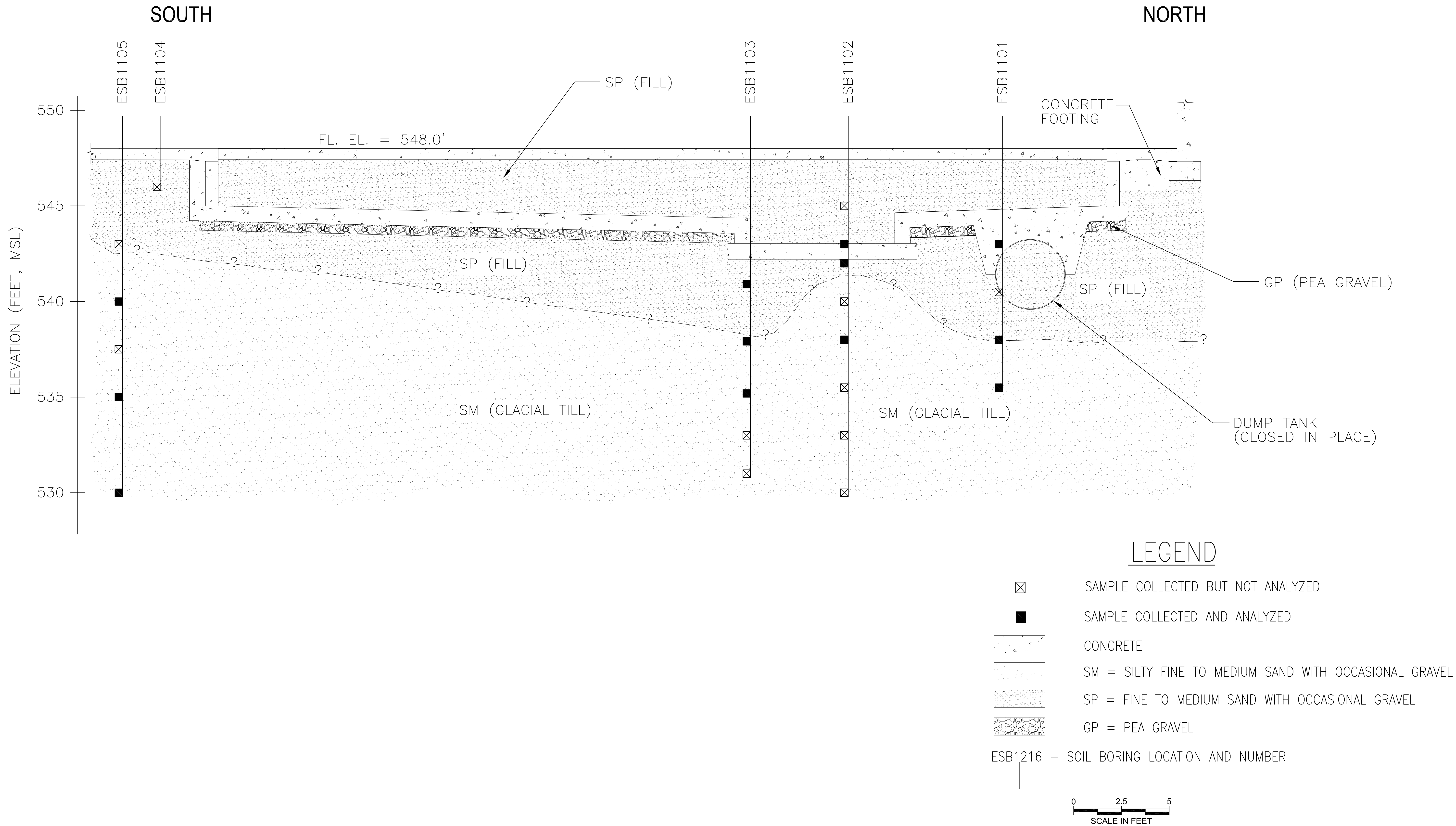



Figure 3-2
**BUILDING 40-51 SOIL BORING, GROUNDWATER PROBE AND MONITORING WELL LOCATIONS**

Job No. 33761927

URS Q:\geo\Boeing\Everett\GW Monitoring Report\2010 RI\06 Report\Fig 3-2.dwg
Mod: 08/11/2010, 10:29 | Plotted: 08/11/2010, 10:29 | john_knobbs

Boeing Commercial Airplanes, Everett Plant
REMEDIAL INVESTIGATION REPORT




Job No. 33761927

Figure 3-3

**BUILDING 40-51 CROSS SECTION A**

URS

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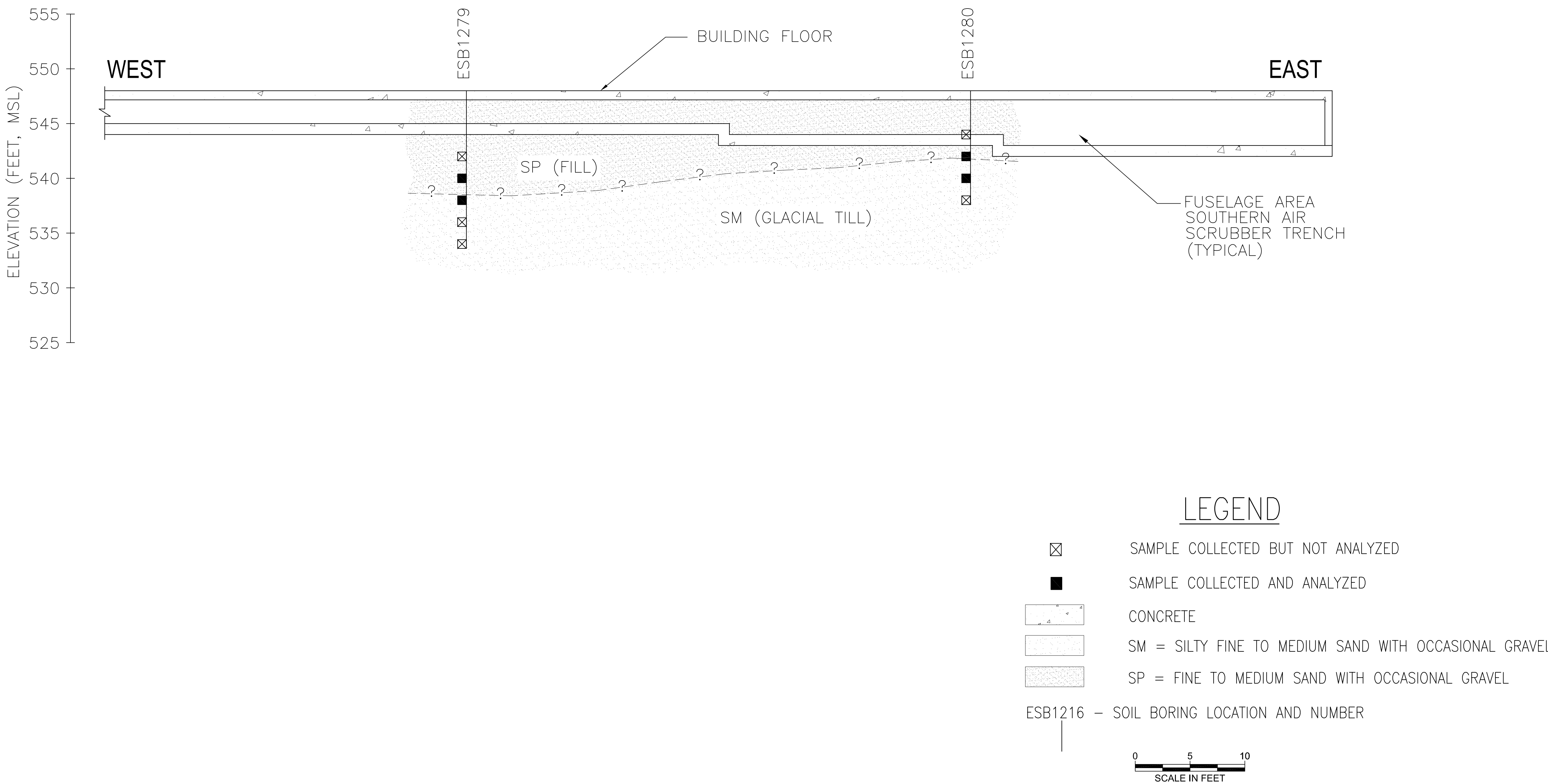
Mod: 08/11/2010, 10:36 | Plotted: 08/11/2010, 10:36 | john_knobbs

Boeing Commercial Airplanes, Everett Plant
REMEDIAL INVESTIGATION REPORT



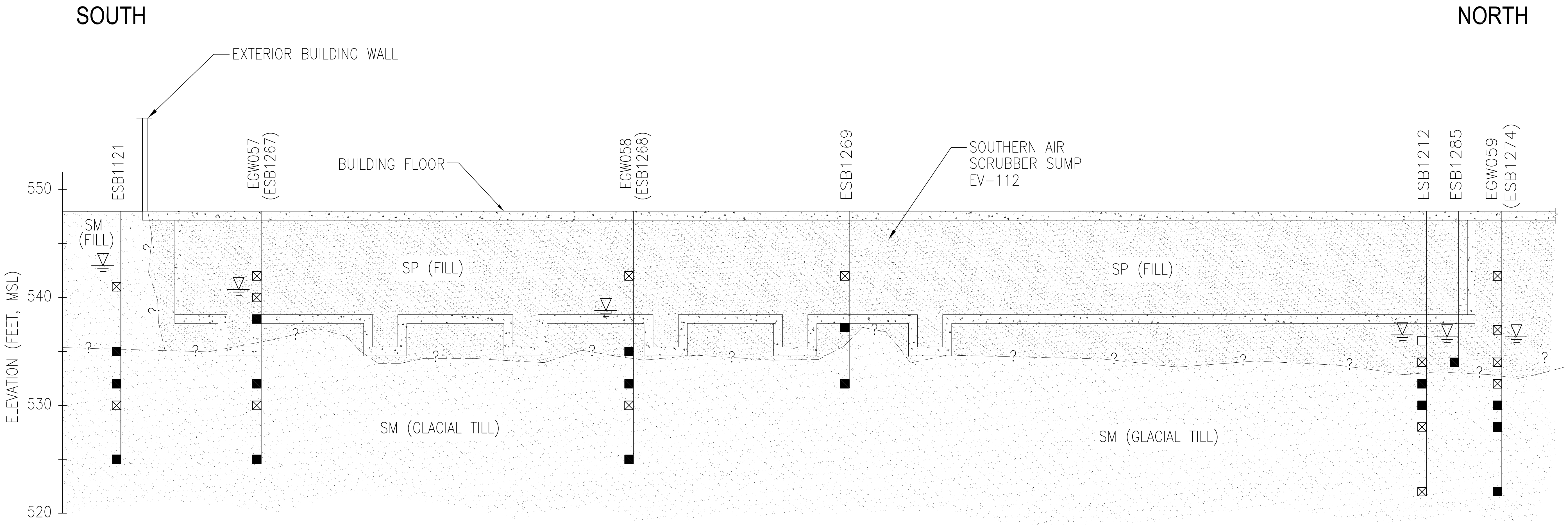

Job No. 33761927

**Figure 3-4**

**BUILDING 40-51 CROSS SECTION B**

Boeing Commercial Airplanes, Everett Plant
REMEDIAL INVESTIGATION REPORT

URS Q:\geo\Boeing\Everett\GW Monitoring Report\2010 RI06 Report\Fig 3-4.dwg
Mod: 07/06/2006, 16:24 | Plotted: 08/11/2010, 10:40 | john_knobbs




# LEGEND

| | |
|---|---|
| □ | WATER SAMPLE COLLECTED AND ANALYZED |
| ⊠ | SAMPLE COLLECTED BUT NOT ANALYZED |
| ■ | SAMPLE COLLECTED AND ANALYZED |
| ▽ | PERCHED WATER LEVEL DURING DRILLING |
| | SM = SILTY FINE TO MEDIUM SAND WITH OCCASIONAL GRAVEL |
| | SP = FINE TO MEDIUM SAND WITH OCCASIONAL GRAVEL |
| ESB 1121 | SOIL BORING |
| EGW057 (ESB1267) | SOIL BORING COMPLETED AS MONITORING WELL |

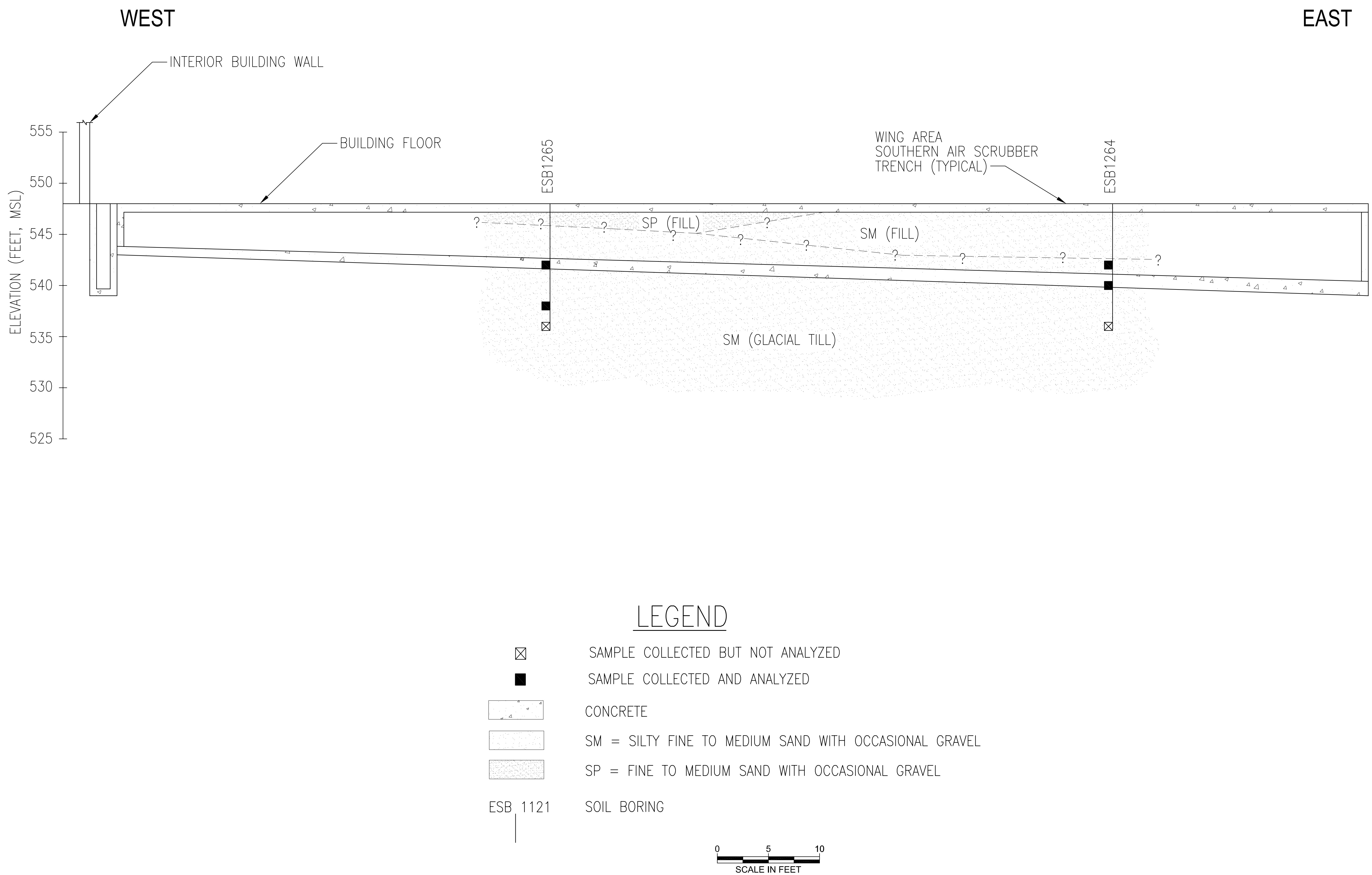
0 5 10
SCALE IN FEET

Job No. 33761927

Figure 3-5
**BUILDING 40-51 CROSS SECTION C**

URS
Q:\geo\Boeing\Everett\GW Monitoring Report\2010 RI\06 Report\Fig 3-5.dwg
Mod: 08/11/2010, 10:44 | Plotted: 08/11/2010, 10:44 | john_knobbs

Boeing Commercial Airplanes, Everett Plant
REMEDIAL INVESTIGATION REPORT




Job No. 33761927

**Figure 3-6**

**BUILDING 40-51 CROSS SECTION D**

URS

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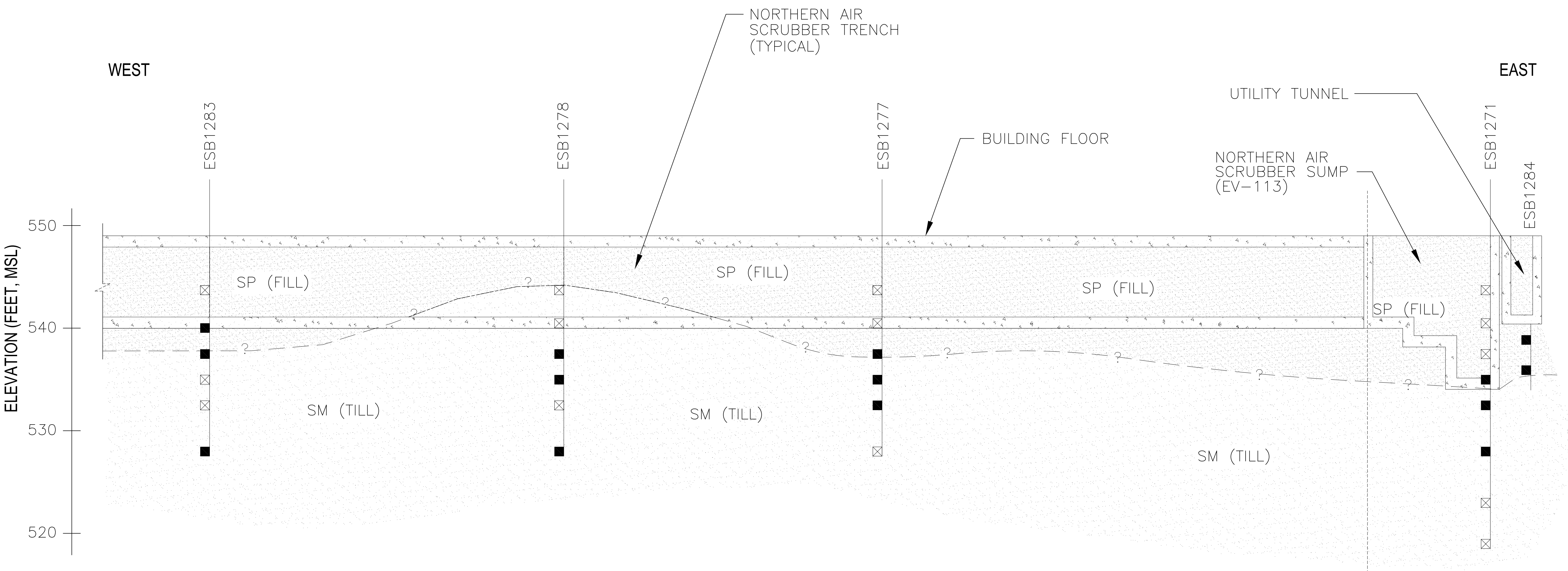
Mod: 08/11/2010, 10:47 | Plotted: 08/11/2010, 10:47 | john_knobbs

Boeing Commercial Airplanes, Everett Plant
REMEDIAL INVESTIGATION REPORT




## LEGEND

SAMPLE COLLECTED BUT NOT ANALYZED

SAMPLE COLLECTED AND ANALYZED

CONCRETE

SM = SILTY FINE TO MEDIUM SAND WITH OCCASIONAL GRAVEL

SP = FINE TO MEDIUM SAND WITH OCCASIONAL GRAVEL

ESB1216 – SOIL BORING LOCATION AND NUMBER

0 20 40
SCALE IN FEET

Job No. 33761927

Figure 3-7
**BUILDING 40-51 CROSS SECTION E**

URS
Q:\geo\Boeing\Everett\GW Monitoring Report\2010 RI\06 Report\Fig 3-7.dwg
Mod: 08/11/2010, 10:49 | Plotted: 08/11/2010, 10:51 | john_knobbs

Boeing Commercial Airplanes, Everett Plant
REMEDIAL INVESTIGATION REPORT

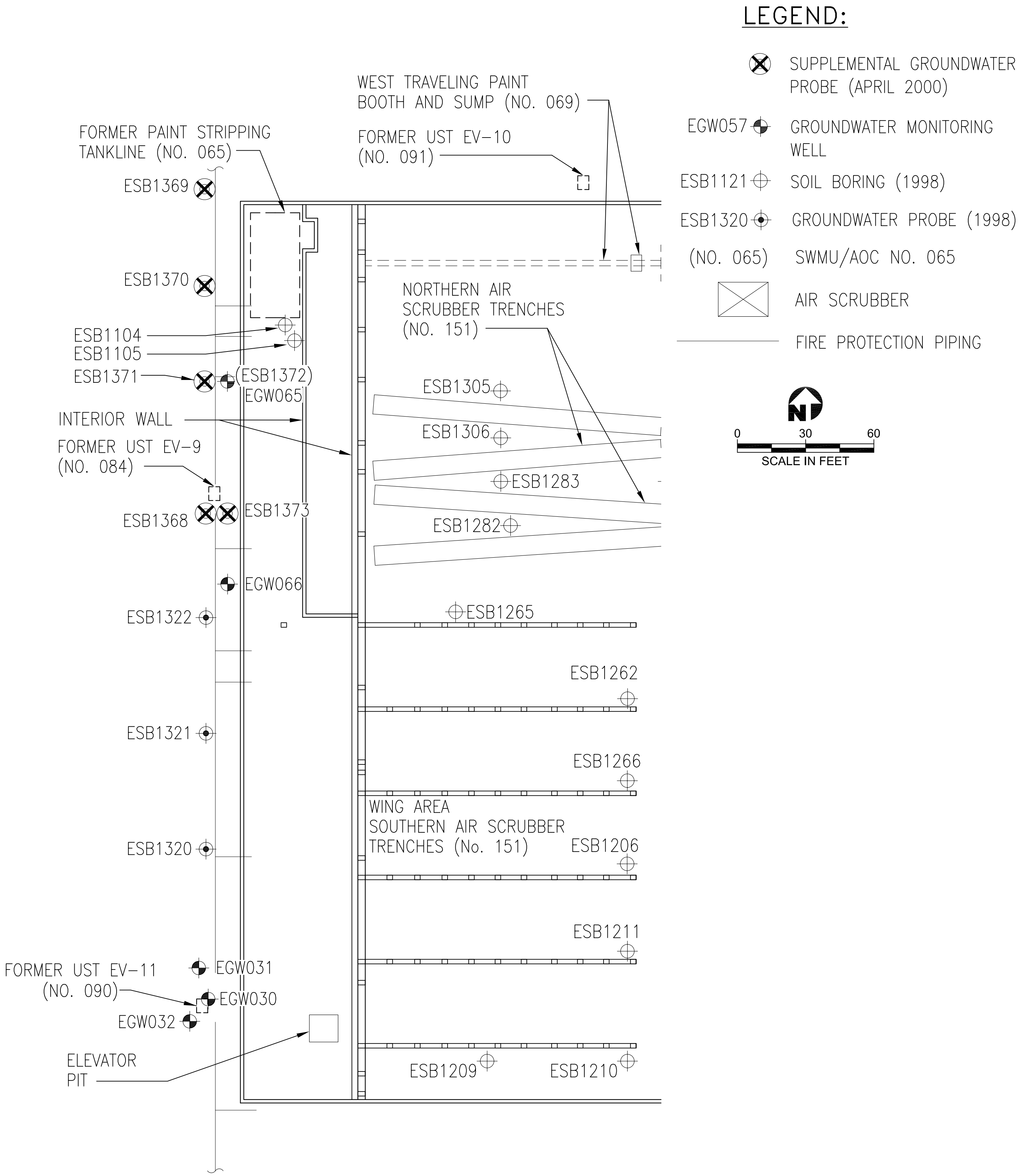



Figure 3-8
**BUILDING 40-51, FORMER UST EV-11 (NO. 090)**
**GROUNDWATER PROBE BORING LOCATIONS**

Job No. 33761927

Q:\geo\Boeing\Everett\GW Monitoring Report\2010 RI\06 Report\Fig 3-8.dwg
Mod: 08/12/2010, 09:52 | Plotted: 08/12/2010, 09:53 | john_knobbs

Boeing Commercial Airplanes, Everett Plant
REMEDIAL INVESTIGATION REPORT

# 4.0 BUILDING 45-01

This section presents the results of the investigation of soils performed at two Attachment 5 SWMU/AOCs (Nos. 93 and 142) located near Building 45-01 at the Everett Plant (Figure 4-1). The subsurface conditions, prior investigations and remedial actions, and description of these SWMU/AOCs are presented in Section 6.0 of the RIWP. This investigation was performed in accordance with Section 6.4 of the RIWP, and Section 3.2 of the Supplemental RIWP.

## 4.1 SWMU/AOC NO. 093 FOUR FORMER SOLVENT USTS EV-18, EV-19, EV-20, AND EV-54

SWMU/AOC No. 093 consists of former USTs EV-18, EV-19, EV-20, EV-54 located near Building 45-01 (Figure 4-1). These USTs were used to store methyl ethyl ketone (MEK or 2-butanone) and toluene and were removed in 1988. Previous analysis of soil samples collected in 1985 did not detect MEK. Water present in the excavation was not analyzed. Potential dangerous constituents are MEK and toluene. Further details regarding this SWMU/AOC are presented in Section 6.0 of the RIWP and Section 3.2 of the Supplemental RIWP.

### 4.1.1 Purpose and Scope

The purpose of the investigation was to assess whether MEK or toluene is present in subsurface soil located in the vicinity of former USTs EV-18, EV-19, EV-20, and EV-54 and associated piping. The scope of investigation performed was in general accordance with Section 6.4.1 of the RIWP and included the following:

- Drilled 15 soil borings to depths ranging from 2 to 32 feet bgs using a truck-mounted and limited access hollow-stem auger drilling rigs
- Collected soil samples at prescribed depth intervals
- Field screened samples for organic vapors
- Submitted selected soil samples for analysis for VOCs

There was one deviation from the planned scope of investigation. Planned boring ESB1135 was not completed due to the presence of subgrade utilities and concrete structures of unknown origin in the vicinity of the planned boring location. As an alternative, an additional soil sample from boring ESB1134 was analyzed to provide additional analytical data for the base elevation of the former USTs that was to have been provided by ESB1135.

Based on the results of the RI investigation and Ecology’s request, additional investigation of soils in the vicinity of former USTs EV-19 and EV-20, near boring ESB1140 was completed. The additional scope of the investigation was conducted in general accordance with Section 3.2 of the Supplemental RIWP (Dames & Moore, 2000) and included the following:

- Redrilled boring ESB1134 (located 6 feet southwest of ESB1140) to a minimum depth of 25 feet bgs using truck-mounted drilling rig with HSA

- Collected soil samples at prescribed depth intervals
- Field screened samples for organic vapors
- Submitted selected soil samples for analysis for VOCs

### 4.1.2 Documentation of Boring and Sampling Activities

Between March 4 and March 12, 1998, Dames & Moore monitored drilling and collected soil samples from 15 soil borings (Figure 4-2). Fourteen borings were completed at depths ranging from approximately 9 feet to 32 feet bgs. One boring (ESB1135) was terminated at approximately two feet bgs due to the presence of subgrade utilities and concrete of unknown origin. On June 14, 2000, ESB1386 was redrilled in the location of the former soil boring ESB1134 and completed to a depth of approximately 30 feet bgs (Figure 4-2). Monitoring of drilling and soil sample collection of ESB1386 was conducted by Dames & Moore.

Soil samples were collected using a Dames & Moore U-Type sampler, fitted with stainless steel rings. ESB1386 was backfilled with hydrated bentonite chips and surfaced with concrete. Drilling techniques and sampling procedures utilized in the March 1998 and June 2000 investigations were in general accordance with the SAP presented in Appendix A of the RIWP.

### 4.1.3 Field Observations and Sample Analysis Results

Presented in this section are the field observations and sample results associated with soil borings ESB1122 and ESB1123, ESB1127 through ESB1131, ESB1134 through ESB1141, and ESB1386. Geologic logs of the soil borings are presented in Appendix C1. The chain of custody forms and analytical laboratory reports are presented in Appendix C2. Data validation reports are in Appendix C3. Analytical results are summarized in Table 4-1.

#### 4.1.3.1 Field Observations

The area investigated is covered with approximately 9-inch-thick concrete pavement. Underlying the concrete in the former excavations is fill soil consisting of pea gravel and silty sand with pea gravel. Fill was encountered at depths ranging from 2 to 6½ feet bgs in the boring and is up to 9 to 11 feet thick within the former UST excavations. The fill soil is underlain by a concrete slab underneath each former UST location and native glacial till consisting of very dense silty sand with gravel.

A slight odor was encountered in samples collected from boring ESB1140 at depths of 10 to 20 feet bgs. PID readings indicated the presence of organic vapor concentrations above ambient background ranging from approximately 30 to 200 ppm. Similar PID readings were noted at ESB1386 ranging from approximately 50 to 150 ppm. At a depth of 10 to 20 feet bgs soil samples from other borings did not have a noticeable odor and PID readings typically ranged from 0 ppm to 20 ppmv. Staining or other visual indications of dangerous constituents were not observed, with exception to boring ESB1386, which contained trace staining and/or a solvent-like odor to approximately 25 feet bgs.

Perched groundwater was encountered in some of the borings in the excavation fill. The perched groundwater was discontinuous and typically occurred at the till/fill interface. The glacial till was moist to dry to the maximum depth (32 feet bgs) investigated.

#### 4.1.3.2 Sample Analysis Results

Selected soil samples were submitted for analysis per the sample selection criteria specified on Figure A-4 in the SAP (Appendix A of the RIWP). Soil samples from depths ranging from 2½ (ESB1129) to 27½ feet (ESB1140) were analyzed in 1998. Samples from 17½ and 22½ feet bgs in ESB1386 were analyzed in 2000.

Table 4-1 summarizes the soil analytical data for VOCs detected in one or more samples and lists the applicable MTCA Method A and B cleanup levels for soil for these VOCs. The analytical results indicate VOCs were either not detected above method reporting limits or were detected at concentrations below the applicable MTCA Method A and B soil cleanup levels based on direct contact in all of the samples analyzed. At borings where VOCs are detected, the concentrations decrease to less than the method reporting limits in the deeper samples from the borings, with the exception of methyl ethyl ketone (MEK) which was detected in the deepest soil samples at up to 1,800 µg/kg, but at concentrations less than the MTCA Method B soil cleanup level of 48,000,000 µg/kg and the most conservative preliminary soil cleanup level protective of groundwater (19,200 µg/kg). MEK was detected at concentrations (ranging from 54,000 µg/kg to 140,000 µg/kg) exceeding the preliminary soil cleanup level protective of groundwater (19,200 µg/kg) in five soil samples, but these concentrations are below the concentration protective of direct contact (48,000,000 µg/kg). These samples were collected from locations ESB1140 (12 ½ feet bgs and 17 ½ feet bgs) and ESB1386 (12 ½ feet bgs). At both locations, MEK concentrations in one or more deeper samples were below the applicable MTCA soil cleanup levels protective of both direct contact and groundwater. Based on the exceedance of a potential groundwater protection cleanup level, MEK is recommended for evaluation in the FS with respect to the soil to groundwater pathway.

The detection limits for carbon tetrachloride and trichloroethene (TCE) (both 7.3 µg/kg) in the soil sample from ESB1386 at 22 ½ feet bgs were above the preliminary soil cleanup level protective of groundwater for these compounds. In shallower samples from these locations, lower detection limits were achieved that were below the preliminary soil cleanup level protective of groundwater. These compounds were only detected in one soil sample from one boring (ESB1131 at 12½ feet bgs) of the 15 borings drilled in this area and the detected concentrations are below the applicable MTCA Method A and B cleanup levels for soil and protection of groundwater for these VOCs. Therefore these compounds are not recommended for evaluation in the FS for this SWMU/AOC.

The detection limits for tetrachloroethene (PCE) in soil (1.0 µg/kg to 7.3 µg/kg) and the two detections of PCE (5.2 µg/kg and 1.7 µg/kg) exceed the most conservative preliminary soil cleanup level protective of groundwater (0.86 µg/kg) but do not exceed the MTCA Method A cleanup level protective of both direct contact and groundwater (50 µg/kg). Therefore PCE is not recommended for evaluation in the FS for this SWMU/AOC.

Evaluation of the vapor intrusion (VI) pathway for MEK in soil at this SWMU/AOC is recommended for the FS. Screening of the VI pathway was performed in this RI using Ecology's review draft *Guidance for Evaluating Soil Vapor Intrusion in Washington State: Investigation and Remedial Action*, dated October 2009 (VI guidance). Application of the Preliminary Assessment step of the VI guidance to this SWMU/AOC shows that the chemicals detected in soil beneath the SWMU/AOC (Table 4-1) are sufficiently volatile to be a potential VI source. In particular, MEK was detected in soil at concentrations up to 140,000 µg/kg, which "significantly exceed" the protection of groundwater soil cleanup level (19,200 µg/kg) calculated based on the MTCA Method B groundwater cleanup level, in accordance with the screening criteria of WAC 173-340-740(3)(b)(iii)(C)(III). Significant exceedance of the protection of groundwater concentration for MEK were found in soil samples from locations ESB1140 and ESB1386 at depths of 12 ½ to 17 ½ feet bgs within 100 feet of an existing building. PID readings taken during field sampling indicated organic vapors elevated above background ambient levels at locations ESB1140 and ESB1386.

Perched groundwater was present in excavation fill soils, but was not encountered within native glacial till to the maximum depth explored (~27½ ft bgs). Known groundwater (Esperance Sand) occurs at a depth of approximately 200 feet bgs.

## 4.2 SWMU/AOC NO. 142 PAINT HANGAR WASTEWATER FLUMES

SWMU/AOC No. 142 consists of the wastewater flume and air scrubber flume in the basement of Building 45-01 (Figure 4-1). The flumes and associated clarifier sump and scum sump were installed during the construction of the building in 1969. The air scrubber flume and clarifier sump were deactivated in December 1997 when the paint hanger was converted from a wet air scrubber system to a dry air filter system. The clarifier sump was reactivated in 2006 after being upgraded with a new coating. The clarifer sump is used infrequently as back-up wastewater storage. Potentially dangerous constituents that may be present within the wastewater discharged to the paint hangar flumes include acids, metals, petroleum hydrocarbon based solvents, and VOCs. Further details regarding this SWMU/AOC are presented in Section 6.0 of the RIWP.

### 4.2.1 Purpose and Scope

The purpose of the investigation was to assess whether dangerous constituents are present in soil and perched groundwater, if present, in the vicinity of the wastewater and air scrubber flumes. The scope of investigation was in general accordance with Section 6.4.2 and included the following:

- Drilled 8 soil borings to depths of 11½ to 16½ feet bgs adjacent to the flumes using a portable Salisbury drill rig equipped with a hollow stem auger
- Collected soil samples at prescribed depth intervals
- Field screened samples for organic vapors and pH
- Submitted selected soil samples for analysis for VOCs, RCRA metals and strontium, non-halogenated SVOCs, phenol, pH, TPH-G and TPH-D

Deviation from the planned scope of investigation include the termination of one planned boring (ESB1227) at less than the planned depth due to miscommunication between Dames & Moore field personnel and project manager, and soil samples from three borings were not analyzed for phenols due to an incomplete analysis request on the chain of custody form. At Boeing's request, phenol was added to the analytes for this SWMU/AOC.

### 4.2.2 Documentation of Drilling and Sampling Activities

Between May 9 and 15, 1998, Dames & Moore monitored drilling and collected soil samples from eight soil borings (ESB1216 through ESB1220 and ESB1225 through ESB1227) as shown on Figure 4-1. Seven borings were completed to a depth of between 15½ to 16½ feet bgs. Soil boring ESB1227 was terminated at approximately 11½ feet bgs. Samples were retrieved using a SPT sampler. After sampling was completed, the borings were backfilled with hydrated bentonite chips and capped with concrete. Drilling techniques and sampling procedures utilized were in general accordance with the SAP presented in Appendix A of the RIWP.

### 4.2.3 Field Observations and Sample Analysis Results

Presented in this section are the field observations and sample results associated with soil borings ESB1216 through ESB1220 and ESB1225 through ESB1227. Geologic logs of the soil borings are presented in Appendix C1. The chain of custody forms and analytical laboratory reports are presented in Appendix C2. Data validation reports are in Appendix C3. Analytical results are summarized in Tables 4-2 through 4-5.

#### 4.2.3.1 Field Observations

The area investigated is covered with approximately 6- to 8-inch-thick concrete pavement. Underlying the concrete is fill soil consisting of fine to coarse sand with gravel to depths ranging from approximately 1 to 7½ feet bgs. The fill soil is underlain by native glacial till consisting of very dense silty fine to medium sand and sandy silt with gravel. A geologic cross-section showing the subsurface soils encountered and the location of the depth of soil samples collected relative to the base of the flumes are shown on Figure 4-3.

Staining or other visual indications of dangerous constituents were not observed. PID readings did not indicate significantly elevated organic vapors above ambient background levels in the soil samples. Field measurements of soil pH indicated a pH of 7.6 to 9.1 with most values between 7.9 and 8.8. In boring ESB1219, the sample from a depth of 2½ feet bgs had a pH of 11 S.U.

Perched groundwater was encountered in the fill in several of the borings. Groundwater was not encountered in the underlying glacial till to the maximum depth (16½ feet bgs) investigated.

#### 4.2.3.2 Sample Analysis Results

Selected soil samples were submitted for analysis per the sample selection criteria specified in Figure A-3 in Appendix A of the RIWP. Soil samples from depths ranging from 2½ to 10½ feet were submitted for analysis (Figure 4-3). In addition, a sample of perched groundwater was collected from boring ESB1219.

Table 4-2 summarizes the soil analytical data for VOCs detected in one or more samples and lists the applicable MTCA Method A and B soil cleanup levels for these VOCs. The analytical results indicate VOCs were either not detected at concentrations above the method reporting limits or were detected at concentrations below the applicable MTCA Method A and B soil cleanup levels, including the most conservative preliminary soil cleanup levels protective of groundwater, in all of the samples analyzed. The concentrations of all the detected VOCs decreased with depth except for toluene and MEK in the 2½ foot and 5 foot bgs samples from boring ESB1216.

Table 4-3 summarizes the soil analytical data for TPH-D and TPH-G, non-halogenated SVOCs, phenol, and pH. This table also lists the MTCA Method A cleanup levels for TPH in soil and the Method B soil cleanup level for phenol. The analytical results indicate non-halogenated SVOCs and phenol were not detected above the method reporting limits. TPH-D and TPH-G were not detected or were detected at concentrations below the MTCA Method A soil cleanup levels. Values of pH were relatively consistent and ranged from 9.1 S.U. to 11 S.U.

Table 4-4 summarizes the analytical data for RCRA metals and strontium in soil samples. This table also lists the appropriate applicable MTCA Method A and B cleanup levels. Metals were either not detected above the method reporting limits or were detected at concentrations below the applicable MTCA Method A and B soil cleanup levels except for arsenic, chromium, and strontium. Arsenic concentrations (2 mg/kg to 5.2 mg/kg) are above the applicable MTCA Method B soil cleanup level (0.667 mg/kg) and the most conservative preliminary soil cleanup level protective of groundwater (0.03 mg/kg), but are less than the Puget Sound background concentration of 7.3 mg/kg (Ecology, 1994) and the MTCA Method A soil cleanup level protective of groundwater (20 mg/kg). Total chromium concentrations ranged from 31.6 mg/kg to 51.9 mg/kg and are below the applicable MTCA Method A and B soil cleanup levels for trivalent chromium (2,000 mg/kg and 120,000 mg/kg, respectively) and the applicable Method B level for hexavalent chromium (240 mg/kg). These concentrations are above the MTCA Method A level (19 mg/kg) and the most conservative preliminary soil cleanup level protective of groundwater (18 mg/kg) for hexavalent chromium. However, all the total chromium concentrations but one are below the Puget Sound background concentration for total chromium of 48.2 mg/kg; at ESB1219 at 10 feet bgs chromium was detected at 51.9 mg/kg. Based on the lack of elevated concentrations of other metals or organic constituents analyzed for in this and other shallower samples from this boring, this concentration is not considered to be indicative of a release. Therefore arsenic and chromium are not recommended for evaluation in the FS for this SWMU/AOC.

Concentrations of strontium ranged from 23.1 mg/kg to 85.2 mg/kg, with 10 of the 19 samples exhibiting strontium concentrations exceeding the most conservative preliminary soil cleanup level protective of groundwater (38.4 mg/kg). All of the detected concentrations are well below the MTCA Method B soil cleanup level protective of direct contact (48,000 mg/kg). Therefore strontium is not recommended for evaluation in the FS for this SWMU/AOC.

Table 4-5 summarizes the analytical data for TPH-D, TPH-G, non-halogenated SVOCs, phenol, RCRA metals and strontium, and pH for the groundwater sample from boring ESB1219. This table also lists the appropriate applicable MTCA Method A and B groundwater cleanup levels. The analytical results indicate non-halogenated SVOCs, silver, and TPH-G were not detected above the method reporting limits. Two VOCs (acetone and MEK), phenol, arsenic, mercury, selenium, and strontium were detected at concentrations below the MTCA cleanup levels. Detected concentrations of TPH-D and the metals barium, cadmium, chromium and lead are above the applicable MTCA Method A or B groundwater cleanup levels. It should be noted that the groundwater sample was an unfiltered sample collected from the open borehole. Therefore, it is likely that the elevated metal concentrations are attributable to soil suspended in the water sample.

Evaluation of the vapor intrusion (VI) pathway for this SWMU/AOC is not recommended for the FS. Screening of the VI pathway was performed in this RI using Ecology's review draft *Guidance for*

*Evaluating Soil Vapor Intrusion in Washington State: Investigation and Remedial Action*, dated October 2009 (VI guidance). Application of the Preliminary Assessment step of the VI guidance to this SWMU shows that seven chemicals present in soil beneath the SWMU/AOC (MEK, carbon disulfide, ethylbenzene, xylenes, toluene, and TPH as diesel and gasoline, Tables 4-2 and 4-3), are sufficiently volatile to be a potential VI source. However, these detections of volatile chemicals are not considered to be a potential source of VI at Building 45-01 for the following reasons:

- The maximum detection of TPH-D in soil (150 mg/kg) is well below the VI screening level for this compound (10,000 mg/kg, WAC 173-340-740[3][iii][C][II]).

- The single detection of TPH-G in soil (12.0 mg/kg) was qualified by the laboratory as "pattern profile does not match a typical gasoline or diesel pattern" and this concentrations does not exceed the protection of groundwater soil cleanup level for TPH-G of 100 mg/kg in accordance with WAC 173-340-740(3)(b)(iii)(C)(III). In addition, TPH-G was not detected in the one grab sample of perched groundwater beneath this SWMU.

- In accordance with WAC 173-340-740(3)(b)(iii)(C)(III), the concentrations of the other detected volatile compounds in soil are less than the protection of groundwater soil cleanup levels calculated based on the MTCA Method A or Method B groundwater cleanup levels.

- Except for TPH-G, the volatile chemical concentrations in the soil samples are at least two orders of magnitude below the lowest soil screening level.

- PID readings taken during field sampling did not indicate organic vapors significantly elevated above background ambient levels in the soil samples.

- Other than TPH-D, concentrations of volatile chemicals detected in the one grab sample of perched groundwater were below the VI screening concentrations provided in the VI guidance. The TPH-D detected in groundwater in 1998 was a low concentration and qualified by the laboratory as "pattern profile does not match a typical diesel pattern."

## 4.3 SWMU/AOC NO. 142 PAINT HANGAR WASTEWATER SUMPS

SWMU/AOC No. 142 includes two sumps, the wastewater flume and the air scrubber flume (Figure 4-1). The clarifier sump, scum sump and associated flumes were installed during the construction of the building in 1969 and the clarifier sump and air scrubber flume were deactivated in December 1997 when the paint hanger was converted from a wet air scrubber system to a dry air filter system. The clarifier sump was reactivated in 2006 after being upgraded with a new coating. The clarifier sump is used infrequently as back-up wastewater storage. Potentially dangerous constituents that may be present within the wastewater discharged to the sumps include acids, metals, petroleum hydrocarbon based solvents, and VOCs. Further details regarding this SWMU/AOC are presented in Section 6.0 of the RIWP.

### 4.3.1 Purpose and Scope

The purpose of the investigation was to assess whether dangerous constituents are present in soil and perched groundwater, if present, in the vicinity of the sumps. The scope of investigation was in general accordance with Section 6.4.2 and included the following:

- Drilled 5 soil borings to depths of 35½ to 45½ feet bgs adjacent to the sumps using a truck-mounted drill rig equipped with hollow-stem auger
- Collected soil samples at prescribed depth intervals
- Field screened samples for organic vapors and pH
- Physical testing of selected soil samples
- Submitted selected soil samples for analysis for VOCs, RCRA metals and strontium, non-halogenated SVOCs, TPH-G, and TPH-D

Deviation from the planned scope of investigation included the termination of two planned borings (ESB1124 and ESB1133) at less than planned depths due to drilling refusal. Drilling through the bottom of the clarifier sump according to an Ecology approved RIWP revision was not successful because water was encountered in the space between the sump floor and the basement floor. In order to avoid providing a path for this water to flow in the soil beneath Building 45-01, this boring location was replaced with ESB1125 (Figure 4-1).

### 4.3.2 Documentation of Drilling and Sampling Activities

Between March 5 and 10, 1998, Dames & Moore monitored drilling of and collected soil samples from five soil borings (ESB1124 through ESB1126, ESB1132, and ESB1133) shown on Figure 4-1. Three borings were completed to a depth of 45½ feet bgs. Due to drilling refusal, soil borings ESB1124 and ESB1133 were terminated at 35½ feet bgs and 42 feet bgs, respectively. Samples were retrieved using either a Dames & Moore U-type or a SPT sampler. After sampling was completed, the borings were backfilled with hydrated bentonite chips and capped with concrete. Drilling techniques and sampling procedures utilized were in general accordance with the SAP presented in Appendix A of the RIWP.

### 4.3.3 Field Observations and Sample Analysis Results

Presented in this section are the field observations and sample results associated with soil borings ESB1124 through ESB1126, ESB1132, and ESB1133. Geologic logs of the soil borings are presented in Appendix C1. The chain of custody forms and analytical laboratory reports are presented in Appendix C2. Data validation reports are in Appendix C3. Analytical results are summarized in Tables 4-6 through 4-8.

#### 4.3.3.1 Field Observations

The area investigated is covered with approximately 9-inch-thick concrete pavement. Underlying the concrete is fill soil consisting of fine to coarse sand with gravel to depths ranging from approximately 1 to 2 feet bgs. The fill soil is underlain by native glacial till consisting of very dense silty fine sand and sandy silt with gravel. A geologic cross-section location is shown on Figure 4-1 and the cross-section depicting the soils encountered adjacent to and below the sumps and the depth samples were collected is shown on Figure 4-3.

Staining or other visual indications of dangerous constituents were not observed. PID readings did not indicate significantly elevated organic vapors above ambient background levels in the soil samples. Field measurements indicate soil pH of 8.0 S.U. to 9.6 S.U. with most values between 8.3 S.U. and 8.7 S.U.

Perched groundwater was not encountered in the fill or glacial till in any of the borings to a maximum explored depth of 45½ feet bgs. Minor zones of wet soil were encountered at a depth of 10 feet bgs in ESB1126 and 18 feet bgs in ESB1132.

#### 4.3.3.2 Sample Analysis Results

Selected soil samples from depths ranging from 20 to 45 feet were submitted for analysis per the sample selection criteria specified in Figure A-5 in Appendix A of the RIWP. The locations of these samples relative to the clarifier sump are shown on Figure 4-3.

Table 4-6 summarizes the soil analytical data for VOCs detected in one or more samples and lists the applicable MTCA Method A and B soil cleanup levels for the detected VOCs. The analytical results indicate detected VOC concentrations are less than applicable MTCA Method A and B soil cleanup levels based on direct contact in all the samples analyzed.

The detection limits for tetrachloroethene (PCE) in soil (1.0 µg/kg to 1.1 µg/kg) and the five detections of PCE (ranging from 1.1 µg/kg to 1.6 µg/kg) exceed the most conservative preliminary soil cleanup level protective of groundwater (0.86 µg/kg) but do not exceed the MTCA Method A cleanup level protective of both direct contact and groundwater (50 µg/kg).

Table 4-7 summarizes the soil analytical data for TPH-D, TPH-G, and non-halogenated SVOCs. The analytical results indicate TPH-G, TPH-D, and non-halogenated SVOCs were not detected above the method reporting limits.

Table 4-8 summarizes the analytical data for RCRA metals and strontium in soil samples. This table also lists the applicable MTCA Method A and B cleanup levels. Metals were either not detected above method reporting limits or the detected concentrations were below the applicable MTCA Method A or B cleanup levels except for arsenic, chromium, and strontium. Arsenic concentrations ranged from 0.9 mg/kg to 14.9 mg/kg and were above the applicable MTCA Method B soil cleanup level (0.667 mg/kg) and the most conservative preliminary soil cleanup level protective of groundwater (0.03 mg/kg). However, the arsenic concentrations were generally less than the MTCA Method A soil cleanup level protective of groundwater (20 mg/kg) and the Puget Sound background concentration of 7.30 mg/kg (Ecology, 1994), except for one sample from 35 feet bgs in ESB1124 (14.9 mg/kg). Total chromium concentrations ranged from 29.2 mg/kg to 52.6 mg/kg and are below the applicable MTCA Method A and B soil cleanup levels for trivalent chromium (2,000 mg/kg and 120,000 mg/kg, respectively) and the applicable Method B level for hexavalent chromium (240 mg/kg). These concentrations are above the MTCA Method A level (19 mg/kg) and the most conservative preliminary soil cleanup level protective of groundwater (18 mg/kg) for hexavalent chromium. Total chromium concentrations were also below the Puget Sound background concentration of 48.2 mg/kg with one exception; chromium at ESB1133 at 30 feet bgs was 52.6 mg/kg. Based on the lack of elevated concentrations of metals and organic constituents analyzed in the two samples and other shallower samples from these two borings, the arsenic and chromium concentrations are not considered indicative of a release and are not recommended for evaluation in the FS.

Concentrations of strontium ranged from 25.0 mg/kg to 44.8 mg/kg, with seven of the 20 samples exhibiting strontium concentrations exceeding the most conservative preliminary soil cleanup level protective of groundwater (38.4 mg/kg) but well below the MTCA Method B soil cleanup level protective of direct contact (48,000 mg/kg).

Evaluation of the vapor intrusion (VI) pathway for SWMU/AOC No. 142 is not recommended for the FS. Screening of the VI pathway was performed in this RI using Ecology's review draft *Guidance for Evaluating Soil Vapor Intrusion in Washington State: Investigation and Remedial Action*, dated October 2009 (VI guidance). Application of the Preliminary Assessment step of the VI guidance to this SWMU shows that four chemicals present in soil beneath the SWMU/AOC (MEK, styrene, PCE, and toluene, Table 4-6), are sufficiently volatile to be a potential VI source. However, these detections of volatile chemicals are not considered to potential source of VI for Building 45-01 the following reasons:

- In accordance with WAC 173-340-740(3)(b)(iii)(C)(III), the concentrations of volatile chemicals detected are less than the protection of groundwater soil cleanup levels calculated based on the MTCA Method A groundwater cleanup levels or Method B where no Method A value is available (Table 4-6).

- The volatile chemical concentrations in the soil samples are at least an order of magnitude below the lowest soil screening level.

- PID readings taken during field sampling generally did not indicate organic vapors significantly elevated above background ambient levels in the soil samples.

Metals and PCE detected in soil near SWMU/AOC No. 142 are not recommended as constituents for further evaluation in the FS because:

- All the detected soil metal concentrations are within the typical range detected in native soils at the Boeing Everett site

- There is no indication of a wastewater release at this SWMU/AOC; there would be other organic constituents with noticeably elevated concentrations if there were releases of wastewater containing elevated metals concentrations based on the known use of chemical products in the paint hangar and waste streams generated that flowed through the flumes

- All detected metals concentrations are below the applicable MTCA A and/or B soil cleanup levels for direct contact and/or regional background concentrations

- The five detections of PCE exceed the most conservative preliminary soil cleanup level protective of groundwater but do not exceed the MTCA Method A cleanup level protective of both direct contact and groundwater protection

- Groundwater was not encountered beneath this SWMU/AOC to a depth of 45½ feet bgs and known groundwater (Esperance Sand) occurs at depth of approximately 200 feet bgs.

#### 4.3.3.3 Physical Testing Results

Eleven soil samples of glacial till soils collected from adjacent to and below the sumps were tested for one or more physical parameters including moisture content, effective porosity, percent saturation, and hydraulic conductivity. The laboratory reports are presented in Appendix S and pertinent results are described below. The porosity of the soils from depths of 10 to 27½ feet bgs is on the order of 34% to 36%. Deeper samples from 40 feet bgs have a lower porosity 25% and 29% consistent with the higher amount of coarse sand and gravel in these soils relative to the shallower soils. The moisture content (4% to 10% dry weight) and percent saturation (27% to 49% volume) are relatively low and generally decrease with depth. These results support the interpretation that the chemical analysis results indicate there has not been leakage from the sumps. Vertical hydraulic conductivity values for five samples of the glacial till soils range from 1.24 x $10^{-5}$ to 1.39 x $10^{-4}$ cm/sec (0.04 to 0.39 ft/ day). Horizontal hydraulic conductivity values for two samples of the glacial till soils range from 1.18 x $10^{-5}$ and 1.30 x $10^{-5}$ cm/sec (0.03 to 0.04 ft/day).

## 4.4 CONCLUSIONS AND RECOMMENDATIONS

### 4.4.1 Former Solvent USTs (SWMU/AOC No. 93)

Based on the analytical results discussed in Section 4.1.3.2, the soil in the vicinity of the former USTs EV-18, EV-19, EV-20, EV-54 does not contain VOCs at concentrations above applicable MTCA Method A and B cleanup levels. The limited, discontinuous perched groundwater and the presence of low levels of VOCs (below MTCA cleanup levels) in the underlying glacial till indicate that migration of perched groundwater is not significant. The concentrations of MEK in soil within 100 feet of Building 45-01 warrant evaluation of the VI pathway and protection of groundwater for this SWMU/AOC in the FS.

### 4.4.2 Paint Hangar Wastewater Flumes (SWMU/AOC No. 142)

Based on the analytical results discussed in Section 4.2.3.2, the soil in the vicinity of the wastewater flumes does not contain concentrations of VOCs, TPH-D, and TPH-G, non-halogenated SVOCs, and phenol above the applicable MTCA Method A and B soil cleanup levels. Metals detected are also below the applicable MTCA Method A and B soil cleanup levels or Puget Sound background levels except for:

- One total chromium concentration (51.9 mg/kg) at ESB1219 at 10 feet bgs that is above the Puget Sound soil background concentration of 48.2 mg/kg (Ecology, 1994). The detected concentrations of chromium were within a relatively narrow range of approximately 32 mg/kg to 52 mg/kg) and are consistent with chromium concentrations detected in soil across the Everett facility.

- Strontium was detected in approximately half of the samples exceeding the most conservative preliminary soil cleanup level protective of groundwater (38.4 mg/kg). The detected concentrations of strontium were within a relatively narrow range of approximately 32 mg/kg to 41 mg/kg and are consistent with strontium concentrations detected in soil across the Everett facility.

Based on the consistent strontium and chromium concentrations detected and lack of elevated concentrations of other metals or organic constituents analyzed for in the soil samples near this SWMU/AOC, the slightly elevated chromium concentration in one sample and detected strontium concentrations are not considered indicative of a release and these constituents are not recommended for evaluation in the FS for this SWMU/AOC.

Groundwater is locally present perched within the coarse fill between the concrete floor and the underlying glacial till. An unfiltered sample of groundwater was collected from the open borehole at one location (ESB1219). Non-halogenated SVOCs, TPH-G, VOCs, phenol and several metals were either not detected above method reporting limits or were detected at concentrations less than the applicable MTCA Method A or B groundwater cleanup levels. TPH-D and the metals barium, cadmium, chromium, and lead are the only compounds detected at concentrations above the applicable MTCA Method A or B groundwater cleanup levels in this sample. The metals concentrations are likely due to sediment in the unfiltered sample. The limited, discontinuous occurrence of perched groundwater and the lack of soil concentrations of TPH-D and metals exceeding MTCA cleanup levels in the underlying glacial till soil indicate that migration of perched groundwater is not significant. In addition, the perched water does not represent a risk to human health and the environment due to the lack of exposure or transport pathways under current site conditions.

No further investigation and remedial action are warranted for this SWMU/AOC and it is not recommended for inclusion in the FS.

### 4.4.3 Paint Hangar Wastewater Sumps (SWMU/AOC No. 142)

Based on the analytical results discussed in Section 4.3.3.2, the soil in the vicinity of the wastewater sumps does not contain VOCs, TPH-G, TPH-D, non-halogenated SVOCs, and phenol above the applicable MTCA Method A or B cleanup levels. Metals detected are also below the applicable MTCA Method A and B soil cleanup levels and Puget Sound soil background concentrations except for:

- The arsenic concentration is greater than the Puget Sound background concentration of 7.3 mg/kg (Ecology, 1994) in one sample (14.9 mg/kg) from 35 feet bgs in boring ESB1124.
- The chromium concentration is greater than the Puget Sound background concentration of 48.2 mg/kg (Ecology, 1994) in one sample (52.6 mg/kg) at ESB1133 at 30 feet bgs.

The two elevated values noted above appear to be anomalous because no other metals or organic compounds analyzed for were elevated in these or other samples from the two borings, and the soil moisture appeared similar to the other samples without elevated constituent concentrations in this area. Therefore, these concentrations are not considered indicative of a release and are not recommended for evaluation in the FS for this SWMU/AOC..

Strontium was detected in all of the soil samples analyzed for this metal at concentrations approximately 1,000 times below the MTCA Method B soil cleanup level protective of direct contact (48,000 mg/kg). The concentrations in slightly less than half of the samples exceed the most conservative preliminary soil cleanup level protective of groundwater (38.4 mg/kg) but all the detected concentrations were within a relatively narrow range of approximately 25 to 45 mg/kg consistent with strontium concentrations detected across the Everett facility. Therefore, the strontium concentrations detected are not considered indicative of a release, and are not recommended for evaluation in the FS for this SWMU/AOC. Groundwater was not encountered in the glacial till underlying the SWMU/AOC No. 142 sumps to the maximum depth investigated of 45½ feet bgs.

No further investigation and remedial action are warranted for this SWMU/AOC and is not recommended for inclusion in the FS.

## 4.5 REFERENCES

Dames & Moore, 2000 Supplemental Remedial Investigation Work Plan (Revision 1.0), BCAG Everett Plant, Everett, WA, March 31, 2000.

Washington State Department of Ecology, 1994, Natural Background Soil Metals in Washington State, Publication #94-115.

**Table 4-1**
**Summary of Soil Sample Analytical Results for Volatile Organic Compounds, (ug/kg)**
**Building 45-01 (Former USTs)**
**Boeing Everett Plant Remedial Investigation**

| Sample ID/Date | | 1,1-Dichloroethene | 1,1-Dichloropropene | 1,1,2-Trichloro-1,2,2-trifluoroethane | 1,2,4-Trimethylbenzene | 1,2-Dichlorobenzene | 1,3,5-Trimethylbenzene | 1,3-Dichlorobenzene | 1,4-Dichlorobenzene | 2-Butanone (MEK) | 2-Chlorotoluene |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1996 MTCA Method B Soil Cleanup Value | | 1,670 | NE | NE | NE | 7,200,000 | NE | NE | 41,710 | 48,000,000 | NE |
| 1996 MTCA Method B 100x GW Soil Cleanup Level | | 7,200 | NE | NE | NE | 72,000 | NE | NE | 182 | 480,000 | NE |
| 2001 MTCA Method A or B Soil Cleanup Level | | 1,670 (B)<br>4,000 (B*) | NE | 2,400,000,000 (B*) | 4,000,000 (B*) | 7,200,000 (B) | 4,000,000 (B*) | NE | 41,700 (B) | 48,000,000 (B) | 1,600,000 (B) |
| MTCA Method A or B Protection of Groundwater | | 2,862 (B) | NE | 960,000 (B) | 1,600 (B) | 8,435 (B) | 1,600 (B) | NE | 30 (B) | 19,200 (B) | 640 (B) |
| ESB1122-12.5' | 03/04/98 | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 5.4 U | 1.1 U |
| ESB1122-15' | 03/04/98 | 1.0 U | 1.0 U | 1.0 U | 1.0 U | 1.0 U | 1.0 U | 1.0 U | 1.0 U | 5.2 U | 1.0 U |
| ESB1123-12.5' | 03/04/98 | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 5.3 U | 1.1 U |
| ESB1123-15' | 03/04/98 | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 5.3 U | 1.1 U |
| ESB1127-12.5' | 03/09/98 | 1.1 U | 1.1 U | 2.2 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 5.4 U | 1.1 U |
| ESB1127-15' | 03/09/98 | 1.0 U | 1.0 U | 2.1 U | 1.0 U | 1.0 U | 1.0 U | 1.0 U | 1.0 U | 5.2 U | 1.0 U |
| ESB1128-10' | 03/09/98 | 1.1 U | 1.1 U | 2.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 5.3 U | 1.1 U |
| ESB1128-12.5' | 03/09/98 | 1.1 U | 1.1 U | 2.2 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 5.4 U | 1.1 U |
| ESB1129-2.5' | 03/09/98 | 1.0 U | 1.0 U | 2.0 U | 1.0 U | 1.0 U | 1.0 U | 1.0 U | 1.0 U | 5.1 U | 1.0 U |
| ESB1129-6.5' | 03/09/98 | 1.1 U | 1.1 U | 2.2 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 5.5 U | 1.1 U |
| ESB1130-12.5' | 03/09/98 | 1.0 U | 1.0 U | 2.1 U | 1.0 U | 1.0 U | 1.0 U | 1.0 U | 1.0 U | 5.1 U | 1.0 U |
| ESB1130-15' | 03/09/98 | 1.1 U | 1.1 U | 2.2 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 5.4 U | 1.1 U |
| ESB1131-12.5' | 03/09/98 | 1.4 | 2.5 | 5.8 J | 2.8 | 1.8 | 2.8 | 3.2 | 3.1 | 5.2 U | 2.4 |
| ESB1131-15' | 03/09/98 | 1.1 U | 1.1 U | 2.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 5.3 U | 1.1 U |
| ESB1134-4.5' | 03/10/98 | 1.1 U | 1.1 U | 2.2 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 5.4 U | 1.1 U |
| ESB1134-6.5' | 03/10/98 | 1.0 U | 1.0 U | 2.1 U | 1.0 U | 1.0 U | 1.0 U | 1.0 U | 1.0 U | 5.2 U | 1.0 U |
| ESB1134-8.5' | 03/10/98 | 1.1 U | 1.1 U | 2.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 330 | 1.1 U |
| ESB1136-10' | 03/12/98 | 1.0 U | 1.0 U | 2.0 U | 1.0 U | 1.0 U | 1.0 U | 1.0 U | 1.0 U | 170 | 1.0 U |
| ESB1136-17.5' | 03/12/98 | 1.0 U | 1.0 U | 2.0 U | 1.0 U | 1.0 U | 1.0 U | 1.0 U | 1.0 U | 91 | 1.0 U |
| ESB1137-10' | 03/12/98 | 1.1 U | 1.1 U | 2.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 3,500 | 1.1 U |
| ESB1137-17.5' | 03/12/98 | 1.1 U | 1.1 UJ | 2.1 U | 1.1 UJ | 1.1 UJ | 1.1 UJ | 1.1 UJ | 1.1 UJ | 110 | 1.1 UJ |
| ESB1138-4.5' | 03/12/98 | 1.1 U | 1.1 U | 2.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 67 | 1.1 U |
| ESB1138-6.5' | 03/12/98 | 1.1 U | 1.1 U | 2.2 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 63 | 1.1 U |
| ESB1139-10' | 03/12/98 | 1.1 U | 1.1 U | 2.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 9,200 | 1.1 U |
| ESB1139-17.5' | 03/12/98 | 1.0 U | 1.0 U | 2.1 U | 1.0 U | 1.0 U | 1.0 U | 1.0 U | 1.0 U | 57 | 1.0 U |
| ESB1140-12.5' | 03/12/98 | 1.0 U | 1.0 U | 2.1 U | 1.0 U | 1.0 U | 1.0 U | 1.0 U | 1.0 U | 54,000 | 1.0 U |
| ESB1140-12.5' (DUP) | 03/12/98 | 2.0 U | 1.0 U | 1.0 U | 1.0 U | 1.0 U | 1.0 U | 1.0 U | 1.0 U | 62,000 | 1.0 U |
| ESB1140-17.5' | 03/12/98 | 1.1 U | 1.1 U | 2.2 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 82,000 J | 1.1 U |
| ESB1140-22.5' | 03/12/98 | 1.1 U | 1.1 U | 2.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 370 | 1.1 U |
| ESB1140-27.5' | 03/12/98 | 1.1 U | 1.1 U | 2.2 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 160 | 1.1 U |
| ESB1141-10' | 03/12/98 | 1.1 U | 1.1 U | 2.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 5,100 | 1.1 U |
| ESB1141-17.5' | 03/12/98 | 1.1 U | 1.1 U | 2.3 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 110 | 1.1 U |
| ESB1386-17.5' | 06/14/00 | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 140,000 | 1.1 U |
| ESB1386-17.5' (DUP) | 06/14/00 | 1.0 U | 1.0 U | 1.0 U | 1.0 U | 1.0 U | 1.0 U | 1.0 U | 1.0 U | 100,000 | 1.0 U |
| ESB1386-22.5' | 06/14/00 | 7.3 U | 7.3 U | 7.3 U | 7.3 U | 7.3 U | 7.3 U | 7.3 U | 7.3 U | 1,800 | 7.3 U |

**Notes:**
MTCA - Model Toxics Control Act
(A) - MTCA Method A soil cleanup level for unrestricted land use
(B) - MTCA Method B soil cleanup level
(B*) Revised 2001 MTCA Method B value from Ecology website CLARC tables downloaded June 2010 (https://fortress.wa.gov/ecy/clarc/reporting/CLARCReporting.aspx).
1996 - Indicates MTCA soil cleanup levels, published 1996.
2001 - Indicates MTCA version 3.1 soil cleanup levels, published 2001.
(DUP) - Field duplicate
NE - Not established
U - Compound was analyzed for but not detected above the reporting limit shown.
UJ - Compound was analyzed for but not detected above the reporting limit shown. Reporting limit is an estimated value.
* Analyte was qualified as not detected during data validation due to method blank contamination.
Numbers in grey shading indicate results that exceed a MTCA protection of groundwater level, but do not exceed the current lowest MTCA soil cleanup level protective of direct contact.

**Table 4-1**
**Summary of Soil Sample Analytical Results for Volatile Organic Compounds, (ug/kg)**
**Building 45-01 (Former USTs)**
**Boeing Everett Plant Remedial Investigation**

| Sample ID/Date | | 4-Chlorotoluene | 4-Isopropyltoluene | Acetone | Bromobenzene | Carbon Disulfide | Carbon Tetrachloride | Chlorobenzene | Ethylbenzene | Hexachloro-butadiene | Isopropylbenzene | m,p-Xylene |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1996 MTCA Method B Soil Cleanup Value | | NE | NE | 8,000,000 | NE | 8,000,000 | 7,690 | 160,000 | 8,000,000 | 12,800 | NE | 160,000,000 |
| 1996 MTCA Method B 100x GW Soil Cleanup Level | | NE | NE | 80,000 | NE | 80,000 | 33.7 | 16,000 | 80,000 | 56.1 | NE | 1,600,000 |
| 2001 MTCA Method A or B Soil Cleanup Level | | NE | NE | 8,000,000 (B) | NE | 8,000,000 (B) | 7,690 (B) | 1,600,000 (B) | 6,000 (A) 8,000,000 (B) | 12,820 (B) | NE | 9,000 (A) 160,000,000 (B) |
| MTCA Method A or B Protection of Groundwater | | NE | NE | 3,211 (B) | NE | 5,651 (B) | 3.1 (B) | 1,399 (B) | 6,000 (A) 6,912 (B) | 605 (B) | 3,200 (B) | 135,068 (B) |
| ESB1122-12.5' | 03/04/98 | 1.1 U | 1.1 U | 5.4 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 5.4 U | 1.1 U | 2.2 U |
| ESB1122-15' | 03/04/98 | 1.0 U | 1.0 U | 5.2 U | 1.0 U | 1.0 U | 1.0 U | 1.0 U | 1.0 U | 5.2 U | 1.0 U | 2.1 U |
| ESB1123-12.5' | 03/04/98 | 1.1 U | 1.1 U | 6.0 | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 5.3 U | 1.1 U | 2.1 U |
| ESB1123-15' | 03/04/98 | 1.1 U | 1.1 U | 5.8 | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 5.3 U | 1.1 U | 2.1 U |
| ESB1127-12.5' | 03/09/98 | 1.1 U | 1.1 U | 10 U* | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 5.4 U | 1.1 U | 2.2 U |
| ESB1127-15' | 03/09/98 | 1.0 U | 1.0 U | 10 U* | 1.0 U | 1.0 U | 1.0 U | 1.0 U | 1.0 U | 5.2 U | 1.0 U | 2.1 U |
| ESB1128-10' | 03/09/98 | 1.1 U | 1.1 U | 11 U* | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 5.3 U | 1.1 U | 2.1 U |
| ESB1128-12.5' | 03/09/98 | 1.1 U | 1.1 U | 10 U* | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 5.4 U | 1.1 U | 2.2 U |
| ESB1129-2.5' | 03/09/98 | 1.0 U | 1.0 U | 6 U* | 1.0 U | 1.0 U | 1.0 U | 1.0 U | 1.0 U | 5.1 U | 1.0 U | 2.0 U |
| ESB1129-6.5' | 03/09/98 | 1.1 U | 1.1 U | 11 U* | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 5.5 U | 1.1 U | 2.2 U |
| ESB1130-12.5' | 03/09/98 | 1.0 U | 1.0 U | 9.5 U* | 1.0 U | 1.0 U | 1.0 U | 1.0 U | 1.0 U | 5.1 U | 1.0 U | 2.1 U |
| ESB1130-15' | 03/09/98 | 1.1 U | 1.1 U | 10 U* | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 5.4 U | 1.1 U | 2.2 U |
| ESB1131-12.5' | 03/09/98 | 2.9 | 4.3 | 10 U* | 1.1 | 1.7 U** | 1.2 | 1.3 | 1.9 | 5.8 | 2.2 | 4.6 |
| ESB1131-15' | 03/09/98 | 1.1 U | 1.1 U | 10 U* | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 5.3 U | 1.1 U | 2.1 U |
| ESB1134-4.5' | 03/10/98 | 1.1 U | 1.1 U | 12 U* | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 5.4 U | 1.1 U | 2.2 U |
| ESB1134-6.5' | 03/10/98 | 1.0 U | 1.0 U | 20 U* | 1.0 U | 1.0 U | 1.0 U | 1.0 U | 1.0 U | 5.2 U | 1.0 U | 2.1 U |
| ESB1134-8.5' | 03/10/98 | 1.1 U | 1.1 U | 34 U* | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 5.3 U | 1.1 U | 2.1 U |
| ESB1136-10' | 03/12/98 | 1.0 U | 1.0 U | 25 U* | 1.0 U | 1.0 U | 1.0 U | 1.0 U | 1.0 U | 5.1 U | 1.0 U | 2.0 U |
| ESB1136-17.5' | 03/12/98 | 1.0 U | 1.0 U | 15 U* | 1.0 U | 1.0 U | 1.0 U | 1.0 U | 1.0 U | 5.1 U | 1.0 U | 2.0 U |
| ESB1137-10' | 03/12/98 | 1.1 U | 1.1 U | 51 U* | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 5.4 U | 1.1 U | 2.1 U |
| ESB1137-17.5' | 03/12/98 | 1.1 UJ | 1.1 UJ | 20 U* | 1.1 UJ | 1.1 U | 1.1 U | 1.1 UJ | 1.1 UJ | 5.3 UJ | 1.1 UJ | 2.1 UJ |
| ESB1138-4.5' | 03/12/98 | 1.1 U | 1.1 U | 18 U* | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 5.3 U | 1.1 U | 2.1 U |
| ESB1138-6.5' | 03/12/98 | 1.1 U | 1.1 U | 18 U* | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 5.4 U | 1.1 U | 2.2 U |
| ESB1139-10' | 03/12/98 | 1.1 U | 1.1 U | 220 | 1.1 U | 1.1 | 1.1 U | 1.1 U | 1.1 U | 5.3 U | 1.1 U | 2.1 U |
| ESB1139-17.5' | 03/12/98 | 1.0 U | 1.0 U | 14 U* | 1.0 U | 1.0 U | 1.0 U | 1.0 U | 1.0 U | 5.2 U | 1.0 U | 2.1 U |
| ESB1140-12.5' | 03/12/98 | 1.0 U | 1.0 U | 2,400 | 1.0 U | 3.5 | 1.0 U | 1.0 U | 1.0 U | 5.2 U | 1.0 U | 2.1 U |
| ESB1140-12.5' (DUP) | 03/12/98 | 1.0 U | 1.0 U | 2,200 | 1.0 U | 4.4 | 1.0 U | 1.0 U | 1.0 U | 5.1 U | 1.0 U | 2.0 U |
| ESB1140-17.5' | 03/12/98 | 1.1 U | 1.1 U | 1,800 | 1.1 U | 7.7 | 1.1 U | 1.1 U | 1.1 U | 5.5 U | 1.1 U | 2.2 U |
| ESB1140-22.5' | 03/12/98 | 1.1 U | 1.1 U | 33 U* | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 5.3 U | 1.1 U | 2.1 U |
| ESB1140-27.5' | 03/12/98 | 1.1 U | 1.1 U | 24 U* | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 5.4 U | 1.1 U | 2.2 U |
| ESB1141-10' | 03/12/98 | 1.1 U | 1.1 U | 140 | 1.1 U | 1.2 | 1.1 U | 1.1 U | 1.1 U | 5.4 U | 1.1 U | 2.1 U |
| ESB1141-17.5' | 03/12/98 | 1.1 U | 1.1 U | 16 U* | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 5.7 U | 1.1 U | 2.3 U |
| ESB1386-17.5' | 06/14/00 | 1.1 U | 1.1 U | 280 | 1.1 U | 4.0 | 1.1 U | 1.1 U | 1.4 | 5.6 U | 1.1 U | 12 |
| ESB1386-17.5' (DUP) | 06/14/00 | 1.0 U | 1.0 U | 250 | 1.0 U | 5.4 | 1.0 U | 1.0 U | 1.0 U | 5.2 U | 1.0 U | 2.7 |
| ESB1386-22.5' | 06/14/00 | 7.3 U | 7.3 U | 72 U* | 7.3 U | 7.3 U | 7.3 U | 7.3 U | 7.3 U | 36.0 U | 7.3 U | 26 |

**Notes:**
MTCA - Model Toxics Control Act
(A) - MTCA Method A soil cleanup level for unrestricted land use
(B) - MTCA Method B soil cleanup level
(B*) Revised 2001 MTCA Method B value from Ecology website CLARC tables downloaded June 2010 (https://fortress.wa.gov/ecy/clarc/reporting/CLARCReporting.aspx).
1996 - Indicates MTCA soil cleanup levels, published 1996.
2001 - Indicates MTCA version 3.1 soil cleanup levels, published 2001.
(DUP) - Field duplicate
NE - Not established
U - Compound was analyzed for but not detected above the reporting limit shown.
UJ - Compound was analyzed for but not detected above the reporting limit shown. Reporting limit is an estimated value.
* Analyte was qualified as not detected during data validation due to method blank contamination.
** Carbon Disulfide detected in sample ESB1131-12.5' was qualified as not detected due to rinsate blank results.
Numbers in grey shading indicate results that exceed the preliminary soil cleanup levels protective of groundwater, but do not exceed the soil cleanup level protective of direct contact.

**Table 4-1**
**Summary of Soil Sample Analytical Results for Volatile Organic Compounds, (ug/kg)**
**Building 45-01 (Former USTs)**
**Boeing Everett Plant Remedial Investigation**

| Sample ID/Date | | n-Butylbenzene | n-Propylbenzene | o-Xylene | sec-Butylbenzene | Styrene | tert-Butylbenzene | Tetrachloroethene | Toluene | trans-1,2-Dichloroethene | Trichloroethene | Trichloro-fluoromethane |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1996 MTCA Method B Soil Cleanup Value | | NE | NE | 160,000,000 | NE | 33,300 | NE | 19,600 | 16,000,000 | 1,600,000 | 90,900 | 24,000,000 |
| 1996 MTCA Method B 100x GW Soil Cleanup Level | | NE | NE | 1,600,000 | NE | 146 | NE | 85.8 | 160,000 | 16,000 | 398 | 240,000 |
| 2001 MTCA Method A or B Soil Cleanup Level | | NE | NE | 9,000 (A)<br>160,000,000 (B) | NE | 33,300 (B) | NE | 50 (A)<br>19,600 (B)<br>1,900 (B*) | 7,000 (A)<br>16,000,000 (B)<br>6,400,000 (B*) | 1,600,000 (B) | 30 (A)<br>90,900 (B)<br>11,000 (B*) | 24,000,000 (B) |
| MTCA Method A or B Protection of Groundwater | | NE | NE | 147,027 (B) | NE | 33 (B) | NE | 50 (A)<br>0.86 (B) | 7,000 (A)<br>4,654 (B) | 868 (B) | 30 (A)<br>3.2 (B) | 9,600 (B) |
| ESB1122-12.5' | 03/04/98 | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 2.2 U |
| ESB1122-15' | 03/04/98 | 1.0 U | 1.0 U | 1.0 U | 1.0 U | 1.0 U | 1.0 U | 1.0 U | 1.0 U | 1.0 U | 1.0 U | 2.1 U |
| ESB1123-12.5' | 03/04/98 | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.3 | 1.1 U | 1.1 U | 2.1 U |
| ESB1123-15' | 03/04/98 | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 2.1 U |
| ESB1127-12.5' | 03/09/98 | 2.2 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 2.2 U |
| ESB1127-15' | 03/09/98 | 2.1 U | 1.0 U | 1.0 U | 1.0 U | 1.0 U | 1.0 U | 1.0 U | 1.0 U | 1.0 U | 1.0 U | 2.1 U |
| ESB1128-10' | 03/09/98 | 2.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 2.1 U |
| ESB1128-12.5' | 03/09/98 | 2.2 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 2.2 U |
| ESB1129-2.5' | 03/09/98 | 2.0 U | 1.0 U | 1.0 U | 1.0 U | 1.0 U | 1.0 U | 1.0 U | 1.0 U | 1.0 U | 1.0 U | 2.0 U |
| ESB1129-6.5' | 03/09/98 | 2.2 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 2.2 U |
| ESB1130-12.5' | 03/09/98 | 2.1 U | 1.0 U | 1.0 U | 1.0 U | 1.0 U | 1.0 U | 1.0 U | 1.3 | 1.0 U | 1.0 U | 2.1 U |
| ESB1130-15' | 03/09/98 | 2.2 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 2.2 U |
| ESB1131-12.5' | 03/09/98 | 6.6 J | 3.8 | 1.2 | 3.4 | 1.1 | 1.8 | 5.2 | 1.5 | 1.3 | 2.0 | 2.6 |
| ESB1131-15' | 03/09/98 | 2.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 2.1 U |
| ESB1134-4.5' | 03/10/98 | 2.2 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 2.2 U |
| ESB1134-6.5' | 03/10/98 | 2.1 U | 1.0 U | 1.0 U | 1.0 U | 1.0 U | 1.0 U | 1.7 | 51.0 | 1.0 U | 1.0 U | 2.1 U |
| ESB1134-8.5' | 03/10/98 | 2.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 24.0 | 1.1 U | 1.1 U | 2.1 U |
| ESB1136-10' | 03/12/98 | 2.0 U | 1.0 U | 1.0 U | 1.0 U | 1.0 U | 1.0 U | 1.0 U | 120.0 | 1.0 U | 1.0 U | 2.0 U |
| ESB1136-17.5' | 03/12/98 | 2.0 U | 1.0 U | 1.0 U | 1.0 U | 1.0 U | 1.0 U | 1.0 U | 1.0 U | 1.0 U | 1.0 U | 2.0 U |
| ESB1137-10' | 03/12/98 | 2.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 2.1 U |
| ESB1137-17.5' | 03/12/98 | 2.1 UJ | 1.1 UJ | 1.1 UJ | 1.1 UJ | 1.1 UJ | 1.1 UJ | 1.1 UJ | 1.1 U | 1.1 UJ | 1.1 U | 2.1 UJ |
| ESB1138-4.5' | 03/12/98 | 2.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 2.1 U |
| ESB1138-6.5' | 03/12/98 | 2.2 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 37.0 | 1.1 U | 1.1 U | 2.2 U |
| ESB1139-10' | 03/12/98 | 2.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.3 | 1.1 U | 1.1 U | 2.1 U |
| ESB1139-17.5' | 03/12/98 | 2.1 U | 1.0 U | 1.0 U | 1.0 U | 1.0 U | 1.0 U | 1.0 U | 1.0 U | 1.0 U | 1.0 U | 2.1 U |
| ESB1140-12.5' | 03/12/98 | 2.1 U | 1.0 U | 1.0 U | 1.0 U | 1.0 U | 1.0 U | 1.0 U | 1.1 | 1.0 U | 1.0 U | 2.1 U |
| ESB1140-12.5' (DUP) | 03/12/98 | 2.0 U | 1.0 U | 1.0 U | 1.0 U | 1.0 U | 1.0 U | 1.0 U | 1.6 | 1.0 U | 1.0 U | 2.0 U |
| ESB1140-17.5' | 03/12/98 | 2.2 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 2.2 U |
| ESB1140-22.5' | 03/12/98 | 2.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 2.1 U |
| ESB1140-27.5' | 03/12/98 | 2.2 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 2.2 U |
| ESB1141-10' | 03/12/98 | 2.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 2.1 U |
| ESB1141-17.5' | 03/12/98 | 2.3 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 2.3 U |
| ESB1386-17.5' | 06/14/00 | 2.3 U | 1.1 U | 1.7 | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U |
| ESB1386-17.5' (DUP) | 06/14/00 | 2.1 U | 1.0 U | 1.0 U | 1.0 U | 1.0 U | 1.0 U | 1.0 U | 1.0 U | 1.0 U | 1.0 U | 1.0 U |
| ESB1386-22.5' | 06/14/00 | 15 U | 7.3 U | 7.3 U | 7.3 U | 7.3 U | 7.3 U | 7.3 U | 7.3 U | 7.3 U | 7.3 U | 7.3 U |

**Notes:**
MTCA - Model Toxics Control Act
(A) - MTCA Method A soil cleanup level for unrestricted land use
(B) - MTCA Method B soil cleanup level
(B*) Revised 2001 MTCA Method B value from Ecology website CLARC tables downloaded June 2010 (https://fortress.wa.gov/ecy/clarc/reporting/CLARCReporting.aspx).
1996 - Indicates MTCA soil cleanup levels, published 1996.
2001 - Indicates MTCA version 3.1 soil cleanup levels, published 2001.
(DUP) - Field duplicate
NE - Not established
U - Compound was analyzed for but not detected above the reporting limit shown.
UJ - Compound was analyzed for but not detected above the reporting limit shown. Reporting limit is an estimated value.
* Analyte was qualified as not detected during data validation due to method blank contamination.
Numbers in grey shading indicate results that exceed a MTCA protection of groundwater level, but do not exceed the current lowest MTCA soil cleanup level protective of direct contact.

**Table 4-2**
**Summary of Soil Sample Analytical Results for Volatile Organic Compounds, (ug/kg)**
**Building 45-01 Flumes**
**Boeing Everett Plant Remedial Investigation**

| Sample ID/Date | | 2-Butanone | Acetone | Carbon Disulfide | Ethylbenzene | m,p-Xylene | o-Xylene | Toluene |
|---|---|---|---|---|---|---|---|---|
| 1996 MTCA Method B Soil Cleanup Level | | 48,000,000 | 8,000,000 | 8,000,000 | 8,000,000 | 160,000,000 | 160,000,000 | 16,000,000 |
| 1996 MTCA Method B 100 x GW Soil Cleanup Level | | 480,000 | 80,000 | 80,000 | 80,000 | 1,600,000 | 1,600,000 | 160,000 |
| 2001 MTCA Method A and B Soil Cleanup Level | | 48,000,000 (B) | 8,000,000 (B) | 8,000,000 (B) | 6,000 (A)<br>8,000,000 (B) | 9,000 (A)<br>160,000,000 (B) | 9,000 (A)<br>160,000,000 (B) | 7,000 (A)<br>16,000,000 (B)<br>6,400,000 (B*) |
| MTCA Method A and B Protection of Groundwater | | 19,200 (B) | 3,211 (B) | 5,651 (B) | 6,000 (A)<br>6,912 (B) | 135,068 (B) | 147,027 (B) | 7,000 (A)<br>4,654 (B) |
| ESB1216-2 1/2' | 05/09/98 | 6.4 U* | 12 U* | 1.1 U | 1.1 U | 2.2 U | 1.1 U | 1.1 U |
| ESB1216-5' | 05/09/98 | 600 | 74 U* | 1.1 U | 1.1 U | 2.2 U | 1.1 U | 360 |
| ESB1217-2 1/2' | 05/09/98 | 5.3 U | 12 U* | 1.1 U | 1.1 U | 2.1 U | 1.1 U | 1.1 U |
| ESB1217-2 1/2' (DUP) | 05/09/98 | 5.3 U | 12 U* | 1.1 U | 1.1 U | 2.1 U | 1.1 U | 1.1 U |
| ESB1217-5' | 05/09/98 | 5.7 U | 11 U | 1.1 U | 1.1 U | 2.3 U | 1.1 U | 1.1 U |
| ESB1218-5' | 05/10/98 | 5.5 U | 15 U* | 1.1 U | 1.1 U | 2.2 U | 1.1 U | 1.1 |
| ESB1218-7 1/2' | 05/10/98 | 5.5 U | 12 U* | 1.1 U | 1.1 U | 2.2 U | 1.1 U | 1.1 U |
| ESB1219-2 1/2' | 05/10/98 | 5.5 U | 10 U* | 1.1 U | 1.1 U | 2.2 U | 1.1 U | 1.1 U |
| ESB1219-7 1/2' | 05/10/98 | 5.2 U | 13 U* | 1.1 U | 1.1 U | 2.2 U | 1.1 U | 1.0 U |
| ESB1219-10' | 05/10/98 | 5.4 U | 14 U* | 1.0 U | 1.0 U | 2.1 U | 1.0 U | 1.1 U |
| ESB1220-5' | 05/10/98 | 5.2 U | 13 U* | 1.0 U | 1.0 U | 2.1 U | 1.0 U | 1.0 U |
| ESB1220-7 1/2' | 05/10/98 | 5.5 U | 12 U* | 1.1 U | 1.1 U | 2.2 U | 1.1 U | 1.1 U |
| ESB1225-7 1/2' | 05/14/98 | 16.0 | 28 U* | 1.1 | 3.6 | 9.6 | 4.5 | 200 |
| ESB1225-10 1/2' | 05/14/98 | 5.3 U | 14 U* | 1.1 U | 1.1 U | 2.1 U | 1.1 U | 1.1 |
| ESB1226-2 1/2' | 05/15/98 | 5.2 U | 11 U* | 1.0 U | 1.0 U | 2.1 U | 1.0 U | 1.0 U |
| ESB1226-5' | 05/15/98 | 5.4 U | 14 U* | 1.1 U | 1.1 U | 2.2 U | 1.1 U | 1.1 U |
| ESB1226-7 1/2' | 05/15/98 | 5.2 U | 18 U* | 1.0 U | 1.0 U | 2.1 U | 1.0 U | 1.0 U |
| ESB1227-1' | 05/15/98 | 5.5 U | 30 U* | 3.7 | 1.1 U | 2.2 U | 1.1 U | 11 |
| ESB1227-7 1/2' | 05/15/98 | 5.4 U | 15 U* | 1.1 U | 1.1 U | 2.2 U | 1.1 U | 1.1 U |

**Notes:**
MTCA - Model Toxics Control Act
(A) - MTCA Method A soil cleanup level for unrestricted land use
(B) - MTCA Method B Soil Cleanup Level
(B*) Revised 2001 MTCA Method B value from Ecology website CLARC tables downloaded June 2010 (https://fortress.wa.gov/ecy/clarc/reporting/CLARCReporting.aspx).
1996 - Indicates MTCA soil cleanup levels, published 1996.
2001 - Indicates MTCA version 3.1 soil cleanup levels, published 2001.
(DUP) - Field duplicate
NE - Not established
U - Compound was analyzed for but not detected above the reporting limit shown.
* Analyte was qualified as not detected due to method blank or rinsate blank contamination.

**Table 4-3**
**Summary of Soil Sample Analytical Results for TPH, Non-halogenated SVOCs, Phenol, and Conventional Measurements**
**Building 45-01 Flumes**
**Boeing Everett Plant Remedial Investigation**

| Sample ID/Date | | Total Petroleum Hydrocarbons (mg/kg) | | Non-halogenated SVOCs | Phenol (ug/kg) | Conventional Measurements |
|---|---|---|---|---|---|---|
| | | Diesel-Range | Gasoline-Range | | | pH |
| 1996 MTCA Method A or B Soil Cleanup Level | | 200 (A) | 100 (A) | - | 48,000,000 (B) | - |
| 1996 MTCA Method B 100 x GW Soil Cleanup Level | | NE | NE | - | 960,000 | - |
| 2001 MTCA Method A or B Soil Cleanup Level | | 2,000 (A) | 30 / 100*** (A) | - | 48,000,000 (B) | - |
| MTCA Method A or B Protection of Groundwater | | NC | 30 / 100*** (A) | - | 21,695 (B) | - |
| ESB1216-2 1/2' | 05/09/98 | 7.7 J* | 5.6 U | ND | 150 U | 9.7 J |
| ESB1216-5' | 05/09/98 | 20 U** | 12.0* | ND | 180 U | 10 J |
| ESB1217-2 1/2' | 05/09/98 | 13 U** | 5.4 U | ND | 150 U | 9.6 J |
| ESB1217-2 1/2' (DUP) | 05/09/98 | 11 U** | 5.4 U | ND | 160 U | 9.8 J |
| ESB1217-5' | 05/09/98 | 11 U** | 5.6 U | ND | 140 U | 9.7 J |
| ESB1218-5' | 05/10/98 | 11 U** | 5.6 U | ND | 150 U | 9.6 J |
| ESB1218-7 1/2' | 05/10/98 | 13 U** | 5.6 U | ND | 150 U | 9.7 J |
| ESB1219-2 1/2' | 05/10/98 | 38 U** | 5.6 U | ND | 150 U | 11 J |
| ESB1219-7 1/2' | 05/10/98 | 8.7 U** | 5.4 U | ND | 150 U | 9.9 J |
| ESB1219-10' | 05/10/98 | 5.6 UJ** | 5.4 U | ND | 150 U | 9.1 J |
| ESB1220-5' | 05/10/98 | 6.9 U** | 5.4 U | ND | 150 U | 9.6 J |
| ESB1220-7 1/2' | 05/10/98 | 5.6 U | 5.3 U | ND | 150 U | 9.5 J |
| ESB1225-7 1/2' | 05/14/98 | 5.5 U | 5.6 U | ND | NA | 10 J |
| ESB1225-10 1/2' | 05/14/98 | 5.7 U | 5.6 U | ND | NA | 9.6 J |
| ESB1226-2 1/2' | 05/15/98 | 5.4 U | 5.4 U | ND | NA | 9.6 J |
| ESB1226-5' | 05/15/98 | 5.5 U | 5.4 U | ND | NA | 9.3 J |
| ESB1226-7 1/2' | 05/15/98 | 5.6 U | 5.4 U | ND | NA | 9.5 J |
| ESB1227-1' | 05/15/98 | 150* | 5.4 U | ND | NA | 11 J |
| ESB1227-7 1/2' | 05/15/98 | 5.5 U | 5.4 U | ND | NA | 9.7 J |

**Notes:**
MTCA - Model Toxics Control Act
(A) - MTCA Method A soil cleanup level for unrestricted land use
(B) - MTCA Method B soil cleanup level
1996 - Indicates MTCA soil cleanup levels, published 1996.
2001 - Indicates MTCA version 3.1 soil cleanup levels, published 2001.
(DUP) - Field duplicate
NA- Not analyzed
NC - Not calculated
ND - Not detected. None of the target compounds were detected at, or greater than, the reporting limit.
NE - Not established
J - Estimated value
U - Compound was analyzed for but not detected above the reporting limit shown.
UJ - Compound was analyzed for but not detected above the reporting limit shown. Reporting limit is an estimated value.
* Pattern profile does not match typical gasoline or diesel pattern.
** Data was qualified as not detected during data validation due to method blank contamination.
***gasoline mixtures with benzene/gasoline mixtures without benzene

**Table 4-4**
**Summary of Soil Sample Analytical Results for Metals, (mg/kg)**
**Building 45-01 Flumes**
**Boeing Everett Plant Remedial Investigation**

| Sample ID/Date | | Arsenic | Barium | Chromium | Lead | Selenium | Silver | Strontium |
|---|---|---|---|---|---|---|---|---|
| 1996 MTCA Method A, AI, or B Soil Cleanup Level | | 1.67 (B) | 5,600 (B) | 100 (A)<br>500 (AI) | 250 (A)<br>1,000 (AI) | 400 (B) | 400 (B) | 48,000 (B) |
| 1996 MTCA Method B 100 x GW Soil Cleanup Level | | 0.00583 | 112 | 1,600 ($Cr^{+3}$) | NE | 8.0 | 8.0 | 960 |
| 2001 MTCA Method A, AI, or B Soil Cleanup Level | | 20 (A)<br>0.667 (B) | 5,600 (B)<br>16,000 (B*) | 2,000($Cr^{+3}$) / 19 ($Cr^{+6}$) (A)<br>120,000($Cr^{+3}$) / 240 ($Cr^{+6}$) (B) | 250 (A)<br>1,000 (AI) | 400 (B) | 400 (B) | 48,000 (B) |
| MTCA Method A or B Protection of Groundwater | | 20 (A)<br>0.03 (B) | 2,637 (B) | 2,000 ($Cr^{+3}$) / 19 ($Cr^{+6}$) (A)<br>480,096 ($Cr^{+3}$) / 18 ($Cr^{+6}$) (B) | 250 (A) | 8.3 (B) | 13.6 (B) | 38.4 (B) |
| WA Department of Ecology - Puget Sound Background Concentration | | 7.30 | NE | 48.2 | 24.0 | NE | NE | NE |
| ESB1216-2 1/2' | 05/09/98 | **2.0 J** | 46.7 | **31.6** | 2 U | 0.1 U | 0.5 | 23.1 |
| ESB1216-5' | 05/09/98 | **2.0 J** | 60.8 | **41.4** | 3 | 0.5 U | 0.3 U | 39.3 |
| ESB1217-2 1/2' | 05/09/98 | **2.3 J** | 67.5 | **41.4** | 2 U | 0.1 U | 0.4 | 42.8 |
| ESB1217-2 1/2' (DUP) | 05/09/98 | **2.6 J** | 62.1 | **40.0** | 2 U | 0.1 U | 0.4 | 41.0 |
| ESB1217-5' | 05/09/98 | **3.0 J** | 60.8 | **41.0** | 2 U | 0.1 U | 0.5 | 38.9 |
| ESB1218-5' | 05/10/98 | **3.0 J** | 54.3 | **35.2** | 2 U | 0.1 U | 0.5 | 33.4 |
| ESB1218-7 1/2' | 05/10/98 | **2.0 J** | 54.5 | **38.1** | 2 U | 0.1 U | 0.4 | 35.0 |
| ESB1219-2 1/2' | 05/10/98 | **2.0 J** | 47.3 | **35.1** | 2 U | 0.1 U | 0.5 | 33.8 |
| ESB1219-7 1/2' | 05/10/98 | **2.0 J** | 59.5 | **40.3** | 2 U | 0.1 U | 0.5 | 38.7 |
| ESB1219-10' | 05/10/98 | **3.0 J** | 56.6 | **51.9** | 2 U | 0.1 U | 0.4 | 40.2 |
| ESB1220-5' | 05/10/98 | **2.0 J** | 57.1 | **37.6** | 2 U | 0.1 | 0.5 | 39.6 |
| ESB1220-7 1/2' | 05/10/98 | **2.0 J** | 57.6 | **34.5** | 2 U | 0.1 U | 0.5 | 37.9 |
| ESB1225-7 1/2' | 05/14/98 | **2.2** | 57.4 | **35.4** | 3 | 0.1 U | 0.3 U | 36.4 |
| ESB1225-10 1/2' | 05/14/98 | **2.2** | 63.5 | **38.2** | 3 | 0.2 U | 0.3 U | 39.7 |
| ESB1226-2 1/2' | 05/15/98 | **2.4** | 65.1 | **42.6** | 3 | 0.1 U | 0.3 U | 43.1 |
| ESB1226-5' | 05/15/98 | **2.0** | 58.9 | **37.5** | 3 | 0.2 U | 0.3 U | 38.3 |
| ESB1226-7 1/2' | 05/15/98 | **2.5** | 63.2 | **40.1** | 4 | 0.1 U | 0.3 U | 36.2 |
| ESB1227-1' | 05/15/98 | **5.2** | 60.1 | **35.4** | 5 | 0.2 U | 1.3 | 85.2 |
| ESB1227-7 1/2' | 05/15/98 | **2.6** | 54.9 | **33.3** | 3 | 0.2 U | 0.3 U | 32.0 |

**Notes:**
MTCA - Model Toxics Control Act
(A) - MTCA Method A soil cleanup level for unrestricted land use
(AI) - MTCA Method A soil cleanup level for industrial property
(B) - MTCA Method B soil cleanup level
(B*) Revised 2001 MTCA Method B value from Ecology website CLARC tables downloaded June 2010 (https://fortress.wa.gov/ecy/clarc/reporting/CLARCReporting.aspx).
1996 - Indicates MTCA soil cleanup levels, published 1996.
2001 - Indicates MTCA version 3.1 soil cleanup levels, published 2001.
(DUP) - Field duplicate
J - Estimated value
NE - Not established
U - Compound was analyzed for but not detected above the reporting limit shown.
Samples were analyzed for cadmium and mercury, but these metals were not detected in any of the samples.
Numbers in **bold** font indicate that the result reported exceeds the most current MTCA cleanup level as of June 2010.
Numbers in grey shading indicate results that exceed a MTCA protection of groundwater level, but do not exceed the current lowest MTCA soil cleanup level protective of direct contact.

**Table 4-5**
**Summary of Groundwater Analytical Results for Total Metals, VOCs, Non-halogenated SVOCs, TPH, and Phenol**
**Building 45-01 Flumes**
**Boeing Everett Plant Remedial Investigation**

| Analyte/Sample ID | ESB1219-1' (05/10/98) | 1996 MTCA Method A or B Groundwater Cleanup Level | 2001 MTCA Method A Groundwater Cleanup Level | 2001 MTCA Method B Groundwater Cleanup Level |
|---|---|---|---|---|
| **Total Metals, (mg/L)** | | | | |
| Arsenic | 0.005 R | 0.0000583 (B) | 0.005 | 0.0000583 |
| Barium | **3.94** | 1.12 (B) | NE | 0.56 / 3.2 (B*) |
| Cadmium | **0.02** | 0.008 (B) | 0.005 | 0.008 |
| Chromium | **1.97** | 0.05 (A) | 0.05 | 24 ($Cr^{+3}$) / 0.048 ($Cr^{+6}$) |
| Lead | **0.4** | 0.005 (A) | 0.015 | NE |
| Mercury | 0.0019 J | 0.0048 (B) | 0.002 | 0.0048 |
| Selenium | 0.01 J | 0.08 (B) | NE | 0.08 |
| Silver | 0.02 U | 0.08 (B) | NE | 0.08 |
| Strontium | 3.92 | 9.6 (B) | NE | 9.6 |
| **Volatile Organic Compounds, (ug/L)** | | | | |
| 2-Butanone | 11 | 4,800 (B) | NE | 4,800 |
| Acetone | 5.5 | 800 (B) | NE | 800 |
| **Total Petroleum Hydrocarbons, (mg/L)** | | | | |
| Diesel-Range Hydrocarbons | **9.1*** | 1.0 (A) | 0.5 | NE |
| Gasoline-Range Hydrocarbons | 0.25 U | 1.0 (A) | 0.8 / 1.0** | NE |
| **Non-halogenated SVOCs** | ND | - | - | - |
| **Phenol, (ug/L)** | 3 | 9,600 (B) | NE | 9,600 / 4,800 (B*) |
| **Conventional Parameter** | | | | |
| pH (Standard Units) | 9.7 J | - | - | - |

**Notes:**
MTCA - Model Toxics Control Act
(B) - MTCA Method B groundwater cleanup level
(B*) Revised 2001 MTCA Method B value from Ecology website CLARC tables downloaded June 2010 (https://fortress.wa.gov/ecy/clarc/reporting/CLARCReporting.aspx).
1996 - Indicates MTCA groundwater cleanup levels, published 1996.
2001 - Indicates MTCA version 3.1 groundwater cleanup levels, published 2001.
J - Estimated value
NC - Not calculated
ND - Not detected. None of the target compounds were detected at, or greater than, the reporting limit.
R - Result rejected due to quality assurance.
U - Compound was analyzed for but not detected above the reporting limit shown.
Numbers in **bold** font indicate that the result reported exceeds the most current MTCA cleanup level as of June 2010.
Numbers in grey shading indicate results that exceed the MTCA Protection of Groundwater levels, but do not exceed the most current MTCA cleanup levels.
*Pattern profile does not match typical diesel pattern.
**gasoline mixtures with benzene/gasoline mixtures without benzene

**Table 4-6**
**Summary of Soil Sample Analytical Results for Volatile Organic Compounds, (ug/kg)**
**Building 45-01 (Wastewater Sumps)**
**Boeing Everett Plant Remedial Investigation**

| Sample ID/Date | | 2-Butanone | Acetone | m,p-Xylene | Methylene Chloride | Styrene | Tetrachloroethene | Toluene |
|---|---|---|---|---|---|---|---|---|
| 1996 MTCA Method B Soil Cleanup Level | | 48,000,000 | 8,000,000 | 160,000,000 | 133,000 | 33,300 | 19,600 | 16,000,000 |
| 1996 MTCA Method B 100x GW Soil Cleanup Level | | 480,000 | 80,000 | 1,600,000 | 583 | 15 | 85.8 | 160,000 |
| 2001 MTCA Method A or B Soil Cleanup Level | | 48,000,000 (B) | 8,000,000 (B) | 9,000 (A)<br>160,000,000 (B) | 20 (A)<br>133,000 (B) | 33,300 (B) | 50 (A)<br>19,600 (B)<br>1,900 (B*) | 7,000 (A)<br>16,000,000 (B)<br>6,400,000 (B*) |
| MTCA Method A or B Protection of Groundwater | | 19,200 (B) | 3,211 (B) | 135,068 (B) | 20 (A)<br>25 (B) | 33 (B) | 50 (A)<br>0.86 (B) | 7,000 (A)<br>4,654 (B) |
| ESB1124-20' | 03/05/98 | 6.2 | 11.0 U * | 2.1 U | 2.1 U | 1.1 U | 1.1 U | 1.1 U |
| ESB1124-30' | 03/05/98 | 5.5 U | 12.0 U * | 2.2 U | 5.2 U * | 1.1 U | 1.1 | 1.1 U |
| ESB1124-35' | 03/05/98 | 5.2 U | 8.7 U * | 2.0 U | 3.9 U * | 1.0 U | 1.0 U | 1.0 U |
| ESB1125-20' | 03/07/98 | 5.4 U | 8.4 U * | 2.1 U | 4.6 U * | 1.1 U | 1.1 U | 1.1 U |
| ESB1125-30' | 03/07/98 | 5.2 U | 12.0 U * | 2.1 U | 3.3 U * | 1.0 U | 1.0 U | 1.0 U |
| ESB1125-35' | 03/07/98 | 5.2 U | 13.0 U * | 2.1 U | 4.1 U * | 1.0 U | 1.0 U | 1.0 U |
| ESB1125-35' (DUP) | 03/07/98 | 5.4 U | 16.0 U * | 2.2 U | 3.5 U * | 1.1 U | 1.1 U | 1.1 U |
| ESB1125-45' | 03/07/98 | 5.1 U | 10.0 U * | 2.0 U | 2.9 U * | 1.0 U | 1.0 U | 1.0 U |
| ESB1126-20' | 03/07/98 | 5.5 U | 8.0 U * | 2.2 U | 5.0 U * | 1.1 U | 1.1 U | 1.1 U |
| ESB1126-30' | 03/07/98 | 5.2 U | 12.0 U * | 2.1 U | 2.4 U * | 1.0 U | 1.0 U | 1.0 U |
| ESB1126-35' | 03/07/98 | 5.3 U | 14.0 U * | 2.1 U | 3.0 U * | 1.1 U | 1.1 U | 1.1 U |
| ESB1126-45' | 03/07/98 | 5.3 U | 7.2 U * | 2.1 U | 3.2 U * | 1.1 U | 1.1 U | 1.1 U |
| ESB1132-20' | 03/10/98 | 5.4 U | 9.9 U * | 2.2 U | 2.2 U | 1.1 U | 1.1 U | 1.1 U |
| ESB1132-30' | 03/10/98 | 5.3 U | 11.0 U * | 2.1 U | 2.1 U | 1.1 U | 1.5 | 1.1 U |
| ESB1132-35' | 03/10/98 | 5.3 U | 14.0 U * | 2.1 U | 2.1 U | 1.1 U | 1.1 U | 1.1 U |
| ESB1132-45' | 03/10/98 | 5.1 U | 8.8 U * | 2.0 U | 2.0 U | 1.0 U | 1.3 | 1.2 |
| ESB1133-20' | 03/10/98 | 5.4 U | 12.0 U * | 2.1 U | 2.1 U | 2.1 | 1.6 | 1.3 |
| ESB1133-30' | 03/10/98 | 5.1 U | 12.0 U * | 2.0 U | 2.0 U | 1.0 U | 1.0 U | 1.0 U |
| ESB1133-35' | 03/10/98 | 5.3 U | 13.0 U * | 2.1 U | 2.1 U | 1.1 U | 1.4 | 1.1 U |
| ESB1133-40' | 03/10/98 | 5.2 U | 13.0 U * | 2.1 U | 2.1 U | 1.0 U | 1.0 U | 1.0 U |

**Notes:**
MTCA - Model Toxics Control Act
(A) - MTCA Method A soil cleanup level for unrestricted land use
(B) MTCA Method B soil cleanup level
(B*) Revised 2001 MTCA Method B value from Ecology website CLARC tables downloaded June 2010 (https://fortress.wa.gov/ecy/clarc/reporting/CLARCReporting.aspx).
1996 - Indicates MTCA soil cleanup levels, published 1996.
2001 - Indicates MTCA version 3.1 soil cleanup levels, published 2001.
(DUP) - Field duplicate
U - Compound was analyzed for but not detected above the reporting limit shown.
* Analyte was qualified as not detected during data validation due to method blank contamination.
Numbers in grey shading indicate results and reporting limits that exceed a MTCA protection of groundwater level, but do not exceed the current lowest MTCA soil cleanup level protective of direct contact.

**Table 4-7**
**Summary of Soil Sample Analytical Results for TPH and Non-halogenated SVOCs**
**Building 45-01 (Wastewater Sumps)**
**Boeing Everett Plant Remedial Investigation**

| Sample ID/Date | | Total Petroleum Hydrocarbons | | Non-halogenated SVOCs |
|---|---|---|---|---|
| | | Diesel-Range (mg/kg) | Gasoline-Range (mg/kg) | |
| 1996 MTCA Method A Soil Cleanup Level | | 200 | 30 / 100* | - |
| 1996 MTCA Method B 100x GW Soil Cleanup Level | | NE | NE | - |
| MTCA Method A or B Protection of Groundwater | | NC | 30 / 100* (A) | - |
| ESB1133-40' | 03/10/98 | 5.3 U | 5.3 U | ND |
| ESB1124-20' | 03/05/98 | 5.5 U | 5.4 U | ND |
| ESB1124-30' | 03/05/98 | 5.5 U | 5.6 U | ND |
| ESB1124-35' | 03/05/98 | 5.3 U | 5.1 U | ND |
| ESB1125-20' | 03/07/98 | 5.4 U | 5.3 U | ND |
| ESB1125-30' | 03/07/98 | 5.4 U | 5.0 U | ND |
| ESB1125-35' | 03/07/98 | 5.3 U | 5.2 U | ND |
| ESB1125-35' (DUP) | 03/07/98 | 5.4 U | 6.0 U | ND |
| ESB1125-45' | 03/07/98 | 5.6 U | 5.2 U | ND |
| ESB1126-20' | 03/07/98 | 5.8 U | 5.6 U | ND |
| ESB1126-30' | 03/07/98 | 5.4 U | 5.1 U | ND |
| ESB1126-35' | 03/07/98 | 5.4 U | 5.3 U | ND |
| ESB1126-45' | 03/07/98 | 5.3 U | 5.1 U | ND |
| ESB1132-20' | 03/10/98 | 5.4 U | 5.3 U | ND |
| ESB1132-30' | 03/10/98 | 5.4 U | 5.3 U | ND |
| ESB1132-35' | 03/10/98 | 5.4 U | 5.2 U | ND |
| ESB1132-45' | 03/10/98 | 5.2 U | 5.0 U | ND |
| ESB1133-20' | 03/10/98 | 5.6 U | 5.1 U | ND |
| ESB1133-30' | 03/10/98 | 5.4 U | 5.1 U | ND |
| ESB1133-35' | 03/10/98 | 5.4 U | 5.2 U | ND |

**Notes:**
MTCA - Model Toxics Control Act
(A) - MTCA Method A soil cleanup level for unrestricted land use
1996 - Indicates MTCA soil cleanup levels, published 1996.
2001 - Indicates MTCA version 3.1 soil cleanup levels, published 2001.
(DUP) - Field duplicate
NC - Not calculated
ND - Not detected. None of the target compounds were detected at, or greater than, the reporting limit.
NE - Not established
U - Compound was analyzed for but not detected above the reporting limit shown.
*gasoline mixtures with benzene/gasoline mixtures without benzene

**Table 4-8**
**Summary of Soil Sample Analytical Results for Total Metals, (mg/k**
**Building 45-01 (Wastewater Sumps**
**Boeing Everett Plant Remedial Investigatio**

| Sample ID/Date | | Arsenic | Barium | Chromium | Lead | Selenium | Silver | Strontium |
|---|---|---|---|---|---|---|---|---|
| 1996 MTCA Method A, AI, or B Soil Cleanup Level | | 1.67 (B) | 5,600 (B) | 100 (A)<br>500 (AI) | 250 (A)<br>1,000 (AI) | 400 (B) | 400 (B) | 48,000 (B) |
| 1996 MTCA Method B 100x GW Soil Cleanup Level | | 0.00583 | 112 | 1,600 ($Cr^{+3}$) | NE | 8.0 | 8.0 | 960 |
| 2001 MTCA Method A, AI, or B Soil Cleanup Level | | 20 (A)<br>0.667 (B) | 5,600 (B)<br>16,000 (B*) | 2,000($Cr^{+3}$) / 19 ($Cr^{+6}$) (A)<br>120,000($Cr^{+3}$) / 240 ($Cr^{+6}$) (B) | 250 (A)<br>1,000 (AI) | 400 (B) | 400 (B) | 48,000 (B) |
| MTCA Method A or B Protection of Groundwater | | 20 (A)<br>0.03 (B) | 2,637 (B) | 2,000 (Cr+3) / 19 (Cr+6) (A)<br>480,096 (Cr+3) / 18 (Cr+6) (B) | 250 (A) | 8.3 (B) | 13.6 (B) | 38.4 (B) |
| WA Department of Ecology - Puget Sound Background Concentration | | 7.3 | NE | 48.2 | 24.0 | NE | NE | NE |
| ESB1124-20' | 03/05/98 | **3.1** | 54.4 | **32.2** | 2.0 | 5.0 U | 0.3 U | 36.1 |
| ESB1124-30' | 03/05/98 | **4.8** | 62.1 | **42.4** | 2.0 U | 0.1 U | 0.4 | 41.0 |
| ESB1124-35' | 03/05/98 | **14.9** | 66.4 | **43.1** | 2.0 U | 0.1 U | 0.4 | 44.8 |
| ESB1125-20' | 03/07/98 | **2.1** | 54.9 | **32.2** | 2.0 | 5.0 U | 0.3 U | 37.3 |
| ESB1125-30' | 03/07/98 | **2.6** | 58.6 | **36.6** | 2.0 U | 0.1 U | 0.3 | 34.7 |
| ESB1125-35' | 03/07/98 | **2.6** | 68.6 | **41.0** | 4.0 | 0.1 U | 0.4 | 36.7 |
| ESB1125-35' (DUP) | 03/07/98 | **2.7** | 63.7 | **41.4** | 3.0 | 0.1 U | 0.4 | 34.6 |
| ESB1125-45' | 03/07/98 | **2.7** | 43.5 | **34.1** | 2.0 U | 0.2 | 0.3 | 29.8 |
| ESB1126-20' | 03/07/98 | **2.9** | 63.7 | **38.3** | 3.0 | 6.0 U | 0.4 | 39.4 |
| ESB1126-30' | 03/07/98 | **1.5** | 58.6 | **40.3** | 2.0 | 0.1 U | 0.4 | 37.4 |
| ESB1126-35' | 03/07/98 | **2.6** | 65.0 | **39.5** | 3.0 | 0.1 U | 0.4 | 40.5 |
| ESB1126-45' | 03/07/98 | **0.9** | 32.1 | **29.2** | 2.0 | 0.1 U | 0.3 U | 25.0 |
| ESB1132-20' | 03/10/98 | **2.3** | 53.8 | **38.4** | 3.0 | 5.0 U | 0.3 U | 35.3 |
| ESB1132-30' | 03/10/98 | **2.4** | 52.6 | **34.8** | 3.0 | 5.0 U | 0.3 | 38.9 |
| ESB1132-35' | 03/10/98 | **2.1** | 64.8 | **39.3** | 5.0 | 5.0 U | 0.3 U | 39.6 |
| ESB1132-45' | 03/10/98 | **2.7** | 62.4 | **33.3** | 5.0 | 5.0 U | 0.3 U | 28.6 |
| ESB1133-20' | 03/10/98 | **2.2** | 56.0 | **34.6** | 4.0 | 5.0 U | 0.3 U | 37.1 |
| ESB1133-30' | 03/10/98 | **2.1** | 64.0 | **52.6** | 3.0 | 5.0 U | 0.3 U | 40.6 |
| ESB1133-35' | 03/10/98 | **2.2** | 62.9 | **39.1** | 2.0 | 5.0 U | 0.3 U | 35.5 |
| ESB1133-40' | 03/10/98 | **1.68** | 37.9 | **29.5** | 2.0 | 5.0 U | 0.3 U | 28.8 |

**Notes:**
MTCA - Model Toxics Control Ac
(A) - MTCA Method A soil cleanup level for unrestricted land us
(AI) - MTCA Method A soil cleanup level for industrial propert
(B) MTCA Method B soil cleanup leve
(B*) Revised 2001 MTCA Method B value from Ecology website CLARC tables downloaded June 2010 (https://fortress.wa.gov/ecy/clarc/reporting/CLARCReporting.asp
1996 - Indicates MTCA soil cleanup levels, published 1996
2001 - Indicates MTCA version 3.1 soil cleanup levels, published 2001
(DUP) - Field duplicate
NE - Not established
Samples were analyzed for cadmium and mercury, but these metals were not detected in any of the samples liste
U - Compound was analyzed for but not detected above the reporting limit show
Numbers in **bold** font indicate that the result reported exceeds the most current MTCA cleanup level as of June 201
Numbers in grey shading indicate results that exceed a MTCA protection of groundwater level, but do not exceed the current lowest MTCA soil cleanup level protective of direct conta

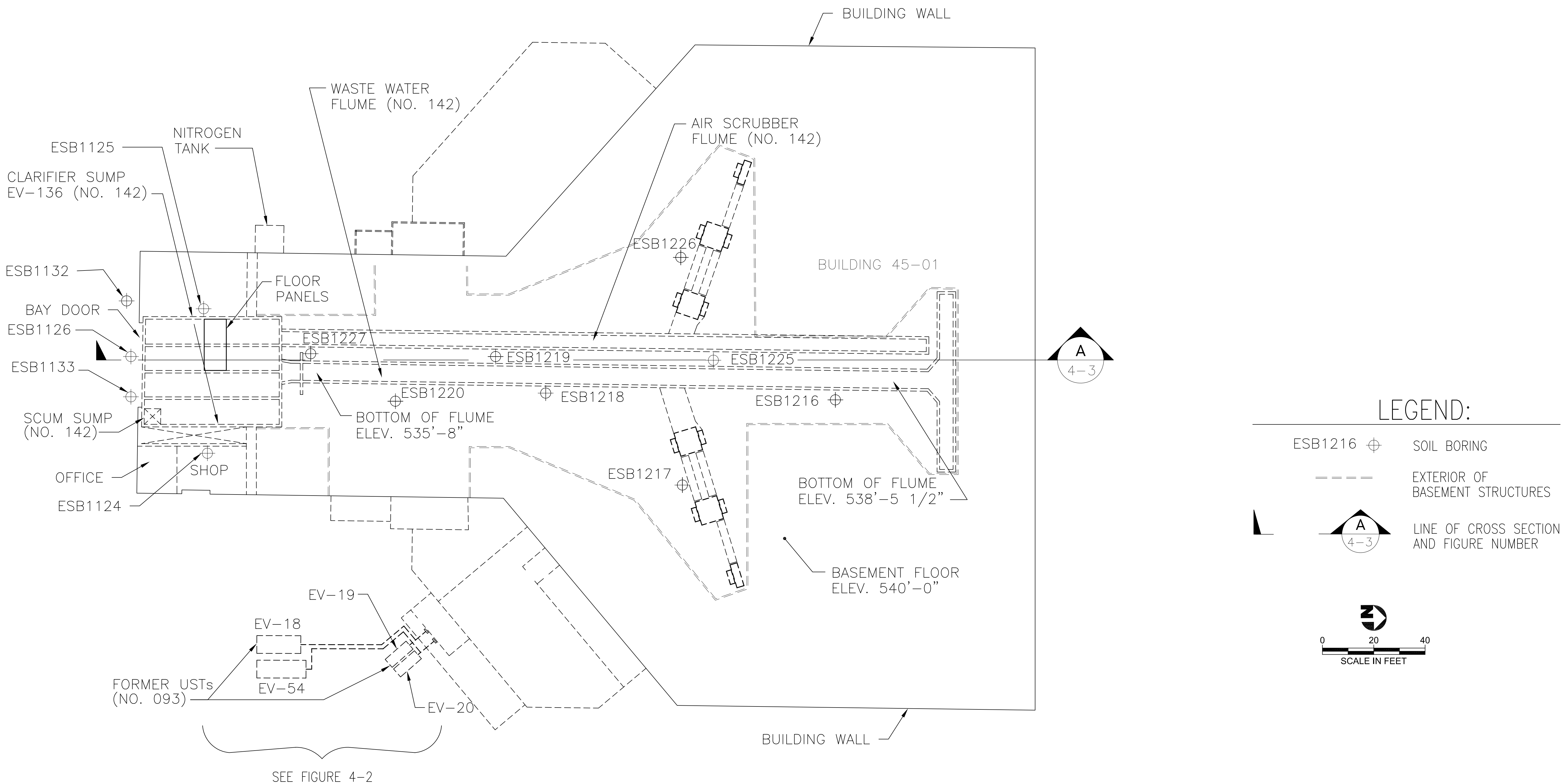



Figure 4-1

**BUILDING 45-01 WASTEWATER SUMP AND FLUME (NO. 142) SOIL BORING LOCATIONS**

Job No. 33761927

Boeing Commercial Airplanes, Everett Plant
REMEDIAL INVESTIGATION REPORT

URS Q:\geo\Boeing\Everett\GW Monitoring Report\2010 RI\06 Report\Fig 4-1.dwg
Mod: 08/11/2010, 10:57 | Plotted: 08/11/2010, 10:57 | john_knobbs

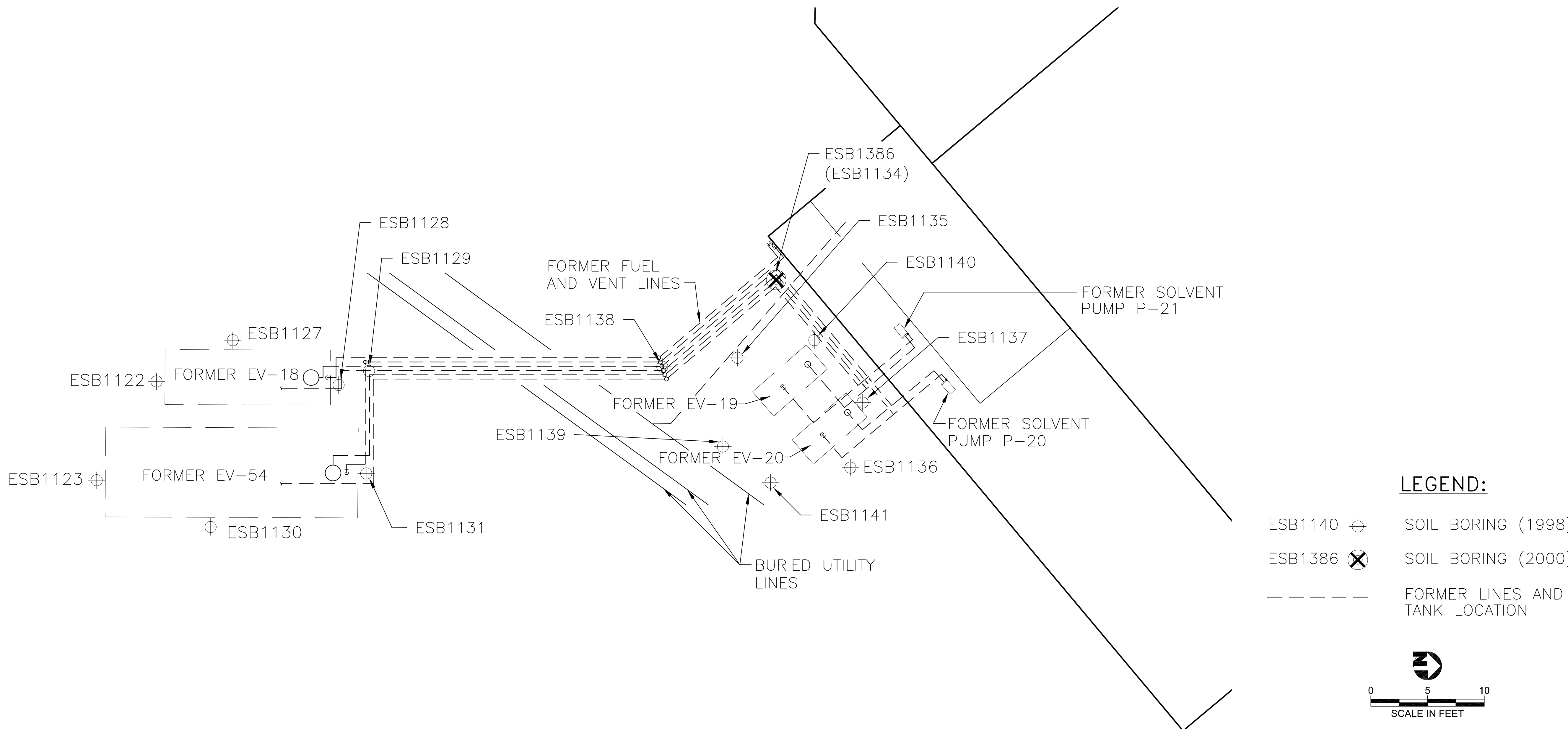



Figure 4-2
**BUILDING 45-01 FORMER SOLVENT TANKS (NO. 093) SOIL BORING LOCATIONS**

Job No. 33761927

URS Q:\geo\Boeing\Everett\GW Monitoring Report\2010 RI06 Report\Fig 4-2.dwg
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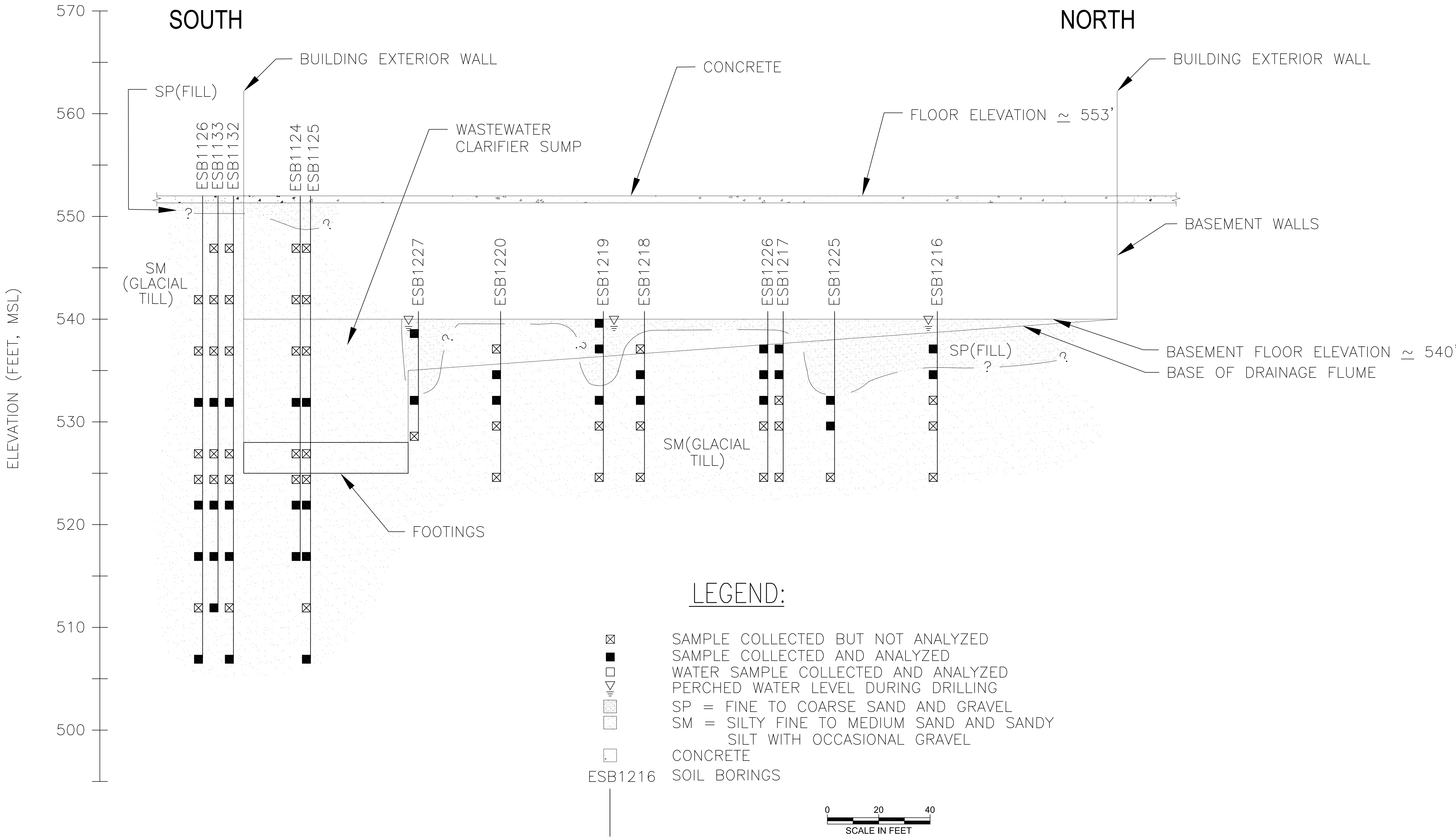
Boeing Commercial Airplanes, Everett Plant
REMEDIAL INVESTIGATION REPORT




Job No. 33761927

Figure 4-3

**BUILDING 45-01 CROSS SECTION A**

Boeing Commercial Airplanes, Everett Plant
REMEDIAL INVESTIGATION REPORT

URS
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# 5.0 BUILDING 40-11

Presented in this section are the results of the investigation of soils and groundwater performed at Attachment 5 and Attachment 6 SWMU/AOCs (Nos. 097 and 112, respectively) located near Building 40-11 at the Everett Plant (Figure 5-1). The subsurface conditions, prior investigations and remedial actions, and description of these SWMU/AOCs are presented in Section 7.0 of the RIWP (SWMU/AOC No. 097) and Section 6.0 of the IAWP (SWMU/AOC No. 112). The investigation of SWMU/AOC No. 097 was performed in accordance with Section 7.3 of the RIWP. The interim actions conducted at SWMU/AOC No. 112 were in accordance with Section 6.4 of the IAWP.

## 5.1 SWMU/AOC NO. 097 FORMER VAPOR DEGREASER

A vapor degreaser was located inside Building 40-11 near building column C-6 (Figure 5-2). The vapor degreaser was a self-contained, above-ground unit that used trichloroethylene (TCE) as the degreasing agent. The unit was installed in 1975, used infrequently, and removed in 1993. Further details regarding this SWMU/AOC are presented in Section 7.2 of the RIWP.

### 5.1.1 Purpose and Scope

The purpose of the investigation was to assess whether TCE is present in subsurface soil located in the vicinity of the former vapor degreaser. The scope of investigation performed was in general accordance with Section 7.3 of the RIWP and included the following:

- Drilled two soil borings to a depth of 2¾ feet bgs using a hand auger, and two borings to depths of 15 and 25½ feet bgs using a limited access hollow-stem auger drilling rig
- Collected soil samples at prescribed depth intervals
- Field screened samples for organic vapors
- Submitted selected soil samples for analysis for VOCs

### 5.1.2 Documentation of Drilling and Sampling

On February 16 and August 18, 1998, Dames & Moore monitored drilling of four soil borings shown on Figure 5-2. On February 16, two hand auger borings (ESB1106 and ESB1107) were completed to a depth of only 2¾ feet due to refusal. Consequently, two additional borings (ESB1323 and ESB1324) were completed on August 18 to depths of 15 feet and 25½ feet, respectively, using a limited access hollow stem auger drill rig.

Samples were retrieved using a hand-driven core sampler fitted with stainless steel rings, a hand auger, and a SPT split spoon sampler. After sampling was completed, the borings were backfilled with hydrated bentonite chips and capped with concrete. Drilling techniques and sampling procedures utilized were in general accordance with the SAP presented in Appendix A of the RIWP.

### 5.1.3 Field Observations and Sample Analysis Results

Presented in this section are the field observations and sample results associated with soil borings ESB1106, ESB1107, ESB1323 and ESB1324. Geologic logs of the soil borings are presented in Appendix D1. The chain of custody forms and analytical laboratory reports are presented in Appendix D2. Data validation reports are in Appendix D3. Analytical results are summarized in Table 5-1.

#### 5.1.3.1 Field Observations

The area investigated is covered with approximately 8-inch thick concrete pavement. An additional 4-inch thick layer of concrete was encountered below the concrete floor slab at borings ESB1106, ESB1107, and ESB1323. Fill soil consisting of gray silty fine sand with a trace of gravel to a depth of 2 feet was encountered at ESB1106 and ESB1107. A 6-inch-thick layer of brown fine to medium sand (fill) was encountered below the concrete floor slab at ESB1323. Fill soil was not encountered at soil boring ESB1324. Below the fill soil is very dense, silty fine sand with occasional gravel (native glacial till) to the maximum depth investigated (25½ feet). A gravelly layer was encountered at a depth of 6 feet in boring ESB1324. Cobbles are present in the glacial till at a depth of approximately 15 feet (ESB1323, ESB1324).

Staining or other visual indications of dangerous constituents were not observed. PID readings were observed above ambient background and ranged from 5.0 ppmv or less in borings ESB1106 and ESB1107, and from 20 ppmv to 120 ppmv of organic vapors in boring ESB1323.

The soil was dry except for a thin zone of moist soil located within 1 to 2 feet below the concrete floor slab in soil borings ESB1106, ESB1107, and ESB1323. Groundwater was not encountered in the glacial till to the maximum depth explored of 25½ feet bgs.

#### 5.1.3.2 Sample Analytical Results

Selected soil samples were submitted to ARI for analysis per the sample selection criteria specified on Figure A-3 in the SAP (Appendix A of the RIWP). Soil samples from depths of between 1 foot and 2½ feet bgs from soil borings ESB1106 and ESB1107 and from 5 to 25 feet bgs in soil borings ESB1323 and ESB1324 were analyzed for VOCs.

Table 5-1 summarizes the soil analytical data for VOCs detected in one or more samples and also lists the applicable MTCA Method A and B cleanup levels for soil for these VOCs. Benzene, methylene chloride, tetrachloroethene, toluene, and TCE were detected in several of the samples analyzed; however, the concentrations were below the applicable MTCA Method A and B soil cleanup levels protective of direct contact. TCE concentrations in borings ESB1106 (27 μg/kg at 2 feet bgs and 18 μg/kg at 2½ feet bgs) and ESB1107 (17 μg/kg at 1 foot bgs and 2.6 ug/kg at 2½ feet bgs) decreased with increasing sample depth. These concentrations are below the applicable MTCA Method A soil cleanup level of 30 μg/kg, which is protective of both direct contact and groundwater. TCE concentrations (ranging from 17 μg/kg to 27 μg/kg) in three soil samples from ESB1106 and ESB1107 exceeded the most conservative preliminary soil cleanup level protective of groundwater (3.2 μg/kg). TCE was not detected in the deeper samples collected and analyzed from adjacent borings ESB1323 and ESB1324. Based on the extent of TCE in soil, evaluation of TCE in soil near SWMU097 is recommended for the FS for CVOCs in soil and the potential for groundwater contamination.

The detection limits for tetrachloroethene (PCE) in soil (1.0 µg/kg to 1.1 µg/kg) and the eight detections of PCE (ranging from 1.2 µg/kg to 3.9 µg/kg) exceed the most conservative preliminary soil cleanup level protective of groundwater (0.86 µg/kg) but do not exceed the MTCA Method A cleanup level protective of both direct contact and groundwater (50 µg/kg). Based on the limited extent of PCE in soil and lack of detected concentrations above the MTCA Method A soil cleanup level protective of direct contact and groundwater, evaluation of PCE in soil near this SWMU/AOC is not recommended for the FS.

Evaluation of the vapor intrusion (VI) pathway for this SWMU/AOC is recommended for the FS. Screening of the VI pathway was performed in this RI using Ecology's review draft *Guidance for Evaluating Soil Vapor Intrusion in Washington State: Investigation and Remedial Action,* dated October 2009 (VI guidance). Application of the Preliminary Assessment step of the VI guidance to this SWMU shows that five chemicals detected in soil beneath the SWMU (benzene, methylene chloride, PCE, toluene, and TCE, Table 5-1), are sufficiently volatile to be a potential VI source. The detected concentrations of volatile organic compounds may pose a potential for VI in Building 40-11 for the following reasons:

- In accordance with WAC 173-340-740(3)(b)(iii)(C)(III), the concentrations of TCE detected are less than the protection of groundwater soil cleanup levels calculated based on the MTCA Method A groundwater cleanup level, but above the Method B soil cleanup levels protective of groundwater. Concentrations of TCE in shallow soils are similar to the shallow TCE soil concentrations below the former large vapor degreaser in the 40-02 building, where further vapor intrusion will be assessed in the FS.
- Similar TCE shallow soil concentrations at the former 40-02 large degreaser are known to result in elevated TCE sub-slab vapor concentrations that may potentially result in unacceptable TCE VI into the building.

Groundwater was not encountered beneath this SWMU/AOC to a depth of 25½ feet bgs and the known groundwater occurs at a depth of approximately 200 feet bgs.

## 5.2 SWMU/AOC NO. 112 BUILDING 40-11 OIL/WATER SEPARATOR

A 12,000 gallon, double-wall, steel oil/water separator (EV-118-1) is located approximately 50 feet east of Building 40-11 and approximately 300 feet north of the southeastern corner of Building 40-11 (Figure 5-3). The original oil/water separator EV-51 was removed and replaced with EV-118-1 in 1988. The oil/water separator receives wastewater from an automotive and forklift maintenance shop located in Building 40-11. The water is then pumped to the wastewater treatment plant. A dewatering well (EGW046) constructed of 12-inch diameter polyvinyl chloride (PVC) pipe was installed in 1988 in the backfill around the oil/water separator. The operation of this well was intended to maintain perched groundwater at a low level within the backfill. The current interim actions for this area consist of dewatering the UST backfill and semi-annual groundwater monitoring in the recovery well (EGW046). Prior groundwater analyses indicate the presence of TPH and VOCs in the perched groundwater within the backfill (Dames & Moore, 1998). However, native glacial till soils surrounding the backfill did not contain these compounds (Herrera, 1992). Extracted groundwater is pumped to the inlet of the oil/water separator. Further details regarding this SWMU/AOC are presented in Section 6.0 of the IAWP.

Beginning in 1995, groundwater from well EGW046 has been sampled and analyzed on a quarterly or semi-annual basis. The water samples were analyzed for VOCs, TPH, and metals (cadmium, chromium, lead, and silver). The analytical data through 1997 are summarized in Section 5.0 of Dames & Moore's *1997 Groundwater Monitoring Report* dated May 28, 1998. The groundwater has contained petroleum hydrocarbons and several VOCs from known overflows from the oil/water separator. Metals were not detected in the one 1997 sample analyzed for metals. None of the prior samples collected by Dames & Moore or Herrera (1992) were analyzed for metals.

### 5.2.1 Purpose and Scope

The purpose of the investigation was to install a monitoring well constructed in accordance with WAC 173-160 adjacent to the oil/water separator to allow future monitoring of groundwater quality. The scope of the investigation was in general accordance with Section 6.4 of the IAWP and included the following:

- Installed one monitoring well in the backfill adjacent to the inlet side of the oil/water separator using a truck mounted hollow stem auger drill rig
- Collected soil samples at prescribed depth intervals
- Collected groundwater samples on a quarterly or semiannual basis from the new well (EGW054) and the existing recovery well (EGW046)
- Field screened samples for organic vapors
- Submitted groundwater and selected soil samples for analysis for VOCs, metals (cadmium, chromium, lead, and silver), TPH-G, TPH-D, and TPH-O.

### 5.2.2 Documentation of Drilling and Sampling

On February 18, 1998, Dames & Moore monitored drilling and well installation activities for monitoring well EGW054 shown on Figure 5-3. The boring was completed to a depth of 19 feet bgs. Samples were retrieved using a Dames & Moore U-type sampler fitted with stainless steel rings. The boring was completed as monitoring well EGW054. Drilling techniques, sampling procedures, and well installation procedures utilized were in general accordance with the SAP presented in Appendix B of the IAWP.

### 5.2.3 Field Observations and Sample Analysis Results

Presented in this section are the field observations associated with the installation of monitoring well EGW054 and groundwater and soil sample results. The geologic log and well construction details are presented in Appendix D1. The chain of custody forms and analytical laboratory reports for samples collected through 1998 are presented in Appendix D2. Data validation reports associated with data collected through 1998 are in Appendix D3. Subsequent groundwater laboratory analytical data reports have been submitted to Ecology separate from this report. Soil analytical results are summarized in Tables 5-2 and 5-3. Groundwater analytical results are summarized in Tables 5-4 through 5-6.

#### 5.2.3.1 Field Observations

The area surrounding SWMU/AOC No. 112 is covered with approximately 12-inch thick concrete. Underlying the concrete adjacent to the oil/water separator is fill soil consisting of medium to coarse sand and pea gravel to a depth of 15 feet.

A petroleum odor was encountered at a depth of 14 feet bgs. Elevated PID readings ranging up to 2,000 ppm organic vapors were recorded from soil samples collected at depths of 14 feet to 16 feet bgs.

Perched water was encountered in the fill at a depth of 12 1/2 feet bgs. The underlying till was dry to damp at the bottom of the borings at 19 feet bgs. The fill soil is underlain by very dense silty sand with gravel (native glacial till).

#### 5.2.3.2 Sample Analytical Results

**Soil**

One soil sample of native glacial till from a depth of 15 feet was submitted for analysis per Section B.1.2.4 in Appendix B of the IAWP. Table 5-2 summarizes the soil analytical data for VOCs detected, TPH-G, and TPH-D and lists the applicable MTCA Method A or B cleanup level for soil for these compounds. TPH-G and TPH-D were not detected above the method reporting limits. The only VOC detected was acetone at a concentration (39 μg/kg) three to five orders of magnitude less than the applicable MTCA Method B (8,000,000 μg/kg) soil cleanup level for direct contact, and below the most conservative preliminary soil cleanup level (3,211 μg/kg) protective of groundwater; therefore acetone in soil near this SWMU/AOC is not recommended for evaluation in the FS.

Table 5-3 summarizes the soil analytical data for the four metals analyzed for in the EGW054 soil sample collected at 15 feet bgs. Cadmium and silver were not detected at concentrations above the method reporting limits. Lead (3 mg/kg) was detected at concentrations below the MTCA Method A cleanup level (250 mg/kg). Total chromium (40.3 mg/kg) is below the applicable MTCA Method A and B soil cleanup levels for trivalent chromium (2,000 mg/kg and 120,000 mg/kg, respectively), Puget Sound background concentration of 48.2 mg/kg (Ecology, 1994), and the Method B soil cleanup level for hexavalent chromium (240 mg/kg). This concentration is above the MTCA Method A soil cleanup level (19 mg/kg) and the most conservative preliminary soil cleanup level protective of groundwater (18 mg/kg) for hexavalent chromium; however, because, the total chromium concentration is below the Puget Sound background concentration of 48.2 mg/kg (Ecology, 1994), soil near this SWMU/AOC is not recommended for evaluation in the FS for hexavalent chromium.

**Groundwater**

The March 1995 to April 2010 groundwater analytical results are summarized in Tables 5-4 through 5-6. VOC concentrations in samples from wells EGW046 and EGW054 have been less than the applicable MTCA cleanup levels since the fourth quarter 1998, with the exceptions of 1,1,2,2-tetrachloroethane (1,1,2,2-PCA), acetone, chloroethane, TCE, and/or vinyl chloride. TCE was detected at concentrations ranging from 0.00012 mg/L to 0.0078 mg/L. The concentrations of TCE in EGW046 are above the applicable MTCA Method B groundwater cleanup level of 0.00049 mg/L, but typically have been below MTCA Method A cleanup level of 0.005 mg/L. Concentrations of TCE detected in EGW054 samples are below the MTCA Method A cleanup level, and have been below the applicable MTCA Method B cleanup level since November of 2003. Based on the detected TCE concentrations in well EGW046 samples above the applicable MTCA Method B groundwater cleanup level, and occasional exceedance of the MTCA

Method A cleanup level, evaluation of TCE in groundwater is recommended for the FS for this SWMU/AOC.

Vinyl chloride was detected at concentrations ranging from 0.00002 mg/L to 0.0083 mg/L. The concentrations of vinyl chloride detected in EGW046 were generally above the applicable MTCA Method B groundwater cleanup level of 0.0000292 mg/L and the MTCA Method A cleanup level of 0.0002 mg/L. The concentrations of vinyl chloride detected in EGW054 were generally above the applicable MTCA Method B groundwater cleanup level, but below the applicable MTCA Method A cleanup level; however, vinyl chloride has not been detected in EGW054 at a concentration above the applicable MTCA Method A or B groundwater cleanup level since October of 2004. Based on the detected vinyl chloride concentrations above the MTCA Method A and/or B groundwater cleanup level in samples from well EGW046, evaluation of vinyl chloride in groundwater is recommended for the FS for this SWMU/AOC.

Acetone was detected intermittently in both wells at concentrations above the applicable MTCA Method B groundwater cleanup level (0.8 mg/L), chloroethane was detected once in EGW054 in January of 2009 at a concentration above the applicable MTCA Method B groundwater cleanup level (0.015 mg/L), and 1,1,2,2-PCA was detected once in both wells in July of 2006 at a concentration above the applicable MTCA Method B groundwater cleanup level (0.000219 mg/L). Based on the lack of consistent detection of these VOCs at concentrations above the applicable MTCA Method B groundwater cleanup levels, evaluation of these compounds in groundwater is not recommended for the FS for this SWMU/AOC.

PCE was detected intermittently at concentrations ranging from 0.00002 mg/L to 0.0018 mg/L in wells EGW046 and EGW054. These concentrations of PCE are less than the MTCA Method A cleanup level of 0.005 mg/L. PCE has not been detected at a concentration above the applicable MTCA Method B cleanup level since August 1998 in EGW046 and May 1998 in EGW054. Based on the lack of detected PCE at concentrations above the MTCA Method A groundwater cleanup level, evaluation of PCE in groundwater is not recommended for the FS for this SWMU/AOC. Diesel-range TPH was detected at concentrations above the applicable MTCA Method A cleanup level (0.5 mg/l) in most samples collected from wells EGW046 and EGW054 prior to the October 2004 sampling round (Table 5-5). Beginning in October 2004, diesel-range TPH was detected at concentrations above the applicable MTCA Method A cleanup level in less than 50% of the samples collected from these wells. In general, diesel-range TPH concentrations decreased over time and concentrations have been relatively stable equal to or less than 1.6 mg/L since May, 2000. However, a small increase in concentrations was detected in both wells during the 2007 to 2008 timeframe. Following this small increase, concentrations have decreased to less than 1.0 mg/L since April 2008. The concentrations of gasoline-range TPH have not exceeded the applicable MTCA Method A cleanup level (1.0 mg/l) in wells EGW046 and EGW054 since November 1997, and it has not been detected in either well since 2001. Analysis of samples for gasoline-range TPH was discontinued in 2005 with approval by Ecology (2005). Oil-range TPH was not detected in EGW-054 since May 2002; however, prior to May of 2002 oil-range TPH concentrations exceeded the cleanup levels during six of 17 quarterly samples. Oil-range TPH concentrations were detected intermittently at concentrations above the applicable MTCA Method A cleanup level (0.5 mg/L) in EGW046. Based on the intermittent detection of TPH as diesel and/or oil in groundwater samples from one or both monitoring wells, these petroleum constituents are recommended for evaluation in the FS for this SWMU/AOC.

Total and dissolved metals concentrations are summarized in Table 5-6. Dissolved cadmium, dissolved chromium, dissolved lead, dissolved silver, and total silver were either not detected or were below applicable MTCA cleanup levels in all samples from both wells. Total cadmium, total chromium, and/or total lead were detected in one or more groundwater samples above the applicable MTCA Method A cleanup levels in 1998 through November 2001. However, the detected concentrations of these total metals have been below the applicable MTCA Method A cleanup levels in all samples since the first quarter 2002. Note that total and dissolved barium was analyzed during the fourth quarter 1998 due to an incorrect analytical request. Barium concentrations detected in 1998 are less than the applicable MTCA Method B cleanup level. Potential mobilization of arsenic and metals in groundwater at SWMU 112 shall be included in the FS due to the potential for redox changes in the aquifer due to CVOC degradation.

Evaluation of the vapor intrusion (VI) pathway for this SWMU/AOC is recommended for the FS. Screening of the VI pathway was performed in this RI using Ecology's review draft *Guidance for Evaluating Soil Vapor Intrusion in Washington State: Investigation and Remedial Action*, dated October 2009 (VI guidance). Application of the Preliminary Assessment step of the VI guidance to this SWMU shows that five chemicals present in groundwater beneath the SWMU (vinyl chloride, 1,1-DCA, cis-1,2-DCE, TCE, and PCE, Table 5-4), are sufficiently volatile to be a potential VI source. In addition, the low concentrations of TPH-D may be a potential VI source. The most recent detection of TCE in groundwater is considered to pose a potential VI problem because the maximum recent concentration detected (0.9 µg/L) exceeds the VI guidance screening criterion (0.42 µg/L). This concentration of TCE in groundwater is within 100 feet of Building 40-11.

## 5.3 UST EV-48-1

UST EV-48-1 is located at the fueling station north of Building 40-11 (Figure 1-2). The fueling station facilities include two double-walled, steel USTs of approximately 15,000-gallon capacity, a dispenser island with two dispensers and an overhead canopy, two oil-water separators, and associated piping (Figure 5-4). USTs EV-48-1contains unleaded gasoline and EV-49-1 contains diesel. On May 18, 2006, an apparent release of unleaded gasoline was discovered by Boeing personnel during routine maintenance work on EV-48-1. The release was verbally reported to the Ecology UST program by Boeing Everett personnel that same day. A crack was observed in the containment chamber that surrounds the fill ports of the gasoline UST and a small quantity of gasoline was puddled in soil underlying the containment chamber. The puddled gasoline was suspected to be the result of over-filling during a fuel delivery, which then migrated through the crack in the containment chamber. Boeing temporarily terminated use of the UST until an inspection and necessary repairs were completed. The containment chamber and fill pipe of the UST were replaced on June 6-9, 2006. The UST passed a tightness test on June 13, 2006 and was returned to service.

### 5.3.1 Purpose and Scope

URS performed a site check consistent with the Ecology UST guidance (Ecology, 2003) and a work plan for site check sampling that was submitted to Ecology (URS, 2006). The objective of the investigation was to evaluate the subsurface extent of the apparent release of unleaded gasoline from EV-48-1. Specific tasks included:

- Drilling six soil borings in the vicinity of EV-48-1
- Collecting representative soil samples from each of the soil borings, and

- Submitting selected soil samples to ARI for analytical testing for petroleum hydrocarbons (TPH-G, TPH-D and TPH-O) and related volatile aromatic constituents benzene, ethylbenzene, toluene, and ethylbenzene (BTEX).

A report documenting the investigation was prepared and submitted to Ecology (URS, 2009). The following summary of the scope and results of the assessment are based on this report.

### 5.3.2 Documentation of Drilling and Sampling

On January 15 and 16, 2007, URS monitored drilling and soil sampling from six soil borings (ESB1675 through ESB1680) as shown on Figure 5-4. The borings were advanced to total depths ranging from approximately 11½ to 20 feet bgs. The borings were completed using a truck-mounted, Geoprobe direct-push drilling rig. The retrieved soil samples were logged and field screened, and sub-samples collected for laboratory analysis based on the field screening in accordance with Ecology's guidance (Ecology, 2003) and the QA/QC procedures described in the Quality Assurance Project Plan (QAPP) for the Everett Plant (URS, 2005). Samples for BTEX analysis were collected using EPA Method 5035A techniques and were placed directly into the laboratory-supplied glassware (Ecology, 2004).

### 5.3.3 Field Observations

Soils encountered during the drilling included reworked native glacial till, consisting principally of silty sand and gravel, overlying pea gravel fill within the footprint of the UST basin. At the inferred margins of the UST basin, the pea gravel fill was less discrete, appearing to have been commingled with the surrounding native soil. Recovery within the pea gravel fill was generally poor, because of the looseness and lack of cohesion of the material. Underlying the pea gravel was an organic-rich, low plasticity silt with varying amounts of fine sand. The concrete slab reportedly underlying the USTs at approximately 15 feet bgs was not encountered. Groundwater was not encountered in any of the borings.

### 5.3.4 Sample Analytical Results

The analytical results are summarized in Table 5-7. The laboratory noted that, for several of the samples, the chromatographic fingerprint of the diesel-range fraction did not match the diesel standard and was more characteristic of a light fuel such as Jet A or kerosene.

Diesel (TPH-D) and motor oil-range (TPH-O) petroleum hydrocarbons were not detected at concentrations exceeding their respective MTCA Method A soil cleanup levels in any of the soil samples collected. Petroleum hydrocarbons and BTEX were not detected at concentrations exceeding their respective MTCA Method A soil cleanup levels in the soil samples collected from ESB1676 and ESB1680.

Benzene was detected at a concentration of 37 µg/kg, which exceeds the MTCA Method A soil cleanup level of 30 µg/kg, in the soil sample from ESB1675. The other petroleum hydrocarbons and BTEX constituents were detected in this sample at concentrations below the MTCA Method A and Method B soil cleanup levels.

Gasoline-range petroleum hydrocarbons (TPH-G) and BTEX were detected in nearly all of the soil samples collected from borings ESB1677, ESB1678, and ESB1679. The maximum concentrations of TPH-G and benzene in these samples were 3,700 mg/kg and 5,300 µg/kg, respectively. The maximum concentrations of toluene, ethylbenzene, and total xylenes in these samples were 63,000 µg/kg, 23,000 µg/kg, and 230,000 µg/kg, respectively. These concentrations all exceed the MTCA Method A soil cleanup levels for direct contact and protection of groundwater (Table 5-7). The deepest samples from these borings (20 feet bgs, 11 feet bgs, and 12 feet bgs, respectively) contained one or more petroleum constituents exceeding MTCA Method A cleanup levels; however, concentrations generally decreased with depth.

Based on the analytical results, TPH-G and BTEX soils in the vicinity of UST EV-48-1 should be evaluated in the FS, including the potential VI pathway.

## 5.4 CONCLUSIONS AND RECOMMENDATIONS

### 5.4.1 Building 40-11 Former Vapor Degreaser (SWMU/AOC NO. 097)

Based on the analytical results discussed in Section 5.1.3.2, the soil underlying the former vapor degreaser does not contain concentrations of VOCs greater than the applicable MTCA Method B soil cleanup levels, including the most applicable preliminary soil cleanup levels protective of groundwater. Perched groundwater was not encountered to the maximum depth (25½ feet bgs) explored. No further investigation and remedial action are warranted in this area; therefore, this area is not recommended for inclusion in the FS.

### 5.4.2 Building 40-11 Oil/Water Separator (SWMU/AOC NO. 112)

Based on the analytical results discussed in Section 5.2.3.2, the glacial till soil beneath perched groundwater in fill soil adjacent to SWMU/AOC No. 112 does not contain VOCs, TPH-G, TPH-D, or selected metals at concentrations greater than the applicable MTCA Method A or B soil cleanup levels, including those protective of groundwater. Elevated PID readings detected at a depth of 14 to 16 feet bgs are interpreted to be from the perched groundwater within the fill that is known to contain TPH and VOCs based on groundwater data collected from the extraction well (EGW046). The presence of dry glacial till below the saturated fill soil, absence of TPH, and low levels of several VOCs detected in the glacial till soil indicate that minimal infiltration of the perched water into the glacial till has occurred. Based on these and prior soil sample analysis results (Herrera, 1992), further soil investigation is not warranted in this area.

Concentrations of TCE and vinyl chloride continue to be above the applicable MTCA Method A or B cleanup levels in EGW046. No exceedance of the applicable MTCA Method A or B cleanup levels for either chemical has occurred in EGW054 since October of 2004. Groundwater analytical results for samples from wells EGW046 and EGW054 indicate that PCE has not been detected above the applicable MTCA Method A or B cleanup levels since August of 1998. Chloroethane, acetone, and 1,1,2,2-PCA have been detected in both wells; however, detection of these compounds at concentrations above the applicable MTCA Method B cleanup levels have been infrequent.

Diesel-range TPH concentrations have decreased in wells EGW046 and EGW054; however, diesel-range TPH concentrations in these wells over the last year are at or slightly below the applicable MTCA Method A cleanup level. Gasoline-range TPH concentrations were below the applicable MTCA Method A cleanup level in wells EGW046 and EGW054 from 1998 through 2005, when monitoring for this chemical constituent was discontinued. Oil-range TPH was detected intermittently in well EGW046 above the applicable MTCA Method A cleanup level. Oil-range TPH has not been detected in well EGW054 since May 2002. Detected concentrations of metals have been below the applicable MTCA Method A or B cleanup levels in all samples collected since the first quarter of 2002.

It is recommended that the FS for this area address TCE and vinyl chloride in groundwater and the associated potential for vapor intrusion. It is also recommended that extraction of perched groundwater within the fill soils adjacent to the oil/water separator, and monitoring of groundwater in the dewatering well (EGW046) and monitoring well (EGW054) be continued as interim actions until such time that a final remedial action is implemented or Ecology-approved groundwater quality standards are achieved.

### 5.4.3 UST EV-48-1

The analytical results discussed in Section 5.3.4 indicate TPH-G and BTEX were detected in soils in the vicinity of UST EV-48-1 at concentrations greater than the MTCA Method A soil cleanup levels protective of direct contact and protection of groundwater. Based on the analytical results, TPH-G and BTEX in soils in the vicinity of UST EV-48-1, the potential to contaminate groundwater, and the potential VI pathway should be evaluated in the FS. Additional investigation of the lateral and vertical extent of the impacted soils is recommended as part of the FS.

## 5.5 REFERENCES

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**Table 5-1**
**Summary of Soil Sample Analytical Results for Volatile Organic Compounds, (ug/kg)**
**Building 40-11 Vapor Degreaser**
**Boeing Everett Plant Remedial Investigation**

| Sample ID | Sample Date | Acetone | Benzene | Methylene Chloride | Tetrachloroethene | Toluene | Trichloroethene |
|---|---|---|---|---|---|---|---|
| 1996 MTCA Method B Soil Cleanup Level | | 8,000,000 | 34,500 | 133,000 | 19,600 | 16,000,000 | 90,900 |
| 1996 MTCA Method B 100x GW Soil Cleanup Level | | 80,000 | 151 | 583 | 85.8 | 160,000 | 398 |
| 2001 MTCA Method A or B Soil Cleanup Level | | 8,000,000 (B) | 30 (A)<br>18,200 (B) | 20 (A)<br>133,000 (B) | 50 (A)<br>19,600 (B)<br>1,900 (B*) | 7,000 (A)<br>16,000,000 (B)<br>6,400,000 (B*) | 30 (A)<br>90,900 (B)<br>11,000 (B*) |
| MTCA Method A or B Protection of Groundwater | | 3,211 (B) | 30 (A)<br>4.5 (B) | 20 (A)<br>25 (B) | 50 (A)<br>0.86 (B) | 7,000 (A)<br>4,654 (B) | 30 (A)<br>3.2 (B) |
| ESB1106-2' | 02/16/98 | 10 U | 1.1 U | 2.2 U | 1.1 U | 1.1 U | 27 |
| ESB1106-2 1/2' | 02/16/98 | 6.9 U | 1.1 U | 2.2 U | 1.1 U | 1.1 U | 18 |
| ESB1107-1' | 02/16/98 | 5.5 U | 1.1 U | 2.2 U | 1.1 U | 1.1 U | 17 |
| ESB1107-2 1/2' | 02/16/98 | 7.8 U | 1.0 U | 2.1 U | 1.0 U | 1.0 U | 2.6 |
| ESB1323-5' | 08/18/98 | 8.0 U** | 1.6 | 2.4 | 2.5 | 2.3 | 1.1 U |
| ESB1323-10' | 08/18/98 | 9.0 U** | 1.7 | 2.6 | 2.9 | 2.8 | 1.1 U |
| ESB1323-13' | 08/18/98 | 7.1 U** | 1.5 | 2.2 U | 3.4 | 2.5 | 1.1 U |
| ESB1324-5' | 08/18/98 | 8.9 U** | 1.2 | 2.3 | 3.9 | 1.7 | 1.1 U |
| ESB1324-10' | 08/18/98 | 11 U** | 1.4 | 2.2 U | 1.6 | 1.7 | 1.1 U |
| ESB1324-18' | 08/18/98 | 7.5 U** | 1.2 | 2.2 | 1.2 | 2.3 | 1.1 U |
| ESB1324-23' | 08/18/98 | 7.0 U** | 1.6 | 2.3 | 1.8 | 2.9 | 1.0 U |
| ESB1324-23' (DUP) | 08/18/98 | 8.8 U** | 1.8 | 2.6 | 2.1 | 3.6 | 1.1 U |
| ESB1324-25 | 08/18/98 | 5.3 U | 1.1 | 2.1 U | 1.1 U | 1.9 | 1.1 U |

**Notes:**
MTCA - Model Toxics Control Act
(A) - MTCA Method A soil cleanup level for unrestricted land use
(B) MTCA Method B soil cleanup levels
(B*) Revised 2001 MTCA Method B value from Ecology website CLARC tables downloaded June 2010 (https://fortress.wa.gov/ecy/clarc/reporting/CLARCReporting.aspx).
1996 - Indicates MTCA soil cleanup levels, published 1996.
2001 - Indicates MTCA version 3.1 soil cleanup levels, published 2001.
(DUP) - Field duplicate
U - Compound was analyzed for but not detected above the reporting limit shown.
U** - Sample result was qualified as not detected due to method blank.
Numbers in grey shading indicate results that exceed a MTCA protection of groundwater level, but do not exceed the current lowest MTCA soil cleanup level protective of direct contact.

**Table 5-2**
**Summary of Soil Sample Analytical Results for TPH and Volatile Organic Compounds**
**Building 40-11 Auto Sump**
**Boeing Everett Plant Remedial Investigation**

| Sample ID | Sample Date | Volatile Organic Compounds (ug/kg) | Total Petroleum Hydrocarbons (mg/kg) | |
|---|---|---|---|---|
| | | Acetone | Diesel-Range Hydrocarbons | Gasoline-Range Hydrocarbons |
| 1996 MTCA Method A or B Soil Cleanup Level | | 8,000,000 (B) | 200 (A) | 100 (A) |
| 1996 MTCA Method B 100x GW Soil Cleanup Value | | 80,000 (B) | NE | NE |
| 2001 MTCA Method A or B Soil Cleanup Level | | 8,000,000 (B) | 2,000 (A) | 30 / 100* (A) |
| MTCA Method A or B Protection of Groundwater | | 3,211 (B) | NC | 30 / 100* (A) |
| EGW054-15' | 02/18/98 | 39 | 5.3 U | 5.4 U |

**Notes:**
MTCA - Model Toxics Control Act
(A) - MTCA Method A soil cleanup level for unrestricted land use
(B) MTCA Method B soil cleanup levels
1996 - Indicates MTCA soil cleanup levels, published 1996.
2001 - Indicates MTCA version 3.1 soil cleanup levels, published 2001.
NC - Not calculated
NE - Not established
U - Compound was analyzed for but not detected above the reporting limit shown.
*gasoline mixtures with benzene/gasoline mixtures without benzene

**Table 5-3**
**Summary of Soil Sample Analytical Results for Metals, (mg/kg)**
**Building 40-11 Auto Sump**
**Boeing Everett Plant Remedial Investigation**

| Sample ID | Sample Date | Cadmium | Chromium | Lead | Silver |
|---|---|---|---|---|---|
| 1996 MTCA Method A or B Soil Cleanup Level | | 80 (B) | 100 (A)<br>500 (AI) | 250 (A)<br>1,000 (AI) | 400 (B) |
| 1996 MTCA Method B 100 x GW Soil Cleanup Level | | 1.6 | 1,600 ($Cr^{+3}$) | NE | 8.0 |
| 2001 MTCA Method A or B Soil Cleanup Level | | 2 (A)<br>80 (B) | 2,000($Cr^{+3}$) / 19 ($Cr^{+6}$) (A)<br>120,000($Cr^{+3}$) / 240 ($Cr^{+6}$) (B) | 250 (A)<br>1,000 (AI) | 400 (B) |
| MTCA Method A or B Protection of Groundwater | | 2 (A)<br>1.1 (B) | 2,000 ($Cr^{+3}$) / 19 ($Cr^{+6}$) (A)<br>480,096 ($Cr^{+3}$) / 18 ($Cr^{+6}$) (B) | 250 (A) | 13.6 (B) |
| WA Department of Ecology - Puget Sound Background Concentration | | 0.8 | 48.2 | 24.0 | NE |
| EGW054-15' | 02/18/98 | 0.2 U | **40.3** | 3 | 0.3 U |

**Notes:**
MTCA - Model Toxics Control Act
(A) - MTCA Method A soil cleanup level for unrestricted land use
(AI) - MTCA Method A soil cleanup level for industrial property
(B) - MTCA Method B soil cleanup level
1996 - Indicates MTCA soil cleanup levels, published 1996.
2001 - Indicates MTCA version 3.1 soil cleanup levels, published 2001.
NE - Not established
U - Compound was analyzed for but not detected above the reporting limit shown.

**Table 5-4**
**Summary of Groundwater Analytical Results for Volatile Organic Compounds, (mg/L)**
**Building 40-11 (Auto Sump)**
**Boeing Everett Plant**

| Well ID | Sample Date | Chloromethane | Vinyl Chloride | Chloroethane | Acetone | Carbon Disulfide | 1,1-DCE | 1,1-DCA | cis-1,2-DCE | Chloroform | 2-Butanone | 1,1,1-TCA | TCE | 4-Methyl-2-Pentanone | 2-Hexanone | PCE | 1,1,2,2-PCA | Toluene | Ethylbenzene | Total Xylenes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MTCA Method A or B Groundwater Screening Level | | 0.00337 (B) | 0.0002 (A)<br>0.0000292 (B) | 0.015 (B) | 0.8 (B) | 0.8 (B) | 0.4 (B) | 1.6 (B) | 0.08 (B) | 0.0072 (B) | 4.8 (B) | 0.2 (A)<br>16 (B) | 0.005 (A)<br>0.00049 (B) | 0.64 (B) | NE | 0.005 (A)<br>0.000081 (B) | 0.000219 (B) | 1 (A)<br>0.64 (B) | 0.7 (A)<br>0.8 (B) | 1 (A)<br>1.6 (B) |
| **EGW046** | 03/07/95 | NA | NA | NA | 0.028 | NA | NA | NA | 0.0071 | NA | 0.060 | NA | **0.0012** | NA | 0.005 U | 0.001 U | NA | 0.001 U | 0.004 | 0.0152 |
| | 04/28/95 | NA | NA | NA | 0.034 J | NA | NA | NA | 0.0032 | NA | 0.050 | NA | 0.001 U | NA | 0.0098 | 0.001 U | NA | 0.001 | 0.001 U | 0.0033 |
| | 11/14/95 | NA | NA | NA | 0.005 U | NA | NA | NA | 0.0028 | NA | 0.0073 | NA | 0.001 U | NA | 0.005 U | 0.001 U | NA | 0.001 | 0.001 U | 0.001 U |
| | 03/01/96 | NA | NA | NA | 0.0092 | NA | NA | NA | 0.0041 | NA | 0.012 | NA | 0.001 U | NA | 0.005 U | 0.001 U | NA | 0.001 U | 0.001 U | 0.001 U |
| | 06/03/96 | NA | NA | NA | 0.012 | NA | NA | NA | 0.0052 | NA | 0.005 U | NA | 0.001 U | NA | 0.005 U | 0.001 U | NA | 0.001 U | 0.001 U | 0.001 U |
| | 08/26/96 | NA | NA | NA | 0.0077 | NA | NA | NA | 0.0031 | NA | 0.005 U | NA | 0.001 U | NA | 0.005 U | 0.001 U | NA | 0.0014 | 0.001 U | 0.001 U |
| | 12/09/96 | NA | NA | NA | **3.30** | NA | NA | NA | 0.0017 | NA | 0.037 | NA | 0.001 U | NA | 0.005 U | **0.0015** | NA | 0.001 U | 0.001 U | 0.001 U |
| | 03/04/97 | NA | 0.002 U | NA | **3.70** | NA | NA | 0.0022 | 0.009 | NA | 0.210 | 0.0013 | 0.001 U | 0.0063 | 0.005 U | 0.001 U | NA | 0.0034 | 0.001 U | 0.0011 |
| | 05/27/97 | NA | **0.0015** | NA | 0.300 | NA | NA | 0.0036 | 0.006 | NA | 0.068 | 0.001 U | 0.001 U | 0.005 U | 0.005 U | 0.001 U | NA | 0.001 | 0.001 U | 0.001 U |
| | 08/12/97 | NA | **0.0021** | NA | 0.400 | NA | NA | 0.002 | 0.012 | NA | 0.034 | 0.001 U | 0.001 U | 0.005 U | 0.005 U | 0.001 U | NA | 0.0025 | 0.001 U | 0.002 |
| | 11/17/97 | NA | **0.0014** | NA | 0.280 | NA | NA | 0.001 U | 0.0084 | NA | 0.0066 | 0.001 U | **0.0018** | 0.005 U | 0.005 U | **0.0012** | NA | 0.0054 | 0.001 U | 0.001 U |
| | 03/12/98 | 0.002 U | **0.0013** | 0.002 U | 0.0087 | 0.001 U | 0.001 U | 0.001 U | 0.0043 | 0.001 U | 0.005 U | 0.001 U | **0.0028** | 0.005 U | 0.005 U | **0.0018** | 0.001 U | 0.001 U | 0.001 U | 0.001 U |
| | 05/12/98 | 0.002 U | **0.00014** | 0.002 U | 0.0067 U* | 0.001 U | 0.001 U | 0.001 U | 0.008 | 0.001 U | 0.005 U | 0.001 U | **0.0048** | 0.005 U | 0.005 U | **0.0012** | 0.001 U | 0.001 U | 0.001 U | 0.0017 |
| | 08/11/98 | 0.002 U | **0.0039** | 0.002 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.013 | 0.001 U | 0.005 U | 0.001 U | **0.0034** | 0.005 U | 0.005 U | **0.001** | 0.001 U | 0.001 U | 0.001 U | 0.0011 |
| | 11/10/98 | 0.002 U | 0.00001 U | 0.002 U | 0.046 | 0.001 U | 0.001 U | 0.001 U | 0.0047 | 0.001 U | 0.005 U | 0.001 U | **0.0022** | 0.005 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U |
| | 02/02/99 | 0.002 U | **0.0032** | 0.002 U | 0.0057 | 0.001 U | 0.001 U | 0.001 U | 0.0041 | 0.001 U | 0.005 U | 0.001 U | **0.0027** | 0.005 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U |
| | 05/10/99 | 0.001 U | **0.0018** | 0.001 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.004 | 0.001 U | 0.005 U | 0.001 U | **0.0025** | 0.005 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U |
| | 08/02/99 | 0.001 U | **0.0023** | 0.001 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.0044 | 0.001 U | 0.005 U | 0.001 U | **0.0028** | 0.005 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U |
| | 11/08/99 | 0.001 U | **0.0013** | 0.001 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.003 | 0.001 U | 0.005 U | 0.001 U | **0.002** | 0.005 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U |
| | 01/31/00 | 0.001 U | **0.0014** | 0.001 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.0054 | 0.001 U | 0.005 U | 0.001 U | **0.0038** | 0.005 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U |
| | 05/01/00 | 0.001 U | **0.0023** | 0.001 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.0019 | 0.001 U | 0.005 U | 0.001 U | **0.0015** | 0.005 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U |
| | 07/31/00 | 0.001 U | **0.0022** | 0.001 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.0037 | 0.001 U | 0.005 U | 0.001 U | **0.0015** | 0.005 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U |
| | 11/13/00 | 0.001 U | **0.0026** | 0.001 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.0051 | 0.001 U | 0.005 U | 0.001 U | **0.0020** | 0.005 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U |
| | 02/01/01 | 0.001 U | **0.00082** | 0.001 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.0024 | 0.001 U | 0.005 U | 0.001 U | **0.0018** | 0.005 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U |
| | 04/30/01 | 0.001 U | **0.0059** | 0.001 U | 0.54 | 0.001 U | 0.001 U | 0.001 U | 0.0073 | 0.001 U | 0.0076 | 0.001 U | **0.0022** | 0.005 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U |
| | 08/07/01 | 0.001 U | **0.0016** | 0.001 U | 0.010 | 0.001 U | 0.001 U | 0.001 U | 0.0027 | 0.001 U | 0.005 U | 0.001 U | **0.0022** | 0.005 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U |
| | 11/13/01 | 0.001 U | **0.00066** | 0.001 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.0014 | 0.001 U | 0.005 U | 0.001 U | **0.001** | 0.005 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U |
| | 02/04/02 | 0.0002 U | **0.00067** | 0.0002 U | 0.11 D | 0.0002 U | 0.000038 | 0.0002 U | 0.002 | 0.0002 U | 0.001 U | 0.0002 U | **0.0015** | 0.001 U | 0.001 U | 0.0002 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0004 U |
| | 05/02/02 | 0.0002 U | **0.0025** | 0.0002 U | 0.001 U | 0.0002 U | 0.00011 | 0.0002 U | 0.0036 | 0.0002 U | 0.001 U | 0.0002 U | **0.002** | 0.001 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U |
| | 11/14/02 | 0.0002 U | **0.00220** | 0.0002 U | 0.001 U | 0.0002 U | 0.000120 | 0.0002 U | 0.0050 | 0.0002 U | 0.001 U | 0.0002 U | **0.0032** | 0.001 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U |
| | 05/06/03 | 0.0002 U | **0.00083** | 0.0002 U | 0.041 | 0.0002 U | 0.000082 | 0.0002 U | 0.0047 | 0.0002 U | 0.0012 | 0.0002 U | **0.0041** | 0.001 U | 0.001 U | 0.0002 U | 0.0009 UJ | 0.0002 U | 0.0002 U | 0.0004 U |
| | 11/03/03 | 0.0002 | **0.00078** | 0.0002 U | 0.023 | 0.0002 U | 0.000037 | 0.0002 U | 0.0031 | 0.0002 U | 0.0010 | 0.0002 U | **0.0026** | 0.001 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U |
| | 04/15/04 | 0.0002 U | **0.001** | 0.0002 U | 0.001 U | 0.0002 U | 0.000058 | 0.0002 U | 0.0033 | 0.0002 U | 0.001 U | 0.0002 U | **0.0032** | 0.001 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U |
| | 10/04/04 | 0.0002 U | **0.00083** | 0.0002 U | 0.0018 U | 0.0002 U | 0.000065 | 0.0002 U | 0.0064 J | 0.0002 U | 0.001 U | 0.0002 U | **0.0033 J** | 0.001 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U |
| | 03/29/05 | 0.0002 U | **0.0083** | 0.0002 U | 0.001 U | 0.0002 U | 0.0002 | 0.0002 U | 0.0082 | 0.0002 U | 0.001 U | 0.0002 U | **0.0043** | 0.001 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U |
| | 10/18/05 | 0.0002 U | **0.0072** | 0.0002 U | 0.003 U | 0.0002 U | 0.0002 | 0.0002 U | 0.0048 | 0.0002 U | 0.001 U | 0.0002 U | **0.0023** | 0.001 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0012 | 0.0004 U |
| | 01/11/06 | 0.0002 U | **0.0003** | 0.0002 U | 0.018 | 0.0002 U | 0.000021 | 0.0002 U | 0.0015 | 0.0002 U | 0.001 U | 0.0002 U | **0.001** | 0.001 U | 0.001 U | 0.0002 U | 0.0011 UJ | 0.0002 U | 0.0002 U | 0.0004 U |
| | 07/05/06 | 0.0002 U | **0.008** | 0.0002 U | 0.001 | 0.0002 U | 0.00018 | 0.0002 U | 0.005 | 0.0002 U | 0.001 U | 0.0002 U | **0.0021** | 0.001 U | 0.001 U | 0.0002 U | **0.0008** | 0.0002 U | 0.0002 | 0.0004 U |
| | 01/03/07 | 0.0002 U | **0.00048** | 0.0002 U | **1.6** | 0.0020 J | 0.000043 | 0.0002 U | 0.0013 J | 0.0002 U | 0.049 J | 0.0002 U | **0.00081** | 0.0018 J | 0.003 U | 0.00002 U | 0.0002 U | 0.0004 J | 0.0002 U | 0.0004 U |
| | 07/02/07 | 0.0002 U | **0.00069** | 0.0002 U | 0.0039 | 0.0002 U | 0.000051 | 0.0002 U | 0.0027 | 0.0002 | 0.001 U | 0.0002 U | **0.0018** | 0.001 U | 0.003 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U |
| | 01/03/08 | 0.010 U | **0.00028** | 0.01 U | **1.0** | 0.010 U | 0.000041 | 0.010 U | 0.010 U | 0.010 U | 0.050 U | 0.010 U | **0.0017** | 0.050 U | 0.050 U | 0.000036 | 0.010 U | 0.010 U | 0.010 U | 0.010 U |
| | 04/23/08 | 0.0002 U | **0.00002** | 0.0002 U | 0.0046 | 0.0004 | 0.00002 U | 0.0002 U | 0.0033 | 0.0002 U | 0.0025 U | 0.0002 U | **0.0027** | 0.0025 U | 0.0025 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 |
| | 07/07/08 | 0.0002 U | **0.0011** | 0.0002 U | 0.003 U | 0.0002 U | 0.0018 | 0.0002 U | 0.0075 | 0.0002 U | 0.0025 U | 0.0002 U | **0.0078** | 0.0025 U | 0.0025 U | 0.000033 | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U |
| | 01/02/09 | 0.0002 U | 0.00002 U | 0.0002 U | 0.17 D | 0.0002 U | 0.00002 U | 0.0002 U | 0.0031 | 0.0002 U | 0.0025 U | 0.0002 U | **0.0025** | 0.0025 U | 0.0025 U | 0.000031 | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U |
| | 07/06/09 | 0.0005 U | **0.0025** | 0.0002 U | 0.0050 U | 0.0002 U | 0.00024 | 0.0002 U | 0.0011 | 0.0002 U | 0.0050 U | 0.0002 U | **0.0048** | 0.0050 U | 0.0050 U | 0.00003 | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U |
| | 01/08/10 | 0.0005 U | 0.00020 | 0.0002 U | 0.005 U | 0.0002 U | 0.00002 U | 0.0002 U | 0.002 | 0.0002 U | 0.005 U | 0.0002 U | **0.0009** | 0.005 U | 0.005 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U |

**Table 5-4**
**Summary of Groundwater Analytical Results for Volatile Organic Compounds, (mg/L)**
**Building 40-11 (Auto Sump)**
**Boeing Everett Plant**

| Well ID | Sample Date | Chloromethane | Vinyl Chloride | Chloroethane | Acetone | Carbon Disulfide | 1,1-DCE | 1,1-DCA | cis-1,2-DCE | Chloroform | 2-Butanone | 1,1,1-TCA | TCE | 4-Methyl-2-Pentanone | 2-Hexanone | PCE | 1,1,2,2-PCA | Toluene | Ethylbenzene | Total Xylenes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MTCA Method A or B Groundwater Screening Level | | 0.00337 (B) | 0.0002 (A)<br>0.0000292 (B) | 0.015 (B) | 0.8 (B) | 0.8 (B) | 0.4 (B) | 1.6 (B) | 0.08 (B) | 0.0072 (B) | 4.8 (B) | 0.2 (A)<br>16 (B) | 0.005 (A)<br>0.00049 (B) | 0.64 (B) | NE | 0.005 (A)<br>0.000081 (B) | 0.000219 (B) | 1 (A)<br>0.64 (B) | 0.7 (A)<br>0.8 (B) | 1 (A)<br>1.6 (B) |
| **EGW054** | 03/12/98 | 0.002 U | **0.000095** | 0.002 U | 0.013 | 0.001 U | 0.001 U | 0.001 U | 0.001U | 0.001 U | 0.005 U | 0.001 U | 0.001 U | 0.005 U | 0.005 U | **0.0012** | 0.001 U | 0.0011 | 0.001 U | 0.001 U |
| | 05/12/98 | 0.002 U | **0.0026** | 0.002 U | 0.01 U* | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | 0.001 U | 0.001 U | 0.005 U | 0.005 U | **0.0012** | 0.001 U | 0.001 U | 0.001 U | 0.001 U |
| | 08/11/98 | 0.002 U | **0.00021** | 0.002 U | 0.0075 | 0.001 U | 0.001 U | 0.0011 | 0.001 | 0.001 U | 0.005 U | 0.001 U | 0.001 U | 0.005 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U |
| | 11/10/98 | 0.002 U | **0.00018** | 0.002 U | 0.37 | 0.001 U | 0.001 U | 0.001 U | 0.0012 | 0.001 U | 0.011 | 0.001 U | 0.001 U | 0.005 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U |
| | 02/02/99 | 0.002 U | **0.00013** | 0.002 U | 0.015 | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | 0.001 U | 0.001 U | 0.005 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U |
| | 05/10/99 | 0.001 U | **0.00014** | 0.001 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | 0.001 U | 0.001 U | 0.005 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U |
| | 08/02/99 | 0.001 U | **0.00011** | 0.001 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | 0.001 U | 0.001 U | 0.005 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U |
| | 11/08/99 | 0.001 U | **0.000039** | 0.001 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | 0.001 U | 0.001 U | 0.005 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U |
| | 01/31/00 | 0.001 U | **0.000049** | 0.001 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | 0.001 U | 0.001 U | 0.005 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U |
| | 05/01/00 | 0.001 U | **0.000034** | 0.001 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | 0.001 U | 0.001 U | 0.005 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U |
| | 07/31/00 | 0.001 U | **0.000044** | 0.001 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | 0.001 U | 0.001 U | 0.005 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U |
| | 11/13/00 | 0.001 U | **0.000049** | 0.001 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | 0.001 U | 0.001 U | 0.005 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U |
| | 02/01/01 | 0.001 U | **0.000053** | 0.001 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | 0.001 U | 0.001 U | 0.005 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U |
| | 04/30/01 | 0.01 U | **0.000051** | 0.01 U | **1.9** | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.05 U | 0.01 U | 0.01 U | 0.05 U | 0.05 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U |
| | 08/07/01 | 0.001 U | **0.000036** | 0.001 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | 0.001 U | 0.001 U | 0.005 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U |
| | 11/13/01 | 0.001 U | **0.000027** | 0.001 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | 0.001 U | 0.001 U | 0.005 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U |
| | 02/04/02 | 0.0002 U | **0.00004** | 0.0002 U | 0.059 | 0.0002 U | 0.000034 | 0.0007 | 0.0004 | 0.0002 U | 0.0013 UJ | 0.0002 U | 0.0003 | 0.001 U | 0.001 U | 0.0002 U | 0.00099 UJ | 0.0002 U | 0.0002 U | 0.0004 U |
| | 05/02/02 | 0.0002 U | 0.000020 U | 0.0002 U | 0.001 U | 0.0002 U | 0.00002 U | 0.0004 | 0.0002 | 0.0002 U | 0.001 U | 0.0002 U | 0.0002 | 0.001 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U |
| | 11/14/02 | 0.0002 U | 0.00002 U | 0.0002 U | 0.001 U | 0.0002 U | 0.00002 U | 0.0005 | 0.0004 | 0.0002 U | 0.001 U | 0.0002 U | **0.0006** | 0.001 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U |
| | 05/06/03 | 0.0002 U | 0.00002 U | 0.0002 U | 1.4 D | 0.0002 U | 0.00002 U | 0.0004 | 0.0003 | 0.0002 U | 0.046 | 0.0002 U | **0.0008** | 0.001 U | 0.001 U | 0.0002 U | 0.0007 UJ | 0.0002 U | 0.0002 U | 0.0004 U |
| | 11/03/03 | 0.0002 U | 0.00002 U | 0.0002 U | 0.0013 U | 0.0002 U | 0.00002 U | 0.0006 | 0.0005 | 0.0002 U | 0.001 U | 0.0002 U | **0.0005** | 0.001 U | 0.001 U | 0.0002 U | 0.0012 UJ | 0.0002 U | 0.0002 U | 0.0004 U |
| | 04/15/04 | 0.0002 U | 0.00002 U | 0.0002 U | 0.001 U | 0.0002 U | 0.00002 U | 0.0004 | 0.0004 | 0.0002 U | 0.001 U | 0.0002 U | 0.0003 | 0.001 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U |
| | 10/04/04 | 0.0002 U | **0.000033** | 0.0002 U | 0.001 U | 0.0002 U | 0.00002 U | 0.0004 J | 0.0005 J | 0.0002 U | 0.001 U | 0.0002 U | 0.0004 J | 0.001 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U |
| | 03/29/05 | 0.0002 U | 0.000025 | 0.0002 U | 0.001 U | 0.0002 U | 0.00002 U | 0.0007 | 0.0006 | 0.0002 U | 0.001 U | 0.0002 U | 0.0002 U | 0.001 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U |
| | 10/18/05 | 0.0002 U | 0.00002 U | 0.0002 U | 0.0024 U | 0.0002 U | 0.00002 U | 0.0005 J | 0.0006 | 0.0002 U | 0.001 U | 0.0002 U | 0.0003 J | 0.001 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U |
| | 01/11/06 | 0.0002 U | 0.00002 U | 0.0002 U | 0.001 U | 0.0002 U | 0.00002 U | 0.0002 | 0.0005 | 0.0002 U | 0.001 U | 0.0002 U | 0.0002 U | 0.001 U | 0.001 U | 0.0002 U | 0.0012 UJ | 0.0002 U | 0.0002 U | 0.0004 U |
| | 07/05/06 | 0.0002 U | 0.00002 U | 0.0002 U | 0.001 U | 0.0002 U | 0.00002 U | 0.0004 | 0.0005 | 0.0002 U | 0.001 U | 0.0002 U | 0.0002 | 0.001 U | 0.001 U | 0.0002 U | **0.0015** | 0.0002 U | 0.0002 U | 0.0004 U |
| | 01/03/07 | 0.0002 U | 0.00002 U | 0.0002 U | **2.3** | 0.0003 J | 0.00002 U | 0.0002 U | 0.0004 J | 0.0002 U | 0.099 | 0.0002 U | 0.00002 U | 0.0034 J | 0.003 U | 0.00002 U | 0.0002 U | 0.0003 J | 0.0002 U | 0.0004 U |
| | 07/02/07 | 0.0002 U | 0.000027 | 0.0002 U | 0.003 U | 0.0002 U | 0.00002 U | 0.0002 U | 0.0004 J | 0.0002 U | 0.001 U | 0.0002 U | 0.00019 | 0.001 U | 0.003 U | 0.000022 | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U |
| | 01/03/08 | 0.001 U | 0.00002 U | 0.001 U | **3.0 D** | 0.001 U | 0.00002 U | 0.001 U | 0.001 U | 0.001 U | 0.036 | 0.001 U | 0.00036 | 0.005 U | 0.005 U | 0.000021 | 0.001 U | 0.0036 | 0.001 U | 0.0012 |
| | 04/23/08 | 0.0002 U | 0.00002 U | 0.0002 U | 0.003 U | 0.0002 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0025 U | 0.0002 U | 0.00015 | 0.0025 U | 0.0025 U | 0.000038 | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U |
| | 07/07/08 | 0.0002 U | 0.00002 U | 0.0002 U | 0.003 U | 0.0002 U | 0.00002 U | 0.0002 U | 0.0002 | 0.0002 U | 0.0025 U | 0.0002 U | 0.00013 | 0.0025 U | 0.0025 U | 0.000022 | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U |
| | 01/02/09 | 0.0003 | 0.00002 U | **0.28 J** | **12 D** | 0.0002 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0025 U | 0.0002 U | 0.0003 | 0.0025 U | 0.0025 U | 0.000046 | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U |
| | 07/06/09 | 0.0005 U | 0.00002 U | 0.0002 U | 0.0050 U | 0.0002 U | 0.00002 U | 0.0002 | 0.0003 | 0.0002 U | 0.0050 U | 0.0002 U | 0.00021 | 0.0050 U | 0.0050 U | 0.000029 | 0.0002 U | 0.0003 | 0.0002 U | 0.0004 U |
| | 01/08/10 | 0.0005 U | 0.00002 U | 0.0002 U | 0.005 U | 0.0002 U | 0.00002 U | 0.0002 | 0.0002 | 0.0002 U | 0.005 U | 0.0002 U | 0.00012 | 0.005 U | 0.005 U | 0.000020 | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U |

**Notes:**

Values in **bold** font indicate that the result reported exceeds the most current MTCA levels based on the Ecology website

Model Toxics Control Act (MTCA) Cleanup Regulation, WAC 173-340. MTCA Method A and B values are from Ecology website CLARC tables downloaded as of June 2010. (https://fortress.wa.gov/ecy/clarc/reporting/CLARCReporting.aspx).

(A) = MTCA Method A
(B) = MTCA Method B

1,1-DCA = 1,1-Dichloroethane
1,1-DCE = 1,1-Dichloroethene
cis-1,2-DCE = cis-1,2-Dichloroethene
1,1,2,2-PCA = 1,1,2,2-Tetrachloroethane
TCE = Trichloroethene
PCE = Tetrachloroethene
1,1,1-TCA = 1,1,1-Trichloroethane

D = Dilution required to quantitate analyte within linear range of detector. This flag was not used prior to August, 200
NE = Not established
J = Estimated value
U = Compound was analyzed for, but not detected above the reporting limit shown
* Sample result was qualified as not detected due to method blank contamination
* Suspected laboratory contamination.

**Table 5-5**
**Summary of Groundwater Analytical Results for Total Petroleum Hydrocarbons, (mg/L)**
**Building 40-11 (Auto Sump)**
**Boeing Everett Plant**

| Well ID | Sample Date | Gasoline-Range | Diesel-Range | Oil-Range |
|---|---|---|---|---|
| MTCA Method A Groundwater Screening Level | | 0.8 / 1.0*** | 0.5 | 0.5 |
| **EGW046** | 03/07/95 | **1,900** | **63** | **46** |
| | 04/28/95 | **51** | 10 U | 25 U |
| | 11/14/95 | **1,600** | **81** | **100** |
| | 03/01/96 | 10 U | 10 U | 25 U |
| | 06/03/96 | **2.7** | **15** | **4.3** |
| | 08/26/96 | **2.2** | **12** | **5.2** |
| | 12/09/96 | **1.4** | **21** | **67** |
| | 03/04/97 | **1.6** | **13** | 0.50 U |
| | 05/27/97 | **3.0** | **17** | 0.50 U |
| | 08/12/97 | **1.3 J** | **16 J** | **0.52** |
| | 11/17/97 | **1.4 J** | **9.0** | **1.2** |
| | 03/12/98 | 0.57 ** | **5.4** | 0.50 U |
| | 05/12/98 | 0.41 ** | **4.3 *** | 0.50 U |
| | 08/11/98 | 0.39 ** | **4.7 *** | 0.50 U |
| | 11/10/98 | 0.48 ** | **4.5 *** | **0.84 *** |
| | 02/02/99 | 0.48** | **4.1**** | **2.1**** |
| | 05/10/99 | 0.51 J** | **2.8 *** | 0.50 U |
| | 08/02/99 | 0.36** | **2.6*** | **0.72*** |
| | 11/08/99 | 0.50 J** | **3.0*** | **0.70*** |
| | 01/31/00 | 0.38 J ** | **3.9*** | **5.7*** |
| | 05/01/00 | 0.45** | **0.93*** | 0.50 U |
| | 07/31/00 | 0.42 J ** | **1.0 *** | 0.50 U |
| | 11/13/00 | 0.38** | **1.6*** | **0.63*** |
| | 02/01/01 | 0.25 U | **0.84 *** | 0.50 U |
| | 04/30/01 | 0.25 U | **0.95 *** | 0.50 U |
| | 08/07/01 | 0.28 ** | **0.87 *** | 0.50 U |
| | 11/13/01 | 0.25 U | **0.96 *** | **0.95 *** |
| | 02/04/02 | 0.25 U | **0.56 *** | 0.50 U |
| | 05/02/02 | 0.25 U | **0.66 *** | 0.50 U |
| | 11/14/02 | 0.25 U | **1.2 *** | **1.8 *** |
| | 05/06/03 | 0.25 U | **0.52 *** | 0.50 U |
| | 11/03/03 | 0.25 U | **0.62 *** | 0.50 U |
| | 04/15/04 | 0.25 U | **0.50 *** | 0.50 U |
| | 10/04/04 | 0.25 U | 0.25 U | 0.50 U |
| | 03/29/05 | 0.25 U | **0.58*** | 0.50 U |
| | 10/18/05 | NA | 0.25 U | 0.50 U |
| | 01/11/06 | NA | 0.28* | 0.50 U |
| | 07/05/06 | NA | 0.29* | 0.50 U |
| | 01/03/07 | NA | **6.3** | **3.0** |
| | 07/02/07 | NA | 0.43 * | 0.50 U |
| | 01/03/08 | NA | **3.6*** | **1.9*** |
| | 04/23/08 | NA | **8.6*** | **23** |
| | 07/07/08 | NA | **0.54*** | **0.90** |
| | 01/02/09 | NA | 0.25 U | 0.50 U |
| | 07/06/09 | NA | 0.49* | 0.50 U |
| | 01/08/10 | NA | 0.25 U | 0.50 U |

**Table 5-5**
**Summary of Groundwater Analytical Results for Total Petroleum Hydrocarbons, (mg/L)**
**Building 40-11 (Auto Sump)**
**Boeing Everett Plant**

| Well ID | Sample Date | Gasoline-Range | Diesel-Range | Oil-Range |
|---|---|---|---|---|
| **EGW054** | 03/12/98 | 0.46 ** | **6.4 *** | **2.0*** |
| | 05/12/98 | 0.42 ** | **5.0 *** | **0.72*** |
| | 08/11/98 | 0.66 ** | **4.8 *** | 0.50 U |
| | 11/10/98 | 0.62 J ** | **5.2 *** | **2.6 *** |
| | 02/02/99 | 0.49** | **4.9*** | **2.3*** |
| | 05/10/99 | 0.62 J** | **3.8 *** | 0.50 U |
| | 08/02/99 | 0.38** | **2.4*** | 0.50 U |
| | 11/08/99 | 0.40 J** | **2.8*** | 0.50 U |
| | 01/31/00 | 0.36 J** | **1.5*** | 0.50 U |
| | 05/01/00 | 0.25 U | **0.86*** | 0.50 U |
| | 07/31/00 | 0.28 J ** | **0.51 *** | 0.50 U |
| | 11/13/00 | 0.25 U | **1.5*** | **0.64*** |
| | 02/01/01 | 0.25 U | **1.1 *** | 0.50 U |
| | 04/30/01 | 0.25 U | **1.0*** | 0.50 U |
| | 08/07/01 | 0.25 U | **0.91 *** | 0.50 U |
| | 11/13/01 | 0.25 U | **0.94 *** | 0.50 U |
| | 02/04/02 | 0.25 U | **0.84 *** | **0.60 *** |
| | 05/02/02 | 0.25 U | **0.53 *** | 0.50 U |
| | 11/14/02 | 0.25 U | **0.59 *** | 0.50 U |
| | 05/06/03 | 0.25 U | **0.54 *** | 0.50 U |
| | 11/03/03 | 0.25 U | 0.49 * | 0.50 U |
| | 04/15/04 | 0.25 U | 0.36 * | 0.50 U |
| | 10/04/04 | 0.25 U | 0.29* | 0.50 U |
| | 03/29/05 | 0.25 U | **0.64*** | 0.50 U |
| | 10/18/05 | NA | 0.26* | 0.50 U |
| | 01/11/06 | NA | 0.26* | 0.50 U |
| | 07/05/06 | NA | 0.27* | 0.50 U |
| | 01/03/07 | NA | **9.4** | 0.50 U |
| | 07/02/07 | NA | **2.3 *** | 0.50 U |
| | 01/03/08 | NA | **4.4*** | 0.50 U |
| | 04/23/08 | NA | 0.25 U | 0.50 U |
| | 07/07/08 | NA | 0.29* | 0.50 U |
| | 01/02/09 | NA | 0.25 U | 0.50 U |
| | 07/06/09 | NA | **0.50*** | 0.50 U |
| | 01/08/10 | NA | 0.27* | 0.50 U |

**Notes:**
Values in **bold** font indicate that the result reported exceeds the most current MTCA level based on the Ecology website.
Model Toxics Control Act (MTCA) Cleanup Regulation, WAC 173-340. MTCA Method A values are from Ecology website CLARC tables downloaded as of June 2010. (https://fortress.wa.gov/ecy/clarc/reporting/CLARCReporting.aspx
J - Estimated value
NA - Not analyzed
TPH - Total Petroleum Hydrocarbons; Diesel range fractions were quantitated using NWTPH-Dx and oil range fractions were quantitated using NWTPH-Dx extended.
U - Compound was analyzed for, but not detected above the reporting limit shown.
* Pattern profile does not match typical diesel or motor oil range patterns.
** Pattern profile does not match typical gasoline range pattern.
***gasoline mixtures with benzene/gasoline mixtures without benzene.

**Table 5-6**
**Summary of Groundwater Analytical Results for Metals, (mg/L)**
**Building 40-11 (Auto Sump)**
**Boeing Everett Plant Remedial Investigation**

| Well ID | Sample Date | Barium | | Cadmium | | Chromium | | Lead | | Silver | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Dissolved |
| 1996 MTCA Method A or B Groundwater Cleanup Level | | 1.12 (B) | | 0.005 (A)<br>0.008 (B) | | 0.05 (A) | | 0.005 (A) | | 0.08 (B) | |
| 2001 MTCA Method A or B Groundwater Cleanup Level | | 0.56 (B)<br>3.2 (B*) | | 0.005 (A)<br>0.008 (B) | | 0.05 (A)<br>24 ($Cr^{+3}$) (B)<br>0.048 ($Cr^{+6}$) (B) | | 0.015 (A) | | 0.08 (B) | |
| **EGW046** | 11/17/97 | NA | NA | 0.002 UJ | 0.002 UJ | 0.005 UJ | 0.005 UJ | 0.001 J | 0.001 UJ | 0.003 UJ | 0.003 UJ |
| | 03/12/98 | NA | NA | 0.002 U | 0.002 U | 0.005 U | 0.005 U | 0.002 | 0.001 U | 0.003 U | 0.003 U |
| | 05/12/98 | NA | NA | 0.002 U | 0.002 U | 0.005 U | 0.005 U | 0.004 J | 0.001 U | 0.003 U | 0.003 U |
| | 08/11/98 | NA | NA | 0.002 U | 0.002 U | 0.005 U | 0.005 U | 0.004 | 0.001 U | 0.003 U | 0.003 U |
| | 11/10/98 | 0.108 | 0.697 | 0.003 | 0.002 U | 0.017 | 0.005 U | **0.030** | 0.020 U | 0.003 U | 0.003 U |
| | 02/02/99 | NA | NA | 0.002 U | 0.002 U | 0.005 U | 0.005 U | 0.004 | 0.001 U | 0.003 U | 0.003 U |
| | 05/10/99 | NA | NA | 0.002 U | 0.002 U | 0.005 U | 0.005 U | 0.002 | 0.001 U | 0.003 U | 0.003 U |
| | 08/02/99 | NA | NA | 0.002 U | 0.002 U | 0.012 | 0.005 U | 0.002 | 0.001 U | 0.003 U | 0.003 U |
| | 11/08/99 | NA | NA | 0.002 U | 0.002 U | 0.005 U | 0.005 U | 0.004 | 0.001 U | 0.003 U | 0.003 U |
| | 01/31/00 | NA | NA | **0.030** | 0.002 U | **0.242** | 0.005 U | **0.22** | 0.001 U | 0.003 U | 0.003 U |
| | 05/01/00 | NA | NA | 0.002 U | 0.002 U | 0.005 U | 0.005 U | 0.004 | 0.001 U | 0.003 U | 0.003 U |
| | 07/31/00 | NA | NA | 0.002 U | 0.002 U | 0.005 U | 0.005 U | 0.011 | 0.001 U | 0.003 U | 0.003 U |
| | 11/13/00 | NA | NA | 0.002 U | 0.002 U | 0.007 | 0.005 U | 0.003 | 0.001 U | 0.003 U | 0.003 U |
| | 02/01/01 | NA | NA | 0.002 U | 0.002 U | 0.005 U | 0.005 U | 0.001 U | 0.001 U | 0.003 U | 0.003 U |
| | 04/30/01 | NA | NA | 0.002 U | 0.002 U | 0.005 U | 0.005 U | 0.001 | 0.001 U | 0.003 U | 0.003 U |
| | 08/07/01 | NA | NA | 0.002 U | 0.002 U | 0.005 U | 0.005 U | 0.002 | 0.001 U | 0.003 U | 0.003 U |
| | 11/13/01 | NA | NA | 0.002 U | 0.002 U | 0.017 | 0.005 U | **0.018** | 0.001 U | 0.003 U | 0.003 U |
| | 02/04/02 | NA | NA | 0.002 U | 0.002 U | 0.005 U | 0.005 U | 0.004 | 0.002 | 0.003 U | 0.003 U |
| | 05/02/02 | NA | NA | 0.002 U | 0.002 U | 0.005 U | 0.005 U | 0.001 U | 0.001 U | 0.003 U | 0.003 U |
| | 11/14/02 | NA | NA | 0.002 U | 0.002 U | 0.005 U | 0.005 U | 0.003 | 0.001 U | NA | NA |
| | 05/06/03 | NA | NA | 0.002 U | 0.002 U | 0.005 U | 0.005 U | 0.004 | 0.002 | NA | NA |
| | 11/03/03 | NA | NA | 0.002 U | 0.002 U | 0.005 U | 0.005 U | 0.002 | 0.001 | NA | NA |
| | 04/15/04 | NA | NA | 0.003 | 0.002 U | 0.005 U | 0.005 U | 0.009 | 0.001 | NA | NA |
| | 10/04/04 | NA | NA | 0.002 U | 0.002 U | 0.005 U | 0.005 U | 0.001 U | 0.001 U | NA | NA |
| | 03/29/05 | NA | NA | 0.002 U | 0.002 U | 0.005 U | 0.005 U | 0.005 | 0.001 U | NA | NA |
| **EGW054** | 03/12/98 | NA | NA | 0.002 U | 0.002 U | **0.212** | 0.005 U | **0.024** | 0.001 U | 0.003 U | 0.003 U |
| | 05/12/98 | NA | NA | 0.002 U | 0.002 U | **0.081** | 0.005 U | **0.011 J** | 0.001 U | 0.003 U | 0.003 U |
| | 08/11/98 | NA | NA | 0.002 U | 0.002 U | 0.01 | 0.005 U | 0.002 | 0.001 U | 0.003 U | 0.003 U |
| | 11/10/98 | 0.87 | 1.07 | 0.004 | 0.002 U | **0.347** | 0.005 U | **0.050** | 0.02 U | 0.003 U | 0.003 U |
| | 02/02/99 | NA | NA | 0.002 | 0.002 U | **0.148** | 0.005 U | **0.020** | 0.001 U | 0.003 U | 0.003 U |
| | 05/10/99 | NA | NA | 0.002 U | 0.002 U | 0.005 U | 0.005 U | 0.001 U | 0.001 U | 0.003 U | 0.003 U |
| | 08/02/99 | NA | NA | 0.002 U | 0.002 U | 0.015 | 0.005 U | **0.017** | 0.001 U | 0.003 U | 0.003 U |
| | 11/08/99 | NA | NA | 0.002 U | 0.002 U | 0.005 U | 0.005 U | 0.002 | 0.001 U | 0.003 U | 0.003 U |
| | 01/31/00 | NA | NA | 0.002 U | 0.002 U | 0.007 | 0.005 U | 0.001 | 0.001 U | 0.003 U | 0.003 U |
| | 05/01/00 | NA | NA | 0.002 U | 0.002 U | 0.013 | 0.005 U | 0.001 | 0.001 U | 0.003 U | 0.003 U |
| | 07/31/00 | NA | NA | 0.002 U | 0.002 U | 0.005 U | 0.005 U | 0.001 U | 0.001 U | 0.003 U | 0.003 U |
| | 11/13/00 | NA | NA | 0.002 U | 0.002 U | 0.005 U | 0.005 U | 0.001 U | 0.001 U | 0.003 U | 0.003 U |
| | 02/01/01 | NA | NA | 0.002 U | 0.002 U | 0.005 U | 0.005 U | 0.001 U | 0.001 U | 0.003 U | 0.003 U |
| | 04/30/01 | NA | NA | 0.002 U | 0.002 U | 0.005 U | 0.005 U | 0.001 U | 0.001 U | 0.003 U | 0.003 U |
| | 08/07/01 | NA | NA | 0.002 U | 0.002 U | 0.005 U | 0.005 U | 0.001 U | 0.001 U | 0.003 U | 0.003 U |
| | 11/13/01 | NA | NA | 0.002 U | 0.002 U | 0.005 U | 0.005 U | 0.001 U | 0.001 U | 0.003 U | 0.003 U |
| | 02/04/02 | NA | NA | 0.002 U | 0.002 U | 0.005 U | 0.005 U | 0.001 | 0.001 | 0.003 U | 0.003 U |
| | 05/02/02 | NA | NA | 0.002 U | 0.002 U | 0.005 U | 0.005 U | 0.001 U | 0.001 U | 0.003 U | 0.003 U |
| | 11/14/02 | NA | NA | 0.002 U | 0.002 U | 0.005 U | 0.005 U | 0.001 U | 0.001 U | NA | NA |
| | 05/06/03 | NA | NA | 0.002 U | 0.002 U | 0.005 U | 0.005 U | 0.001 | 0.001 U | NA | NA |
| | 11/03/03 | NA | NA | 0.002 U | 0.002 U | 0.005 U | 0.005 U | 0.001 U | 0.001 U | NA | NA |
| | 04/15/04 | NA | NA | 0.002 U | 0.002 U | 0.005 U | 0.005 U | 0.001 U | 0.001 U | NA | NA |
| | 10/04/04 | NA | NA | 0.002 U | 0.002 U | 0.005 | 0.005 U | 0.001 U | 0.001 U | NA | NA |
| | 03/29/05 | NA | NA | 0.002 U | 0.002 U | 0.005 U | 0.005 U | 0.001 U | 0.001 U | NA | NA |

**Notes:**
MTCA - Model Toxics Control Act
(A) MTCA Method A groundwater cleanup level
(B) MTCA Method B groundwater cleanup level
(B*) Revised 2001 MTCA Method B value from Ecology website CLARC tables downloaded June 2010 (https://fortress.wa.gov/ecy/clarc/reporting/CLARCReporting.aspx)
1996 - Indicates MTCA groundwater cleanup levels, published 1996.
2001 - Indicates MTCA version 3.1 groundwater cleanup levels, published 2001.
J - Estimated value
U - Compound was analyzed for, but not detected above the reporting limit shown
UJ - Compound was analyzed for, but not detected above the reporting limit shown. Reporting limit is an estimated value
Numbers in **bold** font indicate that the result reported exceeds the most current MTCA cleanup level as of June 2010.

**Table 5-7**
**Summary of Soil Analytical Results**
**UST Site Check - EV-48-1**
**Boeing Everett Plant**

| **Sample ID** | **Sample Date** | **Sample Depth (feet bgs)** | **TPH (mg/kg)** | | | **VOCs (ug/kg)** | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | Gasoline-Range | Diesel-Range | Motor Oil-Range | Benzene | Toluene | Ethylbenzene | Total Xylenes |
| ESB1675 | 1/16/07 | 4 | 27* | 260 | 19* | **37** | 140 | 83 | 650 |
| ESB1676 | 1/16/07 | 18 | 6.6 U | 6.0 U | 12 U | 17 U | 17 U | 17 U | 17 U |
| ESB1677 | 1/16/07 | 3.5 | **2,100** | 48*[b] | 11 U | **1,500** | **24,000** | **6,900** | **122,000** |
| | 1/16/07 | 11 | **3,700** | 81*[b] | 20 | **5,300** | **63,000** | **23,000** | **230,000** |
| | 1/16/07 | 20 | **82*** | 83* | 440* | **42** | 120 | 110 | 700 |
| ESB1678 | 1/16/07 | 11 | **31** | 45* | 230* | **110** | 210 | 63 | 1,020 |
| ESB1679 | 1/16/07 | 3 | **170** | 38*[b] | 49 | **620** | 2,900 | 2,300 | **17,400** |
| | 1/16/07 | 12 | 14 | 39* | 330* | **43** | 140 | 20 U | 180 |
| ESB1680 | 1/16/07 | 6 | 5.3 U | 150 | 1,100 | 13 U | 13 U | 13 U | 34 |
| 2001 MTCA Method A or B Soil Cleanup Levels | | | 30/100 (A) [a] | 2,000 (A) | 2,000 (A) | 30 (A)<br>18,200 (B) | 7,000 (A)<br>6,400,000 (B*) | 6,000 (A)<br>8,000,000 (B) | 9,000 (A)<br>160,000,000 (B) |
| MTCA Method A or B Protection of Groundwater | | | 30 / 100* (A) | NC | NC | 30 (A)<br>4.5 (B) | 7,000 (A)<br>4,654 (B) | 6,000 (A)<br>6,912 (B) | 9,000 (A)<br>14,630 (B) |

**Notes:**

Model Toxics Control Act (MTCA) Cleanup Regulation, WAC 173-340. MTCA Method A and B values are from Ecology website CLARC tables downloaded June 2010.
(https://fortress.wa.gov/ecy/clarc/reporting/CLARCReporting.aspx)

(A) - MTCA Method A soil cleanup level

(B) - MTCA Method B soil cleanup level

(B*) Revised 2001 MTCA Method B value from Ecology website CLARC tables downloaded June 2010 (https://fortress.wa.gov/ecy/clarc/reporting/CLARCReporting.aspx).

bgs - below ground surface

TPH - Total petroleum hydrocarbons

NC - Not calculated

U - Parameter was analyzed for but not detected above the reporting limit shown.

VOCs - Volatile organic compounds

Numbers in **bold** font indicate that the result reported exceeds a MTCA cleanup level.

[a] The soil cleanup level is 100 mg/kg if benzene is not present and the total of ethylbenzene, toluene, and xylenes is less than 1% of the gasoline mixture. The cleanup level for all other gasoline mixtures is 30 mg/kg.

[b] The diesel-range chromatographic fingerprint resembles a light fuel such as Jet A or kerosene.

* Chromatographic profile does not match the laboratory standard chromatogram.

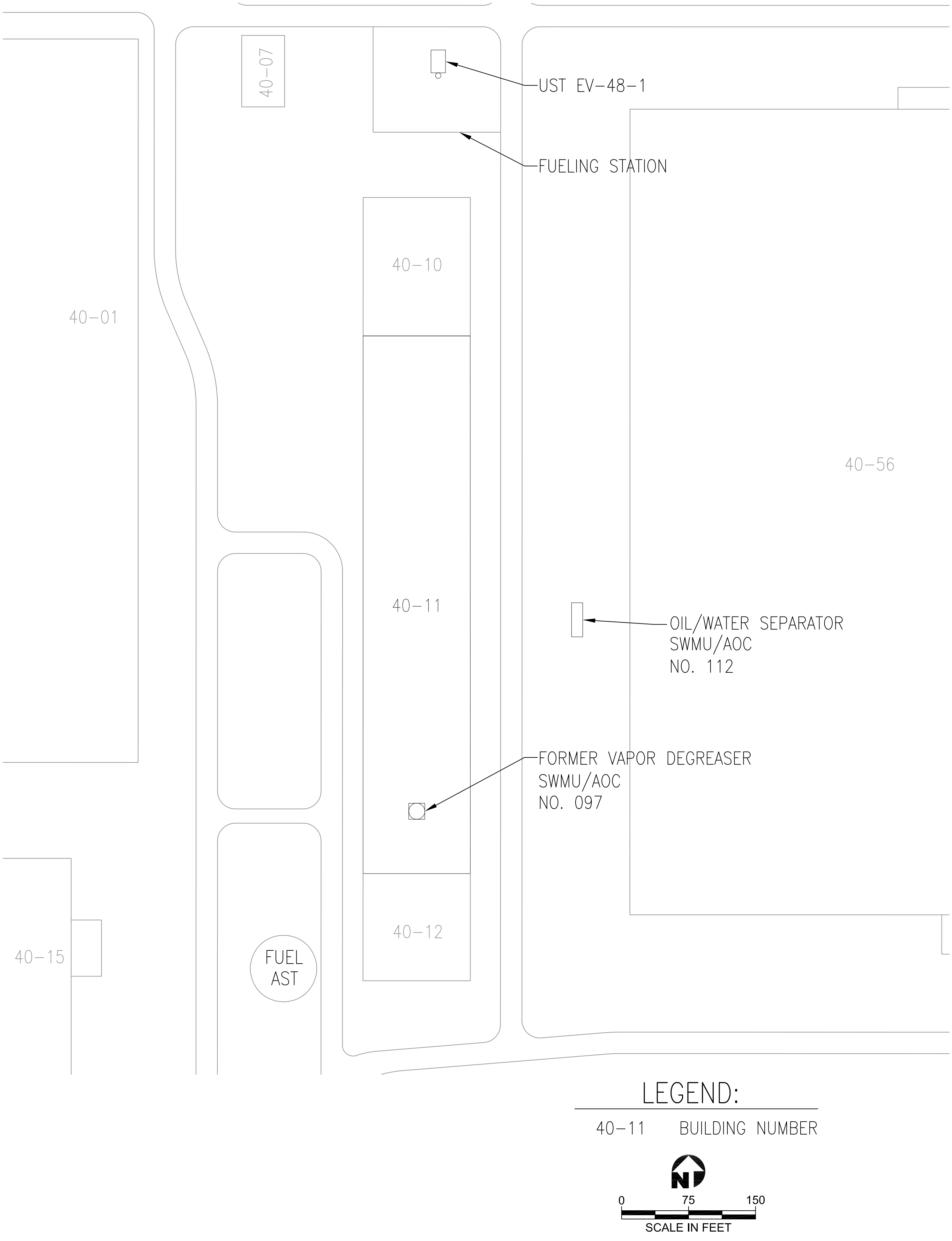



**Figure 5-1**

**BUILDING 40-11 PLAN AND SWMU/AOC LOCATIONS**

Job No. 33761927

Boeing Commercial Airplanes, Everett Plant

REMEDIAL INVESTIGATION REPORT

URS Q:\geo\Boeing\Everett\RI\2010\Fig 5-1.dwg
Mod: 11/15/2010, 09:57 | Plotted: 11/16/2010, 14:30 | john_knobbs

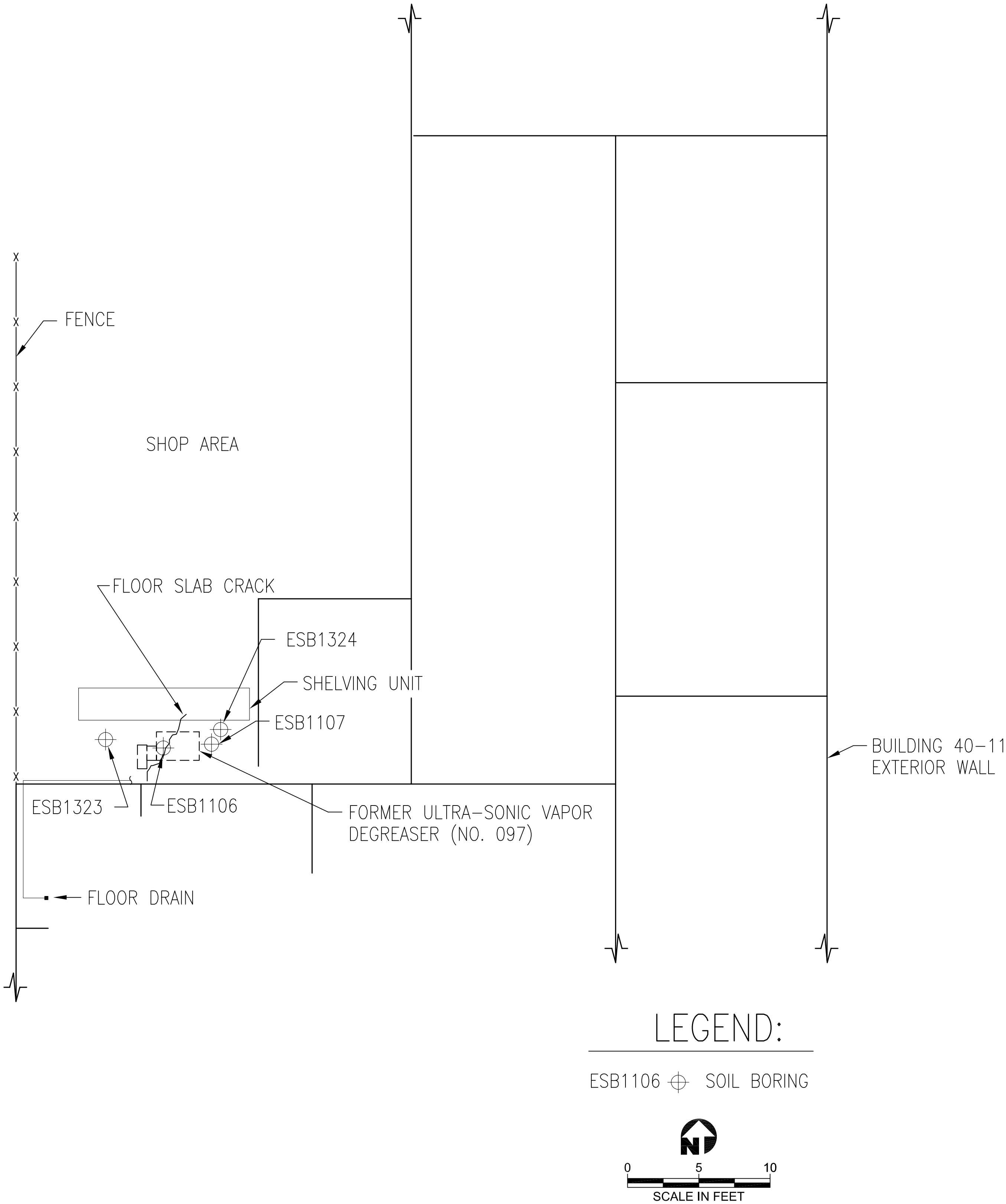



Figure 5-2
**BUILDING 40-11 FORMER VAPOR DEGREASER (NO. 097) SOIL BORING LOCATIONS**

Job No. 33761927

URS Q:\geo\Boeing\Everett\GW Monitoring Report\2010 RI\06 Report\Fig 5-2.dwg
Mod: 08/12/2010, 10:09 | Plotted: 08/12/2010, 10:09 | john_knobbs

Boeing Commercial Airplanes, Everett Plant
REMEDIAL INVESTIGATION REPORT

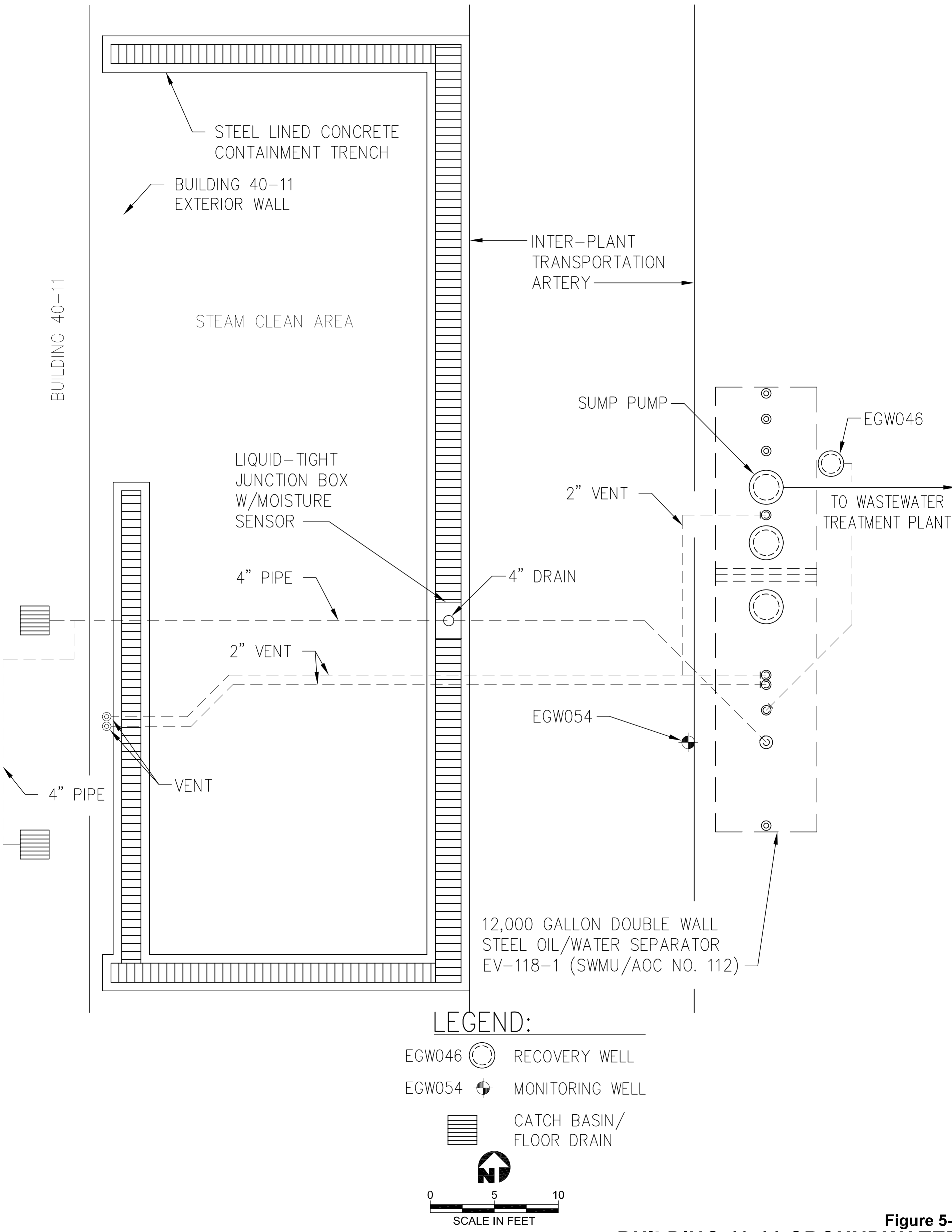
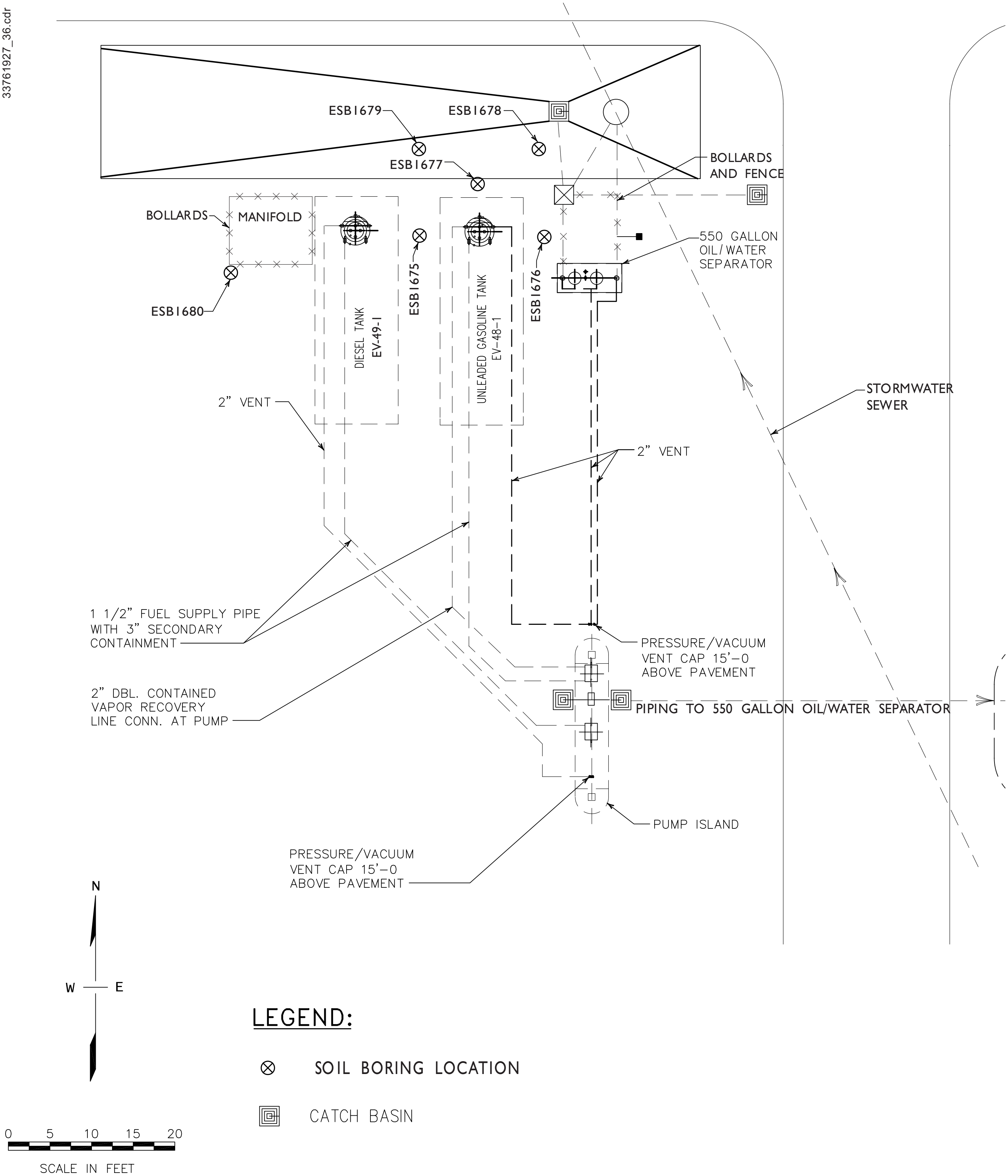



Figure 5-3
**BUILDING 40-11 GROUNDWATER MONITORING WELL LOCATIONS**

Job No. 33761927

Boeing Commercial Airplanes, Everett Plant
REMEDIAL INVESTIGATION REPORT




Job No. 33761927

**Figure 5-4**

**UST EV-48-1 Boring Locations**

URS

## 6.0 BUILDING 40-02

Presented in this section are the results of the investigation of soils performed at the Attachment 5 SWMU/AOC No. 121 and several SWMUs/AOCs referenced in Attachment 8 of the Agreed Order that are located in and adjacent to Building 40-02 at the Everett Plant (Figure 1-2). The subsurface conditions and description of SWMU/AOC No. 121 are presented in Section 9.0 of the RIWP, and the investigation of this SWMU/AOC was performed in accordance with the scope of work in Section 9.3 of the RIWP. Two vapor degreasers (SWMU/AOC No. 169 and No. 170), a tank line consisting of a series of aboveground tanks and containment sumps, and an associated air scrubber (SWMU/AOC No. 003, No. 005, and No. 149) used to clean and treat metal parts for corrosion control, and a chemical storage crib were decommissioned in 2008 as part of Boeing's conversion of Building 40-02 into a general manufacturing space. Environmental assessment of soils, soil gas and indoor air in the area of these former facilities were performed (Landau 2008a, 2008b) as part of Boeing's due diligence associated with the building re-purposing. Additional assessment of sub-slab soil gas, indoor air, and groundwater was performed as supplemental RI per subsequent requests by Ecology. The results of the additional sampling and analysis performed previously submitted to Ecology via technical memoranda and data submittals are incorporated into this section of the RI.

### 6.1 SWMU/AOC NO. 121 HYDRAULIC JACK TEST STAND UNIT

SWMU/AOC No. 121 is the hydraulic jack test stand (HJTS) unit located adjacent to the north side of Building 40-02 (Figure 6-1). Potential dangerous constituents are petroleum hydrocarbons (diesel and oil range) in hydraulic oil used in the HJTS unit. No previous environmental investigations have been performed in the area of the HJTS unit. Further details regarding this SWMU/AOC are presented in Section 9.2 of the RIWP.

#### 6.1.1 PURPOSE AND SCOPE

The purpose of the investigation was to assess whether hydraulic oil is present in subsurface soil in the vicinity of the HJTS unit. The scope of work performed included the following:

- Drilled five soil borings to depths ranging from 12½ to 19 feet bgs using a truck-mounted hollow stem auger drilling rig
- Collected soil samples at prescribed depth intervals
- Field screened samples for organic vapors
- Submitted selected soil samples for analysis of TPH-D and TPH-O by Ecology Method NWTPH-Dx-Ext

Per the RIWP, physical testing of soil samples was not performed because field and laboratory analytical results do not indicate a release from the HJTS unit has occurred.

### 6.1.2 DOCUMENTATION OF DRILLING AND SAMPLING

On February 17, 1998, Dames & Moore monitored drilling of the five soil borings identified on Figure 6-1. The borings were completed at depths ranging from 12½ feet (ESB1110, ESB1111, and ESB1112) to 19 feet bgs (ESB1109). Boring ESB1108 was completed at a depth of 18 feet bgs. The borings were drilled using a truck-mounted drill rig with a nominal 9-inch hollow stem auger. Samples were retrieved using a Dames & Moore U-type sampler fitted with stainless steel rings. After sampling was completed, the borings were backfilled with hydrated bentonite chips and capped with concrete. Drilling techniques and sampling procedures utilized were in general accordance with the SAP presented in Appendix A of the RIWP.

### 6.1.3 FIELD OBSERVATIONS AND SAMPLE ANALYSIS RESULTS

Presented in this section are the field observations and sample analysis results associated with soil borings ESB1108 through ESB1112. Geologic logs of the soil borings are presented in Appendix E1. The chain of custody forms and analytical laboratory reports are presented in Appendix E2. Data validation reports are in Appendix E3. Analytical results are summarized in Table 6-1.

#### 6.1.3.1 Field Observations

A cross section location is shown in Figure 6-1 and the cross section depicting the soil conditions at the HJTS unit is presented on Figure 6-2. The ground surface in the vicinity of the HJTS unit is asphalt and concrete paved. Fill soils were encountered to the total depth of each boring except at ESB1108 where very dense glacial till consisting of silty fine sand with occasional gravel was encountered at a depth of 18 feet. The fill soils in the vicinity of the oil/water separator (ESB1108 and ESB1109) consist of crushed rock to a depth of 4 feet bgs underlain by fine to medium sand to a depth of approximately 7½ feet bgs. At soil boring locations ESB1110, ESB1111, and ESB1112, fill soil consisting of fine to coarse sand underlies the pavement to a depth of approximately 10 to 11 feet bgs. Silty fine to medium sand with occasional wood fragments and gravel comprises the fill soil to a depth of 18 feet bgs. Groundwater was not encountered during drilling to the maximum depth explored of 19 feet bgs.

Staining or other visual indications of dangerous constituents were not observed. PID readings did not indicate elevated organic vapors in the soil samples.

#### 6.1.3.2 Sample Analytical Results

Selected soil samples from each boring were submitted for analysis per the sample selection criteria specified on Figure A-3 and A-4 in Appendix A of the RIWP, as appropriate. The sample depths from three borings relative to the base of the HJTS unit and oil/water separator are shown on Figure 6-2. Table 6-1 summarizes the analytical data and lists the MTCA Method A cleanup level for TPH in soil. The analytical results indicate diesel and/or oil range TPH were detected in several samples from boring ESB1108 and the deepest (11 feet bgs) samples from borings ESB1110 through ESB1112. All detected TPH-D and TPH-O concentrations (ranging from 8.4 mg/kg to 150 mg/kg) are well below the MTCA Method A soil cleanup level of 2000 mg/kg TPH-D or TPH-O. The pattern profile for diesel range TPH detected in the samples was more indicative of motor oil except in the sample from ESB1108 at 10 feet bgs whose pattern did not match a diesel or oil TPH pattern.

In soil boring ESB1108, TPH-O decreased from 150 mg/kg in the 7-1/2-foot bgs (22 mg/kg in duplicate sample) to less than the method reporting limits in the native glacial till sample at 17½ feet in this boring. TPH-D and TPH-O were not detected in the shallow (2-foot and 6-foot bgs) samples from ESB1110, ESB1111, and ESB1112, but were detected at concentrations (ranging from 8.4 mg/kg to 81 mg/kg) in the 11-feet bgs fill soil samples.

## 6.2 SWMU/AOC 169 SMALL VAPOR DEGREASER, SWMU/AOC 170 LARGE VAPOR DEGREASER, AND CHEMICAL CRIB TRENCH

Two former vapor degreaser pits and the former paint shop chemical crib trench were located in separate rooms within Building 40-02 (Figure 6-3) prior to its remodeling in 2008-2009. The two former degreasers are referenced as the small degreaser and the large degreaser based on their relative size. Both former degreasers were constructed in 1990 and were situated within stainless steel-lined concrete containment pits constructed below grade (six feet deep). Decommissioning of the degreasers and backfilling of the pits with controlled density fill (CDF) was completed in February/March 2008. The area of the former vapor degreasers are currently used by the wire shop. Chemical use in the wire shop is limited to small volumes that contain VOCs, but there is some use of TCE. Boeing has identified only one product, used infrequently at the 40-02 building wire shop, that contained TCE. The paint shop chemical crib trench has not been decommissioned.

Both degreasers originally used 1,1,1-trichloroethane (TCA), but were converted to use TCE in the mid-1990s. The solvent stabilizer 1,4-dioxane was used in both degreasers according to Boeing personnel. Sampling and analysis of subsurface soil, sub-slab soil gas, and indoor air at these former SWMUs/AOCs was performed by Landau and URS and the analytical results and supporting documentation was previously submitted to Ecology via technical memoranda and data submittals (Boeing 2009, 2010; Landau, 2008a). The scope of sampling and the analytical results are summarized in Sections 6.2.1 through 6.2.4. The scope of sampling and analytical results of Esperance Sand groundwater near Building 40-02, investigated currently with subslab vapor and indoor air, are summarized in Section 6.4.

### 6.2.1 Landau Soil and Sub-Slab Soil Gas Sampling Scope and Analytical Results

Landau (2008a) performed an independent subsurface investigation of soils and sub-slab soil gas beneath the two degreaser pits and trench in January 2008. Ecology did not review or approve the work plan. A total of 16 soil/soil gas borings were completed using a hydraulic direct push probe and associated sampling equipment. The sub-slab soil gas samples were collected from directly beneath the floor of the concrete containment pits, and then each boring was continued to refusal. One or two soil samples collected during drilling were selected from each boring for laboratory analysis. A total of 27 soil samples were submitted for analysis. All of the soil samples were analyzed for VOCs by EPA Method SW8260B, diesel-range petroleum hydrocarbons by NWTPH-Dx with silica gel cleanup, total metals using EPA Method 6000/7000 series, and 1,4-dioxane using EPA Method SW8270D. All of the sub-slab soil gas samples were analyzed for VOCs by EPA Method SW8260B and 1,4-dioxane using EPA Method SW8270D.

The soil results indicate that metals, diesel-range petroleum hydrocarbons, and 1,4-dioxane were either not detected or were detected at concentrations below the applicable MTCA Method A or B soil cleanup levels in all the samples analyzed from beneath the two former vapor degreaser pits and trench. VOCs were either not detected or detected at concentrations below the applicable MTCA Method A or B soil cleanup levels, including the levels protective of groundwater, in all the soil samples analyzed form the former small degreaser and trench areas. TCE was the only VOC detected above an applicable MTC Method A or B soil cleanup level in samples from beneath the former large degreaser pit. Only one of the 13 samples from this area had a TCE concentration (40 µg/kg from boring ESB1529 at 4.1 feet below the degreaser pit floor) exceeding the MTCA Method A soil cleanup level (30 µg/kg) protective of direct contact and groundwater. Eight of the 13 samples had concentrations above the Method B cleanup level protective of groundwater (3.2 µg/kg). The soil analytical results for the VOCs detected in one or more samples are summarized in Table 6-2 and TCE concentrations in soil are shown on Figures 6-4, 6-5, and 6-6.

The sub-slab soil gas analytical results are summarized in Table 6-3 and shown Figures 6-4, 6-5, and 6-6. These results indicate that one or more of the VOCs dichlorodifluoromethane (Freon 12), TCE, and chloroform were detected in all but one of the sub-slab soil gas samples from both of the former vapor degreaser areas (Figures 6-4 and 6-5) above the draft Method B sub-slab soil gas screening levels of 800 µg/m$^3$, 1.0 µg/m$^3$, and 1.1 µg/m$^3$, respectively (Ecology, 2009). Chloroform and/or TCE were detected above the draft Method B sub-slab soil gas screening levels (Ecology, 2009) in two of the three samples from the paint crib trench area (Figure 6-6). Based on the indoor air and subslab analytical results, Ecology requested additional sub-slab soil gas sampling in the three areas of Building 40-02 assessed by Landau. The scope and results of this sampling and analysis are presented in Section 6.2.3.

### 6.2.2 Landau Indoor Air Sampling Scope and Analytical Results

Indoor air grab samples were collected in January 2008 by Landau (2008a) in the proximity of the former small degreaser, the former large degreaser, and the paint shop chemical crib trench (Figures 6-4, 6-5, and 6-6, respectively). The samples were collected prior to backfilling the degreaser pits and were intended for baseline screening purposes with respect to potential vapor intrusion from VOCs in the subsurface and not as an assessment of indoor air quality with respect to occupational health and safety. The samples were collected in Tedlar bags and analyzed by EPA Method SW8260B (in vapor) by Libby Environmental. The analytical results are summarized in Table 6-4 and shown on Figures 6-4, 6-5, and 6-6. The results indicate that TCE was detected in all three samples at concentrations ranging from 110 µg/m$^3$ to 230 µg/m$^3$, which exceed the MTCA Method B (0.1 µg/m$^3$) and C (1.0 µg/m$^3$) indoor air cleanup levels. The other compounds detected in one or more samples (1,3 dichlorobenzene, toluene and total xylenes) were all detected at concentrations below the applicable MTCA Method B and C indoor air cleanup levels. Based on the indoor air and subslab analytical results, Ecology requested additional indoor air monitoring in the three areas of Building 40-02 assessed by Landau. The scope and results of this sampling and analysis are presented in Section 6.2.4.

### 6.2.3 URS Sub-Slab Soil Gas Sampling Scope and Analytical Results

Sub-slab soil gas samples were collected from near the two former vapor degreasers and in the paint crib area in February 2009. The sampling and analysis was performed in accordance with work plan approved by Ecology (URS, 2009a) and the results were reported to Ecology in attachments to an e-mail from Boeing (April 3, 2009). Sub-slab soil gas samples from locations SSV4002-1 through SSV4002-4 (Figure 6-3) were collected on February 28, 2009. On this date, the floor slab in the vicinity of locations SSV4002-5 and SSV4002-6 (Figure 6-3) in the paint crib was found to be too thick to allow penetration with the available drill bit. Sub-slab soil gas samples from these two locations were subsequently collected on March 14, 2009, using a specialty drill bit purchased for this effort. The helium concentrations detected in some of the samples (see Table 6-5) were all less than 5 percent of the helium concentration in the sample point shroud at the time of sample collection.

The analytical results of the 2009 sub-slab soil gas samples are summarized in Table 6-5. Multiple VOCs were detected in all six of the samples and the duplicate sample. Five compounds were detected above the applicable MTCA Method B sub-slab soil gas cleanup levels in one or more samples: TCE, tetrachloroethene (PCE), benzene, chloroform and Freon 12. TCE was detected in all of the sub-slab soil gas samples (26 µg/$m^3$ to 980 µg/$m^3$) above the draft Method B (1.0 µg/$m^3$) and Method C (10 µg/$m^3$) sub-slab soil gas screening levels (Ecology, 2009). The highest concentrations (980 and 910 µg/$m^3$) were detected in the primary and duplicate samples from SSV4002-3 near the former large degreaser. PCE, Freon 12, benzene and chloroform were each detected above the applicable draft Method B sub-slab soil gas screening levels (Ecology, 2009) in one of the two samples collected near the former small vapor degreaser. Freon 12 was detected at concentrations up to 5,500 µg/$m^3$. Benzene and chloroform were each detected above the applicable draft Method B sub-slab soil gas screening levels (Ecology, 2009) in one of the two samples collected near the former large vapor degreaser. No VOCs other than TCE were detected above the applicable draft Method B sub-slab soil gas screening levels (Ecology, 2009) in the two samples collected in the paint crib area.

### 6.2.4 URS Indoor Air Sampling Scope and Analytical Results

An indoor air sampling event was performed by URS on January 3, 2010 at the locations shown on Figure 6-3. The sampling and analysis was performed in accordance with work plan approved by Ecology (URS, 2009b) and the results were reported to Ecology in February (Boeing, 2010). The scope and results of the sampling event are summarized in the following sections.

A building reconnaissance was performed on December 31, 2009 to walk through the building and secure all chemicals that contain or may contain volatile constituents by sealing them in plastic bags. Chemicals were generally located at four hazardous materials storage areas, as well as Satellite Accumulation Areas (SAA) used to store small quantities of hazardous waste located next to each of the chemical storage areas. Containers within the SAAs were also secured using plastic bags and twist ties.

#### 6.2.4.1 Summary of Sampling Event Conditions

Sampling was performed on January 3, 2010. Upon arrival at Building 40-02, the wind direction in the vicinity of Building 40-02 was identified as primarily coming from the southeast to east, based on meteorological weather data from Paine Field and qualitative assessment by the field crew. URS and Boeing EHS personnel noted that work was being performed by shop workers and chemicals were in use. No chemicals containing TCE were in use during the indoor air sampling event. Ambient and indoor air locations are shown on Figure 6-3.

Samples were collected over an 8-hour period to be representative of an industrial worker scenario, except as indicated below. With the exception of the roof-top ambient air sample location, two canisters were filled at each location in the event of a sampling or laboratory problem. Samples were collected in 6-liter Summa canisters with an initial vacuum of greater than 25 inches of mercury (Hg). The flow controller was pre-set by the laboratory, to allow for the proper flow rate. The ambient air canisters were fitted with a stainless steel sampling cane to prevent moisture from entering the summa canister. The progress of the sampling was monitored by recording the Summa canister vacuums and time at regular intervals. The sampling was terminated early if the final vacuum was greater than 5 inches of Hg but less than 7.5 inches of Hg in less than eight hours (this occurred in 4 of 13 canisters). The final vacuum in all samples collected was at least 5 inches of Hg.

The laboratory, Air Toxics Ltd., was directed to only analyze one of the Summa canisters from each sampling station except for the field duplicate station, where the laboratory was instructed to analyze both canisters. The laboratory inadvertently analyzed all of the canisters and the data for all 13 canisters are therefore presented in Table 6-6. Only the field duplicate from station IA4002-3 was collected using the standard field duplicate sampling protocol, wherein the canisters are connected together with a tee fitting and therefore “split” the same air stream. At the other stations, the extra canister was located directly adjacent to the primary canister during sample collection.

#### 6.2.4.2 Sample Analysis Results

The analytical results of the January 2010 indoor air and ambient samples are summarized in Table 6-6. Multiple VOCs were detected in both indoor air and ambient air samples. Three compounds were detected above the applicable MTCA Method B indoor air cleanup levels in one or more samples: TCE, PCE, and benzene.

TCE was detected in three samples at uncorrected (see below for definition) concentrations that were above the MTCA Method B cleanup level, but below the MTCA Method C cleanup level. Benzene was detected at similar concentrations in all of the samples, both indoor air and ambient air samples, at uncorrected concentrations above the MTCA Method B cleanup level but below the MTCA Method C cleanup level. When the lowest detected concentrations in the ambient air samples are subtracted from the indoor air sample results (“corrected” results), the TCE and benzene concentrations in all indoor air samples are below the MTCA Method B air cleanup levels.

PCE was only detected in the ambient air sample from station AA4002-2 and the duplicate sample from indoor station IA4002-3. PCE was detected at a concentration greater than the MTCA Method C cleanup level (4.2 $\mu g/m^3$) in the duplicate sample from station IA4002-3 had a PCE concentration of 8.1 $\mu g/m^3$ but was not detected above 0.24 $\mu g/m^3$ in the primary sample from this station, the alternate sampling can, or the duplicate alternate sampling can from this station. This is in contrast to the results of all other analytes detected at this station, which were very similar between the primary, duplicate, and alternate samples. The lack of detectable PCE in the other three samples from this location calls into question the validity of the PCE result in the duplicate.

### 6.2.5 Conclusion

Based on the cumulative soil and/or sub-slab soil gas results, the two former vapor degreasers and paint crib trench are recommended for evaluation in the FS with respect to the vapor intrusion pathway. The soil beneath the former large vapor degreaser area should also be assessed with respect to protection of groundwater for TCE.

## 6.3 SWMU/AOC NO. 003, 005, 149 TANK LINE PIT, SUMPS AND TANKS

The former tank line pit was located in the northwest corner of Building 40-02 (Figure 6-3) and was decommissioned in 2008 by removing the equipment and backfilling with CDF. The former tank line pit was built in 1991 and operated until September 2004. The pit was constructed of concrete and was 146 feet long, 30 feet deep and varied from 12 to 26 feet wide. During its operation, the tanks within the pit contained various acids, deoxidizers and alkaline cleaning solutions; two of which (chromic acid and potassium dichromate) contained hexavalent chrome. The chemical solutions were used to clean and treat metal piping for corrosion control.

Sampling and analysis of subsurface soil at this former SWMU/AOC was performed by Landau and the analytical results and supporting documentation was previously submitted to Ecology via a technical memorandum and data submittal (Landau, 2008b). The scope of sampling and the analytical results are summarized in Section 6.3.1.

### 6.3.1 Investigation Scope and Results

The subsurface investigation of the former tank line pit area was performed by Landau (2008b) to evaluate and document subsurface conditions in support of decommissioning of the tank line pit as part of the Building 40-02 construction upgrade and renovation. The scope of investigation included completion of 17 soil borings drilled through holes cored in the 30 to 42-inch thick concrete slab at the bottom of the tank line pit in Building 40-02 (Figure 6-7). The borings ranged in total depth from 12½ ft to 14½ ft bgs. A total of 51 soil samples were collected for laboratory analysis and analyzed for the eight RCRA metals, copper, nickel, and zinc using EPA Method 6000/7000 series and hexavalent chromium using EPA Method 3500.

No field evidence of potential contamination was identified during drilling and none of the 51 soil samples selected for laboratory analysis had concentrations of the analytes above the applicable MTCA Method A or B soil cleanup levels. Thirteen of the samples analyzed had concentrations of hexavalent chromium greater than the laboratory reporting limit; however, the highest detected concentration of 0.838 mg/kg was well below the MTCA Method A soil cleanup level (19 mg/kg) for direct contact and protection of groundwater and the Method B soil cleanup level (18 mg/kg) for protection of groundwater. Groundwater was not encountered during drilling at any of the 17 locations.

Based on the Landau (2008b) soil sampling results, the former tank line area is not recommended for evaluation in the FS.

## 6.4 ESPERANCE SAND GROUNDWATER

Two monitoring wells (EGW177 and EGW178 on Figure 6-3) were installed downgradient of the former large vapor degreaser to assess whether TCE, or other VOCs, were present in the Esperance Sand groundwater. Extrapolation of groundwater elevation data in the Esperance Sand aquifer from existing monitoring wells on the upland portion of the Everett Plant indicated that the groundwater flow beneath Building 40-02 was to the northwest. In September 2008, an attempt was made to install a monitoring well within the building as close as practicable to the northwest of the large vapor degreaser at ESB174 on Figure 6-3; however the largest sonic drilling rig that could fit inside the building reached refusal at a depth of 173 feet bgs and did not reach the groundwater surface. Therefore, monitoring well EGW177 (Figure 6-3) was installed outside the building at the closest location downgradient (northwest) of the former vapor degreaser. Ecology subsequently requested an additional well be installed on the north side of the building (EGW178 on Figure 6-3). The monitoring well and boring logs are presented in Appendix M1.

Five grab soil samples were collected at selected depths between 28 and 76 feet bgs from boring ESB174 based on distinct changes in the soil grain size and the presence of an approximately 5-foot thick lens of saturated sand and gravel at a depth of approximately 67½ to 72½ feet bgs. A grab soil sample from a depth of approximately 46½ feet bgs in the well EGW177 boring was also collected. These samples were analyzed for VOCs to provide an assessment of whether TCE was present in soils at this location. Any concentrations of VOCs detected in these samples would be minimum values because of the sonic drilling and sampling of disturbed soil can allow loss of VOCs due to volatilization. TCE was not detected in any of the samples. One or more of the VOCs acetone, carbon disulfide and 2- butanone were detected in each sample at concentrations below the applicable MTCA Method B soil cleanup levels (Table 6-7), including the preliminary cleanup levels protective of groundwater.

Monitoring well EGW177 was installed in February 2009 and EGW178 was installed in May 2009. Groundwater samples were collected from these wells in May, July and December 2009, and January and April 2010. An additional sample was collected from EGW177 in February 2009. The analytical results are summarized in Table 6-8. TCE, toluene and chloroform were detected at concentrations below the applicable MTCA Method A and B groundwater cleanup levels in the February 2009 EGW177 sample. TCE was also detected below the MTCA Method A groundwater cleanup level in the May 2009 samples from both wells, and chloromethane was also detected in this EGW178 sample below the MTCA Method B groundwater cleanup level. VOCs were not detected in groundwater samples from either well collected in July and December 2009, and January and April 2010.

Groundwater elevations have been monitored in the wells and elevation contour maps for the Building 40-02 area in October 2009 and January 2010 are presented on Figures 6-8 and 6-9. These data are consistent with prior data and indicate a northwesterly groundwater flow direction.

## 6.5 CONCLUSIONS AND RECOMMENDATIONS

Based on the analytical results discussed in Section 6.1.3.2, the fill soil underlying the HJTS unit contains concentrations of TPH-D and TPH-O that are well below the MTCA Method A soil cleanup level. Groundwater is not present within the fill soils beneath this unit to the depth (19 feet bgs) investigated. No further investigation and remedial actions are warranted in this area; therefore this area is not recommended for inclusion in the FS.

Based on the cumulative (URS and Landau) soil and/or sub-slab soil gas results, the two former vapor degreasers and paint crib trench are recommended for evaluation in the FS with respect to the vapor intrusion pathway for Freon 12, chloroform and TCE. The soil beneath the former large vapor degreaser area should also be assessed with respect to protection of groundwater for TCE.

The former tank line pit area is not recommended for evaluation in the FS based on the Landau (2008b) soil sampling results.

Groundwater analytical results from samples the two monitoring wells downgradient of Building 40-02 indicate that TCE concentrations detected in February and May 2009 were below the MTCA Method A groundwater cleanup level and TCE has not been detected in quarterly samples since July 2009. The potential for future groundwater contamination due to contaminated soils below the large vapor degreaser unit shall be evaluated in the FS.

## 6.6 REFERENCES

Boeing, 2009, Boeing Everett - Bldg 40-02 Subslab Vapor Results, Email with attachments to Washington Department of Ecology, April 3, 2009.

Boeing, 2010, Boeing Everett Facility – Building 40-02 Indoor Air Data Package, Letter to Washington Department of Ecology with attachments, February 12, 2010.

Landau Associates, 2008a, Sampling Support for Building 40-02 Modifications Degreaser Pits and Paint Shop Chemical Crib, Boeing Everett, Everett, Washington, April 24, 2008.

Landau Associates, 2008b, Building 40-02 Tank Line Decommissioning, Construction Support Due Diligence Assessment Results, Boeing Everett Plant, Everett, Washington, November 25, 2008.

URS, 2009a, Supplemental Remedial Investigation Work Plan (Revision 1.0), Building 40-02 Area, BCA Everett Plant, Everett, Washington, January 19, 2009.

URS, 2009b, Supplemental Remedial Investigation Work Plan, Indoor Air Sampling, Building 40-02 Area, BCA Everett Plant, Everett, Washington, September 29, 2009.

Washington Department of Ecology, 2009, Guidance for Evaluating Soil Vapor Intrusion in Washington State: Investigation and Remedial Action, Publication no. 09-09-047, Review Draft October 2009.

**Table 6-1**
**Summary of Soil Sample Analytical Results for TPH, (mg/kg)**
**Building 40-02, Hydraulic Jack Test Stand**
**Boeing Everett Plant Remedial Investigation**

| Sample ID/Date | | Diesel-Range Hydrocarbons | Oil-Range Hydrocarbons |
|---|---|---|---|
| 1996 MTCA Method A Soil Cleanup Value | | 200 | 200 |
| 2001 MTCA Method A Soil Cleanup Value | | 2,000 | 2,000 |
| MTCA Method A Protection of Groundwater | | NC | NC |
| ESB1108-7.5' | 02/17/98 | 19 * | 150 |
| ESB1108-7.5' (DUP) | 02/17/98 | 5.3 U | 22 |
| ESB1108-10' | 02/17/98 | 12 ** | 52 |
| ESB1108-17.5' | 02/17/98 | 5.5 U | 11 U |
| ESB1109-7.5' | 02/17/98 | 5.4 U | 11 U |
| ESB1109-17.5' | 02/17/98 | 5.6 U | 11 U |
| ESB1110-2' | 02/17/98 | 5.3 U | 11 U |
| ESB1110-6' | 02/17/98 | 5.3 U | 11 U |
| ESB1110-11' | 02/17/98 | 9.9 * | 81 |
| ESB1111-2' | 02/17/98 | 5.4 U | 11 U |
| ESB1111-6' | 02/17/98 | 5.5 U | 11 U |
| ESB1111-11' | 02/17/98 | 8.4 * | 35 |
| ESB1112-2' | 02/17/98 | 5.2 U | 10 U |
| ESB1112-6' | 02/17/98 | 5.5 U | 11 U |
| ESB1112-11' | 02/17/98 | 12 * | 69 |

**Notes:**
MTCA - Model Toxics Control Act
(A) - MTCA Method A soil cleanup level for unrestricted land use
1996 - Indicates MTCA soil cleanup levels, published 1996.
2001 - Indicates MTCA version 3.1 soil cleanup levels, published 2001.
(DUP) - Field duplicate
NC - Not calculated
TPH - Total Petroleum Hydrocarbons; diesel-range fractions were quantitated using NWTPH-Dx and oil-range fractions were quantitated using NWTPH-Dx-extended.
U - Compound was analyzed for but not detected above the reporting limit shown.
* Pattern profile is more indicative of motor oil.
** Pattern profile does not match diesel or motor oil pattern.

**Table 6-2**
**Summary of Soil Analytical Results for Volatile Organic Compounds (ug/kg)**
**Building 40-02, Former Vapor Degreasers and Paint Crib**
**Boeing Everett Plant**

| Sample ID | Sample Depth (feet | Date Collected | Acetone | Carbon Disulfide | Trichloroethene |
|---|---|---|---|---|---|
| **MTCA Soil Cleanup Levels** | | Method A | NE | NE | 30 |
| | | Method B | 8,000,000 | 8,000,000 | 11,000 |
| | | MTCA Method A or B Protection of Groundwater | 3,211 (B) | 5,651 (B) | 30 (A)<br>3.2 (B) |
| **ESB1518** | 2.3 | 1/22/2008 | 8.5 U | 0.9 U | 0.9 U |
| **ESB1519** | 2.2 | 1/22/2008 | 13 U | 0.8 U | 3.1 |
| | 4.0 | 1/22/2008 | 8.5 U | 0.9 U | 0.9 U |
| **ESB1520** | 2.1 | 1/23/2008 | 9.2 U | 0.8 U | 0.9 |
| | 4.2 | 1/23/2008 | 9.3 | 0.8 U | 0.8 U |
| **ESB1521** | 2.1 | 1/23/2008 | 8.9 U | 0.9 U | 2.2 |
| | 3.7 | 1/23/2008 | 7.7 U | 0.9 U | 0.9 U |
| **ESB1522** | 2.3 | 1/24/2008 | 12 | 0.9 U | 1.1 |
| **ESB1523** | 2.5 | 1/23/2008 | 7.1 U | 0.9 U | 1.3 |
| | 3.6 | 1/23/2008 | 8.3 U | 0.9 U | 0.9 U |
| **ESB1524** | 2.2 | 1/24/2008 | 9.5 | 1.0 U | 2.3 |
| | 4.0 | 1/24/2008 | 9.7 | 0.9 U | 2.6 |
| **ESB1525** | 1.9 | 1/24/2008 | 12 | 1.0 U | **4.6** |
| | 4.4 | 1/24/2008 | 9.3 | 0.8 U | **5.8** |
| **ESB1526** | 2.1 | 1/24/2008 | 13 | 0.8 U | **3.7** |
| **ESB1527** | 1.8 | 1/24/2008 | 11 | 1.0 U | **8.3** |
| | 4.5 | 1/24/2008 | 11 | 1.0 U | **3.9** |
| **ESB1528** | 2.1 | 1/25/2008 | 11 | 0.9 U | 0.9 U |
| **ESB1529** | 2.0 | 1/25/2008 | 11 | 0.9 U | **28** |
| | 4.1 | 1/25/2008 | 19 | 1.3 U | **40** |
| **ESB1530** | 2.2 | 1/25/2008 | 10 | 5.9 | **9.9** |
| **ESB1531** | 1.2 | 1/25/2008 | 54 | 0.9 U | 0.9 U |
| | 10.3 | 1/25/2008 | 26 | 1.1 | 0.8 U |
| **ESB1532** | 1.2 | 1/28/2008 | 21 | 0.8 U | 0.8 U |
| | 10.9 | 1/28/2008 | 63 | 1.0 U | 1.0 U |
| **ESB1533** | 1.4 | 1/28/2008 | 46 | 0.8 U | 0.8 U |
| | 9.9 | 1/28/2008 | 54 | 1.5 | 1.0 U |

**Notes:**

Samples collected and data reported by Landau (2008)

Values in **bold** font indicate that the result reported exceeds the most current MTCA levels based on the Ecology website protection of groundwater calculations.

Model Toxics Control Act (MTCA) Cleanup Regulation, chapter 173-340 WAC; MTCA Method A and B from Ecology website downloaded December 2010 (https://fortress.wa.gov/ecy/clarc/Reporting/CLARCReporting.aspx).

(A) - MTCA Method A

(B) - MTCA Method B

NE - Not established

U - Compound was analyzed for but not detected above the reporting limit shown

**Table 6-3**
**Summary of 2008 Sub-Slab Soil Gas Analytical Results for Volatile Organic Compounds (ug/m$^3$)**
**Building 40-02, Former Vapor Degreasers and Paint Crib**
**Boeing Everett Facility**

| Sample ID: | Soil Gas Screening Levels | | ESB1518 | ESB1519 | ESB1520 | ESB1521 | ESB1522 | ESB1523 | ESB1524 | ESB1525 |
|---|---|---|---|---|---|---|---|---|---|---|
| Sample Date: | Method B | Method C | 1/22/2008 | 1/22/2008 | 1/23/2008 | 1/23/2008 | 1/24/2008 | 1/23/2008 | 1/24/2008 | 1/24/2008 |
| **Volatile Organic Compounds (ug/m$^3$)** | | | | | | | | | | |
| Chloroform | 1.1 | 11 | 100 U | 100 U | 100 U | **260** | 100 U | 100 U | **180** | **270** |
| Freon 12 (Dichlorodifluoromethane) | 800 | 1,800 | **13,200** | **12,500** | **12,100** | **14,200** | **15,400** | **15,500** | **6,010** | **6,980** |
| 1,3-Dichlorobenzene | NE | NE | 700 | 470 J | 790 | 590 | 860 | 680 | 710 | 780 |
| 1,1,1-Trichloroethane | 48,000 | 110,000 | 1,140 | 1,120 | 1,180 | 1,120 | 1,200 | 1,260 | 680 | 990 |
| Trichloroethene | 1 | 10 | **770** | **720** | **640** | **600** | **670** | **650** | 100 U | **210** |
| Toluene | 22,000 | 49,000 | 2,110 | 1,120 | 760 | 1,600 | 420 | 800 | 720 | 820 |
| Xylenes (total) | 460 | 1,000 | 250 | 210 | 230 | 100 U | 240 | 200 | 210 | 310 |

| Sample ID: | Soil Gas Screening Levels[1] | | ESB1526 | ESB1527 | ESB1528 | ESB1529 | ESB1530 | ESB1531 | ESB1532 | ESB1533 |
|---|---|---|---|---|---|---|---|---|---|---|
| Sample Date: | | | 1/24/2008 | 1/24/2008 | 1/25/2008 | 1/25/2008 | 1/25/2008 | 1/25/2008 | 1/28/2008 | 1/28/2008 |
| **Volatile Organic Compounds (ug/m$^3$)** | | | | | | | | | | |
| Chloroform | 1.1 | 11 | **220** | 100 U | **370** | 100 U | 100 U | 100 U | **100** | 100 U |
| Freon 12 (Dichlorodifluoromethane) | 800 | 1,800 | **5,850** | 200 U | **6,050** | **4,550** | **5,360** | 200 U | 200 U | 200 U |
| 1,3-Dichlorobenzene | NE | NE | 1,220 | 850 | 1,000 | 890 | 740 | 370 | 120 | 160 |
| 1,1,1-Trichloroethane | 48,000 | 110,000 | 270 | 100 U | 950 | 940 | 1,220 | 100 U | 100 U | 100 U |
| Trichloroethene | 1 | 10 | **460** | **3,260** | **410** | **7,040** | **650** | **170** | **130** | 100 U |
| Toluene | 22,000 | 49,000 | 400 | 410 | 290 | 300 | 280 | 100 U | 120 | 100 U |
| Xylenes (total) | 460 | 1,000 | 100 U | 200 | 170 | 100 U | 140 | 100 U | 100 U | 100 U |

**Notes:**
Samples collected and data reported by Landau (2008)
Values in **bold** font indicate that the result reported exceeds the sub-slab soil gas screening levels based on Appendix 8 in Ecology's *Guidance for Evaluating Soil Vapor Intrusion in Washingto*
*and Remedial Action*, Publication no. 09-09-047, Review Draft October 2009
Model Toxics Control Act (MTCA) Cleanup Regulation, chapter 173-340 WAC
(DUP) - Field duplicate
NE - Not established
U - Compound was analyzed for but not detected above the reporting limit shown

**Table 6-4**

**Summary of 2008 Indoor Air Analytical Results for Volatile Organic Compounds (ug/m$^3$)**
**Building 40-02, Former Vapor Degreasers and Paint Crib**
**Boeing Everett Facility**

| Sample ID: / Sample Date: | MTCA Air Cleanup Levels Method B | MTCA Air Cleanup Levels Method C | Indoor 1 1/28/2008 | Indoor 2 1/28/2008 | Indoor 3 1/28/2008 |
|---|---|---|---|---|---|
| **Volatile Organic Compounds (ug/m$^3$)** | | | | | |
| Chloroform | 0.11 | 1.1 | 100 U | 100 U | 100 U |
| Freon 12 (Dichlorodifluoromethane) | 80 | 180 | 200 U | 200 U | 200 U |
| 1,3-Dichlorobenzene | NE | NE | 170 J | 310 | 100 U |
| 1,1,1-Trichloroethane | 4,800 | 11,000 | 100 U | 100 U | 100 U |
| Trichloroethene | 0.1 | 1 | **200** | **230 J** | **110** |
| Toluene | 2,200 | 4,900 | 130 | 160 | 100 U |
| Xylenes (total) | 46 | 100 | 100 U | 100 | 100 U |

**Notes:**

Samples collected and data reported by Landau (2008)

Values in **bold** font indicate that the result reported exceeds the most current MTCA levels based on the Ecology website.

Model Toxics Control Act (MTCA) Cleanup Regulation, chapter 173-340 WAC; MTCA Method B and C from Ecology website downloaded December 2010 (https://fortress.wa.gov/ecy/clarc/Reporting/CLARCReporting.aspx).

J - Estimated value

NE - Not established

U - Compound was analyzed for but not detected above the reporting limit shown

**Table 6-5**

**Summary of 2009 Sub-Slab Soil Gas Analytical Results for Volatile Organic Compounds (ug/m$^3$)**

**Building 40-02, Former Vapor Degreasers and Paint Crib**

**Boeing Everett Facility**

| Sample ID: | **Soil Gas Screening Levels** | | **SSV4002-1** | **SSV4002-2** | **SSV4002-3** | | **SSV4002-4** | **SSV4002-5** | **SSV4002-6** |
|---|---|---|---|---|---|---|---|---|---|
| Sample Date: | | | 2/28/2009 | 2/28/2009 | 2/28/2009 | 2/28/2009 | 2/28/2009 | 3/14/2009 | 3/14/2009 |
| Field QC: | Method B | Method C | | | | (DUP) | | | |
| **Inorganic Compounds (%)** | | | | | | | | | |
| Helium | NE | NE | 0.31 | 0.082 U | 0.084 U | 0.084 U | 0.10 | 0.32 | 0.080 U |
| **Volatile Organic Compounds (ug/m$^3$)** | | | | | | | | | |
| Chloroform | 1.1 | 11 | 17 U | **5.3** | 16 U | 16 U | **1.9** | 2.0 U | 0.79 U |
| Freon 12 (Dichlorodifluoromethane) | 800 | 1,800 | **5,500** | 20 | 760 | 660 | 6.5 | 120 | 140 |
| 1,3-Dichlorobenzene | NE | NE | 22 U | 3.3 U | 20 U | 20 U | 1.2 U | 2.5 U | 0.97 U |
| trans-1,2-Dichloroethene | 320 | 700 | 28 | 68 | 13 U | 15 | 0.80 U | 3.6 | 2.1 |
| Vinyl Chloride | 2.8 | 28 | 0.92 U | 0.67 | 0.86 U | 0.86 U | 0.59 | 0.10 U | 0.056 |
| 1,1-Dichloroethene | 910 | 2,000 | 3.3 | 24 | 13 | 12 | 11 | 0.16 U | 0.29 |
| cis-1,2-Dichloroethene | 160 | 350 | 2.8 U | 0.43 U | 2.7 U | 2.7 U | 0.46 | 0.32 U | 0.13 U |
| 1,1,1-Trichloroethane | 48,000 | 110,000 | 330 | 400 | 2,700 | 2,400 | 110 | 74 | 160 |
| Benzene | 3.2 | 32 | 5.7 U | **9.2** | 5.4 U | 5.4 U | **16** | 0.81 | 0.84 |
| Trichloroethene | 1 | 10 | **410** | **60** | **980** | **910** | **72** | **220** | **26** |
| Toluene | 22,000 | 49,000 | 6.4 | 12 | 2.5 U | 2.5 U | 49 | 6.4 | 2.4 |
| Tetrachloroethene | 4.2 | 42 | **22** | 1.1 | 4.6 U | 4.6 U | 1.1 | **10** | 0.46 |
| m,p-Xylene | 460 | 1,000 | 6.2 U | 5.0 | 5.8 U | 24 | 98 | 1.5 | 1.2 |
| o-Xylene | 460 | 1,000 | 3.1 U | 2.4 | 2.9 U | 10 | 44 | 0.58 | 0.38 |

**Notes:**

Values in **bold** font indicate that the result reported exceeds the sub-slab soil gas screening levels based on Appendix 8 in Ecology *Guidance for Evaluating Soil Vapor Intrusion in Washingto and Remedial Action* , Publication no. 09-09-047, Review Draft October 2009

Model Toxics Control Act (MTCA) Cleanup Regulation, chapter 173-340 WAC

(DUP) - Field duplicate

NE - Not established

U - Compound was analyzed for but not detected above the reporting limit shown

**Table 6-6**
**Summary of 2010 Indoor Air Analytical Results for Volatile Organic Compounds (ug/m$^3$)**
**Building 40-02, Former Vapor Degreasers and Paint Crib**
**Boeing Everett Facility**

| Sample ID: | MTCA Air Cleanup Levels | | IA4002-1 | | IA4002-2 | | IA4002-3 | | | | AA4002-1 | AA4002-2 | | AA4002-3 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample Date: | | | 1/3/2010 | | 1/3/2010 | | 1/3/2010 | | | | 1/3/2010 | 1/3/2010 | | 1/3/2010 | |
| Field QC: | Method B | Method C | | (ALT) | | (ALT) | | (DUP) | (ALT) | (ALT DUP) | | | (ALT) | | (ALT) |
| **Volatile Organic Compounds (ug/m$^3$)** | | | | | | | | | | | | | | | |
| Chloroform | 0.11 | 1.1 | 0.85 U | 0.85 U | 0.82 U | 0.89 U | 0.86 U | 0.88 U | 0.85 U | 0.84 U | 0.80 U | 1.1 U | 0.80 U | 0.77 U | 0.77 U |
| Freon 12 (Dichlorodifluorometha | 80 | 180 | 3.0 | 3.2 | 2.3 | 2.7 | 2.9 | 3.0 | 2.8 | 2.7 | 2.2 | 2.3 | 2.2 | 1.5 | 2.4 |
| 1,3-Dichlorobenzene | NE | NE | 1.0 U | 1.0 U | 1.0 U | 1.1 U | 1.0 U | 1.1 U | 1.0 U | 1.0 U | 0.99 U | 1.3 U | 0.99 U | 0.94 U | 0.95 U |
| trans-1,2-Dichloroethene | 32 | 70 | 0.69 U | 0.69 U | 0.67 U | 0.72 U | 0.70 U | 0.72 U | 0.69 U | 0.68 U | 0.65 U | 0.88 U | 0.65 U | 0.62 U | 0.63 U |
| Vinyl Chloride | 0.28 | 2.8 | 0.045 U | 0.045 U | 0.043 U | 0.047 U | 0.045 U | 0.046 U | 0.045 U | 0.044 U | 0.042 U | 0.057 U | 0.042 U | 0.040 U | 0.040 U |
| 1,1-Dichloroethene | 91 | 200 | 0.069 U | 0.069 U | 0.067 U | 0.072 U | 0.070 U | 0.072 U | 0.069 U | 0.068 U | 0.065 U | 0.088 U | 0.065 U | 0.062 U | 0.063 U |
| cis-1,2-Dichloroethene | 16 | 35 | 0.14 U | 0.14 U | 0.13 U | 0.14 U | 0.14 U | 0.14 U | 0.14 U | 0.14 U | 0.13 U | 0.18 U | 0.13 U | 0.12 U | 0.12 U |
| 1,1,1-Trichloroethane | 4,800 | 11,000 | 0.19 U | 0.19 U | 0.18 U | 0.20 U | 0.19 U | 0.20 U | 0.19 U | 0.19 U | 0.18 U | 0.24 U | 0.18 U | 0.17 U | 0.17 U |
| Benzene | 0.32 | 3.2 | **0.60** | **0.53** | **0.50** | **0.62** | **0.57** | **0.52** | **0.54** | **0.53** | **0.40** | **0.43** | **0.39** | **0.32** | **0.43** |
| Trichloroethene | 0.1 | 1 | 0.090 | 0.090 | 0.088 | **0.11** | 0.084 | **0.11** | **0.10** | 0.085 | 0.043 | 0.037 | 0.032 | 0.025 U | 0.031 |
| Toluene | 2,200 | 4,900 | 4.0 | 4.9 | 2.2 | 2.6 | 2.9 | 3.0 | 2.8 | 2.8 | 0.54 | 0.62 | 0.53 | 0.52 | 0.75 |
| Tetrachloroethene | 0.42 | 4.2 | 0.24 U | 0.24 U | 0.23 U | 0.25 U | 0.24 UJ | **8.1 J** | 0.24 UJ | 0.23 UJ | 0.22 U | **1.3 J** | 0.22 UJ | 0.21 U | 0.21 U |
| m,p-Xylene | 46 | 100 | 0.54 | 0.89 | 0.43 | 0.51 | 0.52 | 0.51 | 0.47 | 0.45 | 0.29 U | 0.39 U | 0.29 U | 0.27 U | 0.34 |
| o-Xylene | 46 | 100 | 0.19 | 0.35 | 0.15 | 0.19 | 0.18 | 0.18 | 0.16 | 0.16 | 0.14 U | 0.19 U | 0.14 U | 0.14 U | 0.14 U |

**Notes:**
Values in **bold** font indicate that the result reported exceeds the most current MTCA levels based on the Ecology website.
Model Toxics Control Act (MTCA) Cleanup Regulation, chapter 173-340 WAC; MTCA Method B and C from Ecology website downloaded December 2010 (https://fortress.wa.gov/ecy/clarc/Reporting/CLARCReporting.aspx).
(ALT) - Alternate sample volume collected that was inadvertently analyzed by the laboratory. See data validation report for more details.
(ALT DUP) - Field duplicate of alternate sample volume inadvertently analyzed by the laboratory. See data validation report for more details.
(DUP) - Field duplicate
J - Estimated value
NE - Not established
U - Compound was analyzed for but not detected above the reporting limit shown
UJ - Compound was analyzed for but not detected above the reporting limit shown. The reporting limit is an estimated value.

**Table 6-7**
**Summary of Soil Analytical Results for Volatile Organic Compounds (ug/kg)**
**Building 40-02, Downgradient of Former Vapor Degreasers**
**Boeing Everett Facility**

| Sample ID: | **MTCA Soil Cleanup Levels** | | | **ESB174 [a]** | | | | | **EGW177** |
|---|---|---|---|---|---|---|---|---|---|
| Sample Depth (ft bgs): | | | | **28** | **46.5** | **48.5** | **69** | **76** | **46.5** |
| Sample Date: | Method A | Method B | Method B Protection of Groundwater | 9/10/2008 | 9/10/2008 | 9/10/2008 | 9/10/2008 | 9/10/2008 | 2/11/2009 |
| Acetone | NE | 8,000,000 | 3,211 | 29 | 24 | 46 | 20 | 9.8 | 19 |
| Carbon disulfide | NE | 8,000,000 | 5,651 | 2.1 J | 3.9 J | 17 J | 1.3 J | 0.8 U | 1.1U |
| 2-Butanone | NE | 64,000,000 | 19,200 | 4.0 U | 3.4 U | 7.3 | 4.2 U | 3.7 U | 5.6U |

**Notes:**

Model Toxics Control Act (MTCA) Cleanup Regulation, chapter 173-340 WAC; MTCA Method A and B from Ecology website downloaded December 2010 (https://fortress.wa.gov/ecy/clarc/Reporting/CLARCReporting.aspx).

[a] Sample location is notated on the laboratory summary reports as EGW174.

ft bgs - feet below ground surface

J - Estimated value

U - Compound was analyzed for but not detected above the reporting limit shown

**Table 6-8**
**Summary of Groundwater Analytical Results for Volatile Organic Compounds (ug/L)**
**Building 40-02**
**Boeing Everett Plant**

| Sample ID | Date Collected | Chloromethane | Chloroform | Trichloroethene | Toluene |
|---|---|---|---|---|---|
| **MTCA Groundwater Screening Levels** | Method A | NE | NE | 5 | 1,000 |
| | Method B | 3.4 | 7.2 | 0.49 | 640 |
| **EGW177** | 2/11/2009 | 0.2 U | N | 0.085 | 0.4 |
| | 2/11/2009 (DUP | 0.2 U | N | 0.083 | 0.4 |
| | 5/19/2009 | 0.2 | 0.2 U | 0.18 | 0.2 U |
| | 5/19/2009 (DUP | 0.2 U | 0.2 U | 0.18 | 0.2 U |
| | 7/7/2009 | 0.5 U | 0.2 U | 0.020 U | 0.2 U |
| | 12/17/2009 | 0.5 U | 0.2 U | 0.020 U | 0.2 U |
| | 1/26/2010 | 0.5 UJ | 0.2 UJ | 0.020 U | 0.2 UJ |
| | 4/1/2010 | 0.5 U | 0.2 U | 0.020 U | 0.2 U |
| **EGW178** | 5/19/2009 | 0.3 | 0.3 U | 0.13 | 0.2 U |
| | 7/7/2009 | 5.0 U | 2.0 U | 0.020 U | 2.0 U |
| | 12/17/2009 | 0.5 U | 0.2 U | 0.020 U | 0.2 U |
| | 1/26/2010 | 0.5 U | 0.2 U | 0.020 U | 0.2 U |
| | 4/1/2010 | 0.5 U | 0.2 U | 0.020 U | 0.2 U |

**Notes:**

Model Toxics Control Act (MTCA) Cleanup Regulation, chapter 173-340 WAC; MTCA Method A and B from Ecology v
downloaded December 2010 (https://fortress.wa.gov/ecy/clarc/Reporting/CLARCReporting.aspx).

(DUP) - Field duplicate

N - Result was reported at a concentration between the method detection limit and the reporting limit; refer to the laborato
for the numerical value.

NE - Not established

U - Compound was analyzed for but not detected above the reporting limit shown.

UJ - Compound was analyzed for but not detected above the reporting limit shown. Reporting limit is an estimated value.

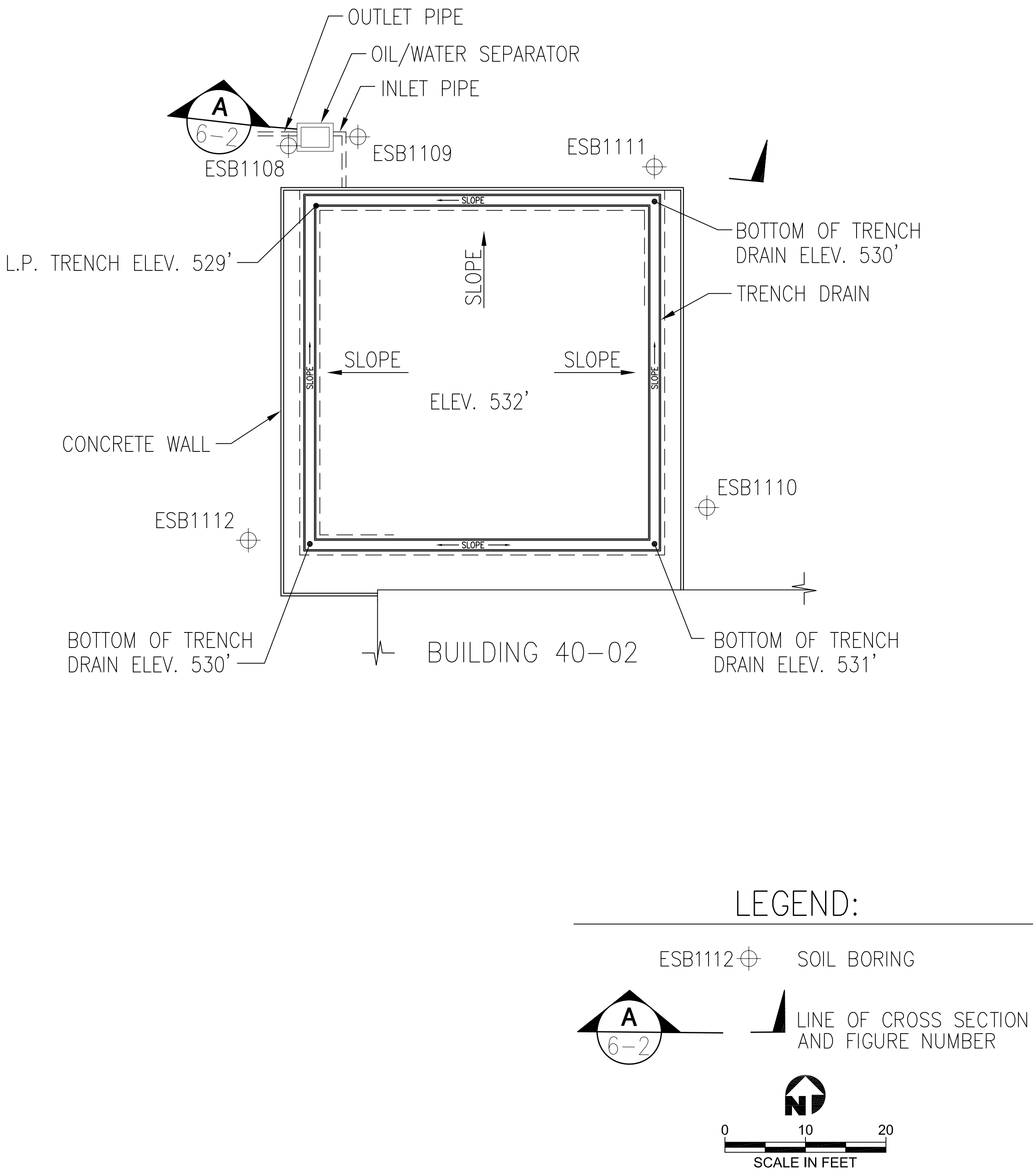



Figure 6-1
**BUILDING 40-02**
**HYDRAULIC JACK TEST STAND (NO. 121) SOIL BORING LOCATIONS**

Job No. 33761927

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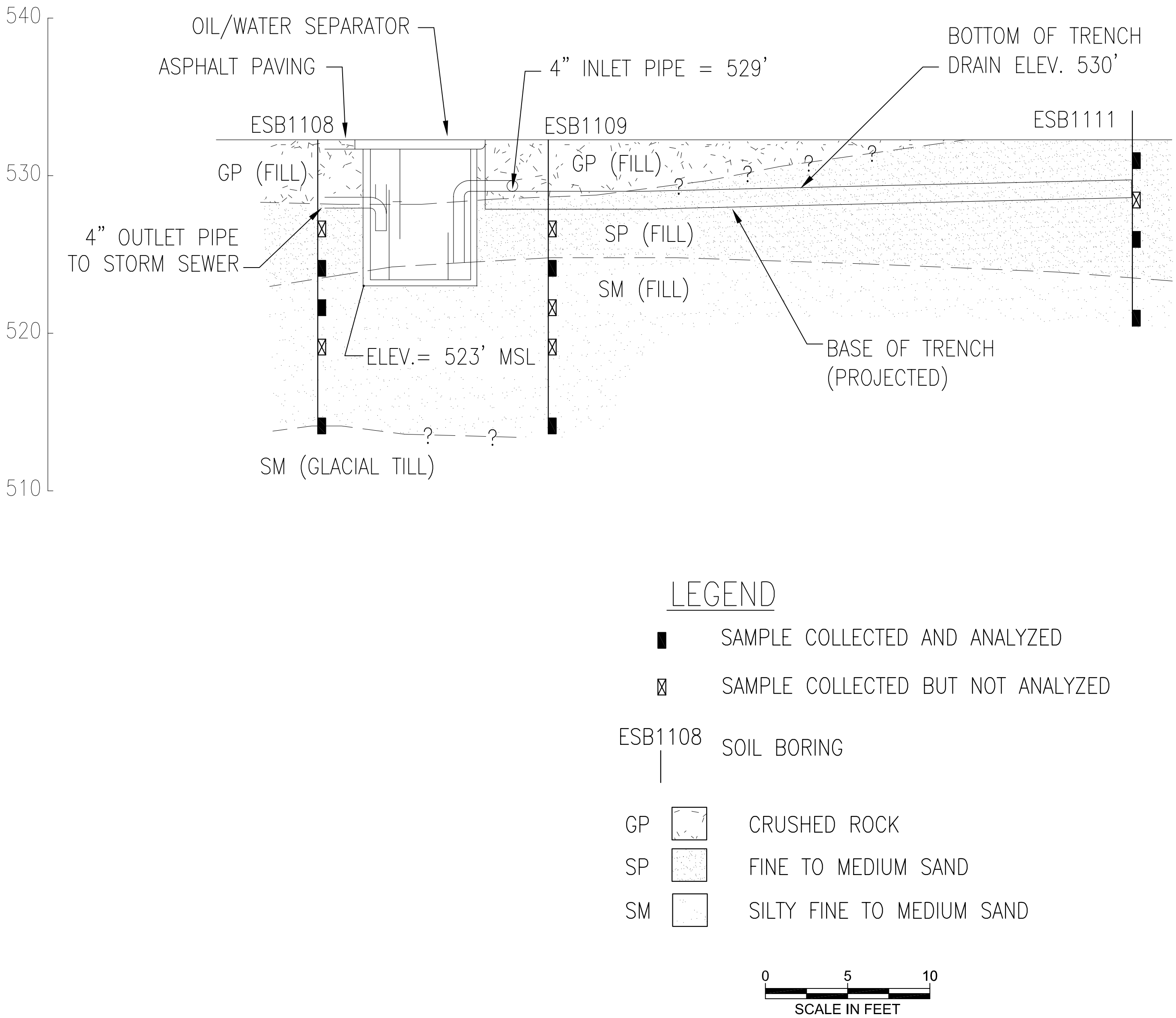
Q:\geo\Boeing\Everett\GW Monitoring Report\2010 RI\06 Report\Fig 6-1.dwg
Mod: 08/12/2010, 10:20 | Plotted: 08/12/2010, 10:21 | john_knobbs

Boeing Commercial Airplanes, Everett Plant
REMEDIAL INVESTIGATION REPORT




Job No. 33761927

**Figure 6-2**

**BUILDING 40-02**

**HYDRAULIC JACK TEST STAND (NO. 121) CROSS SECTION A**

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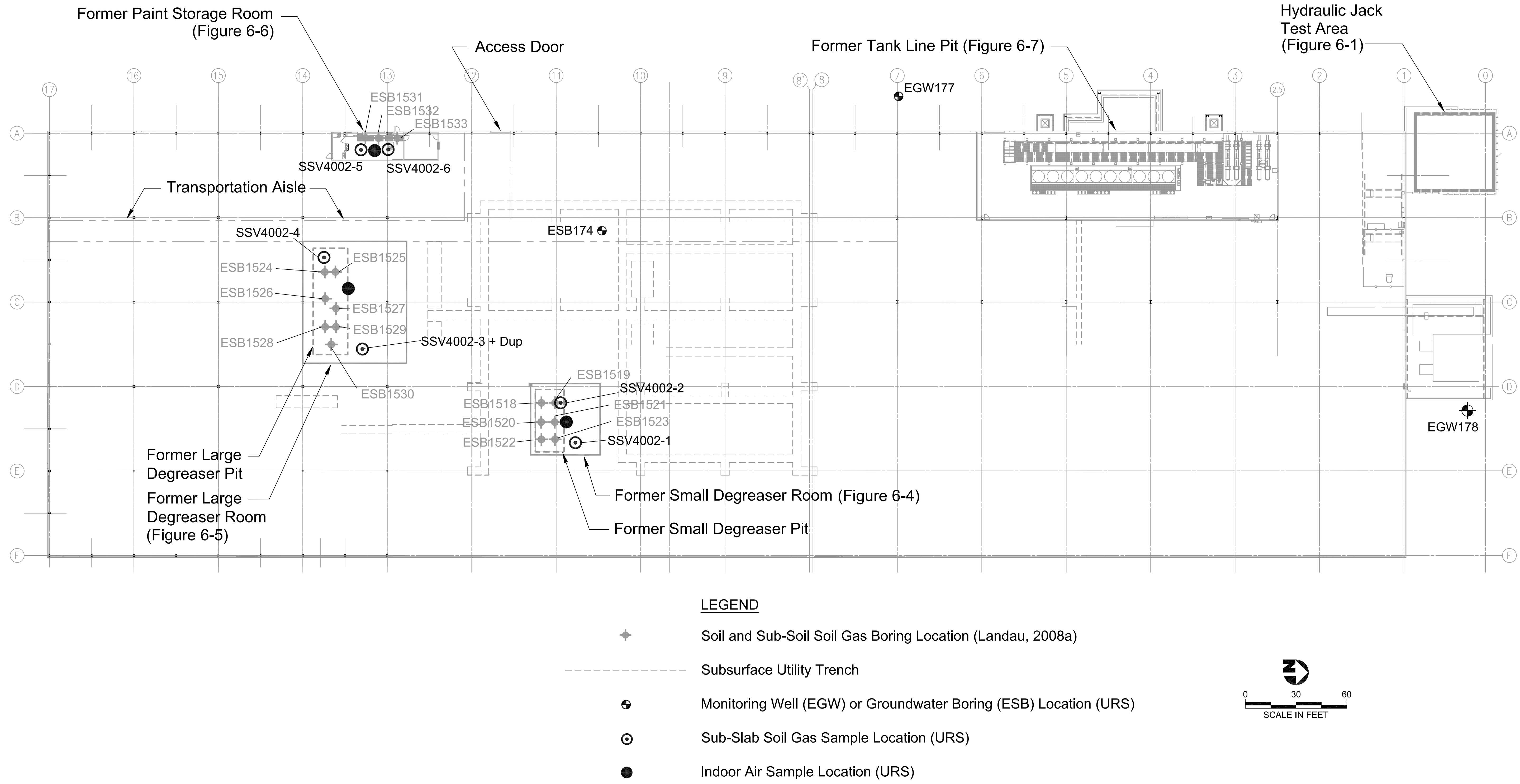
Mod: 08/12/2010, 10:26 | Plotted: 08/12/2010, 10:26 | john_knobbs

Boeing Commercial Airplanes, Everett Plant
REMEDIAL INVESTIGATION REPORT




Job No. 33761927

Figure 6-3

**Building 40-0 2Supplemental RI Sample Locations**

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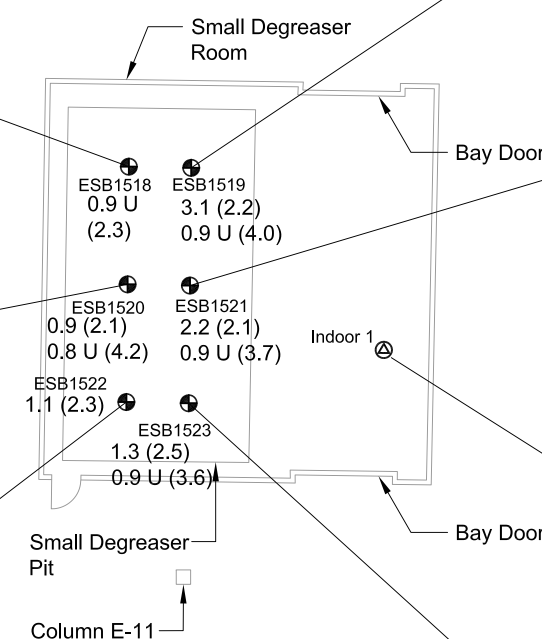
Q:\geo\Boeing\Everett\RI\2010\Fig 6-3 Samp Locs.dwg
Mod: 12/06/2010, 09:24 | Plotted: 12/10/2010, 13:50 | john_knobbs

Boeing Commercial Airplanes, Everett Plant
REMEDIAL INVESTIGATION REPORT

## Legend

- Boring Location and Designation
- Indoor Air Sample
- 3.1 TCE Concentration in Soil ug/kg
- U Not Detected Above Reporting Limit
- (4.2) Sample Depth in Feet Below Former Pit Floor




| ESB1518 | |
|---|---|
| Dichlorodifluoromethane | **13,200** |
| Chloroform | 100 U |
| 1,1,1-Trichloroethane (TCA) | 1,140 |
| Trichloroethene (TCE) | **770** |
| Toluene | 2,110 |
| Total Xylenes | 250 |
| 1,3-Dichlorobenzene | 700 |

| ESB1520 | |
|---|---|
| Dichlorodifluoromethane | **12,100** |
| Chloroform | 100 U |
| 1,1,1-Trichloroethane (TCA) | 1,180 |
| Trichloroethene (TCE) | **640** |
| Toluene | 760 |
| Total Xylenes | 230 |
| 1,3-Dichlorobenzene | 790 |

| ESB1522 | |
|---|---|
| Dichlorodifluoromethane | **15,400** |
| Chloroform | 100 U |
| 1,1,1-Trichloroethane (TCA) | 1,200 |
| Trichloroethene (TCE) | **670** |
| Toluene | 420 |
| Total Xylenes | 240 |
| 1,3-Dichlorobenzene | 860 |

| ESB1519 | |
|---|---|
| Dichlorodifluoromethane | **12,500** |
| Chloroform | 100 U |
| 1,1,1-Trichloroethane (TCA) | 1,120 |
| Trichloroethene (TCE) | **720** |
| Toluene | 1,120 |
| Total Xylenes | 210 |
| 1,3-Dichlorobenzene | 470 |

| ESB1521 | |
|---|---|
| Dichlorodifluoromethane | **14,200** |
| Chloroform | **260** |
| 1,1,1-Trichloroethane (TCA) | 1,120 |
| Trichloroethene (TCE) | **600** |
| Toluene | 1,600 |
| Total Xylenes | 100 U |
| 1,3-Dichlorobenzene | 590 |

| Indoor Air (Indoor 1) | |
|---|---|
| Dichlorodifluoromethane | 200 U |
| Chloroform | 100 U |
| 1,1,1-Trichloroethane (TCA) | 100 U |
| Trichloroethene (TCE) | **200** |
| Toluene | 130 |
| Total Xylenes | 100 U |
| 1,3-Dichlorobenzene | 170 |

| ESB1523 | |
|---|---|
| Dichlorodifluoromethane | **15,500** |
| Chloroform | 100 U |
| 1,1,1-Trichloroethane (TCA) | 1,260 |
| Trichloroethene (TCE) | **650** |
| Toluene | 800 |
| Total Xylenes | 200 |
| 1,3-Dichlorobenzene | 680 |

## Notes

1. Data in boxes are for sub slab soil gas except where noted indoor air.
2. Bold text indicates exceedance of applicable Ecology (2009) sub slab soil gas screening level, MTCA indoor air cleanup level or MTCA Method A or B soil cleanup level.
3. Column size and location are approximate.
4. All air and soil gas analytes in $\mu g/m^3$

Source: Landau, 2008a

0 10 20
SCALE IN FEET

Job No. 33761927

**Figure 6-4**
**Building 40-02 Small Degreaser Pit**
**Soil, Sub Slab Soil Gas and Indoor Air Sample Results**

URS LA Landau Associates

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Mod: 12/02/2010, 10:11 | Plotted: 12/02/2010, 10:18 | john_knobbs

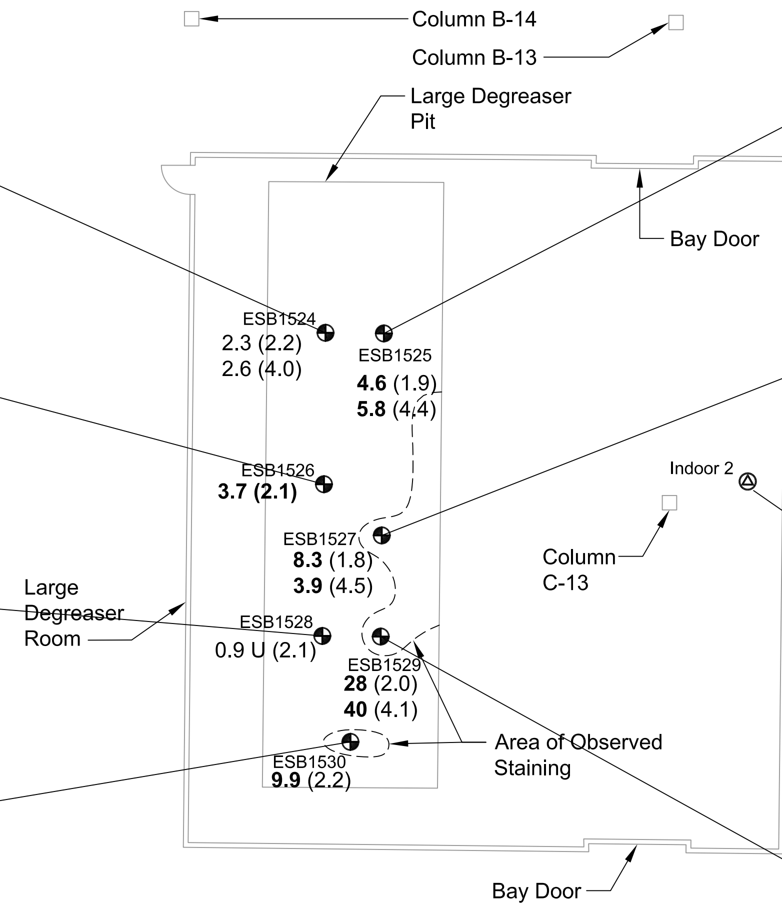
Boeing Commercial Airplanes, Everett Plant
REMEDIAL INVESTIGATION REPORT

| ESB1524 | |
|---|---|
| Dichlorodifluoromethane | **6,010** |
| Chloroform | **180** |
| 1,1,1-Trichloroethane (TCA) | 680 |
| Trichloroethene (TCE) | 100 U |
| Toluene | 720 |
| Total Xylenes | 210 |
| 1,3-Dichlorobenzene | 710 |

| ESB1526 | |
|---|---|
| Dichlorodifluoromethane | **5,850** |
| Chloroform | **220** |
| 1,1,1-Trichloroethane (TCA) | 270 |
| Trichloroethene (TCE) | **460** |
| Toluene | 400 |
| Total Xylenes | 100 U |
| 1,3-Dichlorobenzene | **1,220** |

| ESB1528 | |
|---|---|
| Dichlorodifluoromethane | **6,050** |
| Chloroform | **370** |
| 1,1,1-Trichloroethane (TCA) | 950 |
| Trichloroethene (TCE) | **410** |
| Toluene | 290 |
| Total Xylenes | 170 |
| 1,3-Dichlorobenzene | 1,000 |

| ESB1530 | |
|---|---|
| Dichlorodifluoromethane | **5,360** |
| Chloroform | 100 U |
| 1,1,1-Trichloroethane (TCA) | 1,220 |
| Trichloroethene (TCE) | **650** |
| Toluene | 280 |
| Total Xylenes | 140 |
| 1,3-Dichlorobenzene | 740 |




| ESB1525 | |
|---|---|
| Dichlorodifluoromethane | **6,980** |
| Chloroform | **270** |
| 1,1,1-Trichloroethane (TCA) | 990 |
| Trichloroethene (TCE) | **210** |
| Toluene | 820 |
| Total Xylenes | 310 |
| 1,3-Dichlorobenzene | 780 |

| ESB1527 | |
|---|---|
| Dichlorodifluoromethane | 200 U |
| Chloroform | 100 U |
| 1,1,1-Trichloroethane (TCA) | 100 U |
| Trichloroethene (TCE) | **3,260** |
| Toluene | 410 |
| Total Xylenes | 200 |
| 1,3-Dichlorobenzene | 850 |

| Indoor Air (Indoor 2) | |
|---|---|
| Dichlorodifluoromethane | 200 U |
| Chloroform | 200 U |
| 1,1,1-Trichloroethane (TCA) | 100 U |
| Trichloroethene (TCE) | 230 |
| Toluene | 160 |
| Total Xylenes | 100 |
| 1,3-Dichlorobenzene | 310 |

| ESB1529 | |
|---|---|
| Dichlorodifluoromethane | **4,550** |
| Chloroform | 100 U |
| 1,1,1-Trichloroethane (TCA) | 940 |
| Trichloroethene (TCE) | **7,040** |
| Toluene | 300 |
| Total Xylenes | 100 U |
| 1,3-Dichlorobenzene | 890 |

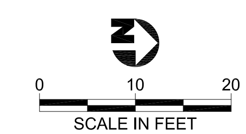
## Legend

- Boring Location and Designation
- Indoor Air Sample
- 3.1 TCE Concentration in Soil ug/kg
- U Not Detected Above Reporting Limit
- (4.2) Sample Depth in Feet Below Former Pit Floor

## Notes

1. Data in boxes are for sub slab soil gas except where noted indoor air.
2. Bold text indicates exceedance of applicable Ecology (2009) sub slab soil gas screening level, MTCA indoor air cleanup level or MTCA Method A or B soil cleanup level.
3. Column size and location are approximate.
4. All air and soil gas analytes in µg/m³

Source: Landau, 2008b




Job No. 33761927

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Q:\geo\Boeing\Everett\RI\2010\Fig 6-5 Large Degrease.dwg
Mod: 12/02/2010, 08:42 | Plotted: 12/02/2010, 10:17 | john_knobbs

**Figure 6-5**
**Building 40-02 Large Degreaser Pit**
**Sub Slab Soil Gas and Indoor Air Sample Results**

Boeing Commercial Airplanes, Everett Plant
REMEDIAL INVESTIGATION REPORT

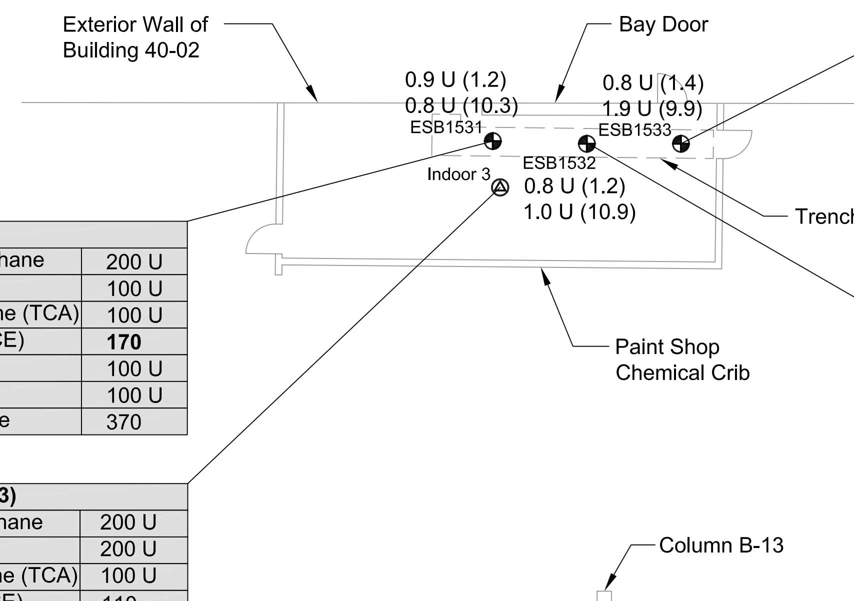
## Legend

| | |
|---|---|
| ⊕ | Boring Location and Designation |
| ⊗ | Indoor Air Sample |
| 3.1 | TCE Concentration in Soil ug/kg |
| U | Not Detected Above Reporting Limit |
| (4.2) | Sample Depth in Feet Below Former Pit Floor |

## Notes

1. Data in boxes are for sub slab soil gas except where noted indoor air.
2. Bold text indicates exceedance of applicable Ecology (2009) sub slab soil gas screening level, MTCA indoor air cleanup level or MTCA Method A or B soil cleanup level.
3. Column size and location are approximate.
4. All air and soil gas analytes in µg/m³

Source: Landau, 2008a




| ESB1531 | |
|---|---|
| Dichlorodifluoromethane | 200 U |
| Chloroform | 100 U |
| 1,1,1-Trichloroethane (TCA) | 100 U |
| Trichloroethene (TCE) | **170** |
| Toluene | 100 U |
| Total Xylenes | 100 U |
| 1,3-Dichlorobenzene | 370 |

| Indoor Air (Indoor 3) | |
|---|---|
| Dichlorodifluoromethane | 200 U |
| Chloroform | 200 U |
| 1,1,1-Trichloroethane (TCA) | 100 U |
| Trichloroethene (TCE) | 110 |
| Toluene | 100 U |
| Total Xylenes | 100 U |
| 1,3-Dichlorobenzene | 100 U |

| ESB1533 | |
|---|---|
| Dichlorodifluoromethane | 200 U |
| Chloroform | 100 U |
| 1,1,1-Trichloroethane (TCA) | 100 U |
| Trichloroethene (TCE) | 100 U |
| Toluene | 100 U |
| Total Xylenes | 100 U |
| 1,3-Dichlorobenzene | 160 |

| ESB1532 | |
|---|---|
| Dichlorodifluoromethane | 200 U |
| Chloroform | **100** |
| 1,1,1-Trichloroethane (TCA) | 100 U |
| Trichloroethene (TCE) | **130** |
| Toluene | 120 |
| Total Xylenes | 100 U |
| 1,3-Dichlorobenzene | 120 |

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SCALE IN FEET

Job No. 33761927

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Q:\geo\Boeing\Everett\RI\2010\Fig 6-6 Paint Shop.dwg
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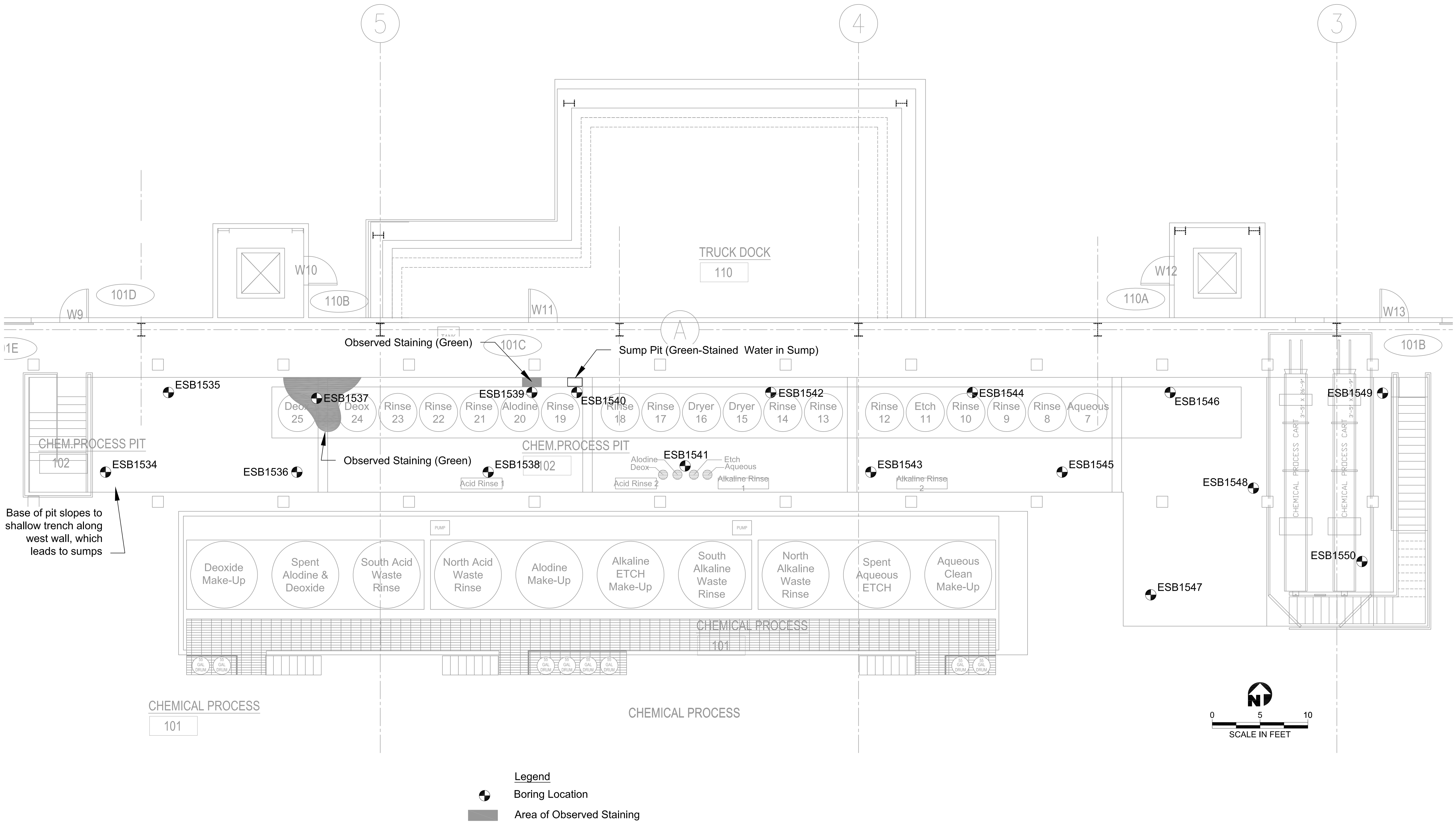
**Figure 6-6**

**Building 40-02 Paint Shop Crib**
**Sub Slab Soil Gas and Indoor Air Sample Results**

Boeing Commercial Airplanes, Everett Plant
REMEDIAL INVESTIGATION REPORT




Source: Landau, 2008b

Job No. 33761927

Figure 6-7

**Building 40-02 Tank Line Pit Boring Locations**

Boeing Commercial Airplanes, Everett Plant
REMEDIAL INVESTIGATION REPORT

URS | LANDAU ASSOCIATES

Q:\geo\Boeing\Everett\RI\2010\Fig 6-7 (Tank Line Pit Borings).dwg
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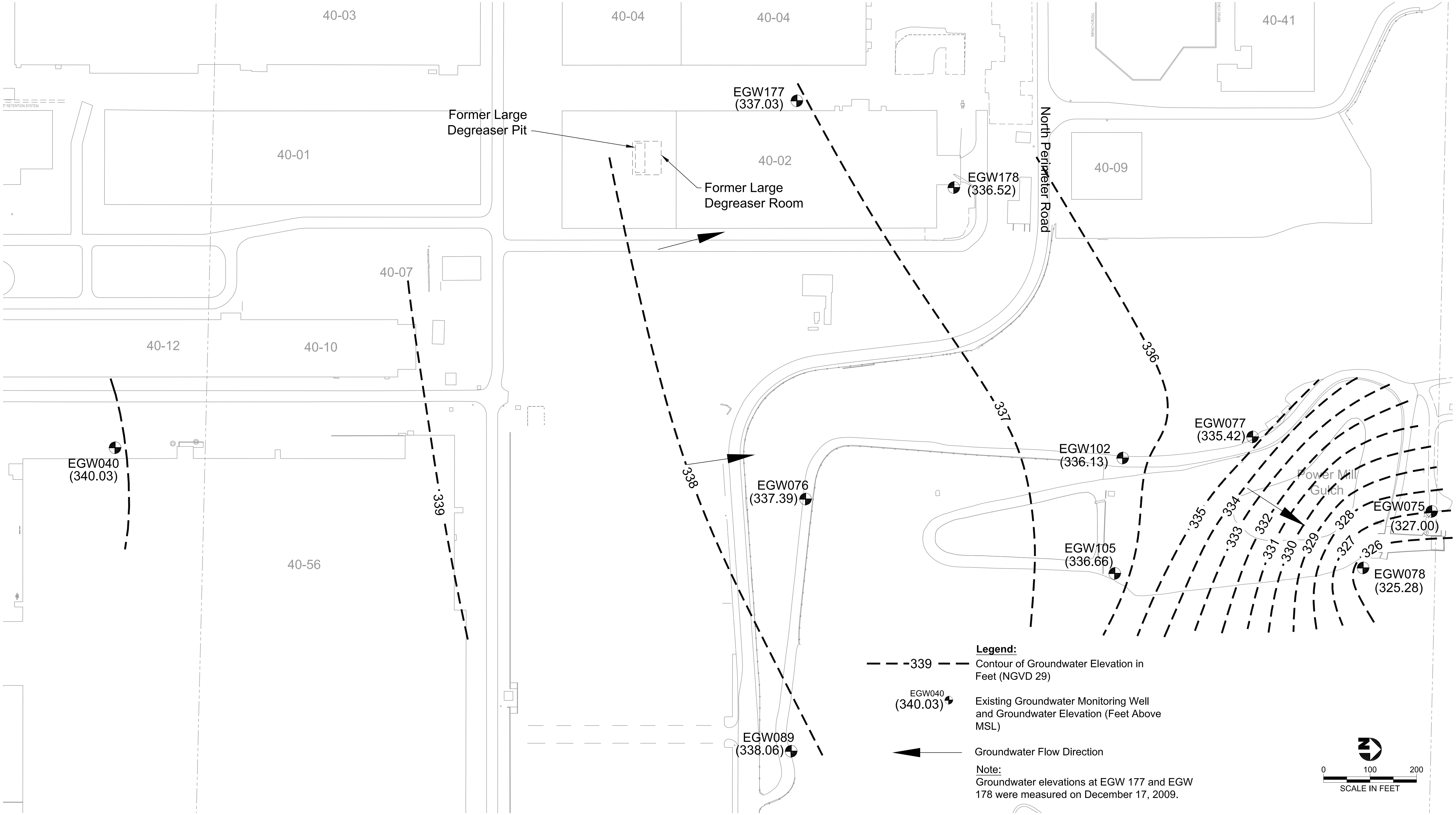


Figure 6-8
**Groundwater Elevations Contour Map**
**Building 40-02 Area, October 2009**

Job No. 33761927

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Q:\geo\Boeing\Everett\RI\2010\Fig 6-8 ( 40-02 GW Oct 2009).dwg
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Boeing Commercial Airplanes, Everett Plant
REMEDIAL INVESTIGATION REPORT

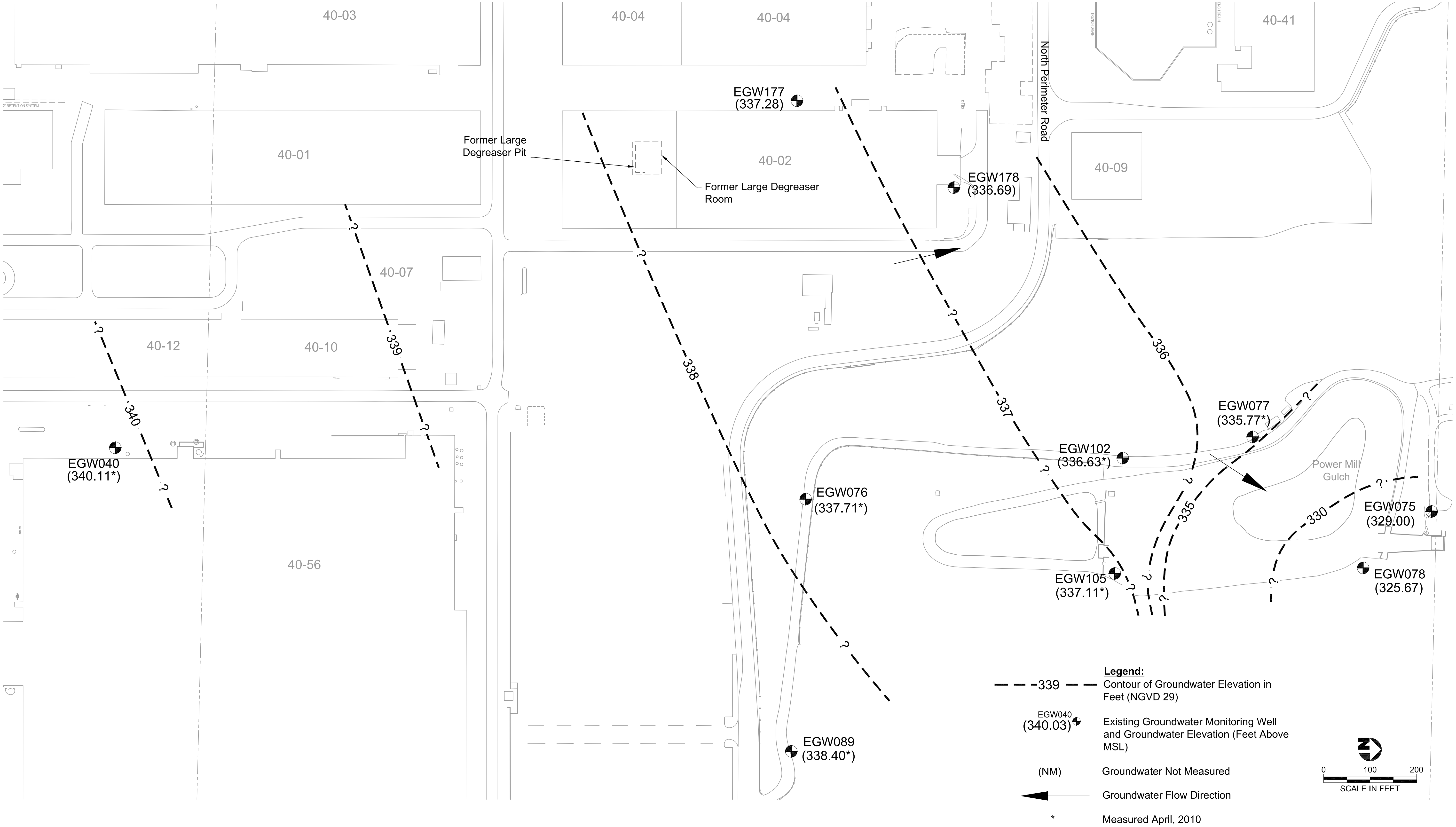


Figure 6-9
**Groundwater Elevations Contour Map**
**Building 40-02 Area, January-April 2010**

Job No. 33761927

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Q:\geo\Boeing\Everett\RI\2010\Fig 6-9 (40-02 GW Jan 2010).dwg
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Boeing Commercial Airplanes, Everett Plant
REMEDIAL INVESTIGATION REPORT

## 7.0 BUILDING 40-33

Presented in this section are the results of the soil investigation performed at the Attachment 5 SWMU/AOC (No. 145) located near the center of Building 40-33 at the Everett Plant (Figure 7-1). SWMU/AOC No. 145 is a 767 Wing Stub Clean, Seal, Test and Paint (CST & P) wastewater trench and sump. The subsurface conditions, prior investigations, and description of this SWMU/AOC are presented in Section 10.0 of the RIWP. This investigation was performed in accordance with Section 10.3 of the RIWP.

### 7.1 SWMU/AOC NO. 145 CST & P CELL

The Wing Stub CST & P cell is an above grade concrete containment with a trench that drains into nearby tank EV-200, an aboveground steel tank in a steel-lined concrete vault below the building floor. The processes performed in this unit include cleaning, sealing, and painting of wing stubs. Waste chemicals, water, and paint used in the CST&P process are collected within the containment. The cell, trenches, and a small sump inside the cell were constructed in 1981. The sump inside the CST & P cell was likely lined with stainless steel in 1991. There were no previous investigations of this SWMU/AOC. Potentially dangerous constituents that may be present within the wastewater from the CST & P cell include VOCs, non-halogenated SVOCs, phenol, TPH and RCRA metals, strontium, and zinc. Further details regarding this SWMU/AOC are presented in Section 10.0 of the RIWP.

### 7.2 PURPOSE AND SCOPE

The purpose of the investigation was to assess whether potential dangerous constituents are present in soil and perched groundwater, if present, in the vicinity of the trench and sump within the 767 Wing Stub CST & P cell. The scope of investigation was in general accordance with Section 10.3 of the RIWP and included the following:

- Drilled four soil borings to depths of 4 to 11½ feet bgs adjacent to the trench and sump using a hand auger and Salisbury portable drill rig equipped with hollow stem auger
- Collected soil samples at prescribed depth intervals
- Field screened samples for organic vapors
- Submitted selected soil samples for analysis for VOCs, non-halogenated SVOCs, phenol, TPH-G and TPH-D, and RCRA metals, strontium, and zinc

### 7.3 DOCUMENTATION OF DRILLING AND SAMPLING ACTIVITIES

On May 13, 1998, Dames & Moore monitored drilling of four soil borings (ESB1221 through ESB1224) shown on Figure 7-1. The borings were completed to a depth of between 10 ½ to 12 feet bgs. Samples were retrieved using a hand auger and a SPT split spoon sampler. After sampling was completed, the borings were backfilled with hydrated bentonite chips and capped with concrete. Drilling techniques and sampling procedures utilized were in general accordance with the SAP presented in Appendix A of the RIWP.

## 7.4 FIELD OBSERVATIONS AND RESULTS OF SAMPLE ANALYSIS

Presented in this section are the field observations and sample results associated with soil borings ESB1221 through ESB1224. Geologic logs of the soil borings are presented in Appendix F1. The chain of custody forms and analytical laboratory reports are presented in Appendix F2. Data validation reports are in Appendix F3. Analytical results are summarized in Tables 7-1 and 7-2.

### 7.4.1 Field Observations

The area investigated is covered with approximately 1½ feet to 3-feet thick concrete floor slab. Underlying the floor slab is fill soil consisting of medium dense, fine to coarse sand that is dry to moist. Dense weathered glacial till consisting of dense silty fine sand with occasional gravel was encountered at a depth of approximately 10 feet bgs at boring locations ESB1221 and ESB 1222. Hand auger drilling refusal was encountered at boring location ESB1223 in fill soil at a depth of 10 feet bgs. Hand auger drilling refusal was encountered in soil boring ESB1224 at a depth of 5 feet bgs due to loose, caving sand. Wet soil or perched water was not encountered in any of these borings to the depth (11½ feet bgs) investigated.

Staining or other visual indications of dangerous constituents were not observed. PID readings did not indicate organic vapor levels above ambient background in the soil samples.

### 7.4.2 Soil Sample Analytical Results

Selected soil samples were submitted for analysis per the sample selection criteria specified in Figure A-3 in Appendix A of the RIWP. Soil samples from depths ranging from 3½ to 10 feet bgs were submitted for analysis (Figure 7-2).

Table 7-1 summarizes the soil analytical data for VOCs, TPH-D, TPH-G, non-halogenated SVOCs, and phenol. In addition, it lists the applicable MTCA Method A and B cleanup levels for soil for these compounds. The analytical results indicate VOCs, TPH-D, TPH-G, non-halogenated SVOCs, and phenol were not detected at concentrations greater than the method reporting limits or detected at concentrations below the 2001 MTCA soil cleanup levels, including the most conservative preliminary soil cleanup levels protective of groundwater.

Table 7-2 summarizes the analytical data for RCRA metals, strontium, and zinc in the soil samples analyzed. This table also lists the applicable MTCA Method A and B cleanup levels. The analytical results indicate that metal concentrations were either below method reporting limits or applicable MTCA Method A or B cleanup levels, except for arsenic, chromium, and strontium. Arsenic concentrations (maximum of 3.3 mg/kg) were below the Puget Sound background concentration of 7.3 mg/kg (Ecology, 1994) and the MTCA Method A soil cleanup level protective of groundwater (20 mg/kg). Total chromium concentrations are below applicable MTCA Method A and B soil cleanup levels for trivalent chromium (2,000 mg/kg and 120,000 mg/kg, respectively) and the applicable Method B level for hexavalent chromium (240 mg/kg). The total chromium concentrations are above the MTCA Method A level (19 mg/kg) and the most conservative preliminary soil cleanup level protective of groundwater (18 mg/kg) for hexavalent chromium; however all are below the Puget Sound background of 48.2 mg/kg for total chromium (Ecology, 1994).

Concentrations of strontium ranged from 24.7 mg/kg to 46.0 mg/kg, with two of the eight samples exhibiting strontium concentrations exceeding the most conservative preliminary soil cleanup level protective of groundwater (38.4 mg/kg); however, all are well below the MTCA Method B soil cleanup level protective of direct contact (48,000 mg/kg).

Evaluation of the vapor intrusion (VI) pathway for this SWMU/AOC is not recommended for the FS. Screening of the VI pathway was performed in this RI using Ecology's review draft *Guidance for Evaluating Soil Vapor Intrusion in Washington State: Investigation and Remedial Action*, dated October 2009 (VI guidance). Application of the Preliminary Assessment step of the VI guidance to this SWMU shows that chemicals present in soil beneath the SWMU are not sufficiently volatile to be a potential VI source. The maximum concentration of TPH-D detected in soil (12 mg/kg) is well below the VI screening level for this compound (10,000 mg/kg, WAC 173-340-740[3][iii][C][II]). Groundwater was not encountered beneath this SWMU/AOC to a depth of 11½ feet bgs. In addition, PID readings taken during field sampling did not indicate organic vapors significantly elevated above background ambient levels in the soil samples.

## 7.5 CONCLUSIONS AND RECOMMENDATIONS

Based on the analytical results discussed in section 7.4.2, soil in the vicinity of the 767 Wing Stub CST&P cell does not contain detectable concentrations of VOCs, non-halogenated SVOCs, phenol, and TPH-G. TPH-D and metals, except for strontium, were either: (1) not detected above the method reporting limits or (2) were detected at concentrations below the applicable MTCA Method A or B soil cleanup levels (including and the MTCA Method A soil cleanup level protective of groundwater, or (3) were detected at concentrations less than the Puget Sound background concentrations. Groundwater is not present within the coarse fill or in the glacial till beneath the fill to the depth (11½ feet bgs) investigated.

Strontium was detected in all of the soil samples analyzed for this metal at concentrations approximately 1,000 times below the MTCA Method B soil cleanup level protective of direct contact (48,000 mg/kg). The concentrations in two of the eight samples exceed the most conservative preliminary soil cleanup level protective of groundwater (38.4 mg/kg) but all the detected concentrations were within a relatively narrow range of approximately 24 to 46 mg/kg consistent with strontium concentrations detected across the Everett facility. Therefore, the strontium concentrations detected are not considered indicative of a release, and are not recommended for evaluation in the FS for this SWMU/AOC.

No further investigation and remedial action are warranted for this SWMU/AOC and it is not recommended for inclusion in the FS.

**Table 7-1**
**Summary of Soil Sample Analytical Results for TPH, VOCs, Non-halogenated SVOCs, and Phenol**
**Building 40-33 CST&P Cell**
**Boeing Everett Plant Remedial Investigation**

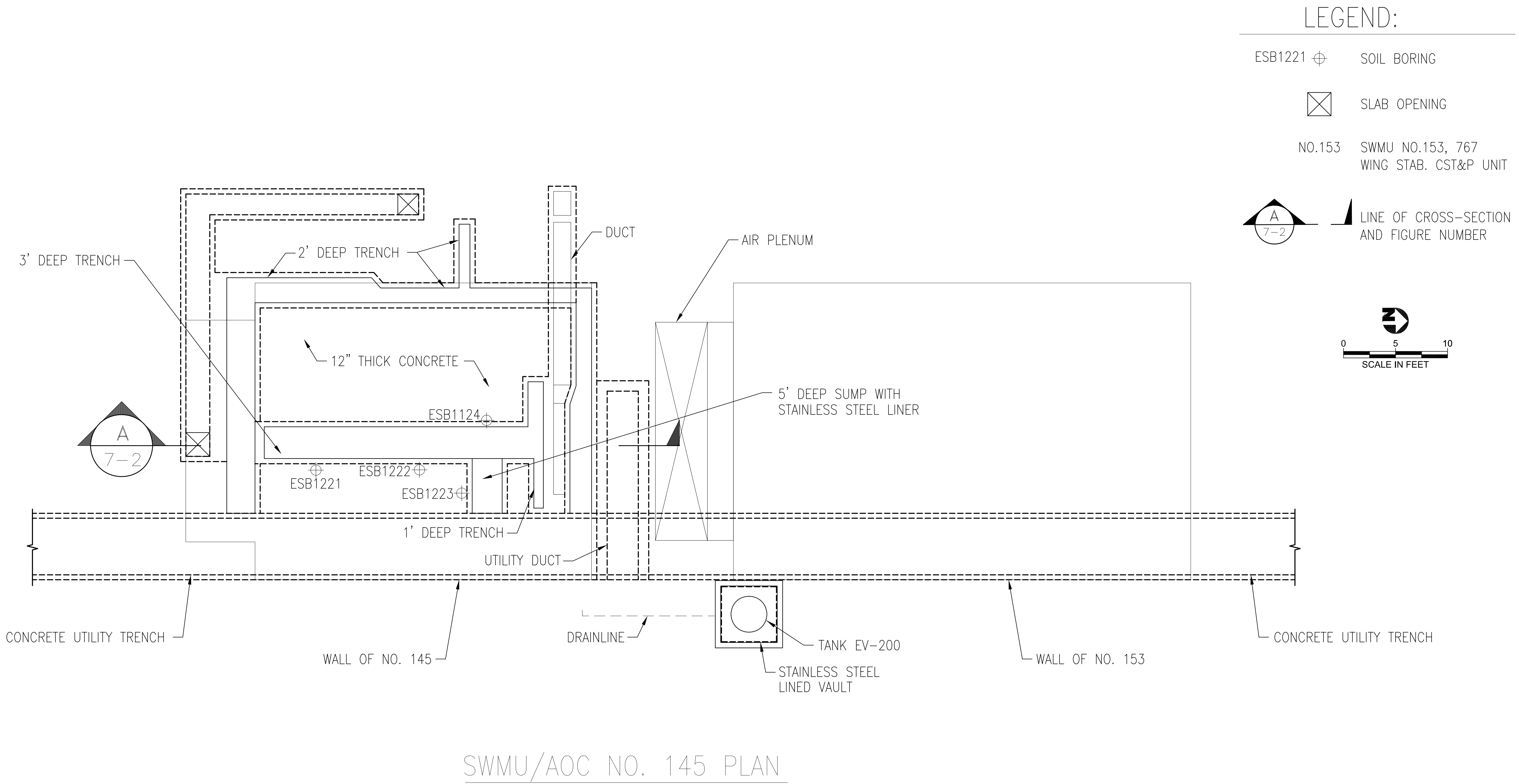
| Sample ID/Date | | Total Petroleum Hydrocarbons (mg/kg) | | VOCs (ug/kg) | Non-halogenated SVOCs | Phenol (ug/kg) |
|---|---|---|---|---|---|---|
| | | Diesel-Range | Gasoline-Range | Acetone | | |
| 1996 MTCA Method A or B Soil Cleanup Level | | 200 (A) | 100 (A) | 8,000,000 (B) | - | 48,000,000 (B) |
| 1996 MTCA Method B 100x GW Soil Cleanup Level | | NE | NE | 80,000 | - | 960,000 |
| 2001 MTCA Method A or B Soil Cleanup Level | | 2,000 (A) | 30 / 100*** | 8,000,000 (B) | - | 48,000,000 (B) |
| MTCA Method A or B Protection of Groundwater | | NC | 30 / 100*** | 3,211 (B) | - | 21,965 (B) |
| ESB1221-5' | 5/13/1998 | 5.2 U | 5.1 U | 6.8 U** | ND | 140 U |
| ESB1221-9 1/2' | 5/13/1998 | 5.2 U | 5.2 U | 8.5 U** | ND | 140 U |
| ESB1222-5' | 5/13/1998 | 5.4 U | 5.4 U | 7.3 U** | ND | 140 U |
| ESB1222-10' | 5/13/1998 | 5.5 U | 5.4 U | 9.6 U** | ND | 150 U |
| ESB1223-5' | 5/13/1998 | 5.2 U | 5.1 U | 8 U** | ND | 140 U |
| ESB1223-9 1/2' | 5/13/1998 | 8.3 * | 5.3 U | 7.6 U** | ND | 150 U |
| ESB1224-3 1/2' | 5/13/1998 | 12.0 * | 5.2 U | 5.9 U** | ND | 140 U |
| ESB1224-3 1/2' (DUP) | 5/13/1998 | 8.9 * | 5.2 U | 6.8 U** | ND | 140 U |

**Notes:**
MTCA - Model Toxics Control Act
(A) - MTCA Method A soil cleanup level for unrestricted land use
(B) - MTCA Method B soil cleanup level
1996 - Indicates MTCA soil cleanup levels, published 1996.
2001 - Indicates MTCA version 3.1 soil cleanup levels, published 2001.
(DUP) - Field duplicate
ND - Not detected
NE - Not established
U - Compound was analyzed for but not detected above the reporting limit shown.
* Pattern profile is not typical of a diesel pattern.
** Analyte result was qualified as not detected during data validation.
***gasoline mixtures with benzene/gasoline mixtures without benzene.

**Table 7-2**
**Summary of Soil Sample Analytical Results for Metals, (mg/kg)**
**Building 40-33 CST&P Cell**
**Boeing Everett Plant Remedial Investigation**

| Sample ID/Date | | Arsenic | Barium | Cadmium | Chromium | Lead | Selenium | Strontium | Zinc |
|---|---|---|---|---|---|---|---|---|---|
| 1996 MTCA Method A, AI, or B Soil Cleanup Level | | 1.67 (B) | 5,600 (B) | 80 (B) | 100 (A)<br>500 (AI) | 250 (A)<br>1,000 (AI) | 400 (B) | 48,000 (B) | 24,000 (B) |
| 1996 MTCA Method B 100x GW Soil Cleanup Level | | 0.00583 | 112 | 1.6 | 1,600 ($Cr^{+3}$) | NE | 8.0 | 960 | 480 |
| 2001 MTCA Method A, AI, or B Soil Cleanup Level | | 20 (A)<br>0.667 (B) | 5,600 (B)<br>16,000 (B*) | 2 (A)<br>80 (B) | 2,000($Cr^{+3}$) / 19 ($Cr^{+6}$) (A)<br>120,000($Cr^{+3}$) / 240 ($Cr^{+6}$) (B) | 250 (A)<br>1,000 (AI) | 400 (B) | 48,000 (B) | 24,000 (B) |
| MTCA Method A or B Protection of Groundwater | | 20 (A)<br>0.03 (B) | 2,637 (B) | 2 (A)<br>1.1 (B) | 2,000 ($Cr^{+3}$) / 19 ($Cr^{+6}$) (A)<br>480,096 ($Cr^{+3}$) / 18 ($Cr^{+6}$) (B) | 250 (A) | 8.3 (B) | 38.4 (B) | 5,971 (B) |
| WA Department of Ecology - Puget Sound Background Regional Concentration | | 7.30 | NE | 0.8 | 48.2 | 24.0 | NE | NE | 85.1 |
| ESB1221-5' | 5/13/1998 | **2.4** | 45.4 | 0.2 U | **38.2** | 3.0 | 0.2 U | 26.8 | 33.9 |
| ESB1221-9 1/2' | 5/13/1998 | **3.1** | 36.3 | 0.2 U | **30.4** | 3.0 | 0.1 U | 25.1 | 37.1 |
| ESB1222-5' | 5/13/1998 | **2.7** | 46.3 | 0.2 U | **29.1** | 3.0 | 0.2 U | 28.4 | 35.5 |
| ESB1222-10' | 5/13/1998 | **2.7** | 57.5 | 0.2 U | **40.6** | 3.0 | 0.2 U | 35.4 | 37.0 |
| ESB1223-5' | 5/13/1998 | **3.0** | 39.8 | 0.2 U | **48.1** | 5.0 | 0.1 U | 24.7 | 35.0 |
| ESB1223-9 1/2' | 5/13/1998 | **3.3** | 52.0 | 0.2 | **37.2** | 5.0 | 0.2 | 42.5 | 38.7 |
| ESB1224-3 1/2' | 5/13/1998 | **2.9** | 50.5 | 0.2 U | **35.4** | 5.0 | 0.2 U | 35.2 | 40.7 |
| ESB1224-3 1/2' (DUP) | 5/13/1998 | **3.0** | 64.3 | 0.2 U | **34.5** | 4.0 | 0.2 U | 46.0 | 41.5 |

**Notes:**
MTCA - Model Toxics Control Act
(A) - MTCA Method A soil cleanup level for unrestricted land use
(AI) - MTCA Method A soil cleanup level for industrial property
(B) - MTCA Method B soil cleanup level
(B*) Revised 2001 MTCA Method B value from Ecology website CLARC tables downloaded June 2010 (https://fortress.wa.gov/ecy/clarc/reporting/CLARCReporting.aspx).
1996 - Indicates MTCA soil cleanup levels, published 1996.
2001 - Indicates MTCA version 3.1 soil cleanup levels, published 2001.
(DUP) - Field duplicate
NE - Not established
U - Compound was analyzed for but not detected above the reporting limit shown.
Samples were analyzed for mercury and silver, but these metals were not detected in the tabulated samples.
Numbers in **bold** font indicate that the result reported exceeds the most current MTCA cleanup level as of June 2010.
Numbers in grey shading indicate results that exceed a MTCA protection of groundwater level, but do not exceed the current lowest MTCA soil cleanup level protective of direct contact.




Job No. 33761927

**Figure 7-1**
**BUILDING 40-33 SWMU/AOC (NO. 145) PLAN, AND SOIL BORING LOCATIONS**

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Boeing Commercial Airplanes, Everett Plant
REMEDIAL INVESTIGATION REPORT

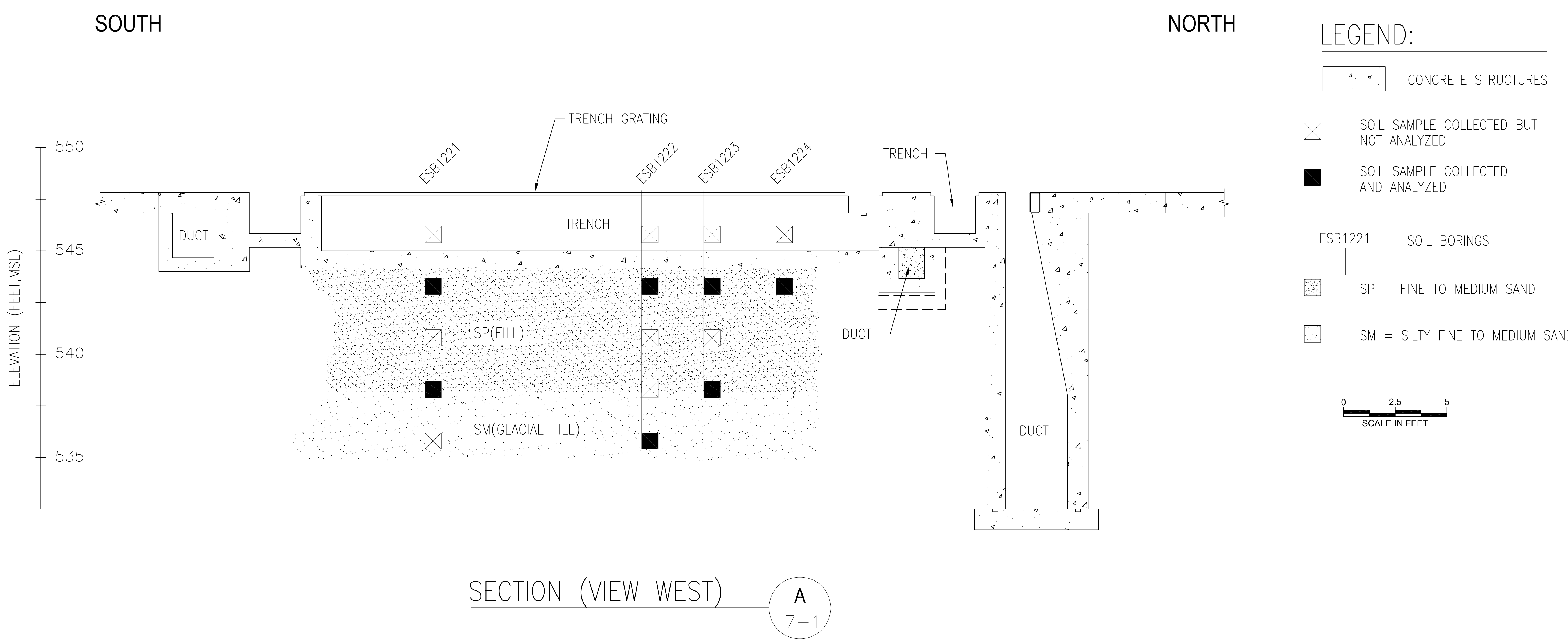



Figure 7-2
**BUILDING 40-33 SWMU/AOC (NO. 145)**
**CROSS SECTION**

Job No. 33761927

Boeing Commercial Airplanes, Everett Plant
REMEDIAL INVESTIGATION REPORT

# 8.0 BUILDING 40-37

Presented in this section are the results of the soil investigation performed at the Attachment 5 SWMU/AOC (No. 154) located in Building 40-37 at the Everett Plant (Figure 8-1). SWMU/AOC No. 154 consists of four Clean, Seal, Test & Paint (CST&P) cells, and one Corrosion Inhibiting Compound (CIC) cell located in the basement of Building 40-37. The subsurface conditions, prior investigations, and description of this SWMU/AOC are presented in Section 11.0 of the RIWP. This investigation was performed in accordance with Section 11.3 of the RIWP.

## 8.1 SWMU/AOC NO. 154 777 CST&P CELLS AND CIC CELL

The catch basins for the four CST&P cells and one CIC cell are enclosed in rooms that extend from the base of the finished ground level floor to the basement floor. The rooms contain subfloors situated above the basement floor that slope to a collection sump in the central portion of each cell basin. Four CST&P cells and the CIC cell are currently active. Two CST&P cells were used prior to being coated with a sealant. Cracks were discovered in the catch basins after the cells were used but before the sealant was applied. Wastewater likely went through the cracks into the sand between the basement floor and catch basin concrete. Liquid wastes collected in the sumps are pumped to a 10,000-gallon double-walled steel AST via subgrade piping. The sumps are steel lined with interstitial monitoring and routinely receive wastewater containing dangerous constituents. Potentially dangerous constituents that may be present within the wastewater received by the cells include VOCs (cyclohexanone and various ketones), non-halogenated SVOCs, phenol, TPH, RCRA metals, zinc, and strontium). Further details regarding this SWMU/AOC are presented in Section 11.0 of the RIWP.

## 8.2 PURPOSE AND SCOPE

The purpose of the investigation was to assess whether any of the potential dangerous constituents in the wastewater discharged to the cells are present in soil and perched groundwater, if present within the till, in the vicinity of the two active CST&P cells and one CIC cell. The scope of investigation was in general accordance with Section 11.3 of the RIWP and included the following:

- Drilled 12 soil borings to depths of 15½ to 16½ feet bgs (below the basement floor) adjacent to the three active cells using a portable Salisbury rig equipped with hollow stem auger
- Collected soil samples at prescribed depth intervals
- Field screened samples for organic vapors and pH
- Submitted selected soil samples for analysis for VOCs (including cyclohexanone and various ketones), non-halogenated SVOCs, phenol, TPH-G, TPH-D, RCRA metals, strontium, and zinc

## 8.3 DOCUMENTATION OF DRILLING AND SAMPLING

Dames & Moore monitored drilling of nine soil borings (ESB1171 through ESB1179) between April 14 and 17, 1998. On May 5 and 6, 1998, three soil boring (ESB1180 through ESB1182) were completed to a depth of between 15½ to 16½ feet bgs. The boring locations are shown on Figure 8-1. Samples were retrieved using a hand auger and a SPT sampler. After sampling was completed, the borings were backfilled with hydrated bentonite chips and capped with concrete. Drilling techniques and sampling procedures utilized were in general accordance with the SAP presented in Appendix A of the RIWP.

## 8.4 FIELD OBSERVATIONS AND RESULTS OF SAMPLE ANALYSIS

Presented in this section are the field observations and sample results associated with soil borings ESB1171 through ESB1182. Geologic logs of the soil borings are presented in Appendix G1. The chain of custody forms and analytical laboratory reports are presented in Appendix G2. Data validation reports are in Appendix G3. Analytical results are summarized in Tables 8-1 and 8-2.

### 8.4.1 Field Observations

The area investigated is covered with a floor slab consisting of approximately 2½ to 5½ feet thick reinforced concrete. Underlying the concrete is native glacial till consisting of dense to very dense silty sand with occasional fine gravel with interbedded fine sandy silt. A 3-inch to 12-inch thick layer of fine to medium sand was encountered in ESB1172 at 10½ feet, ESB1173 at 8½ feet, and ESB1177 at 8½ feet.

Staining or other visual indications of dangerous constituents were not observed. PID readings did not indicate organic vapor levels above ambient background in the soil samples. Field measurements of soil pH ranged from 7.6 S.U. to 11.0 S.U. Most of the samples had a pH of between 7.9 S.U. and 8.8 S.U. except for several soil samples collected directly below the concrete slab. These samples contained pH of between 9.0 S.U. and 11.0 S.U. that is likely the result of the overlying alkaline concrete.

Perched water was encountered directly beneath the concrete slab in the thin sand layer noted above or at the interface between the concrete and the underlying soil in borings ESB1171, ESB1176, ESB1178, and ESB1182. The underlying glacial till soil was moist to wet (some of the moisture is likely due to water used during drilling) but did not contain apparent groundwater to the maximum depth investigated of 16½ feet bgs. In order to assess if this water may have contained dangerous constituents, soil samples were collected directly below the concrete floor at these borings and submitted for analysis. Due to the limited thickness of the perched water zone and use of water during drilling with the Salisbury rig, groundwater samples were not collected from the borehole.

### 8.4.2 Soil Sample Analytical Results

Selected soil samples were submitted for analysis per the sample selection criteria specified in Figure A-5 in Appendix A of the RIWP. Soil samples from depths ranging from 2½ to 15 feet bgs were submitted for analysis (Tables 8-1 and 8-2).

Table 8-1 summarizes the soil analytical data for VOCs, TPH-D, TPH-G, non-halogenated SVOCs, and phenol detected in one or more samples. In addition, it lists the applicable MTCA Method A and B cleanup levels for soil for these compounds. TPH-G, TPH-D, non-halogenated SVOCs, and phenol were not detected at concentrations greater than the method reporting limits. VOCs detected in the samples were below the applicable MTCA Method A or B soil cleanup levels, including the most conservative preliminary soil cleanup levels protective of groundwater.

Table 8-2 summarizes the analytical data for RCRA metals, strontium and zinc in soil samples. This table also lists the applicable MTCA Method A and B cleanup levels and the Puget Sound background concentration for metals in soil (Ecology, 1994). The analytical results indicate that metal concentrations were either: (1) below the method reporting limits, or (2) were detected at concentrations less than the applicable MTCA Method A or B cleanup levels except for arsenic, chromium, and strontium. Arsenic concentrations ranging from 0.7 mg/kg to 5.2 mg/kg were below the Puget Sound background concentration of 7.3 mg/kg (Ecology, 1994) and the MTCA Method A soil cleanup level protective of groundwater (20 mg/kg). Total chromium concentrations ranged from 31.1 mg/kg to 54.0 mg/kg and are below the applicable MTCA Method A and B soil cleanup levels for trivalent chromium (2,000 mg/kg and 120,000 mg/kg, respectively) and the applicable MTCA Method B level for hexavalent chromium (240 mg/kg). These concentrations are above the MTCA Method A level (19 mg/kg) and the most conservative preliminary soil cleanup level protective of groundwater (18 mg/kg) for hexavalent chromium, but most are below the Puget Sound background concentration of 48.2 mg/kg (Ecology, 1994). Total chromium in one samples from each of five different boring locations (ESB1173, ESB1175, ESB1177, ESB1178, and ESB1179) are above the Puget Sound background concentration; however in each boring, chromium concentrations in other samples were lower than background and there were no other elevated metal or organic compound concentrations in the samples from these borings to indicate that the chromium concentrations above background were due to a release.

Concentrations of strontium ranged from 32.0 mg/kg to 53.3 mg/kg, with 39 of the 42 samples exhibiting strontium concentrations exceeding the most conservative preliminary soil cleanup level protective of groundwater (38.4 mg/kg), but all are well below the MTCA Method B soil cleanup level protective of direct contact (48,000 mg/kg).

Evaluation of the vapor intrusion (VI) pathway for this SWMU/AOC is not recommended for the FS. Screening of the VI pathway was performed in this RI using Ecology's review draft *Guidance for Evaluating Soil Vapor Intrusion in Washington State: Investigation and Remedial Action*, dated October 2009 (VI guidance). Application of the Preliminary Assessment step of the VI guidance to this SWMU shows that four chemicals present in soil beneath the SWMU (1,1,2-trhichloro-1,2,2-trifluoroethane, carbon disulfide, methylene chloride, and toluene, Table 8-1), are sufficiently volatile to be a potential VI source. However, these detections of volatile chemicals are not considered to be a source of VI for Building 40-37 for the following reasons:

- In accordance with WAC 173-340-740(3)(b)(iii)(C)(III), the concentrations of volatile chemicals detected are less than the protection of groundwater soil cleanup levels calculated based on the MTCA Method A groundwater cleanup levels (or Method B where no Method A value is available).
- The volatile chemical concentrations in the soil samples are at least an order of magnitude below the lowest soil screening level.
- PID readings taken during field sampling generally did not indicate organic vapors significantly elevated above background ambient levels in the soil samples.

Groundwater was not encountered beneath this SWMU/AOC to a depth of 16½ feet bgs.

## 8.5 CONCLUSIONS AND RECOMMENDATIONS

Based on the analytical results discussed in section 8.4.2, the soil in the vicinity of the CST&P and CIC cells contained non-halogenated SVOCs, TPH-G, TPH-D, phenol, metals and VOC concentrations which were either (1) not detected above the method reporting limits, (2) were detected at concentrations less than the applicable MTCA Method A or B cleanup levels, including the preliminary soil cleanup levels protective of groundwater, or (3) were detected at concentrations less than the Puget Sound background concentrations with the exception of chromium detected in one sample in each of five of the borings, and strontium in most of the soil samples.

The detected chromium concentrations ranged from 48.9 mg/kg to 54 mg/kg and are slightly above the Puget Sound background concentration of 48.2 mg/kg. However, these concentrations are consistent with the range of chromium concentrations in other soils without evidence of a release across the Everett facility, and other metals or organic compounds were not detected above applicable MTCA A or B soil cleanup levels in these or other samples from these borings. Therefore, these concentrations are not considered to be indicative of a release and chromium is not recommended for evaluation in the FS for this SWMU/AOC.

Strontium was detected in all of the soil samples analyzed for this metal, with the concentrations in nearly all of the samples exceeding the most conservative preliminary soil cleanup level protective of groundwater (38.4 mg/kg), but are approximately 1,000 times below the MTCA Method B soil cleanup level protective of direct contact (48,000 mg/kg). The detected concentrations of strontium were within a relatively narrow range of approximately 32 to 54 mg/kg and are consistent with strontium concentrations detected across the Everett facility. Therefore, the detected strontium concentrations are not considered indicative of a release and strontium is not recommended for evaluation in the FS for this SWMU/AOC.

Several water saturated soil samples from directly below the concrete slab contained alkaline pH measurements that are likely the result of leaching from the alkaline concrete. Perched groundwater was present at the interface between the concrete floor slab and the underlying glacial till at several boring locations. Groundwater was not apparent in underlying glacial till to the maximum depth explored of 16 ½ bgs.

Based on these results, no further investigation or remedial action is warranted in the Building 40-37 CST&P and CIC cell area and this SWMU/AOC is not recommended for evaluation in the FS.

**Table 8-1**
**Summary of Soil Sample Analytical Results for VOCs, Non-halogenated SVOCs, TPH and Phenol**
**Building 40-37 Basins**
**Boeing Everett Plant Remedial Investigation**

| Sample ID/Date | | Volatile Organic Compounds (ug/kg) | | | | | | | Total Petroleum Hydrocarbons (mg/kg) | | Non-halogenated SVOCs (mg/kg) | Phenol (ug/kg) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 1,1,2-Trichloro-1,2,2-trifluoroethane | 2-Butanone | Acetone | Carbon Disulfide | Chloroethane | Methylene Chloride | Toluene | Gasoline-Range Hydrocarbons | Diesel-Range Hydrocarbons | | |
| 1996 MTCA Method A or B Soil Cleanup Level | | NE | 48,000,000 (B) | 8,000,000 (B) | 8,000,000 (B) | NE | 133,000 (B) | 16,000,000 (B) | 100 (A) | 200 (A) | - | 48,000,000 (B) |
| 1996 MTCA Method B 100 x GW Soil Cleanup Level | | NE | 480,000 | 80,000 | 80,000 | NE | 583 | 160,000 | NE | NE | - | 960,000 |
| 2001 MTCA Method A or B Soil Cleanup Level | | 2,400,000,000 (B*) | 48,000,000 (B) | 8,000,000 (B) | 8,000,000 (B) | 345,000 (B*) | 20 (A)<br>133,000 (B) | 7,000 (A)<br>16,000,000 (B)<br>6,400,000 (B*) | 30 / 100** (A) | 2,000 (A) | - | 48,000,000 (B) |
| MTCA Method A or B Protection of Groundwater | | 960,000 (B) | 19,200 (B) | 3,211 (B) | 5,651 (B) | 60 (B) | 20 (A)<br>25 (B) | 7,000 (A)<br>4,654 (B) | 30 / 100** (A) | NC | - | 21,965 (B) |
| ESB1171-2 1/2' | 04/14/98 | 2.3 U | 5.8 U | 14 U* | 1.2 U | 3.3 | 2.3 U | 1.2 U | 5.8 U | 6 U | ND | 160 U |
| ESB1171-5' | 04/14/98 | 2.3 U | 5.7 U | 13 U* | 1.1 U | 2.3 U | 2.3 U | 1.1 U | 5.8 U | 5.6 U | ND | 150 U |
| ESB1171-10' | 04/14/98 | 2.3 U | 5.7 U | 14 U* | 1.1 U | 2.3 U | 2.3 U | 1.1 U | 5.7 U | 5.6 U | ND | 150 U |
| ESB1171-15' | 04/14/98 | 2.2 U | 5.5 U | 13 U* | 1.1 U | 2.2 U | 2.2 U | 1.1 U | 5.6 U | 5.6 U | ND | 150 U |
| ESB1172-2 1/2' | 04/14/98 | 2.2 U | 5.6 U | 16 U* | 1.1 U | 2.2 U | 2.2 U | 1.1 U | 5.6 U | 5.6 U | ND | 150 U |
| ESB1172-5' | 04/14/98 | 2.2 U | 5.4 U | 14 U* | 1.1 U | 2.2 U | 2.2 U | 1.1 U | 5.4 U | 5.5 U | ND | 150 U |
| ESB1172-5' (DUP) | 04/14/98 | 2.2 U | 5.5 U | 19 U* | 1.1 U | 2.2 U | 2.2 U | 1.1 U | 5.7 U | 5.6 U | ND | 150 U |
| ESB1172-10' | 04/14/98 | 26.0 | 5.5 U | 16 U* | 1.1 U | 2.2 U | 2.2 U | 1.1 U | 5.6 U | 5.6 U | ND | 150 U |
| ESB1172-15' | 04/14/98 | 2.2 U | 5.5 U | 16 U* | 1.1 U | 2.2 U | 2.2 U | 1.1 U | 5.6 U | 5.6 U | ND | 150 U |
| ESB1173-5' | 04/14/98 | 2.1 U | 5.3 U | 14 U* | 1.1 U | 2.1 U | 2.1 U | 1.1 U | 5.6 U | 5.8 U | ND | 160 U |
| ESB1173-10' | 04/14/98 | 2.4 U | 5.9 U | 16 U* | 1.2 U | 2.4 U | 2.4 U | 1.2 U | 6.0 U | 5.8 U | ND | 150 U |
| ESB1173-15' | 04/14/98 | 2.1 U | 5.3 U | 17 U* | 1.1 U | 2.1 U | 7.4 | 1.1 U | 5.6 U | 5.6 U | ND | 150 U |
| ESB1174-5' | 04/15/98 | 2.2 U | 5.6 U | 17 U* | 1.1 U | 2.2 U | 2.2 U | 1.1 U | 5.7 U | 5.6 U | ND | 150 U |
| ESB1174-10' | 04/15/98 | 2.2 U | 5.5 U | 13 U* | 1.1 U | 2.2 U | 2.2 U | 1.1 U | 5.6 U | 5.7 U | ND | 150 U |
| ESB1174-15' | 04/15/98 | 2.2 U | 5.6 U | 18 U* | 1.1 U | 2.2 U | 2.2 U | 1.1 U | 5.7 U | 5.6 U | ND | 150 U |
| ESB1175-5' | 04/15/98 | 2.2 U | 5.6 U | 15 U* | 1.1 U | 2.2 U | 2.2 U | 1.1 U | 5.4 U | 5.7 U | ND | 150 U |
| ESB1175-10' | 04/15/98 | 2.2 U | 5.6 U | 14 U* | 1.1 U | 2.2 U | 2.2 U | 1.1 U | 5.6 U | 5.5 U | ND | 150 U |
| ESB1175-15' | 04/15/98 | 2.3 U | 5.7 U | 17 U* | 1.7 | 2.3 U | 2.3 U | 1.1 U | 5.7 U | 5.7 U | ND | 150 U |
| ESB1176-2 1/2' | 04/15/98 | 2.4 U | 5.9 U | 13 U* | 1.2 U | 2.4 U | 3.2 | 1.2 U | 6.0 U | 5.7 U | ND | 150 U |
| ESB1176-5' | 04/15/98 | 2.2 U | 5.6 U | 14 U* | 1.1 U | 2.2 U | 2.2 U | 1.1 U | 5.7 U | 5.8 U | ND | 150 U |
| ESB1176-10' | 04/16/98 | 2.2 U | 5.6 U | 9.7 U* | 1.1 U | 2.2 U | 4.1 | 1.1 U | 5.6 U | 5.8 U | ND | 150 U |
| ESB1176-15' | 04/16/98 | 2.1 U | 5.4 U | 17 U* | 1.1 U | 2.1 U | 2.1 U | 1.1 U | 5.6 U | 5.5 U | ND | 150 U |
| ESB1177-5' | 04/16/98 | 2.1 U | 5.3 U | 12 U* | 1.1 U | 2.1 U | 2.1 U | 1.1 U | 5.6 U | 5.9 U | ND | 160 U |
| ESB1177-10' | 04/16/98 | 2.3 U | 5.8 U | 15 U* | 1.2 | 2.3 U | 2.3 U | 1.2 U | 5.8 U | 5.7 U | ND | 150 U |
| ESB1177-15' | 04/16/98 | 2.2 U | 5.5 U | 12 U* | 1.1 U | 2.2 U | 2.2 U | 1.6 | 5.6 U | 5.8 U | ND | 150 U |
| ESB1178-2 1/2' | 04/16/98 | 2.3 U | 5.8 U | 11 U* | 1.2 U | 2.3 U | 2.3 U | 1.2 U | 6.0 U | 5.9 U | ND | 160 U |
| ESB1178-5' | 04/16/98 | 2.3 U | 5.7 U | 16 U* | 1.1 U | 2.3 U | 2.3 U | 1.1 U | 5.7 U | 5.6 U | ND | 150 U |
| ESB1178-10' | 04/16/98 | 2.2 U | 5.4 U | 12 U* | 1.1 U | 2.2 U | 2.2 U | 1.1 U | 5.6 U | 5.6 U | ND | 150 U |
| ESB1178-15' | 04/16/98 | 2.3 U | 5.7 U | 13 U* | 1.1 U | 2.3 U | 2.7 | 1.1 U | 5.7 U | 5.7 U | ND | 150 U |

**Table 8-1**
**Summary of Soil Sample Analytical Results for VOCs, Non-halogenated SVOCs, TPH and Phenol**
**Building 40-37 Basins**
**Boeing Everett Plant Remedial Investigation**

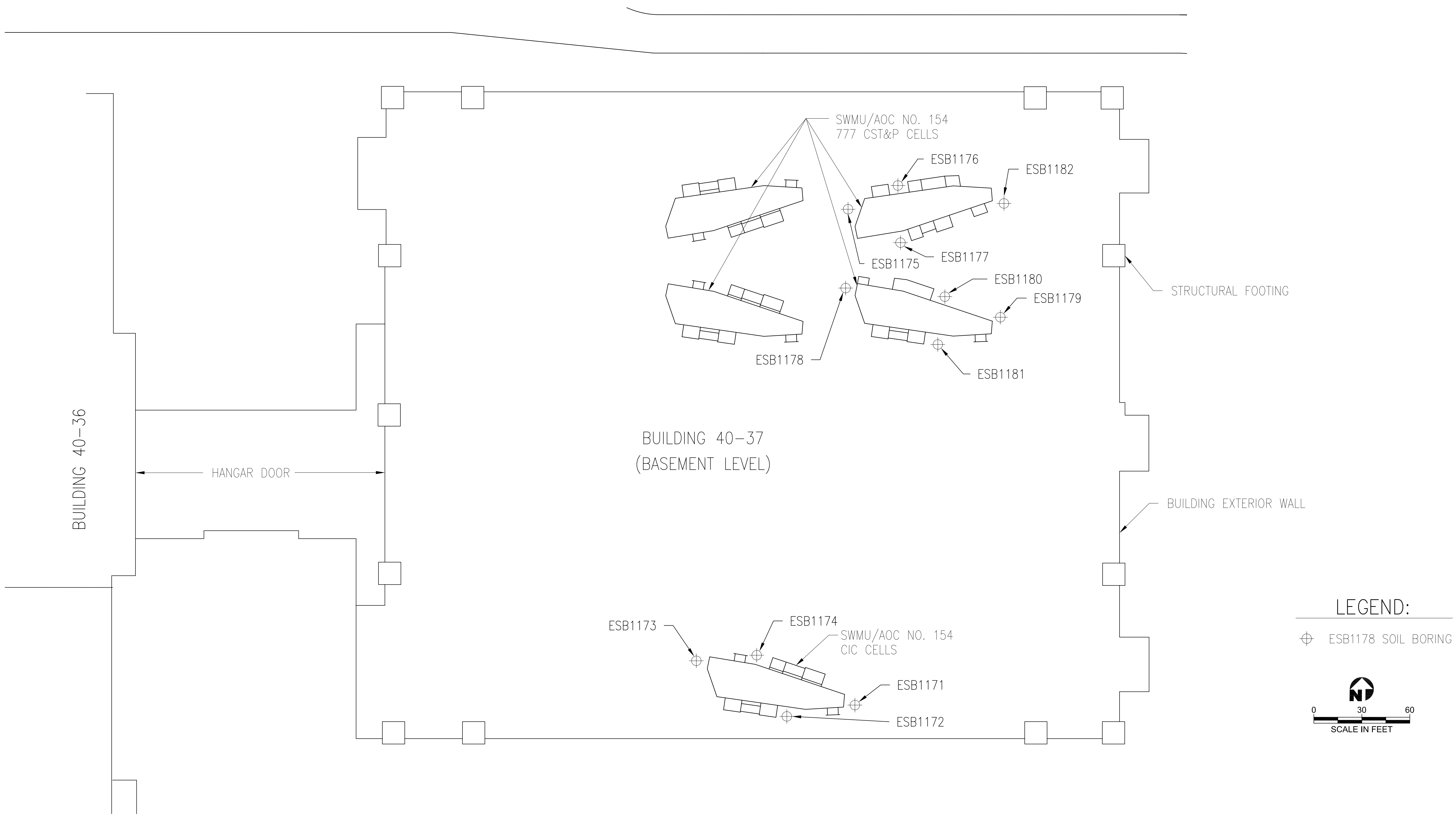
| Sample ID/Date | | Volatile Organic Compounds (ug/kg) | | | | | | | Total Petroleum Hydrocarbons (mg/kg) | | Non-halogenated SVOCs (mg/kg) | Phenol (ug/kg) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 1,1,2-Trichloro-1,2,2-trifluoroethane | 2-Butanone | Acetone | Carbon Disulfide | Chloroethane | Methylene Chloride | Toluene | Gasoline-Range Hydrocarbons | Diesel-Range Hydrocarbons | | |
| 1996 MTCA Method A or B Soil Cleanup Level | | NE | 48,000,000 (B) | 8,000,000 (B) | 8,000,000 (B) | NE | 133,000 (B) | 16,000,000 (B) | 100 (A) | 200 (A) | - | 48,000,000 (B) |
| 1996 MTCA Method B 100 x GW Soil Cleanup Level | | NE | 480,000 | 80,000 | 80,000 | NE | 583 | 160,000 | NE | NE | - | 960,000 |
| 2001 MTCA Method A or B Soil Cleanup Level | | 2,400,000,000 (B*) | 48,000,000 (B) | 8,000,000 (B) | 8,000,000 (B) | 345,000 (B*) | 20 (A)<br>133,000 (B) | 7,000 (A)<br>16,000,000 (B)<br>6,400,000 (B*) | 30 / 100** (A) | 2,000 (A) | - | 48,000,000 (B) |
| ESB1179-6' | 04/16/98 | 2.2 U | 5.6 U | 16 U* | 1.1 U | 2.2 U | 2.2 U | 1.1 U | 5.6 U | 5.7 U | ND | 150 U |
| ESB1179-10' | 04/17/98 | 2.3 U | 26 U* | 12 U* | 1.1 U | 2.3 U | 2.3 U | 1.1 U | 5.7 U | 5.6 U | ND | 150 U |
| ESB1179-15' | 04/17/98 | 2.2 UJ | 5.5 U | 13 U* | 1.1 U | 2.2 U | 2.2 U | 1.1 U | 5.6 U | 5.6 U | ND | 150 U |
| ESB1180-5' | 05/05/98 | 4.2 U* | 5.4 U | 14 U* | 1.1 U | 2.2 U | 2.2 U | 1.1 U | 5.7 U | 5.8 U | ND | 150 U |
| ESB1180-10' | 05/05/98 | 4.2 U* | 5.5 U | 12 U* | 1.1 U | 2.2 U | 2.8 U* | 1.1 U | 5.7 U | 5.7 U | ND | 150 U |
| ESB1180-15' | 05/05/98 | 3.5 U* | 5.5 U | 12 U* | 1.1 U | 2.2 U | 6.1 U* | 1.1 U | 5.6 U | 5.6 U | ND | 150 U |
| ESB1181-5' | 05/05/98 | 3.4 U* | 5.5 U | 16 U* | 1.1 U | 2.2 U | 5.3 U* | 1.1 U | 5.6 U | 5.6 U | ND | 150 U |
| ESB1181-5' (DUP) | 05/05/98 | 2.2 U | 5.4 U | 12 U * | 1.1 U | 2.2 U | 2.5 U* | 1.1 U | 5.6 U | 5.7 U | ND | 150 U |
| ESB1181-10' | 05/05/98 | 2.2 U | 5.4 U | 14 U* | 1.1 U | 2.2 U | 2.6 U | 1.1 U | 5.6 U | 5.7 U | ND | 150 U |
| ESB1181-15' | 05/05/98 | 2.4 U | 5.9 U | 19 U* | 1.2 U | 2.4 U | 3.0 U* | 1.2 U | 6.0 U | 5.9 U | ND | 160 U |
| ESB1182-5 1/2' | 05/06/98 | 3.9 U* | 5.7 U | 13 U* | 2.5 | 2.3 U | 2.3 U* | 1.1 U | 6.0 U | 5.9 U | ND | 160 U |
| ESB1182-10' | 05/06/98 | 2.2 U | 6.2 | 10 U* | 1.1 U | 2.2 U | 2.9 U* | 1.1 U | 5.4 U | 5.6 U | ND | 150 U |
| ESB1182-15' | 05/06/98 | 2.3 U | 5.7 U | 16 U* | 1.1 U | 2.3 U | 2.6 U* | 1.1 U | 5.7 U | 5.9 U | ND | 160 U |

**Notes:**
MTCA - Model Toxics Control Act
(A) - MTCA Method A soil cleanup level for unrestricted land use
(B) - MTCA Method B soil cleanup level
(B*) Revised 2001 MTCA Method B value from Ecology website CLARC tables downloaded June 2010 (https://fortress.wa.gov/ecy/clarc/reporting/CLARCReporting.aspx).
1996 - Indicates MTCA soil cleanup levels, published 1996.
2001 - Indicates MTCA version 3.1 soil cleanup levels, published 2001.
(DUP) - Field duplicate
NC - Not calculated
NE - Not established
U - Compound was analyzed for but not detected above the reporting limit shown.
UJ - Compound was analyzed for but not detected above the reporting limit shown. Reporting limit is an estimated value.
* Analyte was qualified as not detected due to method blank, trip blank, or rinsate blank contamination.
**gasoline mixtures with benzene/gasoline mixtures without benzene.

**Table 8-2**
**Summary of Soil Sample Analytical Results for Metals, (mg/kg)**
**Building 40-37 Basins**
**Boeing Everett Plant Remedial Investigation**

| Sample ID/Date | | Arsenic | Barium | Cadmium | Chromium | Lead | Silver | Strontium | Zinc |
|---|---|---|---|---|---|---|---|---|---|
| 1996 MTCA Method A, AI, or B Soil Cleanup Level | | 1.67 (B) | 5,600 (B) | 80.0 (B) | 100 (A)<br>500 (AI) | 250 (A)<br>1,000 (AI) | 400 (B) | 48,000 (B) | 24,000 (B) |
| 1996 MTCA Method B 100 x GW Soil Cleanup Level | | 0.00583 | 112 | 1.6 | 1,600 ($Cr^{+3}$) | NE | 8.0 | 960 | 480 |
| 2001 MTCA Method A, AI, or B Soil Cleanup Level | | 20 (A)<br>0.667 (B) | 5,600 (B)<br>16,000 (B*) | 2 (A)<br>80 (B) | 2,000($Cr^{+3}$) / 19 ($Cr^{+6}$) (A)<br>120,000($Cr^{+3}$) / 240 ($Cr^{+6}$) (B) | 250 (A)<br>1,000 (AI) | 400 (B) | 48,000 (B) | 24,000 (B) |
| MTCA Method A or B Protection of Groundwater | | 20 (A)<br>0.03 (B) | 2,637 (B) | 2 (A)<br>1.1 (B) | 2,000 ($Cr^{+3}$) / 19 ($Cr^{+6}$) (A)<br>480,096 ($Cr^{+3}$) / 18 ($Cr^{+6}$) (B) | 250 (A) | 13.6 (B) | 38.4 (B) | 5,971 (B) |
| WA Department of Ecology - Puget Sound Background Regional Concentration | | 7.3 | NE | 0.8 | 48.2 | 24.0 | NE | NE | 85 |
| ESB1171-2 1/2' | 04/14/98 | **3.5** | 65.3 | 0.2 U | **45.2** | 8 | 0.3 U | 43.9 | 42.3 |
| ESB1171-5' | 04/14/98 | **3.4** | 53.7 | 0.2 U | **35.9** | 3 | 0.3 U | 38.9 | 31.4 |
| ESB1171-10' | 04/14/98 | **3.1** | 57.6 | 0.2 U | **35.1** | 5 | 0.3 U | 44.6 | 35.3 |
| ESB1171-15' | 04/14/98 | **3.5** | 67.0 | 0.2 U | **47.9** | 5 | 0.3 U | 46.9 | 45.0 |
| ESB1172-2 1/2' | 04/14/98 | **3.6** | 52.4 | 0.2 U | **34.2** | 6 | 0.3 U | 39.6 | 33.7 |
| ESB1172-5' | 04/14/98 | **3.2** | 85.9 | 0.2 U | **41.6** | 5 | 0.3 U | 45.4 | 40.6 |
| ESB1172-5' (DUP) | 04/14/98 | **3.7** | 68.2 | 0.2 U | **44.0** | 7 | 0.3 U | 46.7 | 41.3 |
| ESB1172-10' | 04/14/98 | **3.2** | 65.2 | 0.2 U | **37.4** | 6 | 0.3 U | 43.4 | 39.3 |
| ESB1172-15' | 04/14/98 | **3.5** | 69.2 | 0.2 U | **41.9** | 5 | 0.3 U | 43.9 | 42.3 |
| ESB1173-5' | 04/14/98 | **4.7** | 83.4 | 0.2 U | **51.2** | 6 | 0.4 U | 58.6 | 49.9 |
| ESB1173-10' | 04/14/98 | **2.8** | 52.9 | 0.2 U | **31.6** | 4 | 0.3 U | 40.6 | 32.7 |
| ESB1173-15' | 04/14/98 | **3.4** | 60.0 | 0.2 U | **35.0** | 4 | 0.3 U | 41.6 | 44.2 |
| ESB1174-5' | 04/15/98 | **3.7** | 73.9 | 0.2 U | **42.0** | 5 | 0.3 U | 52.2 | 46.0 |
| ESB1174-10' | 04/15/98 | **3.0** | 46.1 | 0.2 U | **31.1** | 5 | 0.3 U | 37.7 | 32.1 |
| ESB1174-15' | 04/15/98 | **2.9** | 66.7 | 0.2 U | **39.8** | 5 | 0.3 U | 41.9 | 40.9 |
| ESB1175-5' | 04/15/98 | **3.8** | 88.3 | 0.2 U | **47.9** | 6 | 0.3 U | 53.6 | 49.9 |
| ESB1175-10' | 04/15/98 | **3.3** | 66.7 | 0.2 | **42.8** | 4 | 0.3 U | 44.8 | 40.5 |
| ESB1175-15' | 04/15/98 | **3.5** | 78.8 | 0.2 U | **54.0** | 6 | 0.3 U | 50.2 | 67.7 |
| ESB1176-2 1/2' | 04/15/98 | **3.4** | 59.6 | 0.2 U | **38.7** | 5 | 3.4 | 54.2 | 36.6 |
| ESB1176-5' | 04/15/98 | **3.0** | 64.9 | 0.2 U | **41.0** | 5 | 0.3 U | 41.2 | 40.9 |
| ESB1176-10' | 04/16/98 | **3.3** | 55.5 | 0.2 U | **37.3** | 6 | 0.3 U | 44.4 | 35.2 |
| ESB1176-15' | 04/16/98 | **3.6** | 67.5 | 0.2 | **45.0** | 5 | 0.3 U | 49.1 | 130 |
| ESB1177-5' | 04/16/98 | **3.5** | 82.9 | 0.2 U | **49.0** | 7 | 0.3 U | 47.5 | 52.6 |
| ESB1177-10' | 04/16/98 | **3.2** | 77.9 | 0.2 U | **44.1** | 7 | 0.3 U | 48.4 | 48.8 |
| ESB1177-15' | 04/16/98 | **3.0** | 59.2 | 0.2 U | **38.6** | 6 | 0.3 U | 45.4 | 38.3 |
| ESB1178-2 1/2' | 04/16/98 | **2.8** | 61.5 | 0.2 U | **37.4** | 6 | 1.6 | 54.8 | 34.3 |
| ESB1178-5' | 04/16/98 | **3.1** | 68.9 | 0.2 U | **47.0** | 6 | 0.3 U | 48.3 | 45.1 |
| ESB1178-10' | 04/16/98 | **2.9** | 66.0 | 0.2 U | **40.5** | 4 | 0.3 U | 42.1 | 37.8 |
| ESB1178-15' | 04/16/98 | **3.6** | 80.2 | 0.2 U | **48.9** | 4 | 0.3 U | 50.5 | 69.7 |
| ESB1179-6' | 04/16/98 | **5.2** | 108.0 | 0.3 | **58.5** | 6 | 0.4 | 59.5 | 54.7 |
| ESB1179-10' | 04/17/98 | **3.2** | 58.5 | 0.2 U | **34.5** | 4 | 0.3 U | 41.5 | 33.9 |
| ESB1179-15' | 04/17/98 | **3.8** | 68.0 | 0.2 U | **42.7** | 4 | 0.3 | 45.2 | 70.9 |
| ESB1180-5' | 05/05/98 | **3.5** | 64.0 | 0.2 U | **38.8** | 5 | 0.3 U | 41.7 | 39.7 |
| ESB1180-10' | 05/05/98 | **0.7** | 72.5 | 0.2 U | **41.5** | 5 | 0.3 U | 41.6 | 43.5 |
| ESB1180-15' | 05/05/98 | **2.2** | 52.7 | 0.2 U | **43.6** | 4 | 0.3 U | 32.0 | 33.9 |
| ESB1181-5' | 05/05/98 | **3.3** | 73.7 | 0.2 U | **41.8** | 5 | 0.3 U | 45.3 | 43.2 |
| ESB1181-5' (DUP) | 05/05/98 | **3.0** | 58.0 | 0.2 U | **39.4** | 4 | 0.3 U | 40.2 | 35.0 |
| ESB1181-10' | 05/05/98 | **3.6** | 85.1 | 0.2 U | **47.2** | 5 | 0.3 U | 48.5 | 44.2 |
| ESB1181-15' | 05/05/98 | **3.9** | 89.3 | 0.2 U | **48.1** | 6 | 0.3 U | 53.3 | 49.9 |
| ESB1182-5 1/2' | 05/06/98 | **3.4** | 61.6 | 0.2 U | **43.0** | 5 | 1.8 | 44.6 | 40.8 |
| ESB1182-10' | 05/06/98 | **3.3** | 47.0 | 0.2 U | **33.3** | 4 | 0.3 U | 32.5 | 34.3 |
| ESB1182-15' | 05/06/98 | **2.9** | 53.1 | 0.2 U | **39.0** | 4 | 0.3 U | 40.9 | 64.0 |

**Notes:**
MTCA - Model Toxics Control Act
(A) - MTCA Method A soil cleanup level for unrestricted land use
(AI) - MTCA Method A soil cleanup level for industrial property
(B) - MTCA Method B soil cleanup level
(B*) Revised 2001 MTCA Method B value from Ecology website CLARC tables downloaded June 2010 (https://fortress.wa.gov/ecy/clarc/reporting/CLARCReporting.aspx).
1996 - Indicates MTCA soil cleanup levels, published 1996.
2001 - Indicates MTCA version 3.1 soil cleanup levels, published 2001.
(DUP) - Field duplicate
NE - Not established
U - Compound was analyzed for but not detected above the reporting limit shown.
Samples were analyzed for mercury and selenium, but these metals were not detected in any of the samples.
Numbers in **bold** font indicate that the result reported exceeds the most current MTCA cleanup level as of June 2010.
Numbers in grey shading indicate results that exceed a MTCA protection of groundwater level, but do not exceed the current lowest MTCA soil cleanup level protective of direct contact.




Job No. 33761927

**Figure 8-1**

**BUILDING 40-37 SOIL BORING LOCATIONS**

Boeing Commercial Airplanes, Everett Plant
REMEDIAL INVESTIGATION REPORT

URS Q:\geo\Boeing\Everett\GW Monitoring Report\2010 RI\06 Report\Fig 8-1.dwg
Mod: 08/11/2010, 11:28 | Plotted: 08/11/2010, 11:29 | john_knobbs

# 9.0 BUILDING 45-03

Presented in this section are the results of the soil investigation performed at the Attachment 5 SWMU/AOC (No. 157) located in Building 45-03 at the Everett Plant (Figure 9-1). SWMU/AOC No. 157 consists of three paint hangar wastewater sumps and a flume (trench) located in the basement level of Building 45-03. The subsurface conditions, prior investigations, and description of this SWMU/AOC are presented in Section 12.0 of the RIWP, and Section 3.3 of the Supplemental RIWP. This investigation was performed in accordance with Section 12.4 of the RIWP.

## 9.1 SWMU/AOC NO. 157 WASTEWATER FLUME

The flume transmits wastewater produced within Building 45-03 to the wastewater clarifier system (sumps EV-124, EV-125, and EV-129) located in the sub-basement level of the south portion of the building (Figure 9-1). The flume was installed during the construction of the building in 1979 and is currently in operation. The flume is currently coated with a chemical resistant coating. Dangerous constituents that may be potentially present within the wastewater discharged to the flume include acids, RCRA metals and strontium, petroleum hydrocarbon based solvents, phenol, non-halogenated SVOCs and VOCs. Further details regarding this SWMU/AOC are presented in Section 12.0 of the RIWP.

### 9.1.1 Purpose and Scope

The purpose of the investigation was to assess whether potential dangerous constituents are present in soil and perched groundwater, if present, in the vicinity of the wastewater flume. The scope of investigation was in general accordance with Section 12.4.1 and included the following:

- Drilled 8 soil borings to depths of 10½ to 12 feet bgs adjacent to the flume using a portable Salisbury rig equipped with hollow-stem auger
- Collected soil samples at prescribed depth intervals
- Field screened samples for organic vapors and pH
- Submitted selected soil samples for analysis for VOCs, RCRA metals and strontium, non-halogenated SVOCs, phenol, TPH-G and TPH-D

### 9.1.2 Documentation of Drilling and Sampling

Between April 7 and 10, 1998, Dames & Moore monitored drilling and collected soil samples from eight soil borings (ESB1159 through ESB1166) shown on Figure 9-1. The borings were completed to depths of 10½ to 12 feet bgs. Samples were retrieved using a hand auger and a SPT sampler. After sampling was completed, the borings were backfilled with hydrated bentonite chips and capped with concrete. Drilling techniques and sampling procedures utilized were in general accordance with the SAP presented in Appendix A of the RIWP.

### 9.1.3 Field Observations and Sample Analysis Results

Presented in this section are the field observations and sample analysis results associated with soil borings ESB1159 through ESB1166. Geologic logs of the soil borings are presented in Appendix H1. The chain of custody forms and analytical laboratory reports are presented in Appendix H2. Data validation reports are in Appendix H3. Analytical results are summarized in Tables 9-1 and 9-2.

#### 9.1.3.1 Field Observations

The area investigated is covered with approximately 6 to 8-inch thick concrete pavement. Underlying the concrete is fill soil consisting of fine to medium sand with occasional gravel, pea gravel, or crushed rock to depths ranging from approximately 1½ to 6½ feet bgs. The fill soil is underlain by native glacial till consisting of very dense, silty fine to medium sand with occasional gravel, and sand and gravel. A geologic cross-section (Figure 9-2), the location of which is shown on Figure 9-1, depicts the subsurface soils beneath the flume.

Staining or other visual indications of dangerous constituents were not observed. PID readings did not indicate organic vapors above ambient background in the soil samples. Field measurements indicated a soil pH of 7.5 S.U. to 9.7 S.U. One sample of fill from a depth of 2½ feet bgs in boring ESB1162 had an elevated pH of 9.7 S.U.

Perched groundwater was not encountered in the fill in any of the borings. The underlying glacial till was dry to moist and groundwater was not encountered to the maximum depth (12 feet bgs) explored.

#### 9.1.3.2 Soil Sample Analytical Results

Selected soil samples were submitted for analysis per the sample selection criteria specified in Figure A-3 in Appendix A of the RIWP. Soil samples from depths ranging from 2½ to 7½ feet bgs were submitted for analysis. The depth of these samples relative to the flume is shown on Figure 9-2.

Table 9-1 summarizes the soil analytical data for VOCs detected in one or more samples, TPH-D, TPH-G, non-halogenated SVOCs, and phenol. In addition, it lists the applicable MTCA Method A and B soil cleanup levels for these compounds. The analytical results indicate TPH-G, non-halogenated SVOCs, and phenol were not detected at concentrations greater than the method reporting limits. One VOC (methylene chloride) and TPH-D were either not detected above the method reporting limits or were detected at concentrations below the applicable MTCA Method A and B soil cleanup levels in the samples analyzed, including the preliminary soil cleanup levels protective of groundwater.

Table 9-2 summarizes the analytical data for RCRA metals and strontium in soil samples. This table also lists the applicable MTCA Method A and B soil cleanup levels. The analytical results indicate these metals were either not detected above the method reporting limits or were detected at concentrations below the applicable MTCA Method A and B cleanup levels except for arsenic, chromium, and strontium. Arsenic concentrations exceed the applicable MTCA Method B soil cleanup level (0.667 mg/kg) but are below the Puget Sound background concentration of 7.3 mg/kg (Ecology, 1994) and the MTCA Method A soil cleanup level protective of groundwater (20 mg/kg). Total chromium concentrations are below applicable MTCA Method A and B soil cleanup levels for trivalent chromium (2,000 mg/kg and 120,000 mg/kg, respectively) and the applicable MTCA Method B level for hexavalent chromium (240 mg/kg). These concentrations are above the MTCA Method A soil cleanup level (19 mg/kg) and the most conservative preliminary soil cleanup level protective of groundwater (18 mg/kg) for hexavalent chromium. All but one total chromium concentrations are below the Puget Sound soil background concentration of 48.2 mg/kg

(Ecology, 1994); the sample at ESB1162 at 5 feet bgs had a total chromium concentration of 52.4 mg/kg. Concentrations of other metals and organic compounds analyzed for were not elevated in this and other samples and the chromium concentration decreased to 41.3 mg/kg at 7 ½ feet bgs. Therefore, the elevated chromium concentrations above background are not considered to be indicative of a release and chromium is not recommended for evaluation in the FS for this SWMU/AOC.

Concentrations of strontium ranged from 23.0 mg/kg to 49.5 mg/kg, with four of the 17 samples exhibiting strontium concentrations exceeding the most conservative preliminary soil cleanup level protective of groundwater (38.4 mg/kg). All the detected concentrations are well below the MTCA Method B soil cleanup level protective of direct contact (48,000 mg/kg) and are consistent with strontium concentrations detected across the Everett facility. Therefore, the detected strontium concentrations are not considered indicative of a release and strontium is not recommended for evaluation in the FS for this SWMU/AOC.

Evaluation of the vapor intrusion (VI) pathway for this SWMU/AOC is not recommended for the FS. Screening of the VI pathway was performed in this RI using Ecology's review draft *Guidance for Evaluating Soil Vapor Intrusion in Washington State: Investigation and Remedial Action*, dated October 2009 (VI guidance). Application of the Preliminary Assessment step of the VI guidance to this SWMU shows that two chemicals detected in soil beneath the SWMU (methylene chloride and TPH as diesel, Table 9-1), are sufficiently volatile to be a potential VI source. However, these detections of volatile chemicals are not considered to be a potential source of VI for Building 45-03 for the following reasons:

- The one detection of TPH-D in soil (7.6 mg/kg) is well below the VI screening level for this compound (10,000 mg/kg, WAC 173-340-740[3][iii][C][II]).

- In accordance with WAC 173-340-740(3)(b)(iii)(C)(III), the concentration of methylene chloride is less than the protection of groundwater soil cleanup level calculated based on the applicable MTCA Method A or Method B groundwater cleanup levels.

- The volatile chemical concentrations in the soil samples are at least an order of magnitude below the lowest soil screening level.

- PID readings taken during field sampling did not indicate organic vapors significantly elevated above background ambient levels in the soil samples.

Groundwater was not encountered beneath this SWMU/AOC to a depth of 12 feet bgs.

## 9.2 SWMU/AOC NO. 157 PAINT HANGAR WASTEWATER SUMPS

SWMU/AOC No. 157 consists of three sumps as well as the wastewater flume (Figure 9-1). The clarifier sump, stripping sump, stripping surge sump, and associated flume were installed during the construction of the building in 1979 and lined with fiberglass in 1987. The clarifier sump was deactivated in 1998 when the wet air scrubber system in the paint hanger was replaced with a dry system. Dangerous constituents that may be potentially present within the wastewater discharged to the sumps include acids, metals, petroleum hydrocarbon based solvents, non-halogenated SVOCs, phenol, and VOCs. Further details regarding this SWMU/AOC are presented in Section 12.0 of the RIWP, and Section 3.3 of the Supplemental RIWP.

### 9.2.1 Purpose and Scope

The purpose of the investigation was to assess whether potential dangerous constituents are present in soil and perched groundwater, if present, in the vicinity of the sumps. The scope of investigation was in general accordance with Section 12.4.1 and included the following:

- Drilled four soil borings to depths of 15 ½ to 16 feet bgs adjacent to the sumps using a Salisbury portable drill rig equipped with hollow-stem auger
- Collected soil samples at prescribed depth intervals
- Field screened samples for organic vapors and pH
- Submitted selected soil samples for analysis for VOCs, non-halogenated SVOCs, phenol and TPH-G, TPH-D, and RCRA metals and strontium

Copper, nickel, and zinc were also analyzed because of an incorrect analysis request on the chain of custody form.

Based upon the elevated concentrations of chromium and nickel detected in soil from boring ESB1167, further investigation in the vicinity of EV-125 (wastewater clarifier sump) was conducted. The scope of the supplemental investigation was conducted in general accordance with Section 3.3 of the Supplemental RIWP and included the following:

- Drilled one soil boring near previous boring ESB1167 to a depth of 5½ feet bgs using a hand-driven Geoprobe
- Collected soil samples at prescribed depth intervals
- Field screened samples for organic vapors and pH
- Submitted selected soil samples for analysis for chromium and nickel

Analysis for VOCs, non-halogenated SVOCs, phenol, TPH-G and TPH-D were not conducted in accordance with the supplemental RIWP because field screening did not indicate elevated organic vapors.

### 9.2.2 Documentation of Drilling and Sampling

Between April 10 and 13, 1998, Dames & Moore monitored drilling of four soil borings (ESB1167 through ESB1170) shown on Figure 9-1. The borings were completed to a depth of 15½ to 16 feet bgs. One additional soil boring (ESB1375) was completed on April 4, 2000, to a depth of 5 ½ feet bgs (Figure 9-3). Boring ESB1375 could not be completed to 2½ feet below the fill/glacial till interface as planned due to refusal.

Dames & Moore monitored the drilling and collected soil samples. Soil samples were collected using either a hand auger or an SPT sampler. The borings were backfilled with hydrated bentonite chips and resurfaced with concrete. Drilling techniques and sampling procedures utilized in the April 1998 and 2000 investigations were in general accordance with the SAP presented in Appendix A of the RIWP.

### 9.2.3 Field Observations and Sample Analysis Results

Presented in this section are the field observations and sample results associated with soil borings ESB1167 through ESB1170, and ESB1375. Geologic logs of the soil borings are presented in Appendix H1. The chain of custody forms and analytical laboratory reports are presented in Appendix H2. Data validation reports are in Appendix H3. Analytical results are summarized in Tables 9-3 and 9-4.

#### 9.2.3.1 Field Observations

The area investigated is covered with approximately 12-inch thick concrete pavement. Underlying the concrete is fill soil consisting of fine to medium sand with occasional gravel, pea gravel, or crushed rock to depths ranging from approximately 4½ to 6½ feet bgs. The fill soil is underlain by native glacial till consisting of very dense silty fine to medium sand with occasional gravel, and coarse sand. A geologic cross-section depicting the soils encountered beneath the sumps is shown on Figure 9-2.

Staining or other visual indications of dangerous constituents were not observed. PID readings did not indicate significantly elevated organic vapors relative to ambient background in the soil samples. Field measurements indicated a soil pH of 7.2 S.U. to 10.1 S.U. with most values between 7.5 S.U. and 8.7 S.U.

Perched groundwater was encountered at a depth of 5 feet bgs in the fill in one boring (ESB1168). Groundwater was not encountered in the underlying glacial till to the maximum depth (16 feet bgs) explored.

#### 9.2.3.2 Soil Sample Analytical Results

Selected soil samples were submitted for analysis per the sample selection criteria specified in Figure A-3 in Appendix A of the RIWP. Soil samples from depths ranging from 4½ to 7½ feet bgs were submitted for analysis. The location of these samples relative to the base of the sumps is shown on Figure 9-2.

Table 9-3 summarizes the soil analytical data for VOCs detected in one or more samples and TPH-D, TPH-G, phenol and non-halogenated SVOCs. In addition, it lists the applicable MTCA Method A and B soil cleanup levels for these compounds. The analytical results indicate TPH-G, TPH-D, phenol and non-halogenated SVOCs were not detected above the method reporting limits. VOCs were not detected above the method reporting limits except in three of the samples analyzed. In these three samples, one or more VOCs were detected at concentrations below applicable MTCA Method A and B soil cleanup levels, including the preliminary soil cleanup levels protective of groundwater.

Table 9-4 summarizes the analytical data for RCRA metals, copper, nickel, strontium, and zinc in soil samples. This table also lists the applicable MTCA Method A and B soil cleanup levels. Metals concentrations were either not detected above the method reporting limits, were below applicable MTCA soil cleanup levels, or were below the Puget Sound background concentrations with the exception of arsenic, chromium, and strontium. Arsenic concentrations exceed the applicable MTCA Method B soil cleanup level (0.667 mg/kg) but are below the Puget Sound background concentration of 7.3 mg/kg (Ecology, 1994) and the MTCA Method A soil cleanup level protective of groundwater (20 mg/kg).

Total chromium concentrations are below MTCA Method A and B soil cleanup levels for trivalent chromium (2,000 mg/kg and 120,000 mg/kg, respectively) and the applicable Method B level for hexavalent chromium (240 mg/kg) in all but one sample. These concentrations are above the MTCA Method A soil cleanup level (19 mg/kg) and the most conservative preliminary soil cleanup level protective of groundwater (18 mg/kg) for hexavalent chromium. All but two total chromium concentrations are below the Puget Sound soil background concentration of 48.2 mg/kg (Ecology, 1994). Chromium was detected at ESB1167 at 5 feet bgs at 970 mg/kg and at adjacent boring ESB1375 at 5 feet bgs at 59.3 mg/kg. Concentrations of other metals and organic compounds analyzed for were not elevated in this and other samples and the next deeper sample at 7½ feet bgs in ESB1167 had a chromium concentration (33.7 mg/kg) below the Puget Sound soil background level. Therefore, the elevated chromium concentrations above background are not considered to be indicative of a release from this SWMU/AOC.

Concentrations of strontium ranged from 24.1 mg/kg to 47.2 mg/kg, with three of the 10 samples exhibiting strontium concentrations exceeding the most conservative preliminary soil cleanup level protective of groundwater (38.4 mg/kg). All the detected concentrations are well below the MTCA Method B soil cleanup level protective of direct contact (48,000 mg/kg) and are consistent with strontium concentrations detected across the Everett facility.

Evaluation of the vapor intrusion (VI) pathway for this SWMU/AOC is not recommend for the FS. Screening of the VI pathway was performed in this RI using Ecology's review draft *Guidance for Evaluating Soil Vapor Intrusion in Washington State: Investigation and Remedial Action,* dated October 2009 (VI guidance). Application of the Preliminary Assessment step of the VI guidance to this SWMU shows that five chemicals detected in soil beneath the SWMU (1,1-DCA, MEK, carbon disulfide, 1,2-DCE, and TCE, Table 9-3), are sufficiently volatile to be a potential VI source. However, these detections of volatile chemicals are not considered to a potential source of VI for Building 45-03 for the following reasons:

- In accordance with WAC 173-340-740(3)(b)(iii)(C)(III), the concentrations of volatile chemicals detected are less than the protection of groundwater soil cleanup levels calculated based on the MTCA Method A groundwater cleanup levels (or Method B where no Method A value is available).

- The volatile chemical concentrations in the soil samples are at least an order of magnitude below the lowest soil screening level.

- PID readings taken during field sampling did not indicate organic vapors significantly elevated above background ambient levels in the soil samples.

Groundwater was encountered perched in granular backfill material, but was not encountered in native glacial till beneath this SWMU/AOC to a depth of 16 feet bgs.

## 9.3 CONCLUSIONS AND RECOMMENDATIONS

### 9.3.1 Paint Hangar Wastewater Flume (SWMU/AOC No. 157)

Groundwater is not present within the coarse fill or in the glacial till to the maximum depth investigated of 12 feet bgs. Based on the analytical results discussed in Section 9.1.3.2 the soil in the vicinity of the wastewater flumes does not contain concentrations of VOC's, non-halogenated SVOCs, TPH-D, TPH-G, and phenol above the applicable MTCA Method A and B soil cleanup levels. Metals detected are also below the applicable MTCA Method A and B soil cleanup levels except for arsenic, chromium, and strontium; however, the arsenic concentrations and all but one chromium concentration are less than the Puget Sound background concentrations. The concentration of chromium at ESB1162 at 5 feet bgs (52.4 mg/kg) is slightly above the Puget Sound soil background (48.2 mg/kg). Based on the lack of elevated concentrations of other metals or organic compounds analyzed in this and other soil samples from borings in this area, this chromium concentration is not considered to be indicative of a release. Therefore, chromium is not recommended for evaluation in the FS for this SWMU/AOC.

Strontium was detected in all of the soil samples analyzed for this metal, with the concentrations in slightly less than one quarter of the samples exceeding the most conservative preliminary soil cleanup level protective of groundwater (38.4 mg/kg), but are approximately 1,000 times below the MTCA Method B soil cleanup level protective of direct contact (48,000 mg/kg). The detected concentrations of strontium were within a relatively narrow range of approximately 23 to 50 mg/kg and are consistent with strontium concentrations detected in soil across the Everett facility. Therefore, the detected strontium concentrations are not considered indicative of a release and strontium is not recommended for evaluation in the FS for this SWMU/AOC.

Based on these results, no further investigation and remedial action are warranted in this area and this SWMU/AOC is not recommended for evaluation in the FS.

### 9.3.2 Paint Hangar Wastewater Sumps (SWMU/AOC No. 157)

Groundwater was not encountered in the glacial till underlying the sumps to the depth investigated of 16 feet bgs. A minor amount of perched water was detected to a depth of 5 feet bgs in the fill overlying the glacial till in boring ESB1168. Based on the analytical results discussed in section 9.2.3.2, the soil in the vicinity of the wastewater sumps does not contain concentrations of VOCs, non-halogenated SVOCs, TPH-G, TPH-D and phenol above the applicable MTCA Method A and B soil cleanup levels. The metals concentrations are less than applicable MTCA Method A and B soil cleanup levels or Puget Sound background concentrations (arsenic) except for chromium and strontium as discussed below.

The chromium concentrations detected are less than the Puget Sound background concentration except for the samples from 5 feet bgs in boring ESB1167 and an adjacent boring ESB1375. The concentration (970 mg/kg) at ESB1167 is also above the applicable MTCA Method A and B soil cleanup levels for hexavalent chromium and is anomalous relative to other detected concentrations in other soil samples near this SWMU/AOC and at the Everett facility. The elevated chromium in soil at ESB1167 does not pose a threat to human health or the environment given that: (1) the one soil sample (ESB1167) containing chromium at 970 mg/kg is located beneath a concrete basement floor of the building, and (2) the soil above, below, and adjacent to this sample has total chromium concentrations less than the applicable MTCA A and B soil cleanup levels for total chromium indicating this is a limited occurrence. Based on the lack of elevated concentrations of other metals or organic compounds analyzed in this and other soil samples from borings in this area, this chromium concentration is not considered to be indicative of a release from the SWMU/AOC. Therefore, chromium is not recommended for evaluation in the FS for this SWMU/AOC.

Strontium was detected in all of the soil samples analyzed for this metal, with the concentrations in three of 10 samples exceeding the most conservative preliminary soil cleanup level protective of groundwater (38.4 mg/kg), but are approximately 1,000 times below the MTCA Method B soil cleanup level protective of direct contact (48,000 mg/kg). The detected concentrations of strontium were within a relatively narrow range of approximately 24 to 48 mg/kg and are consistent with strontium concentrations detected in soil across the Everett facility. Therefore, the detected strontium concentrations are not considered indicative of a release and strontium is not recommended for evaluation in the FS for this SWMU/AOC.

Based on these results, no further investigation or remedial action are warranted in th area and this SWMU/AOC is not recommended for inclusion in the FS.

**Table 9-1**
**Summary of Soil Sample Analytical Results for VOCs, Non-halogenated SVOCs, TPH, and Phenol**
**Building 45-03 Flume**
**Boeing Everett Plant Remedial Investigation**

| Sample ID/Date | | Volatile Organic Compound (ug/kg) | | Total Petroleum Hydrocarbons (mg/kg) | | Non-halogenated SVOCs (mg/kg) | Phenol (ug/kg) |
|---|---|---|---|---|---|---|---|
| | | Acetone | Methylene Chloride | Diesel-Range | Gasoline-Range | | |
| 1996 MTCA Method A or B Soil Cleanup Level | | 8,000,000 (B) | 133,000 (B) | 200 (A) | 100 (A) | - | 48,000,000 (B) |
| 1996 MTCA Method B 100 x GW Soil Cleanup Level | | 80,000 | 583 | NE | NE | - | 960,000 |
| 2001 MTCA Method A or B Soil Cleanup Level | | 8,000,000 (B) | 20 (A) 133,000 (B) | 2,000 (A) | 30 / 100*** (A) | - | 48,000,000 (B) |
| MTCA Method A or B Protection of Groundwater | | 3,211 (B) | 20 (A) 25 (B) | NC | 30 / 100*** (A) | - | 21,965 (B) |
| ESB1159-2 1/2' | 04/07/98 | 7.5 U** | 2.0 U | 5.1 U | 5.1 U | ND | 140 U |
| ESB1159-5' | 04/07/98 | 10 U** | 2.1 U | 5.6 U | 5.2 U | ND | 150 U |
| ESB1160-2 1/2' | 04/07/98 | 7.4 U** | 2.1 U | 5.3 U | 5.2 U | ND | 140 U |
| ESB1160-5' | 04/08/98 | 17 U** | 2.4 U | 5.5 U | 6.0 U | ND | 150 U |
| ESB1161-5' | 04/08/98 | 7.9 U** | 1.9 U | 7.6 * | 5.1 U | ND | 140 U |
| ESB1161-7 1/2' | 04/08/98 | 16 U** | 2.0 U | 5.7 U | 5.3 U | ND | 150 U |
| ESB1162-5' | 04/08/98 | 9 U** | 2.1 U | 5.6 U | 5.4 U | ND | 150 U |
| ESB1162-7 1/2' | 04/08/98 | 13 U** | 2.2 U | 5.7 U | 5.6 U | ND | 150 U |
| ESB1163-5' | 04/08/98 | 8.4 U** | 2.0 U | 5.1 U | 5.1 U | ND | 140 U |
| ESB1163-5' (DUP) | 04/08/98 | 8.3 U** | 2.4 | 5.2 U | 5.1 U | ND | 140 U |
| ESB1163-7 1/2' | 04/09/98 | 16 U** | 2.8 | 5.7 U | 5.8 U | ND | 150 U |
| ESB1164-5' | 04/09/98 | 8.8 U** | 2.0 U | 5.3 U | 5.2 U | ND | 140 U |
| ESB1164-7 1/2' | 04/09/98 | 13 U** | 3.2 | 5.6 U | 5.6 U | ND | 150 U |
| ESB1165-5' | 04/09/98 | 16 U** | 2.1 U | 5.6 U | 5.4 U | ND | 150 U |
| ESB1165-7 1/2' | 04/10/98 | 15 U** | 2.2 U | 5.8 U | 5.7 U | ND | 150 U |
| ESB1166-5' | 04/10/98 | 15 U** | 2.2 U | 5.5 U | 5.6 U | ND | 150 U |
| ESB1166-7 1/2' | 04/10/98 | 16 U** | 2.2 U | 5.4 U | 5.6 U | ND | 150 U |

**Notes:**
MTCA - Model Toxics Control Act
(A) - MTCA Method A soil cleanup level for unrestricted land use
(B) - MTCA Method B soil cleanup level
1996 - Indicates MTCA soil cleanup levels, published 1996.
2001 - Indicates MTCA version 3.1 soil cleanup levels, published 2001.
(DUP) - Field duplicate
NC - Not calculated
NE - Not established
J - Estimated value
U - Compound was analyzed for but not detected above the reporting limit shown.
 * Pattern profile does not match typical diesel pattern.
** Result was qualified as not detected during validation due to method blank, trip blank, or rinsate blank results.
***gasoline mixtures with benzene/gasoline mixtures without benzene

**Table 9-2**
**Summary of Soil Sample Analytical Results for Metals, (mg/kg)**
**Building 45-03 Flume**
**Boeing Everett Plant Remedial Investigation**

| Sample ID/Date | | Arsenic | Barium | Cadmium | Chromium | Lead | Silver | Strontium |
|---|---|---|---|---|---|---|---|---|
| 1996 MTCA Method A or B Soil Cleanup Level | | 1.67 (B) | 5,600 (B) | 80.0 (B) | 100 (A)<br>500 (AI) | 250 (A)<br>1,000 (AI) | 400 (B) | 48,000 (B) |
| 1996 MTCA Method B 100 x GW Soil Cleanup Level | | 0.00583 | 112 | 1.6 | 1,600 ($Cr^{+3}$) | NE | 8.0 | 960 |
| 2001 MTCA Method A or B Soil Cleanup Level | | 20 (A)<br>0.667 (B) | 5,600 (B)<br>16,000 (B*) | 2 (A)<br>80 (B) | 2,000($Cr^{+3}$) / 19 ($Cr^{+6}$) (A)<br>120,000($Cr^{+3}$) / 240 ($Cr^{+6}$) (B) | 250 (A)<br>1,000 (AI) | 400 (B) | 48,000 (B) |
| MTCA Method A or B Protection of Groundwater | | 20 (A)<br>0.03 (B) | 2,637 (B) | 2 (A)<br>1.1 (B) | 2,000 ($Cr^{+3}$) / 19 ($Cr^{+6}$) (A)<br>480,096 ($Cr^{+3}$) / 18 ($Cr^{+6}$) (B) | 250 (A) | 13.6 (B) | 38.4 (B) |
| WA Department of Ecology - Puget Sound Background Regional Concentration (90th Percentile) | | 7.30 | NE | 0.8 | 48.2 | 24.0 | NE | NE |
| ESB1159-2 1/2' | 04/07/98 | **2.6** | 36.9 | 0.2 U | **36.0 J** | 2 U | 0.3 U | 24.2 J |
| ESB1159-5' | 04/07/98 | **3.3** | 59.8 | 0.2 U | **47.5 J** | 3 | 0.3 U | 34.6 J |
| ESB1160-2 1/2' | 04/07/98 | **2.4** | 52.4 | 0.2 U | **33.7 J** | 3 | 0.3 | 33.2 J |
| ESB1160-5' | 04/08/98 | **2.3** | 40.9 | 0.2 U | **28.1 J** | 2 U | 0.3 U | 24.9 J |
| ESB1161-5' | 04/08/98 | **2.5** | 46.0 | 0.2 U | **38.5 J** | 3 | 0.4 | 35.8 J |
| ESB1161-7 1/2' | 04/08/98 | **3.0** | 53.7 | 0.2 U | **37.9 J** | 2 U | 0.3 U | 33.3 J |
| ESB1162-5' | 04/08/98 | **2.6** | 73.3 | 0.2 U | **52.4 J** | 3 | 0.3 U | 41.5 J |
| ESB1162-7 1/2' | 04/08/98 | **2.9** | 54.4 | 0.2 U | **41.3 J** | 3 | 0.3 U | 38.6 J |
| ESB1163-5' | 04/08/98 | **2.7** | 37.7 | 0.7 | **45.8 J** | 3 | 0.3 U | 26.3 J |
| ESB1163-5' (DUP) | 04/08/98 | **2.5** | 42.7 | 0.2 U | **36.2 J** | 3 | 0.3 U | 30.2 J |
| ESB1163-7 1/2' | 04/09/98 | **1.1** | 99.3 | 0.2 U | **45.4 J** | 4 | 0.3 U | 32.7 |
| ESB1164-5' | 04/09/98 | **2.6** | 31.7 | 0.2 U | **44.4 J** | 4 | 0.3 U | 23.0 |
| ESB1164-7 1/2' | 04/09/98 | **2.1** | 65.4 | 0.2 U | **41.5 J** | 4 | 0.3 U | 43.1 |
| ESB1165-5' | 04/09/98 | **2.0** | 61.7 | 0.2 U | **39.3 J** | 4 | 0.3 U | 49.5 |
| ESB1165-7 1/2' | 04/10/98 | **1.3** | 46.0 | 0.2 U | **35.9 J** | 6 | 0.3 U | 32.6 |
| ESB1166-5' | 04/10/98 | **2.3** | 63.3 | 0.2 U | **39.6 J** | 4 | 0.3 U | 37.7 |
| ESB1166-7 1/2' | 04/10/98 | **1.5** | 36.8 | 0.2 U | **33.5 J** | 4 | 0.3 U | 27.9 |

**Notes:**
MTCA - Model Toxics Control Act
(A) - MTCA Method A soil cleanup level for unrestricted land use
(AI) - MTCA Method A soil cleanup level for industrial property
(B) - MTCA Method B soil cleanup level
(B*) Revised 2001 MTCA Method B value from Ecology website CLARC tables downloaded June2010 (https://fortress.wa.gov/ecy/clarc/reporting/CLARCReporting.aspx).
1996 - Indicates MTCA soil cleanup levels, published 1996.
2001 - Indicates MTCA version 3.1 soil cleanup levels, published 2001.
(DUP) - Field duplicate
J - Estimated value
NE - Not established
U - Compound was analyzed for but not detected above the reporting limit shown.
Numbers in **bold** font indicate that the result reported exceeds the most current MTCA cleanup level as of June 20
Numbers in grey shading indicate results that exceed a MTCA protection of groundwater level, but do not exceed the current lowest MTCA soil cleanup level protective of direct contact.

**Table 9-3**
**Summary of Soil Sample Analytical Results for VOCs, Non-halogenated SVOCs, TPH, and Phenol**
**Building 45-03 Sumps**
**Boeing Everett Plant Remedial Investigation**

| Sample ID/Date | | Volatile Organic Compounds (ug/kg) | | | | | | Total Petroleum Hydrocarbons (mg/kg) | | Non-halogenated SVOCs (mg/kg) | Phenol (ug/kg) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 1,1-Dichloroethane | 2-Butanone | Acetone | Carbon Disulfide | cis-1,2-Dichloroethene | Trichloroethene | Diesel-Range | Gasoline-Range | | |
| 1996 MTCA Method A or B Soil Cleanup Level | | 8,000,000 (B) | 48,000,000 (B) | 8,000,000 (B) | 8,000,000 (B) | 800,000 (B) | 90,900 (B) | 200 (A) | 100 (A) | - | 48,000,000 (B) |
| 1996 MTCA Method B 100x GW Soil Cleanup Level | | 80,000 | 480,000 | 80,000 | 80,000 | 8,000 | 398 | NE | NE | - | 960,000 |
| 2001 MTCA Method A or B Soil Cleanup Level | | 8,000,000 (B)<br>16,000,000 (B*) | 48,000,000 (B) | 8,000,000 (B) | 8,000,000 (B) | 800,000 (B) | 30 (A)<br>90,900 (B)<br>11,000 (B*) | 2,000 (A) | 30 / 100** (A) | - | 48,000,000 (B) |
| MTCA Method A or B Protection of Groundwater | | 8,734 (B) | 19,200 (B) | 3,211 (B) | 5,651 (B) | 400 (B) | 30 (A)<br>3.2 (B) | NC | 30 / 100** (A) | - | 21,965 (B) |
| ESB1167-5' | 04/10/98 | 1.0 U | 5.0 U | 9.5 U* | 1.0 U | 1.0 U | 1.0 U | 5.1 U | 5.2 U | ND | 140 U |
| ESB1167-7 1/2' | 04/10/98 | 1.1 U | 5.3 U | 16 U* | 1.1 U | 1.1 U | 1.1 U | 5.5 U | 5.6 U | ND | 150 U |
| ESB1168-4 1/2' | 04/11/98 | 3.9 | 5.5 U | 24 U* | 1.1 | 26.0 | 1.1 U | 5.6 U | 5.6 U | ND | 150 U |
| ESB1168-7 1/2' | 04/13/98 | 10.0 | 17.0 | 58 U* | 1.1 | 20.0 | 1.2 | 5.5 U | 5.6 U | ND | 150 U |
| ESB1169-5' | 04/11/98 | 3.6 | 5.4 U | 11 U* | 1.1 U | 1.1 U | 1.1 U | 5.5 U | 5.4 U | ND | 150 U |
| ESB1169-7 1/2' | 04/11/98 | 1.1 U | 5.5 U | 14 U* | 1.1 U | 1.1 U | 1.1 U | 5.6 U | 5.6 U | ND | 150 U |
| ESB1170-5' | 04/11/98 | 1.1 U | 5.3 U | 9.1 U* | 1.1 U | 1.1 U | 1.1 U | 5.5 U | 5.3 U | ND | 150 U |
| ESB1170-5' (DUP) | 04/11/98 | 1.1 U | 5.4 U | 9.7 U* | 1.1 U | 1.1 U | 1.1 U | 5.7 U | 5.7 U | ND | 150 U |
| ESB1170-7 1/2' | 04/11/98 | 1.0 U | 5.6 U | 12 U* | 1.1 U | 1.1 U | 1.1 U | 5.5 U | 5.7 U | ND | 150 U |

**Notes:**
MTCA - Model Toxics Control Act
(A) - MTCA Method A soil cleanup level for unrestricted land use
(B) - MTCA Method B soil cleanup level
(B*) Revised 2001 MTCA Method B value from Ecology website CLARC tables downloaded June 2010 (https://fortress.wa.gov/ecy/clarc/reporting/CLARCReporting.aspx).
1996 - Indicates MTCA soil cleanup levels, published 1996.
2001 - Indicates MTCA version 3.1 soil cleanup levels, published 2001.
(DUP) - Field duplicate
NC - Not calculated
NE - Not established
U - Compound was analyzed for but not detected above the reporting limit shown.
* Result was qualified as not detected during validation due to method blank, trip blank, or rinsate blank results.
**gasoline mixtures with benzene/gasoline mixtures without benzene

**Table 9-4**
**Summary of Soil Sample Analytical Results for Metals, (mg/kg)**
**Building 45-03 Sumps**
**Boeing Everett Plant Remedial Investigation**

| Sample ID/Date | | Arsenic | Barium | Cadmium | Chromium | Copper | Lead | Nickel | Strontium | Zinc |
|---|---|---|---|---|---|---|---|---|---|---|
| 1996 MTCA Method A or B Soil Cleanup Level | | 1.67 (B) | 5,600 (B) | 80.0 (B) | 100 (A)<br>500 (AI) | 2,960 (B) | 250 (A)<br>1,000 (AI) | 1,600 (B) | 48,000 (B) | 24,000 (B) |
| 1996 MTCA Method B 100x GW Soil Cleanup Level | | 0.00583 | 112 | 1.6 | 1,600 ($Cr^{+3}$) | 59.2 | NE | 32.0 | 960 | 480 |
| 2001 MTCA Method A or B Soil Cleanup Level | | 20 (A)<br>0.667 (B) | 5,600 (B)<br>16,000 (B*) | 2 (A)<br>80 (B) | 2,000($Cr^{+3}$) / 19 ($Cr^{+6}$) (A)<br>120,000($Cr^{+3}$) / 240 ($Cr^{+6}$) (B) | 2,960 (B) | 250 (A)<br>1,000 (AI) | 1,600 (B) | 48,000 (B) | 24,000 (B) |
| MTCA Method A or B Protection of Groundwater | | 20 (A)<br>0.03 (B) | 2,637 (B) | 2 (A)<br>1.1 (B) | 2,000 ($Cr^{+3}$) / 19 ($Cr^{+6}$) (A)<br>480,096 ($Cr^{+3}$) / 18 ($Cr^{+6}$) (B) | 263 (B) | 250 (A) | 417 (B) | 38.4 (B) | 5,971 (B) |
| WA Department of Ecology - Puget Sound Background Regional Concentration (90th Percentile) | | 7.30 | NE | 0.8 | 48.2 | 36.4 | 24.0 | 47.8 | NE | 85.1 |
| ESB1167-2 1/2' | 04/10/98 | **4.9 J** | 31.5 J | 0.2 UJ | **30.4 J** | NA | 3 J | 49 J | 24.1 J | 33.8 J |
| ESB1167-5' | 04/10/98 | **2.0** | 38.7 | 0.3 | **970 J** | 16.1 | 5 | 363 J | 37.0 | 48.2 |
| ESB1167-7 1/2' | 04/10/98 | **1.5** | 41.8 | 0.2 U | **33.7 J** | 14.4 | 3 | 42 J | 25.9 | 26.8 |
| ESB1168-4 1/2' | 04/11/98 | **2.2** | 51.7 | 0.2 U | **31.3 J** | 12.8 | 4 | 54 J | 38.3 | 32.4 |
| ESB1168-7 1/2' | 04/13/98 | **1.7** | 49.9 | 0.2 U | **30.4 J** | 24.9 | 4 | 47 J | 31.7 | 31.4 |
| ESB1169-5' | 04/11/98 | **1.5** | 61.5 | 0.2 U | **34.7 J** | 14.6 | 5 | 48 J | 47.2 | 35.5 |
| ESB1169-7 1/2' | 04/11/98 | **1.4** | 41.9 | 0.2 U | **32.4 J** | 98.9 | 4 | 45 J | 32.3 | 27.8 |
| ESB1170-5' | 04/11/98 | **1.8** | 62.2 | 0.2 U | **37.2 J** | 15.8 | 5 | 57 J | 43.0 | 36.9 |
| ESB1170-5' (DUP) | 04/11/98 | **2.3** | 62.0 | 0.2 U | **32.5 J** | 13.9 | 4 | 56 J | 37.5 | 32.6 |
| ESB1170-7 1/2' | 04/11/98 | **1.9** | 65.1 | 0.2 U | **38.5 J** | 24.9 | 5 | 56 J | 46.0 | 41.0 |
| ESB1375-4' | 4/4/2000 | NA | NA | NA | **31.9 J** | NA | NA | 45 | NA | NA |
| ESB1375-5' | 4/4/2000 | NA | NA | NA | **59.3 J** | NA | NA | 52.5 | NA | NA |

**Notes:**
MTCA - Model Toxics Control Act
(A) - MTCA Method A soil cleanup level for unrestricted land use
(AI) - MTCA Method A soil cleanup level for industrial property
(B) - MTCA Method B soil cleanup level
(B*) Revised 2001 MTCA Method B value from Ecology website CLARC tables downloaded June 2010 (https://fortress.wa.gov/ecy/clarc/reporting/CLARCReporting.aspx).
1996 - Indicates MTCA soil cleanup levels, published 1996.
2001 - Indicates MTCA version 3.1 soil cleanup levels, published 2001.
(DUP) - Field duplicate
J - Estimated value
NA - Not analyzed
NE - Not established
U - Compound was analyzed for but not detected above the reporting limit shown.
Samples were analyzed for silver and selenium, but these metals were not detected in any of the samples. Sample ESB1167-2 1/2' was also analyzed for mercury.
Numbers in **bold** font indicate that the result reported exceeds the most current MTCA cleanup level as of June 201(
Numbers in grey shading indicate results that exceed a MTCA protection of groundwater level, but do not exceed the current lowest MTCA soil cleanup level protective of direct contact.

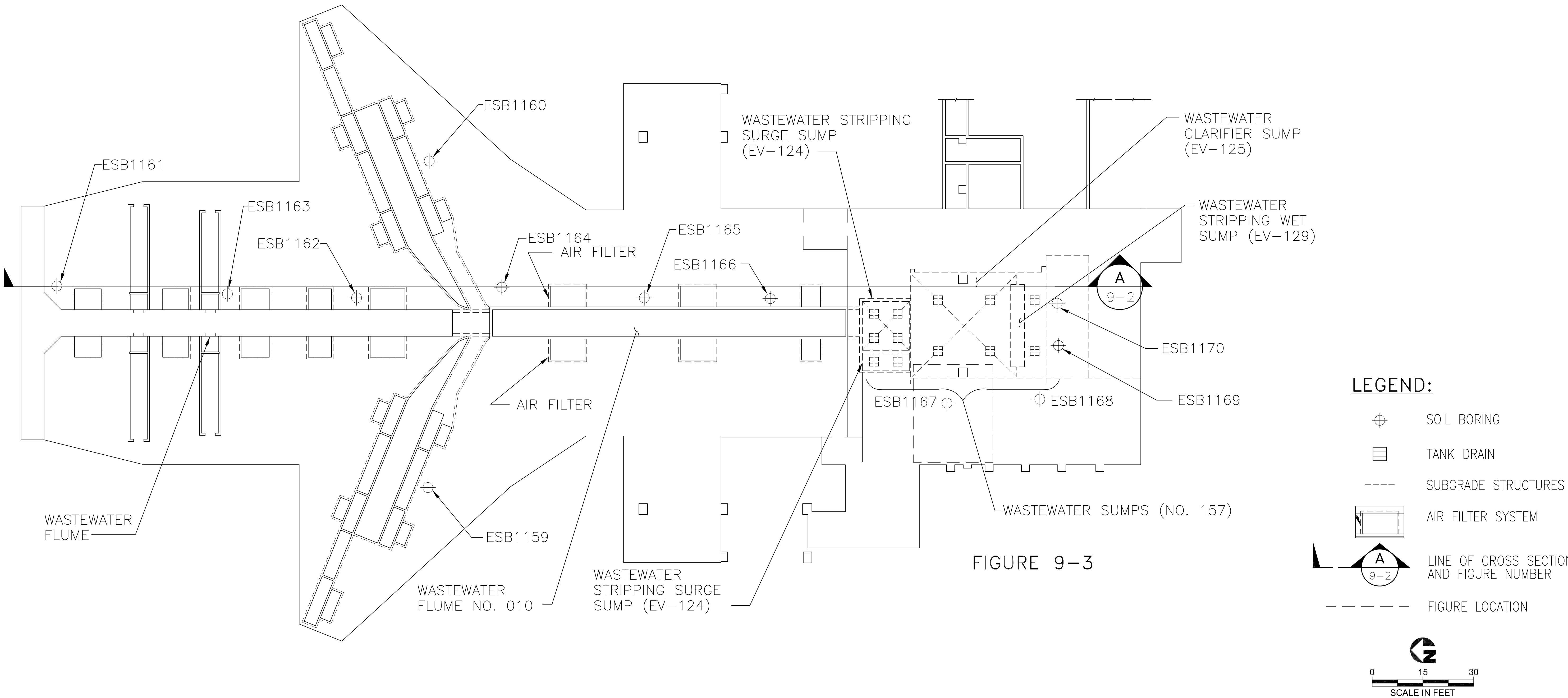


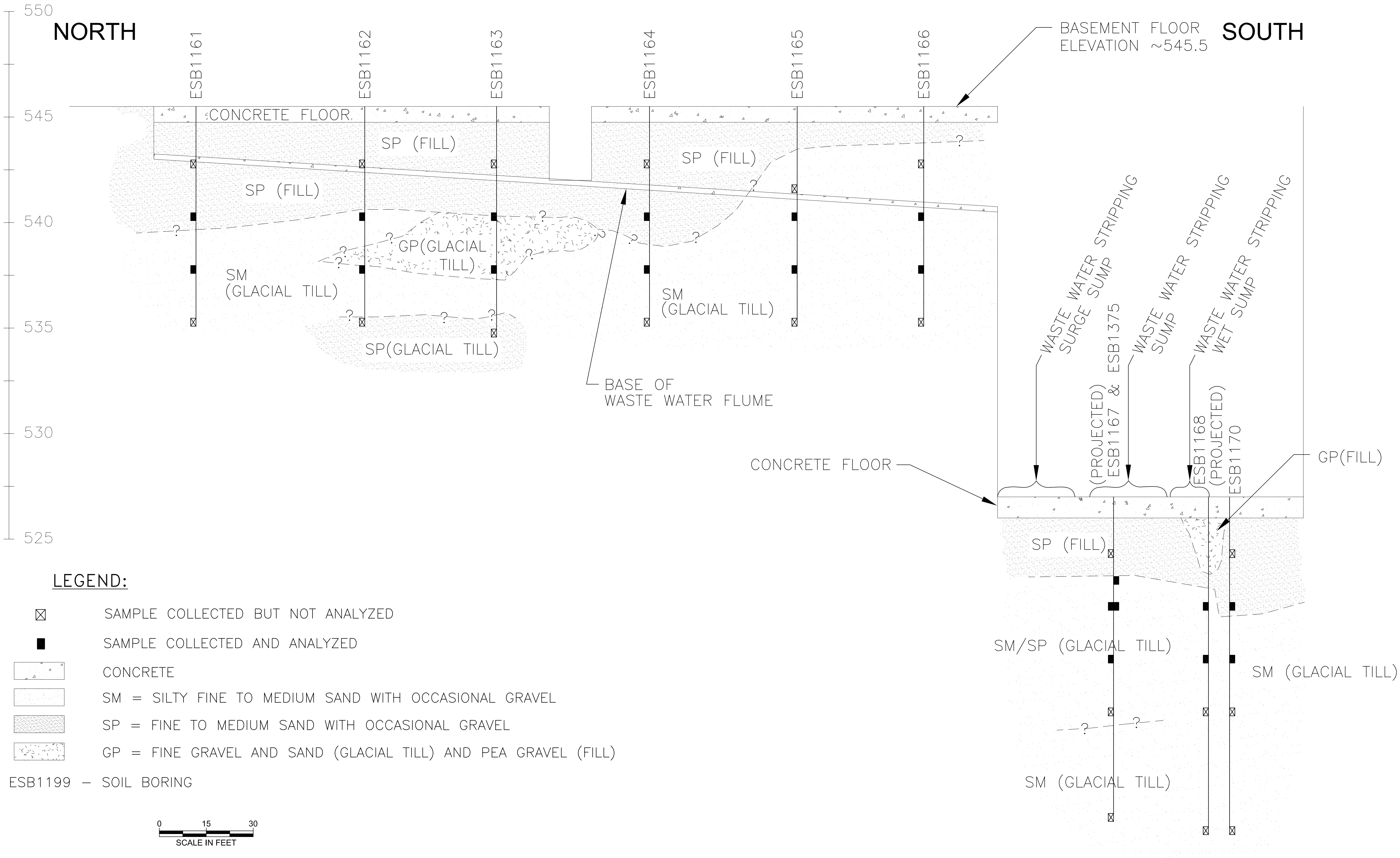

Figure 9-1

**BUILDING 45-03 WASTEWATER SUMPS**
**FLUME (NO. 157) PLAN, CROSS SECTIONS AND BORING LOCATIONS**

Job No. 33761927

URS Q:\geo\Boeing\Everett\GW Monitoring Report\2010 RI\06 Report\Fig 9-1.dwg
Mod: 08/11/2010, 11:41 | Plotted: 08/11/2010, 11:42 | john_knobbs

Boeing Commercial Airplanes, Everett Plant
REMEDIAL INVESTIGATION REPORT




LEGEND:

- ☒ SAMPLE COLLECTED BUT NOT ANALYZED
- ■ SAMPLE COLLECTED AND ANALYZED
- CONCRETE
- SM = SILTY FINE TO MEDIUM SAND WITH OCCASIONAL GRAVEL
- SP = FINE TO MEDIUM SAND WITH OCCASIONAL GRAVEL
- GP = FINE GRAVEL AND SAND (GLACIAL TILL) AND PEA GRAVEL (FILL)

ESB1199 — SOIL BORING

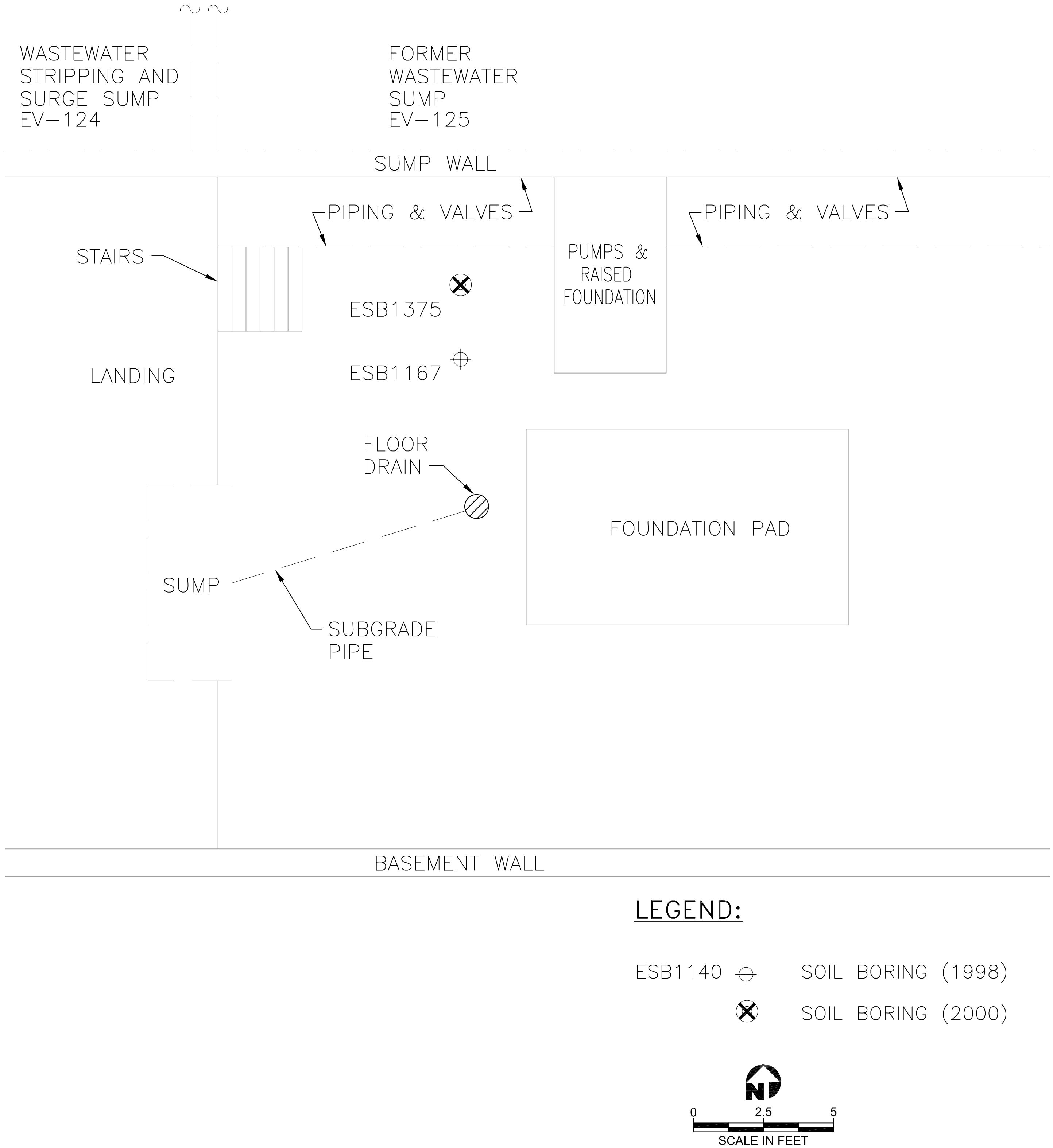
0 15 30
SCALE IN FEET

Job No. 33761927

Figure 9-2
**BUILDING 45-03 CROSS SECTION A**

Boeing Commercial Airplanes, Everett Plant
REMEDIAL INVESTIGATION REPORT

URS Q:\geo\Boeing\Everett\GW Monitoring Report\2010 RI06 Report\Fig 9-2.dwg
Mod: 08/11/2010, 13:40 | Plotted: 08/11/2010, 13:41 | john_knobbs




Job No. 33761927

Figure 9-3
**BUILDING 45-03 BASEMENT SOIL BORING LOCATIONS**

Boeing Commercial Airplanes, Everett Plant
REMEDIAL INVESTIGATION REPORT

URS Q:\geo\Boeing\Everett\GW Monitoring Report\2010 RI\06 Report\Fig 9-3.dwg
Mod: 08/12/2010, 09:43 | Plotted: 08/12/2010, 09:43 | john_knobbs

# 10.0 BUILDING 45-06

Presented in this section are the results of the subsurface investigation performed at the Attachment 5 SWMU/AOC (No. 167) located near Building 45-06 at the Everett Plant (Figure 10-1). SWMU/AOC No. 167 consists of three concrete USTs, EV-21, EV-22, and EV-23, located adjacent to the north side of Building 45-06. The subsurface conditions, prior investigations, and description of this SWMU/AOC are presented in Section 12.0 of the RIWP. This investigation was performed in accordance with Section 12.4 of the RIWP.

## 10.1 SWMU/AOC NO. 167 WASTEWATER USTS

SWMU/AOC No. 167 includes a west (EV-21), center (EV-22), and an east (EV-23) UST. These USTs all receive a mixture of industrial wastewater from the three paint hangars (Building 45-01, 45-03, and 45-04), the Bluestreak shop (Building 40-31), rinse water and wastewater from the various CS&P and CST&P operations, groundwater from recovery systems, Building 40-56 silkscreen rinse water, paint booth washwater, vehicle maintenance and equipment cleaning (Building 40-11) wastewater, and similar wastewater from other Boeing plants. The USTs were constructed in 1979 and have been lined with an epoxy coating. The tanks were probably unlined for several years prior to the initial lining. This statement is from the Ecology approved RIWP, Section 12. Further details regarding this SWMU/AOC are presented in Section 12.0 of the RIWP.

## 10.2 PURPOSE AND SCOPE

The purpose of the investigation was to assess whether petroleum hydrocarbons, VOCs, non-halogenated SVOCs, phenol, RCRA metals, and several other metals are present in soil and perched groundwater (if present) in the vicinity of SWMU/AOC No. 167. The scope of investigation was in general accordance with Section 12.4.2 of the RIWP and included the following:

- Drilled nine soil borings to depths ranging from 21 to 26 feet adjacent to the USTs using limited-access and truck-mounted hollow stem auger rigs
- Collected samples at prescribed depth intervals
- Field screened samples for organic vapors and pH
- Submitted selected samples for analysis for TPH-D, TPH-G, VOCs (including cyclohexanone, various ketones, and 2,4- pentadione), non-halogenated SVOCs, phenol, RCRA metals, strontium, nickel, copper, and zinc

Two of the eleven planned borings could not be completed due to the presence of subgrade utilities and restricted surface access by aboveground piping. These borings were to be located south of the tanks. The presence of utilities precluded relocating these borings anywhere on the south side of the tanks.

## 10.3 DOCUMENTATION OF DRILLING AND SAMPLING

Between March 23 and March 27, 1998, Dames & Moore monitored the drilling of nine soil borings (ESB1142 through ESB1150) shown on Figure 10-1. The borings were completed to depths ranging from approximately 21 feet to 26 feet bgs. Samples were retrieved using a Dames & Moore U-type sampler fitted with stainless steel rings or an SPT sampler as appropriate. After sampling was completed, the borings were back-filled with hydrated bentonite chips and capped with concrete. Drilling techniques and sampling procedures utilized were in general accordance with the SAP presented in Appendix A of the RIWP.

## 10.4 FIELD OBSERVATIONS AND SAMPLE ANALYSIS RESULTS

Presented in this section are the field observations and sample analysis results associated with soil borings ESB1142 through ESB1150. Geologic logs of the soil borings are presented in Appendix I1. Chain of custody forms and analytical laboratory results are in Appendix I2. Data validation reports are in Appendix I3. Analytical results are summarized on Tables 10-1 and 10-2.

### 10.4.1 Field Observations

The area adjacent to SWMU/AOC No. 167 is covered with 10-inch-thick concrete. Underlying the concrete is granular fill soil consisting of predominantly fine to medium sand to depths ranging from 10 feet to approximately 16 feet bgs. The fill soil is underlain by native glacial till consisting of very dense silty fine sand with a trace of gravel to the maximum depth explored of 26 feet bgs (Figure 10-2).

Staining or other visual indications of dangerous constituents were not observed. PID readings did not indicate organic vapor concentrations above ambient background levels in the soil samples. Soil pH ranged from 6.5 S.U. to 8.3 S.U., based on field measurements.

Groundwater or anomalous moisture was not encountered in fill in any of the borings. The underlying glacial till to a maximum explored depth of 26 feet bgs was moist. The uppermost approximately 5 feet of glacial till (16 to 21 feet bgs) in boring ESB1149 was wet.

### 10.4.2 Sample Analysis Results

Selected soil samples from depths ranging from 10 to 25 feet bgs were submitted for analysis per the sample selection criteria specified in Figure A-5 in Appendix A of the RIWP. A cross-section of the sample locations and depths are shown on Figure 10-2.

Table 10-1 summarizes soil analytical data for VOCs, non-halogenated SVOCs, TPH-D, TPH-G, and phenol. In addition it lists the applicable MTCA Method A and B cleanup levels for soil for these compounds. Non-halogenated SVOCs, TPH-G, and phenol were not detected at concentrations above the method reporting limits. The analytical results indicate that VOCs were not detected except for low concentrations of acetone and methylene chloride in several samples, at concentrations below the MTCA Method A and B cleanup levels for soil, including the most conservative preliminary soil cleanup levels protective of groundwater. Methylene chloride and acetone are common laboratory contaminants. Based on review of the laboratory blank results associated with these samples, the presence of these constituents in these samples is interpreted to be associated with laboratory contamination. TPH-D was detected in only four samples from borings ESB1144 and ESB1147 at concentrations (ranging from 9.8 mg/kg to 22.0 mg/kg) below the MTCA Method A cleanup level for TPH-D in soil (2,000 mg/kg).

Table 10-2 summarizes the analytical data for RCRA metals, strontium, copper, nickel and zinc. The analytical results indicate that silver and cadmium were not detected above the method reporting limits.

Other metals were detected but were below the applicable MTCA Method A or B soil cleanup levels in all the samples with the exception of arsenic, chromium, and strontium as discussed below.

Arsenic concentrations in 34 of the 36 samples analyzed are below the Puget Sound background soil concentration of 7.3 mg/kg and the MTCA Method A soil cleanup level for direct contact and protective of groundwater (20 mg/kg). All of the arsenic concentrations are above the MTCA Method B soil cleanup levels for direct contact and the most conservative preliminary soil cleanup level protective of groundwater. Two of the 36 samples (10 and 15-feet bgs samples from ESB1147) had concentrations (16.0 mg/kg and 24.0 mg/kg) that exceed the Puget Sound background soil concentration of 7.3 mg/kg (Ecology, 1994) and the arsenic concentration in the sample from 15 feet bgs also exceeds the 20 mg/kg MTCA Method A soil cleanup level. Concentrations in the two deeper samples (collected at 20 feet and 25 feet bgs in ESB1147) contained arsenic concentrations below the MTCA Method A soil cleanup and Puget Sound soil background levels.

Total chromium concentrations are below applicable MTCA Method A and B soil cleanup levels for trivalent chromium (2,000 mg/kg and 120,000 mg/kg, respectively) and the Method B level for hexavalent chromium (240 mg/kg), but are above the Method A level (19 mg/kg) and the most conservative preliminary soil cleanup level protective of groundwater (18 mg/kg) for hexavalent chromium. These concentrations are below the Puget Sound soil background level of 48.2 mg/kg with the exception of samples from ESB1144 at 17½ feet bgs (80.8 mg/kg) and 25 feet bgs (65.4 mg/kg), and ESB1147 at 10 feet bgs (50.4 mg/kg) and 25 feet bgs (48.3 mg/kg). At ESB1147, chromium is below the Puget Sound background level at 15 and 20 feet bgs. At ESB1144, concentrations of other metals are not elevated, nor were other constituents detected at elevated concentrations at the depths with the higher chromium levels.

Concentrations of strontium ranged from 19.0 mg/kg to 54.8 mg/kg, with six of the 36 samples exhibiting strontium concentrations exceeding the most conservative preliminary soil cleanup level protective of groundwater (38.4 mg/kg). All the detected concentrations are well below the MTCA Method B soil cleanup level protective of direct contact (48,000 mg/kg).

Evaluation of the vapor intrusion (VI) pathway for this SWMU/AOC is not recommended for the FS. Screening of the VI pathway was performed in this RI using Ecology's review draft *Guidance for Evaluating Soil Vapor Intrusion in Washington State: Investigation and Remedial Action*, dated October 2009 (VI guidance). Application of the Preliminary Assessment step of the VI guidance to this SWMU shows that two chemicals detected in soil beneath the SWMU (methylene chloride and TPH as diesel, Table 10-1), are sufficiently volatile to be a potential VI source. However, these detections of volatile chemicals are not considered to be a potential source of VI for Building 45-06 for the following reasons:

- The one detection of TPH-D in soil (22 mg/kg) is well below the VI screening level for this compound (10,000 mg/kg, WAC 173-340-740[3][iii][C][II]).

- In accordance with WAC 173-340-740(3)(b)(iii)(C)(III), the concentration of methylene chloride is less than the protection of groundwater soil cleanup level calculated based on the applicable MTCA Method A or Method B groundwater cleanup levels.

- The volatile chemical concentrations in the soil samples are approximately an order of magnitude below the lowest soil screening level.

- PID readings taken during field sampling did not indicate organic vapors significantly elevated above background ambient levels in the soil samples.

Groundwater was not encountered beneath this SWMU/AOC to a depth of 26 feet bgs and known groundwater occurs at a depth of approximately 200 feet bgs.

## 10.5 PHYSICAL TESTING

Three samples of glacial till collected at a depth of 17½ feet bgs in the Building 45-06 area were tested for various physical parameters including moisture content, effective porosity, percent saturation, and hydraulic conductivity. The laboratory reports are presented in Appendix S and pertinent results are described below. The moisture content (8% to 12% dry weight) and effective porosity (32% to 36% volume) are similar in all three samples. Percent saturation was 39% and 42% in two samples, but was 68% in the sample from boring ESB1149. Vertical hydraulic conductivity values for the three samples are similar and range from $6.74 \times 10^{-5}$ to $2.26 \times 10^{-4}$ cm/sec (0.019 to 0.64 ft/ day). Horizontal hydraulic conductivity values were measured for two of these samples and are $8.57 \times 10^{-6}$ and $2.48 \times 10^{-5}$ cm/sec (0.024 and 0.07 ft/day). The higher vertical hydraulic conductivity values relative to horizontal values may be a result of sample disturbance during collection and/or laboratory preparation of the samples.

## 10.6 CONCLUSIONS AND RECOMMENDATIONS

The results of drilling in the vicinity of three concrete USTs (SWMU/ACO No. 167) adjacent to the north side of Building 45-06 indicate the presence of fill to depths ranging from 10 feet to 16 feet bgs. Glacial till underlies the USTs to the maximum depth investigated of 26 feet bgs. Groundwater was not encountered but a minor zone of wet soils was detected from 16 to 21 feet bgs in the uppermost glacial till in boring ESB1149. This boring is located adjacent to the underground storm and sanitary sewer pipes which may be a source of this water. The lack of perched water in the fill and shallow glacial till soils indicate that there is not apparent ongoing leakage from the USTs.

The soil analytical results presented in Section 10.4.2 indicate that past releases from the USTs to the underlying soil, if any, have been very limited. This conclusion is supported by the following:

- VOCs, TPH-D, TPH-G, non-halogenated SVOCs, and phenol in the soil samples were either not detected above reporting limits or were below the applicable MTCA Method A or B soil cleanup levels, including the most conservative preliminary soil cleanup levels protective of groundwater.
- Metal concentrations were either (1) not detected above reporting limits, (2) below an applicable MTCA Method A or B soil cleanup level, or (3) below Puget Sound background soil concentrations with the exception of arsenic concentrations at two sample depths at one location (ESB1147), chromium at two separate depths each at ESB1144 and ESB1147, and strontium in six samples as discussed below.

- The analytical results indicate that soils with elevated arsenic and chromium concentrations detected in borings ESB1144 and ESB1147are limited in lateral and vertical extent. The soils with elevated arsenic and chromium concentrations detected in borings ESB1144 and ESB1147 are not a current risk to human health and the environment because there is no available direct exposure or transport pathway due to the presence of pavement or buildings covering the area of the USTs and the absence of shallow groundwater. Therefore, arsenic and chromium are not recommended for evaluation in the FS for this SWMU/AOC.
- Strontium concentrations exceeded the MTCA Method B soil cleanup level protective of groundwater in six of 36 samples, and all but one was at least 1000 times less than the Method B soil cleanup level protective of direct contact (48,000 mg/kg). The detected concentrations of strontium were consistent with the range of strontium concentrations detected in soils at other SWMUs/AOCs at the Everett facility without evidence of a release, and the two highest concentrations (46.6 mg/kg and 54.8 mg/kg) were in samples in different borings, neither of which had elevated arsenic or chromium. Therefore, the strontium concentrations detected are not considered indicative of a release, and are not recommended for evaluation in the FS for this SWMU/AOC.

No further investigation or remedial action are warranted in the Building 45-06 wastewater USTs area; therefore, this SWMU/AOC is not recommended for inclusion in the FS.

**Table 10-1**
**Summary of Soil Sample Analytical Results for VOCs, Non-halogenated SVOCs, TPH, and Phenol**
**Building 45-06 Wastewater USTs**
**Boeing Everett Plant Remedial Investigation**

| Sample ID/Date | | Total Petroleum Hydrocarbons (mg/kg) | | Volatile Organic Compounds (ug/kg) | | Non-halogenated SVOCs (mg/kg) | Phenol (ug/kg) |
|---|---|---|---|---|---|---|---|
| | | Diesel-Range | Gasoline-Range | Acetone | Methylene Chloride | | |
| 1996 MTCA Method A or B Soil Cleanup Level | | 200 (A) | 100 (A) | 8,000,000 (B) | 133,000 (B) | - | 48,000,000 (B) |
| 1996 MTCA Method B 100x GW Soil Cleanup Level | | NE | NE | 80,000 | 583 | - | 960,000 |
| 2001 MTCA Method A or B Soil Cleanup Level | | 2,000 (A) | 30 / 100*** (A) | 8,000,000 (B) | 20 (A)<br>133,000 (B) | - | 48,000,000 (B) |
| MTCA Method A or B Protection of Groundwater | | NC | 30 / 100*** (A) | 3,211 (B) | 20 (A)<br>25 (B) | - | 21,965 (B) |
| ESB1142-10' | 03/23/98 | 5.6 U | 5.1 U | 9.8 U | 9.8 U | ND | 150 U |
| ESB1142-18' | 03/23/98 | 5.4 U | 5.2 U | 9.6 U | 9.6 U | ND | 140 U |
| ESB1142-20' | 03/23/98 | 5.5 U | 5.3 U | 10 U | 10 U | ND | 150 U |
| ESB1142-25' | 03/23/98 | 5.5 U | 5.6 U | 10 U | 4.0 J | ND | 150 U |
| ESB1143-10' | 03/23/98 | 5.6 U | 5.4 U | 10 U | 10 U | ND | 150 U |
| ESB1143-15' | 03/23/98 | 5.5 U | 5.2 U | 9.5 U | 9.5 U | ND | 150 U |
| ESB1143-20' | 03/23/98 | 5.5 U | 5.3 U | 9.4 U | 9.4 U | ND | 150 U |
| ESB1143-25' | 03/23/98 | 5.5 U | 5.3 U | 10 U | 3.8 J | ND | 150 U |
| ESB1144-10' | 03/23/98 | 5.3 U | 5.2 U | 10 U | 7.4 J | ND | 140 U |
| ESB1144-15' | 03/23/98 | 5.2 U | 5.2 U | 9.4 U | 9.4 U | ND | 140 U |
| ESB1144-17 1/2' | 03/23/98 | 14.0* | 5.1 U | 9.2 U | 9.2 U | ND | 140 U |
| ESB1144-25' | 03/23/98 | 9.8* | 5.3 U | 9.3 U | 9.3 U | ND | 140 U |
| ESB1145-10' | 03/25/98 | 5.3 U | 5.1 U | 8 U** | 2.1 U** | ND | 140 U |
| ESB1145-15' | 03/25/98 | 5.2 U | 5.2 U | 7.1 U** | 2.1 U | ND | 140 U |
| ESB1145-20' | 03/25/98 | 5.3 U | 5.1 U | 9.3 U** | 2.9 U** | ND | 140 U |
| ESB1145-25' | 03/25/98 | 5.5 U | 5.4 U | 8.7 U** | 2.5 U** | ND | 150 U |
| ESB1146-10' | 03/24/98 | 5.6 U | 5.4 U | 9.6 U | 9.6 U | ND | 150 U |
| ESB1146-15' | 03/24/98 | 5.5 U | 5.3 U | 10 U | 10 U | ND | 150 U |
| ESB1146-15' (DUP) | 03/25/98 | 5.5 U | 5.2 U | 9.9 U | 9.9 U | ND | 150 U |
| ESB1146-20' | 03/24/98 | 5.5 U | 5.4 U | 9.6 U | 9.6 U | ND | 150 U |
| ESB1147-10' | 03/24/98 | 5.2 U | 5.1 U | 9.3 U | 9.3 U | ND | 140 U |
| ESB1147-15' | 03/24/98 | 5.5 U | 5.2 U | 9.8 U | 9.8 U | ND | 150 U |
| ESB1147-20' | 03/24/98 | 12.0 * | 5.7 U | 10 U | 10 U | ND | 150 U |
| ESB1147-25' | 03/24/98 | 22.0 * | 5.3 U | 9.5 U | 9.5 U | ND | 150 U |
| ESB1148-10' | 03/27/98 | 5.4 U | 5.3 U | 6.5 U** | 2.0 U | ND | 140 U |
| ESB1148-15' | 03/27/98 | 5.7 U | 5.2 U | 8.3 U** | 2.5 U** | ND | 150 U |
| ESB1148-20' | 03/27/98 | 5.5 U | 5.4 U | 7.3 U** | 2.1 U | ND | 150 U |
| ESB1148-25' | 03/27/98 | 5.8 U | 5.3 U | 8.2 U** | 2.2 U | ND | 150 U |
| ESB1149-10' | 03/27/98 | 5.3 U | 5.1 U | 6.9 U** | 2.0 U | ND | 140 U |
| ESB1149-15' | 03/27/98 | 5.5 U | 5.2 U | 7.6 U** | 2.0 U | ND | 150 U |
| ESB1149-20' | 03/27/98 | 5.5 U | 5.4 U | 8.5 U** | 2.2 U | ND | 140 U |
| ESB1149-25' | 03/27/98 | 5.5 U | 5.3 U | 7.7 U** | 2.1 U | ND | 140 U |
| ESB1150-10' | 03/27/98 | 5.3 U | 5.2 U | 7.8 U** | 2.0 U | ND | 140 U |
| ESB1150-15' | 03/27/98 | 5.4 U | 5.3 U | 7.9 U** | 2.1 U | ND | 150 U |
| ESB1150-20' | 03/27/98 | 5.5 U | 5.3 U | 8 U** | 2.2 U** | ND | 150 U |
| ESB1150-25' | 03/27/98 | 5.6 U | 5.4 U | 8.2 U** | 2.1 U | ND | 150 U |

**Notes:**

MTCA - Model Toxics Control Act
(A) - MTCA Method A soil cleanup level for unrestricted land use
(B) - MTCA Method B soil cleanup level
1996 - Indicates MTCA soil cleanup levels, published 1996.
2001 - Indicates MTCA version 3.1 soil cleanup levels, published 2001.
(DUP) - Field duplicate
J - Estimated value
NC - Not calculated
NE - Not established
U - Compound was analyzed for but not detected above the reporting limit shown.
 * Pattern profile does not match typical diesel pattern.
** Result was qualified as not detected during validation due to method blank, trip blank, or rinsate blank results.
***gasoline mixtures with benzene/gasoline mixtures without benzene.

**Table 10-2**
**Summary of Soil Sample Analytical Results for Metals, (mg/kg**
**Building 45-06 Wastewater USTs**
**Boeing Everett Plant Remedial Investigation**

| Sample ID/Date | | Arsenic | Barium | Chromium | Copper | Lead | Mercury | Nickel | Selenium | Strontium | Zinc |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1996 MTCA Method A or B Soil Cleanup Level | | 1.67 (B) | 5,600 (B) | 100 (A)<br>500 (AI) | 2,960 (B) | 250 (A)<br>1,000 (AI) | 24.0 (B) | 1,600 (B) | 400 (B) | 48,000 (B) | 24,000 (B) |
| 1996 MTCA Method B 100x GW Soil Cleanup Level | | 0.00583 | 112 | 1,600 ($Cr^{+3}$) | 59.2 | NE | 0.48 | 32.0 | 8.0 | 960 | 480 |
| 2001 MTCA Method A or B Soil Cleanup Level | | 20 (A)<br>0.667 (B) | 5,600 (B)<br>16,000 (B*) | 2,000($Cr^{+3}$) / 19 ($Cr^{+6}$) (A)<br>120,000($Cr^{+3}$) / 240 ($Cr^{+6}$) (B) | 2,960 (B) | 250 (A)<br>1,000 (AI) | 2 (A)<br>24 (B) | 1,600 (B) | 400 (B) | 48,000 (B) | 24,000 (B) |
| MTCA Method A or B Protection of Groundwater | | 20 (A)<br>0.03 (B) | 2,637 (B) | 2,000 ($Cr^{+3}$) / 19 ($Cr^{+6}$) (A)<br>480,096 ($Cr^{+3}$) / 18 ($Cr^{+6}$) (B) | 263 (B) | 250 (A) | 2 (A)<br>5.02 (B) | 417 (B) | 8.3 (B) | 38.4 (B) | 5,971 (B) |
| WA Department of Ecology - Puget Sound Background Concentration | | 7.30 | NE | 48.2 | 36.4 | 24.0 | 0.07 | 47.8 | NE | NE | 85.1 |
| ESB1142-10' | 03/23/98 | **1.7** | 34.1 | **35.9** | 14.4 | 3 | 0.05 U | 48.0 | 0.1 U | 19.0 | 28.6 |
| ESB1142-18' | 03/23/98 | **2.9** | 53.8 | **35.3** | 16.3 | 3 | 0.05 U | 51.0 | 0.2 | 31.9 | 35.5 |
| ESB1142-20' | 03/23/98 | **2.7** | 59.9 | **31.9** | 14.4 | 4 | 0.05 U | 45.0 | 0.1 U | 38.9 | 32.6 |
| ESB1142-25' | 03/23/98 | **2.4** | 49.1 | **37.6** | 14.6 | 3 | 0.05 U | 53.0 | 0.1 U | 34.9 | 33.5 |
| ESB1143-10' | 03/23/98 | **2.0** | 38.8 | **28.8** | 13.4 | 2 U | 0.05 U | 44.0 | 0.1 U | 23.8 | 30.3 |
| ESB1143-15' | 03/23/98 | **3.7** | 42.1 | **35.1** | 15.0 | 2 U | 0.05 U | 42.0 | 0.1 U | 26.5 | 30.7 |
| ESB1143-20' | 03/23/98 | **1.6** | 52.6 | **35.2** | 18.4 | 3 | 0.05 U | 46.0 | 0.1 U | 36.2 | 33.1 |
| ESB1143-25' | 03/23/98 | **2.5** | 49.1 | **30.5** | 16.2 | 3 | 0.05 U | 47.0 | 0.1 U | 32.7 | 35.2 |
| ESB1144-10' | 03/23/98 | **2.5** | 42.6 | **38.2** | 18.7 | 2 | 0.05 U | 48.0 | 0.1 U | 26.5 | 34.0 |
| ESB1144-15' | 03/23/98 | **2.3** | 31.0 | **32.3** | 13.8 | 2 U | 0.05 U | 66.0 | 0.1 U | 22.0 | 30.9 |
| ESB1144-17 1/2' | 03/23/98 | **5.5** | 48.7 | **80.8** | 19.2 | 3 | 0.05 U | 50.0 | 0.1 U | 27.9 | 34.6 |
| ESB1144-25' | 03/23/98 | **6.6** | 75.7 | **65.4** | 23.1 | 4 | 0.05 U | 53.0 | 0.1 U | 34.5 | 39.6 |
| ESB1145-10' | 03/25/98 | **1.5** | 35.3 | **41.2 J** | 16.7 | 3 | 0.05 U | 54.0 | 0.1 U | 24.0 | 32.1 |
| ESB1145-15' | 03/25/98 | **4.1** | 50.2 | **35.6 J** | 24.3 | 3 | 0.05 U | 48.0 | 0.1 U | 54.8 | 36.5 |
| ESB1145-20' | 03/25/98 | **2.4** | 51.9 | **32.7 J** | 15.8 | 3 | 0.05 U | 49.0 | 0.2 U | 35.0 | 35.2 |
| ESB1145-25' | 03/25/98 | **2.7** | 59.5 | **33.3 J** | 17.6 | 3 | 0.05 U | 54.0 | 0.1 U | 38.2 | 37.0 |
| ESB1146-10' | 03/24/98 | **2.3** | 42.4 | **45.9** | 17.3 | 3 | 0.04 U | 53.0 | 0.1 U | 31.8 | 34.6 |
| ESB1146-15' | 03/24/98 | **3.0** | 52.8 | **30.3** | 14.5 | 4 | 0.05 U | 47.0 | 0.1 U | 36.1 | 33.3 |
| ESB1146-15' (DUP) | 03/25/98 | **2.3** | 55.9 | **30.8** | 15.7 | 3 | 0.05 | 50.0 | 0.1 U | 38.5 | 34.9 |
| ESB1146-20' | 03/24/98 | **2.2** | 52.8 | **36.8** | 16.2 | 3 | 0.05 U | 51.0 | 0.1 | 36.2 | 34.5 |
| ESB1147-10' | 03/24/98 | **16** | 62.7 | **50.4** | 50.7 | 14 | 0.05 U | 54.0 | 0.1 U | 39.4 | 71.5 |
| ESB1147-15' | 03/24/98 | **24** | 58.0 | **36.0** | 65.4 | 19 | 0.04 U | 45.0 | 0.1 U | 35.0 | 90.7 |
| ESB1147-20' | 03/24/98 | **1.0** | 54.4 | **29.8** | 14.0 | 3 | 0.05 U | 44.0 | 0.1 U | 32.6 | 32.0 |
| ESB1147-25' | 03/24/98 | **7.1** | 59.4 | **48.3** | 34.8 | 22 | 0.05 U | 51.0 | 0.1 U | 38.7 | 74.6 |
| ESB1148-10' | 03/27/98 | **1.5** | 43.1 | **33.5** | 15.0 | 2 | 0.05 U | 48.0 | 0.1 U | 25.1 | 31.2 |
| ESB1148-15' | 03/27/98 | **2.6** | 41.4 | **31.1** | 14.4 | 2 U | 0.05 U | 46.0 | 0.1 U | 27.3 | 30.4 |
| ESB1148-20' | 03/27/98 | **1.7** | 53.6 | **27.5** | 16.5 | 3 | 0.05 U | 44.0 | 0.1 U | 34.8 | 30.1 |
| ESB1148-25' | 03/27/98 | **1.9** | 69.7 | **40.5** | 20.0 | 3 | 0.05 U | 56.0 | 0.1 U | 32.8 | 38.4 |
| ESB1149-10' | 03/27/98 | **1.6** | 171 | **29.0** | 15.4 | 2 U | 0.04 U | 44.0 | 0.1 U | 28.5 | 32.1 |
| ESB1149-15' | 03/27/98 | **3.9** | 39.7 | **45.4** | 17.3 | 2 | 0.05 U | 48.7 | 0.1 U | 20.6 | 30.0 |
| ESB1149-20' | 03/27/98 | **1.6** | 48.8 | **33.1** | 17.1 | 3 | 0.05 U | 51.2 | 0.1 U | 28.8 | 29.8 |
| ESB1149-25' | 03/27/98 | **2.3** | 67.3 | **37.3** | 44.5 | 5 | 0.05 U | 55.0 | 0.1 | 46.6 | 54.1 |
| ESB1150-10' | 03/27/98 | **1.8** | 30.2 | **38.5** | 15.2 | 2 | 0.05 U | 47.0 | 0.1 U | 21.2 | 35.6 |
| ESB1150-15' | 03/27/98 | **2.8** | 37.1 | **30.7** | 15.5 | 2 | 0.05 U | 45.0 | 0.1 U | 23.9 | 33.6 |
| ESB1150-20' | 03/27/98 | **2.2** | 57.4 | **33.7** | 15.2 | 3 | 0.05 U | 48.0 | 0.1 U | 34.9 | 35.0 |
| ESB1150-25' | 03/27/98 | **1.9** | 53.7 | **34.3** | 14.5 | 3 | 0.05 U | 59.0 | 0.1 U | 32.2 | 33.3 |

**Notes:**
MTCA - Model Toxics Control Act
(A) - MTCA Method A soil cleanup level for unrestricted land use
(AI) - MTCA Method A soil cleanup level for industrial property
(B) - MTCA Method B soil cleanup level
(B*) Revised 2001 MTCA Method B value from Ecology website CLARC tables downloaded June 2010 (https://fortress.wa.gov/ecy/clarc/reporting/CLARCReporting.aspx).
1996 - Indicates MTCA soil cleanup levels, published 1996.
2001 - Indicates MTCA version 3.1 soil cleanup levels, published 2001.
(DUP) - Field duplicate
NE - Not established
U - Compound was analyzed for but not detected above the reporting limit shown.
Samples were analyzed for cadmium and silver, but these metals were not detected in any of the samples.
Numbers in **bold** font indicate that the result reported exceeds the most current MTCA cleanup level as of June 2010.
Numbers in grey shading indicate results that exceed a MTCA protection of groundwater level, but do not exceed the current lowest MTCA soil cleanup level protective of direct contact.

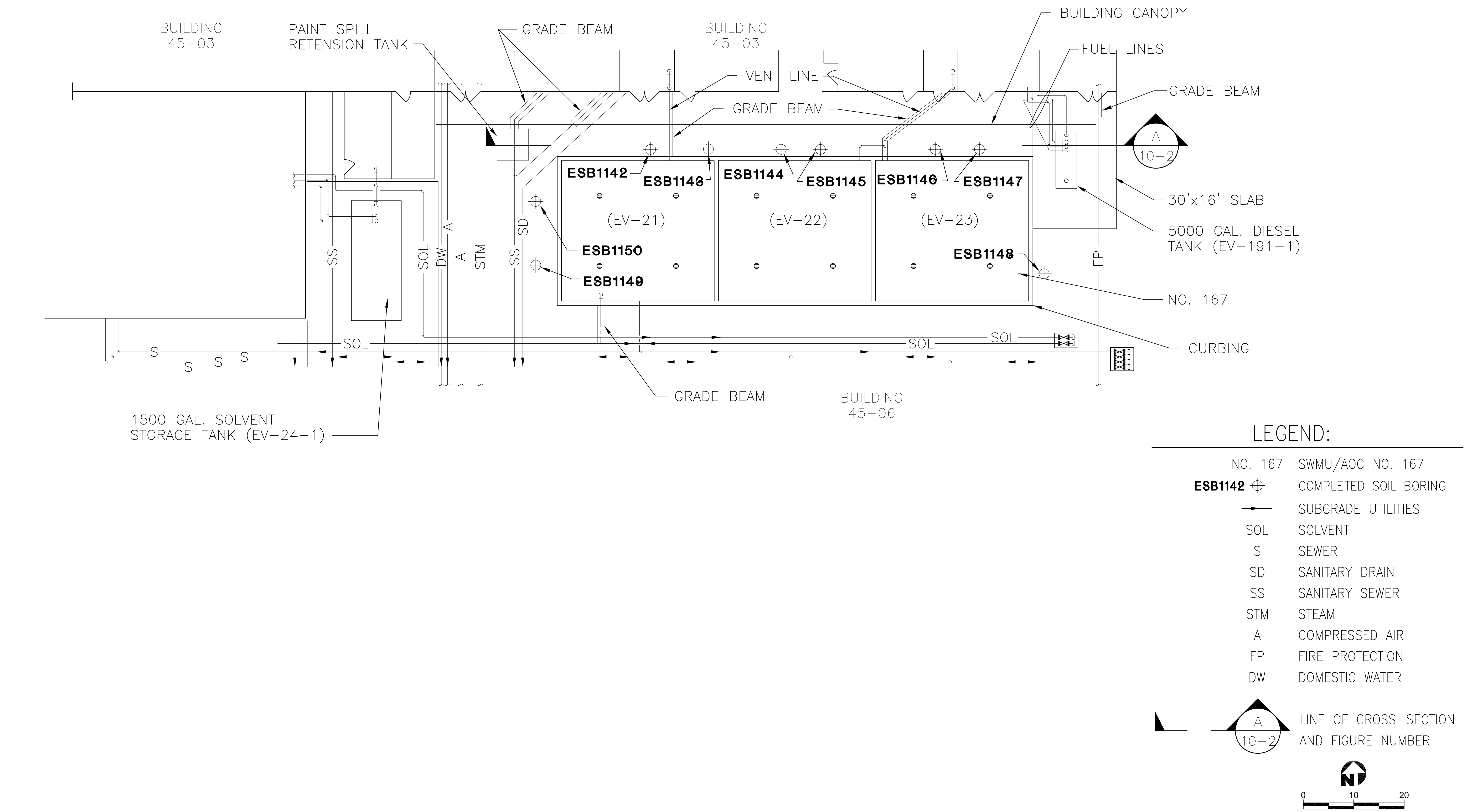



Figure 10-1
**BUILDING 45-06 (NO. 167) USTS EV-21, EV-22, & EV-23 PLAN AND BORING LOCATIONS**

Job No. 33761927

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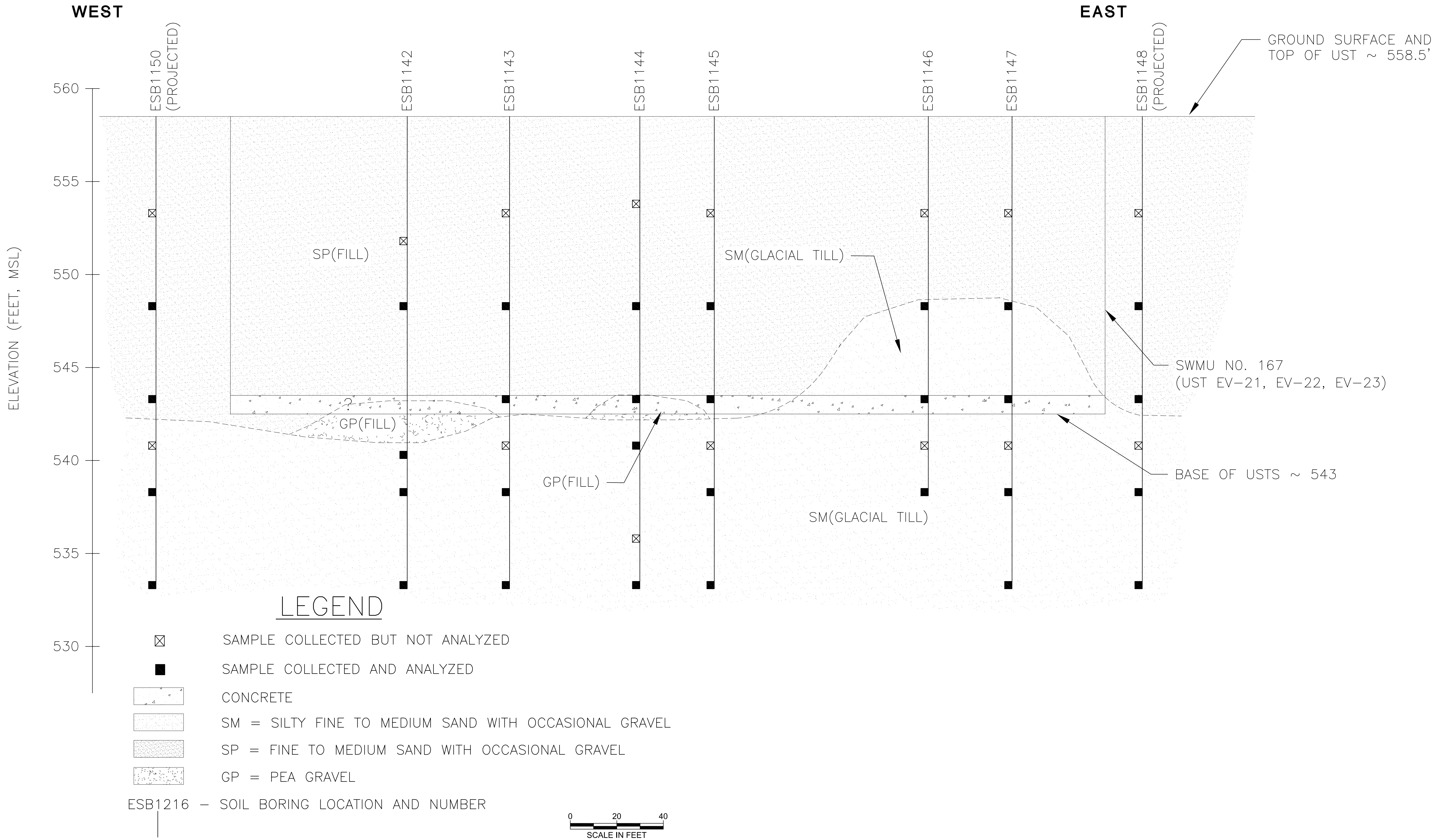
Boeing Commercial Airplanes, Everett Plant
REMEDIAL INVESTIGATION REPORT




Job No. 33761927

Figure 10-2

**BUILDING 45-06 (NO. 167) CROSS SECTION A**

Boeing Commercial Airplanes, Everett Plant
REMEDIAL INVESTIGATION REPORT

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# 11.0 BUILDING 40-23

Presented in this section are the results of the soil investigation performed at the Attachment 7 SWMU/AOC (No. 144) located in the northern portion of Building 40-23 at the Everett Plant (Figure 11-1). SWMU/AOC No. 144 is a 747 Wing Stub Clean, Seal, Test and Paint (CST & P) wastewater sump and associated sump vault, catch basin and cell. The subsurface conditions, prior investigations, and description of this SWMU/AOC are presented in Section 13.0 of the RIWP. This investigation was performed in accordance with Section 13.3 of the RIWP.

## 11.1 SWMU/AOC NO. 144 747 CST & P CELL

The Wing Stub CST & P cell consists of an above grade concrete containment and contains two floor drains. The floor drains discharge by gravity to tank EV-128 via buried piping and subgrade piping located within a concrete utility corridor. The concrete containment, trenches and tank were in use from 1968 to 1994. The processes performed in this unit included painting and sealing of the wing stub. Further details regarding this SWMU/AOC are presented in Section 13.0 of the RIWP.

Previous investigations identified cracks in the containment floor. Four soil borings were completed and low concentrations of several VOCs, chromium, and lead were detected in soils beneath the unit (ESE, 1995). The potential dangerous constituents which may have been encountered during this investigation include VOCs, TPH, non-halogenated SVOCs, RCRA metals, strontium, and zinc. Subsequent to this investigation, the containment floor was removed as part of the demolition of the unit. Inspection of the underlying building floor by Dames & Moore indicated that the cracks did not extend into this floor, but the floor has floor joints through which spilled liquids could migrate to the underlying soil.

## 11.2 PURPOSE AND SCOPE

The purpose of the investigation was to assess whether potential dangerous constituents are present in soil in the vicinity of a floor drain and crack in the containment floor and joints in the underlying building floor not previously investigated. The scope of investigation was in general accordance with Section 13.3 of the RIWP and included the following:

- Drilled three soil borings to depths of 10 to 11 feet bgs using a hand auger and a limited access drill rig
- Collected soil samples at prescribed depth intervals
- Field screened samples for organic vapors
- Submitted selected soil samples for analysis for VOCs, non-halogenated SVOCs, TPH-G, TPH-D, RCRA metals, strontium, and zinc

## 11.3 DOCUMENTATION OF DRILLING AND SAMPLING

On May 20, 1998, Dames & Moore monitored drilling of three soil borings (ESB1228 through ESB1230) shown on Figure 11-1. The borings were completed to a depth of between 10 to 11 feet bgs. Samples were retrieved using a hand auger, SPT split spoon, and Dames & Moore U-type sampler. After sampling was completed, the borings were backfilled with hydrated bentonite chips and capped with concrete. Drilling techniques and sampling procedures utilized were in general accordance with the SAP presented in Appendix A of the RIWP.

## 11.4 FIELD OBSERVATIONS AND RESULTS OF SAMPLE ANALYSIS

Presented in this section are the field observations and sample results associated with soil borings ESB1228 through ESB1230. Geologic logs of the soil borings are presented in Appendix J1. The chain of custody forms and analytical laboratory reports are presented in Appendix J2. Data validation reports are in Appendix J3. Analytical results are summarized in Tables 11-1 and 11-2.

### 11.4.1 Field Observations

The area investigated is covered with approximately 4-inch- to 15-inch-thick concrete floor slab. Approximately 2 inches of asphalt were encountered directly below the concrete at one soil boring (ESB1229). The soil encountered at soil borings ESB1228 and ESB1230 is fill soil consisting of medium dense, medium to coarse sand with a trace of fine gravel to a depth of 8 feet and 9 feet bgs, respectively. Underlying this fill material is very dense silty fine sand interpreted as weathered glacial till at ESB1228 and unweathered glacial till at ESB1230 based on soil color. At soil boring ESB1229 very dense, silty fine sand interpreted as weathered glacial till was encountered directly below the concrete floor slab (see Appendix J1). Moist soil conditions were encountered, but soil or perched water were not encountered to the depth explored (11 feet bgs).

Staining or other visual indications of dangerous constituents were not observed. PID readings did not indicate organic vapors concentrations above ambient background in the soil samples.

### 11.4.2 Soil Sample Analytical Results

Selected soil samples were submitted for analysis per the sample selection criteria specified in Figure A-3 in Appendix A of the RIWP. Soil samples from depths ranging from 1½ to 8 feet bgs were submitted for analysis. Table 11-1 summarizes the soil analytical data for VOCs, non-halogenated SVOCs, TPH-G and TPH-D and also lists the applicable MTCA Method A and B cleanup levels for soil. VOCs, non-halogenated SVOCs, and TPH-G were not detected at concentrations greater than the method reporting limits. TPH-D was detected in the soil sample collected from soil boring ESB1229 at a depth of 1 ½ feet at a concentration (16 mg/kg) well below the MTCA Method A cleanup level (2,000 mg/kg).

Table 11-2 summarizes the analytical data for RCRA metals, strontium, and zinc in soil samples. This table also lists the applicable MTCA Method A and B cleanup levels. The analytical results indicate cadmium, mercury, selenium, and silver were not detected above the method reporting limits. Concentrations of other metals are below the applicable MTCA Method A and B cleanup levels except for arsenic and chromium. However, the detected concentrations of arsenic (maximum of 3.4 mg/kg) and chromium (maximum 39.3 mg/kg) are below the Puget Sound background concentrations of 7.3 mg/kg and 48.2 mg/kg, respectively (Ecology, 1994).

Evaluation of the vapor intrusion (VI) pathway for this SWMU/AOC is not recommended for the FS. Screening of the VI pathway was performed in this RI using Ecology's review draft *Guidance for*

*Evaluating Soil Vapor Intrusion in Washington State: Investigation and Remedial Action*, dated October 2009 (VI guidance). Application of the Preliminary Assessment step of the VI guidance to this SWMU shows that chemicals detected in soil beneath the SWMU are not sufficiently volatile to be a potential VI source.

- The maximum concentration of TPH-D detected in soil (16 mg/kg) is well below the VI screening level for this compound (10,000 mg/kg, WAC 173-340-740[3][iii][C][II]).

- Groundwater was not encountered beneath this SWMU/AOC to a depth of 11 feet bgs.

- In addition, PID readings taken during field sampling did not indicate organic vapors significantly elevated above background ambient levels in the soil samples.

## 11.5 CONCLUSIONS AND RECOMMENDATIONS

Based on the analytical results discussed in Section 11.4.2, soil in the vicinity of the Building 40-23 747 Wing Stub CST&P cell does not contain VOCs, non-halogenated SVOCs, and TPH-G detected at concentrations above the method reporting limits. TPH-D and metals were either (1) not detected above reporting limits, (2) at concentrations below the applicable MTCA Method A or B soil cleanup levels, including the most conservative preliminary soil cleanup levels protective of groundwater or (3) were detected at concentrations less than the Puget Sound background concentrations. Groundwater is not present within the coarse fill or in the glacial till to the depth (11 feet bgs) investigated. No further investigation and remedial action are warranted in this area; therefore this area is not recommended for inclusion in the FS.

## 11.6 REFERENCES

ESE, 1995, Subsurface Investigation Report, 747 Wing Stub C ST&P, Building 40-23, Boeing Commercial Airplane Group, Everett Division, Everett Washington, June 8, 1995.

Washington State Department of Ecology, 1994, Natural Background Soil Metals in Washington State, Publication #94-115.

**Table 11-1**
**Summary of Soil Sample Analytical Results for TPH, VOCs, and Non-halogenated SVOCs**
**Building 40-23 (CST&P)**
**Boeing Everett Plant Remedial Investigation**

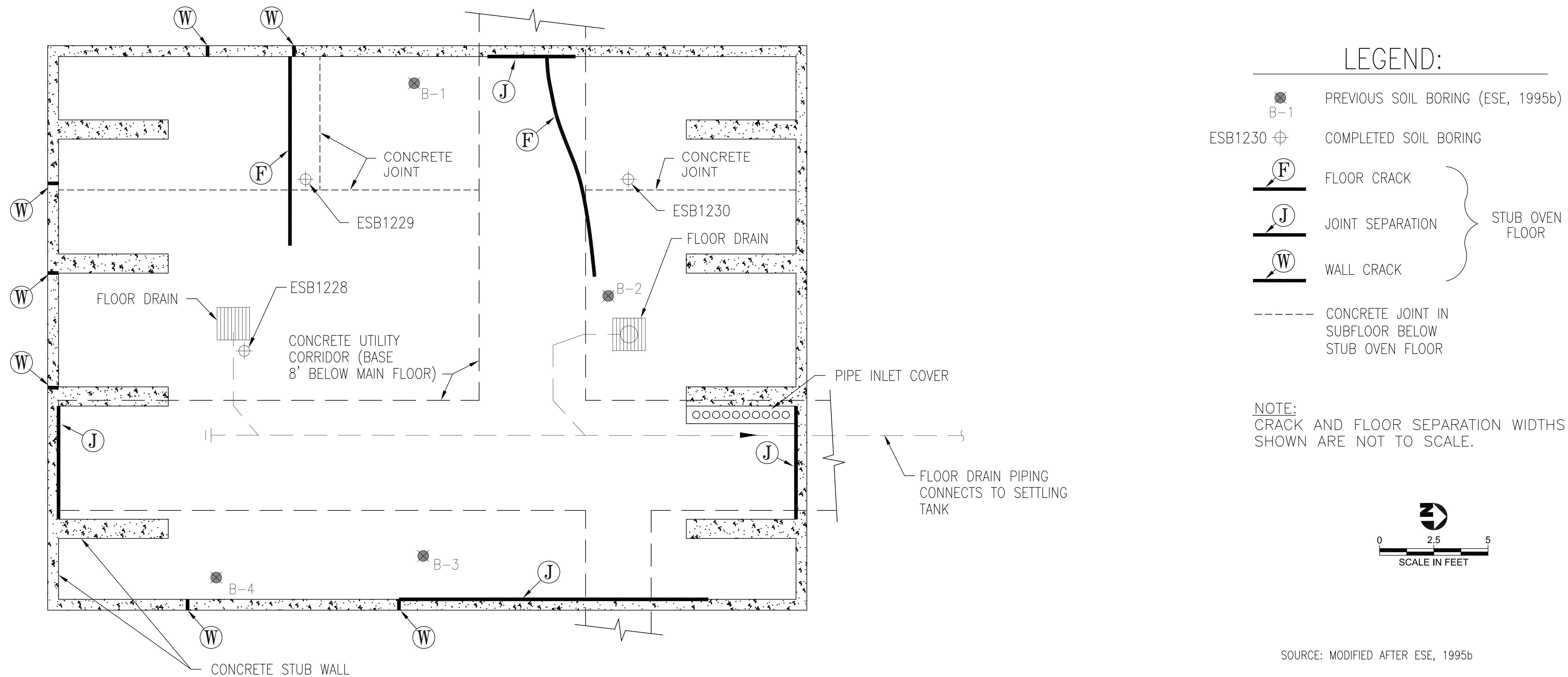
| Sample ID/Date | | Total Petroleum Hydrocarbons (mg/kg) | | VOCs (ug/kg) | | Non-halogenated SVOCs (mg/kg) |
|---|---|---|---|---|---|---|
| | | Diesel-Range | Gasoline-Range | Acetone | 1,1,2-Trichloro-1,2,2-trifluoroethane | |
| 1996 MTCA Method A or B Soil Cleanup Level | | 200 (A) | 100 (A) | 8,000,000 (B) | NE | - |
| 1996 MTCA Method B 100x GW Soil Cleanup Level | | NE | NE | 80,000 | NE | - |
| 2001 MTCA Method A or B Soil Cleanup Level | | 2,000 (A) | 30 / 100*** (A) | 8,000,000 (B) | 2,400,000,000 (B) | - |
| MTCA Method A or B Protection of Groundwater | | NC | 30 / 100*** (A) | 3,211 (B) | 960,000 (B) | - |
| ESB1228-2 1/2' | 5/20/1998 | 5.3 U | 5.4 U | 11 U * | 2.4 U* | ND |
| ESB1228-7 1/2' | 5/20/1998 | 5.7 U | 5.6 U | 6.2 U * | 2.5 U* | ND |
| ESB1229-1 1/2' | 5/20/1998 | 16.0 ** | 5.4 U | 8.3 U * | 3.8 U* | ND |
| ESB1229-3' | 5/20/1998 | 5.4 U | 5.4 U | 7.1 U | 4.1 U* | ND |
| ESB1230-1 1/2' | 5/20/1998 | 5.3 U | 5.2 U | 6.6 U * | 3.1 U* | ND |
| ESB1230-8' | 5/20/1998 | 5.4 U | 5.4 U | 7.1 U * | 2.2 U | ND |

**Notes:**
MTCA - Model Toxics Control Act
(A) - MTCA Method A soil cleanup level for unrestricted land use
(B) - MTCA Method B soil cleanup level
(B*) Revised 2001 MTCA Method B value from Ecology website CLARC tables downloaded June 2010
(https://fortress.wa.gov/ecy/clarc/reporting/CLARCReporting.aspx).
1996 - Indicates MTCA soil cleanup levels, published 1996.
2001 - Indicates MTCA version 3.1 soil cleanup levels, published 2001.
(DUP) - Field duplicate
NC - Not calculated
ND - Not detected
NE - Not established
U - Compound was analyzed for but not detected above the reporting limit shown.
* Analyte result was qualified as not detected during data validation.
** Chromatographic profile does not match a typical diesel hydrocarbon pattern.
***gasoline mixtures with benzene/gasoline mixtures without benzene.

**Table 11-2**
**Summary of Soil Sample Analytical Results for Metals, (mg/kg)**
**Building 40-23 (CST&P)**
**Boeing Everett Plant Remedial Investigation**

| Sample ID/Date | | Arsenic | Barium | Chromium | Lead | Strontium | Zinc |
|---|---|---|---|---|---|---|---|
| 1996 MTCA Method A, AI, or B Soil Cleanup Level | | 1.67 (B) | 5,600 (B) | 100 (A) 500 (AI) | 250 (A)<br>1,000 (AI) | 48,000 (B) | 24,000 (B) |
| 1996 MTCA Method B 100x GW Soil Cleanup Level | | 0.00583 | 112 | 1,600 ($Cr^{+3}$) | NE | 960 | 480 |
| 2001 MTCA Method A or B Soil Cleanup Level | | 20 (A)<br>0.667 (B) | 5,600 (B)<br>16,000 (B*) | 2,000($Cr^{+3}$) / 19 ($Cr^{+6}$) (A)<br>120,000($Cr^{+3}$) / 240 ($Cr^{+6}$) (B) | 250 (A)<br>1,000 (AI) | 48,000 (B) | 24,000 (B) |
| MTCA Method A or B Protection of Groundwater | | 20 (A)<br>0.03 (B) | 2,637 (B) | 2,000 ($Cr^{+3}$) / 19 ($Cr^{+6}$) (A)<br>480,096 ($Cr^{+3}$) / 18 ($Cr^{+6}$) (B) | 250 (A) | 38.4 (B) | 5,971 (B) |
| WA Department of Ecology - Puget Sound Regional Background Concentration | | 7.30 | NE | 48.2 | 24.0 | NE | 85.1 |
| ESB1228-2 1/2' | 5/20/1998 | **2.5** | 47.7 | **39.3 J** | 4.0 | 25.2 | 34.6 |
| ESB1228-7 1/2' | 5/20/1998 | **3.1** | 47.2 | **33.9 J** | 3.0 | 28.3 | 33.9 |
| ESB1229-1 1/2' | 5/20/1998 | **3.4** | 53.6 | **30.2 J** | 4.0 | 29.0 | 33.0 |
| ESB1229-3' | 5/20/1998 | **3.0** | 58.6 | **31.7 J** | 4.0 | 33.9 | 36.2 |
| ESB1230-1 1/2' | 5/20/1998 | **2.2** | 34.2 | **29.1 J** | 4.0 | 22.4 | 33.4 |
| ESB1230-8' | 5/20/1998 | **2.7** | 56.8 | **35.7 J** | 4.0 | 32.6 | 36.5 |

**Notes:**
MTCA - Model Toxics Control Act
(A) - MTCA Method A soil cleanup level for unrestricted land use
(AI) - MTCA Method A soil cleanup level for industrial property
(B) - MTCA Method B soil cleanup level
(B*) Revised 2001 MTCA Method B value from Ecology website CLARC tables downloaded June 2010 (https://fortress.wa.gov/ecy/clarc/reporting/CLARCReporting.aspx).
1996 - Indicates MTCA soil cleanup levels, published 1996.
2001 - Indicates MTCA version 3.1 soil cleanup levels, published 2001.
J - Estimated value
NE - Not established
Samples were analyzed for cadmium, mercury, selenium, and silver but these metals were not detected in any of the samples.
Numbers in **bold** font indicate that the result reported exceeds the most current MTCA cleanup level as of June 2010.




Job No. 33761927

**Figure 11-1**

**BUILDING 40-23 (NO. 144) SOIL BORING LOCATIONS**

Boeing Commercial Airplanes, Everett Plant
REMEDIAL INVESTIGATION REPORT

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# 12.0 BUILDING 40-22

Presented in this section are the results of the investigation of soils performed at the Attachment 7 SWMU/AOC (No. 143) located in Building 40-22 at the Everett Plant (Figure 12-1). The subsurface conditions, prior investigations, and description of this SWMU/AOC are presented in Section 14.0 of the RIWP, and Section 3.4 of the Supplemental RIWP. This investigation was performed in accordance with Section 14.3 of the RIWP.

## 12.1 SWMU/AOC NO. 143 747 WING STUB CST&P

SWMU/AOC No. 143 is a 747 Wing Stub Clean Seal Test Paint (CST&P) unit located in the north central portion of building 40-22. The processes performed in this unit included cleaning, sealing, testing and painting of a wing stub. The Wing Stub CST&P consists of an abovegrade concrete containment, which contains two floor drains. Potential dangerous constituents include VOCs (including cyclohexanone, methyl amyl ketone and di-isobutyl ketone), TPH, RCRA metals including strontium and zinc, and non-halogenated SVOCs. Prior to the RI, a visual and physical engineering assessment of SWMU/AOC No. 143 did not detect evidence that the integrity of the unit had been compromised (ESE, 1995). Further details regarding this SWMU/AOC are presented in Section 14.0 of the RIWP.

## 12.2 PURPOSE AND SCOPE

The purpose of the investigation was to assess whether paints, sealants, or solvents are present in soil beneath SWMU/AOC No. 143. The scope of investigation performed included the following:

- Drilled two horizontal soil borings through a utility corridor wall at a depth of approximately 3 feet bgs using a hand auger
- Collected soil samples at prescribed intervals
- Field screened samples for organic vapors
- Submitted selected soil samples for analysis of TPH, VOCs, non-halogenated SVOCs, and RCRA metals including strontium and zinc

Based on the results of the initial investigation, additional sampling below the prior borings was conducted in order to assess the potential for higher VOC concentrations at greater depths. The scope of additional investigation performed included the following:

- Drilled two horizontal borings through the utility corridor wall at approximately 3 feet below the prior horizontal borings
- Collected soil samples at prescribed intervals
- Field screened samples for organic vapors
- Submitted selected soil samples for analysis of VOCs

## 12.3 DOCUMENTATION OF DRILLING AND SAMPLING

On March 3, 1998, Dames & Moore completed drilling of the two soil borings identified on Figure 12-1. The borings (ESB1119 and ESB1120) were advanced horizontally approximately 2½ feet from the utility trench under the Wing Stub CST&P Unit to beneath the floor drains. Dames & Moore completed two additional horizontal soil borings (ESB1388 and ESB1389) 3 feet below the previous borings on June 15, 2000. ESB1388 and ESB1389 are located below ESB1119 and ESB1120, respectively. Samples were collected in both investigations using a slide hammer and core sampler fitted with stainless steel rings. After sampling was completed, the borings were backfilled with bentonite chips and capped with concrete. Drilling techniques and sampling procedures utilized were in general accordance with the SAP presented in Appendix A of the RIWP.

## 12.4 FIELD OBSERVATIONS AND RESULTS OF SAMPLE ANALYSIS

Presented in this section are the field observations and sample results associated with soil borings ESB1119, ESB1120, ESB1388, and ESB1389. Geologic logs of the soil borings were not prepared because the borings were short and horizontal. The chain of custody forms and analytical laboratory reports are presented in Appendix K1. Data validation reports are in Appendix K2. Analytical results are summarized in Tables 12-1, 12-2, and 12-3.

### 12.4.1 Field Observations

The utility corridor walls are approximately 6 to 8-inches thick concrete. Behind the concrete wall and underlying the floor drains is fill soil consisting of medium sand with gravel. Very dense silty sand with gravel, inferred to be glacial till or recompacted till fill, was encountered in boring ESB1120 at a lateral distance of approximately 2½ feet from the utility trench wall. Groundwater was not encountered in any of the soil borings.

A PID reading of 6.4 ppm was recorded from the samples collected beneath the floor drains in borings ESB1119 and ESB1120. The PID reading for boring ESB1389, located below ESB1120, was 7 ppm. These values are only slightly above ambient background levels. Staining or other visual indications of dangerous constituents were not observed.

### 12.4.2 Soil Sample Analytical Results

One soil sample per boring, collected directly beneath each floor drain, was submitted for analysis per the sample collection criteria specified in Section 14.3 of the RIWP. Soil samples from a lateral distance of 2 feet in soil boring ESB1119 and a lateral distance of 3 feet in soil boring ESB1120 were analyzed. Soil samples collected from a lateral distance of 1 and 2 feet in borings ESB1388 and ESB1389 were also analyzed. Tables 12-1, 12-2, and 12-3 summarize the analytical data and list applicable MTCA Method A and Method B soil cleanup levels for VOCs, TPH and non-halogenated SVOCs, and metals, respectively.

Non-halogenated SVOCs, TPH-G, and TPH-D were not detected at concentrations above the reporting limits in the samples from ESB1119 and ESB1120. Metals concentrations detected were similar in both samples and are below the applicable MTCA Method A or B cleanup levels with the exception of arsenic and chromium. However, arsenic (1.5 mg/kg and 5.7 mg/kg) and chromium (42.0 mg/kg and 34.4 mg/kg) concentrations are below their respective Puget Sound background concentrations of 7.3 mg/kg and 48.2 mg/kg.

Five VOCs (2-butanone, 4-isopropyltoluene, 4-methyl-2-pentanone, acetone and cyclohexanone) were detected in the samples collected from ESB1119 and ESB1120 at concentrations below the applicable MTCA Method B soil cleanup levels. VOCs detected in soil samples from ESB1388 and ESB1389 were also below applicable MTCA Method B soil cleanup levels, including the most conservative preliminary soil cleanup levels protective of groundwater.

Evaluation of the vapor intrusion (VI) pathway for this SWMU/AOC is not recommended for the FS. Screening of the VI pathway was performed in this RI using Ecology's review draft *Guidance for Evaluating Soil Vapor Intrusion in Washington State: Investigation and Remedial Action*, dated October 2009 (VI guidance). Application of the Preliminary Assessment step of the VI guidance to this SWMU shows that four chemicals detected in soil beneath the SWMU (1,1,2-trhichloro-1,2,2-trifluoroethane, MEK, toluene, and xylenes, Table 12-1), are sufficiently volatile to be a potential VI source. However, these detections of volatile chemicals are not considered to be a potential source of VI at Building 40-22 for the following reasons:

- In accordance with WAC 173-340-740(3)(b)(iii)(C)(III), the concentrations of volatile chemicals detected are less than the protection of groundwater soil cleanup levels calculated based on the MTCA Method A groundwater cleanup levels (or Method B where no Method A value is available).

- The volatile chemical concentrations in the soil samples are at three orders of magnitude below the lowest soil screening level.

- PID readings taken during field sampling did not indicate organic vapors significantly elevated above background ambient levels in the soil samples.

Groundwater was not encountered beneath this SWMU/AOC.

## 12.5 CONCLUSIONS AND RECOMMENDATIONS

Based on the analytical results discussed in section 12.4.2, the soil in the vicinity of the Wing Stub CST&P (SWMU/AOC No. 143) does not appear to contain VOCs, TPH-D, TPH-G, non-halogenated SVOCs or metals exceeding the applicable MTCA Method A or B cleanup levels, including the most conservative preliminary soil cleanup levels protective of groundwater, or the Puget Sound background soil concentrations for arsenic and chromium. Based on these results, no further investigation or remedial action is warranted in this area; therefore this area is not recommended for inclusion in the FS.

## 12.6 REFERENCES

ESE, 1995, Preliminary RCRA Facility Investigation Report, Area 1-747 Wing Stub CST&P, Building 40-22, for Boeing Commercial Airplane Group, Everett Division, Everett, Washington, April 20, 1995.

Washington State Department of Ecology, 1994, Natural Background Soil Metals in Washington State, Publication #94-115.

**Table 12-1**
**Summary of Soil Sample Analytical Results for Volatile Organic Compounds, (ug/kg)**
**Building 40-22**
**Boeing Everett Plant Remedial Investigation**

| Sample ID/Date | | 1,1,2-Trichloro-1,2,2-trifluoroethane | 2-Butanone | 4-Isopropyl toluene | 4-Methyl-2-Pentanone (MIBK) | Acetone | Cyclohexanone | Toluene | Total Xylenes |
|---|---|---|---|---|---|---|---|---|---|
| 1996 MTCA Method B Soil Cleanup Level | | NE | 48,000,000 | NE | 6,400,000 | 8,000,000 | 40,000,000 | 16,000,000 | 160,000,000 |
| 1996 MTCA Method B 100x GW Soil Cleanup Level | | NE | 480,000 | NE | 64,000 | 80,000 | 8,000,000 | 160,000 | 1,600,000 |
| 2001 MTCA Method A and B Soil Cleanup Level | | 2,400,000,000 (B) | 48,000,000 (B) | NE | 6,400,000 (B) | 8,000,000 (B) | 400,000,000 (B) | 7,000 (A)<br>16,000,000 (B)<br>6,400,000 (B*) | 9,000 (A)<br>160,000,000 (B) |
| MTCA Method A and B Protection of Groundwater | | 960,000 (B) | 19,200 (B) | NE | 2,560 (B) | 3,211 (B) | 160,000 (B) | 7,000 (A)<br>4,654 (B) | 9,000 (A)<br>14,630 (B) |
| ESB1119-2' | 03/03/98 | 2.0 U | 860 | 1.9 | 2,000 | 94 | 150 | 1.0 U | 1.0 U |
| ESB1120-3' * | 03/03/98 | 2.0 U | 5.1 U | 1.0 U | 5.1 U | 5.1 | 100 U | 1.0 U | 1.0 U |
| ESB1388-1' | 06/15/00 | 1.5 | 130 | 1.0 U | 130 | 95 | NA | 2.7 | 1.0 U |
| ESB1388-2' | 06/15/00 | 1.2 | 6.9 | 1.0 U | 5.2 U | 10 | NA | 1.0 U | 1.0 U |
| ESB1389-1' | 06/15/00 | 1.4 | 5.1 U | 1.0 U | 5.1 U | 7.5 | NA | 1.0 U | 4.1 |
| ESB1389-2' | 06/15/00 | 2.2 | 5.1 U | 1.0 U | 5.1 U | 5.2 | NA | 1.0 U | 2.3 |

**Notes:**
Borings were drilled horizontally through utility trench concrete wall. The sample depth is the horizontal distance from the concrete wall.
MTCA - Model Toxics Control Act
(A) - MTCA Method A soil cleanup level for unrestricted land use
(B) - MTCA Method B soil cleanup level
(B*) Revised 2001 MTCA Method B value from Ecology website CLARC tables downloaded June 2010 (https://fortress.wa.gov/ecy/clarc/reporting/CLARCReporting.aspx
1996 - Indicates MTCA soil cleanup levels, published 1996
2001 - Indicates MTCA version 3.1 soil cleanup levels, published 2001
NA - Not analyzed
NE - Not established
U - Compound was analyzed for but not detected above the reporting limit shown
* This sample was originally labelled ESB1119-3' when relinquished to the laboratory. The sample ID was corrected to match the appropriate project sample ID

**Table 12-2**
**Summary of Soil Sample Analytical Results for TPH and Non-halogenated SVOCs**
**Building 40-22**
**Boeing Everett Plant Remedial Investigation**

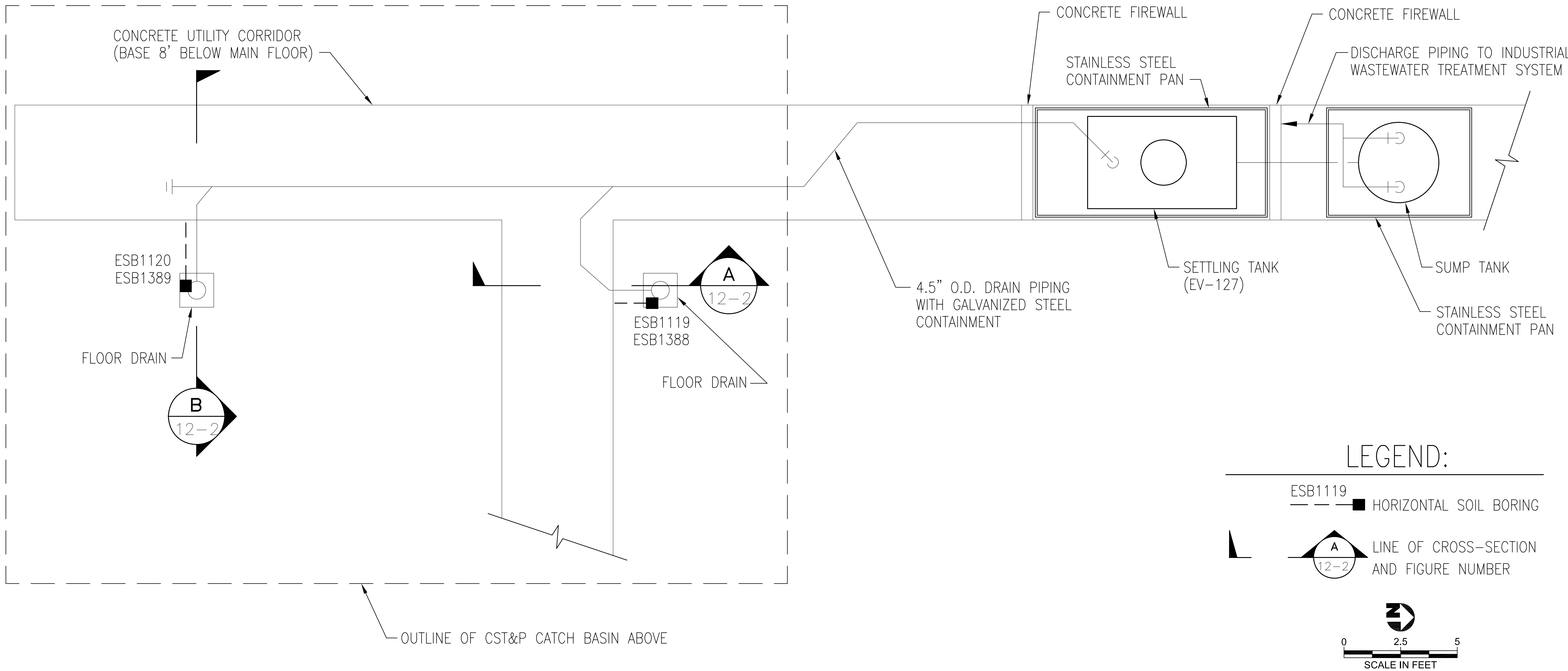
| Sample ID/Date | | Total Petroleum Hydrocarbons (mg/kg) | | Non-halogenated SVOCs |
|---|---|---|---|---|
| | | Diesel-Range | Gasoline-Range | |
| 1996 MTCA Method A Soil Cleanup Level | | 200 | 100 | - |
| 1996 MTCA Method B 100x GW Soil Cleanup Level | | NE | NE | - |
| 2001 MTCA Method A Soil Cleanup Level | | 2,000 | 30 / 100** | - |
| MTCA Method A Protection of Groundwater | | NC | 30 / 100** | - |
| ESB1119-2' | 03/03/98 | 5.0 U | 5.0 U | ND |
| ESB1120-3' * | 03/03/98 | 5.3 U | 5.0 U | ND |

**Notes:**
Borings were drilled horizontally through utility trench concrete wall. The sample depth is the horizontal distance from the concrete wall.
MTCA - Model Toxics Control Act
(A) - MTCA Method A soil cleanup level for unrestricted land use
(B) - MTCA Method B soil cleanup level
1996 - Indicates MTCA soil cleanup levels, published 1996.
2001 - Indicates MTCA version 3.1 soil cleanup levels, published 2001.
NC - Not calculated
ND - Not detected. None of the target compounds were detected at or above the reporting limit.
NE - Not established
U - Compound was analyzed for but not detected above the reporting limit shown.
* This sample was originally labelled ESB1119-3' when relinquished to the laboratory. The sample ID was corrected to match the appropriate project sample ID.
**gasoline mixtures with benzene/gasoline mixtures without benzene

**Table 12-3**
**Summary of Soil Sample Analytical Results for Metals, (mg/kg**
**Building 40-22**
**Boeing Everett Plant Remedial Investigatio**

| Sample ID/Date | | Arsenic | Barium | Cadmium | Chromium | Lead | Strontium | Zinc |
|---|---|---|---|---|---|---|---|---|
| 1996 MTCA Method A, AI, or B Soil Cleanup Level | | 1.67 (B) | 5,600 (B) | 80 (B) | 100 (A)<br>500 (AI) | 250 (A)<br>1,000 (AI) | 48,000 (B) | 24,000 (B) |
| MTCA Method B 100x GW Soil Cleanup Level | | 0.00583 | 112 | 1.6 | 1,600 ($Cr^{+3}$) | NE | 960 | 480 |
| 2001 MTCA Method A, AI, or B Soil Cleanup Level | | 20 (A)<br>0.667 (B) | 5,600 (B)<br>16,000 (B*) | 2 (A)<br>80 (B) | 2,000($Cr^{+3}$) / 19 ($Cr^{+6}$) (A)<br>120,000($Cr^{+3}$) / 240 ($Cr^{+6}$) (B) | 250 (A)<br>1,000 (AI) | 48,000 (B) | 24,000 (B) |
| MTCA Method A or B Protection of Groundwater | | 20 (A)<br>0.03 (B) | 2,637 (B) | 2 (A)<br>1.1 (B) | 2,000 ($Cr^{+3}$) / 19 ($Cr^{+6}$) (A)<br>480,096 ($Cr^{+3}$) / 18 ($Cr^{+6}$) (B) | 250 (A) | 38.4 (B) | 5,971 (B) |
| WA Department of Ecology - Puget Sound Background Concentration | | 7.30 | NE | 0.8 | 48.2 | 24.0 | NE | 85.1 |
| ESB1119-2' | 03/03/98 | **5.7** | 50.7 | 0.3 | **42.0** | 6 | 37.9 | 47.3 |
| ESB1120-3' * | 03/03/98 | **1.5** | 50.4 | 0.2 U | **34.4** | 2 | 30.5 | 30.4 |

**Notes:**
Borings were drilled horizontally through utility trench concrete wall. The sample depth is the horizontal distance from the concrete wall.
MTCA - Model Toxics Control Act
(A) - MTCA Method A soil cleanup level for unrestricted land use
(AI) - MTCA Method A soil cleanup level for industrial property
(B) MTCA Method B soil cleanup level
(B*) Revised 2001 MTCA Method B value from Ecology website CLARC tables downloaded June 2010 (https://fortress.wa.gov/ecy/clarc/reporting/CLARCReporting.aspx).
1996 - Indicates MTCA soil cleanup levels, published 1996.
2001 - Indicates MTCA version 3.1 soil cleanup levels, published 2001.
NE - Not established
Numbers in **bold** font indicate that the result reported exceeds the most current MTCA cleanup level as of June 2010.
Mercury, silver, and selenium were analyzed for, but not detected.
* This sample was originally labeled ESB1119-3' when relinquished to the laboratory. The sample ID was corrected to match the appropriate project sample ID.




Job No. 33761927

Figure 12-1

**BUILDING 40-22 CST&P (NO. 143) SOIL BORING LOCATIONS**

URS

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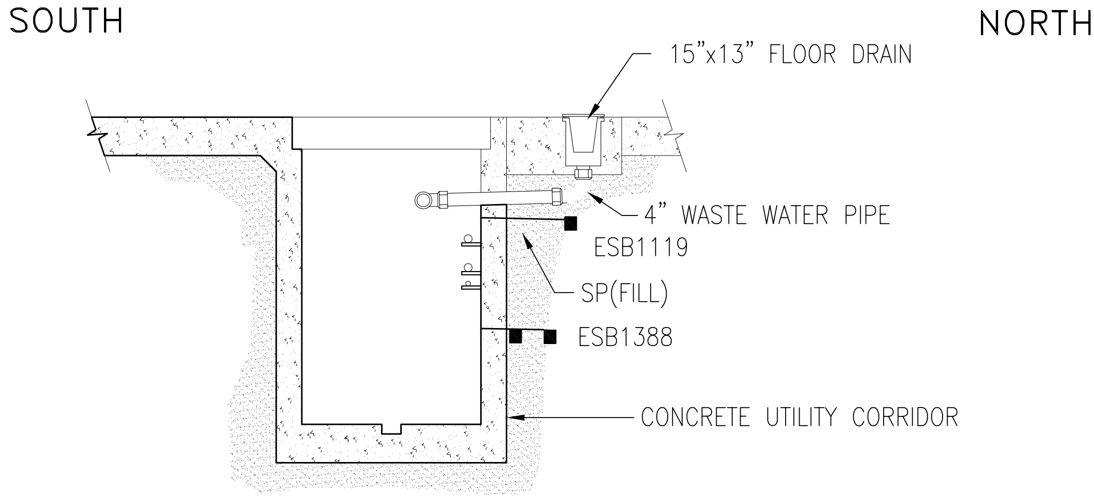
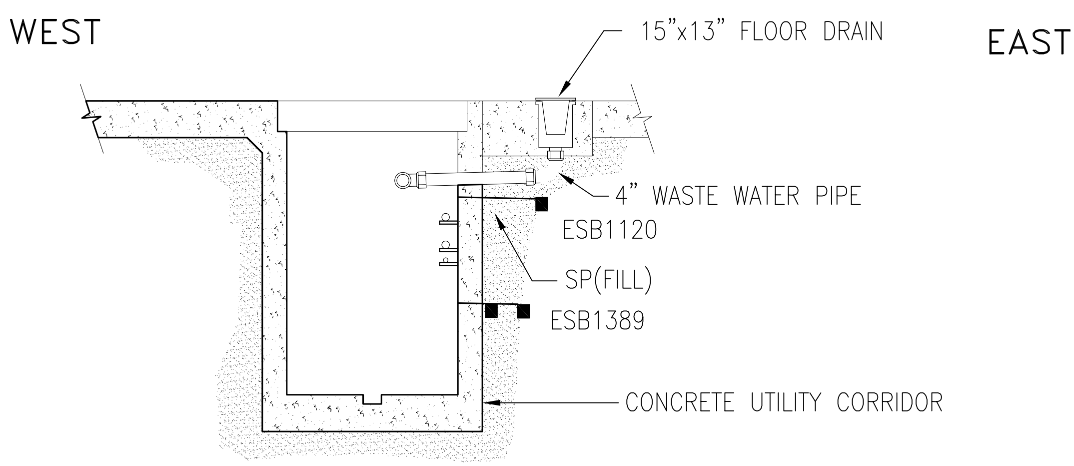
Boeing Commercial Airplanes, Everett Plant
REMEDIAL INVESTIGATION REPORT




UTILITY CORRIDOR AND
NORTH FLOOR DRAIN SECTION
A
12-1

0 5 10

SCALE IN FEET




UTILITY CORRIDOR AND
SOUTH FLOOR DRAIN SECTION
B
12-1

LEGEND:

■ SAMPLE SUBMITTED FOR ANALYSIS

ESB1119 HORIZONTAL SOIL BORING

CONCRETE

SP(FILL) = SAND AND GRAVEL

0 2.5 5

SCALE IN FEET

Job No. 33761927

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**Figure 12-2**
**BUILDING 40-22 CST&P (NO. 143)**
**CROSS SECTIONS A AND B**

Boeing Commercial Airplanes, Everett Plant
REMEDIAL INVESTIGATION REPORT

# 13.0 CONCRETE SLURRY PIT

Presented in this section are the results of the subsurface investigation of Attachment 7 SWMU/AOC No. 173 located approximately 700 feet northwest of Building 40-04 at the Everett Plant (Figure 1-2). The subsurface conditions, prior investigations, and description of this SWMU/AOC are presented in Section 15.0 of the RIWP. This investigation was performed in accordance with Section 15.3 of the RIWP.

The concrete slurry pit is bounded by undeveloped property to the north, south, and west. On the east, a Boeing frontage road (North Perimeter Road) separates the concrete slurry pit area from an asphalt-paved storage area. The concrete slurry pit consists of a trench, approximately 105 feet long and 15 feet wide. It is excavated into fill and native glacial till soil. The concrete slurry pit has been used for temporary storage of concrete slurry since 1991. In 1992 and 1993, paint was accidentally spilled into the pit. Approximately one hundred gallons of used roofing asphaltic emulsion was spilled in the pit in 1995. Consequently, potential dangerous constituents that may have been present in the concrete slurry pit include VOCs, TPH-G, TPH-D, TPH-O, and metals. In 1996, accumulated concrete slurry was removed and disposed of in a Subtitle D permitted landfill. In 1998, accumulated waste slurry was removed and disposed of in a demolition debris landfill. Observations during one removal of slurry from the pit indicate there is buried solidified slurry at the western and eastern ends of the pit area.

Polychlorinated biphenyls (PCBs, primarily Aroclor 1254) were subsequently detected in selected joint compound materials used on the South Complex Flightline (Flightline) and in several concrete samples collected from the Flightline (URS, 2000). Prior to discovery of PCBs in the joint compound material in 2000, concrete debris and slurry generated during maintenance activities on the Flightline, including joint sealant replacement, had been stored in the concrete slurry pit. In 2002, approximately 175 cubic yards (235 tons) of concrete debris and soil were excavated from the slurry pit and transported offsite to Arlington, Oregon for disposal at a Subtitle C landfill. The pit was subsequently (2002-2008) used for storing concrete slurry from areas where PCBs were not known to be present and was excavated again and backfilled in 2008. It is currently a flat, gravel covered area.

Previous investigation of soils exposed in the sidewalls of the pit was conducted after concrete slurry was removed in 1996. The results of this investigation indicate that VOCs, TPH-G, TPH-D, and 13 RCRA priority pollutant metals were not detected at concentrations above applicable MTCA cleanup levels. TPH-O was detected at concentrations above the 1996 MTCA Method A cleanup level (200 mg/kg) that was applicable at that time. Further details on SWMU/AOC No. 173 are presented in Section 15.0 of the RIWP.

## 13.1 PURPOSE AND SCOPE

The purpose of the investigation was to assess whether potential dangerous constituents are present in the glacial till or fill soil beneath the concrete slurry pit. The scope of investigation performed was in general accordance with Section 15.3 of the RIWP and included the following:

- Completed five test pits into the base of the concrete slurry pit to a depth of approximately 6 feet below the base of the pit (13 feet bgs) using a track-hoe
- Collected soil samples at prescribed depth intervals

- Field screened samples for organic vapors
- Submitted selected soil samples for analysis for VOCs, TPH-G, TPH-D, TPH-O and 13 RCRA priority pollutant metals

Deviations from the planned scope of investigation include collecting samples from two locations at each prescribed depth from five test pits rather than from three locations in four test pits as originally planned. This change was implemented to obtain samples that were more representative of the soils beneath the concrete slurry pit based on the actual configuration of the pit.

Following removal of debris and slurry from the pit in October 2002, Boeing personnel collected four soil samples from the floor and sidewalls of the slurry pit for PCB analysis. URS and Boeing personnel collected 10 samples from the floor and sidewalls of the pit for PCB analysis following removal of slurry from the pit in September –October 2008.

## 13.2 DOCUMENTATION OF DRILLING AND SAMPLING

On September 25, 1998, Dames & Moore monitored the excavation of five test pits (ESB1335 through ESB1339) across the floor of the concrete slurry pit as shown on Figure 13-1. The floor of the pit is approximately 7 feet bgs. The test pits were completed to a depth ranging from 12 to 13 feet bgs. Composite samples were collected from two locations in each test pit at each prescribed depth. Samples were retrieved from the test pits using the track-hoe bucket. The samples were collected from the center of the bucket and transferred to laboratory prepared glassware using a disposable plastic spoon. After sampling was completed, the excavations were backfilled with excavated soil. Sampling procedures utilized were in general accordance with the SAP presented in Appendix A of the RIWP.

On October 4 through 8, 2002, Boeing personnel monitored the excavation of concrete and soil debris from the slurry pit. Following the removal of the concrete and soil debris, Boeing personnel collected four surface soil samples (SPIT1 through SPIT4) from the floor and side walls of the slurry pit (Figure 13-1) for laboratory analysis for polychlorinated biphenyls (PCBs). The soil samples were collected from 0 to 0.5 feet below the surface of the excavation floor using a clean hand shovel and transferred to laboratory prepared glassware using dedicated, disposable soil scoops.

Slurry was excavated again from the pit in September 2008 and URS sampled soils from the floor (three samples) and sidewalls (six samples) of the excavation to analyze for PCBs in the exposed soil. Based on the initial results, additional excavation was completed surrounding one floor location (SP-Floor2) in October 2008 and a post-excavation sample was collected by Boeing and analyzed. The sample locations are shown on Figure 13-2.

## 13.3 FIELD OBSERVATIONS AND SAMPLE ANALYSIS RESULTS

Presented in this section are the field observations and sample results associated with test pits ESB1335 through ESB1339, and surface soil samples SPIT1 through SPIT4, SP-Wall1 through SP-Wall6, and SP-Floor1 through SP-Floor4. The location of test pits, soil samples, and a geologic cross section are shown on Figure 13-1. Geologic logs of the test pits are presented in Appendix L1. The chain of custody forms and analytical laboratory reports are presented in Appendix L2. Data validation reports are in Appendix L3. Analytical results are summarized in Tables 13-1 through 13-5.

### 13.3.1 Field Observations

The area investigated in 1998 is below the base of the approximately 7 feet deep concrete slurry pit. Fill soil consisting of concrete slurry, gravel, and silty sand with a trace of gravel was encountered to depths ranging from 7 to 11 feet bgs. Weathered glacial till consisting of very dense silty sand and sandy silt was encountered beneath the fill in the test pits to the maximum depth investigated of 13-1/2 feet bgs. Perched water was encountered in one test pit (ESB1335) at a depth of 10 feet bgs.

Staining or other visual indications of dangerous constituents were not observed. PID readings indicated organic vapors slightly elevated (9 to 175 ppmv) relative to background ambient levels in the soil samples screened. The soil at the base of the pit following removal of debris in October 2002 was a mixed silty-sand fill with gravel and debris, similar to previous observations. Groundwater was not observed during the excavation in 2002.

Figure 13-2 shows the location of the former Concrete Slurry Pit as measured with a GPS in 2008. The excavation measured approximately 103 feet long by 24 feet wide by 7 feet deep. In general, the western, eastern, and southern walls had an approximate slope of 1:1. The north wall was nearly vertical. Traces of solidified concrete slurry were evident on the north wall at the time of sampling. Groundwater was not observed during the excavation in 2008.

### 13.3.2 Sample Analysis Results

Soil samples from depths ranging from 8 feet to 13 feet bgs were submitted for analysis per the sample selection criteria specified on Figure A-3 in the SAP (Appendix A of the RIWP). Table 13-1 summarizes the results for VOCs. Table 13-2 summarizes the results for TPH-G, TPH-D, and TPH-O. Table 13-3 summarizes the results for metals. These tables also list the applicable MTCA Method A and B cleanup levels.

The analytical results indicate VOCs, TPH-G, and TPH-D were either not detected at concentrations above the method reporting limits, or were detected at concentrations below the applicable 2001 MTCA soil cleanup levels, including the most conservative preliminary soil cleanup levels protective of groundwater (Tables 13-1 and 13-2).

The analytical results indicate metals were either not detected at concentrations above the method reporting limits, or were detected at concentrations below the applicable MTCA soil cleanup levels, with the exception of arsenic, chromium, and antimony (Table 13-3). Arsenic (2.3 mg/kg to 5.4 mg/kg) was detected at concentrations exceeding the applicable MTCA Method B soil cleanup level of 0.667 mg/kg and the most conservative preliminary soil cleanup level protective of groundwater (0.03 mg/kg). However, all the detected concentrations are below the Puget Sound background concentration of 7.30 mg/kg (Ecology, 1994) and the MTCA Method A soil cleanup level protective of groundwater (20 mg/kg). Total chromium concentrations ranged from 32.8 mg/kg to 74.6 mg/kg and are below the MTCA Method A and B soil cleanup levels for trivalent chromium (2,000 mg/kg and 120,000 mg/kg, respectively) and Method B level for hexavalent chromium (240 mg/kg). These chromium concentrations are above the MTCA Method A level (19 mg/kg) and the most conservative preliminary soil cleanup level protective of groundwater (18 mg/kg) for hexavalent chromium. These total chromium concentrations are below the Puget Sound soil background level of 48.2 mg/kg except for one sample collected at 11 feet bgs from ESB1335 (54.4 mg/kg) and a sample from 8 feet bgs from ESB1338 (74.6 mg/kg). Chromium concentrations from deeper samples collected at 12 feet bgs at ESB1335 and 12 feet bgs at ESB1338 are below Puget Sound background.

Concentrations of antimony ranged from 5 mg/kg to 6 mg/kg, and for many samples in which antimony was not detected, the reporting limit was 6.0 mg/kg. The antimony concentrations, or the reporting limit, in nine of the 11 samples exceeded the most conservative preliminary soil cleanup level protective of groundwater (5.8 mg/kg) , but were below the MTCA Method B soil cleanup level protective of direct contact (32 mg/kg).

The surface soil samples collected in 2002 were analyzed for PCBs and the results are summarized in Table 13-4. PCBs (as Aroclor 1254) were detected in samples Spit1, Spit2 and Spit4 at concentrations ranging from 0.092 to 0.1 mg/kg, below the applicable MTCA Method A (1.0 mg/kg) and B (0.5 mg/kg) direct contact cleanup levels for PCBs (Table 13-4). These concentrations exceed the preliminary soil cleanup level protective of groundwater (0.0013 mg/kg) for Aroclor 1254 but do not exceed the most conservative preliminary soil cleanup level protective of groundwater for total PCBs (0.271 mg/kg). The preliminary soil cleanup level for protection of groundwater for Aroclor 1254 is below the practical quantitation limit for this PCB.

A summary of the 2008 analytical results for PCBs are presented in Table 13-5. PCBs (as Aroclor 1254) were detected in all samples except SP-Wall2, SP-Wall6, and SP-Floor3. All detected PCB concentrations were below the MTCA Method A (1.0 mg/kg) and B (0.5 mg/kg) soil cleanup levels for total PCBs for direct contact except in the duplicate sample from location SP-Floor2 (0.640 mg/kg). An additional 6 inches of the floor area was excavated at SP-Floor 2 to midway between locations SP-Floor1 and SP-Floor3 and an additional post-excavation sample SP-Floor 4 was collected. Total PCB and Arochlor1254 concentrations in sample SP-Floor4 did not exceed the applicable MTCA Method A and B soil cleanup levels for direct contact. Three of the samples of remaining soils (SP-Wall3, SP-Wall5, and SP- Floor4 had concentrations exceed the preliminary soil cleanup level protective of groundwater (0.0013 mg/kg) for Aroclor 1254 and the preliminary Method B soil cleanup level protective of groundwater for total PCBs (0.271 mg/kg); however these concentrations are below the preliminary Method A soil cleanup level protective of groundwater for total PCBs (0.618 mg/kg).

Evaluation of the vapor intrusion (VI) pathway for this SWMU/AOC is not recommended for the FS. Screening of the VI pathway was performed in this RI using Ecology's review draft *Guidance for Evaluating Soil Vapor Intrusion in Washington State: Investigation and Remedial Action*, dated October 2009 (VI guidance). Application of the Preliminary Assessment step of the VI guidance to this SWMU shows that four chemicals detected in soil beneath the SWMU (MEK, ethylbenzene, xylenes and TPH as diesel/heavy oil, Tables 13-1 and 13-2), are sufficiently volatile to be a potential VI source. However, these detections of volatile chemicals are not considered to be a potential source of VI because there are no buildings within 100 feet of the concrete slurry pit and:

- The maximum detection of TPH as diesel or heavy oil in soil (200 mg/kg) is well below the VI screening level for TPH-D (10,000 mg/kg, WAC 173-340-740[3][iii][C][II]).

- In accordance with WAC 173-340-740(3)(b)(iii)(C)(III), the concentrations of other volatile compounds are less than the protection of groundwater soil cleanup levels calculated based on the applicable MTCA Method A or Method B groundwater cleanup levels.

- The volatile chemical concentrations in the soil samples are at least an order of magnitude below the lowest soil screening level.

- PID readings taken during field sampling did indicate organic vapors only slightly elevated above background ambient levels in the soil samples.

## 13.4 CONCLUSIONS

The analytical results of soil samples from test pits excavated beneath the concrete slurry pit and post-excavation samples from the pit walls and floor after slurry removal in 2002 and 2008 indicate the presence of fill to a depth of up to 3 feet below the base of the pit (to 10 feet bgs). The fill is underlain by very dense weathered and non-weathered glacial till to the maximum depth investigated of 13-1/2 feet bgs. Perched water was encountered in one test pit (ESB1335) at a depth of 10 feet. The soil analytical results from this and the previous investigations (SECOR, 1996) indicate that potential dangerous constituents are not present in soils in the walls and below the floor of the concrete slurry pit, at concentrations above applicable 2001 MTCA soil cleanup levels and the former Concrete Slurry Pit is not recommended for evaluation in the FS. This conclusion is supported by:

- VOCs, TPH-G, TPH-D, and PCBs were either not detected above method reporting limits or were detected at concentrations well below the applicable MTCA Method A or B soil cleanup levels.

- With the exception of chromium at two locations, and antimony in most samples metals were either (1) not detected at concentrations above the reporting limits, or (2) detected at concentrations below an applicable MTCA Method A or B soil cleanup level, or (3) detected at concentrations below the Puget Sound background soil concentration.

- The measured concentrations of PCBs (Aroclor 1254) after final excavation in 2008 are all below the Method A and B soil cleanup levels for direct contact for total PCBs. The Aroclor 1254 concentrations of three samples exceed the preliminary soil cleanup level protective of groundwater (0.0013 mg/kg) for Aroclor 1254 and the Method B preliminary soil cleanup level protective of groundwater for total PCBs (0.271 mg/kg), but are less than the Method A preliminary soil cleanup level protective of groundwater for total PCBs (0.618 mg/kg) and the soil cleanup level protective of direct contact (1.6 mg/kg). The preliminary soil cleanup level for protection of groundwater for Aroclor 1254 is below the practical quantitation limit for this PCB.

Total chromium concentrations in 1998 samples are below the Puget Sound soil background level of 48.2 mg/kg except for one sample collected at 11 feet bgs from ESB1335 (54.4 mg/kg) and a sample from 8 feet bgs from ESB1338 (74.6 mg/kg). Chromium concentrations from samples collected from 12 feet bgs at ESB1335 and 12 feet bgs at ESB1338 were below Puget Sound background. Metals concentrations in adjacent borings were not elevated nor were any metals other than chromium in borings ESB1335 and 1338. Based on the lack of elevated concentrations of other metals or constituents analyzed for samples from this area, the soil containing slightly elevated chromium above background concentrations is interpreted to be of limited extent and not indicate of a release from the slurry pit.

Antimony was detected four of the 11 soil samples collected in 1998, with the concentrations in three of these samples exceeding the preliminary soil cleanup level protective of groundwater (5.8 mg/kg) but below the MTCA Method B soil cleanup level protective of direct contact (32 mg/kg). The reporting limit for six of the samples slightly exceeded the preliminary soil cleanup level protective of groundwater. The detected concentrations of antimony were only slightly above the reporting limit, and the reporting limit was only slightly above the preliminary cleanup level protective of groundwater. The measured antimony concentrations are not indicative of a release, but are more likely typical concentrations for native soil in the area and thus do not pose a risk to groundwater.

Based on the analytical results, no further investigation and remedial action are warranted in the concrete slurry pit area. Therefore this area is not recommended for inclusion in the FS.

## 13.5 REFERENCES

SECOR, 1996, Concrete Slurry Pit Soil Sample Project, Boeing Commercial Airplane Group Facility, Everett, Washington, August 23, 1996.

URS, 2000, PCB Sampling and Analysis Report, Joint Material, Concrete, and Sediment, South Complex, BCAG Everett Plant, Everett, Washington, September 1, 2000.

Washington State Department of Ecology, 1994, Natural Background Soil Metals in Washington State, Publication #94-115.

**Table 13-1**
**Summary of Soil Sample Analytical Results for Volatile Organic Compounds, (ug/kg)**
**Concrete Slurry Pit**
**Boeing Everett Plant Remedial Investigation**

| Sample ID/Date | | 2-Butanone | 4-Isopropyltoluene | Acetone | Ethylbenzene | Total Xylenes |
|---|---|---|---|---|---|---|
| 1996 MTCA Method B Soil Cleanup Level | | 48,000,000 | NE | 8,000,000 | 8,000,000 | 160,000,000 |
| 1996 MTCA Method B 100x GW Soil Cleanup Level | | 480,000 | NE | 80,000 | 80,000 | 1,600,000 |
| 2001 MTCA Method A or B Soil Cleanup Level | | 48,000,000 (B) | NE | 8,000,000 (B) | 6,000 (A)<br>8,000,000 (B) | 9,000 (A)<br>160,000,000 (B) |
| MTCA Method A or B Protection of Groundwater | | 19,200 (B) | NE | 3,211 (B) | 6,000 (A)<br>6,912 (B) | 9,000 (A)<br>14,630 (B) |
| ESB1335-11' * | 09/25/98 | 52 U | 23 | 78 | 78 | 540 |
| ESB1335-12' | 09/25/98 | 43 U | 8.5 U | 43 U | 8.6 | 75 |
| ESB1336-8' | 09/25/98 | 5.7 U | 1.1 U | 7.4 | 2.6 | 4.4 |
| ESB1336-13' | 09/25/98 | 5.9 U | 10 | 5.9 U | 1.2 U | 2.3 U |
| ESB1337-8' | 09/25/98 | 5.9 U | 1.2 U | 6.8 | 1.2 U | 2.3 U |
| ESB1337-12' | 09/25/98 | 6.1 | 1.2 J | 31 J | 1.2 U | 2.4 U |
| ESB1337-12' (DUP) | 09/25/98 | 5.8 U | 24 J | 5.8 UJ | 1.2 U | 2.3 U |
| ESB1338-8' | 09/25/98 | 5.7 U | 1.1 U | 5.7 U | 1.1 U | 2.3 U |
| ESB1338-12' | 09/25/98 | 5.6 U | 1.1 U | 5.6 U | 1.1 U | 2.2 U |
| ESB1339-8' | 09/25/98 | 5.4 U | 1.1 U | 5.4 U | 1.1 U | 2.2 U |
| ESB1339-12' | 09/25/98 | 5.9 U | 1.2 UJ | 5.9 U | 1.2 U | 2.4 U |

**Notes:**
MTCA - Model Toxics Control Act
(A) - MTCA Method A soil cleanup level for unrestricted land use
(B) - MTCA Method B soil cleanup level
1996 - Indicates MTCA soil cleanup levels, published 1996.
2001 - Indicates MTCA version 3.1 soil cleanup levels, published 2001.
(DUP) - Field duplicate
NE - Not established
J - Estimated value
U - Compound was analyzed for but not detected above the reporting limit shown.
UJ - Compound was analyzed for but not detected above the reporting limit shown.  Reporting limit is an estimated value.
* Sample was reported as collected at a depth of 10 feet below ground surface on the test pit log.

**Table 13-2**
**Summary of Soil Sample Analytical Results for TPH, (mg/kg)**
**Concrete Slurry Pit**
**Boeing Everett Plant Remedial Investigation**

| Sample ID/Date | | Total Petroleum Hydrocarbons | | |
|---|---|---|---|---|
| | | Diesel-Range | Gasoline-Range | Motor Oil-Range |
| 1996 MTCA Method A Soil Cleanup Level | | 200 | 100 | 200 |
| 1996 MTCA Method B 100x GW Soil Cleanup Level | | NE | NE | NE |
| 2001 MTCA Method A Soil Cleanup Level | | 2,000 | 30 / 100**** | 2,000 |
| MTCA Method A Protection of Groundwater | | NC | 30 / 100**** | NC |
| ESB1335-11' * | 09/25/98 | 170 | 6.2 U | 260 |
| ESB1335-12' | 09/25/98 | 44 J | 5.4 U | 70 J |
| ESB1336-8' | 09/25/98 | 27** | 5.7 U | 69** |
| ESB1336-13' | 09/25/98 | 41** | 5.8 U | 72** |
| ESB1337-8' | 09/25/98 | 41** | 5.8 U | 110** |
| ESB1337-12' | 09/25/98 | 43 J*** | 5.7 U | 120 |
| ESB1337-12' (DUP) | 09/25/98 | 52 J*** | 5.8 U | 200 |
| ESB1338-8' | 09/25/98 | 25*** | 5.7 U | 100 |
| ESB1338-12' | 09/25/98 | 32*** | 5.7 U | 83 |
| ESB1339-8' | 09/25/98 | 38*** | 5.6 U | 120 |
| ESB1339-12' | 09/25/98 | 31*** | 5.7 U | 79 |

**Notes:**
MTCA - Model Toxics Control Act
(A) - MTCA Method A soil cleanup level for unrestricted land use
(B) - MTCA Method B soil cleanup level
1996 - Indicates MTCA soil cleanup levels, published 1996.
2001 - Indicates MTCA version 3.1 soil cleanup levels, published 2001.
(DUP) - Field duplicate
NC - Not calculated
NE - Not established
J - Estimated value
U - Compound was analyzed for but not detected above the reporting limit shown.
* Sample was reported as collected at depth of 10 feet based on the test pit log.
** Pattern profile does not match typical diesel or motor oil pattern.
*** Pattern profile indicative of motor oil-range hydrocarbon.
****gasoline mixtures with benzene/gasoline mixtures without benzene.

**Table 13-3**
**Summary of Soil Sample Analytical Results for Metals, (mg/kg)**
**Concrete Slurry Pit**
**Boeing Everett Plant Remedial Investigation**

| Sample ID/Date | | Antimony | Arsenic | Barium | Beryllium | Cadmium | Chromium | Copper | Lead | Mercury | Nickel | Zinc |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1996 MTCA Method A, AI, or B Soil Cleanup Level | | NE | 1.67 (B) | 5,600 (B) | 0.233 (B) | 80 (B) | 100 (A)<br>500 (AI) | 2,960 (B) | 250 (A)<br>1,000 (AI) | 24.0 (B) | 1,600 (B) | 24,000 (B) |
| 1996 MTCA Method B 100x GW Soil Cleanup Level | | NE | 0.00583 | 112 | 0.0002033 | 1.6 | 1,600 ($Cr^{+3}$) | 59.2 | NE | 0.48 | 32.0 | 480 |
| 2001 MTCA Method A, AI, or B Soil Cleanup Level | | 32 (B) | 20 (A)<br>0.667 (B) | 5,600 (B)<br>16,000 (B*) | 160 (B) | 2 (A)<br>80 (B) | 2,000($Cr^{+3}$) / 19 ($Cr^{+6}$) (A)<br>120,000($Cr^{+3}$) / 240 ($Cr^{+6}$) (B) | 2,960 (B) | 250 (A)<br>1,000 (AI) | 2 (A)<br>24 (B) | 1,600 (B) | 24,000 (B) |
| MTCA Method A or B Protection of Groundwater | | 5.8 (B) | 20 (A)<br>0.03 (B) | 2,637 (B) | 506 (B) | 2 (A)<br>1.1 (B) | 2,000 ($Cr^{+3}$) / 19 ($Cr^{+6}$) (A)<br>480,096 ($Cr^{+3}$) / 18 ($Cr^{+6}$) (B) | 263 (B) | 250 (A) | 2 (A)<br>5.02 (B) | 417 (B) | 5,971 (B) |
| WA Department of Ecology - Puget Sound Background Concentration | | NE | 7.30 | NE | 0.61 | 0.8 | 48.2 | 36.4 | 24.0 | 0.07 | 47.8 | 85.1 |
| ESB1335-11' * | 09/25/98 | 6 U | **4.0** | 113 | 0.2 | 0.7 | **54.4** | 28.6 J | 76 | 0.06 U | 46 | 59.2 |
| ESB1335-12' | 09/25/98 | 5 U | **2.3** | 79.5 | 0.2 | 0.2 U | **34.8** | 16.6 J | 2 | 0.05 U | 46 | 35.0 |
| ESB1336-8' | 09/25/98 | 6 U | **3.3** | 71.2 | 0.2 | 0.3 | **43.8** | 18.6 J | 4 | 0.05 U | 50 | 38.2 |
| ESB1336-13' | 09/25/98 | 6 U | **3.2** | 60.2 | 0.2 | 0.2 U | **32.8** | 15.9 J | 3 | 0.05 U | 51 | 34.5 |
| ESB1337-8' | 09/25/98 | 6 U | **3.0** | 74.3 | 0.2 | 0.2 U | **39.1** | 16.7 J | 6 | 0.06 U | 53 | 38.6 |
| ESB1337-12' | 09/25/98 | 6 | **3.0** | 65.6 | 0.2 | 0.3 | **38.8** | 18.7 J | 5 | 0.05 U | 53 | 39.7 |
| ESB1337-12' (DUP) | 09/25/98 | 6 U | **3.2** | 68.6 | 0.2 | 0.3 | **36.9** | 15.7 J | 6 | 0.05 | 45 | 38.5 |
| ESB1338-8' | 09/25/98 | 6 | **3.0** | 68.4 | 0.2 | 0.3 | **74.6** | 18.6 J | 20 | 0.05 U | 54 | 38.0 |
| ESB1338-12' | 09/25/98 | 6 | **3.1** | 60.7 | 0.2 | 0.2 | **37.1** | 16.1 J | 5 | 0.06 U | 49 | 36.9 |
| ESB1339-8' | 09/25/98 | 6 U | **3.6** | 58.4 | 0.2 | 0.2 U | **35.3** | 18.8 J | 39 | 0.05 U | 61 | 36.8 |
| ESB1339-12' | 09/25/98 | 5 | **5.4** | 64.1 | 0.2 | 0.2 U | **35.5** | 15.5 J | 44 | 0.06 U | 48 | 35.6 |

**Notes:**
MTCA - Model Toxics Control Act
(A) - MTCA Method A soil cleanup level for unrestricted land use
(AI) - MTCA Method A soil cleanup level for industrial property
(B) - MTCA Method B soil cleanup level
(B*) Revised 2001 MTCA Method B value from Ecology website CLARC tables downloaded June 2010 (https://fortress.wa.gov/ecy/clarc/reporting/CLARCReporting.aspx).
1996 - Indicates MTCA soil cleanup levels, published 1996.
2001 - Indicates MTCA version 3.1 soil cleanup levels, published 2001.
(DUP) - Field duplicate
NE - Not established
J - Estimated value
U - Compound was analyzed for but not detected above the reporting limit shown.
Samples were analyzed for selenium, silver, and thallium, but these were not detected in any of the samples.
* Sample was reported as collected at depth of 10 feet based on the test pit log.
Numbers in **bold** font indicate that the result reported exceeds the most current MTCA cleanup level as of June 2010.
Numbers in grey shading indicate results that exceed a MTCA protection of groundwater level, but do not exceed the current lowest MTCA soil cleanup level protective of direct contact.

**Table 13-4**
**Summary of 2002 Soil Sample Analytical Results for PCBs, (mg/kg)**
**Concrete Slurry Pit**
**Boeing Everett Plant Remedial Investigation**

| Sample ID/Date | | Aroclor 1016 | Aroclor 1242 | Aroclor 1248 | Aroclor 1254 | Aroclor 1260 | Aroclor 1221 | Aroclor 1232 | Total PCBs |
|---|---|---|---|---|---|---|---|---|---|
| Spit1 | 10/04/02 | 0.036 U | 0.036 U | 0.036 U | 0.097 | 0.036 U | 0.071 U | 0.036 U | 0.097 |
| Spit2 | 10/04/02 | 0.040 U | 0.040 U | 0.040 U | 0.100 | 0.040 U | 0.079 U | 0.040 U | 0.100 |
| Spit3 | 10/07/02 | 0.036 U | 0.036 U | 0.036 U | 0.036 U | 0.036 U | 0.072 U | 0.036 U | NA |
| Spit4 | 10/07/02 | 0.038 U | 0.038 U | 0.038 U | 0.092 | 0.038 U | 0.075 U | 0.038 U | 0.092 |
| 2001 MTCA Method A or B Soil Cleanup Level | | 5.6 (B) | NE | NE | 1.6 (B) | NE | NE | NE | 1 (A)<br>10 (AI) 0.5<br>(B*) |
| MTCA Method A or B Protection of Groundwater | | 2.408 (B) | NE | NE | 0.0013 (B) | NE | NE | NE | 0.618 (A)<br>0.271 (B) |

<u>**Notes:**</u>
MTCA - Model Toxics Control Act
(A) - MTCA Method A soil cleanup level for unrestricted land use
(AI) - MTCA Method A soil cleanup level for industrial property
(B) - MTCA Method B soil cleanup level
(B*) Revised 2001 MTCA Method B value from Ecology website CLARC tables downloaded June 2010 (https://fortress.wa.gov/ecy/clarc/reporting/CLARCReporting.aspx).
2001 - Indicates MTCA version 3.1 soil cleanup levels, published 2001.
NA - Not Applicable
NE - Not Established
U - Sample was analyzed for, but not detected above the reporting limit shown.
All samples were collected from 0-0.5 feet below ground surface.
Numbers in grey shading indicate results that exceed a MTCA protection of groundwater level, but do not exceed the current lowest MTCA soil cleanup level protective of direct contact.

**Table 13-5**
**Summary of 2008 Soil Analytical Results for PCBs, (mg/kg)**
**Concrete Slurry Pit**
**Boeing Everett Plant Remedial Investigation**

| Sample ID: | MTCA Method A or B | | SP-Wall1 | SP-Wall2 | SP-Wall3 | SP-Wall4 | SP-Wall5 | SP-Wall6 | SP-Floor1 | SP-Floor2 [1] | | SP-Floor3 | SP-Floor4 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample Date: | Protection of Groundwater | 2001 Soil Cleanup Level | 9/16/2008 | 9/16/2008 | 9/16/2008 | 9/16/2008 | 9/16/2008 | 9/16/2008 | 9/16/2008 | 9/16/2008 | | 9/16/2008 | 10/30/2008 |
| Field QC: | | | | | | | | | | | (DUP) | | |
| **PCBs (ug/kg)** | | | | | | | | | | | | | |
| Aroclor 1016 | 2.408 (B) | 5.6 | 0.031 U | 0.030 U | 0.098 U | 0.030 U | 0.041 U | 0.030 U | 0.031 U | 0.097 U | 0.120 U | 0.031 U | 0.033 U |
| Aroclor 1242 | NE | NE | 0.031 U | 0.030 U | 0.098 U | 0.030 U | 0.041 U | 0.030 U | 0.031 U | 0.097 U | 0.120 U | 0.031 U | 0.033 U |
| Aroclor 1248 | NE | NE | 0.031 U | 0.030 U | 0.098 U | 0.030 U | 0.041 U | 0.030 U | 0.031 U | 0.097 U | 0.120 U | 0.031 U | 0.033 U |
| Aroclor 1254 | 0.0013 (B) | 1.6 | 0.170 | 0.030 U | 0.400 | 0.160 | 0.350 | 0.030 U | 0.210 | 0.390 | 0.640 | 0.031 U | 0.290 |
| Aroclor 1260 | NE | NE | 0.031 U | 0.030 U | 0.098 U | 0.030 U | 0.061 UJ | 0.030 U | 0.039 UJ | 0.097 U | 0.120 U | 0.031 U | 0.049 UJ |
| Aroclor 1221 | NE | NE | 0.031 U | 0.030 U | 0.098 U | 0.030 U | 0.041 U | 0.030 U | 0.031 U | 0.097 U | 0.120 U | 0.031 U | 0.033 U |
| Aroclor 1232 | NE | NE | 0.031 U | 0.030 U | 0.098 U | 0.030 U | 0.041 U | 0.030 U | 0.031 U | 0.097 U | 0.120 U | 0.031 U | 0.033 U |
| Total PCBs | 0.618 (A)<br>0.271 (B) | 10 (AI)<br>1.0 (A) 0.5 (B*) | 0.170 | NA | 0.400 | 0.160 | 0.350 | NA | 0.210 | 0.390 | **0.640** | NA | 0.290 |

**Notes:**

MTCA - Model Toxics Control Act
(A) - MTCA Method A soil cleanup level for unrestricted land use
(AI) - MTCA Method A soil cleanup level for industrial property
(B) - MTCA Method B soil cleanup level
(B*) Revised 2001 MTCA Method B value from Ecology website CLARC tables downloaded June 2010 (https://fortress.wa.gov/ecy/clarc/reporting/CLARCReporting.aspx).
2001 - Indicates MTCA version 3.1 soil cleanup levels, published 2001.
DUP - Field duplicate
U - Compound was analyzed for but not detected above the reporting limit shown.
UJ - Compound was analyzed for but not detected above the reporting limit shown. The reporting limit is an estimated concentration.
NA - Not applicable
NE - Not established
PCBs - Polychlorinated biphenyls
Numbers in **bold** font indicate that the result reported exceeds the most current MTCA cleanup level as of June 2010.
Numbers in grey shading indicate results and reporting limits that exceed a MTCA protection of groundwater level, but do not exceed the current lowest MTCA soil cleanup level protective of direct contact.
1 = Additional soil was excavated at this location after receipt of data and sample SP-Floor4 was collected

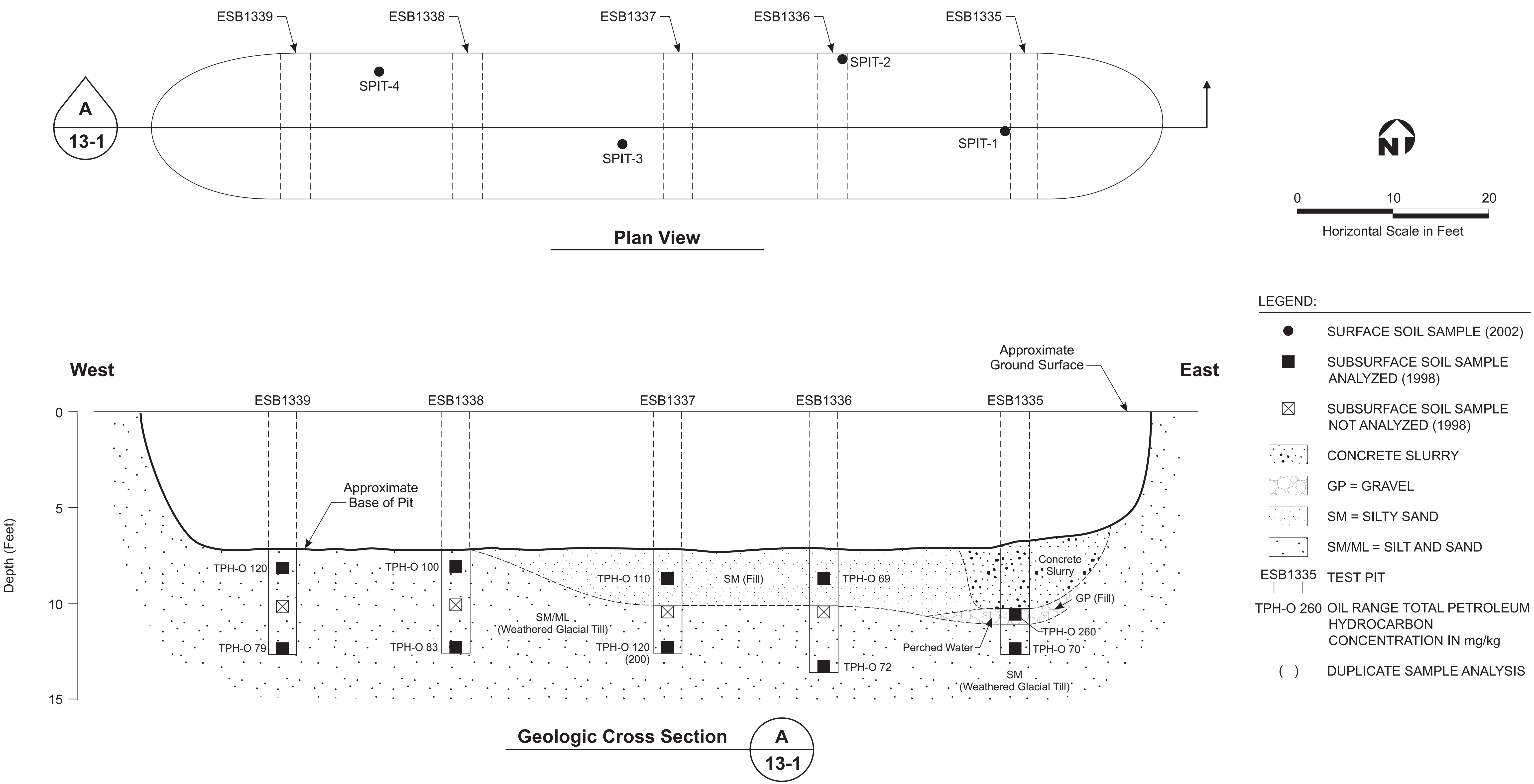
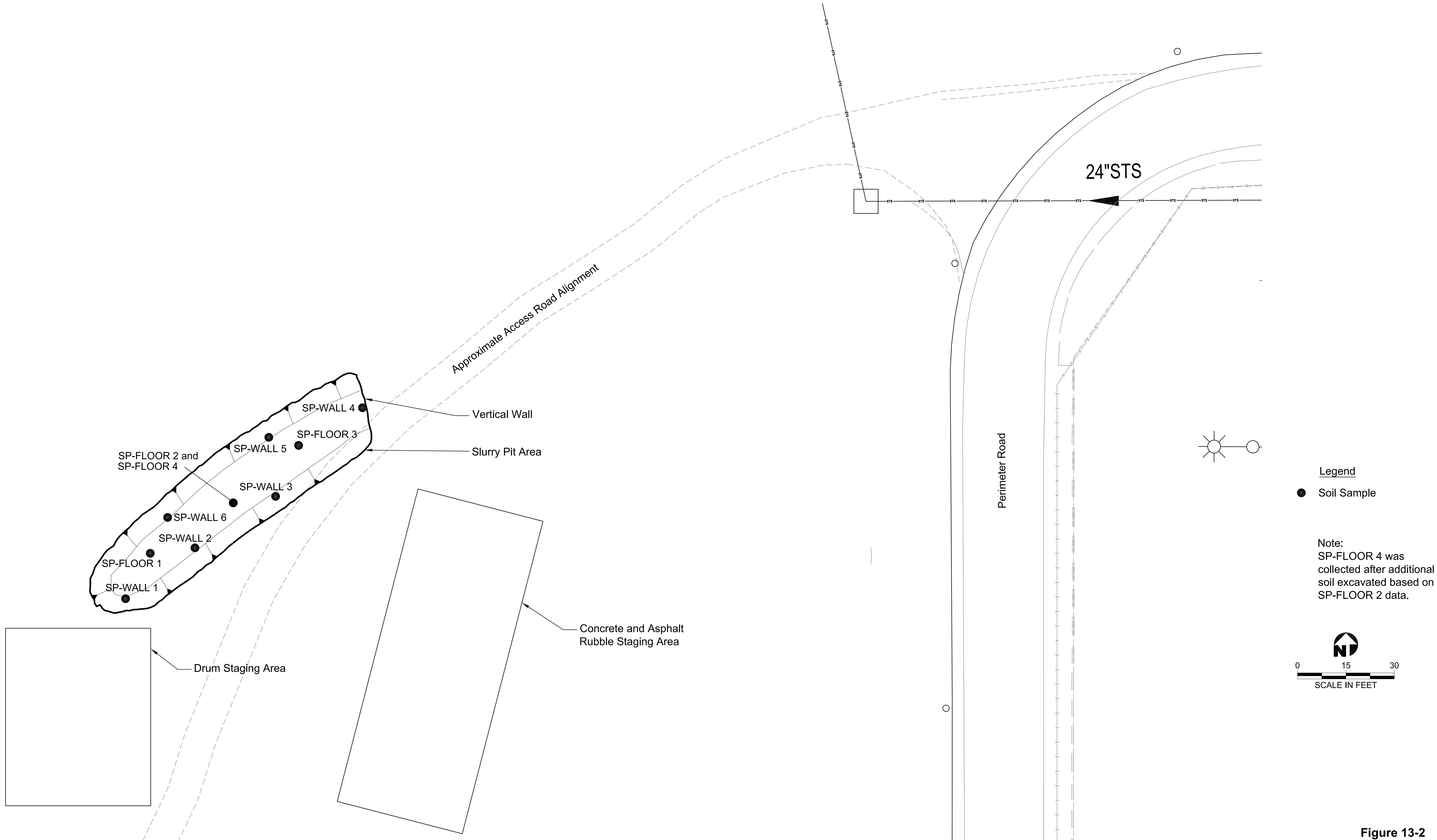



**Figure 13-1**
**FORMER CONCRETE SLURRY PIT**
**1998 & 2002 SAMPLE LOCATIONS AND CROSS SECTION**

Job No. 33761927

URS




Q:\geo\Boeing\Everett\RI\2010\Fig 13-2 Fmr Slurry Pit.dwg
Mod: 12/13/2010, 14:31 | Plotted: 12/13/2010, 14:52 | john_knobbs

URS

**Figure 13-2**
**Former Concrete Slurry Pit**
**2008 Soil Sampling Locations**

Boeing Commercial Airplanes, Everett Plant
REMEDIAL INVESTIGASTION REPORT

## 14.0 ESPERANCE SAND GROUNDWATER

Presented in this section are the results of the installation of two monitoring wells into groundwater in the Esperance Sand aquifer present beneath the upland portion of the Everett Plant and the hydraulic properties of the aquifer. The subsurface conditions, prior investigations, and description of this SWMU/AOC are presented in Section 16.0 of the RIWP. This investigation was performed in accordance with Section 16.0 of the RIWP. Additional investigation of the Esperance Sand aquifer has been conducted beneath Powder Mill Gulch at the northern end of the Everett Facility. The results of the Powder Mill Gulch investigation are provided separately in Section 21 of this report.

The hydrogeologic setting of the site is presented in Section 2.0 of the RIWP and summarized in Section 1.2 of this report. As described therein, the site is located on the northern portion of the Intercity Plateau. The two principal hydrogeologic units beneath the site are the Vashon till (glacial till) and the underlying Esperance Sand (Vashon advance outwash of the U.S. Geological Survey (USGS), 1997). The Vashon till is generally non-water-bearing and is a confining unit (aquitard) of the underlying Esperance Sand aquifer that restricts downward movement of ground water into the aquifer. Vashon till can yield usable amounts of water from thin, discontinuous layers of sand and gravel. However, no sand and gravel lenses with usable amounts of water were encountered during this investigation in the Vashon till underlying the Everett Plant.

Based on regional information, the groundwater flow in the Esperance Sand is to the northwest toward Port Gardner Bay in Possession Sound (Figure 14-1). There is limited use of Esperance Sand groundwater within a one-mile radius of the Everett Plant. Known wells are shown on Figure 14-2, and a summary of pertinent information on these wells is presented in Table 14-1. Only one well (28/4-3C on Figure 14-2) is located downgradient from the plant. This well is reported to be a municipal well on its Washington State Water Well Report, but has been determined to be a private domestic well. Other wells in the vicinity are reportedly for domestic, irrigation, industrial, cathodic protection, and resource protection use (Figure 14-2). A follow-up search to identify wells located downgradient of the Everett Plant was conducted in June 2004. No additional wells were identified in the Ecology database; however, during a drive-by reconnaissance to locate well 28/4-3C, a well was located at 1531 3rd Street downslope of well 28/4-3C. Based on geologic mapping and visual observation in the area, there is only minor saturated thickness of the Esperance Sand, if any, at the well location and it is unlikely the well is completed in the Esperance Sand. Boeing was subsequently notified by the owner of this well that the well was not in use. The current status (active, inactive, abandoned, etc.) and pumping rate of wells not located on Boeing's property is uncertain. None of these wells has pumping rates indicated on the well reports and this information is not publicly available.

Prior to initiating the RI, groundwater monitoring was conducted from one existing monitoring well (EGW040) by Boeing personnel on a quarterly or semiannual basis since the well was installed in February 1995. This monitoring included measuring groundwater elevation, and collecting and analyzing groundwater samples for VOCs completed in the Esperance Sand. VOCs were not detected in groundwater samples from this well, located near Building 40-56 (Figure 14-3), with one exception. In May 1997, vinyl chloride was detected at a very low concentration of 0.015 μg/L (see Table 16-8 in Section 16). However, vinyl chloride was not detected in subsequent samples collected and analyzed in 1997 and 1998 (Dames & Moore, 1999), nor in subsequent groundwater monitoring samples collected from this well.

## 14.1 PURPOSE AND SCOPE

The purpose of the investigation was to install two monitoring wells in order to obtain additional information regarding physical characteristics, groundwater quality, elevations, and flow direction in the Esperance Sand aquifer. One well (EGW060) is located near the west boundary of Boeing Lake and one (EGW061) is adjacent to Building 40-37 in the southeast corner of the north complex of the Everett Plant (Figure 14-3). Since installation, these wells have been included in the groundwater monitoring program. The scope of investigation performed was in general accordance with Section 16.0 of the RIWP and included the following:

- Installed two monitoring wells (EGW060 and EGW061) to depths of 234 feet bgs and 219 feet bgs, respectively, using a truck-mounted air-rotary drilling rig
- Collected soil samples at prescribed depth intervals
- Field screened samples for organic vapors
- Submitted selected soil samples for physical testing
- Installed dedicated pumps
- Collected and analyzed groundwater samples from the two new and one existing (EGW040) Esperance Sand wells on a quarterly basis
- Modified the surface monument for EGW040

There were no deviations from the planned scope of this portion of the investigation.

## 14.2 DOCUMENTATION OF DRILLING AND SAMPLING

Dames & Moore monitored the installation of monitoring well EGW060 near Boeing Lake between October 5 and October 14, 1998, and monitoring well EGW061 near Building 40-37 between October 20 and October 22, 1998. The locations of these wells are shown on Figure 14-3. The existing ground surface elevations at the well locations are approximately 566 feet MSL at EGW060 and 547 feet MSL at EGW061. The monitoring wells were completed to depths of 234 feet bgs and 219 feet bgs, respectively. Soil samples were retrieved at selected depths using a Dames & Moore U-type sampler fitted with stainless steel rings. Grab samples of the soil cuttings were also collected periodically for visual inspection and description of the soil characteristics. Drilling and well installation techniques, and sampling procedures utilized were in general accordance with the SAP presented in Appendix A of the RIWP.

## 14.3 FIELD OBSERVATIONS

Presented in this section are the field observations of subsurface soils and groundwater occurrence during the installation of monitoring wells EGW060 and EGW061. Geologic logs of the soil borings and well construction details are presented in Appendix M1. Groundwater elevation contours for the Esperance Sand groundwater beneath the upland portion of the Everett Plant for October 2009 and April 2010 are shown on Figures 14-3 and 14-4. These contour maps include elevation data from several additional Esperance Sand monitoring wells installed near Building 40-02 (Section 6.5) and at the head of Powder Mill Gulch (Section 21). Additional groundwater contour maps for Esperance Sand groundwater within the Powder Mill Gulch area are shown and discussed in Section 21. Regional hydrogeologic cross section locations are shown on Figure 14-2. Hydrogeologic cross sections incorporating borings EGW060 and EGW061 are shown on Figures 14-5 and 14-6, respectively.

The soil encountered directly beneath the asphalt parking surface and base coarse fill in both well borings was weathered glacial till consisting of silty sand with gravel, to a depth of approximately 5 feet bgs. At 5 feet bgs, the till graded to unweathered, silty fine sand with trace to some gravel. The till graded to gravelly silty sand near the base of this unit. The Esperance Sand was encountered in boring EGW060 at approximately 147 feet bgs (Figure 14-6), and in boring EGW061 at approximately 130 feet bgs (Figure 14-5). The Esperance Sand consisted primarily of medium brown sand, with occasional lenses of silt and gravel. Staining or other visual indications of dangerous constituents were not observed. PID readings did not indicate organic vapors above ambient background levels in the soil samples screened.

Groundwater was first encountered in boring EGW060 at a depth of approximately 216 feet bgs in the Esperance Sand. Subsequent water level measurements during well development and in November 1998 did not detect an appreciable rise in the groundwater level and indicate that the Esperance Sand groundwater is unconfined at this location. The well was completed with the screened section from a depth of 203 feet to 233 feet bgs. The well was developed and sampled during the fourth quarter of 1998 groundwater monitoring event. The groundwater elevation was measured at 350.32 feet MSL (215.73 feet bgs) on November 17, 1998.

Groundwater was first encountered in boring EGW061 at a depth of approximately 55 feet bgs in the glacial till. The groundwater occurrence appeared to be perched groundwater existing within a gravelly layer within the glacial till. Saturated conditions were not encountered in the glacial till below approximately 75 feet bgs. The actual saturated thickness of this perched zone is uncertain because the driller had introduced water into the borehole in order to facilitate recovery of the soil cuttings. Groundwater was encountered in the Esperance Sand at a depth of 198 feet bgs. Subsequent water level measurements during well development and in November 1998 did not detect an appreciable rise in the groundwater level and indicate that the Esperance Sand groundwater is unconfined. The well was completed with the screened section from a depth of 189 feet to 219 feet bgs. The well was developed and sampled during the fourth quarter of 1998 groundwater monitoring event. The groundwater elevation was measured at 345.64 feet MSL (201.34 feet bgs) on November 17, 1998.

## 14.4 GROUNDWATER ANALYSIS RESULTS

Groundwater samples collected from monitoring wells EGW060 and EGW061 on November 17, 1998 were analyzed for VOCs, TPH, total dissolved solids (TDS), total organic carbon (TOC), and total and dissolved RCRA (eight) metals. In addition, a groundwater sample collected from well EGW040 on November 9, 1998, was analyzed for VOCs. Since 1999, all the Esperance groundwater samples have been analyzed for RCRA (8) metals, strontium, zinc, PCBs, phosphate compounds, PAHs, and TPH. In May 2005, metals analyses were reduced to total and dissolved arsenic and lead. Chain-of-custody forms and analytical laboratory reports for the 1998 samples are presented in Appendix M2. Data validation reports for the 1998 samples are in Appendix M3. Subsequent laboratory analytical data reports have been submitted to Ecology separate from this report. Analytical results from 1998 through April 2010 are summarized in Tables 14-2 and 14-3 and discussed below.

The analytical results indicate that VOCs, TPH, PAHs, and PCBs were not detected at concentrations above the method reporting limits in any of the samples or are well below the applicable MTCA Method A or B groundwater cleanup levels (Table 14-2). The TOC results from 1998 indicate TOC was below method reporting limits. Total and dissolved RCRA and other metals were either not detected above method reporting limits or were detected at or below applicable MTCA groundwater cleanup levels, except for: (1) total and dissolved arsenic in all the samples and (2) total chromium in the initial EGW060 sample and the two initial EGW061 samples and the EGW040 sample collected during the 3rd quarter 2002 (Table 14-3).

Total and dissolved arsenic concentrations in sample EGW061 range from 0.007 mg/L to 0.012 mg/L and are above the applicable MTCA Method A cleanup level of 0.005 mg/L and also above the applicable MTCA Method B cleanup level of 0.0000583 mg/L. Total and dissolved arsenic concentrations in groundwater samples from EGW040 and EGW060 have ranged from 0.002 mg/L to 0.006 mg/L. These values are equal to or below the applicable MTCA Method A cleanup level, except for the concentration in one sample collected from EGW060 in October of 2006. However, these concentrations are also above the applicable MTCA Method B cleanup level. November 1998 total chromium concentrations in EGW060 and EGW061 (0.157 mg/L and 0.086 mg/L, respectively), the February 1999 total chromium concentration in EGW061 sample (0.088 mg/L), and the August 2002 total chromium concentration in EGW040 (0.078 mg/L) are above the applicable MTCA Method A cleanup level of 0.05 mg/L and the applicable MTCA Method B cleanup level for hexavalent chromium (0.048 mg/L). These concentrations are below the applicable MTCA Method B cleanup level for trivalent chromium. Dissolved chromium concentrations in these three samples, as well as total and dissolved concentrations in all subsequent samples from the three Esperance Sand wells, are less than the applicable MTCA Method A and Method B cleanup levels.

Tributyl phosphate (TBP) and/or dibutyl phenyl phosphate (DPP) have occasionally been detected at low concentrations in groundwater samples from wells EGW060 and EGW061 (Table 14-2). Neither of these wells is located near or downgradient of an area where phosphate-based hydraulic fluid is or has been used in the facility's operations. Based on the available data, it is likely that these compounds are associated with carryover in the laboratory preparation of samples from Building 40-24 that contain elevated TBP and DPP concentrations. Boeing and ARI modified the sampling and sample preparation protocol to minimize the potential for this to occur in the future.

TDS concentrations for EGW040, EGW060, and EGW061 were 120 mg/L, 160 mg/L, and 130 mg/L, respectively. The TDS concentrations are well below the Secondary Drinking Water Standard recommended level of 500 mg/L (WAC 173-200) and are consistent with regional concentrations. The median TDS concentration for groundwater in western Snohomish County is 133 mg/L and groundwater from other wells in the northern portion of the Intercity Plateau have TDS concentrations of between 100 mg/L and 299 mg/L (USGS, 1997).

## 14.5 GROUNDWATER FLOW AND HYDRAULIC PROPERTIES

The Vashon till and Esperance Sand geologic units (Figures 14-5 and 14-6) were encountered in the two new monitoring well borings and were consistent with previous interpretations of the subsurface geology at the site and in the region (USGS, 1997). As previously noted, groundwater was not encountered in the Vashon till in the two new upland well borings, except within a relatively thin (<20-foot-thick), gravelly sand layer encountered at EGW061. This perched groundwater was detected at approximately 55 feet bgs and extended to a maximum depth of 75 feet bgs.

Groundwater within the Esperance Sand is unconfined, and occurs at a depth of approximately 195 feet to 215 feet bgs, below the upland area of the Everett Plant which is approximately 60 feet to 70 feet below the top of the sand. Groundwater level elevations were measured in the three Esperance Sand wells quarterly or semiannually since November 1998. Based on the measured elevation data, groundwater flow beneath the Everett Plant is north-northwest (Figures 14-3 and 14-4) and is consistent with previous interpretations of the regional groundwater flow in the site vicinity (Figure 14-1). The gradient across the Everett Plant is approximately 12.5 feet/mile or 0.002. Given this gradient, a horizontal hydraulic conductivity of 4 ft/day to 38 ft/day (see Section 21.4.3), and an effective porosity of 41% (see Section 14.6), the average groundwater flow velocity is estimated to be 0.02 ft/day to 0.18 ft/day using the equation:

$$V = \frac{k}{n} i$$

where:

V = velocity

k = horizontal hydraulic conductivity

i = gradient

n = effective porosity

## 14.6 PHYSICAL PROPERTIES OF ESPERANCE SAND

Physical properties of the Esperance Sand were assessed based on published regional data (USGS, 1997), prior physical tests of soil samples from the Everett Plant, and physical testing of selected soil samples from EGW060 and EGW061. Specific capacity data for 49 wells in the Esperance Sand underlying the Intercity Plateau was used by the USGS (1997) to estimate horizontal hydraulic conductivity. The estimated values range from $1.2 \times 10^{-3}$ cm/s to 0.11 cm/s (3.4 ft/day to 310 ft/day) with a median of $1.5 \times 10^{-2}$ cm/s (42 ft/day). A laboratory-derived vertical hydraulic conductivity of $5.4 \times 10^{-2}$ cm/s (154 ft/day) was previously obtained for one Esperance Sand soil sample collected in Powder Mill Gulch (Dames & Moore, 1988). This sample consisted of fine to coarse sand and gravel collected at a depth of 13 feet bgs. Esperance Sand was present at ground surface at this location. Landau’s 2009 analysis performed as part of this RI indicates the horizontal hydraulic conductivity in the Esperance Sand in the northern (Powder Mill Gulch) area of the Boeing property is 4 to 38 ft/day (Section 21.4.3).

One sample of Esperance Sand and Vashon glacial till from both borings EGW060 and EGW061 were selected for physical testing. The test results are presented in Appendix S. These results indicate the Esperance Sand samples have an effective porosity of 37.7% and 41.2%, and a vertical hydraulic conductivity of $1.55 \times 10^{-3}$ and $5.94 \times 10^{-3}$ cm/s (4.4 and 16.8 ft/day). The lower hydraulic conductivity value and higher effective porosity is for the soil sample collected nearest the groundwater surface. The horizontal hydraulic conductivity for this sample is $5.32 \times 10^{-3}$ cm/s (15.1 ft/day). Vertical hydraulic conductivity for the two Vashon till samples is an order of magnitude lower than the Esperance Sand and the effective porosity is 31.1% and 34.5%.

## 14.7 CONCLUSIONS AND RECOMMENDATIONS

Esperance Sand groundwater monitoring wells EGW060 and EGW061 were installed in October 1998. Monitoring well EGW060 is up-gradient from the main portion of the Everett Plant, well EGW061 is cross-gradient of the plant, and well EGW040 (installed in 1995) is downgradient of much of the plant. The three deep wells were primarily intended to provide groundwater quality data and assess site-specific groundwater flow direction and gradient within the Esperance Sand. These wells were not intended or designed to specifically address any one SWMU or AOC as part of the RI, although well EGW040 was installed prior to the RI with the intent of assessing Esperance Sand groundwater near Building 40-56.

Geologic materials and unit thickness observed during drilling were consistent with other borings and wells completed in the Esperance Sand in the site region. Groundwater within the Esperance Sand is unconfined. Groundwater level elevations of between approximately 341 and 351 feet MSL across the site were measured since November 1998. Based on the groundwater level elevation contour maps developed from these measurements, the groundwater flow beneath the Everett Plant is to the north-northwest, with a gradient of approximately 12.5 ft/mile (0.002) and an estimated average velocity of 0.017 ft/day to 1.5 ft/day.

The horizontal hydraulic conductivity value derived from laboratory testing of one soil sample is $5.32 \times 10^{-3}$ cm/s (15.1 ft/day). This value is consistent with previous values of $1.2 \times 10^{-3}$ to 0.11 cm/s (3.4 ft/day to 310 ft/day) obtained for the Esperance Sand aquifer in the region (USGS, 1997).

Analytical results for groundwater samples from the two new and one existing Esperance Sand wells, collected on a quarterly or semiannual basis since November 1998 did not indicate concentrations of VOCs, TPH, PAHs, or PCBs above method reporting limits or the applicable MTCA Method A or B groundwater cleanup levels. TDS concentrations of 120 mg/L, 130 mg/L, and 160 mg/L in the November 1998 samples from EGW040, EGW060, and EGW061 are below state and federal drinking water standards and are consistent with regional concentrations. TOC was not detected in 1998 samples.

With the exception of total and dissolved arsenic and total chromium, total and dissolved RCRA and other metals were either not detected above method reporting limits or detected at concentrations equal to or below applicable MTCA cleanup levels in all samples from EGW040, EGW060, and EGW061. Total and dissolved arsenic concentrations in sample EGW061 range from 0.007 mg/L to 0.012 mg/L and are above the MTCA Method A cleanup level of 0.005 mg/L and also above the applicable MTCA Method B cleanup level of 0.0000583 mg/L. Total and dissolved arsenic concentrations in groundwater samples from EGW040 and EGW060 have ranged from 0.002 mg/L to 0.006 mg/L. These values are equal to or below the MTCA Method A cleanup level, except for the concentration in one sample collected from EGW060 in October of 2006. However, these concentrations are also above the applicable MTCA Method B cleanup level.

The arsenic concentrations are consistently greater in groundwater from well EGW061 relative to wells EGW040 and EGW060. The arsenic concentrations detected in wells EGW040 and EGW060 are interpreted to be representative of regional background based on the location of these wells relative to SWMUs/AOCs investigated and the available soil and shallow, perched groundwater analytical data from this RI and prior investigations at the site. Soils and shallow groundwater with elevated arsenic or chromium are limited in occurrence and do not extend below a depth of approximately 30 feet bgs. Consequently, there is at least 170 feet of soil, much of it lower permeability glacial till, separating the Esperance Sand groundwater from the media containing elevated arsenic and chromium concentrations. However, it is currently uncertain whether the arsenic concentrations in well EGW061 are representative of background concentrations and this issue will be evaluated further in the FS.

The potential for vertical migration of dangerous constituents detected in shallow soil and/or perched groundwater at selected locations of the Everett Plant will be evaluated as part of the FS. The need for installation of additional deep wells on the main Everett facility and long-term monitoring of the Esperance Sand aquifer will be determined by Ecology and Boeing based on: (1) the needs and results of the FS evaluation; and (2) the nature and effectiveness of remedial actions implemented per the Ecology Cleanup Action Plan. However, it is recommended that the three existing monitoring wells continue to be sampled on a semiannual basis and the samples analyzed for the current suite of analytes to assess if there are future changes in groundwater analyte concentrations. As part of the sampling, groundwater level elevations should be recorded for the purpose of monitoring groundwater flow direction and gradient beneath the upland area of the Everett Plant, and to observe seasonal or other variations in groundwater flow regime in the area.

## 14.8 REFERENCES

Dames & Moore, 1988. Geotechnical Investigation Water Retention Dam, Powder Mill Gulch, Everett Facility, Report prepared for The Boeing Company.

Dames & Moore 1999, Report, 1998. Groundwater Monitoring, Boeing Commercial Airplane Group, Everett Plant, Report prepared for The Boeing Company.

U.S. Geological Survey, 1997. The Ground-Water System and Ground-Water Quality in Western Snohomish County, Washington, Water Resources Investigations Report 96-4312.

## TABLE 14-1
## DATA SUMMARY FOR WATER WELLS AND DEEP BORINGS NEAR BOEING EVERETT PLANT

| Well Number | Well or Boring Owner | Year Drilled | Ground Surface Elevation (ft) | Total Depth Drilled (ft) | Screen Interval (ft) | Static Water Level | | Estimated Well Yield (gpm) | Producing Information | Reference | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Depth (ft) | Date Measured | | | | |
| 28/4-3c | Fletcher (Loney) | 1985 | 350 | 263 | 241-251 | 116 | 2/19/85 | 24 | Fine sand | Ecology well logs | Domestic |
| 28/4-10J[1] | GTE Northwest | 1989 | -- | 200 | NA | NA | NA | NA | NA | Ecology well logs | Cathodic protection well |
| 28/4-10K | Boeing | 1986 | -- | 133 | NA | NA | NA | NA | NA | Ecology well logs | Cathodic protection well |
| 28/4-11J | Kohkoku | 1974 | -- | 244 | 220-230 | 201 | 5/30/74 | 138 | Sand and gravel | Ecology well logs | |
| 28/4-14D | Butler | 1988 | -- | 445 | NA | -- | -- | NA | NA | Ecology well logs | Test boring |
| 28/4-16E | Skulley Construction | 1990 | -- | 185 | 180-185 | 165 | 8/5/90 | 12 | Clay sand and gravel | Ecology well logs | |
| 28/4-16K | Suhadolnik | 1997 | -- | 200 | 192-197 | 155 | 2/26/97 | 10 | Gravel and sand | Ecology well logs | |
| 28/4-16G | Golf NW, Inc. | 1988 | 487 | 552 | 542-552 | 344 | 11/20/88 | -- | Sandy gravel | Ecology well logs | |
| 28/4-17H | Williams | 1979 | 100 | 69 | 67-69 | 46 | 10/4/79 | 10 | Gravel and coarse sand | Ecology well logs | |
| 28/4-22 B1 | U.S. Army Air Corps. | 1938 | 580 | 547 | NA | -- | -- | 240 | Esperance sand | Newcomb, 1952 | Abandoned-inadequate yield |
| 28/5-7G2 | Beverly Park | 1936 | 500 | 217 | -- | 138 | 1936 | 250 | Esperance sand | Newcomb, 1952 | |
| B-1/12-88 | Boeing | 1988 | 372 | 60 | NA | 51 | 10/21/88 | NA | NA | D&M report December 12, 1988 | Test boring |

NA = Not applicable
-- = Information not available
( ) Current well owner
Well number: 28/4-22B1 = Township 28 North, Range 4 East, Section 22, Number B1
B-1/12-88 = Boring B-1 from Dames & Moore (D&M) report of December 1988
Ecology well logs: Well logs on file at Washington Department of Ecology Northwest Regional Office, Redmond, Washington
[1] = Based on description of well location, this well is probably in Sections 4 or 9

**Table 14-2**
**Summary of Groundwater Analytical Results for Organic (VOCs, PAHs, PCBs, Phosphate Compounds, BHT and TPH) and Conventional Analyses**
**Esperance Sand**
**Boeing Everett Plant**

| Well ID | Sample Date | Volatile Organic Compounds (VOCs) (mg/L) | | | | Polynuclear Aromatic Hydrocarbons (PAHs) (mg/L) | | Polychlorinated Biphenyls (PCBs) (mg/L)[7] | Phosphate Compounds (Skydrol) (mg/L) | | BHT (mg/L) | Total Petroleum Hydrocarbons[1] (mg/L) | Conventional Analyses (mg/L) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Acetone | Chloromethane | Vinyl Chloride | TCE | PNAs | Naphthalene | | Dibutyl Phenyl Phosphate | Tributyl Phosphate | | | Total Dissolved Solids | Total Organic Carbon |
| MTCA Method A or B Groundwater Screening Level | | 0.8 (B) | 0.00337 (B) | 0.0002 (A)<br>0.0000292 (B) | 0.005 (A)<br>0.00049 (B) | Variable | 0.16 (A)<br>0.16 (B) | 0.0001 (Total) (A)<br>0.000044 (Total) (B)<br>0.00032 (Aroclor 1254) (B) | 5.16 [5] | 4.8 [5] | NE | Variable | NE | NE |
| **EGW040[2]** | 11/09/98 | 0.005 U | 0.002 U | 0.000010 U | 0.001 UJ | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 02/02/99 | 0.005 U | 0.002 U | 0.000010 U | 0.001 U | NA | NA | NA | NA | NA | NA | ND | 120 | 1.50 U |
| | 05/13/99 | 0.005 U | 0.001 U | 0.000020 U | 0.001 U | ND | 0.0001 U | ND | ND | ND | NA | ND | NA | NA |
| | 08/04/99 | 0.005 U | 0.001 U | 0.000020 U | 0.001 U | ND | 0.0001 U | ND | ND | ND | NA | ND | NA | NA |
| | 11/11/99 | 0.005 U | 0.001 U | 0.000020 U | 0.001 U | ND | 0.0001 U | ND | ND | ND | NA | ND | NA | NA |
| | 02/07/00 | NA | NA | 0.000020 U | NA | ND | NA | ND | ND | ND | NA | ND | NA | NA |
| | 05/02/00 | NA | NA | 0.000020 U | NA | ND | NA | ND | ND | ND | NA | ND | NA | NA |
| | 08/02/00 | NA | NA | 0.000020 U | NA | ND | NA | ND | 0.002 U | 0.001 U | NA | ND | NA | NA |
| | 11/14/00 | NA | NA | 0.000020 U | NA | ND | NA | ND | 0.002 U | 0.001 U | NA | ND | NA | NA |
| | 02/05/01 | 0.005 U | 0.001 U | 0.000020 U | 0.001 U | ND | 0.0001 U | ND | 0.002 U | 0.001 U | NA | ND | NA | NA |
| | 05/03/01 | 0.005 U | 0.001 U | 0.000020 U | 0.001 U | ND | 0.0001 U | ND | 0.002 U | 0.001 U | 0.00003 U | ND * | NA | NA |
| | 08/01/01 | 0.005 U | 0.001 U | 0.000020 U | 0.001 U | ND | 0.0001 U | ND | 0.0005 U | 0.00025 U | 0.00025 U | ND | NA | NA |
| | 11/09/01 | 0.005 U | 0.001 U | 0.000020 U | 0.001 U | ND | 0.0001 U | ND | 0.0005 U | 0.00025 U | 0.00025 U | ND | NA | NA |
| | 02/04/02 | 0.001 U | 0.0003 (4) | 0.000020 U | 0.0002 U | ND | 0.0001 U | ND | 0.0005 U | 0.00025 U | 0.00025 U | ND | NA | NA |
| | 05/02/02 | 0.001 U | 0.0002 U | 0.000020 U | 0.0002 U | ND | 0.0001 U | ND | 0.0005 U | 0.00025 U | 0.00025 U | ND | NA | NA |
| | 08/01/02 | 0.001 U | 0.0002 U | 0.000020 U | 0.0002 U | ND | 0.0001 U | ND | 0.0005 U | 0.00025 U | 0.00025 U | ND | NA | NA |
| | 11/11/02 | 0.001 U | 0.0002 U | 0.000020 U | 0.0002 U | ND | 0.0001 U | ND | 0.0005 U | 0.00025 U | 0.00025 UJ | ND | NA | NA |
| | 02/03/03 | 0.001 U | 0.0002 U | 0.000020 U | 0.0002 U | ND | 0.0001 U | ND | 0.0005 U | 0.00025 U | 0.00025 U | ND | NA | NA |
| | 05/01/03 | 0.0013 (6) | 0.0002 U | 0.000020 U | 0.0002 U | ND | 0.0001 U | ND | 0.0005 U | 0.00025 U | 0.00025 U | ND | NA | NA |
| | 07/21/03 | 0.001 U | 0.0002 U | 0.000020 U | 0.0002 U | ND | 0.0001 U | ND | 0.0005 U | 0.00025 U | 0.00025 U | ND | NA | NA |
| | 11/03/03 | 0.001 U | 0.0002 U | 0.000020 U | 0.0002 U | ND | 0.0001 U | ND | 0.0005 U | 0.00025 U | 0.00025 U | ND | NA | NA |
| | 01/19/04 | 0.001 U | 0.0002 U | 0.000020 U | 0.0002 U | ND | 0.0001 U | ND | 0.0005 UJ | 0.00025 UJ | 0.00025 UJ | ND | NA | NA |
| | 04/12/04 | 0.001 U | 0.0002 U | 0.000020 U | 0.0002 U | ND | 0.0001 U | ND | 0.0005 U | 0.00025 U | 0.00025 U | ND | NA | NA |
| | 07/12/04 | 0.001 U | 0.0002 U | 0.000020 U | 0.0002 U | ND | 0.0001 U | ND | 0.0002 U | 0.00010 U | 0.00010 U | ND | NA | NA |
| | 10/04/04 | 0.001 U | 0.0002 U | 0.000020 U | 0.0002 U | ND | 0.0001 U | ND | 0.0002 U | 0.00010 U | 0.00010 U | ND | NA | NA |
| | 01/04/05 | 0.001 U | 0.0002 U | 0.000020 U | 0.0002 U | ND | 0.0001 U | ND | 0.0002 U | 0.00010 U | 0.00010 U | ND | NA | NA |
| | 04/04/05 | 0.001 U | 0.0002 U | 0.000020 U | 0.0002 U | ND | 0.00001 U | ND | 0.0002 U | 0.00010 U | 0.00010 U | ND | NA | NA |
| | 10/10/05 | 0.0018 U | 0.0002 U | 0.000020 U | 0.0002 U | ND | 0.00001 U | ND | 0.0002 U | 0.00010 U | 0.00010 U | ND | NA | NA |
| | 04/03/06 | 0.001 (6) | 0.0002 U | 0.000020 U | 0.0002 U | ND** | 0.000015 | ND | 0.0002 U | 0.00010 U | 0.00010 U | ND | NA | NA |
| | 10/19/06 | 0.003 U | 0.0002 U | 0.000020 U | 0.00002 U | ND** | 0.000017 | ND | 0.0002 U | 0.00010 U | 0.00010 U | ND | NA | NA |
| | 04/02/07 | 0.003 U | 0.0002 U | 0.000020 U | 0.00002 U | ND** | 0.000014 | ND | 0.0002 U | 0.0001 U | 0.0001 U | ND | NA | NA |
| | 10/24/07 | 0.003 U | 0.0002 U | 0.00002 U | 0.00002 U | ND** | 0.000010 (6) | ND | 0.0002 U | 0.0001 U | 0.0001 U | ND | NA | NA |
| | 04/02/08 | 0.003 U | 0.002 U | 0.00002 U | 0.00002 U | ND | 0.00001 U | ND | 0.0002 U | 0.0001 U | 0.0001 U | ND | NA | NA |
| | 10/01/08 | 0.003 U | 0.0002 U | 0.00002 U | 0.00002 U | ND | 0.00001 U | ND | 0.0002 U | 0.0001 | 0.0001 U | ND | NA | NA |
| | 04/02/09 | 0.0025 U | 0.0002 U | 0.00002 U | 0.00002 U | ND | 0.000011 U | ND | 0.0002 U | 0.0001 U | 0.0001 U | ND | NA | NA |
| | 10/29/09 | 0.005 U | 0.0005 U | 0.00002 U | 0.00002 U | ND | 0.00001 U | ND | 0.0002 U | 0.0001 U | 0.0001 U | ND | NA | NA |
| | 04/05/10 | 0.005 U | 0.0005 U | 0.00002 U | 0.00002 U | ND | 0.00001 U | ND | 0.0002 U | 0.0001 U | 0.0001 U | ND | NA | NA |

**Table 14-2**
**Summary of Groundwater Analytical Results for Organic (VOCs, PAHs, PCBs, Phosphate Compounds, BHT and TPH) and Conventional Analyses**
**Esperance Sand**
**Boeing Everett Plant**

| Well ID | Sample Date | Volatile Organic Compounds (VOCs) (mg/L) | | | | Polynuclear Aromatic Hydrocarbons (PAHs) (mg/L) | | Polychlorinated Biphenyls (PCBs) (mg/L)[7] | Phosphate Compounds (Skydrol) (mg/L) | | BHT (mg/L) | Total Petroleum Hydrocarbons[1] (mg/L) | Conventional Analyses (mg/L) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Acetone | Chloromethane | Vinyl Chloride | TCE | PNAs | Naphthalene | | Dibutyl Phenyl Phosphate | Tributyl Phosphate | | | Total Dissolved Solids | Total Organic Carbon |
| MTCA Method A or B Groundwater Screening Level | | 0.8 (B) | 0.00337 (B) | 0.0002 (A)<br>0.0000292 (B) | 0.005 (A)<br>0.00049 (B) | Variable | 0.16 (A)<br>0.16 (B) | 0.0001 (Total) (A)<br>0.000044 (Total) (B)<br>0.00032 (Aroclor 1254) (B) | 5.16 [5] | 4.8 [5] | NE | Variable | NE | NE |
| **EGW060** | 11/17/98 | 0.005 U | 0.002 U | 0.002 U | 0.001 U | NA | NA | NA | NA | NA | NA | ND | 160 | 1.50 U |
| | 02/02/99 | 0.005 U | 0.002 U | 0.000010 U | 0.001 U | NA | NA | NA | NA | NA | NA | ND | 160 | 1.50 U |
| | 05/13/99 | 0.005 U | 0.001 U | 0.000020 U | 0.001 U | ND | 0.0001 U | ND | ND | ND | NA | ND | NA | NA |
| | 08/04/99 | 0.005 U | 0.001 U | 0.000020 U | 0.001 U | ND | 0.0001 U | ND | ND | ND | NA | ND | NA | NA |
| | 08/04/99 (DUP) | 0.005 U | 0.001 U | 0.000020 U | 0.001 U | NA | NA | ND | ND | ND | NA | NA | NA | NA |
| | 11/11/99 | 0.005 U | 0.001 U | 0.000020 U | 0.001 U | ND | 0.0001 U | ND | ND | ND | NA | ND | NA | NA |
| | 02/07/00 | NA | NA | 0.000020 U | NA | ND | NA | ND | ND | ND | NA | ND | NA | NA |
| | 05/02/00 | NA | NA | 0.000020 U | NA | ND | NA | ND | ND | ND | NA | ND | NA | NA |
| | 08/02/00 | NA | NA | 0.000020 U | NA | ND | NA | ND | 0.003 (3) | 0.017 (3) | NA | ND | NA | NA |
| | 08/23/00 | NA | NA | NA | NA | NA | NA | NA | 0.002 U (3) | 0.001 U (3) | NA | NA | NA | NA |
| | 11/14/00 | NA | NA | 0.000020 U | NA | ND | NA | ND | 0.002 U | 0.001 U | NA | ND | NA | NA |
| | 02/05/01 | 0.005 U | 0.001 U | 0.000020 U | 0.001 U | ND | 0.0001 U | ND | 0.002 U | 0.001 U | NA | ND | NA | NA |
| | 05/03/01 | 0.005 U | 0.001 U | 0.000020 U | 0.001 U | ND | 0.0001 U | ND | 0.002 U | 0.0017 | 0.00003 U | ND * | NA | NA |
| | 08/01/01 | 0.005 U | 0.001 U | 0.000020 UJ | 0.001 U | ND | 0.0001 U | ND | 0.0005 U | 0.00025 U | 0.00025 U | ND | NA | NA |
| | 11/09/01 | 0.005 U | 0.001 U | 0.000020 U | 0.001 U | ND | 0.0001 U | ND | 0.0005 U | 0.00025 U | 0.00025 U | ND | NA | NA |
| | 02/04/02 | 0.001 U | 0.0002 U | 0.000020 U | 0.0002 U | ND | 0.0001 U | ND | 0.0005 U | 0.00025 U | 0.00025 U | ND | NA | NA |
| | 05/02/02 | 0.001 U | 0.0002 U | 0.000020 U | 0.0002 U | ND | 0.0001 U | ND | 0.0005 U | 0.00025 U | 0.00025 U | ND | NA | NA |
| | 08/01/02 | 0.001 U | 0.0002 U | 0.000020 U | 0.0002 U | ND | 0.0001 U | ND | 0.0005 U | 0.00025 U | 0.00025 U | ND | NA | NA |
| | 11/11/02 | 0.001 U | 0.0002 U | 0.000020 U | 0.0002 U | ND | 0.0001 U | ND | 0.00051 U | 0.00025 U | 0.00025 U | ND | NA | NA |
| | 02/03/03 | 0.001 U | 0.0002 U | 0.000020 U | 0.0002 U | ND | 0.0001 U | ND | 0.0005 U | 0.00025 U | 0.00025 U | ND | NA | NA |
| | 05/01/03 | 0.0015 (6) | 0.0002 U | 0.000020 U | 0.0002 U | ND | 0.0001 U | ND | 0.0005 U | 0.00025 U | 0.00025 U | ND | NA | NA |
| | 07/21/03 | 0.001 U | 0.0002 U | 0.000020 U | 0.0002 U | ND | 0.0001 U | ND | 0.0005 U | 0.00025 U | 0.00025 U | ND | NA | NA |
| | 11/03/03 | 0.0013 (6) | 0.0002 U | 0.000020 U | 0.0002 U | ND | 0.0001 U | ND | 0.0005 U | 0.00025 U | 0.00025 U | ND | NA | NA |
| | 01/19/04 | 0.001 U | 0.0002 U | 0.000020 U | 0.0002 U | ND | 0.0001 U | ND | 0.0005 UJ | 0.00025 UJ | 0.00025 UJ | ND | NA | NA |
| | 04/12/04 | 0.001 U | 0.0002 U | 0.000020 U | 0.0002 U | ND | 0.0001 U | ND | 0.0005 U | 0.00025 U | 0.00025 U | ND | NA | NA |
| | 07/12/04 | 0.001 U | 0.0002 U | 0.000020 U | 0.0002 U | ND | 0.0001 U | ND | 0.0002 U | 0.00010 U | 0.00010 U | ND | NA | NA |
| | 10/04/04 | 0.001 U | 0.0002 U | 0.000020 U | 0.0002 U | ND | 0.0001 U | ND | 0.0002 U | 0.00010 U | 0.00010 U | ND | NA | NA |
| | 01/04/05 | 0.001 U | 0.0002 U | 0.000020 U | 0.0002 U | ND | 0.0001 U | ND | 0.0002 U | 0.00010 U | 0.00010 U | ND | NA | NA |
| | 04/04/05 | 0.001 U | 0.0002 U | 0.000020 U | 0.0002 U | ND | 0.00001 U | ND | 0.0002 U | 0.00010 U | 0.00010 U | ND | NA | NA |
| | 10/10/05 | 0.001 U | 0.0002 U | 0.000020 U | 0.0002 U | ND | 0.00001 U | ND | 0.0002 U | 0.00010 U | 0.00010 U | ND | NA | NA |
| | 04/03/06 | 0.001 U | 0.0002 U | 0.000020 U | 0.0002 U | ND | 0.00001 U | ND | 0.0002 U | 0.00010 U | 0.00010 U | ND | NA | NA |
| | 10/19/06 | 0.003 U | 0.0002 U | 0.000020 U | 0.00002 U | ND | 0.00001 U | ND | 0.0002 U | 0.00010 U | 0.00010 U | ND | NA | NA |
| | 04/02/07 | 0.003 U | 0.0002 U | 0.000020 U | 0.00002 U | ND** | 0.000010 | ND | 0.0002 U | 0.0001 U | 0.0001 U | ND | NA | NA |
| | 10/24/07 | 0.003 U | 0.0002 U | 0.00002 U | 0.0004 | ND | 0.00001 U | ND | 0.0002 U | 0.0001 U | 0.0001 U | ND | NA | NA |
| | 04/02/08 | 0.003 U | 0.002 U | 0.00002 U | 0.00002 U | ND | 0.00001 U | ND | 0.0002 U | 0.0001 U | 0.0001 U | ND | NA | NA |
| | 10/01/08 | 0.003 U | 0.0002 U | 0.00002 U | 0.00002 U | ND | 0.00001 U | ND | 0.0002 U | 0.0001 U | 0.0001 U | ND | NA | NA |
| | 04/02/09 | 0.0025 U | 0.0002 U | 0.00002 U | 0.00002 U | ND | 0.000018 U | ND | 0.0002 U | 0.0001 U | 0.0001 U | ND | NA | NA |
| | 10/29/09 | 0.005 U | 0.0005 U | 0.00002 U | 0.00002 U | ND | 0.00001 U | ND | 0.0002 U | 0.0001 U | 0.0001 U | ND | NA | NA |
| | 04/05/10 | 0.005 U | 0.0005 U | 0.00002 U | 0.00002 U | ND | 0.00001 U | ND | 0.0002 U | 0.0001 U | 0.0001 U | ND | NA | NA |

**Table 14-2**
**Summary of Groundwater Analytical Results for Organic (VOCs, PAHs, PCBs, Phosphate Compounds, BHT and TPH) and Conventional Analyses**
**Esperance Sand**
**Boeing Everett Plant**

| Well ID | Sample Date | Volatile Organic Compounds (VOCs) (mg/L) | | | | Polynuclear Aromatic Hydrocarbons (PAHs) (mg/L) | | Polychlorinated Biphenyls (PCBs) (mg/L)[7] | Phosphate Compounds (Skydrol) (mg/L) | | BHT (mg/L) | Total Petroleum Hydrocarbons[1] (mg/L) | Conventional Analyses (mg/L) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Acetone | Chloromethane | Vinyl Chloride | TCE | PNAs | Naphthalene | | Dibutyl Phenyl Phosphate | Tributyl Phosphate | | | Total Dissolved Solids | Total Organic Carbon |
| MTCA Method A or B Groundwater Screening Level | | 0.8 (B) | 0.00337 (B) | 0.0002 (A)<br>0.0000292 (B) | 0.005 (A)<br>0.00049 (B) | Variable | 0.16 (A)<br>0.16 (B) | 0.0001 (Total) (A)<br>0.000044 (Total) (B)<br>0.00032 (Aroclor 1254) (B) | 5.16 [5] | 4.8 [5] | NE | Variable | NE | NE |
| **EGW061** | 11/17/98 | 0.005 U | 0.002 U | 0.002 U | 0.001 U | NA | NA | NA | NA | NA | NA | ND | 130 | 1.50 U |
| | 02/02/99 | 0.005 U | 0.002 U | 0.000010 U | 0.001 U | NA | NA | NA | NA | NA | NA | ND | 130 | 1.50 U |
| | 05/13/99 | 0.005 U | 0.001 U | 0.000020 U | 0.001 U | ND | 0.0001 U | ND | ND | ND | NA | ND | NA | NA |
| | 08/04/99 | 0.005 U | 0.001 U | 0.000020 U | 0.001 U | ND | 0.0001 U | ND | ND | ND | NA | ND | NA | NA |
| | 11/11/99 | 0.005 U | 0.001 U | 0.000020 U | 0.001 U | ND | 0.0001 U | ND | ND | ND | NA | ND | NA | NA |
| | 02/07/00 | NA | NA | 0.000020 U | NA | ND | NA | ND | ND | ND | NA | ND | NA | NA |
| | 05/02/00 | NA | NA | 0.000020 U | NA | ND | NA | ND | ND | ND | NA | ND | NA | NA |
| | 08/02/00 | NA | NA | 0.000020 U | NA | ND | NA | ND | 0.002 U (3) | 0.0027 (3) | NA | ND | NA | NA |
| | 08/23/00 | NA | NA | NA | NA | NA | NA | NA | 0.002 U (3) | 0.001 U (3) | NA | NA | NA | NA |
| | 11/14/00 | NA | NA | 0.000020 U | NA | ND | NA | ND | 0.002 U | 0.001 U | NA | ND | NA | NA |
| | 02/05/01 | 0.005 U | 0.001 U | 0.000020 U | 0.001 U | ND | 0.0001 U | ND | 0.002 U | 0.001 U | NA | ND | NA | NA |
| | 05/03/01 | 0.005 U | 0.001 U | 0.000020 U | 0.001 U | ND | 0.0001 U | ND | 0.002 U | 0.0011 | 0.00003 U | ND * | NA | NA |
| | 08/01/01 | 0.005 U | 0.001 U | 0.000020 U | 0.001 U | ND | 0.0001 U | ND | 0.0005 U | 0.00025 U | 0.00025 U | ND | NA | NA |
| | 11/09/01 | 0.005 U | 0.001 U | 0.000020 U | 0.001 U | ND | 0.0001 U | ND | 0.0005 U | 0.00025 U | 0.00025 U | ND | NA | NA |
| | 02/04/02 | 0.001 U | 0.0004 (4) | 0.000020 U | 0.0002 U | ND | 0.0001 U | ND | 0.0005 U | 0.00025 U | 0.00025 U | ND | NA | NA |
| | 05/02/02 | 0.001 U | 0.0002 U | 0.000020 U | 0.0002 U | ND | 0.0001 U | ND | 0.0005 U | 0.00025 U | 0.00025 U | ND | NA | NA |
| | 08/01/02 | 0.001 U | 0.0002 U | 0.000020 U | 0.0002 U | ND | 0.0001 U | ND | 0.0005 U | 0.00025 U | 0.00025 U | ND | NA | NA |
| | 11/11/02 | 0.001 U | 0.0002 U | 0.000020 U | 0.0002 U | ND | 0.0001 U | ND | 0.00051 U | 0.00025 U | 0.00025 U | ND | NA | NA |
| | 02/03/03 | 0.001 U | 0.0002 U | 0.000020 U | 0.0002 U | ND | 0.0001 U | ND | 0.0005 U | 0.00025 U | 0.00025 U | ND | NA | NA |
| | 05/01/03 | 0.0018 (6) | 0.0002 U | 0.000020 U | 0.0002 U | ND | 0.0001 U | ND | 0.0005 U | 0.00025 U | 0.00025 U | ND | NA | NA |
| | 07/21/03 | 0.001 U | 0.0002 U | 0.000020 U | 0.0002 U | ND | 0.0001 U | ND | 0.0005 U | 0.00025 U | 0.00025 U | ND | NA | NA |
| | 11/03/03 | 0.0015 (6) | 0.0002 U | 0.000020 U | 0.0002 U | ND | 0.0001 U | ND | 0.0005 U | 0.00025 U | 0.00025 U | ND | NA | NA |
| | 01/19/04 | 0.001 U | 0.0002 U | 0.000020 U | 0.0002 U | ND | 0.0001 U | ND | 0.0005 UJ | 0.00026 J | 0.00025 UJ | ND | NA | NA |
| | 04/12/04 | 0.001 U | 0.0002 U | 0.000020 U | 0.0002 U | ND | 0.0001 U | ND | 0.0005 U | 0.00025 U | 0.00025 U | ND | NA | NA |
| | 07/12/04 | 0.001 U | 0.0002 U | 0.000020 U | 0.0002 U | ND | 0.0001 U | ND | 0.0002 U | 0.00010 U | 0.00010 U | ND | NA | NA |
| | 10/04/04 | 0.001 U | 0.0002 U | 0.000020 U | 0.0002 U | ND | 0.0001 U | ND | 0.0002 U | 0.00010 U | 0.00010 U | ND | NA | NA |
| | 01/04/05 | 0.001 U | 0.0002 U | 0.000020 U | 0.0002 U | ND | 0.0001 U | ND | 0.0002 U | 0.00010 U | 0.00010 U | ND | NA | NA |
| | 04/04/05 | 0.001 U | 0.0002 U | 0.000020 U | 0.0002 U | ND | 0.00001 U | ND | 0.0002 U | 0.00010 U | 0.00010 U | ND | NA | NA |
| | 10/10/05 | 0.0018 U | 0.0002 U | 0.000020 U | 0.0002 U | ND | 0.00001 U | ND | 0.0002 U | 0.00010 U | 0.00010 U | ND | NA | NA |
| | 04/03/06 | 0.001 (6) | 0.0002 U | 0.000020 U | 0.0002 U | ND | 0.00001 U | ND | 0.0002 U | 0.00010 U | 0.00010 U | ND | NA | NA |
| | 10/19/06 | 0.003 U | 0.0002 U | 0.000020 U | 0.00002 U | ND | 0.00001 U | ND | 0.0002 U | 0.00010 U | 0.00010 U | ND | NA | NA |
| | 04/02/07 | 0.003 U | 0.0002 U | 0.000020 U | 0.00002 U | ND** | 0.000011 | ND | 0.0002 U | 0.0001 U | 0.0001 U | ND | NA | NA |
| | 10/24/07 | 0.003 U | 0.0002 U | 0.00002 U | 0.00002 U | ND | 0.00001 U | ND | 0.0002 U | 0.0001 U | 0.0001 U | ND | NA | NA |
| | 04/02/08 | 0.003 U | 0.002 U | 0.00002 U | 0.00002 U | ND | 0.00001 U | ND | 0.0002 U | 0.0001 U | 0.0001 U | ND | NA | NA |
| | 10/01/08 | 0.003 U | 0.0002 U | 0.00002 U | 0.00002 U | ND | 0.00001 U | ND | 0.0002 U | 0.0001 U | 0.0001 U | ND | NA | NA |
| | 04/02/09 | 0.0025 U | 0.0002 U | 0.00002 U | 0.00002 U | ND | 0.00001 U | ND | 0.0002 U | 0.0001 U | 0.0001 U | ND | NA | NA |
| | 10/29/09 | 0.005 U | 0.0005 U | 0.00002 U | 0.00002 U | ND | 0.00001 U | ND | 0.0002 U | 0.0001 U | 0.0001 U | ND | NA | NA |
| | 04/05/10 | 0.005 U | 0.0005 U | 0.00002 U | 0.00002 U | ND | 0.00001 U | ND | 0.0002 U | 0.0001 U | 0.0001 U | ND | NA | NA |

**Notes:**

[1]Samples analyzed for diesel-range, gasoline-range, Jet A-range, and/or oil-range hydrocarbons using NWTPH methods, but petroleum hydrocarbons were not detected in any of the samples.

[2]Well EGW040 is located near Building 40-56 and has been sampled since February 1995. See Building 40-56 data summary table for data from February 1995 through August 1998.

[3]Detected compounds in the 8/2/00 sample were suspect. Samples were recollected on 8/23/00 and analyzed for phosphate compounds.

[4]Chloromethane was the only VOC detected during the first quarter 2002 GW sampling. First quarter 2002 was the first time 20-mL purge volumes were used for VOC analysis by EPA Method 8260.

[5]Value calculated by Boeing consistent with 1996 MTCA Method B methodology.

[6]Suspected laboratory contamination

[7]PCBs will be analyzed by the low-level method for each Aroclor (0.00001 mg/L) beginning April 1, 2007.

*Samples were not analyzed for Jet-A range petroleum hydrocarbons; however, Jet-A-range TPH is within the diesel- and motor oil-range TPH which were not detected.

**Compounds were not detected above the specific compound reporting limits, except as shown.

Values in **bold** font indicate that the result reported exceeds the most current MTCA levels based on the Ecology website.

Model Toxics Control Act (MTCA) Cleanup Regulation, WAC 173-340. MTCA Method A and B values are from Ecology website CLARC tables downloaded June 2010. (https://fortress.wa.gov/ecy/clarc/reporting/CLARCReporting.aspx).

(A) - MTCA Method A

(B) - MTCA Method B

BHT - Butylated hydroxytoluene

(DUP) - Field duplicate

NA - Not analyzed

NE - Not established

ND - Compounds analyzed for were not detected above the specific compound reporting limits

U - Compound was analyzed for but not detected above the reporting limit shown.

UJ - Compound was analyzed for but not detected above the reporting limit shown. Reporting limit is an estimated value.

**Table 14-3**
**Summary of Groundwater Analytical Results for Metals, (mg/L)**
**Esperance Sand**
**Boeing Everett Plant**

| Well ID | Sample Date | Arsenic | | Barium | | Chromium | | Copper | | Lead | | Nickel | | Selenium | | Silver | | Strontium | | Zinc | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Dissolved |
| MTCA Method A or B Groundwater Screening Level | | 0.005 (A) 0.0000583 (B) | | 3.2 (B) | | 0.05 (A) 24 ($Cr^{+3}$) (B) 0.048 ($Cr^{+6}$) (B) | | 0.592 (B) | | 0.015 (A) | | 0.32 (B) | | 0.080 (B) | | 0.080 (B) | | 9.6 (B) | | 4.8 (B) | |
| **EGW040** | 02/02/99 | **0.005** | **0.004** | 0.004 | 0.004 | 0.007 | 0.005 U | 0.002 | 0.002 U | 0.001 U | 0.001 U | 0.010 U | 0.010 U | 0.001 U | 0.002 U | 0.003 U | 0.003 U | 0.063 | 0.063 | 0.005 | 0.004 U |
| | 05/13/99 | **0.004** | **0.004** | 0.004 | 0.004 | 0.008 | 0.005 U | 0.002 U | 0.002 U | 0.001 U | 0.001 U | 0.010 U | 0.010 U | 0.001 U | 0.001 U | 0.003 U | 0.003 U | 0.058 | 0.062 | 0.004 U | 0.004 U |
| | 08/04/99 | **0.005** | **0.004** | 0.005 | 0.005 | 0.014 | 0.006 | 0.002 U | 0.002 U | 0.001 U | 0.001 U | 0.010 U | 0.010 U | 0.001 | 0.001 U | 0.003 U | 0.003 U | 0.066 | 0.073 | 0.004 | 0.004 U |
| | 11/11/99 | **0.003** | **0.004** | 0.007 | 0.007 | 0.010 | 0.006 | 0.002 U | 0.002 U | 0.001 U | 0.001 U | 0.010 U | 0.010 U | 0.002 U | 0.002 U | 0.003 U | 0.003 U | 0.083 | 0.086 | 0.006 U | 0.006 U |
| | 02/07/00 | **0.004** | **0.003** | 0.005 | 0.005 | 0.017 | 0.008 | 0.002 U | 0.002 U | 0.001 U | 0.001 U | 0.010 U | 0.010 U | 0.002 U | 0.002 U | 0.003 U | 0.009 U | 0.082 | 0.085 | 0.006 U | 0.006 U |
| | 05/02/00 | **0.005** | **0.004** | 0.006 | 0.006 | 0.012 | 0.007 | 0.002 U | 0.002 U | 0.001 U | 0.001 U | 0.010 U | 0.010 U | 0.002 U | 0.002 U | 0.003 U | 0.003 U | 0.083 | 0.088 | 0.006 U | 0.006 U |
| | 08/02/00 | **0.004** | **0.004** | 0.005 | 0.005 | 0.019 | 0.008 | 0.002 U | 0.002 U | 0.001 U | 0.001 U | 0.01 | 0.010 U | 0.002 U | 0.002 U | 0.003 U | 0.003 U | 0.082 | 0.087 | 0.006 U | 0.006 U |
| | 11/14/00 | **0.004** | **0.004** | 0.006 | 0.006 | 0.012 | 0.006 | 0.002 U | 0.002 U | 0.001 U | 0.001 U | 0.01 U | 0.01 U | 0.002 U | 0.002 U | 0.003 U | 0.003 U | 0.082 | 0.089 | 0.006 U | 0.006 U |
| | 02/05/01 | **0.004** | **0.004** | 0.005 | 0.005 | 0.019 | 0.009 | 0.002 U | 0.002 U | 0.001 U | 0.001 U | 0.01 | 0.01 U | 0.002 U | 0.002 U | 0.003 U | 0.003 U | 0.081 | 0.083 | 0.006 U | 0.006 U |
| | 05/03/01 | **0.004** | **0.003** | 0.005 | 0.005 | 0.016 | 0.007 | 0.002 U | 0.002 U | 0.001 U | 0.001 U | 0.01 U | 0.01 U | 0.002 U | 0.002 U | 0.003 U | 0.003 U | 0.079 | 0.084 | 0.006 U | 0.006 U |
| | 08/01/01 | **0.004** | **0.003** | 0.005 | 0.005 | 0.014 | 0.008 | 0.002 U | 0.002 U | 0.001 U | 0.001 U | 0.01 U | 0.01 U | 0.002 U | 0.002 U | 0.003 U | 0.003 U | 0.078 | 0.083 | 0.006 U | 0.006 U |
| | 11/09/01 | **0.003** | **0.003** | 0.004 | 0.005 | 0.020 | 0.008 | 0.002 U | 0.002 U | 0.001 U | 0.001 U | 0.01 U | 0.01 U | 0.05 U | 0.05 U | 0.003 U | 0.003 U | 0.082 | 0.083 | 0.006 U | 0.006 U |
| | 02/04/02 | **0.003** | **0.003** | 0.004 | 0.005 | 0.013 | 0.007 | 0.002 U | 0.002 U | 0.001 U | 0.001 U | 0.01 U | 0.01 U | 0.05 U | 0.05 U | 0.003 U | 0.003 U | 0.074 | 0.085 | 0.006 U | 0.006 U |
| | 05/02/02 | **0.003** | **0.003** | 0.005 | 0.006 | 0.010 | 0.007 | 0.002 U | 0.002 U | 0.001 U | 0.001 U | 0.01 U | 0.01 U | 0.05 U | 0.05 U | 0.003 UJ | 0.003 U | 0.081 | 0.092 | 0.006 U | 0.006 U |
| | 08/01/02 | **0.005** | **0.004** | 0.029 | 0.006 | **0.078** | 0.010 | 0.007 | 0.002 U | 0.001 U | 0.001 U | 0.05 | 0.01 U | 0.05 U | 0.05 U | 0.003 U | 0.003 U | 0.102 | 0.089 | 0.016 | 0.006 U |
| | 11/11/02 | **0.003** | **0.003** | 0.009 | 0.006 | 0.031 | 0.010 | 0.004 | 0.002 U | 0.001 U | 0.001 U | 0.03 | 0.01 U | 0.05 U | 0.05 U | 0.003 U | 0.003 U | 0.085 | 0.087 | 0.006 U | 0.006 U |
| | 02/03/03 | **0.003** | **0.003** | 0.006 | 0.005 | 0.016 | 0.008 | 0.002 U | 0.002 U | 0.001 U | 0.001 U | 0.01 U | 0.01 U | 0.05 U | 0.05 U | 0.003 U | 0.003 U | 0.086 | 0.087 | 0.008 | 0.006 U |
| | 05/01/03 | **0.004** | **0.004** | 0.005 | 0.003 U | 0.009 | 0.005 | 0.002 U | 0.002 U | 0.001 U | 0.001 U | 0.01 U | 0.01 U | 0.05 U | 0.05 U | 0.003 U | 0.003 U | 0.079 | 0.082 | 0.006 | 0.006 U |
| | 07/21/03 | **0.004** | **0.003** | 0.007 | 0.005 | 0.024 | 0.012 | 0.002 U | 0.002 U | 0.001 U | 0.001 U | 0.01 | 0.01 U | 0.05 U | 0.05 U | 0.003 U | 0.003 U | 0.083 | 0.079 | 0.019 | 0.006 U |
| | 11/03/03 | **0.004** | **0.003** | 0.004 | 0.004 | 0.009 | 0.006 | 0.002 U | 0.002 U | 0.001 U | 0.001 U | 0.01 U | 0.01 U | 0.05 U | 0.05 U | 0.003 U | 0.003 U | 0.076 | 0.079 | 0.006 U | 0.006 U |
| | 01/19/04 | **0.003** | **0.005** | 0.006 | 0.003 | 0.016 | 0.010 | 0.003 | 0.002 U | 0.001 U | 0.001 U | 0.01 U | 0.01 U | 0.05 U | 0.05 U | 0.003 U | 0.003 U | 0.074 | 0.075 | 0.006 U | 0.006 U |
| | 04/12/04 | **0.003** | **0.003** | 0.004 | 0.004 | 0.010 | 0.006 | 0.002 U | 0.002 U | 0.001 U | 0.001 U | 0.01 U | 0.01 U | 0.05 U | 0.05 U | 0.003 U | 0.003 U | 0.077 | 0.083 | 0.006 U | 0.006 U |
| | 07/12/04 | **0.003** | **0.004** | 0.004 | 0.003 U | 0.011 | 0.007 | 0.002 U | 0.002 U | 0.001 U | 0.001 U | 0.01 U | 0.01 U | 0.05 U | 0.05 U | 0.003 U | 0.003 U | 0.070 | 0.068 | 0.006 U | 0.006 U |
| | 10/04/04 | **0.003** | **0.004** | 0.003 U | 0.003 U | 0.025 | 0.008 | 0.002 U | 0.002 U | 0.001 U | 0.001 U | 0.02 | 0.01 U | 0.05 U | 0.05 U | 0.003 U | 0.003 U | 0.071 | 0.072 | 0.007 | 0.006 U |
| | 01/04/05 | **0.004** | **0.004** | 0.007 | 0.004 | 0.022 | 0.006 | 0.002 | 0.002 U | 0.002 | 0.001 U | 0.02 | 0.01 U | 0.05 U | 0.05 U | 0.003 U | 0.003 U | 0.076 | 0.076 | 0.006 U | 0.006 U |
| | 04/04/05 | **0.003** | **0.004** | 0.005 | 0.004 | 0.010 | 0.006 | 0.002 U | 0.002 U | 0.001 U | 0.001 U | 0.01 U | 0.01 U | 0.05 U | 0.05 U | 0.003 U | 0.003 U | 0.075 | 0.077 | 0.006 U | 0.006 U |
| | 10/10/05 | **0.005** | **0.003** | NA | NA | NA | NA | NA | NA | 0.001 U | 0.001 U | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 04/03/06 | **0.004** | **0.003** | NA | NA | NA | NA | NA | NA | 0.001 U | 0.001 U | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 10/19/06 | **0.003** | **0.003** | NA | NA | NA | NA | NA | NA | 0.001 U | 0.001 U | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 04/02/07 | **0.004** | **0.004** | NA | NA | NA | NA | NA | NA | 0.001 U | 0.001 U | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 10/24/07 | **0.004** | **0.004** | NA | NA | NA | NA | NA | NA | 0.001 U | 0.001 U | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 04/02/08 | **0.003** | **0.003** | NA | NA | NA | NA | NA | NA | 0.001 U | 0.001 U | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 10/01/08 | **0.003** | **0.003** | NA | NA | NA | NA | NA | NA | 0.002 U | 0.002 U | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 04/02/09 | **0.0028** | **0.0028** | NA | NA | NA | NA | NA | NA | 0.001 U | 0.001 U | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 10/29/09 | **0.0027** | **0.0027** | NA | NA | NA | NA | NA | NA | 0.001 U | 0.001 U | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 04/05/10 | **0.0028** | **0.0028** | NA | NA | NA | NA | NA | NA | 0.001 U | 0.001 U | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |

**Table 14-3**
**Summary of Groundwater Analytical Results for Metals, (mg/L)**
**Esperance Sand**
**Boeing Everett Plant**

| Well ID | Sample Date | Arsenic | | Barium | | Chromium | | Copper | | Lead | | Nickel | | Selenium | | Silver | | Strontium | | Zinc | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Dissolved |
| MTCA Method A or B Groundwater Screening Level | | 0.005 (A) 0.0000583 (B) | | 3.2 (B) | | 0.05 (A) 24 ($Cr^{+3}$) (B) 0.048 ($Cr^{+6}$) (B) | | 0.592 (B) | | 0.015 (A) | | 0.32 (B) | | 0.080 (B) | | 0.080 (B) | | 9.6 (B) | | 4.8 (B) | |
| **EGW060** | 11/17/98 | **0.005** | **0.005** | 0.008 | 0.750 | **0.157** | 0.031 | NA | NA | 0.001 U | 0.001 U | NA | NA | 0.001 U | 0.001 U | 0.003 U | 0.003 | NA | NA | NA | NA |
| | 02/02/99 | **0.004** | **0.003** | 0.003 U | 0.003 U | 0.012 | 0.005 U | 0.002 U | 0.002 U | 0.001 U | 0.001 U | 0.010 U | 0.010 U | 0.001 U | 0.002 U | 0.003 U | 0.003 | 0.119 | 0.120 | 0.004 | 0.004 U |
| | 05/13/99 | **0.003** | **0.003** | 0.003 U | 0.003 U | 0.015 | 0.006 | 0.002 U | 0.002 U | 0.001 U | 0.001 U | 0.010 | 0.010 U | 0.001 U | 0.001 U | 0.003 U | 0.003 | 0.109 | 0.114 | 0.004 U | 0.004 U |
| | 08/04/99 | **0.004** | **0.004** | 0.003 U | 0.003 U | 0.011 | 0.006 | 0.002 U | 0.002 U | 0.001 U | 0.001 U | 0.010 | 0.010 | 0.001 U | 0.001 U | 0.003 U | 0.003 | 0.108 | 0.117 | 0.004 U | 0.004 U |
| | 08/04/99 (DUP) | **0.004** | **0.004** | 0.003 U | 0.003 U | 0.011 | 0.006 | 0.002 U | 0.002 U | 0.001 U | 0.001 U | 0.010 | 0.010 | 0.002 U | 0.002 U | 0.003 U | 0.003 | 0.109 | 0.119 | 0.026 | 0.007 |
| | 11/11/99 | **0.004** | **0.004** | 0.003 | 0.003 U | 0.012 | 0.006 | 0.002 U | 0.002 U | 0.001 U | 0.001 U | 0.010 U | 0.010 U | 0.002 U | 0.004 U | 0.003 U | 0.003 | 0.104 | 0.104 | 0.006 U | 0.006 U |
| | 02/07/00 | **0.003** | **0.003** | 0.004 | 0.004 | 0.007 | 0.005 | 0.002 U | 0.002 U | 0.001 U | 0.001 U | 0.010 U | 0.010 U | 0.002 U | 0.01 U | 0.003 U | 0.009 U | 0.110 | 0.114 | 0.006 U | 0.006 U |
| | 05/02/00 | **0.005** | **0.003** | 0.004 | 0.004 | 0.006 | 0.005 U | 0.002 U | 0.002 | 0.001 U | 0.001 U | 0.010 U | 0.010 U | 0.01 U | 0.01 U | 0.003 U | 0.003 | 0.105 | 0.107 | 0.006 U | 0.006 U |
| | 08/02/00 | **0.004** | **0.003** | 0.004 | 0.004 | 0.006 | 0.005 U | 0.002 U | 0.002 U | 0.001 U | 0.001 U | 0.01 U | 0.01 U | 0.002 U | 0.004 U | 0.003 U | 0.003 U | 0.106 | 0.113 | 0.006 U | 0.006 U |
| | 11/14/00 | **0.004** | **0.004** | 0.006 | 0.006 | 0.005 U | 0.005 U | 0.002 U | 0.002 U | 0.001 | 0.001 | 0.01 U | 0.01 U | 0.002 U | 0.004 U | 0.003 U | 0.003 U | 0.111 | 0.119 | 0.006 | 0.019 |
| | 02/05/01 | **0.004** | **0.004** | 0.005 | 0.006 | 0.007 | 0.005 U | 0.002 U | 0.002 U | 0.001 U | 0.001 U | 0.01 U | 0.01 U | 0.002 U | 0.002 U | 0.003 U | 0.003 U | 0.107 | 0.113 | 0.006 U | 0.006 U |
| | 05/03/01 | **0.004** | **0.004** | 0.006 | 0.006 | 0.008 | 0.005 U | 0.002 | 0.002 U | 0.001 U | 0.001 U | 0.01 U | 0.01 U | 0.002 U | 0.004 U | 0.003 U | 0.003 U | 0.116 | 0.120 | 0.006 U | 0.006 U |
| | 08/01/01 | **0.003** | **0.003** | 0.006 | 0.006 | 0.010 | 0.005 U | 0.002 U | 0.002 U | 0.001 U | 0.001 U | 0.01 U | 0.01 U | 0.002 U | 0.004 U | 0.003 U | 0.003 U | 0.113 | 0.111 | 0.007 | 0.006 U |
| | 11/09/01 | **0.004** | **0.004** | 0.006 | 0.006 | 0.006 | 0.005 U | 0.002 U | 0.002 U | 0.001 U | 0.001 U | 0.01 U | 0.01 U | 0.05 U | 0.05 U | 0.003 U | 0.003 U | 0.114 | 0.114 | 0.006 U | 0.006 U |
| | 02/04/02 | **0.005** | **0.004** | 0.006 | 0.007 | 0.005 U | 0.005 U | 0.002 U | 0.002 U | 0.001 U | 0.001 U | 0.01 U | 0.01 U | 0.05 U | 0.05 U | 0.003 U | 0.003 U | 0.109 | 0.115 | 0.006 U | 0.006 U |
| | 05/02/02 | **0.003** | **0.003** | 0.006 | 0.007 | 0.006 | 0.005 U | 0.002 U | 0.002 U | 0.001 U | 0.001 U | 0.01 U | 0.01 U | 0.05 U | 0.05 U | 0.003 UJ | 0.003 U | 0.108 | 0.112 | 0.006 U | 0.006 U |
| | 08/01/02 | **0.004** | **0.004** | 0.006 | 0.007 | 0.006 | 0.005 | 0.002 U | 0.002 U | 0.001 U | 0.001 U | 0.01 U | 0.01 U | 0.05 U | 0.05 U | 0.003 U | 0.003 U | 0.106 | 0.112 | 0.012 | 0.006 U |
| | 11/11/02 | **0.003** | **0.003** | 0.008 | 0.008 | 0.006 | 0.005 U | 0.002 U | 0.002 U | 0.001 U | 0.001 U | 0.01 U | 0.01 U | 0.05 U | 0.05 U | 0.003 U | 0.003 U | 0.102 | 0.114 | 0.006 U | 0.006 U |
| | 02/03/03 | **0.004** | **0.004** | 0.008 | 0.007 | 0.006 | 0.005 U | 0.002 U | 0.002 U | 0.001 U | 0.001 U | 0.01 U | 0.01 U | 0.05 U | 0.05 U | 0.003 U | 0.003 U | 0.114 | 0.116 | 0.006 U | 0.006 U |
| | 05/01/03 | **0.004** | **0.004** | 0.006 | 0.003 | 0.005 U | 0.005 U | 0.002 U | 0.002 U | 0.001 U | 0.001 U | 0.01 U | 0.01 U | 0.05 U | 0.05 U | 0.003 U | 0.003 U | 0.100 | 0.106 | 0.006 | 0.006 U |
| | 07/21/03 | **0.004** | **0.004** | 0.008 | 0.007 | 0.005 U | 0.005 | 0.002 U | 0.002 U | 0.001 U | 0.001 U | 0.01 U | 0.01 U | 0.05 U | 0.05 U | 0.003 U | 0.003 U | 0.104 | 0.111 | 0.006 U | 0.006 U |
| | 11/03/03 | **0.003** | **0.002** | 0.006 | 0.006 | 0.005 U | 0.006 | 0.002 U | 0.002 U | 0.001 U | 0.001 U | 0.01 U | 0.01 U | 0.05 U | 0.05 U | 0.003 U | 0.003 U | 0.112 | 0.114 | 0.006 U | 0.006 U |
| | 01/19/04 | **0.004** | **0.004** | 0.008 | 0.007 | 0.007 | 0.006 | 0.002 U | 0.002 U | 0.001 U | 0.001 U | 0.01 U | 0.01 U | 0.05 U | 0.05 U | 0.003 U | 0.003 U | 0.108 | 0.114 | 0.006 U | 0.006 U |
| | 04/12/04 | **0.003** | **0.003** | 0.007 | 0.006 | 0.005 U | 0.005 U | 0.002 U | 0.002 U | 0.001 U | 0.001 U | 0.01 U | 0.01 U | 0.05 U | 0.05 U | 0.003 U | 0.003 U | 0.120 | 0.107 | 0.006 U | 0.006 U |
| | 07/12/04 | **0.004** | **0.004** | 0.006 | 0.005 | 0.005 U | 0.005 U | 0.002 U | 0.002 U | 0.001 U | 0.001 U | 0.01 U | 0.01 U | 0.05 U | 0.05 U | 0.003 U | 0.003 U | 0.099 | 0.106 | 0.006 U | 0.006 U |
| | 10/04/04 | **0.003** | **0.004** | 0.006 | 0.005 | 0.005 | 0.005 U | 0.002 U | 0.002 U | 0.001 U | 0.001 U | 0.01 U | 0.01 U | 0.05 U | 0.05 U | 0.003 U | 0.003 U | 0.112 | 0.116 | 0.006 U | 0.006 U |
| | 01/04/05 | **0.003** | **0.004** | 0.008 | 0.006 | 0.006 | 0.005 U | 0.002 U | 0.002 U | 0.001 U | 0.001 U | 0.01 U | 0.01 U | 0.05 U | 0.05 U | 0.003 U | 0.003 U | 0.114 | 0.118 | 0.006 U | 0.006 U |
| | 04/04/05 | **0.004** | **0.004** | 0.007 | 0.006 | 0.005 U | 0.005 U | 0.002 U | 0.002 U | 0.001 U | 0.001 U | 0.01 U | 0.01 U | 0.05 U | 0.05 U | 0.003 U | 0.003 U | 0.104 | 0.114 | 0.006 U | 0.006 U |
| | 10/10/05 | **0.004** | **0.004** | NA | NA | NA | NA | NA | NA | 0.001 U | 0.001 U | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 04/03/06 | **0.004** | **0.003** | NA | NA | NA | NA | NA | NA | 0.001 U | 0.001 U | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 10/19/06 | **0.004** | **0.006** | NA | NA | NA | NA | NA | NA | 0.001 U | 0.001 U | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 04/02/07 | **0.004** | **0.005** | NA | NA | NA | NA | NA | NA | 0.001 U | 0.001 U | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 10/24/07 | **0.004** | **0.004** | NA | NA | NA | NA | NA | NA | 0.001 U | 0.001 U | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 04/02/08 | **0.003** | **0.003** | NA | NA | NA | NA | NA | NA | 0.001 U | 0.001 U | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 10/01/08 | **0.003** | **0.003** | NA | NA | NA | NA | NA | NA | 0.002 U | 0.002 U | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 04/02/09 | **0.0030** | **0.0032** | NA | NA | NA | NA | NA | NA | 0.001 U | 0.001 U | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 10/29/09 | **0.0030** | **0.0030** | NA | NA | NA | NA | NA | NA | 0.001 U | 0.001 U | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 04/05/10 | **0.0032** | **0.0033** | NA | NA | NA | NA | NA | NA | 0.001 U | 0.001 U | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |

**Table 14-3**
**Summary of Groundwater Analytical Results for Metals, (mg/L)**
**Esperance Sand**
**Boeing Everett Plant**

| Well ID | Sample Date | Arsenic | | Barium | | Chromium | | Copper | | Lead | | Nickel | | Selenium | | Silver | | Strontium | | Zinc | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Dissolved |
| MTCA Method A or B Groundwater Screening Level | | 0.005 (A) 0.0000583 (B) | | 3.2 (B) | | 0.05 (A) 24 ($Cr^{+3}$) (B) 0.048 ($Cr^{+6}$) (B) | | 0.592 (B) | | 0.015 (A) | | 0.32 (B) | | 0.080 (B) | | 0.080 (B) | | 9.6 (B) | | 4.8 (B) | |
| **EGW061** | 11/17/98 | **0.010** | **0.010** | 0.003 U | 0.636 | **0.086** | 0.032 | NA | NA | 0.001 U | 0.001 U | NA | NA | 0.001 U | 0.001 U | 0.003 U | 0.003 U | NA | NA | NA | NA |
| | 02/02/99 | **0.010** | **0.009** | 0.007 | 0.003 U | **0.088** | 0.008 | 0.014 | 0.004 | 0.001 | 0.001 U | 0.050 | 0.010 U | 0.001 U | 0.001 U | 0.003 U | 0.003 U | 0.093 | 0.089 | 0.01 | 0.004 U |
| | 05/13/99 | **0.009** | **0.009** | 0.004 | 0.003 U | 0.021 | 0.009 | 0.006 | 0.003 | 0.001 U | 0.001 U | 0.010 | 0.010 U | 0.001 | 0.001 U | 0.003 U | 0.003 U | 0.085 | 0.086 | 0.004 U | 0.004 U |
| | 08/04/99 | **0.010** | **0.009** | 0.009 | 0.006 | 0.026 | 0.005 U | 0.002 | 0.002 U | 0.001 U | 0.001 U | 0.020 | 0.010 | 0.001 U | 0.001 U | 0.003 U | 0.003 U | 0.088 | 0.092 | 0.013 | 0.006 |
| | 11/11/99 | **0.009** | **0.011** | 0.008 | 0.007 | 0.013 | 0.006 | 0.002 U | 0.002 U | 0.001 | 0.001 U | 0.010 U | 0.010 U | 0.002 U | 0.002 U | 0.003 U | 0.003 U | 0.089 | 0.091 | 0.007 | 0.006 U |
| | 02/07/00 | **0.011** | **0.010** | 0.005 | 0.005 | 0.008 | 0.008 | 0.002 | 0.003 | 0.001 U | 0.001 U | 0.010 U | 0.010 U | 0.002 U | 0.002 U | 0.003 U | 0.009 U | 0.088 | 0.089 | 0.006 U | 0.006 U |
| | 05/02/00 | **0.011** | **0.010** | 0.005 | 0.005 | 0.008 | 0.008 | 0.005 | 0.008 | 0.001 U | 0.001 U | 0.010 U | 0.010 U | 0.002 U | 0.002 U | 0.003 U | 0.003 U | 0.085 | 0.087 | 0.006 U | 0.006 U |
| | 08/02/00 | **0.010** | **0.010** | 0.005 | 0.005 | 0.008 | 0.005 | 0.007 | 0.005 | 0.001 U | 0.001 U | 0.01 U | 0.01 U | 0.002 U | 0.002 U | 0.003 U | 0.003 U | 0.087 | 0.090 | 0.006 U | 0.006 U |
| | 11/14/00 | **0.010** | **0.010** | 0.005 | 0.006 | 0.008 | 0.006 | 0.004 | 0.003 | 0.001 U | 0.001 U | 0.01 U | 0.01 U | 0.002 U | 0.002 U | 0.003 U | 0.003 U | 0.081 | 0.092 | 0.006 U | 0.006 U |
| | 02/05/01 | **0.012** | **0.010** | 0.005 | 0.005 | 0.011 | 0.006 | 0.006 | 0.008 | 0.001 U | 0.001 U | 0.01 U | 0.01 U | 0.002 U | 0.004 U | 0.003 U | 0.003 U | 0.083 | 0.088 | 0.006 U | 0.006 U |
| | 05/03/01 | **0.012** | **0.011** | 0.005 | 0.006 | 0.010 | 0.007 | 0.009 | 0.010 | 0.001 U | 0.001 U | 0.01 U | 0.01 U | 0.002 U | 0.002 U | 0.003 U | 0.003 U | 0.084 | 0.093 | 0.006 U | 0.006 U |
| | 08/01/01 | **0.012** | **0.009** | 0.005 | 0.005 | 0.013 | 0.008 | 0.009 | 0.003 | 0.001 U | 0.001 U | 0.01 U | 0.01 U | 0.002 U | 0.002 U | 0.003 U | 0.003 U | 0.083 | 0.090 | 0.006 U | 0.006 U |
| | 11/09/01 | **0.011** | **0.010** | 0.005 | 0.005 | 0.013 | 0.007 | 0.015 | 0.005 | 0.001 U | 0.001 U | 0.01 U | 0.01 U | 0.05 U | 0.05 U | 0.003 U | 0.003 U | 0.088 | 0.087 | 0.006 U | 0.006 U |
| | 02/04/02 | **0.012** | **0.011** | 0.005 | 0.005 | 0.017 | 0.009 | 0.013 | 0.008 | 0.001 U | 0.001 U | 0.01 U | 0.01 U | 0.05 U | 0.05 U | 0.003 U | 0.003 U | 0.081 | 0.086 | 0.006 U | 0.006 U |
| | 05/02/02 | **0.010** | **0.011** | 0.006 | 0.006 | 0.010 | 0.009 | 0.008 | 0.005 | 0.001 U | 0.001 U | 0.01 U | 0.01 U | 0.05 U | 0.05 U | 0.003 UJ | 0.003 U | 0.082 | 0.087 | 0.006 U | 0.006 U |
| | 08/01/02 | **0.011** | **0.012** | 0.005 | 0.005 | 0.012 | 0.009 | 0.009 | 0.006 | 0.001 U | 0.001 U | 0.01 U | 0.01 U | 0.05 U | 0.05 U | 0.003 U | 0.003 U | 0.082 | 0.087 | 0.006 U | 0.006 U |
| | 11/11/02 | **0.010** | **0.010** | 0.006 | 0.006 | 0.008 | 0.007 | 0.008 | 0.005 | 0.001 U | 0.001 U | 0.01 U | 0.01 U | 0.05 U | 0.05 U | 0.003 U | 0.003 U | 0.083 | 0.087 | 0.006 U | 0.006 U |
| | 02/03/03 | **0.011** | **0.011** | 0.005 | 0.006 | 0.008 | 0.006 | 0.002 U | 0.002 U | 0.001 U | 0.001 U | 0.01 U | 0.01 U | 0.05 U | 0.05 U | 0.003 U | 0.003 U | 0.086 | 0.090 | 0.006 U | 0.006 U |
| | 05/01/03 | **0.012** | **0.011** | 0.005 | 0.003 U | 0.008 | 0.005 | 0.002 | 0.002 U | 0.001 U | 0.001 U | 0.01 U | 0.01 U | 0.05 U | 0.05 U | 0.003 U | 0.003 U | 0.082 | 0.084 | 0.006 U | 0.006 U |
| | 07/21/03 | **0.011** | **0.011** | 0.006 | 0.006 | 0.008 | 0.008 | 0.003 | 0.002 | 0.001 U | 0.001 U | 0.01 U | 0.01 U | 0.05 U | 0.05 U | 0.003 U | 0.003 U | 0.083 | 0.088 | 0.006 U | 0.006 U |
| | 11/03/03 | **0.010** | **0.007** | 0.006 | 0.005 | 0.009 | 0.007 | 0.004 | 0.002 | 0.001 U | 0.001 U | 0.01 U | 0.01 U | 0.05 U | 0.05 U | 0.003 U | 0.003 U | 0.090 | 0.092 | 0.008 | 0.006 U |
| | 01/19/04 | **0.010** | **0.011** | 0.008 | 0.005 | 0.015 | 0.013 | 0.004 | 0.002 U | 0.001 U | 0.001 U | 0.01 U | 0.01 U | 0.05 U | 0.05 U | 0.003 U | 0.003 U | 0.087 | 0.090 | 0.011 | 0.006 U |
| | 04/12/04 | **0.010** | **0.010** | 0.005 | 0.005 | 0.008 | 0.005 | 0.002 | 0.002 U | 0.001 U | 0.001 U | 0.01 U | 0.01 U | 0.05 U | 0.05 U | 0.003 U | 0.003 U | 0.093 | 0.099 | 0.006 U | 0.006 U |
| | 07/12/04 | **0.009** | **0.012** | 0.005 | 0.004 | 0.010 | 0.006 | 0.003 | 0.002 U | 0.001 U | 0.001 U | 0.01 U | 0.01 U | 0.05 U | 0.05 U | 0.003 U | 0.003 U | 0.077 | 0.084 | 0.006 U | 0.006 U |
| | 10/04/04 | **0.010** | **0.011** | 0.005 | 0.003 | 0.006 | 0.006 | 0.002 U | 0.002 U | 0.001 U | 0.001 U | 0.01 U | 0.01 U | 0.05 U | 0.05 U | 0.003 U | 0.003 U | 0.084 | 0.090 | 0.006 U | 0.006 U |
| | 01/04/05 | **0.011** | **0.012** | 0.007 | 0.005 | 0.007 | 0.005 | 0.002 | 0.002 U | 0.001 U | 0.001 U | 0.01 U | 0.01 U | 0.05 U | 0.05 U | 0.003 U | 0.003 U | 0.089 | 0.091 | 0.006 U | 0.006 U |
| | 04/04/05 | **0.011** | **0.012** | 0.005 | 0.005 | 0.007 | 0.005 U | 0.002 U | 0.002 U | 0.001 U | 0.001 | 0.01 U | 0.01 U | 0.05 U | 0.05 U | 0.003 U | 0.003 U | 0.087 | 0.092 | 0.007 | 0.008 |
| | 10/10/05 | **0.011** | **0.011** | NA | NA | NA | NA | NA | NA | 0.001 U | 0.001 U | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 04/03/06 | **0.009** | **0.009** | NA | NA | NA | NA | NA | NA | 0.001 U | 0.001 U | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 10/19/06 | **0.011** | **0.010** | NA | NA | NA | NA | NA | NA | 0.001 U | 0.001 U | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 04/02/07 | **0.011** | **0.012** | NA | NA | NA | NA | NA | NA | 0.001 U | 0.001 U | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 10/24/07 | **0.010** | **0.011** | NA | NA | NA | NA | NA | NA | 0.001 U | 0.001 U | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 04/02/08 | **0.011** | **0.011** | NA | NA | NA | NA | NA | NA | 0.001 U | 0.001 U | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 10/01/08 | **0.009** | **0.009** | NA | NA | NA | NA | NA | NA | 0.005 U | 0.005 U | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 04/02/09 | **0.0099** | **0.0095** | NA | NA | NA | NA | NA | NA | 0.001 U | 0.001 U | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 10/29/09 | **0.0109** | **0.0100** | NA | NA | NA | NA | NA | NA | 0.001 U | 0.001 U | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 04/05/10 | **0.0105** | **0.0104** | NA | NA | NA | NA | NA | NA | 0.001 U | 0.001 U | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |

**Notes:**

Values in **bold** font indicate that the result reported exceeds the most current MTCA levels based on the Ecology website.

Model Toxics Control Act (MTCA) Cleanup Regulation, WAC 173-340. MTCA Method A and B values are from Ecology website CLARC tables downloaded June 2010. (https://fortress.wa.gov/ecy/clarc/reporting/CLARCReporting.aspx).

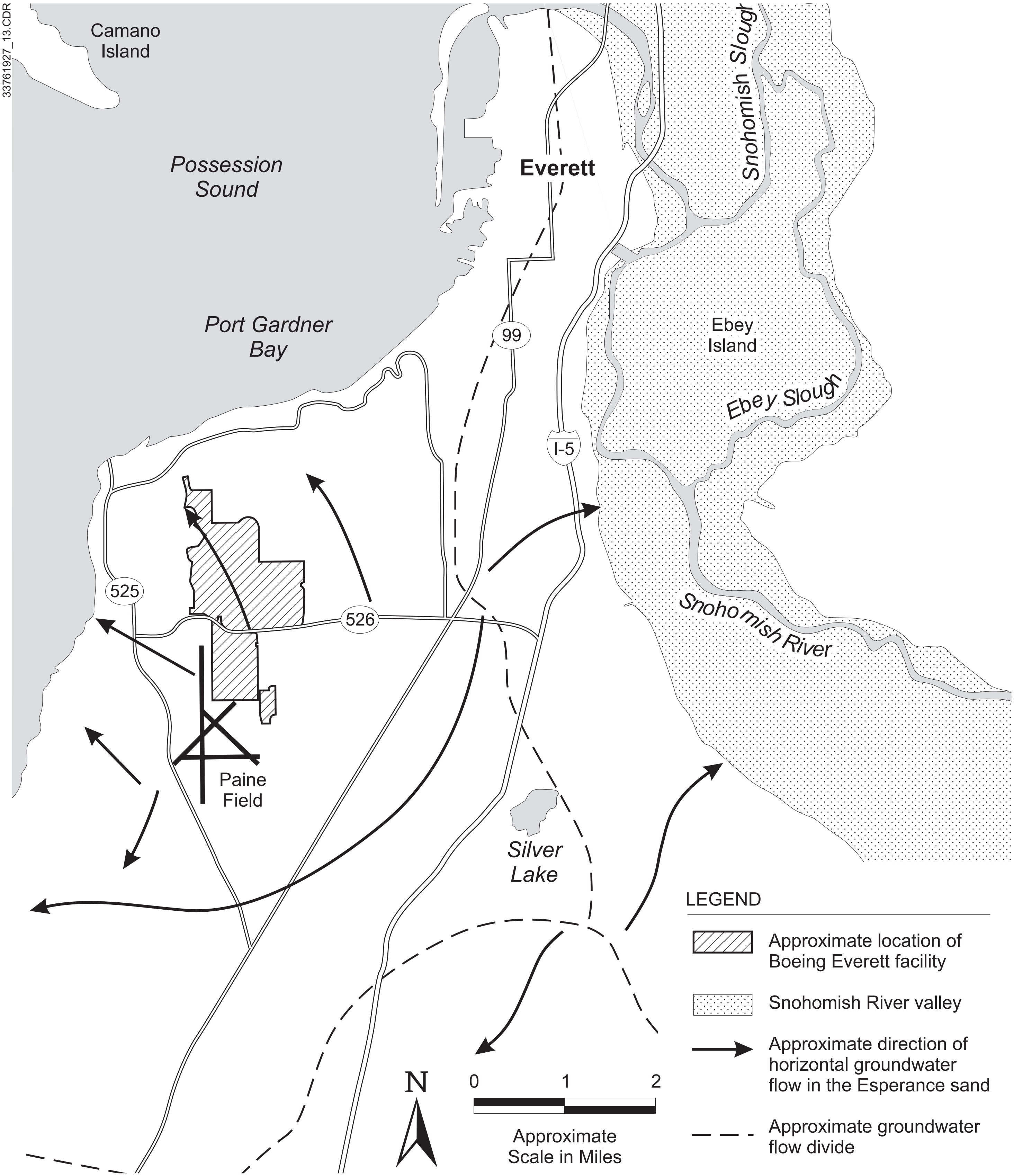
(A) - MTCA Method A (B) - MTCA Method B

(DUP) - Field duplicate

NA - Not Analyzed

U - Compound was analyzed for but not detected above the reporting limit shown.

Samples were analyzed for cadmium and mercury but these metals were not detected above the method reporting limits in any of the samples.



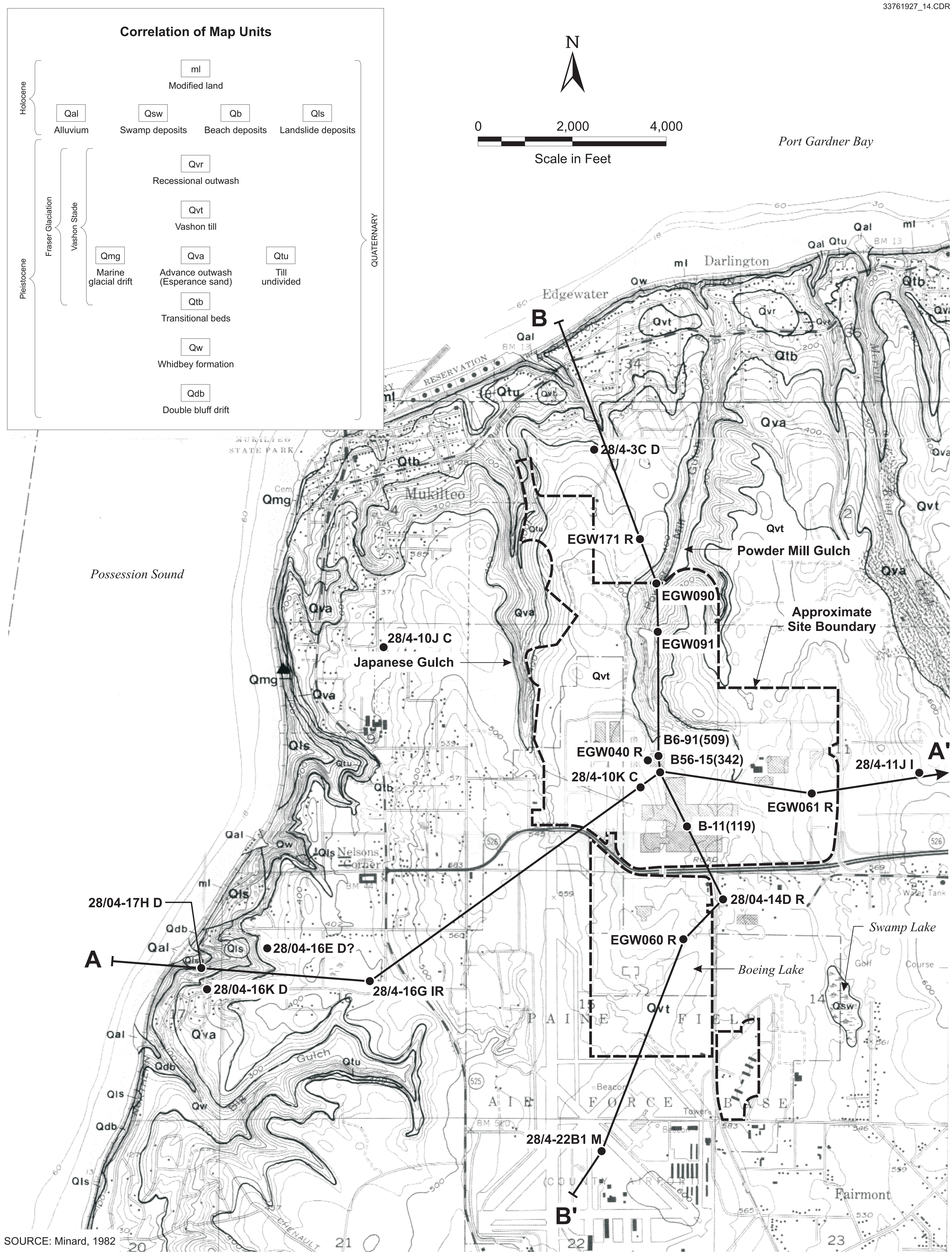

SOURCE: After Newcomb, 1952, CH2M Hill, 1991, and USGS, 1997.

Figure 14-1

**GENERALIZED REGIONAL GROUNDWATER FLOW IN THE ESPERANCE SAND**

Job No. 33761927

33761927_14.CDR




LEGEND

A A' Line of geologic cross section (Figures 14-5 and 14-6)

? ● Well/soil boring location (locations approximate, queried where uncertain):

- **B1(119)** Dames & Moore soil boring (job number)
- **28/04-14D** Ecology state well number
- **EGW040** Boeing well number

Line of contact between geologic map units

Property boundary

REPORTED WELL USE

- **M** Municipal well
- **C** Cathodic protection well
- **R** Resource protection or test well
- **I** Industrial well
- **D** Domestic well

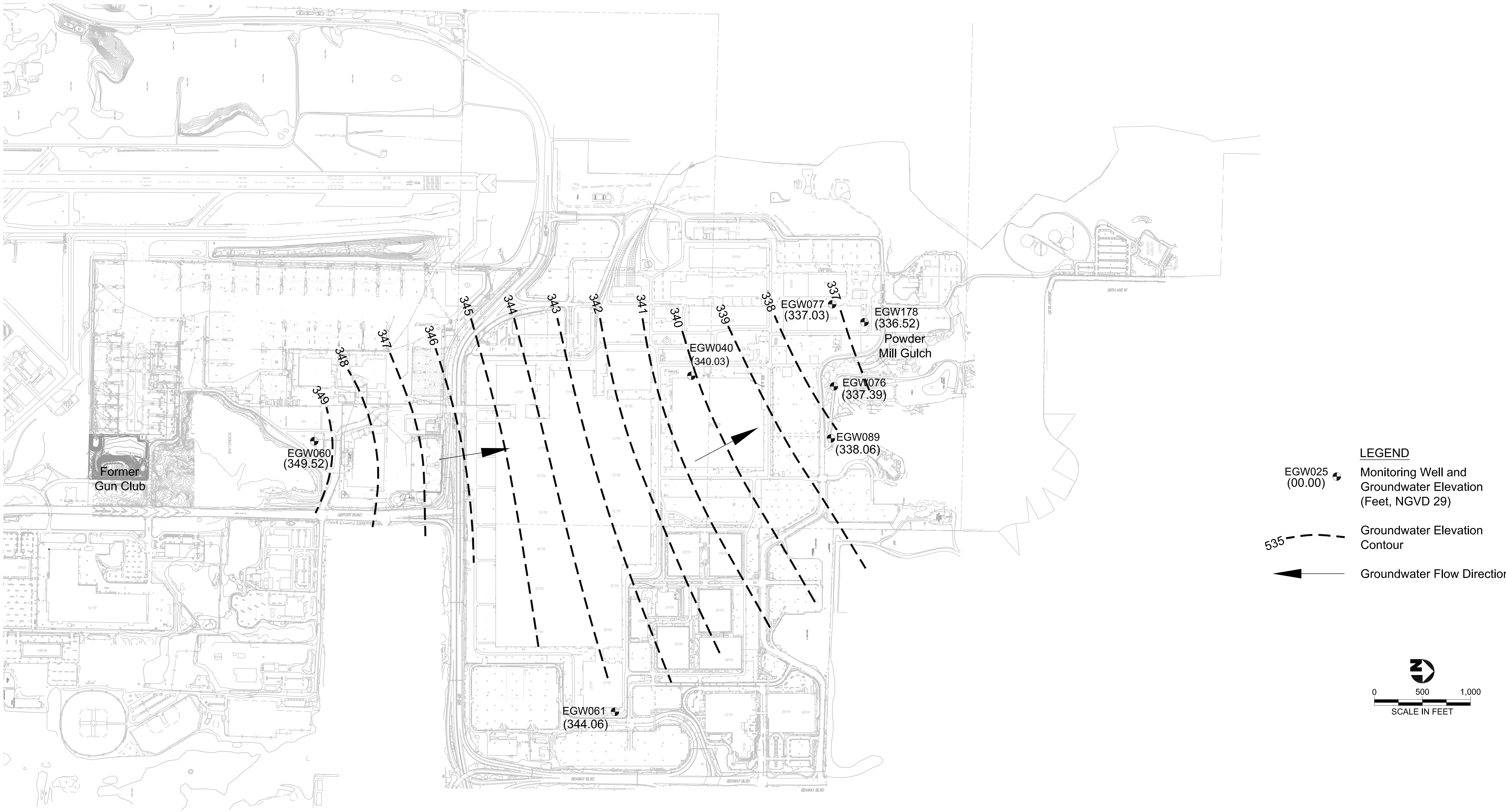
Figure 14-2

## REGIONAL TOPOGRAPHY AND GEOLOGY

Job No. 33761927

URS

Boeing Commercial Airplanes, Everett Plant
Remedial Investigation Report



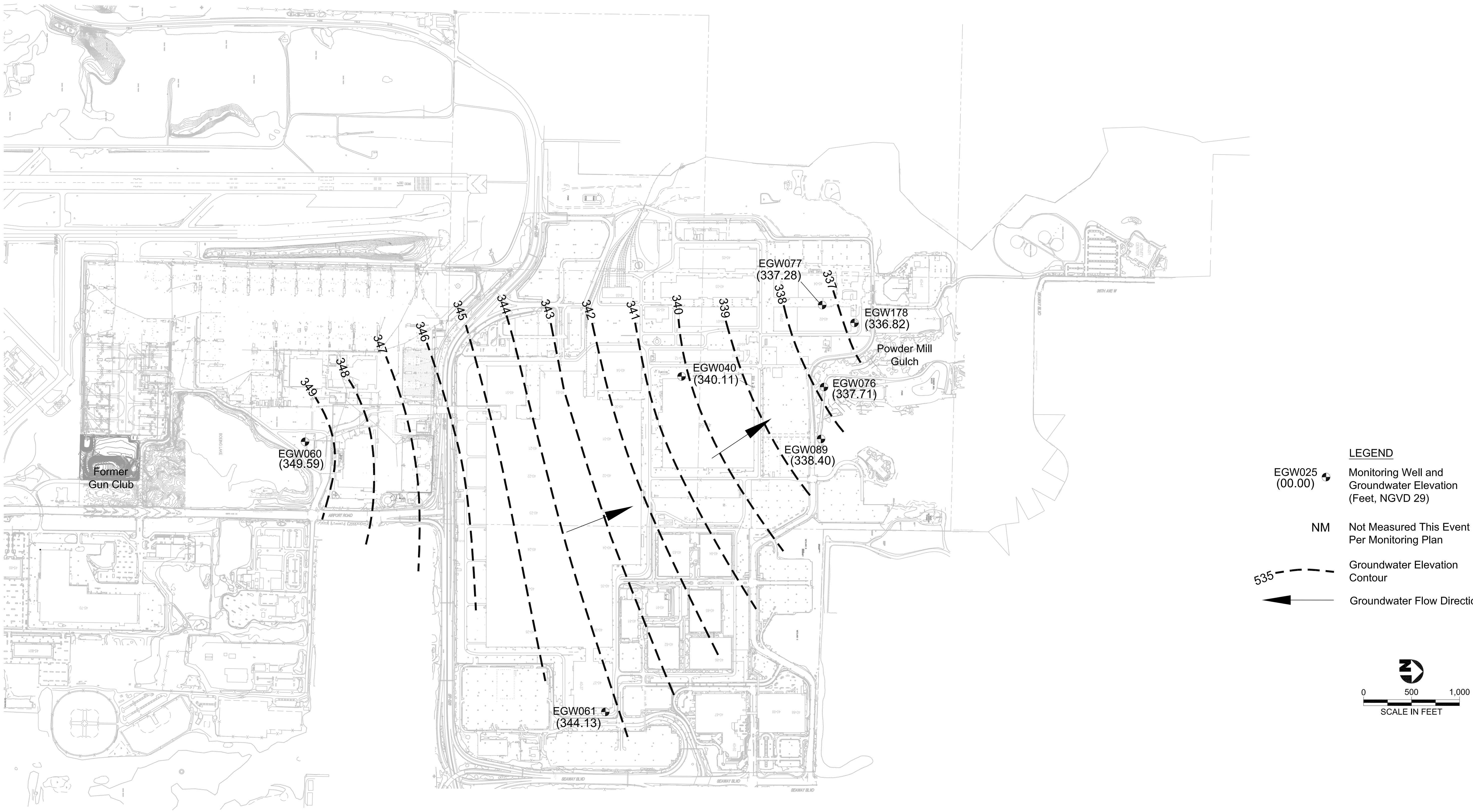

Note: Groundwater elevations at EEGW 177 and EGW 178 were measured on December 17, 2009

Figure 14-3
**Groundwater Elevations Contour Map**
**Upland Esperance Sands - October 2009**

Job No. 33761927

URS
Q:\geo\Boeing\Everett\RI\2010\Fig 14-3 Upland Oct 09.dwg
Mod: 11/15/2010, 09:57 | Plotted: 11/16/2010, 14:29 | john_knobbs

Boeing Commercial Airplanes, Everett Plant
REMEDIAL INVESTIGATION REPORT



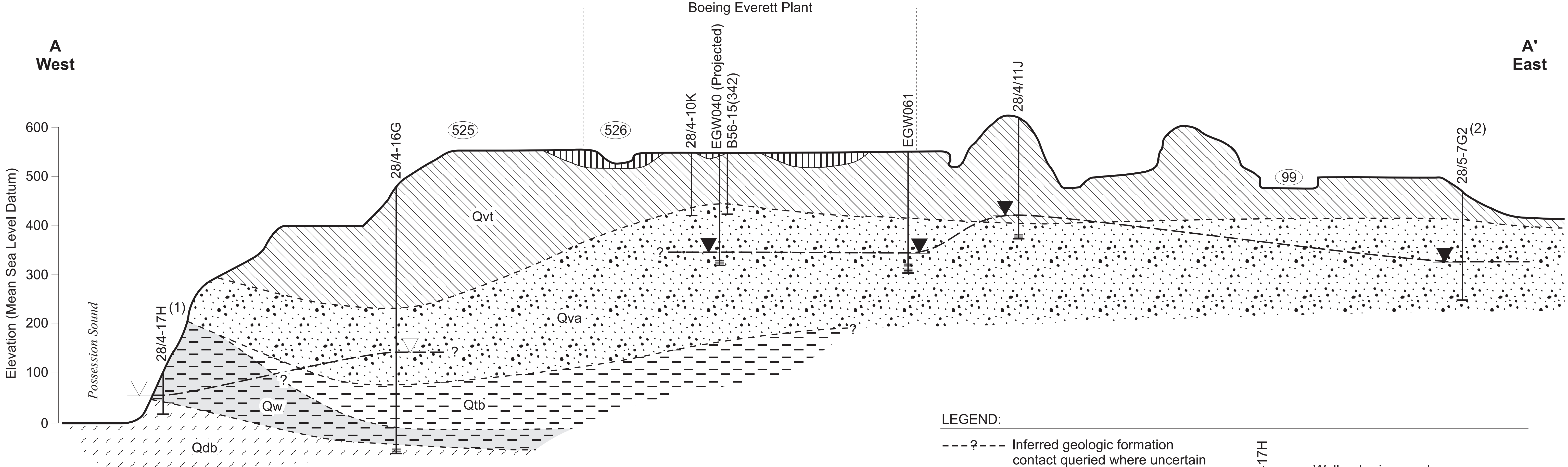

Job No. 33761927

**Figure 14-4**
**Groundwater Elevations Contour Map**
**Upland Esperance Sands - April 2010**

URS Q:\geo\Boeing\Everett\RI\2010\Fig 14-4 Upland April 2010.dwg
Mod: 12/13/2010, 14:26 | Plotted: 12/13/2010, 14:32 | john_knobbs

Boeing Commercial Airplanes, Everett Plant
REMEDIAL INVESTIGATION REPORT

33762736_27.cdr




LEGEND:

- - - ? - - - Inferred geologic formation contact queried where uncertain

Fill

Qvt Vashon till

Qva Esperance Sand

Qtb Transition beds – undifferentiated Lawton Clay and Olympia beds

Qw Whidbey Fm.

Qdb Double Bluff drift

525 State highway

28/4-17H Well or boring number

Esperance Sand groundwater level reported on well or boring log

Double Bluff Drift groundwater level reported on well log

Well screened interval

Total depth of well or boring

— — — — Interpreted groundwater potentiometric surface

0 2000 4000

Horizontal Scale in Feet
Vertical Exaggeration 10:1

NOTES:

(1) No well screen installed.

(2) Well screen data not available. Ground water level from drill log.

*Modified after CH2M Hill, 1991, Minard, 1982 and USGS 1997.*

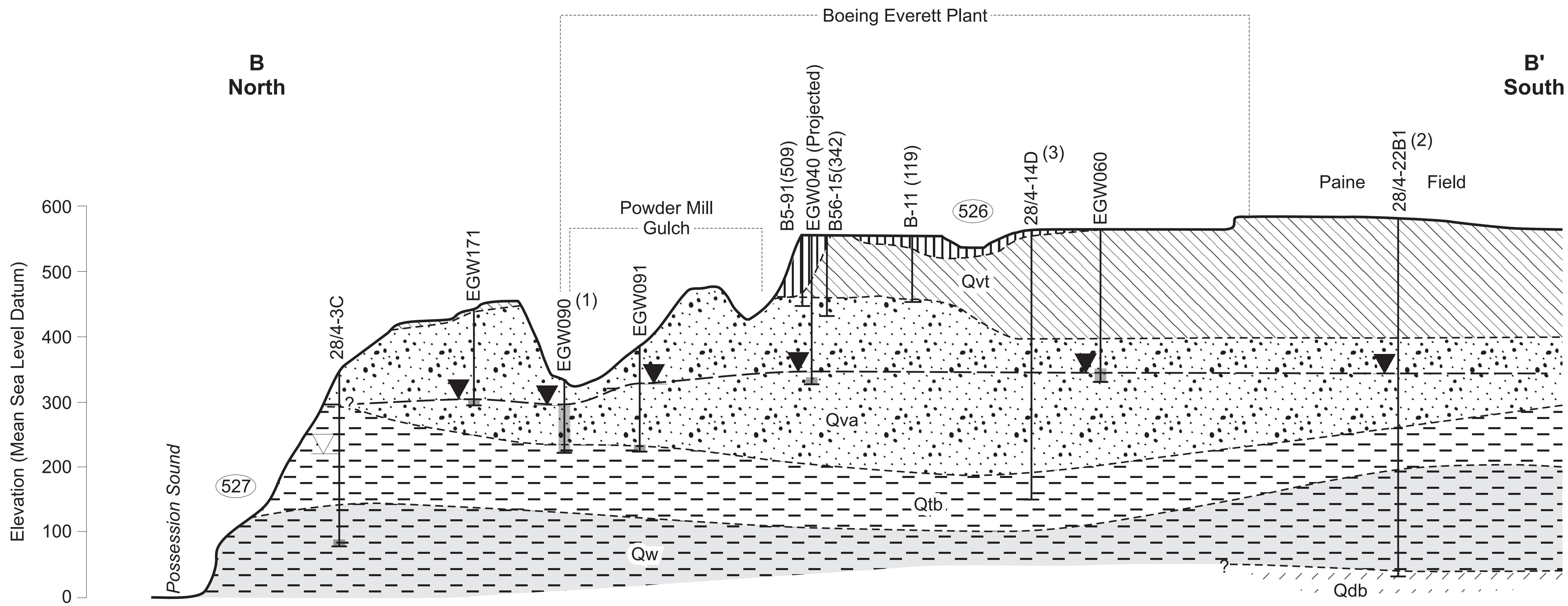
Job No. 33762736

**Figure 14-5**

**HYDROGEOLOGIC CROSS-SECTION A-A'**

URS

Boeing Commercial Airplanes, Everett Plant
Remedial Investigation Report




NOTES:

(1) EGW090 has five discrete, 6 ft screened intervals between depth of 37 ft and 103 ft below ground surface.

(2) Well screen data not available. Groundwater level in Esperance Sand from well log.

(3) Well screen and groundwater level data not available.

LEGEND:

- Inferred geologic formation contact queried where uncertain
- Fill
- Qvt — Vashon till
- Qva — Esperance Sand
- Qtb — Transition beds – undifferentiated Lawton Clay and Olympia beds
- Qw — Whidbey Fm.
- Qdb — Double Bluff drift
- 525 — State highway
- 28/4-17H — Well or boring number
- Esperance Sand groundwater level reported on well or boring log
- Whidbey Fm. groundwater level reported on well log
- Well screened interval
- Total depth of well or boring
- Interpreted groundwater potentiometric surface

0 2000 4000

Horizontal Scale in Feet
Vertical Exaggeration 10:1

*Modified after CH2M Hill, 1991, Minard, 1982 and USGS 1997.*

Job No. 33762736

**Figure 14-6**

## HYDROGEOLOGIC CROSS SECTION B-B'

URS

# 15.0 BUILDING 40-24

Presented in this section are the results of the subsurface investigation of two Attachment 5 SWMUs/AOCs located in or near Building 40-24 at the Everett Plant (Figure 15-1). These SWMUs/AOCs include:

- No. 055 – Former central hydraulic system waste tanks (EV-75 and EV-76)
- No. 168 – Utility sumps and trenches

The subsurface conditions, prior investigations, and description of these SWMUs/AOCs are presented in Section 3.0 of the IAWP. This investigation was performed in accordance with Section 3.4 of the IAWP, supplemental SAP (Dames & Moore, 1998), Section 3.5 of the Supplemental RIWP (Dames & Moore, 2000), and a Supplemental RIWP for Building 40-24 Vault E (URS, 2001).

## 15.1 SWMU/AOC NO. 055 FORMER CENTRAL HYDRAULIC SYSTEM WASTE TANKS (EV-75 AND EV-76)

SWMU/AOC No. 055 is located near the central portion of Building 40-24 (Figure 15-1). SWMU/AOC No. 055 consisted of two single-wall stainless steel 500-gallon tanks that were used to receive waste phosphate-based hydraulic fluids (Washington State only WT02 dangerous waste) collected in subgrade utility trenches and sumps. These tanks were used to store waste hydraulic fluid resulting from aircraft hydraulic testing, final assembly, and maintenance. The hydraulic oil used in Building 40-24 was a phosphate ester based hydraulic fluid such as Solutia (formerly Monsanto), Skydrol LD-4™, and Chevron Hyjet IVA™. The principal dangerous constituents in this fluid are tributyl phosphate (TBP), dibutyl phenyl phosphate (DPP), butyl diphenyl phosphate (BDP), triphenyl phosphate (TPP), 2,6- di-tert-butyl-p-cresol (also known as butylated hydroxytoluene or BHT). BHT was not known to be a component of the hydraulic fluid until after completion of the initial investigation. Consequently this compound was not analyzed for in soil samples collected in the area of this SWMU/AOC.

The phosphate based hydraulic fluids all have a very low solubility in water and a density that varies with temperature as well as the specific product. The available data indicates that between about 20°-24°C the density declines to less than 1.0 (i.e. less than water) and thus it would float on top of groundwater. At lower temperatures, the density increases to greater than 1.0 and the fluid would sink below the groundwater surface. Therefore, at typical groundwater temperatures, the hydraulic fluid would be expected to sink.

The tanks were located below grade in concrete vaults on the base level of an adjacent utility trench and were removed in 1993. The results of previous investigations indicate all four constituents of hydraulic fluid were detected in subsurface soil samples collected and analyzed from the former tank and utility trench area (SECOR 1994 a, b). TBP was the predominant constituent detected in the soil and was detected at concentrations up to 1,900 mg/kg in glacial till soil beneath the former tank vault at a depth of 17 ½ feet bgs in boring PVB-4. DPP was also typically present at lower concentrations in samples with detected TBP. Further details on SWMU/AOC No. 055 are presented in Section 3.0 of the IAWP.

### 15.1.1 Purpose and Scope

The purpose of the investigation was to assess whether potential dangerous constituents are present in the fill and glacial till soil beneath former tanks EV-75 and EV-76. The scope of investigation performed was in general accordance with Section 3.4.2 of the IAWP and included the following:

- Completed three soil borings to depths ranging from 50½ feet to 60½ feet bgs using a limited access hollow stem auger drill rig
- Collected soil samples at prescribed depth intervals
- Field screened samples for organic vapors
- Submitted selected soil samples for analysis for the four phosphate compounds, VOCs, SVOCs
- Submitted selected soil samples for physical testing

The deviations from the planned scope of investigation included: (1) the planned lysimeter installation was not completed after mutual agreement with Ecology, and (2) one soil boring (ESB1332) was completed to a depth of 50½ feet, rather than the originally planned depth of 60 feet, due to drilling refusal. Screening levels used for the hydraulic fluid constituents during the RI were calculated by Boeing using the 1996 MTCA Method B cleanup level methodology and available exposure data for these constituents (see Appendix N4). The screening levels were approved by Ecology for use during the RI. However, these values will be re-evaluated and updated as appropriate during the FS based on the applicable MTCA Method B methodology and updated exposure and toxicological data that may be available.

### 15.1.2 Documentation of Drilling and Sampling

On November 16, 17, and 18, 1998, Dames & Moore monitored the drilling of three soil borings (ESB1332 through ESB1334) in the area of SWMU/AOC No. 055 as shown on Figure 15-1. Three soil borings were completed to depths ranging from 50½ feet to 60½ feet adjacent to (ESB1332 and ESB1334) and through (ESB1333) the base of the tank vault. Samples were retrieved using Dames & Moore U-type and SPT split spoon samplers. The Dames & Moore sampler was fitted with stainless steel rings. The samples collected using the SPT split spoon sampler were transferred to laboratory prepared glassware using a cleaned stainless steel spoon. After sampling was completed, the borings were backfilled with hydrated bentonite chips and capped with concrete. Drilling techniques and sampling procedures utilized were in general accordance with the SAP presented in Appendix B of the IAWP.

### 15.1.3 Field Observations and Sample Analysis Results

Presented in this section are the field observations and sample results associated with soil borings ESB1332 through ESB1334. The locations of the soil borings and two geologic cross section locations through the former tank area are presented on Figure 15-2. The cross sections are presented on Figures 15-3 and 15-5. Geologic logs of the borings are presented in Appendix N1. The chain-of-custody forms and analytical laboratory reports are presented in Appendix N2. Data validation reports are in Appendix N3. Physical testing laboratory reports are presented in Appendix N4. Analytical results are summarized in Tables 15-1 and 15-2, and selected results are shown on Figures 15-3, 15-5, and 15-9.

#### 15.1.3.1 Field Observations

The area investigated is covered with an approximate 12-inch thick concrete floor slab. The base of the tank vault extends to a depth of 9 feet bgs. Fill soil consisting of gravel was encountered beneath the base of the vault to a depth of 10½ feet bgs. Fill soil consisting of medium to coarse sand was encountered in the two borings (ESB1332 and ESB1334) north and south of the vault to a depth of approximately 11 to 13 feet bgs. Underlying the sand and gravel fill is very dense weathered glacial till consisting of silty sand with a trace of gravel to a depth of approximately 17 to 20 feet bgs. Beneath this soil was unweathered glacial till consisting of sandy silt and silty sand extending to the maximum depth investigated of 60½ feet bgs. In boring ESB1334, medium to coarse sand was encountered between the depths of 55 feet and 60 feet bgs. Groundwater was not encountered to the maximum depth investigated of 60½ feet bgs.

#### 15.1.3.2 Sample Analytical Results

Staining or other visual indications of dangerous constituents were not observed. PID readings did not indicate organic vapors above background ambient levels in the soil samples screened.

Selected soil samples from depths ranging from 12½ feet to 60 feet bgs were submitted for analysis for phosphate compounds per the SAP (Appendix B of the IAWP). In addition, three samples were selected for analysis for VOCs and SVOCs to provide baseline concentrations for these compounds, if present, in the event future bench scale testing of phosphate compound degradation is conducted. Table 15-1 summarizes the analytical results of the four phosphate compounds in soil and also lists the MTCA Method B cleanup levels calculated by Boeing and used as screening levels for this RI (Appendix N4). The analytical results indicate these phosphate compounds were not detected at concentrations above the method reporting limits in samples from borings ESB1332 and ESB1334. In boring ESB1333, TBP, BDP and DPP were detected at concentrations less than the Boeing calculated soil screening levels. TBP concentrations ranged from 220 mg/kg at 12½ feet bgs to 0.093 mg/kg at 35 feet bgs. The DPP concentrations ranged from a maximum of 24 mg/kg at a depth of 12½ feet bgs and decreased to 1.4 mg/kg at 25 feet bgs. BDP was only detected at concentrations of 1.0 mg/kg and 0.49 mg/kg at depths of 20 feet and 25 feet bgs. TBP was detected at a concentration of 1,900 mg/kg at 17½ feet bgs at previous soil boring, PVB-4, completed near ESB1333 (SECOR, 1994b).

Table 15-2 summarizes the analytical results for VOCs and SVOCs in three soil samples from boring ESB1333 and lists applicable soil screening levels for detected compounds. VOCs and SVOCs were either not detected above the method reporting limits or were detected below the soil screening levels protective of direct contact. Except for the acetone concentration in the soil sampled from 20 feet bgs at location ESB1333, detected VOC and SVOC concentrations were also below the most conservative preliminary soil cleanup levels protective of groundwater. The acetone concentration in this one sample (11,000 mg/kg) exceeded the most conservative preliminary soil cleanup level protective of groundwater (3,211 mg/kg); however, the result was qualified as being out of range of the laboratory instrument. Shallower soil samples at this same location exhibited acetone concentrations two orders of magnitude lower which are well below the most conservative preliminary soil cleanup level protective of groundwater.

Evaluation of the vapor intrusion (VI) pathway for this SWMU/AOC is not recommended for the FS. Screening of the VI pathway was performed in this RI using Ecology's review draft *Guidance for*

*Evaluating Soil Vapor Intrusion in Washington State: Investigation and Remedial Action*, dated October 2009 (VI guidance). Applying the Preliminary Assessment step of the VI guidance to this SWMU shows that two chemicals detected in soil beneath the SWMU (1,2-trhichloro-1,2,2-trifluoroethane, and methylene chloride, Table 15-2), are sufficiently volatile to be a potential VI source. However, these detections of volatile chemicals are not considered to be a potential source of VI for Building 40-24 for the following reasons:

- In accordance with WAC 173-340-740(3)(b)(iii)(C)(III), the concentrations of volatile chemicals detected are less than the protection of groundwater soil cleanup levels calculated based on the MTCA Method A groundwater cleanup levels (or Method B where no Method A value is available).
- The volatile chemical concentrations in the soil samples are at approximately an order of magnitude below the lowest soil screening level.
- PID readings taken during field sampling generally did not indicate organic vapors significantly elevated above background ambient levels in the soil samples.

Groundwater was not encountered beneath this SWMU/AOC to a depth of 60½ feet bgs.

#### 15.1.3.3 Physical Testing Results

Twenty-three samples of glacial till soils that were collected from areas adjacent to and below the former waste tanks vault were tested for one or more physical parameters including moisture content, effective porosity, percent saturation, and hydraulic conductivity. The laboratory reports are presented in Appendix S and pertinent results are described below. The porosity of the soils from depths of 15 to 25 feet bgs is on the order of 32% to 35%, and a sample from 55 feet bgs in boring ESB1333 has 41.5% porosity. The moisture content (5% to 11% dry weight) and percent saturation (21% to 50% volume) are relatively low and consistent from depths of 15 feet to 40 feet bgs. These values are generally lowest at depths of 40 to 55 feet bgs. These results support the interpretation that the chemical analysis results indicate that prior leakage from the tank vault has not migrated beyond a depth of about 40 to 45 feet bgs. Vertical hydraulic conductivity values for four samples of glacial till soil range from 1.40 x $10^{-5}$ to 1.59 x $10^{-3}$ cm/sec (0.04 to 4.5 ft/ day). Horizontal hydraulic conductivity values for these samples of glacial till soil are 2.31 x $10^{-6}$ and 1.41 x $10^{-3}$ cm/sec (0.007 and 4.0 ft/day), respectively. The higher ($10^{-3}$) values are from a sample collected at a depth of 55 feet in boring ESB1333. This sample did not have significantly coarser soils or less silt and clay than the other samples, thus the higher porosity and hydraulic conductivity may be due to disturbance of the sample.

### 15.2 SWMU/AOC NO. 168 UTILITY TRENCHES AND SUMPS

This SWMU/AOC consists of utility trenches and two sumps located within Building 40-24 and associated buried piping as shown on Figure 15-1. A vault located south of Building 40-24 (Vault E) is associated with this SWMU/AOC but is discussed separately in Section 15.3. Further use of the utility trenches and two sumps for collection of waste hydraulic fluid was discontinued in 1993. As part of closure, the piping was pressure tested in 1994. The piping near Slant 4 and Slant 5 (Figure 15-1) did not pass the pressure test. The principal dangerous constituents of the fluid contained in these areas are TBP, DPP, BDP, TPP, and BHT.

BHT was not known to be a component of the hydraulic fluid until after completion of the initial and most of the supplemental RI. Consequently this compound was not analyzed for in soil and groundwater samples collected in the area of the SWMU/AOC N0. 168 utility trench and sumps.

The results of previous investigations in the areas at the two sumps and trench are summarized in Section 3.0 of the IAWP. Phosphate compounds were detected in soils near the two sumps and in perched groundwater in fill beneath the southern end of the trench at well EGW037 (Figure 15-1). TBP was detected in the groundwater below the trench at ESB1290 (60 mg/L) and in previous water samples collected from the north sump (490,000 mg/L) and the south sump (210 mg/L) (SECOR 1994b). Further details on SWMU/AOC No. 168 are presented in Section 3.0 of the IAWP.

### 15.2.1 Purpose and Scope

The purpose of the investigation was to assess whether potential dangerous constituents are present in the fill, glacial till soil, and perched groundwater beneath the utility trenches, sumps and vault, and selected buried piping associated with this SWMU/AOC. The scope of investigation performed was in general accordance with Sections 3.4.3 and 3.4.4 of the IAWP and a supplemental SAP (Dames & Moore, 1998). The scope included the following:

- Completed nine hand auger soil borings within the utility trench to depths of approximately 2½ feet below the utility trench floor (up to 10½ feet bgs)
- Completed four soil borings to depths of 15½ feet to 21½ feet bgs near the utility trench using a truck mounted hollow stem auger drill rig. Collected soil samples at prescribed depth intervals
- Collected soil samples from three utility vault excavations adjacent to the utility trench
- Field screened samples for organic vapors and visual evidence of hydraulic fluid
- Collected groundwater samples from two hand auger borings
- Submitted groundwater and selected soil samples for analysis for phosphate compounds

There were no significant deviations from the planned scope of investigation.

### 15.2.2 Documentation of Drilling and Sampling

On February 19, 1998, Dames & Moore monitored the drilling of two soil borings (ESB1117 and ESB1118) in the area near Slant 5 and Slant 4, respectively, as shown on Figure 15-1. The soil borings were completed to a depth of 20½ feet bgs adjacent to sections of buried piping that did not pass pressure testing. On July 15 and 16, 1998, seven hand auger borings (ESB1286 through ESB 1292) were completed within the utility trenches. These borings were completed to a depth of approximately 2½ feet below the floor of the utility trench. The floor of the utility trench is approximately 8 feet below the building floor surface elevation (i.e., bgs).

On December 14, 1998 and February 22 and April 15, 1999, Dames & Moore collected two or three soil samples from each of three utility vault excavations adjacent to the utility trench near Slants 1, 3, and 5 (Figure 15-1). These samples (ESB1340 through ESB1344 and ESB1350 through ESB1352) were collected from the excavation floors and sidewalls at depths of approximately 6 to 11½ feet bgs. These samples were generally coincident with the adjacent utility trench base or at the fill/glacial till interface exposed in the sidewall. Soil was retrieved from the backhoe bucket and transferred to laboratory prepared glassware using a clean stainless steel spoon.

On January 15, 2001, URS monitored the drilling of two soil borings (ESB1393 and ESB1394) adjacent to the utility trench in the area between Slant 5 and Slant 4. In addition, two hand auger borings (ESB1395 and ESB1396) were completed within the utility trench near Slant 4. The boring locations are shown on Figures 15-1 and 15-10. The drilled soil borings were completed to a depth of 15½ feet bgs and the hand auger borings were completed to a depth of approximately 2 feet below the floor of the utility trench.

Soil samples were retrieved using Dames & Moore U-type and SPT split spoon samplers from borings completed with a drilling rig, and the hand auger bit from the hand drilled borings. The Dames & Moore sampler was fitted with stainless steel rings. Samples collected using the SPT split spoon sampler and hand auger were transferred to laboratory prepared glassware using a clean stainless steel spoon. After sampling was completed, the borings were backfilled with hydrated bentonite chips and capped with concrete. Drilling techniques and sampling procedures utilized were in general accordance with the SAP presented in Appendix B of the IAWP and the Supplemental SAP.

### 15.2.3 Field Observations and Sample Analysis Results

Presented in this section are the field observations and sample results associated with soil borings ESB1117, ESB1118, ESB1286 through ESB1292, ESB1340 through ESB1344, ESB1350 through ESB1352, and ESB1393 through ESB1396. The locations of the soil borings and nine geologic cross section locations are presented in Figures 15-1 and 15-2. The cross sections are presented on Figures 15-3 through 15-8. Geologic logs of the borings are presented in Appendix N1. The chain-of-custody forms and analytical laboratory reports are presented in Appendix N2. Data validation reports are in Appendix N3. Analytical results are summarized in Tables 15-3 and 15-4.

#### 15.2.3.1 Field Observations

The utility tunnel floor outside the building consists of 12- to 19-inch thick concrete. The floor of the utility trench is approximately 8 feet bgs. A layer of gravel fill varying from 1 inch to 6 inches thick was encountered beneath the base of the utility trench floor in all but one of the borings in this area. Fill soil consisting of silty sand with occasional gravel was encountered beneath the gravel layer at soil borings ESB1286, ESB1287, ESB1288, and ESB1289 to the maximum depth investigated of approximately 2½ feet beneath the floor of the utility tunnel. Glacial till consisting of very dense silty sand with occasional gravel was encountered at soil borings ESB1290, ESB1291, and ESB1292 beneath the gravel layer to the maximum depth investigated of approximately 2½ feet below the floor of the utility trench. Perched water was encountered in fill in soil borings ESB1290 and ESB1292.

The area investigated by ESB1117 and ESB1118 near the buried piping is covered with approximately 15-inch to 21-inch thick concrete floorslab. Fill soil consisting of fine to coarse sand and silty sand was encountered beneath the floor slab to a depth of 8 feet to 10 feet bgs. Underlying the fill soil is very dense glacial till consisting of silty sand with a trace of gravel to a depth investigated of 25 feet bgs. The base of the utility tunnel consists of 12- to 19-inch thick concrete. The floor of the utility trench is approximately 8 feet bgs. Groundwater was not encountered to the depth investigated.

The materials exposed in the sidewalls of the utility vault excavation near Slant 1 consisted of 15 inches of concrete, 2 feet of sandy fill, ½ foot of asphalt, and glacial till to the base of the excavation at 11½ feet bgs. The soils on the excavation floor consisted of an approximately 3-foot-wide strip of sandy fill adjacent to the concrete utility trench and glacial till. Soil samples were collected from the fill (ESB1340) and till (ESB1341) exposed on the excavation floor.

Staining or other visual indications of dangerous constituents were not observed in any of the soil samples. PID readings did not indicate organic vapors elevated above background ambient levels in the soil samples screened.

#### 15.2.3.2 Soil Sample Analysis Results

Selected soil samples from depths ranging from 10 feet to 10½ feet bgs (2 feet to 2½ feet bgs below the floor of the utility trench) in the hand auger borings and utility vault excavation were submitted for analysis. The samples were selected per the SAPs and Supplemental RIWPs (Appendix B of the IAWP; Dames & Moore, 1998, 2000; URS, 2001). Table 15-3 summarizes the analytical results for the four phosphate compounds in soil. This table also lists the Boeing calculated screening levels used for this RI. Selected sample results are shown on the geologic cross-sections (Figures 15-3 through 15-8) and a plan view map (Figure 15-9).

The analytical results for samples from beneath and adjacent to the utility trench indicate that the phosphate compounds were either not detected at concentrations above the method reporting limits or were detected at concentrations below the Boeing calculated soil screening levels based on ingestion.

Three soil samples each from borings ESB1117, ESB1118, ESB1393, and ESB1394 adjacent to the utility trench and buried piping were submitted for analysis. The samples were from depths ranging from 5 feet to 20 feet bgs and were selected per the SAP (Appendix B of the IAWP) and Supplemental RIWP (Dames & Moore, 2000). The analytical results for these samples indicate the four phosphate compounds were either not detected at concentrations above the method reporting limits or were detected at concentrations below the Boeing calculated soil screening levels based on ingestion.

#### 15.2.3.3 Groundwater Sample Analysis Results

Samples of perched groundwater collected from soil borings ESB1290 and ESB1292 were submitted for analysis per the SAP (Appendix B of the IAWP). Table 15-4 summarizes the analytical results for phosphate compounds in perched water. This table also lists the Boeing calculated groundwater screening levels.

Groundwater samples were collected from a depth of 1½ feet below the utility trench floor surface in borings ESB1290 and ESB1292. The analytical results indicate that only TBP (60 mg/L) in the sample collected from ESB1290 was detected at a concentration above the Boeing calculated groundwater screening level (4.80 mg/L).

Evaluation of the vapor intrusion (VI) pathway for this SWMU/AOC is not recommended for the FS. Screening of the VI pathway was performed in this RI using Ecology's review draft *Guidance for Evaluating Soil Vapor Intrusion in Washington State: Investigation and Remedial Action*, dated October 2009 (VI guidance). Applying the Preliminary Assessment step of the VI guidance to this SWMU shows that chemicals detected in soil and groundwater beneath the SWMU are not listed in Ecology's guidance as being sufficiently volatile to be a potential VI source. In addition, PID readings taken during field sampling did not indicate organic vapors significantly elevated above background ambient levels in the soil samples.

## 15.3 SWMU/AOC NO. 168 UTILITY TRENCHES VAULT E

Vault E is 9 feet by 12 feet in plan and 8 feet deep. The vault is composed of cast-in-place reinforced concrete with a 2-foot diameter by 4-foot deep sump in one corner, and serves as the southern terminus for below grade utility trench in Building 40-24. These corridors contain a variety of piped utilities, including hydraulic fluid pipelines. Following discovery of DNAPL in one of the monitoring wells installed during the RI (Section 15.3.3.1), a hole was discovered in the sump that appeared to be a "knockout" in a preformed concrete pipe that was part of the sump. The sump was filled with concrete and a leaking hydraulic accumulator was removed from the vault as well. The principal dangerous constituents of the fluid contained in these areas are TBP, DPP, BDP, and TPP and BHT. BHT was not known to be a component of the hydraulic fluid until after completion of the initial and most of the supplemental RI. Consequently this compound was not analyzed for in soil and groundwater samples collected in the area of Vault E prior to April 2001.

Monitoring well EGW037 was installed during a prior investigation of the utility trench system (SECOR, 1994a,b). This well is at the south end of the utility trench approximately 40 feet north of Vault E (Figure 15-10 and 15-11). Groundwater samples have been collected from this well on a quarterly basis since 1995. Analytical data for groundwater samples from this well are discussed in this section because the perched groundwater at well EGW037 appears to be in hydraulic continuity with perched water around Vault E.

### 15.3.1 Purpose and Scope

The purpose of the investigation was to assess whether potential dangerous constituents are present in the fill, glacial till soil, and perched groundwater beneath Vault E, and to assess whether immiscible hydraulic fluid (dense non-aqueous phase liquid or DNAPL) is present and if so, the lateral extent and thickness of DNAPL. The scope of investigation performed near Vault E was in general accordance with Sections 3.4.3 and 3.4.4 of the IAWP, Section 3.5 of the Supplemental RIWP (Dames & Moore, 2000) and a Supplemental RIWP specifically for Vault E (URS, 2001). The scope included the following:

- Completed three soil borings to depths of 21½ feet to 30½ feet bgs near the vault using a truck mounted and limited access hollow stem auger drill rig. Installed a monitoring well in one of these borings
- Completed seven soil borings to depths of 25½ feet to 46 feet bgs near the vault using a truck mounted hollow stem auger drill rig. Installed monitoring wells in five of these borings
- Collected soil samples at prescribed depth intervals

- Field screened samples for organic vapors and visual evidence of hydraulic fluid
- Collected groundwater samples from the wells on a quarterly or semiannual basis
- Measured groundwater elevations and DNAPL thickness (if present) in the monitoring wells, and collected one sample of DNAPL for selected chemical analyses
- Submitted groundwater and selected soil samples for analysis for phosphate compounds, and selected samples for analysis for VOCs, SVOCs, non-halogenated SVOCs, and RCRA (8) metals and copper, nickel, strontium, and zinc
- Submitted the DNAPL sample for analysis for VOCs and phosphate compounds

There were no deviations from the planned scope of the investigation except that boring ESB1116 was terminated in glacial till at a depth of 21½ feet bgs due to the presence of perched groundwater in the overlying granular fill.

### 15.3.2 Documentation of Drilling and Sampling

On February 19 and September 21 and 23, 1998, Dames & Moore monitored the drilling of three soil borings (ESB1116, ESB1330, and ESB1331) in the area of the SWMU/AOC No. 168 utility vault (Vault E) located just south of Building 40-24 (Figure 15-1). These soil borings were adjacent to and south of the utility vault (Figure 15-10) and were completed to depths ranging from 21½ feet to 30½ feet. Boring ESB1116 was completed as monitoring well EGW055.

On June 13, 2000, Dames & Moore monitored the drilling of two supplemental soil borings (ESB1384 and ESB1385) west and east of the utility vault (Figure 15-10 and Figure 15-11). These soil borings were completed to depths ranging from 21½ feet to 30½ feet. On April 3-5, 2001, URS monitored the drilling of five soil borings within and adjacent to the utility vault. These soil borings were completed to depths ranging from 21½ feet to 30½ feet. The five borings were completed as monitoring wells EGW070 through EGW074 (Figure 15-11).

Groundwater samples were collected from existing well EGW037 and new well EGW055 on a quarterly basis throughout the duration of the RI (i.e., from March 1998 to April 2006), except when measurable DNAPL was present in EGW055. Samples were collected quarterly or semiannually from new wells EGW070 through EGW074 from May 2001 through April 2006.

### 15.3.3 Field Observations and Sample Analysis Results

The locations of the soil borings near Vault E are presented on Figure 15-10 and Figure 15-11, and three geologic cross section locations through Vault E are presented on Figure 15-2. The cross sections are presented on Figures 15-5, 15-12, and 15-13. Geologic logs of the borings are presented in Appendix N1. The construction details for monitoring well EGW055 are included on the log for boring ESB1116. The chain-of custody forms and analytical laboratory reports for the soil samples and the 1998 groundwater samples are presented in Appendix N2. Data validation reports for all the soil samples and the 1998 groundwater samples are in Appendix N3. Prior and subsequent groundwater sample chain-of-custody forms and laboratory analytical reports have been submitted previously to Ecology separate from this report. Analytical results are summarized in Tables 15-5 through 15-8.

#### 15.3.3.1 Field Observations

The area investigated near the Vault E south of Building 40-24 is covered with an approximately 12-inch to 16-inch thick concrete slab. Fill soil associated with the backfill of excavations for the utility vault and a nearby sewer utility consisted of fine to coarse sand and was encountered to a depth of 9 to 11 feet bgs in borings ESB1116/EGW055 and EGW070 through EGW074, and to 16½ feet bgs in ESB1330. Fill was encountered to a depth of 5 feet bgs in borings ESB1384 and ESB1385. Glacial till consisting of silty sand and sandy silt was encountered beneath the fill and beneath the concrete slab at boring ESB1331. The glacial till extends to the maximum depth investigated of 46½ feet bgs. Perched water was encountered at the till/fill interface in soil borings ESB1116/EGW055, EGW070 through EGW074, and ESB1330. There was insufficient water to complete boring ESB1330 as a monitoring well.

Staining or other visual indications of dangerous constituents were not observed in the soil samples except in fill below the depth of the vault base in boring ESB1116/EGW055. PID readings did not indicate organic vapors elevated above background ambient levels in the soil samples field screened. Slight odors and a slight sheen when soil was placed in water were observed for some of the samples at and slightly below the fill/glacial till interface in borings EGW070 through EGW074. An odor was also detected from one sample collected at 15 feet bgs from boring ESB1384.

During sampling of well EGW055 in May 1999, Boeing discovered that DNAPL was accumulated in the bottom of the well. The maximum DNAPL thickness measured was 1.54 feet on July 13, 1999. Since then, Boeing has periodically removed the accumulated DNAPL and DNAPL has not been detected at measurable amounts since December 1, 2000. Wells EGW070 through EGW074 were monitored for DNAPL (as well as LNAPL) by Boeing in May and July 2001. On May 2, 2001, LNAPL and DNAPL were not detected in wells EGW055 and EGW071 through EGW074. A minor amount of DNAPL was detected in well EGW070 and approximately one teaspoon was removed from the well. On July 6, 2001, LNAPL and DNAPL were not detected in wells EGW055, and EGW072 through EGW074. A trace of LNAPL and DNAPL were detected in well EGW070, and a trace of LNAPL was detected in well EGW071. Wells EGW070 through EGW074 were monitored one to two times quarterly from November 2001 through April 2010 for DNAPL. DNAPL has not been detected in measurable amounts during this period. The monitoring data and soil and groundwater analytical results indicate that DNAPL occurrence is limited to the immediate vicinity of the sump in Vault E. Since prior removal of DNAPL from well EGW055, there is a minimal amount of DNAPL present and only a trace of LNAPL has been detected.

#### 15.3.3.2 Soil Sample Analytical Results

Presented in this section are the analytical results for soil samples collected near, adjacent, and below Vault E. The soil samples were selected and analyzed per the SAP (Appendix B of the IAWP) and Supplemental RIWPs (Dames & Moore, 2000; URS, 2001). Table 15-5 summarizes the analytical results for the four phosphate compounds in soil. This table also lists the calculated soil screening levels proposed as screening levels by Boeing. There are no MTCA published cleanup levels or a calculated screening level for BHT. Analytical results for VOCs, non-halogenated SVOCs, and SVOCs are summarized in Table 15-6. Detected metals concentrations are summarized in Table 15-7. Selected sample results are shown on the geologic cross-sections (Figures 15-5, 15-12 and 15-13) and a plan view map (Figure 15-9).

Twelve soil samples from depths between 10 feet to 30 feet bgs from four borings (ESB1330, ESB1331, ESB1384 and ESB1385) near, but not directly adjacent to, Vault E were submitted for analysis. The analytical results for the 12 samples indicate that the phosphate compounds were not detected at concentrations above the method reporting limits (Table 15-5).

The analytical results for 42 samples from six borings beneath and adjacent to the Vault E (ESB1116/EGW055, and EGW070 through EGW074) indicate that phosphate compounds and BHT were either not detected at concentrations above the method reporting limits, or were detected at concentrations below the Boeing calculated soil screening levels based on ingestion (Table 15-5). As shown on Figures 15-12 and 15-13, detected phosphate compounds and BHT are predominately present in fill soils adjacent to or directly beneath the vault, and concentrations decrease with depth. Some compounds were detected in glacial till below the fill; however at least one sample without detected phosphate compounds or BHT was obtained in glacial till in each boring except EGW071. In this boring, TBP and DPP were detected in the deepest sample (45 feet bgs) collected.

It should be noted that some of the BHT reporting limit values for samples without detected BHT are qualified as estimated values because of low surrogate recovery during the analysis. However, it is our opinion that this does not significantly affect the validity of the results because: (1) BHT was not detected unless TBP was also detected, but TBP was detected in some samples without BHT, and (2) BHT concentrations were one to four orders of magnitude lower than corresponding TBP concentrations with one exception (sample EGW074-11.0’). Therefore it is very unlikely that BHT would be present at a concentration significantly higher than the qualified reporting limit.

Two samples each from borings EGW070 through EGW074 were analyzed for VOCs, non-halogenated SVOCs, and SVOCs. These constituents were either not detected at concentrations above the method reporting limits, or were detected at concentrations below the applicable MTCA Method A or B soil cleanup levels protective of direct contact (Table 15-6). Except for methylene chloride and n-butyl alcohol, these constituents, when detected, were detected at concentrations below the preliminary cleanup levels protective of groundwater. Methylene chloride was detected in the sample from ESB073 at a concentration (0.087 mg/kg) exceeding the most conservative preliminary soil cleanup level protective of groundwater (0.02 mg/kg), however this detection was flagged as a suspected laboratory contaminant. Methylene chloride was not detected above the reporting limit in any other soil sample. N-butyl alcohol was detected in all but one of the soil samples at concentrations (13 mg/kg to 23 mg/kg) exceeding the preliminary soil cleanup level protective of groundwater (3.311 mg/kg). In the one soil sample in which n-butyl alcohol was not detected, the reporting limit (13 mg/kg) exceeded the preliminary soil cleanup level protective of groundwater (3.311 mg/kg).

Two samples each from borings EGW070 through EGW074 were analyzed for the eight RCRA metals plus copper, nickel, strontium, and zinc. These metals were either not detected at concentrations above the method reporting limits, or were detected at concentrations below the applicable 2001 MTCA Method A or B soil cleanup levels with the exception of arsenic, chromium, and strontium (Table 15-7). Arsenic was detected at concentrations above the MTCA Method B soil cleanup level (0.667 mg/kg arsenic) but below the Puget Sound background concentration (7.3 mg/kg) established by Ecology (1994) and below the MTCA Method A soil cleanup level protective of groundwater (20 mg/kg). Total chromium concentrations detected are below the applicable MTCA Method A and B soil cleanup levels for trivalent chromium (2,000 mg/kg and 120,000 mg/kg, respectively) and Method B soil cleanup level for hexavalent chromium (240 mg/kg). These total chromium concentrations are above the MTCA Method A soil cleanup level of 19 mg/kg and the most conservative preliminary soil cleanup level protective of groundwater (18 mg/kg) for hexavalent chromium, but below the Puget Sound background level of 48.2 mg/kg.

Concentrations of strontium ranged from 18.1 mg/kg to 39.6 mg/kg, with two of the 10 samples exhibiting strontium concentrations slightly exceeding the most conservative preliminary soil cleanup level protective of groundwater (38.4 mg/kg) but well below the MTCA Method B soil cleanup level protective of direct contact (48,000 mg/kg).

#### 15.3.3.3 Groundwater Analytical Results

Groundwater samples were collected on a quarterly or semiannual basis from monitoring well EGW055 since March 1998 in conjunction with the groundwater sampling from existing well EGW037, except when measurable DNAPL was present in EGW055. Groundwater samples have been collected on a quarterly or semiannual basis from wells EGW037, EGW055, and EGW070 through EGW074 since May 2001. The groundwater samples were collected and analyzed per the Groundwater Monitoring Plan (Appendix A of the IAWP) and Supplemental RIWP (URS, 2001). The samples from all of the wells were analyzed for phosphate compounds and BHT. In addition, two samples of DNAPL were collected from EGW055 and analyzed for phosphate compounds and/or VOCs. Groundwater samples from well EGW070 have been analyzed for VOCs, SVOCs, and RCRA (8) metals and copper, nickel, strontium, and zinc. One sample from EGW070 was analyzed for non-halogenated SVOCs in May 2001. Non-halogenated SVOCs were not detected. Wells EGW071 through EGW074 have been analyzed for VOCs, SVOCs, and total/dissolved arsenic since August 2002.

Table 15-8 summarizes the analytical results for the four phosphate compounds and BHT in groundwater, and also lists the calculated MTCA Method B groundwater screening levels proposed by Boeing. There are no MTCA cleanup levels or a calculated cleanup level for BHT. Analytical results for VOCs and phosphate compounds in DNAPL are summarized in Table 15-9. Analytical results for VOCs and SVOCs in groundwater are summarized in Table 15-10 and detected metals concentrations are summarized in Table 15-11.

The analytical results for EGW055 groundwater samples (Table 15-8) indicate that prior to initiating removal of DNAPL in May 1999, detected concentrations of BDP (64 mg/L to 9,100 mg/L), DPP (240 to 29,000 mg/L), and TBP (650 mg/L to 54,000 mg/L) were above the Boeing calculated groundwater screening levels (4.80 mg/L to 5.52 mg/L). TPP was detected at a concentration (15 mg/L) above the calculated screening level (5.88 mg/L) in only one sample, but the reporting limits were higher (5 mg/L to 5,000 mg/L) for the other samples. Detected concentrations of phosphate compounds in samples from EGW055 were significantly less after August 2001. Detected concentrations of BDP (0.73 mg/L to 32 mg/L), DPP (6.7 mg/L to 150 mg/L), and TBP (64 mg/L to 290 mg/L) in these samples were above the Boeing calculated groundwater screening levels (4.80 mg/L to 5.52 mg/L). TPP was not detected and BHT was detected intermittently.

The analytical results for EGW037 groundwater samples (Table 15-8) indicate that detected concentrations of TBP (8 mg/L to 120 mg/L) were above the Boeing calculated groundwater screening level (4.80 mg/L).

BDP, DPP and TPP were either not detected or detected at concentrations below the Boeing calculated groundwater screening levels (5.16 mg/L to 5.88 mg/L). BHT was detected in May 2001 (0.014 mg/L), April 2005 (0.02 mg/L), and April 2006 (0.024 mg/L).

The analytical results for groundwater samples from wells EGW070 through EGW074 (Table 15-8) indicate that detected concentrations of TBP (15 mg/L to 510 mg/L) and DPP (5.3 mg/L to 43 mg/L) in samples from wells EGW070, EGW071, and EGW074 were above the Boeing calculated groundwater screening levels (4.80 mg/L and 5.16 mg/L, respectively). TBP and DPP were detected at concentrations below the Boeing calculated groundwater screening levels in the EGW072 and EGW073 samples. BDP and TPP were either not detected or detected at concentrations below the Boeing calculated groundwater screening levels (5.52 mg/L and 5.88 mg/L, respectively) in all the samples from these wells.

BHT was detected in the May 2001 samples from all Vault E wells at concentrations ranging from 0.0011 mg/L to 0.31 mg/L. The highest concentration was in the well EGW070 sample, which also had the highest TBP and DPP concentrations in the May samples. BHT has been detected intermittently in samples from all Vault E wells at concentrations ranging from 0.00063 mg/L to 1.0 mg/L in one or more sampling events since May 2001. There is not a published or calculated MTCA cleanup or screening level for BHT in groundwater.

The DNAPL samples from well EGW055 contained detectable concentrations of toluene and total xylenes, in addition to the four phosphate compounds. The DNAPL analytical results are summarized in Table 15-9.

Groundwater samples from wells EGW055 and EGW070 through EGW074 were analyzed for VOCs and SVOCs quarterly or semiannually from August 2001 through April 2006. These constituents were either not detected at concentrations above the method reporting limits, or were detected at concentrations below the applicable 2001 MTCA Method A or B groundwater cleanup level with the exception of phenol, bis(2-ethylhexyl)phthalate, and tetrachloroethene (PCE). Phenol was detected above the MTCA Method B cleanup level (4.8 mg/L) in several samples collected from EGW055 prior to July 2008 and EGW070 prior to January 2004, but has not exceeded 4.8 mg/l since then. Bis(2-ethylhexyl)phthalate was detected once in each of EGW055, EGW070, and EGW071 above the MTCA Method B cleanup level (0.00625 mg/L) but there have been no exceedances since May 2003. PCE was detected above the MTCA Method B cleanup level (0.081 ug/L) once in samples from well EGW 055 and twice in samples from well EGW070. PCE has not been detected since April 2004.

Groundwater samples from well EGW070 were analyzed for total and dissolved concentrations of the eight RCRA metals plus copper, nickel, strontium, and zinc from May 2001 through May 2002. These metals were either not detected at concentrations above the method reporting limits, or were detected at concentrations below the applicable 2001 MTCA Method A or B groundwater cleanup levels with the exception of arsenic and one result for total cadmium (Table 15-11). Groundwater samples from EGW055 and EGW070 through EGW074 were analyzed for total and dissolved arsenic from August 2002 through April 2006. Total and dissolved arsenic were detected in all wells at concentrations (0.005 mg/L to 0.050 mg/L) at or above the MTCA Method A groundwater cleanup level (0.005 mg/L).

Evaluation of the vapor intrusion (VI) pathway for this SWMU/AOC is not recommended for the FS. Screening of the VI pathway was performed in this RI using Ecology's review draft *Guidance for*

*Evaluating Soil Vapor Intrusion in Washington State: Investigation and Remedial Action*, dated October 2009 (VI guidance). Application of the Preliminary Assessment step of the VI guidance to this SWMU shows that five chemicals detected in soil and groundwater beneath the SWMU (MEK, carbon disulfide, methylene chloride, toluene, and xylenes TCE, Tables 15-6 and 15-10), are sufficiently volatile to be a potential VI source. However, the detected concentrations of volatile compounds in soil groundwater are not considered to be a potential source of VI in Building 40-24 for the following reasons

- In accordance with WAC 173-340-740(3)(b)(iii)(C)(III), the concentrations of volatile chemicals in soil are less than the protection of groundwater soil cleanup levels calculated based on the MTCA Method A groundwater cleanup levels (or Method B where Method A is not available).

- The concentrations of volatile chemicals in groundwater are less than the screening levels provided in the VI guidance.

- PID readings taken during field sampling did not indicate organic vapors significantly elevated above background ambient levels in the soil samples.

## 15.4 CONCLUSIONS

The results of drilling beneath and adjacent to the two SWMUs/AOCs in and adjacent to Building 40-24 indicate the presence of fill to depths ranging from 11 feet to 16½ feet bgs. A thin layer of gravel fill underlies the concrete floor of the utility trench. The fill soils are underlain by very dense, glacial till to the maximum depth investigated of 60½ feet bgs. The glacial till consists of silty sand with gravel.

VOCs and SVOCs were either not detected above the method reporting limits or were detected below the soil screening levels protective of direct contact. Acetone and methylene chloride were each detected in single soil samples at concentrations exceeding the most conservative preliminary soil cleanup levels protective of groundwater; the results for these two compounds were qualified by data QA/QC and are not considered representative of actual concentrations in soil beneath the site. N-butyl alcohol was detected in all but one of the soil samples collected from the vicinity of Vault E at concentrations (13 mg/kg to 23 mg/kg) exceeding the preliminary soil cleanup level protective of groundwater (3.311 mg/kg). In the one soil sample in which n-butyl alcohol was not detected, the reporting limit (13 mg/kg) exceeded the preliminary soil cleanup level protective of groundwater (3.311 mg/kg). The soil to groundwater pathway for n-butyl alcohol is recommended for evaluation in the FS. Toluene, xylene, and ethylbenzene are found in high concentrations associated with free product in the subsurface, and therefore are included in the FS for soil, groundwater, and vapor intrusion. Boeing previously agreed to add benzene.

None of the phosphate compounds analyzed were detected in soil at concentrations above the Boeing calculated soil screening levels based on ingestion. Low concentrations of TBP were detected to a depth of 45 feet bgs in boring EGW071. In a previous investigation (SECOR, 1994b), soil with TBP concentrations of 1,900 mg/kg was detected at a depth of 17½ feet bgs from boring PVB-4 beneath the former tank vault. The results for samples collected during the RI adjacent, above, and below the prior 17½-foot sample indicate TBP concentrations in soil are less than this concentration and the Boeing calculated soil screening level based on ingestion. These results indicate that: (1) TBP concentrations may have naturally attenuated/degraded since 1994 and/or (2) the lateral and vertical migration of TBP is very limited due to the relatively low permeability of the underlying very dense glacial till soil. However, the discontinuous presence of NAPL in monitoring wells beneath Vault E indicate soil concentrations locally exceed the MTCA Method B soil cleanup level criteria per WAC I73-340-747(3)(g) and the soil in the Vault E area is recommended for evaluation in the FS in conjunction with the perched water further discussed below.

Perched groundwater was encountered at a typical depth of 9 to 10 feet bgs adjacent to Vault E south of Building 40-24. A nearby monitoring well (EGW037) was installed previously in perched groundwater beneath the utility trench approximately 40 feet north of Vault E. Perched water was also encountered in two hand auger borings (ESB1290 and ESB1292) completed beneath the floor of the utility tunnel. Groundwater elevations and occurrence suggest that the groundwater encountered in the wells adjacent and through Vault E and in well EGW037 is contiguous, but that perched groundwater only occurs in discontinuous lenses beneath the utility trench north of EGW037. The perched water, where present, is situated within coarse granular backfill (i.e. sand and gravel) beneath and adjacent to the utility trench and Vault E. Groundwater was not encountered within the glacial till surrounding and underlying Vault E to the depth explored of 45 feet bgs.

TBP was detected in the water sample from ESB1290 at a concentration above the Boeing calculated groundwater screening level (4.80 mg/L) but not in the ESB1292 sample. Analytical results for groundwater samples collected from monitoring wells EGW055, EGW070, EGW071, and EGW074 through and adjacent to Vault E, as well as nearby well EGW037, indicate that BDP, DPP, TPP and TBP were detected in one or more samples at concentrations above the Boeing calculated groundwater screening levels. The concentrations are highest in samples from wells EGW055 and EGW070, two of the three wells adjacent to the sump in the vault floor. This sump was the likely point of release of hydraulic fluid into the perched groundwater and it has been filled with concrete to preclude future releases. The concentrations detected in EGW055 groundwater samples have decreased significantly since DNAPL that had accumulated in the well was removed. Bis(2-ethylhexyl)phthalate and phenol were detected in perched groundwater samples from beneath Vault E at concentrations above the applicable MTCA Method B groundwater cleanup levels prior to May 2003 and July 2008, respectively. Two one-time detections of PCE were reported in wells EGW055 and EGW070, in 2004 and 2002 respectively, but PCE has not been detected above the laboratory reporting limits since. Detected arsenic concentrations in perched groundwater near Vault E are above the MTCA Method A cleanup level in all the wells. Arsenic and phosphate compounds in perched groundwater are recommended for evaluation in the FS.

Based on field observation and the analytical results discussed above, no further investigations of soil or groundwater are warranted in the area of Building 40-24 under the RI. The results indicate perched groundwater and limited areas of soil do contain one or more phosphate compounds at concentrations above the Boeing calculated screening levels. Consequently, this area is recommended for inclusion in the FS. Based on the analytical results of groundwater samples and former presence of DNAPL in well EGW055, the monitoring wells should be periodically measured for evidence of DNAPL, and if present, the thickness should be measured and the DNAPL removed. Perched groundwater quality in the wells should continue to be monitored as part of the ongoing Boeing groundwater monitoring program. These actions should continue until such time that an appropriate remedial action is selected and completed, and/or Ecology approves termination of monitoring in this area.

## 15.5 REFERENCES

Dames & Moore, 1998, Sampling and Analysis Plan, Utility Vault Excavations, Building 40-24, Everett Plant, November 17, 1998.

Dames & Moore, 2000, Supplemental Remedial Investigation Work Plan, BCAG Everett Plant, March 31, 2000

SECOR, 1994a, Final Report on the Demolition, Decontamination, and Integrity Testing of Above Ground Dangerous Waste Tank System Closure, Building 40-24, Boeing Commercial Airplane Group Facility, Everett, Washington.

SECOR, 1994b, Subsurface Investigation, Former Dangerous Waste Tank System, 40-24 Building, Boeing Commercial Airplane Group, Everett, Washington.

URS, 2001, Supplemental Remedial Investigation Work Plan, Building 40-24 Vault E (Revision 2.0), BCAG Everett Plant, March 6, 2001.

URS, 2002, Supplemental Remedial Investigation Work Plan, Monitoring Well Installation Addendum, BCAG Everett Plant, May 30, 2000.

**Table 15-1**
**Summary of Soil Sample Analytical Results for Phosphate Compounds, (mg/kg)**
**Building 40-24 Former Tanks (EV-75 and EV-76) Vault**
**Boeing Everett Plant Remedial Investigation**

| Sample ID/Date | | Butyl Diphenyl Phosphate | Dibutyl Phenyl Phosphate | Tributyl Phosphate | Triphenyl Phosphate |
|---|---|---|---|---|---|
| MTCA Method B 100x GW Soil Cleanup Level* | | 552* | 516* | 480* | 588* |
| MTCA Method B Soil Cleanup Level* | | 27,605* | 25,802* | 24,000* | 29,398* |
| ESB1332-12 1/2' | 11/16/98 | 0.36 U | 0.14 U | 0.072 U | 0.36 U |
| ESB1332-20' | 11/16/98 | 0.36 U | 0.14 U | 0.072 U | 0.36 U |
| ESB1332-30' | 11/16/98 | 0.36 U | 0.15 U | 0.073 U | 0.36 U |
| ESB1332-40' | 11/16/98 | 0.36 U | 0.14 U | 0.072 U | 0.36 U |
| ESB1333-12 1/2' | 11/18/98 | 36 U | 24 | 220 | 1.4 |
| ESB1333-15' | 11/18/98 | 0.36 U | 0.14 U | 1.0 | 0.36 U |
| ESB1333-17 1/2' | 11/18/98 | 0.38 U | 0.24 | 1.5 | 0.38 U |
| ESB1333-20' | 11/18/98 | 0.35 U | 0.14 U | 0.16 | 0.35 U |
| ESB1333-20' (DUP) | 11/18/98 | 1.0 | 3.0 | 29 | 0.36 U |
| ESB1333-25' | 11/18/98 | 0.49 | 1.4 | 14 | 0.37 U |
| ESB1333-35' | 11/18/98 | 0.36 U | 0.14 U | 0.093 | 0.36 U |
| ESB1333-45' | 11/18/98 | 0.35 U | 0.14 U | 0.071 U | 0.35 U |
| ESB1333-50' | 11/18/98 | 0.36 U | 0.14 U | 0.072 U | 0.36 U |
| ESB1333-60' | 11/18/98 | 0.35 U | 0.14 U | 0.071 U | 0.35 U |
| ESB-1334-15' | 11/17/98 | 0.37 U | 0.15 U | 0.073 U | 0.37 U |
| ESB-1334-20' | 11/17/98 | 0.36 U | 0.15 U | 0.073 U | 0.36 U |
| ESB-1334-30' | 11/17/98 | 0.37 U | 0.15 U | 0.074 U | 0.37 U |
| ESB-1334-40' | 11/17/98 | 0.36 U | 0.14 U | 0.072 U | 0.36 U |

**Notes:**
MTCA - Model Toxics Control Act
(B) - MTCA Method B soil cleanup level
1996 - Indicates MTCA soil cleanup levels, published 1996.
2001 - Indicates MTCA version 3.1 soil cleanup levels, published 2001.
(DUP) - Field duplicate
U - Compound was analyzed for but not detected above the reporting limit shown.
*Value calculated by Boeing consistent with 1996 MTCA Method B methodology.

**Table 15-2**
**Summary of Soil Sample Analytical Results for VOCs and SVOCs**
**Building 40-24 Former Tanks (EV-75 and EV-76) Vault**
**Boeing Everett Plant Remedial Investigation**

| Sample ID/Date | | Volatile Organic Compounds[1] (VOCs) (ug/kg) | | | | Semi-Volatile Organic Compounds (SVOCs) (ug/kg) | |
|---|---|---|---|---|---|---|---|
| | | 1,1,2-Trichloro-1,2,2-trifluoroethane | 2-Butanone | Acetone | Methylene Chloride | bis(2-Ethylhexyl)phthalate | Phenol |
| 1996 MTCA Method B Soil Cleanup Level | | NE | 48,000,000 | 8,000,000 | 133,000 | 71,400 | 48,000,000 |
| 1996 MTCA Method B 100x GW Soil Cleanup Level | | NE | 480,000 | 80,000 | 583 | 625 | 960,000 |
| 2001 MTCA Method A or B Soil Cleanup Level | | 2,400,000,000 (B*) | 48,000,000 (B) | 8,000,000 (B) | 20 (A)<br>133,000 (B) | 71,400 (B) | 48,000,000 (B) |
| MTCA Method A or B Protection of Groundwater | | 960,000 (B) | 19,200 (B) | 3,211 (B) | 20 (A)<br>25 (B) | 13,915 (B) | 21,965 (B) |
| ESB1333-12 1/2' | 11/18/98 | 2.2 U | 7.5 | 490 | 6.0 U* | 380 | 4,000 |
| ESB1333-17 1/2' | 11/18/98 | 3.0 | 5.9 U | 60 | 3.5 | 77 U | 150 U |
| ESB1333-20' | 11/18/98 | 9.1 U | 23 U | 11,000 E | 16 U* | 73 | 140 U |

**Notes:**
MTCA - Model Toxics Control Act
(A) - MTCA Method A soil cleanup level for unrestricted land use
(B) - MTCA Method B soil cleanup level
(B*) Revised 2001 MTCA Method B value from Ecology website CLARC tables downloaded January 2006 (https://fortress.wa.gov/ecy/clarc/reporting/CLARCReporting.aspx).
1996 - Indicates MTCA soil cleanup levels, published 1996.
2001 - Indicates MTCA version 3.1 soil cleanup levels, published 2001.
NE - Not established
[1] Values reported are the result of suspected laboratory contamination.
E - Result reported is out of calibration range.
U - Compound was analyzed for but not detected above the reporting limit shown.
U* - Sample result qualified as not detected due to method blank contamination.
Numbers in grey shading indicate results that exceed a MTCA protection of groundwater level, but do not exceed the current lowest MTCA soil cleanup level protective of direct contact.

**Table 15-3**
**Summary of Soil Sample Analytical Results for Phosphate Compounds, (mg/kg)**
**Building 40-24 Utility Trenches and Sumps**
**Boeing Everett Plant Remedial Investigation**

| Sample ID/Date | | Butyl Diphenyl Phosphate | Dibutyl Phenyl Phosphate | Tributyl Phosphate | Triphenyl Phosphate |
|---|---|---|---|---|---|
| MTCA Method B 100x GW Soil Cleanup Level* | | 552* | 516* | 480* | 588* |
| MTCA Method B Soil Cleanup Level* | | 27,605* | 25,802* | 24,000* | 29,398* |
| ESB1117-5' | 02/19/98 | 0.4 | 2 | 3.2 | 0.35 U |
| ESB1117-10' | 02/19/98 | 0.37 | 1.9 | 4.7 | 0.36 U |
| ESB1117-20' | 02/19/98 | 0.37 U | 0.82 | 3.3 | 0.37 U |
| ESB1118-5' | 02/19/98 | 0.34 U | 0.14 U | 0.069 U | 0.34 U |
| ESB1118-10' | 02/19/98 | 0.37 U | 0.15 U | 0.073 U | 0.37 U |
| ESB1118-20' | 02/19/98 | 0.37 U | 0.18 | 0.62 | 0.37 U |
| ESB1286-2 1/2' ** | 07/15/98 | 33 | 140 | 2,300 | 84 |
| ESB1287-2 1/2' ** | 07/15/98 | 60 | 180 | 2,700 | 57 U |
| ESB1288-2' ** | 07/15/98 | 6.6 J | 42 J | 320 J | 2.7 UJ |
| ESB1288-2' (DUP) | 07/15/98 | 13 | 56 | 440 | 11 U |
| ESB1289-2 1/4' ** | 07/15/98 | 0.42 U | 0.17 U | 0.56 | 0.42 U |
| ESB1290-2 1/2' ** | 07/16/98 | 6.7 EJ | 150 | 1,700 | 38 |
| ESB1291-2 1/2' ** | 07/16/98 | 53 U | 28 | 1,700 | 56 |
| ESB1292-2' ** | 07/16/98 | 0.41 U | 0.48 | 16 | 0.41 U |
| ESB1340-9'8" | 12/14/98 | 0.35 U | 0.14 U | 3.5 | 0.35 U |
| ESB1341-10' | 12/14/98 | 0.37 U | 0.15 U | 0.074 U | 0.37 U |
| ESB1342-11 1/2' | 02/22/99 | 0.36 U | 0.31 | 18 | 0.36 U |
| ESB1343-6' | 02/22/99 | 0.72 U | 0.29 U | 1 | 0.72 U |
| ESB1344-10' | 02/22/99 | 0.34 U | 0.14 U | 0.069 U | 0.34 U |
| ESB1350-9 1/2' | 04/15/99 | 0.37 U | 0.12 J | 7.3 | 0.37 U |
| ESB1351-11' | 04/15/99 | 0.36 U | 0.15 | 3.3 | 0.36 U |
| ESB1352-6' | 04/15/99 | 0.36 U | 0.14 U | 0.072 U | 0.36 U |
| ESB1393-10' | 01/15/01 | 0.35 U | 0.14 U | 0.070 U | 0.35 U |
| ESB1393-12.5' | 01/15/01 | 0.36 U | 0.15 U | 0.073 U | 0.36 U |
| ESB1393-15' | 01/15/01 | 0.36 U | 0.14 U | 0.072 U | 0.36 U |
| ESB1394-10' | 01/15/01 | 0.36 U | 0.14 U | 8.2 | 0.36 U |
| ESB1394-12.5' | 01/15/01 | 0.36 U | 0.15 U | 0.073 U | 0.36 U |
| ESB1394-15' | 01/15/01 | 0.37 U | 0.15 U | 0.073 U | 0.37 U |
| ESB1395-2' | 01/15/01 | 0.36 U | 0.15 U | 0.16 | 0.36 U |
| ESB1395-2' (DUP) | 01/15/01 | 0.37 U | 0.15 U | 0.42 | 0.37 U |
| ESB1396-2' | 01/15/01 | 25 | 67 EJ | 1,600 | 33 |

**Notes:**
MTCA - Model Toxics Control Act
(B) - MTCA Method B soil cleanup level
1996 - Indicates MTCA soil cleanup levels, published 1996.
2001 - Indicates MTCA version 3.1 soil cleanup levels, published 2001.
(DUP) - Field duplicate
EJ - The result is an estimated value, as it exceeds the calibration range of the instrument.
J - Estimated value
U - Compound was analyzed for but not detected above the reporting limit shown.
UJ - Compound was analyzed for but not detected above the reporting limit shown. Reporting limit is an estimated value.
*Value calculated by Boeing consistent with 1996 MTCA Method B methodology.
**Depth below floor of utility trench that is 8 feet below the floor of the building.

**Table 15-4**
**Summary of Groundwater Sample Analytical Results for Phosphate Compounds, (mg/L)**
**Building 40-24 Utility Trenches**
**Boeing Everett Plant Remedial Investigation**

| Sample ID/Date | | Butyl Diphenyl Phosphate | Dibutyl Phenyl Phosphate | Tributyl Phosphate | Triphenyl Phosphate |
|---|---|---|---|---|---|
| MTCA Method B Groundwater Cleanup Level* | | 5.52* | 5.16* | 4.80* | 5.88* |
| ESB1290-1 1/2' | 07/15/98 | 0.028 | 1.4 | **60** | 0.0084 |
| ESB1292-1 1/2' | 07/16/98 | 0.005 U | 0.002 U | 0.052 U** | 0.005 U |

**Notes:**
MTCA - Models Toxics Control Act
(B) - MTCA Method B groundwater cleanup level
1996 - Indicates MTCA groundwater cleanup levels, published 1996.
2001 - Indicates MTCA version 3.1 groundwater cleanup levels, published 2001.
J - Estimated value
U - Compound was analyzed for but not detected above the reporting limit shown.
*Value calculated by Boeing consistent with 1996 MTCA Method B methodology.
** Result qualified as not detected due to rinsate blank results.
Numbers in **bold** font indicate that the result reported exceeds the most current MTCA cleanup level as of Jjune 2010.

**Table 15-5**
**Summary of Soil Sample Analytical Results for Phosphate Compounds and BHT, (mg/kg)**
**Building 40-24 Vault E**
**Boeing Everett Plant Remedial Investigation**

| Sample ID/Date | | Butyl Diphenyl Phosphate | Dibutyl Phenyl Phosphate | Tributyl Phosphate | Triphenyl Phosphate | Butylated Hydroxytoluene |
|---|---|---|---|---|---|---|
| MTCA Method B 100x GW Soil Cleanup Level* | | 552* | 516* | 480* | 588* | NE |
| MTCA Method B Soil Cleanup Level* | | 27,605* | 25,802* | 24,000* | 29,398* | NE |
| ESB1116-20' ** | 02/19/98 | 360 U | 0.92 | 1.8 | 0.36 U | NA |
| ESB1330-15' | 09/21/98 | 0.36 U | 0.14 U | 0.071 U | 0.36 U | NA |
| ESB1330-17 1/2' | 09/21/98 | 0.38 U | 0.15 U | 0.075 U | 0.38 U | NA |
| ESB1330-25' | 09/21/98 | 0.37 U | 0.15 U | 0.074 U | 0.37 U | NA |
| ESB1331-15' | 09/23/98 | 0.36 U | 0.14 U | 0.072 U | 0.36 U | NA |
| ESB1331-17 1/2' | 09/23/98 | 0.37 U | 0.15 U | 0.073 U | 0.37 U | NA |
| ESB1331-30' | 09/23/98 | 0.35 U | 0.14 U | 0.07 U | 0.35 U | NA |
| ESB1384-15' | 06/13/00 | 0.39 U | 0.16 U | 0.079 U | 0.39 U | NA |
| ESB1384-20' | 06/13/00 | 0.38 U | 0.15 U | 0.075 U | 0.38 U | NA |
| ESB1385-10' | 06/13/00 | 0.40 U | 0.16 U | 0.079 U | 0.40 U | NA |
| ESB1385-10' (DUP) | 06/13/00 | 0.36 U | 0.14 U | 0.072 U | 0.36 U | NA |
| ESB1385-15' | 06/13/00 | 0.39 U | 0.16 U | 0.078 U | 0.39 U | NA |
| ESB1385-20' | 06/13/00 | 0.38 U | 0.15 U | 0.076 U | 0.38 U | NA |
| EGW 070-10.0' | 04/03/01 | 34 | 73 | 250 J | 9.5 EJ | 31 |
| EGW 070-11.5' | 04/03/01 | 3.2 | 12 | 94 J | 1.0 J | 1.8 |
| EGW 070-15.0' | 04/03/01 | 2.0 | 3.3 | 22 J | 0.38 UJ | 0.71 |
| EGW 070-20.0' | 04/03/01 | 0.36 U | 0.14 U | 0.16 J | 0.36 UJ | 0.0099 |
| EGW 070-35.0' | 04/03/01 | 0.36 U | 0.14 U | 0.13 J | 0.36 UJ | 0.0071 |
| EGW 070-40.0' | 04/03/01 | 0.37 U | 0.15 U | 0.46 | 0.37 U | 0.0022 UJ |
| EGW 070-45.0' | 04/03/01 | 0.37 U | 0.15 U | 0.075 U | 0.37 U | 0.0023 UJ |
| EGW 071-6.5' | 04/04/01 | 0.35 UJ | 0.19 | 41 | 0.35 UJ | 0.0055 |
| EGW 071-8.0' | 04/04/01 | 0.53 | 0.79 | 61 | 5.3 J | 0.012 |
| EGW 071-9.5' | 04/04/01 | 0.37 U | 0.60 | 13 | 0.37 UJ | 0.064 |
| EGW 071-11.0' | 04/04/01 | 0.37 U | 0.46 | 4.0 | 0.37 UJ | 0.061 |
| EGW 071-15.0' | 04/04/01 | 2.2 | 3.2 | 4.6 | 0.37 UJ | 0.31 |
| EGW 071-20.0' | 04/04/01 | 4.5 | 5.1 | 10 | 0.36 UJ | 0.36 |
| EGW 071-30.0' | 04/04/01 | 0.36 U | 0.36 | 0.61 | 0.36 UJ | 0.017 |
| EGW 071-35.0' | 04/04/01 | 0.36 U | 0.15 U | 0.15 | 0.36 U | 0.0022 UJ |
| EGW 071-40.0' | 04/04/01 | 0.36 U | 0.42 | 0.83 | 0.36 U | 0.0022 UJ |
| EGW 071-45.0' | 04/04/01 | 0.36 U | 0.15 | 0.28 | 0.36 U | 0.0022 UJ |
| EGW 072-5.0' | 04/04/01 | 0.37 U | 0.31 | 0.75 | 0.37 UJ | 0.0049 |
| EGW 072-6.5' | 04/04/01 | 0.36 U | 0.14 U | 1.0 | 0.36 UJ | 0.0022 U |
| EGW 072-8.0' | 04/04/01 | 0.37 U | 0.66 | 4.7 | 0.37 UJ | 0.036 |
| EGW 072-9.5' | 04/04/01 | 0.37 U | 0.15 U | 0.37 | 0.37 UJ | 0.0087 |
| EGW 072-11.0' | 04/04/01 | 0.36 U | 0.14 U | 0.072 U | 0.36 U | 0.0022 UJ |
| EGW 072-12.5' | 04/04/01 | 0.37 U | 0.15 U | 0.074 U | 0.37 UJ | 0.0022 U |
| EGW 072-20.0' | 04/04/01 | 0.37 U | 0.15 U | 0.073 U | 0.37 UJ | 0.0022 U |
| EGW 072-30.0' | 04/04/01 | 0.36 U | 0.14 U | 0.072 U | 0.36 UJ | 0.0022 U |
| EGW 073-5.0' | 04/05/01 | 0.36 U | 0.27 | 0.75 | 0.36 UJ | 0.0025 J |
| EGW 073-6.5' | 04/05/01 | 0.37 U | 0.15 U | 0.073 U | 0.37 U | 0.0022 U |
| EGW 073-8.0' | 04/05/01 | 0.37 U | 0.15 U | 0.074 U | 0.37 U | 0.0022 U |
| EGW 073-9.5' | 04/05/01 | 0.36 U | 0.15 U | 0.073 U | 0.36 UJ | 0.0022 U |
| EGW 073-15.0' | 04/05/01 | 0.36 U | 0.14 U | 0.072 U | 0.36 U | 0.0022 U |
| EGW 073-20.0' | 04/05/01 | 0.37 U | 0.15 U | 0.074 U | 0.37 U | 0.0022 U |
| EGW 073-30.0' | 04/05/01 | 0.35 U | 0.14 U | 0.071 U | 0.35 U | 0.0021 U |
| EGW 074-5.0' | 04/05/01 | 0.36 U | 0.14 U | 0.071 U | 0.36 U | 0.0021 U |
| EGW 074-6.5' | 04/05/01 | 0.35 U | 0.14 U | 0.071 U | 0.35 U | 0.0021 U |
| EGW 074-8.0' | 04/05/01 | 0.36 U | 0.14 U | 0.072 U | 0.36 U | 0.0022 U |
| EGW 074-9.5' | 04/05/01 | 0.36 U | 0.14 U | 1.3 | 0.36 U | 0.0022 U |
| EGW 074-11.0' | 04/05/01 | 0.36 U | 0.14 U | 0.16 J | 0.36 U | 0.13 J |
| EGW 074-15.0' | 04/05/01 | 0.36 U | 1.4 | 5.5 | 0.36 U | 0.077 |
| EGW 074-20.0' | 04/05/01 | 0.36 U | 0.24 | 1.3 | 0.36 U | 0.0095 |
| EGW 074-25.0' | 04/05/01 | 0.36 U | 0.32 | 2.0 J | 0.36 U | 0.0045 J |
| EGW 074-30.0' | 04/05/01 | 0.35 U | 0.14 U | 0.071 U | 0.35 U | 0.0021 U |

**Notes:**
MTCA - Model Toxics Control Act
(B) - MTCA Method B groundwater cleanup level
1996 - Indicates MTCA groundwater cleanup levels, published 1996.
2001 - Indicates MTCA version 3.1 groundwater cleanup levels, published 2001.
(DUP) - Field duplicate
EJ - The result is an estimated value, as it exceeds the calibration range of the instrument.
J - Estimated value
NA - Not analyzed
NE - Not established
U - Compound was analyzed for but not detected above the reporting limit shown.
UJ - Compound was analyzed for but not detected above the reporting limit shown. Reporting limit is an estimated value.
*Value calculated by Boeing consistent with 1996 MTCA Method B methodology.
**Boring ESB1116 was converted to monitoring well EGW055

**Table 15-6**
**Summary of Soil Sample Analytical Results for VOCs, Non-halogenated VOCs, and SVOCs (mg/kg)**
**Building 40-24 Vault E**
**Boeing Everett Plant Remedial Investigation**

| Sample ID | Date | VOCs by 8260B | | | | | Non-Halogenated VOCs | | SVOCs by 8270 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample ID/Date | | 2-Butanone (MEK) | Acetone | Carbon Disulfide | Methylene Chloride | Toluene | Ethylene Glycol | n-Butyl Alcohol | bis(2-Ethylhexyl) Phthalate | Butylbenzyl Phthalate | Phenol |
| EGW 070-10.0' | 04/03/01 | 0.033 * | 0.010 UJ | 0.0023 * | 0.0036 U | 0.0066 * | 7.8 | 13 U | 0.43 | 0.092 | 0.62 |
| EGW 070-11.5' | 04/03/01 | 0.039 * | 0.0094 UJ | 0.0026 * | 0.0035 U | 0.0012 U | 9.4 UJ | 18 | 0.082 | 0.074 U | 0.39 |
| EGW 071-9.5' | 04/04/01 | 0.0055 U | 0.0055 U | 0.0011 U | 0.0033 U | 0.0011 U | 9.3 UJ | 23 | 0.073 U | 0.073 U | 0.15 U |
| EGW 071-11.0' | 04/04/01 | 0.0057 U | 0.0068 | 0.0019 | 0.0034 U | 0.0011 U | 10 UJ | 16 | 0.10 | 0.075 U | 0.15 U |
| EGW 072-8.0' | 04/04/01 | 0.0088 | 0.011 UJ | 0.0011 U | 0.0033 U | 0.0011 U | 9.6 UJ | 14 | 0.075 U | 0.075 U | 0.15 U |
| EGW 072-9.5' | 04/04/01 | 0.0056 U | 0.036 U* | 0.0011 U | 0.0034 U | 0.0011 U | 9.5 UJ | 15 | 0.074 U | 0.074 U | 0.15 U |
| EGW 073-8.0' | 04/05/01 | 0.0056 U | 0.095 U* | 0.0011 U | 0.087 J * | 0.0011 U | 9.1 UJ | 13 | 0.074 U | 0.074 U | 0.15 U |
| EGW 073-9.5' | 04/05/01 | 0.0056 U | 0.034 U* | 0.0011 U | 0.0033 U | 0.0011 U | 9.3 UJ | 15 | 0.073 U | 0.073 U | 0.15 U |
| EGW 074-8.0' | 04/05/01 | 0.0053 U | 0.045 U* | 0.0011 U | 0.0032 U | 0.0011 U | 8.8 UJ | 13 | 0.072 U | 0.072 U | 0.14 U |
| EGW 074-9.5' | 04/05/01 | 0.0057 U | 0.047 U* | 0.0011 U | 0.0034 U | 0.0011 U | 9.3 UJ | 14 | 0.072 U | 0.072 U | 0.14 U |
| 1996 MTCA Method A or B Soil Cleanup Level | | 48,000 (B) | 8,000 (B) | 8,000 (B) | 0.5 (A, AI) 133 (B) | 40 (A, AI) 16,000 (B) | 160,000 (B) | 8,000 (B) | 71.4 (B) | 16,000 (B) | 48,000 (B) |
| 1996 MTCA Method B 100x GW Soil Cleanup Level | | 480 | 80 | 80 | 0.583 | 160 | 3,200 | 160 | 0.625 | 320 | 960 |
| 2001 MTCA Method A or B Soil Cleanup Level | | 48,000 (B) | 8,000 (B) | 8,000 (B) | 0.020 (A) 133 (B) | 7 (A) 16,000 (B) 6,400 (B*) | 160,000 (B) | 8,000 (B) | 71.4 (B) | 16,000 (B) | 48,000 (B) |
| MTCA Method A or B Protection of Groundwater | | 19.2 (B) | 3.211 (B) | 5.651 (B) | 0.02 (A) 0.025 (B) | 7 (A) 4.654 (B) | 64 (B) | 3.311 (B) | 13.915 (B) | 892.544 (B) | 21.965 (B) |

**Notes:**
MTCA - Model Toxics Control Act
(A) - MTCA Method A soil cleanup level for unrestricted land use
(AI) - MTCA Method A soil cleanup level for industrial property
(B) - MTCA Method B soil cleanup level
(B*) Revised 2001 MTCA Method B value from Ecology website CLARC tables downloaded June 2010 (https://fortress.wa.gov/ecy/clarc/reporting/CLARCReporting.aspx).
1996 - Indicates MTCA soil cleanup levels, published 1996.
2001 - Indicates MTCA version 3.1 soil cleanup levels, published 2001.
J - Estimated value
NE - Not established
U - Compound was analyzed for but not detected above the reporting limit shown.
UJ - Compound was analyzed for but not detected above the reporting limit shown. Reporting limit is an estimated value.
U* - Result was qualified as not detected due to method blank contamination.
* Result is suspected laboratory contamination.
Numbers in grey shading indicate results that exceed a MTCA protection of groundwater level, but do not exceed the current lowest MTCA soil cleanup level protective of direct contact.

**Table 15-7**
**Summary of Soil Sample Analytical Results for Metals (mg/kg)**
**Building 40-24 Vault E**
**Boeing Everett Plant Remedial Investigation**

| Sample ID/Date | | Total Metals | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | **Arsenic** | **Barium** | **Cadmium** | **Chromium** | **Copper** | **Lead** | **Nickel** | **Strontium** | **Zinc** |
| 1996 MTCA Method A or B Soil Cleanup Level | | 20 (A)<br>200 (AI)<br>1.67 (B) | 5,600 (B) | 2.0 (A)<br>10 (AI)<br>80 (B) | 100 (A)<br>500 (AI) | 2,960 (B) | 250 (A)<br>1,000 (AI) | 1,600 (B) | 48,000 (B) | 24,000 (B) |
| 1996 MTCA Method B 100x GW Soil Cleanup Level | | 0.00583 | 112 | 1.6 | 1,600 ($Cr^{+3}$) | 59.2 | NE | 32 | 960 | 480 |
| 2001 MTCA Method A or B Soil Cleanup Level | | 20 (A)<br>0.667 (B) | 5,600 (B)<br>16,000 (B*) | 2 (A)<br>80 (B) | 2,000($Cr^{+3}$) / 19 ($Cr^{+6}$) (A)<br>120,000($Cr^{+3}$) / 240 ($Cr^{+6}$) (B) | 2,960 (B) | 250 (A)<br>1,000 (AI) | 1,600 (B) | 48,000 (B) | 24,000 (B) |
| MTCA Method A or B Protection of Groundwater | | 20 (A)<br>0.03 (B) | 2,637 (B) | 2 (A)<br>1.1 (B) | 2,000 ($Cr^{+3) / 19}$ ($Cr^{+6}$) (A)<br>480,096 ($Cr^{+3}$) / 18 ($Cr^{+6}$) (B) | 263 (B) | 250 (A) | 417 (B) | 38.4 (B) | 5,971 (B) |
| WA Department of Ecology - Puget Sound Regional Background Concentration | | 7.30 | NE | 0.8 | 48.2 | 36.4 | 24.0 | 47.8 | NE | 85.1 |
| EGW 070-10.0' | 04/03/01 | **2.5** | 50.4 | 0.3 U* | **28.6** | 17.7 | 2 U | 39 | 34.8 | 42.7 |
| EGW 070-11.5' | 04/03/01 | **2.4** | 56.1 | 0.3 U* | **30.0** | 15.5 | 2 U | 40 | 34.2 | 36.3 |
| EGW 071-9.5' | 04/04/01 | **2.5** | 53.0 | 0.3 U* | **33.4** | 22.7 | 4 | 42 | 38.4 | 33.5 |
| EGW 071-11.0' | 04/04/01 | **3.6** | 58.4 | 0.3 U* | **29.0** | 15.2 | 3 | 44 | 33.0 | 35.0 |
| EGW 072-8.0' | 04/04/01 | **2.2** | 32.8 | 0.3 U* | **27.2** | 15.7 | 2 U | 34 | 27.7 | 34.2 |
| EGW 072-9.5' | 04/04/01 | **3.2** | 58.7 | 0.3 U* | **36.4** | 16.1 | 3 | 44 | 31.8 | 34.7 |
| EGW 073-8.0' | 04/05/01 | **2.4** | 37.5 | 0.2 U | **30.6** | 13.3 | 3 | 46 | 25.6 | 32.2 |
| EGW 073-9.5' | 04/05/01 | **2.3** | 49.9 | 0.2 U | **33.4** | 13.4 | 3 | 44 | 29.2 | 29.3 |
| EGW 074-8.0' | 04/05/01 | **1.6** | 26.5 | 0.2 U | **36.8** | 13.2 | 3 | 40 | 18.1 | 30.4 |
| EGW 074-9.5' | 04/05/01 | **2.7** | 48.7 | 0.2 U | **28.7** | 12.9 | 4 | 41 | 39.6 | 31.4 |

**Notes:**
MTCA - Model Toxics Control Act
(A) - MTCA Method A soil cleanup level for unrestricted land use
(B) - MTCA Method B soil cleanup level
(B*) Revised 2001 MTCA Method B value from Ecology website CLARC tables downloaded June 2010 (https://fortress.wa.gov/ecy/clarc/reporting/CLARCReporting.aspx).
1996 - Indicates MTCA soil cleanup levels, published 1996.
2001 - Indicates MTCA version 3.1 soil cleanup levels, published 2001.
J - Estimated value
U - Compound was analyzed for but not detected above the reporting limit shown.
UJ - Compound was analyzed for but not detected above the reporting limit shown. Reporting limit is an estimated value.
U* - Result was qualified as not detected due to method blank contamination.
NE - Not established
Numbers in **bold** font indicate that the result reported exceeds the most current MTCA cleanup level as of June 2010.
Numbers in grey shading indicate results that exceed a MTCA protection of groundwater level, but do not exceed the current lowest MTCA soil cleanup level protective of direct contact.

**Table 15-8**
**Summary of Groundwater Analytical Results for Phosphate Compounds, (mg/L)**
**Building 40-24**
**Boeing Everett Plant**

| Well ID | Sample Date | Butyl Diphenyl Phosphate | Dibutyl Phenyl Phosphate | Tributyl Phosphate | Triphenyl Phosphate | Butylated hydroxytoluene |
|---|---|---|---|---|---|---|
| MTCA Method B Groundwater Screening Level* | | 5.52* | 5.16* | 4.8* | 5.88* | NE |
| **EGW037** | 02/15/95 | 1.2 U | 2.4 | **70** | 1.2 U | NA |
| | 05/01/95 | 0.0089 | 0.380 E | **41** | 0.005 U | NA |
| | 08/07/95 | 1.0 U | 0.400 U | **49** | 1.0 U | NA |
| | 11/13/95 | 2.0 U | 2.0 J | **88 J** | 2.0 U | NA |
| | 02/27/96 | 1.0 U | 2.4 | **71** | 1.0 U | NA |
| | 06/05/96 | 2.5 U | 1.5 | **73** | 2.5 U | NA |
| | 08/28/96 | 0.5 U | 0.200 U | **15** | 0.5 U | NA |
| | 12/04/96 | 0.5 U | 0.61 | **64** | 0.5 U | NA |
| | 03/05/97 | 1.0 U | 0.88 | **120** | 1.0 U | NA |
| | 05/21/97 | 0.5 U | 0.47 | **39** | 0.5 U | NA |
| | 08/13/97 | 0.050 UJ | 0.020 UJ | **50 J** | 0.050 UJ | NA |
| | 11/18/97 | 0.025 U | 0.028 | **59** | 0.025 U | NA |
| | 03/17/98 | 0.83 UJ | 0.33 UJ | **65 J** | 0.83 UJ | NA |
| | 05/20/98 | 15 U | 6 U | **120** | 15 U | NA |
| | 08/12/98 | 0.5 U | 0.2 U | **8** | 0.5 U | NA |
| | 11/16/1998 | 0.33U | 0.13U | **16** | 0.33U | NA |
| | 02/04/99 | 1 U | 0.4 U | **91** | 1 U | NA |
| | 05/13/99 | 0.33 U | 0.13 U | **12** | 0.33 U | NA |
| | 08/03/99 | 1 UJ | 0.4 UJ | **34 J** | 1 UJ | NA |
| | 11/12/1999 | 1U | 0.44J | **46** | 1 U | NA |
| | 02/09/00 | 0.33 U | 0.26 | **93** | 0.33 U | NA |
| | 05/04/00 | 1 U | 0.4 U | **54** | 1 U | NA |
| | 08/01/00 | 0.1 U | 0.04 U | **8.8** | 0.1 U | NA |
| | 11/15/2000 | 0.015 U | 0.07 | **48** | 0.015 U | NA |
| | 02/14/01 | 0.05 U | 0.22 | **86** | 0.50 U | NA |
| | 05/02/01 | 0.05 | 0.54 | **55** | 0.05 U | 0.014 |
| | 08/08/01 | 0.1 U | 0.19 | **48 D** | 0.1 U | 0.025 U |
| | 11/14/01 | 0.25 UJ | 0.1 UJ | **75 J D** | 0.25 UJ | 0.05 UJ |
| | 02/13/02 | 1.2 U | 0.5 U | **48 D** | 1.2 U | 0.25 U |
| | 05/09/02 | 1.0 U | 0.4 U | **40 D** | 1U | 0.2 U |
| | 08/08/02 | 0.1 U | 0.04 U | **8.2 D** | 0.1 U | 0.02 U |
| | 11/20/02 | 0.33 U | 0.13 U | **36 D** | 0.33 U | 0.067 U |
| | 02/12/03 | 2.5 U | 1 U | **45 D** | 2.5 U | 0.5 U |
| | 05/14/03 | 0.12 U | 0.31 | **24 D** | 0.12 U | 0.025 U |
| | 07/25/03 | 0.051 U | 0.02 U | 2.8 D | 0.051 U | 0.01 U |
| | 11/11/03 | 0.67 U | 0.27 U | **54 D** | 0.67 U | 0.13 U |
| | 01/26/04 | 0.5 U | 0.8 | **55 D** | 0.5 U | 0.1 U |
| | 04/22/04 | 0.5 U | 0.46 | **27 D** | 0.5 U | 0.1 U |
| | 07/26/04 | 0.2 U | 0.08 U | **18 D** | 0.2 U | 0.04 U |
| | 10/10/04 | 0.008 U | 0.012 | **58 D** | 0.008 U | 0.008 U |
| | 01/18/05 | 0.05 U | 1.4 | **58 D** | 0.05 U | 0.05 U |
| | 04/14/05 | 0.02 U | 0.95 | **54 D** | 0.02 U | 0.02 |
| | 10/25/05 | 0.2 U | 0.2 U | **21 D** | 0.2 U | 0.2 U |
| | 01/18/06 | 0.02 U | 1.0 | **46 D** | 0.02 U | 0.024 |
| | 07/18/06 | 0.02 U | 0.02 U | **12 D** | 0.02 U | 0.02 U |
| | 01/20/07 | 0.02 U | 0.52 | **28 D** | 0.02 U | 0.02 U |
| | 07/09/07 | 0.02 U | 0.12 | **13 D** | 0.02 U | 0.02 U |
| | 01/17/08 | 0.02 U | 0.36 | **32 D** | 0.02 U | 0.021 |
| | 07/21/08 | 0.2 UJ | 0.2 UJ | **4.8 J** | 0.2 UJ | 0.2 UJ |
| | 01/07/09 | 0.02 U | 0.27 | **29 D** | 0.02 U | 0.02 U |
| | 07/09/09 | 0.02 U | 0.021 | **7.5 D** | 0.02 U | 0.02 U |
| | 01/12/10 | 0.02 U | 0.25 | **16 D** | 0.02 U | 0.02 U |

**Table 15-8**
**Summary of Groundwater Analytical Results for Phosphate Compounds, (mg/L)**
**Building 40-24**
**Boeing Everett Plant**

| Well ID | Sample Date | Butyl Diphenyl Phosphate | Dibutyl Phenyl Phosphate | Tributyl Phosphate | Triphenyl Phosphate | Butylated hydroxytoluene |
|---|---|---|---|---|---|---|
| MTCA Method B Groundwater Screening Level* | | 5.52* | 5.16* | 4.8* | 5.88* | NE |
| **EGW055** | 03/17/98 | **64 J** | **240 J** | **650 J** | 25 UJ | NA |
| | 05/20/98 | **2,800** | **9,800** | **22,000** | **15** | NA |
| | 08/12/98 | **750** | **2,300** | **5,400** | 50 U | NA |
| | 11/16/98 | **9,100** | **29,000** | **54,000** | 5,000 U | NA |
| | 02/04/99 | **220 J**** | **660** | **1,700** | 5 U | NA |
| | 5/13/99 *** | **4,100** | **14,000** | **41,000** | 200 U | NA |
| | 8/3/99*** | **100 J** | **280 J** | **550 J** | 10 UJ | NA |
| | 11/12/99 | NA | NA | NA | NA | NA |
| | 02/09/00 | NA | NA | NA | NA | NA |
| | 05/04/00 | NA | NA | NA | NA | NA |
| | 08/01/00 | **5.6** | **33** | **170** | 0.02 | NA |
| | 11/15/2000 | NA | NA | NA | NA | NA |
| | 02/06/01 | **8.1** | **40** | **250** | 2.5 U | NA |
| | 05/02/01 | 1.4 | **22** | **68** | 0.05 U | 0.037 |
| | 08/08/01 | 0.73 | **8.6 D** | **64 D** | 0.2 U | 0.05 U |
| | 11/14/01 | 0.88 J D | **6.7 J D** | **110 J D** | 0.25 UJ | 0.052 J D |
| | 11/14/01 (DUP) | 0.75 J D | **7.8 J D** | **120 J D** | 0.25 UJ | 0.054 J D |
| | 02/12/02 | 1.8 | **29** | **200 D** | 1.7 U | 0.33 U |
| | 02/12/02 (DUP) | 1.8 | **24** | **180 D** | 1.7 U | 0.33 U |
| | 05/09/02 | 1.5 | **16 D** | **150 D** | 0.2 U | 0.040 U |
| | 08/08/02 | 3.3 U | **30** | **170 D** | 3.3 U | 0.67 U |
| | 11/20/02 | 2.8 | **16** | **100 D** | 1 U | 0.2 U |
| | 11/20/02 (DUP) | 2.2 | **15** | **100 D** | 1 U | 0.2 U |
| | 02/11/03 | 10 U | **31** | **140** | 10 U | 2 U |
| | 05/13/03 | 5 U | **32** | **150 D** | 5 U | 1 U |
| | 07/25/03 | 5 U | **27** | **120 D** | 5 U | 1 U |
| | 11/11/03 | 2.5 | **21 D** | **110 D** | 0.6 U | 0.12 U |
| | 01/27/04 | 2.5 U | **32** | **150 D** | 2.5 U | 0.5 U |
| | 04/26/04 | **18** | **50** | **150 D** | 5 U | 1 U |
| | 4/26/04 (DUP) | **22** | **84 D** | **200 D** | 1.2 U | 3.9 |
| | 07/27/04 | 3.3 | **22 D** | **100 D** | 1.0 U | 0.2 U |
| | 7/27/04 (DUP) | 3.1 | **22 D** | **110 D** | 1.0 U | 0.2 U |
| | 10/10/04 | **32 D** | **150 D** | **290 D** | 0.23 | 6.2 J |
| | 01/18/05 | **14** | **61 D** | **170 D** | 0.2 U | 2.6 |
| | 04/13/05 | 2.6 | **27 D** | **100 D** | 0.2 U | 0.2 U |
| | 10/25/05 | 2 U | **20** | **77** | 2 U | 2 U |
| | 01/18/06 | 2.8 | **27 D** | **140 D** | 0.2 U | 0.2 U |
| | 1/18/06 (DUP) | 2.9 D | **34 D** | **140 D** | 0.02 U | 0.081 |
| | 07/17/06 | 1.8 | **14** | **92 D** | 0.2 U | 0.2 U |
| | 01/20/07 | 1.3 | **19 D** | **95 D** | 0.2 U | 0.2 U |
| | 1/20/07 (DUP) | 1.2 D | **17 D** | **91 D** | 0.005 U | 0.067 |
| | 07/09/07 | 1.6 | **15** | **82 D** | 0.2 U | 0.2 U |
| | 7/9/2007 (DUP) | 1.3 | **16 D** | **85 D** | 0.02 U | 0.059 |
| | 01/17/08 | 1.4 | **22 D** | **110 D** | 0.2 U | 0.2 U |
| | 1/17/08 (DUP) | 1.4 | **22 D** | **110 D** | 0.2 U | 0.2 U |
| | 07/21/08 | 0.79 J | **14 J D** | **58 J D** | 0.2 UJ | 0.2 UJ |
| | 7/21/08 (DUP) | 0.98 J | **16 J D** | **74 J D** | 0.2 UJ | 0.2 UJ |
| | 01/07/09 | 1.7 | **18 D** | **100 D** | 0.2 U | 0.2 U |
| | 1/7/09 (DUP) | 1.8 J | **20 D** | **110 D** | 0.02 U | 0.065 |
| | 07/09/09 | 1.1 | **15** | **78 D** | 0.2 U | 0.2 U |
| | 01/12/10 | 1.1 | **14** | **87 D** | 0.2 U | 0.2 U |

**Table 15-8**
**Summary of Groundwater Analytical Results for Phosphate Compounds, (mg/L)**
**Building 40-24**
**Boeing Everett Plant**

| Well ID | Sample Date | Butyl Diphenyl Phosphate | Dibutyl Phenyl Phosphate | Tributyl Phosphate | Triphenyl Phosphate | Butylated hydroxytoluene |
|---|---|---|---|---|---|---|
| MTCA Method B Groundwater Screening Level* | | 5.52* | 5.16* | 4.8* | 5.88* | NE |
| **EGW070** | 05/02/01 | 3.1 J | **25 J** | **370 J** | 2.5 UJ | 0.31 |
| | 05/02/01 (DUP) | 4.3 | **28** | **260** | 0.65 | 0.31 |
| | 08/08/01 | 0.98 | **12 D** | **250 D** | 0.5 U | 0.12 U |
| | 11/14/01 | 6.6 D | **30 D** | **380 J D** | 1.4 D | 1.0 D |
| | 02/12/02 | 4.1 | **25** | **420 D** | 2.5 | 0.59 |
| | 05/09/02 | 4.2 | **16 D** | **360 D** | 0.44 | 0.61 |
| | 08/08/02 | 10 U | **21** | **360 D** | 10 U | 2 U |
| | 11/20/02 | 16 | **43** | **510 D** | 5 U | 2 |
| | 02/11/03 | 25 U | **24** | **320** | 25 U | 5 U |
| | 05/13/03 | 5 U | **17** | **350 D** | 5 U | 1 U |
| | 07/25/03 | 10 U | **17** | **280 D** | 10 U | 2 U |
| | 11/11/03 | 5 U | **19** | **300 D** | 5 U | 1 U |
| | 01/27/04 | 2.5 U | **20** | **330 D** | 2.5 U | 0.5 U |
| | 04/26/04 | 2.5 U | **17** | **250 D** | 2.5 U | 0.50 U |
| | 07/27/04 | 1.7 U | **21** | **270 D** | 1.7 U | 0.33 U |
| | 10/10/04 | 1.9 | **21 D** | **420 D** | 0.26 | 0.29 |
| | 01/18/05 | 1.0 | **15** | **200 D** | 0.5 U | 0.5 U |
| | 04/14/05 | 1.1 | **19 D** | **300 D** | 0.2 U | 0.2 U |
| | 10/25/05 | 2 U | **13** | **260 D** | 2 U | 2 U |
| | 01/18/06 | 0.86 | **16** | **300 D** | 0.2 U | 0.2 U |
| | 07/18/06 | 0.46 | **9.7** | **330 D** | 0.2 U | 0.2 U |
| | 01/20/07 | 0.57 | **14** | **260 D** | 0.2 U | 0.2 U |
| | 07/09/07 | 0.3 | **11** | **270 D** | 0.2 U | 0.2 U |
| | 01/17/08 | 0.43 | **12** | **270 D** | 0.2 U | 0.2 U |
| | 07/21/08 | **6.5 J** | **68 J D** | **530 J D** | 1.9 J | 4.7 J |
| | 01/07/09 | 0.56 | **14 D** | **380 D** | 0.2 U | 0.2 U |
| | 07/09/09 | N | **12** | **330 D** | 0.2 U | 0.2 U |
| | 01/12/10 | 0.25 | **9.4** | **200 D** | 0.2 U | 0.2 U |

**Table 15-8**
**Summary of Groundwater Analytical Results for Phosphate Compounds, (mg/L)**
**Building 40-24**
**Boeing Everett Plant**

| Well ID | Sample Date | Butyl Diphenyl Phosphate | Dibutyl Phenyl Phosphate | Tributyl Phosphate | Triphenyl Phosphate | Butylated hydroxytoluene |
|---|---|---|---|---|---|---|
| MTCA Method B Groundwater Screening Level* | | 5.52* | 5.16* | 4.8* | 5.88* | NE |
| **EGW071** | 05/02/01 | 3.4 | **24** | **110** | 0.1 U | 0.075 |
| | 08/08/01 | 3.4 | **24 D** | **120 D** | 0.2 U | 0.076 |
| | 11/14/01 | 1.8 J D | **6.8 J D** | **99 J D** | 0.25 UJ | 0.12 J D |
| | 02/12/02 | 3 | **29** | **190 D** | 1.7 U | 0.33 U |
| | 05/09/02 | 1.6 | **7.4 D** | **61 D** | 0.05 U | 0.12 |
| | 08/08/02 | 2 U | **24** | **96 D** | 2 U | 0.4 U |
| | 11/19/02 | 2 | **17** | **80 D** | 0.83 U | 0.17 U |
| | 02/11/03 | 3.4 | **22 D** | **110 D** | 0.5 U | 0.16 |
| | 02/11/03 (DUP) | 10 U | **15** | **80** | 10 U | 2 U |
| | 05/13/03 | 0.65 | **5.9** | **72 D** | 0.5 U | 0.18 |
| | 07/25/03 | 5 U | **6.6** | **46** | 5 U | 1 U |
| | 11/11/03 | 1 U | **7.1** | **50 D** | 1 U | 0.2 U |
| | 11/11/03 (DUP) | 0.5 U | **5.8** | **44 D** | 0.5 U | 0.1 U |
| | 01/27/04 | 0.5 U | 4.4 | **42 D** | 0.5 U | 0.13 |
| | 1/27/04 (DUP) | 0.5 U | 4.1 | **40 D** | 0.5 U | 0.16 |
| | 04/26/04 | 0.61 | 4.7 | **32 D** | 0.5 U | 0.16 |
| | 07/27/04 | 0.28 | 2.3 D | **22 D** | 0.25 U | 0.15 |
| | 10/10/04 | 0.42 J | 7.0 D | **44 D** | 0.0072 | 0.17 |
| | 01/18/05 | 0.26 | 2.0 D | **25 D** | 0.0055 | 0.21 |
| | 04/14/05 | 0.32 | 3.8 D | **27 D** | 0.02 U | 0.19 |
| | 10/25/05 | 0.2 U | 2.1 | **15** | 0.2 U | 0.2 U |
| | 01/18/06 | 0.18 | 1.5 | **22 D** | 0.02 U | 0.26 |
| | 07/18/06 | 0.11 | 0.64 | **7.3 D** | 0.02 U | 0.19 |
| | 01/20/07 | 0.099 | 1.1 | **13 D** | 0.02 U | 0.19 |
| | 07/09/07 | 0.12 | 1.2 | **7.8 D** | 0.02 U | 0.2 |
| | 01/17/08 | 0.093 | 1.1 | **13 D** | 0.02 U | 0.21 |
| | 07/21/08 | 0.2 UJ | 1.4 J D | **15 J D** | 0.2 UJ | 0.2 J |
| | 01/07/09 | 0.057 | 0.76 | **17 D** | 0.02 U | 0.18 |
| | 07/09/09 | 0.060 | 0.99 | **9.5 D** | 0.02 U | 0.18 |
| | 01/12/10 | 0.035 | 0.49 | **8.6 D** | 0.02 U | 0.16 |

**Table 15-8**
**Summary of Groundwater Analytical Results for Phosphate Compounds, (mg/L)**
**Building 40-24**
**Boeing Everett Plant**

| Well ID | Sample Date | Butyl Diphenyl Phosphate | Dibutyl Phenyl Phosphate | Tributyl Phosphate | Triphenyl Phosphate | Butylated hydroxytoluene |
|---|---|---|---|---|---|---|
| MTCA Method B Groundwater Screening Level* | | 5.52* | 5.16* | 4.8* | 5.88* | NE |
| EGW072 | 05/02/01 | 0.005 U | 0.063 | 2.8 | 0.005 U | 0.027 |
| | 08/08/01 | 0.0015 | 0.007 | 0.37 D | 0.001 U | 0.00095 |
| | 08/08/01 (DUP) | 0.001 U | 0.0041 | 0.28 D | 0.001 U | 0.00063 |
| | 11/14/01 | 0.1 U | 0.36 D | 3.2 J D | 0.1 U | 0.02 U |
| | 02/12/02 | 0.0053 U | 0.0021 U | 0.0018 | 0.0053 U | 0.0011 U |
| | 05/09/02 | 0.010 U | 0.018 | 0.14 | 0.010 U | 0.002 U |
| | 08/08/02 | 0.0053 U | 0.0078 | 0.18 D | 0.0053 U | 0.0013 |
| | 08/08/02 (DUP) | 0.0052 U | 0.0076 | 0.17 D | 0.0052 U | 0.0013 |
| | 11/19/02 | 0.0051 U | 0.0029 | 0.42 D | 0.0051 U | 0.0016 |
| | 02/11/03 | 0.025 U | 0.01 U | 0.51 D | 0.025 U | 0.005 U |
| | 05/13/03 | 0.005 U | 0.002 U | 0.033 | 0.005 U | 0.0011 |
| | 07/25/03 | 0.0056 UJ | 0.016 J | 0.16 J D | 0.0056 UJ | 0.0017 J |
| | 11/11/03 | 0.005 U | 0.012 | 0.81 D | 0.005 U | 0.0016 |
| | 01/27/04 | 0.033 U | 0.013 U | 0.87 D | 0.033 U | 0.0067 U |
| | 04/26/04 | 0.005 U | 0.002 U | 0.0056 | 0.005 U | 0.001 |
| | 07/26/04 | 0.005 U | 0.002 U | 0.072 D | 0.005 U | 0.0017 |
| | 10/10/04 | 0.001 U | 0.001 U | 0.098 D | 0.001 U | 0.001 U |
| | 10/10/04 (DUP) | 0.001 U | 0.001 U | 0.11 D | 0.001 U | 0.001 U |
| | 01/18/05 | 0.017 U | 0.017 U | 0.074 | 0.017 U | 0.017 U |
| | 04/13/05 | 0.001 U | 0.0016 | 0.071 | 0.001 U | 0.001 U |
| | 10/24/05 | 0.001 U | 0.0023 | 0.032 | 0.001 U | 0.001 U |
| | 01/18/06 | 0.001 U | 0.001 U | 0.0055 | 0.001 U | 0.001 U |
| | 07/17/06 | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U |
| | 01/20/07 | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U |
| | 07/09/07 | 0.0024 | 0.012 | 0.066 | 0.001 U | 0.001 U |
| | 01/17/08 | 0.001 U | 0.001 U | 0.15 D | 0.001 U | 0.001 U |
| | 07/21/08 | 0.001 UJ | 0.001 UJ | 0.11 J D | 0.001 UJ | 0.001 UJ |
| | 01/07/09 | 0.0011 | 0.026 | 2.8 D | 0.001 U | 0.0014 |
| | 07/09/09 | 0.001 U | 0.0028 | 0.096 D | 0.001 U | 0.001 U |
| | 01/12/10 | 0.001 U | 0.0061 J | 0.24 D | 0.001 U | 0.001 U |
| | 1/12/10 (DUP) | 0.2 U | 0.2 UJ | 0.29 | 0.2 U | 0.2 U |

**Table 15-8**
**Summary of Groundwater Analytical Results for Phosphate Compounds, (mg/L)**
**Building 40-24**
**Boeing Everett Plant**

| Well ID | Sample Date | Butyl Diphenyl Phosphate | Dibutyl Phenyl Phosphate | Tributyl Phosphate | Triphenyl Phosphate | Butylated hydroxytoluene |
|---|---|---|---|---|---|---|
| MTCA Method B Groundwater Screening Level* | | 5.52* | 5.16* | 4.8* | 5.88* | NE |
| **EGW073** | 05/02/01 | 0.005 U | 0.0078 | 0.57 | 0.005 U | 0.0011 |
| | 08/08/01 | 0.006 | 0.026 D | 0.18 D | 0.0011 U | 0.00044 |
| | 11/14/01 | 0.05 U | 0.13 D | 0.8 J D | 0.05 U | 0.01 U |
| | 02/12/02 | 0.0053 U | 0.019 | 0.14 D | 0.0053 U | 0.0011 U |
| | 05/09/02 | 0.010 U | 0.012 | 0.069 | 0.010 U | 0.002 U |
| | 08/08/02 | 0.0053 U | 0.0085 | 0.042 J | 0.0053 U | 0.0011 U |
| | 11/19/02 | 0.005 U | 0.002 U | 0.0029 | 0.005 U | 0.001 U |
| | 02/11/03 | 0.005 U | 0.0083 | 0.05 | 0.005 U | 0.001 U |
| | 05/13/03 | 0.005 U | 0.002 U | 0.001 U | 0.005 U | 0.001 U |
| | 07/25/03 | 0.005 U | 0.0180 | 0.098 J | 0.005 U | 0.0015 |
| | 11/11/03 | 0.005 U | 0.002 U | 0.0012 | 0.005 U | 0.001 U |
| | 01/26/04 | 0.005 U | 0.0022 | 0.0130 | 0.005 U | 0.001 U |
| | 04/26/04 | 0.005 U | 0.002 U | 0.001 U | 0.005 U | 0.001 U |
| | 07/26/04 | 0.005 U | 0.002 U | 0.002 | 0.005 U | 0.001 U |
| | 10/10/04 | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U |
| | 01/18/05 | 0.001 U | 0.0010 | 0.0036 | 0.001 U | 0.001 U |
| | 04/13/05 | 0.001 U | 0.001 U | 0.0011 | 0.001 U | 0.001 U |
| | 10/24/05 | 0.001 U | 0.0014 | 0.0110 | 0.001 U | 0.001 U |
| | 01/17/06 | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U |
| | 07/17/06 | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U |
| | 7/17/06 (DUP) | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U |
| | 01/20/07 | 0.001 U | 0.001 U | 0.0018 | 0.001 U | 0.001 U |
| | 07/09/07 | 0.0011 | 0.0062 | 0.033 | 0.001 U | 0.001 U |
| | 01/17/08 | 0.001 U | 0.0029 | 0.022 | 0.001 U | 0.001 U |
| | 07/21/08 | 0.001 UJ | 0.001 UJ | 0.001 J | 0.001 UJ | 0.001 UJ |
| | 01/07/09 | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U |
| | 07/09/09 | 0.001 U | 0.0014 | 0.010 | 0.001 U | 0.001 U |
| | 7/9/09 (DUP) | 0.001 U | 0.0020 | 0.015 | 0.001 U | 0.001 U |
| | 01/12/10 | 0.001 U | 0.0033 | 0.022 | 0.001 U | 0.001 U |

**Table 15-8**
**Summary of Groundwater Analytical Results for Phosphate Compounds, (mg/L)**
**Building 40-24**
**Boeing Everett Plant**

| Well ID | Sample Date | Butyl Diphenyl Phosphate | Dibutyl Phenyl Phosphate | Tributyl Phosphate | Triphenyl Phosphate | Butylated hydroxytoluene |
|---|---|---|---|---|---|---|
| MTCA Method B Groundwater Screening Level* | | 5.52* | 5.16* | 4.8* | 5.88* | NE |
| **EGW074** | 05/02/01 | 0.92 | **13** | **140** | 0.1 U | 0.042 |
| | 08/08/01 | 1 | **11 D** | **180 D** | 0.2 U | 0.05 U |
| | 11/14/01 | 0.69 J D | 10 UJ | **340 J D** | 0.25 UJ | 0.05 UJ |
| | 02/12/02 | 1.7 U | **11** | **320 D** | 1.7 U | 0.33 U |
| | 05/09/02 | 0.31 | **6 J D** | **200 D** | 0.200 U | 0.037 J |
| | 05/09/02 (DUP) | 0.36 | **7 J D** | **190 D** | 0.1 U | 0.036 |
| | 08/08/02 | 2 U | **15** | **240 D** | 2 U | 0.4 U |
| | 11/20/02 | 5 U | **9.5** | **220 D** | 5 U | 1 U |
| | 02/11/03 | 10 U | **17** | **200 D** | 10 U | 2 U |
| | 05/13/03 | 0.78 | **9.8** | **140 D** | 0.5 U | 0.1 U |
| | 05/13/03 (DUP) | 5 U | **7.8** | **150 D** | 5 U | 1 U |
| | 07/25/03 | 5 U | **8.6** | **130 D** | 5 U | 1 U |
| | 11/11/03 | 2 U | **5.3** | **110 D** | 2 U | 0.4 U |
| | 01/27/04 | 1.2 U | 3.8 | **60 D** | 1.2 U | 0.25 U |
| | 04/26/04 | 0.25 U | **5.9** | **69 D** | 0.25 U | 0.05 |
| | 07/27/04 | 0.83 U | **6.3** | **72 D** | 0.83 U | 0.17 U |
| | 10/10/04 | 0.3 | **7.9 D** | **170 D** | 0.027 | 0.062 |
| | 01/18/05 | 0.11 | 2.9 | **60 D** | 0.05 U | 0.054 |
| | 04/14/05 | 0.27 | **5.6 D** | **72 D** | 0.026 | 0.061 |
| | 10/25/05 | 0.21 | **6.2** | **100 D** | 0.2 U | 0.2 U |
| | 01/18/06 | 0.11 | 2.1 D | **47 D** | 0.02 U | 0.059 |
| | 07/18/06 | 0.084 | 1.6 | **46 D** | 0.02 U | 0.065 |
| | 01/20/07 | 0.053 | 2.0 | **28 D** | 0.02 U | 0.050 |
| | 07/09/07 | 0.062 | 2.7 D | **37 D** | 0.02 U | 0.062 |
| | 01/17/08 | 0.050 | 2.0 D | **43 D** | 0.02 U | 0.079 |
| | 07/21/08 | 0.2 UJ | 1.6 J | **25 J D** | 0.2 UJ | 0.2 UJ |
| | 01/07/09 | 0.035 | 1.3 | **18 D** | 0.02 U | 0.054 |
| | 07/09/09 | 0.022 | 1.4 | **22 D** | 0.02 U | 0.041 |
| | 01/12/10 | 0.02 U | 0.24 | **7.7 D** | 0.02 U | 0.02 U |

**Notes:**
Values in **bold** font indicate that the result reported exceeds the calculated screening level.
*Value calculated by Boeing consistent with 1996 MTCA Method B methodology.
**Result reported is an estimated value, as the result was outside of the calibration range of the instrument. The dilution performed indicated a value of <250 mg/L.
***Dense non-aqueous phase hydraulic fluid present in well.
D - Dilution required to quantitate analyte within linear range of detector. This flag was not used prior to August, 2001.
(DUP) - Field duplicate
E - Estimated value above the linear range of the instrument detector.
NA - Not sampled and analyzed due to DNAPL in well or not analyzed.
NE - Not established
J - Estimated value
U - Compound was analyzed for but not detected above the reporting limit shown.
UJ - Compound was analyzed for but not detected above the reporting limit shown. Reporting limit is an estimated value.

**Table 15-9**
**Summary of DNAPL Analytical Results for Volatile Organic Compounds and Phosphate Compounds**
**Building 40-24**
**Boeing Everett Plant Remedial Investigation**

| Well ID | Sample Date | Volatile Organic Compounds (ug/kg) | | Phosphate Compounds (mg/L) | | | |
|---|---|---|---|---|---|---|---|
| | | Toluene | Total Xylenes | Butyl Diphenyl Phosphate | Dibutyl Phenyl Phosphate | Tributyl Phosphate | Triphenyl Phosphate |
| **EGW055** | 08/03/99 | 39,000 | 1,600 | 21,000 J | 72,000 J | 110,000 J | 1,200 UJ |
| | 05/09/02 | NA | NA | 1.5 | 16 D | 150 D | 0.200 U |

**Notes:**
DNAPL - Dense non-aqueous phase liquid
J - Estimated value
U - Compound was analyzed for but not detected above the reporting limit shown.

**Table 15-10**
**Summary of Groundwater Analytical Results for Organic Compounds, (mg/L)**
**Building 40-24**
**Boeing Everett Plant**

| Well ID | Sample Date | Volatile Organic Compounds | | | | | | | | | | | | | | Semivolatile Organic Compounds | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Chloromethane | Chloroethane | Methylene Chloride | Acetone | Carbon Disulfide | 1,1-Dichloroethane | 2-Butanone | Benzene | Tetrachloroethene | Toluene | Ethylbenzene | Styrene | 1,1,2-Trichloro-1,2,2-trifluoroethane | Total Xylenes | Phenol | Bis(2-Ethylhexyl) Phthalate | Dimethylphthalate | 4-Methylphenol |
| MTCA Method A or B Groundwater Screening Level | | 0.00337 (B) | 0.015 (B) | 0.005 (A) 0.00583 (B) | 0.8 (B) | 0.8 (B) | 1.6 (B) | 4.8 (B) | 0.005 (A) 0.000795 (B) | 0.005 (A) 0.000081 (B) | 1 (A) 0.64 (B) | 0.7 (A) 0.8 (B) | 0.0015 (B) | 240 (B) | 1 (A) 1.6 (B) | 4.8 (B) | 0.00625 (B) | 16 (B) | 0.04 (B) |
| **EGW055** | 08/08/02 | 0.0002 U | 0.0002 U | 0.0003 U | 0.0064 U | 0.0016 | 0.0002 U | 0.0045 U | 0.0002 U | 0.0002 U | 0.036 | 0.0003 | 0.0002 U | 0.0003 | 0.0012 | **7.1** | 1.3 U | 0.33 U | 0.33 U |
| | 11/20/2002 | 0.0002 U | 0.0002 U | 0.0003 U | 0.0025 UJ | 0.0007 | 0.0002 U | 0.0012 UJ | 0.0002 U | 0.0002 U | 0.02 D | 0.0002 | 0.0002 U | 0.0002 U | 0.001 | **8.3** | 0.8 U | 0.2 U | 0.2 U |
| | 11/20/02 (DUP) | 0.0002 U | 0.0002 U | 0.0003 U | 0.0024 UJ | 0.0006 | 0.0002 U | 0.0015 UJ | 0.0002 U | 0.0002 U | 0.02 D | 0.0002 | 0.0002 U | 0.0002 U | 0.001 | **10** | 0.8 U | 0.2 U | 0.2 U |
| | 02/11/03 | 0.0006 U | 0.0006 U | 0.0009 U | 0.0064 U | 0.0006 U | 0.0006 U | 0.0034 J | 0.0006 U | 0.0006 U | 0.035 | 0.0006 U | 0.0006 U | 0.0006 U | 0.0012 U | **14 D** | **0.25** | 0.1 U | 0.1 U |
| | 05/13/03 | 0.0006 U | 0.0006 U | 0.0009 U | 0.0034 U | 0.0006 U | 0.0006 U | 0.0046 | 0.0006 U | 0.0006 U | 0.028 | 0.0006 U | 0.0006 U | 0.0006 U | 0.0012 U | **18** | 0.3 U | 0.3 U | 0.3 U |
| | 07/25/03 | 0.0006 U | 0.0006 U | 0.0009 U | 0.0055 U | 0.0006 U | 0.0006 U | 0.003 U | 0.0006 U | 0.0006 U | 0.023 | 0.0006 U | 0.0006 U | 0.0006 U | 0.0012 U | **9.7** | 0.1 U | 0.1 U | 0.1 U |
| | 11/11/03 | 0.0006 U | 0.0006 U | 0.0009 U | 0.0090 U | 0.0006 U | 0.0006 U | 0.003 U | 0.0006 U | 0.0006 U | 0.029 | 0.0006 U | 0.0006 U | 0.0006 U | 0.0012 U | **11 J** | 0.12 U | 0.12 U | 0.12 U |
| | 01/27/04 | 0.0006 U | 0.0006 U | 0.0011 U | 0.0030 U | 0.0006 U | 0.0006 U | 0.0031 J | 0.0006 U | 0.0006 U | 0.027 | 0.0006 U | 0.0006 U | 0.0006 U | 0.0012 U | **7.7** | 0.5 U | 0.5 U | 0.5 U |
| | 04/26/04 | 0.0006 U | 0.0006 U | 0.0009 U | 0.0088 U | 0.0006 U | 0.0006 U | 0.0062 U | 0.0006 U | 0.0006 U | 0.027 | 0.0006 U | 0.0006 U | 0.0006 U | 0.0018 U | **18** | 1.0 U | 1.0 U | 1.0 U |
| | 4/26/04 (DUP) | 0.0002 U | 0.0002 U | 0.0003 U | 0.0041 U | 0.0002 U | 0.0002 U | 0.0056 U | 0.0002 U | **0.0002** | 0.025 | 0.0003 | 0.0002 U | 0.0003 | 0.0013 | **17** | 0.25 U | 0.25 U | 0.25 U |
| | 07/27/04 | 0.0006 U | 0.0006 U | 0.0009 U | 0.0068 U | 0.0006 U | 0.0006 U | 0.0030 U | 0.0006 U | 0.0006 U | 0.018 | 0.0006 U | 0.0006 U | 0.0006 U | 0.0012 U | **6.8** | 0.2 U | 0.2 U | 0.2 U |
| | 7/27/04 (DUP) | 0.0006 U | 0.0006 U | 0.0009 U | 0.0030 U | 0.0006 U | 0.0006 U | 0.0030 U | 0.0006 U | 0.0006 U | 0.018 | 0.0006 U | 0.0006 U | 0.0006 U | 0.0012 U | 4.6 | 0.2 U | 0.2 U | 0.2 U |
| | 10/10/04 | 0.001 U | 0.001 U | 0.0015 U | 0.015 | 0.001 U | 0.001 U | 0.024 | 0.001 U | 0.001 U | 0.032 | 0.001 U | 0.001 U | 0.001 U | 0.002 U | **5.1** | 0.067 U | 0.067 U | 0.067 U |
| | 01/18/05 | 0.0006 U | 0.0006 U | 0.0009 U | 0.011 | 0.0006 U | 0.0006 U | 0.0030 U | 0.0006 U | 0.0006 U | 0.022 | 0.0006 U | 0.0006 U | 0.0006 U | 0.0012 U | **9.3** | 0.2 U | 0.2 U | 0.2 U |
| | 04/13/05 | 0.0002 UJ | 0.0002 UJ | 0.0003 UJ | 0.011 U | 0.0002 UJ | 0.0002 UJ | 0.001 UJ | 0.0002 UJ | 0.0002 UJ | 0.02 D | 0.0002 UJ | 0.0002 UJ | 0.0002 UJ | 0.0006 J | **4.9** | 0.2 U | 0.2 U | 0.2 U |
| | 10/25/05 | 0.0004 U | 0.0004 U | 0.0006 U | 0.0043 U | 0.0004 U | 0.0004 U | 0.0020 U | 0.0004 U | 0.0004 U | 0.023 | 0.0004 U | 0.0004 U | 0.0004 U | 0.0008 U | **5.7** | 2.0 U | 2.0 U | 2.0 U |
| | 10/25/05 (DUP) | 0.0002 U | 0.0002 U | 0.0003 U | 0.001 U | 0.0002 U | 0.0002 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U | 0.2 U | 0.2 U | 0.2 U | 0.2 U |
| | 01/18/06 | 0.0002 U | 0.0002 U | 0.0003 U | 0.0062 U | 0.0002 U | 0.0002 U | 0.001 U | 0.0002 U | 0.0002 U | 0.020 | 0.0002 U | 0.0002 U | 0.0002 U | 0.0005 | **6.6** | 0.2 U | 0.2 U | 0.2 U |
| | 1/18/06 (DUP) | 0.0002 U | 0.0002 U | 0.0003 U | 0.0043 U | 0.0002 U | 0.0002 U | 0.001 U | 0.0002 U | 0.0002 U | 0.021 | 0.0002 U | 0.0002 U | 0.0002 U | 0.0006 | **6.0 D** | 0.02 U | 0.02 U | 0.02 U |
| | 07/17/06 | 0.0004 U | 0.0004 U | 0.0006 U | 0.0059 U | 0.0004 U | 0.0004 U | 0.0025 U | 0.0004 U | 0.0004 U | 0.016 | 0.0004 U | 0.0004 U | 0.0004 U | 0.0008 U | **5.0** | 0.2 U | 0.2 U | 0.2 U |
| | 01/20/07 | 0.0002 U | 0.0002 U | 0.0003 U | 0.0044 | 0.0002 U | 0.0002 U | 0.001 U | 0.0002 U | 0.0002 U | 0.020 | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 | **5.9** | 0.2 U | 0.2 U | 0.2 U |
| | 1/20/07 (DUP) | 0.0004 U | 0.0004 U | 0.0006 U | 0.006 U | 0.0004 U | 0.0004 U | 0.002 U | 0.0004 U | 0.0004 U | 0.020 | 0.0004 U | 0.0004 U | 0.0004 U | 0.0008 U | **5.0** | 0.005 U | 0.005 U | 0.005 U |
| | 07/09/07 | 0.0004 U | 0.0004 U | 0.0006 U | 0.006 U | 0.0004 U | 0.0004 U | 0.002 U | 0.0004 U | 0.0004 U | 0.017 | 0.0004 U | 0.0004 U | 0.0004 U | 0.0008 U | 4.2 | 0.2 U | 0.2 U | 0.2 U |
| | 7/9/07 (DUP) | 0.0002 U | 0.0002 U | 0.0003 U | 0.0034 | 0.0002 U | 0.0002 U | 0.001 U | 0.0002 U | 0.0002 U | 0.016 D | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 | 4.4 D | 0.02 U | 0.02 U | 0.02 U |
| | 01/17/08 | 0.0004 U | 0.0004 U | 0.0006 U | 0.006 U | 0.0004 U | 0.0004 U | 0.002 U | 0.0004 U | 0.0004 U | 0.020 | 0.0004 U | 0.0004 U | 0.0004 U | 0.0012 | **13 J** | 0.2 U | 0.2 U | 0.2 U |
| | 1/17/08 (DUP) | 0.0002 U | 0.0002 U | 0.0003 U | 0.0033 | 0.0002 U | 0.0002 U | 0.001 U | 0.0002 U | 0.0002 U | 0.018 D | 0.0002 | 0.0002 U | 0.0002 U | 0.0017 | **13 J** | 0.2 U | 0.2 U | 0.2 U |
| | 07/21/08 | 0.0006 U | 0.0006 U | 0.0015 U | 0.009 U | 0.0006 U | 0.0006 U | 0.0075 U | 0.0006 U | 0.0006 U | 0.016 | 0.0006 U | 0.0006 U | 0.0006 U | 0.0012 U | 4.1 J | 0.2 U | 0.2 U | 0.2 UJ |
| | 7/21/08 (DUP) | 0.0006 U | 0.0006 U | 0.0015 U | 0.009 U | 0.0006 U | 0.0006 U | 0.0075 U | 0.0006 U | 0.0006 U | 0.017 | 0.0006 U | 0.0006 U | 0.0006 U | 0.0012 U | 3.1 J D | 0.01 U | 0.02 U | 0.01 UJ |
| | 01/07/09 | 0.0004 U | 0.0004 U | 0.001 U | 0.0093 U | 0.0004 U | 0.0004 U | 0.005 U | 0.0004 U | 0.0004 U | 0.014 | 0.0004 U | 0.0004 U | 0.0004 U | 0.0008 U | 2.8 | 0.2 U | 0.2 U | 0.2 U |
| | 01/07/09 (DUP) | 0.0004 U | 0.0004 U | 0.001 U | 0.013 U | 0.0004 U | 0.0004 U | 0.005 U | 0.0004 U | 0.0004 U | 0.015 | 0.0004 U | 0.0004 U | 0.0004 U | 0.0008 U | 3.1 D | 0.02 U | 0.02 U | 0.02 U |
| | 07/09/09 | 0.0005 U | 0.0002 U | 0.0005 U | 0.0050 U | 0.0002 U | 0.0002 U | 0.0050 U | 0.0002 U | 0.0002 U | 0.014 | 0.0002 U | 0.0002 U | 0.0002 U | 0.0005 | 3.6 | 0.2 U | 0.2 U | 0.2 U |
| | 01/12/10 | 0.0005 U | 0.0002 U | 0.0005 U | 0.0074 | 0.0002 U | 0.0002 U | 0.005 U | 0.0002 U | 0.0002 U | 0.015 | 0.0002 U | 0.0002 U | 0.0002 U | 0.0005 | 3.1 | 0.2 U | 0.2 U | 0.2 UJ |
| **EGW070** | 05/02/01 | 0.001 U | 0.001 U | 0.002 U | 0.019 | 0.0016 | 0.001 U | 0.041 | 0.001 | 0.001 U | 0.067 | 0.001 U | 0.001 U | 0.002 U | 0.001 U | 1.6 J | 0.001 U | 0.001 U | 0.001 U |
| | 08/08/01 | 0.001 U | 0.001 U | 0.002 U | 0.025 | 0.0017 | 0.001 U | 0.064 | 0.001 U | 0.001 U | 0.064 | 0.001 U | 0.001 U | 0.002 UJ | 0.001 U | **7.7** | **0.32** | 0.1 U | 0.1 U |
| | 11/14/01 | 0.001 U | 0.001 U | 0.002 U | 0.027 | 0.0019 | 0.001 U | 0.100 | 0.001 U | 0.001 U | 0.062 | 0.001 U | 0.001 U | 0.002 U | 0.001 U | 4.2 J | 0.036 UJ | 0.02 U | 0.02 UR |
| | 02/12/02 | 0.002 U | 0.0014 | 0.0003 U | 0.016 | 0.002 | 0.0005 | 0.09 D | 0.0002 | **0.0002** | 0.059 D | 0.001 U | 0.0002 U | 0.0004 | 0.0004 | **30 D** | 0.2 U | 0.1 U | **0.16** |
| | 05/09/02 | 0.0002 | 0.0002 U | 0.0003 U | 0.015 | 0.0009 | 0.0005 | 0.072 D | 0.0002 | 0.0002 U | 0.054 D | 0.0002 U | 0.0002 U | 0.0002 | 0.0004 | **25 J,D** | 0.087 U | 0.022 U | 0.022 UR |
| | 08/08/02 | 0.002 U | 0.002 U | 0.003 U | 0.034 J | 0.002 U | 0.002 U | 0.058 | 0.002 U | 0.002 U | 0.065 | 0.002 U | 0.002 U | 0.002 U | 0.004 U | **21** | 4 U | 1 U | 1 U |
| | 11/20/02 | 0.0002 UJ | 0.0002 U | 0.0003 U | 0.016 | 0.0018 | 0.0004 J | 0.027 | 0.0002 U | **0.0002** | 0.059 D | 0.0002 | 0.0002 U | 0.0002 U | 0.0011 | **31** | 4 U | 1 U | 1 U |
| | 02/11/03 | 0.002 U | 0.002 U | 0.003 U | 0.054 | 0.002 U | 0.002 U | 0.042 | 0.002 U | 0.002 U | 0.065 | 0.002 U | 0.002 U | 0.002 U | 0.004 U | **22 D** | 0.25 U | 0.25 U | 0.25 U |
| | 05/13/03 | 0.002 U | 0.002 U | 0.003 U | 0.025 J | 0.002 U | 0.002 U | 0.016 | 0.002 U | 0.002 U | 0.053 | 0.002 U | 0.002 U | 0.002 U | 0.004 U | **23** | 0.3 U | 0.3 U | 0.3 U |
| | 07/25/03 | 0.001 U | 0.001 U | 0.0015 U | 0.022 | 0.001 U | 0.001 U | 0.021 | 0.001 U | 0.001 U | 0.065 | 0.001 U | 0.001 U | 0.001 U | 0.002 U | **18** | 0.2 U | 0.2 U | 0.2 U |
| | 11/11/03 | 0.002 U | 0.002 U | 0.003 U | 0.039** | 0.002 U | 0.002 U | 0.022** | 0.002 U | 0.002 U | 0.052 | 0.002 U | 0.002 U | 0.002 U | 0.002 | **13** | 1.0 U | 1.0 U | 1.0 U |
| | 01/27/04 | 0.001 U | 0.001 U | 0.002 U | 0.019 U | 0.001 U | 0.001 U | 0.027 | 0.001 U | 0.001 U | 0.059 | 0.001 U | 0.001 U | 0.002 U | 0.001 U | 3.8 | 0.5 U | 0.5 U | 0.5 U |
| | 04/26/04 | 0.001 U | 0.001 U | 0.002 U | 0.033 U | 0.001 U | 0.001 U | 0.032 | 0.001 U | 0.001 U | 0.054 | 0.001 U | 0.001 U | 0.002 U | 0.001 U | 4.4 | 0.50 U | 0.50 U | 0.50 U |
| | 07/27/04 | 0.001 U | 0.001 U | 0.0015 U | 0.029 U | 0.0016 | 0.001 U | 0.036 | 0.001 U | 0.001 U | 0.056 | 0.001 U | 0.001 U | 0.001 U | 0.002 U | 2.8 | 0.33 U | 0.33 U | 0.33 U |
| | 10/10/04 | 0.001 U | 0.001 U | 0.0015 U | 0.027 | 0.001 U | 0.001 U | 0.021 | 0.001 U | 0.001 U | 0.048 | 0.001 U | 0.001 U | 0.001 U | 0.002 U | 2.3 | 0.04 U | 0.04 U | 0.04 U |
| | 01/18/05 | 0.001 U | 0.001 U | 0.0015 U | 0.030 | 0.001 U | 0.001 U | 0.056 | 0.001 U | 0.001 U | 0.064 | 0.001 U | 0.001 U | 0.001 U | 0.002 U | 3.5 | 0.50 U | 0.50 U | 0.50 U |
| | 04/14/05 | 0.002 U | 0.002 U | 0.003 U | 0.014 U | 0.002 U | 0.002 U | 0.038 | 0.002 U | 0.002 U | 0.064 | 0.002 U | 0.002 U | 0.002 U | 0.004 U | 2.6 | 0.2 U | 0.2 U | 0.2 U |
| | 10/25/05 | 0.002 U | 0.002 U | 0.003 U | 0.042 | 0.002 U | 0.002 U | 0.046 | 0.002 U | 0.002 U | 0.064 | 0.002 U | 0.002 U | 0.002 U | 0.004 U | 2.0 U | 2.0 U | 2.0 U | 2.0 U |
| | 01/18/06 | 0.0002 UJ | 0.0002 UJ | 0.0003 UJ | 0.022 UJ | 0.0022 UJ | 0.0004 J | 0.041 J | 0.0002 UJ | 0.0002 UJ | 0.045 | 0.0002 J | 0.0002 UJ | 0.0002 UJ | 0.0005 J | 0.2 | 0.2 U | 0.2 U | 0.2 U |
| | 07/18/06 | 0.001 U | 0.001 U | 0.0015 U | 0.026 | 0.001 U | 0.001 U | 0.053 | 0.001 U | 0.001 U | 0.043 | 0.001 U | 0.001 U | 0.001 U | 0.002 U | 0.56 | 0.2 U | 0.2 U | 0.2 U |
| | 01/20/07 | 0.0004 U | 0.0004 U | 0.0006 U | 0.017 | 0.0005 | 0.0004 U | 0.027 | 0.0004 U | 0.0004 U | 0.030 | 0.0004 U | 0.0004 U | 0.0004 U | 0.0008 U | 0.2 UJ | 0.2 U | 0.2 U | 0.2 U |
| | 07/09/07 | 0.0006 U | 0.0006 U | 0.0009 U | 0.024 | 0.0014 | 0.0006 U | 0.032 | 0.0006 U | 0.0006 U | 0.037 | 0.0006 U | 0.0006 U | 0.0006 U | 0.0012 U | 0.2 U | 0.2 U | 0.2 U | 0.2 U |
| | 01/17/08 | 0.0006 U | 0.0006 U | 0.0009 U | 0.021 | 0.0006 | 0.0006 U | 0.025 | 0.0006 U | 0.0006 U | 0.033 | 0.0006 U | 0.0006 U | 0.0006 U | 0.0022 | 0.2 UJ | 0.2 U | 0.2 U | 0.2 U |
| | 07/21/08 | 0.0006 U | 0.0006 U | 0.0015 U | 0.023 | 0.0006 U | 0.0006 U | 0.024 | 0.0006 U | 0.0006 U | 0.035 | 0.0006 U | 0.0006 U | 0.0006 U | 0.0012 | 0.22 J | 0.2 U | 1.2 | 0.2 UJ |
| | 01/07/09 | 0.0006 U | 0.0006 U | 0.0015 U | 0.026 U | 0.0006 U | 0.0006 U | 0.026 | 0.0006 U | 0.0006 U | 0.042 | 0.0006 U | 0.0006 U | 0.0006 U | 0.0012 U | 0.2 U | 0.2 U | 0.2 U | 0.2 U |
| | 07/09/09 | 0.0005 U | 0.0002 U | 0.0005 U | 0.014 | 0.0004 | 0.0002 U | 0.037 | 0.0002 U | 0.0002 U | 0.037 | 0.0002 U | 0.0002 U | 0.0002 U | 0.0006 | 0.2 U | 0.2 U | 0.2 U | 0.2 U |
| | 01/12/10 | 0.0005 U | 0.0002 U | 0.0005 U | 0.016 | 0.0007 | 0.0002 U | 0.019 | 0.0002 U | 0.0002 U | 0.036 | 0.0002 U | 0.0002 U | 0.0002 U | 0.0006 | 0.2 U | 0.2 U | 0.2 U | 0.2 UJ |

**Table 15-10**
**Summary of Groundwater Analytical Results for Organic Compounds, (mg/L)**
**Building 40-24**
**Boeing Everett Plant**

| Well ID | Sample Date | Volatile Organic Compounds | | | | | | | | | | | | | | Semivolatile Organic Compounds | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | **Chloromethane** | **Chloroethane** | **Methylene Chloride** | **Acetone** | **Carbon Disulfide** | **1,1-Dichloroethane** | **2-Butanone** | **Benzene** | **Tetrachloroethene** | **Toluene** | **Ethylbenzene** | **Styrene** | **1,1,2-Trichloro-1,2,2-trifluoroethane** | **Total Xylenes** | **Phenol** | **Bis(2-Ethylhexyl) Phthalate** | **Dimethylphthalate** | **4-Methylphenol** |
| MTCA Method A or B Groundwater Screening Level | | 0.00337 (B) | 0.015 (B) | 0.005 (A) 0.00583 (B) | 0.8 (B) | 0.8 (B) | 1.6 (B) | 4.8 (B) | 0.005 (A) 0.000795 (B) | 0.005 (A) 0.000081 (B) | 1 (A) 0.64 (B) | 0.7 (A) 0.8 (B) | 0.0015 (B) | 240 (B) | 1 (A) 1.6 (B) | 4.8 (B) | 0.00625 (B) | 16 (B) | 0.04 (B) |
| **EGW071** | 08/08/02 | 0.0002 U | 0.0002 U | 0.0003 U | 0.0054 U | 0.0002 U | 0.0002 U | 0.0072 U | 0.0002 U | 0.0002 U | 0.0008 J | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U | 0.4 U | 0.8 U | 0.2 U | 0.2 U |
| | 11/19/02 | 0.0002 U | 0.0002 U | 0.0003 U | 0.0021 U | 0.0002 U | 0.0002 U | 0.0039 | 0.0002 U | 0.0002 U | 0.0004 | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U | 0.33 U | 0.67 U | 0.17 U | 0.17 U |
| | 02/11/03 | 0.0002 U | 0.0002 U | 0.0003 U | 0.0034 UJ | 0.0002 U | 0.0002 U | 0.0066 | 0.0002 U | 0.0002 U | 0.0003 | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U | 0.2 U | 0.1 U | 0.1 U | 0.1 U |
| | 02/11/03 (DUP) | 0.0002 U | 0.0002 U | 0.0003 U | 0.0025 U | 0.0002 U | 0.0002 U | 0.0064 | 0.0002 U | 0.0002 U | 0.0003 | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U | 0.2 U | 0.1 U | 0.1 U | 0.1 U |
| | 05/13/03 | 0.0002 U | 0.0002 U | 0.0003 U | 0.0029 U | 0.0002 U | 0.0002 U | 0.0056 | 0.0002 U | 0.0002 U | 0.0003 | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U | 0.86 | **0.140** | 0.1 U | 0.1 U |
| | 07/25/03 | 0.0002 U | 0.0002 U | 0.0003 U | 0.0032 U | 0.0002 U | 0.0002 U | 0.0052 J | 0.0002 U | 0.0002 U | 0.0003 | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U | 0.42 | 0.05 U | 0.05 U | 0.05 U |
| | 11/11/03 | 0.0002 U | 0.0002 U | 0.0003 U | 0.0051 U | 0.0002 U | 0.0002 U | 0.0026 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U | 0.4 U | 0.2 U | 0.2 U | 0.2 U |
| | 11/11/03 (DUP) | 0.0002 U | 0.0002 U | 0.0003 U | 0.0073 U | 0.0002 U | 0.0002 U | 0.0023 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U | 0.2 U | 0.1 U | 0.1 U | 0.1 U |
| | 01/27/04 | 0.0002 U | 0.0002 U | 0.0003 U | 0.0021 U | 0.0002 | 0.0002 U | 0.0019 | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U | 0.2 U | 0.1 U | 0.1 U | 0.1 U |
| | 1/27/04 (DUP) | 0.0002 U | 0.0002 U | 0.0003 U | 0.0034 U | 0.0002 U | 0.0002 U | 0.0028 J | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U | 0.2 U | 0.1 U | 0.1 U | 0.1 U |
| | 04/26/04 | 0.0002 U | 0.0002 U | 0.0003 U | 0.0027 U | 0.0002 U | 0.0002 U | 0.0011 UJ | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U | 0.44 | 0.1 U | 0.1 U | 0.1 U |
| | 07/27/04 | 0.0002 U | 0.0002 U | 0.0003 U | 0.0014 U | 0.0002 U | 0.0002 U | 0.0010 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U | 0.1 U | 0.05 U | 0.05 U | 0.05 U |
| | 10/10/04 | 0.0002 U | 0.0002 U | 0.0003 U | 0.0021 | 0.0002 U | 0.0002 U | 0.0010 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0005 U | 0.12 | 0.004 U | 0.004 U | 0.004 U |
| | 01/18/05 | 0.0002 U | 0.0002 U | 0.0003 U | 0.0022 | 0.0002 U | 0.0002 U | 0.0010 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U | 0.039 | 0.005 U | 0.005 U | 0.005 U |
| | 04/14/05 | 0.0002 U | 0.0002 U | 0.0003 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0026 | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 UJ | 0.0002 U | 0.0004 U | 0.02 U | 0.02 U | 0.02 U | 0.02 U |
| | 10/25/05 | 0.0002 U | 0.0002 U | 0.0003 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0010 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U | 0.2 U | 0.2 U | 0.2 U | 0.2 U |
| | 01/18/06 | 0.0002 U | 0.0002 U | 0.0003 U | 0.0019 U | 0.0002 U | 0.0002 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U | 0.02 U | 0.02 U | 0.02 U | 0.02 U |
| | 07/18/06 | 0.0002 U | 0.0002 U | 0.0003 U | 0.001 U | 0.0002 U | 0.0002 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U | 0.02 U | 0.02 U | 0.02 U | 0.02 U |
| | 01/20/07 | 0.0002 U | 0.0002 U | 0.0003 U | 0.003 U | 0.0002 U | 0.0002 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 UJ | 0.0002 U | 0.0004 U | 0.02 UJ | 0.02 U | 0.02 U | 0.02 U |
| | 07/09/07 | 0.0002 U | 0.0002 U | 0.0003 U | 0.003 U | 0.0002 U | 0.0002 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U | 0.02 U | 0.02 U | 0.02 U | 0.02 U |
| | 01/17/08 | 0.0002 U | 0.0002 U | 0.0003 U | 0.003 U | 0.0002 U | 0.0002 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U | 0.02 UJ | 0.02 U | 0.02 U | 0.02 U |
| | 07/21/08 | 0.0002 U | 0.0002 U | 0.0005 U | 0.003 U | 0.0002 U | 0.0002 U | 0.0025 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 UJ | 0.0002 U | 0.0004 U | 0.02 U | 0.02 U | 0.02 U | 0.02 U |
| | 01/07/09 | 0.0002 U | 0.0002 U | 0.0005 U | 0.003 U | 0.0002 U | 0.0002 U | 0.0025 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U | 0.02 U | 0.02 U | 0.02 U | 0.02 U |
| | 07/09/09 | 0.0005 U | 0.0002 U | 0.0005 U | 0.0050 U | 0.0002 U | 0.0002 U | 0.0050 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U | 0.024 | 0.02 U | 0.02 U | 0.02 U |
| | 01/12/10 | 0.0005 U | 0.0002 U | 0.0005 U | 0.005 U | 0.0002 U | 0.0002 U | 0.005 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U | 0.02 U | 0.02 U | 0.02 U | 0.02 UJ |
| **EGW072** | 08/08/02 | 0.0002 U | 0.0002 U | 0.0003 U | 0.0023 UJ | 0.0002 U | 0.0002 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0004 | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U | 0.002 U | 0.004 U | 0.001 U | 0.001 U |
| | 08/08/02 (DUP) | 0.0002 U | 0.0002 U | 0.0003 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0019 UJ | 0.0002 U | 0.0002 U | 0.0004 | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U | 0.002 U | 0.004 U | 0.001 U | 0.001 U |
| | 11/19/02 | 0.0002 U | 0.0002 U | 0.0003 U | 0.001 U | 0.0002 U | 0.0002 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U | 0.002 U | 0.004 U | 0.001 U | 0.001 U |
| | 02/11/03 | 0.0002 U | 0.0002 U | 0.0003 U | 0.0016 U | 0.0002 U | 0.0002 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U | 0.01 U | 0.005 U | 0.005 U | 0.005 U |
| | 05/13/03 | 0.0002 U | 0.0002 U | 0.0003 U | 0.001 U | 0.0002 U | 0.0002 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U | 0.002 U | 0.001 U | 0.001 U | 0.001 U |
| | 07/25/03 | 0.0002 U | 0.0002 U | 0.0003 U | 0.0015 U | 0.0002 U | 0.0002 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U | 0.0021 U | 0.001 U | 0.001 U | 0.001 U |
| | 11/11/03 | 0.0002 U | 0.0002 U | 0.0003 U | 0.001 U | 0.0002 U | 0.0002 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0003 | 0.0020 U | 0.001 U | 0.001 U | 0.001 U |
| | 01/27/04 | 0.0002 U | 0.0002 U | 0.0003 U | 0.001 U | 0.0002 U | 0.0002 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U | 0.013 U | 0.0067 U | 0.0067 U | 0.0067 U |
| | 04/26/04 | 0.0002 U | 0.0002 U | 0.0003 U | 0.0012 J | 0.0002 U | 0.0002 U | 0.001 J | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U | 0.002 U | 0.001 U | 0.001 U | 0.001 U |
| | 07/26/04 | 0.0002 U | 0.0002 U | 0.0003 U | 0.001 U | 0.0002 U | 0.0002 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U | 0.002 U | 0.001 U | 0.001 U | 0.001 U |
| | 10/10/04 | 0.0002 U | 0.0002 U | 0.0003 U | 0.002 | 0.0002 U | 0.0002 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U |
| | 10/10/04 (DUP) | 0.0002 U | 0.0002 U | 0.0003 U | 0.002 | 0.0002 U | 0.0002 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U |
| | 01/18/05 | 0.0002 U | 0.0002 U | 0.0003 U | 0.001 U | 0.0002 U | 0.0002 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U | 0.017 U | 0.017 U | 0.017 U | 0.017 U |
| | 04/13/05 | 0.0002 U | 0.0002 U | 0.0003 U | 0.001 U | 0.0002 U | 0.0002 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U |
| | 10/24/05 | 0.0002 U | 0.0002 U | 0.0003 U | 0.0014 U | 0.0002 U | 0.0002 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U | 0.001 U | 0.0011 | 0.001 U | 0.001 U |
| | 01/18/06 | 0.0002 U | 0.0002 U | 0.0003 U | 0.0016 U | 0.0002 U | 0.0002 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U |
| | 07/17/06 | 0.0002 U | 0.0002 U | 0.0003 U | 0.001 U | 0.0002 U | 0.0002 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U | 0.001 UJ | 0.001 U | 0.001 U | 0.001 UJ |
| | 01/20/07 | 0.0002 U | 0.0002 U | 0.0003 U | 0.003 U | 0.0002 U | 0.0002 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U | 0.001 UJ | 0.0044 | 0.001 U | 0.001 U |
| | 07/09/07 | 0.0002 U | 0.0002 U | 0.0003 U | 0.003 U | 0.0002 U | 0.0002 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U |
| | 01/17/08 | 0.0002 U | 0.0002 U | 0.0003 | 0.003 U | 0.0002 U | 0.0002 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U | 0.001 UJ | 0.001 U | 0.001 U | 0.001 UJ |
| | 07/21/08 | 0.0002 U | 0.0002 U | 0.0005 U | 0.003 U | 0.0002 U | 0.0002 U | 0.0025 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U | 0.001 U | 0.001 U | 0.001 U | 0.02 U |
| | 01/07/09 | 0.0002 U | 0.0002 U | 0.0005 U | 0.003 U | 0.0002 U | 0.0002 U | 0.0025 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U |
| | 07/09/09 | 0.0005 U | 0.0002 U | 0.0005 U | 0.0050 U | 0.0002 U | 0.0002 U | 0.0050 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U |
| | 01/12/10 | 0.0005 U | 0.0002 U | 0.0005 U | 0.005 U | 0.0002 U | 0.0002 U | 0.005 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U | 0.001 U | 0.001 U | 0.001 U | 0.001 UJ |
| | 1/12/10 (DUP) | 0.0005 U | 0.0002 U | 0.0005 U | 0.005 U | 0.0002 U | 0.0002 U | 0.005 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U | 0.2 U | 0.2 U | 0.2 U | 0.2 UJ |

**Table 15-10**
**Summary of Groundwater Analytical Results for Organic Compounds, (mg/L)**
**Building 40-24**
**Boeing Everett Plant**

| Well ID | Sample Date | Volatile Organic Compounds | | | | | | | | | | | | | | Semivolatile Organic Compounds | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | **Chloromethane** | **Chloroethane** | **Methylene Chloride** | **Acetone** | **Carbon Disulfide** | **1,1-Dichloroethane** | **2-Butanone** | **Benzene** | **Tetrachloroethene** | **Toluene** | **Ethylbenzene** | **Styrene** | **1,1,2-Trichloro-1,2,2-trifluoroethane** | **Total Xylenes** | **Phenol** | **Bis(2-Ethylhexyl) Phthalate** | **Dimethylphthalate** | **4-Methylphenol** |
| MTCA Method A or B Groundwater Screening Level | | 0.00337 (B) | 0.015 (B) | 0.005 (A) 0.00583 (B) | 0.8 (B) | 0.8 (B) | 1.6 (B) | 4.8 (B) | 0.005 (A) 0.000795 (B) | 0.005 (A) 0.000081 (B) | 1 (A) 0.64 (B) | 0.7 (A) 0.8 (B) | 0.0015 (B) | 240 (B) | 1 (A) 1.6 (B) | 4.8 (B) | 0.00625 (B) | 16 (B) | 0.04 (B) |
| **EGW073** | 08/08/02 | 0.0002 U | 0.0002 U | 0.0003 U | 0.0029 U | 0.0002 U | 0.0002 U | 0.002 U | 0.0002 U | 0.0002 U | 0.0005 | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U | 0.002 U | 0.004 U | 0.001 U | 0.001 U |
| | 11/19/02 | 0.0002 U | 0.0002 U | 0.0003 U | 0.001 U | 0.0002 U | 0.0002 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U | 0.002 U | 0.004 U | 0.001 U | 0.001 U |
| | 02/11/03 | 0.0002 U | 0.0002 U | 0.0003 U | 0.0013 U | 0.0002 U | 0.0002 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U | 0.0037 | 0.001 U | 0.001 U | 0.001 U |
| | 05/13/03 | 0.0002 U | 0.0002 U | 0.0003 U | 0.0039 U | 0.0002 U | 0.0002 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U | 0.002 U | 0.001 U | 0.001 U | 0.001 U |
| | 07/25/03 | 0.0002 U | 0.0002 U | 0.0003 U | 0.001 U | 0.0002 U | 0.0002 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U | 0.002 U | 0.001 U | 0.001 U | 0.001 U |
| | 11/11/03 | 0.0002 U | 0.0002 U | 0.0003 U | 0.0020 | 0.0002 U | 0.0002 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0003 | 0.002 U | 0.001 U | 0.001 U | 0.001 U |
| | 01/26/04 | 0.0002 U | 0.0002 U | 0.0003 U | 0.001 U | 0.0002 U | 0.0002 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U | 0.002 U | 0.001 U | 0.001 U | 0.001 U |
| | 04/26/04 | 0.0002 U | 0.0002 U | 0.0003 U | 0.0016 J | 0.0002 U | 0.0002 U | 0.0012 J | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U | 0.002 U | 0.001 U | 0.001 U | 0.001 U |
| | 07/26/04 | 0.0002 U | 0.0002 U | 0.0003 U | 0.001 U | 0.0002 U | 0.0002 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U | 0.002 U | 0.001 U | 0.001 U | 0.001 U |
| | 10/10/04 | 0.0002 U | 0.0002 U | 0.0003 U | 0.001 U | 0.0002 U | 0.0002 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U |
| | 01/18/05 | 0.0002 U | 0.0002 U | 0.0003 U | 0.001 U | 0.0002 U | 0.0002 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U |
| | 04/13/05 | 0.0002 U | 0.0002 U | 0.0003 U | 0.001 U | 0.0002 U | 0.0002 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U |
| | 10/24/05 | 0.0002 U | 0.0002 U | 0.0003 U | 0.001 U | 0.0002 U | 0.0002 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U |
| | 01/17/06 | 0.0002 U | 0.0002 U | 0.0003 U | 0.001 U | 0.0002 U | 0.0002 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U |
| | 07/17/06 | 0.0002 U | 0.0002 U | 0.0003 U | 0.001 U | 0.0002 U | 0.0002 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U |
| | 7/17/06 (DUP) | 0.0002 U | 0.0002 U | 0.0003 U | 0.001 U | 0.0002 U | 0.0002 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U |
| | 01/20/07 | 0.0002 U | 0.0002 U | 0.0003 U | 0.003 U | 0.0002 U | 0.0002 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U | 0.001 UJ | 0.0011 | 0.001 U | 0.001 U |
| | 07/09/07 | 0.0002 U | 0.0002 U | 0.0003 U | 0.003 U | 0.0002 U | 0.0002 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U | 0.001 UJ | 0.001 U | 0.001 U | 0.001 UJ |
| | 01/17/08 | 0.0002 U | 0.0002 U | 0.0003 U | 0.003 U | 0.0002 U | 0.0002 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U | 0.001 UJ | 0.001 U | 0.001 U | 0.001 U |
| | 07/21/08 | 0.0002 U | 0.0002 U | 0.0005 U | 0.003 U | 0.0002 U | 0.0002 U | 0.0025 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U |
| | 01/07/09 | 0.0002 U | 0.0002 U | 0.0005 U | 0.003 U | 0.0002 U | 0.0002 U | 0.0025 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U |
| | 07/09/09 | 0.0005 U | 0.0002 U | 0.0005 U | 0.0050 U | 0.0002 U | 0.0002 U | 0.0050 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U |
| | 7/9/09 (DUP) | 0.0005 U | 0.0002 U | 0.0005 U | 0.0050 U | 0.0002 U | 0.0002 U | 0.0050 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U |
| | 01/12/10 | 0.0005 U | 0.0002 U | 0.0005 U | 0.005 U | 0.0002 U | 0.0002 U | 0.005 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U | 0.001 U | 0.001 U | 0.001 U | 0.001 UJ |
| **EGW074** | 08/08/02 | 0.0004 UJ | 0.0002 U | 0.0003 U | 0.0052 U | 0.0010 | 0.0002 U | 0.010 U | 0.0002 U | 0.0002 U | 0.010 | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 | 0.4 U | 0.8 U | 0.2 U | 0.2 U |
| | 11/20/02 | 0.0002 UJ | 0.0002 U | 0.0003 U | 0.0031 UJ | 0.0002 U | 0.0002 U | 0.016 | 0.0002 U | 0.0002 U | 0.0054 | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 | 0.4 U | 0.8 U | 0.2 U | 0.2 U |
| | 02/11/03 | 0.0002 UJ | 0.0002 U | 0.0003 U | 0.005 UJ | 0.0002 U | 0.0002 U | 0.014 | 0.0002 U | 0.0002 U | 0.0078 | 0.0002 U | 0.0002 U | 0.0002 U | 0.0008 | 0.2 U | 0.1 U | 0.1 U | 0.1 U |
| | 05/13/03 | 0.0002 U | 0.0002 U | 0.0003 U | 0.0038 U | 0.0002 U | 0.0002 U | 0.0078 | 0.0002 U | 0.0002 U | 0.0035 | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U | 0.2 U | 0.1 U | 0.1 U | 0.1 U |
| | 05/13/03 (DUP) | 0.0002 U | 0.0002 U | 0.0003 U | 0.0039 U | 0.0002 U | 0.0002 U | 0.0080 | 0.0002 U | 0.0002 U | 0.0035 | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U | 0.2 U | 0.1 U | 0.1 U | 0.1 U |
| | 07/25/03 | 0.0002 | 0.0002 U | 0.0003 U | 0.0039 U | 0.0002 U | 0.0002 U | 0.0077 | 0.0002 U | 0.0002 U | 0.0048 | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U | 0.2 U | 0.1 U | 0.1 U | 0.1 U |
| | 11/11/03 | 0.0002 U | 0.0002 U | 0.0003 U | 0.0030 U | 0.0003 | 0.0002 U | 0.0067 U | 0.0002 U | 0.0002 U | 0.0033 | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U | 0.8 U | 0.4 U | 0.4 U | 0.4 U |
| | 01/27/04 | 0.0002 U | 0.0002 U | 0.0003 U | 0.0053 U | 0.0002 U | 0.0002 U | 0.0030 | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U | 0.5 U | 0.25 U | 0.25 U | 0.25 U |
| | 04/26/04 | 0.0002 U | 0.0002 U | 0.0003 U | 0.0023 U | 0.0002 U | 0.0002 U | 0.0025 U | 0.0002 U | 0.0002 U | 0.0008 | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U | 0.1 U | 0.05 U | 0.05 U | 0.05 U |
| | 07/27/04 | 0.0002 U | 0.0002 U | 0.0003 U | 0.0022 U | 0.0002 U | 0.0002 U | 0.0028 U | 0.0002 U | 0.0002 U | 0.0019 | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U | 0.33 U | 0.17 U | 0.17 U | 0.17 U |
| | 10/10/04 | 0.0002 U | 0.0002 U | 0.0003 U | 0.0042 | 0.0002 | 0.0002 U | 0.0055 | 0.0002 U | 0.0002 U | 0.0041 | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U | 0.02 U | 0.02 U | 0.02 U | 0.02 U |
| | 01/18/05 | 0.0002 U | 0.0002 U | 0.0003 U | 0.0020 | 0.0002 U | 0.0002 U | 0.0017 | 0.0002 U | 0.0002 U | 0.0002 | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U | 0.079 | 0.05 U | 0.05 U | 0.05 U |
| | 04/14/05 | 0.0002 U | 0.0002 U | 0.0003 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0042 | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U | 0.046 | 0.02 U | 0.02 U | 0.02 U |
| | 10/25/05 | 0.0002 U | 0.0002 U | 0.0003 U | 0.0056 U | 0.0002 U | 0.0002 U | 0.0033 | 0.0002 U | 0.0002 U | 0.0007 | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U | 0.2 U | 0.2 U | 0.2 U | 0.20 U |
| | 01/18/06 | 0.0002 U | 0.0002 U | 0.0003 U | 0.006 U | 0.0002 U | 0.0002 U | 0.0024 | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U | 0.032 | 0.02 U | 0.02 U | 0.02 U |
| | 07/18/06 | 0.0002 U | 0.0002 U | 0.0003 U | 0.0014 | 0.0002 U | 0.0002 U | 0.003 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U | 0.024 | 0.02 U | 0.02 U | 0.02 U |
| | 01/20/07 | 0.0002 U | 0.0002 U | 0.0003 U | 0.003 U | 0.0002 U | 0.0002 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U | 0.033 J | 0.02 U | 0.02 U | 0.02 U |
| | 07/09/07 | 0.0002 U | 0.0002 U | 0.0003 U | 0.003 U | 0.0002 U | 0.0002 U | 0.0015 | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U | 0.02 U | 0.02 U | 0.02 U | 0.02 U |
| | 01/17/08 | 0.0002 U | 0.0002 U | 0.0003 U | 0.003 U | 0.0002 U | 0.0002 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U | 0.02 UJ | 0.02 U | 0.02 U | 0.02 U |
| | 07/21/08 | 0.0002 U | 0.0002 U | 0.0005 U | 0.003 U | 0.0002 U | 0.0002 U | 0.0025 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U | 0.02 U | 0.02 U | 0.02 U | 0.02 U |
| | 01/07/09 | 0.0002 U | 0.0002 U | 0.0005 U | 0.003 U | 0.0002 U | 0.0002 U | 0.0025 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 UJ | 0.0002 U | 0.0004 U | 0.02 U | 0.02 U | 0.02 U | 0.02 U |
| | 07/09/09 | 0.0005 U | 0.0002 U | 0.0005 U | 0.0050 U | 0.0002 U | 0.0002 U | 0.0050 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U | 0.02 U | 0.02 U | 0.02 U | 0.02 U |
| | 01/12/10 | 0.0005 U | 0.0002 U | 0.0005 U | 0.005 U | 0.0002 U | 0.0002 U | 0.005 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U | 0.02 U | 0.02 U | 0.02 U | 0.02 UJ |

**Notes:**

Values in **bold** font indicate that the result reported exceeds the most current MTCA levels based on the Ecology website.

Model Toxics Control Act (MTCA) Cleanup Regulation, WAC 173-340. MTCA Method A and B values are from Ecology website
CLARC tables downloaded as of June 2010. (https://fortress.wa.gov/ecy/clarc/reporting/CLARCReporting.aspx).
(A) - MTCA Method A
(B) - MTCA Method B

** Analyte was detected in the associated equipment blank. Sample result was not qualified based on results from previous rounds.

[1] Screening levels are specific to individual compounds

D - Dilution required to quantitate analyte within linear range of detector. This flag was not used prior to August, 2001.
(DUP) - Field duplicate
J - Estimated value
NA - Not analyzed
R - Result is rejected due to serious deficiencies in the ability to meet control criteria for surrogate recovery.
U - Compound was analyzed for but not detected above the reporting limit shown.
UJ - Compound was analyzed for but not detected above the reporting limit shown. Reporting limit is an estimated value.

**Table 15-11**
**Summary of Groundwater Analytical Results for Metals, (mg/L)**
**Building 40-24**
**Boeing Everett Plant**

| Well ID | Sample Date | Arsenic | | Barium | | Cadmium | | Chromium | | Copper | | Lead | | Mercury | | Nickel | | Selenium | | Silver | | Strontium | | Zinc | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | **Total** | **Dissolved** | **Total** | **Dissolved** | **Total** | **Dissolved** | **Total** | **Dissolved** | **Total** | **Dissolved** | **Total** | **Dissolved** | **Total** | **Dissolved** | **Total** | **Dissolved** | **Total** | **Dissolved** | **Total** | **Dissolved** | **Total** | **Dissolved** | **Total** | **Dissolved** |
| MTCA Method A or B Groundwater Screening Level | | 0.005 (A) 0.0000583 (B) | | 3.2 (B) | | 0.005 (A) 0.008 (B) | | 0.05 (A) 24 ($Cr^{+3}$) (B) 0.048 ($Cr^{+6}$) (B) | | 0.592 (B) | | 0.015 (A) | | 0.002 (A) 0.0048 (B) | | 0.32 (B) | | 0.080 (B) | | 0.080 (B) | | 9.6 (B) | | 4.8 (B) | |
| **EGW055** | 08/08/02 | **0.010** | **0.011** | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 11/20/02 | **0.010** | **0.008** | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 11/20/02 (DUP) | **0.009** | **0.008** | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 02/11/03 | **0.007** | **0.008** | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 05/13/03 | **0.010** | **0.009** | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 07/25/03 | **0.006** | **0.008** | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 11/11/03 | **0.008** | **0.007** | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 01/27/04 | **0.009** | **0.009** | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 04/26/04 | **0.009** | **0.010** | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 4/26/04 (DUP) | **0.009** | **0.010** | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 07/27/04 | **0.008** | **0.008** | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 7/27/04 (DUP) | **0.008** | **0.007** | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 10/10/04 | **0.009** | **0.009** | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 01/18/05 | **0.009** | **0.009** | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 04/13/05 | **0.007** | **0.008** | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 10/25/05 | **0.009** | **0.008** | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 01/18/06 | **0.009** | **0.009** | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 1/18/06 (DUP) | **0.008** | **0.009** | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 07/17/06 | **0.007** | **0.009** | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 01/20/07 | **0.009** | **0.009** | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 1/20/07 (DUP) | **0.009** | **0.008** | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 07/09/07 | **0.008** | **0.006** | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 7/9/07 (DUP) | **0.010** | **0.007** | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 01/17/08 | **0.007** | **0.009** | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 1/17/08 (DUP) | **0.009** | **0.009** | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 07/21/08 | **0.008** | **0.009** | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 7/21/08 (DUP) | **0.008** | **0.008** | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 01/07/09 | **0.007** | **0.008** | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 1/7/09 (DUP) | **0.007** | **0.008** | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 07/09/09 | **0.0078** | **0.0072** | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 01/12/10 | **0.0068** | **0.0068** | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |

**Table 15-11**
**Summary of Groundwater Analytical Results for Metals, (mg/L)**
**Building 40-24**
**Boeing Everett Plant**

| Well ID | Sample Date | Arsenic | | Barium | | Cadmium | | Chromium | | Copper | | Lead | | Mercury | | Nickel | | Selenium | | Silver | | Strontium | | Zinc | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | **Total** | **Dissolved** | **Total** | **Dissolved** | **Total** | **Dissolved** | **Total** | **Dissolved** | **Total** | **Dissolved** | **Total** | **Dissolved** | **Total** | **Dissolved** | **Total** | **Dissolved** | **Total** | **Dissolved** | **Total** | **Dissolved** | **Total** | **Dissolved** | **Total** | **Dissolved** |
| MTCA Method A or B Groundwater Screening Level | | 0.005 (A)<br>0.0000583 (B) | | 3.2 (B) | | 0.005 (A)<br>0.008 (B) | | 0.05 (A)<br>24 ($Cr^{+3}$) (B)<br>0.048 ($Cr^{+6}$) (B) | | 0.592 (B) | | 0.015 (A) | | 0.002 (A)<br>0.0048 (B) | | 0.32 (B) | | 0.080 (B) | | 0.080 (B) | | 9.6 (B) | | 4.8 (B) | |
| **EGW070** | 05/02/01 | **0.029** | **0.031** | 0.006 | 0.005 | 0.002 U | 0.002 U | 0.005 U | 0.005 U | 0.003 | 0.002 U | 0.001 U | 0.001 U | 0.0001 U | 0.0001 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.003 U | 0.003 U | 0.139 | 0.135 | 0.007 | 0.007 |
| | 08/08/01 | **0.024** | **0.020** | 0.006 | 0.006 | 0.002 U | 0.002 U | 0.005 U | 0.005 U | 0.002 U | 0.002 U | 0.001 U | 0.001 U | 0.0001 U | 0.0001 U | 0.01 | 0.01 U | 0.01 U | 0.004 U | 0.003 U | 0.003 U | 0.195 | 0.204 | 0.016 | 0.006 |
| | 11/14/01 | **0.028** | **0.032** | 0.006 | 0.006 | 0.002 U | 0.002 U | 0.005 U | 0.006 | 0.002 U | 0.002 U | 0.001 U | 0.001 U | 0.0001 U | 0.0001 U | 0.01 U | 0.01 U | 0.05 U | 0.05 U | 0.003 U | 0.003 U | 0.177 | 0.24 | 0.017 | 0.006 |
| | 02/12/02 | **0.01** | **0.012** | 0.011 | 0.010 | **0.006** | 0.002 U | 0.010 | 0.006 | 0.004 | 0.002 U | 0.001 U | 0.001 U | 0.0001 U | 0.0001 U | 0.01 U | 0.01 U | 0.05 U | 0.05 U | 0.003 U | 0.003 U | 0.366 | 0.329 | 0.031 | 0.006 U |
| | 05/09/02 | **0.016** | **0.011** | 0.005 | 0.007 | 0.002U | 0.002 U | 0.005 U | 0.005 U | 0.002 U | 0.002 U | 0.001 U | 0.001 U | 0.0001 U | 0.0001 U | 0.01 U | 0.01 U | 0.05 U | 0.05 U | 0.003 U | 0.003 U | 0.202 | 0.251 | 0.014 | 0.006 U |
| | 08/08/02 | **0.014** | **0.010** | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 11/20/02 | **0.01** | **0.017** | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 02/11/03 | **0.006** | **0.006** | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 05/13/03 | **0.008** | **0.005** | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 07/25/03 | 0.005 U | **0.005** | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 11/11/03 | **0.003** | **0.004** | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 01/27/04 | **0.008** | **0.009** | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 04/26/04 | **0.010** | **0.010** | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 07/27/04 | **0.016** | **0.015** | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 10/10/04 | **0.010** | **0.012** | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 01/18/05 | **0.012** | **0.010** | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 04/14/05 | **0.008** | **0.008** | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 10/25/05 | **0.020** | **0.014** | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 01/18/06 | **0.010** | **0.010** | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 07/18/06 | **0.014** | **0.013** | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 01/20/07 | **0.020** | **0.011** | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 07/09/07 | **0.020** | **0.018** | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 01/17/08 | **0.010** | **0.009** | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 07/21/08 | **0.070** | **0.013** | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 01/07/09 | **0.013** | **0.009** | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 07/09/09 | **0.0153** | **0.0155** | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 01/12/10 | **0.012** | **0.0106** | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |

**Table 15-11**
**Summary of Groundwater Analytical Results for Metals, (mg/L)**
**Building 40-24**
**Boeing Everett Plant**

| Well ID | Sample Date | Arsenic | | Barium | | Cadmium | | Chromium | | Copper | | Lead | | Mercury | | Nickel | | Selenium | | Silver | | Strontium | | Zinc | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Dissolved |
| MTCA Method A or B Groundwater Screening Level | | 0.005 (A) 0.0000583 (B) | | 3.2 (B) | | 0.005 (A) 0.008 (B) | | 0.05 (A) 24 ($Cr^{+3}$) (B) 0.048 ($Cr^{+6}$) (B) | | 0.592 (B) | | 0.015 (A) | | 0.002 (A) 0.0048 (B) | | 0.32 (B) | | 0.080 (B) | | 0.080 (B) | | 9.6 (B) | | 4.8 (B) | |
| **EGW071** | 08/08/02 | **0.017** | **0.016** | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 11/19/02 | **0.014** | **0.011** | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 02/11/03 | **0.014** | **0.011** | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 02/11/03 (DUP) | **0.012** | **0.012** | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 05/13/03 | **0.016** | **0.020** | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 07/25/03 | **0.016** | **0.017** | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 11/11/03 | **0.006** | **0.005** | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 11/11/03 (DUP) | **0.005** | **0.004** | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 01/27/04 | **0.009** | **0.009** | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 1/27/04 (DUP) | **0.010** | **0.010** | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 04/26/04 | **0.012** | **0.013** | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 07/27/04 | **0.010** | **0.010** | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 10/10/04 | **0.012** | **0.014** | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 01/18/05 | **0.007** | **0.006** | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 04/14/05 | **0.009** | **0.010** | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 10/25/05 | **0.007** | **0.007** | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 01/18/06 | **0.006** | **0.006** | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 07/18/06 | **0.009** | **0.009** | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 01/20/07 | **0.005** | **0.005** | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 07/09/07 | **0.009** | **0.011** | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 01/17/08 | **0.004** | **0.005** | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 07/21/08 | **0.007** | **0.006** | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 01/07/09 | **0.005** | **0.006** | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 07/09/09 | **0.0062** | **0.0056** | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 01/12/10 | **0.0044** | **0.0040** | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |

**Table 15-11**
**Summary of Groundwater Analytical Results for Metals, (mg/L)**
**Building 40-24**
**Boeing Everett Plant**

| Well ID | Sample Date | Arsenic | | Barium | | Cadmium | | Chromium | | Copper | | Lead | | Mercury | | Nickel | | Selenium | | Silver | | Strontium | | Zinc | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Dissolved | Total | Dissolved |
| MTCA Method A or B Groundwater Screening Level | | 0.005 (A) 0.0000583 (B) | | 3.2 (B) | | 0.005 (A) 0.008 (B) | | 0.05 (A) 24 ($Cr^{+3}$) (B) 0.048 ($Cr^{+6}$) (B) | | 0.592 (B) | | 0.015 (A) | | 0.002 (A) 0.0048 (B) | | 0.32 (B) | | 0.080 (B) | | 0.080 (B) | | 9.6 (B) | | 4.8 (B) | |
| **EGW072** | 08/08/02 | **0.042** | **0.050** | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 08/08/02 (DUP) | **0.050** | **0.050** | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 11/19/02 | **0.010 *** | **0.042** | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 02/11/03 | **0.024** | **0.024** | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 05/13/03 | **0.027** | **0.034** | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 07/25/03 | **0.037** | **0.036** | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 11/11/03 | **0.032** | **0.036** | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 01/27/04 | **0.020** | **0.024** | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 04/26/04 | **0.026** | **0.030** | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 07/26/04 | **0.033** | **0.030** | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 10/10/04 | **0.031** | **0.033** | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 10/10/04 (DUP) | **0.025** | **0.033** | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 01/18/05 | **0.050** | **0.048** | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 04/13/05 | **0.040** | **0.038** | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 10/24/05 | **0.044** | **0.036** | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 01/18/06 | **0.040** | **0.042** | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 07/17/06 | **0.046** | **0.039** | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 01/20/07 | **0.053** | **0.043** | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 07/09/07 | **0.035** | **0.034** | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 01/17/08 | **0.027** | **0.033** | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 07/21/08 | **0.033** | **0.029** | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 01/07/09 | **0.023** | **0.025** | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 07/09/09 | **0.0281** | **0.0255** | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 01/12/10 | **0.0315** | **0.0316** | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 1/12/10 (DUP) | **0.0307** | **0.0291** | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |

**Table 15-11**
**Summary of Groundwater Analytical Results for Metals, (mg/L)**
**Building 40-24**
**Boeing Everett Plant**

| Well ID | Sample Date | Arsenic | | Barium | | Cadmium | | Chromium | | Copper | | Lead | | Mercury | | Nickel | | Selenium | | Silver | | Strontium | | Zinc | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | **Total** | **Dissolved** | **Total** | **Dissolved** | **Total** | **Dissolved** | **Total** | **Dissolved** | **Total** | **Dissolved** | **Total** | **Dissolved** | **Total** | **Dissolved** | **Total** | **Dissolved** | **Total** | **Dissolved** | **Total** | **Dissolved** | **Total** | **Dissolved** | **Total** | **Dissolved** |
| MTCA Method A or B Groundwater Screening Level | | 0.005 (A)<br>0.0000583 (B) | | 3.2 (B) | | 0.005 (A)<br>0.008 (B) | | 0.05 (A)<br>24 ($Cr^{+3}$) (B)<br>0.048 ($Cr^{+6}$) (B) | | 0.592 (B) | | 0.015 (A) | | 0.002 (A)<br>0.0048 (B) | | 0.32 (B) | | 0.080 (B) | | 0.080 (B) | | 9.6 (B) | | 4.8 (B) | |
| **EGW073** | 08/08/02 | **0.008** | **0.008** | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 11/19/02 | **0.012** | **0.011** | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 02/11/03 | **0.012** | **0.011** | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 05/13/03 | **0.010** | **0.010** | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 07/25/03 | **0.007** | **0.007** | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 11/11/03 | **0.010** | **0.010** | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 01/26/04 | **0.011** | **0.009** | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 04/26/04 | **0.009** | **0.010** | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 07/26/04 | **0.010** | **0.007** | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 10/10/04 | **0.008** | **0.007** | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 01/18/05 | **0.011** | **0.010** | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 04/13/05 | **0.010** | **0.009** | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 10/24/05 | **0.010** | **0.009** | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 01/17/06 | **0.011** | **0.010** | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 07/17/06 | **0.010** | **0.010** | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 7/17/06 (DUP) | **0.009** | **0.010** | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 01/20/07 | **0.010** | **0.010** | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 07/09/07 | **0.011** | **0.009** | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 01/17/08 | **0.009** | **0.009** | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 07/21/08 | **0.009** | **0.009** | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 01/07/09 | **0.007** | **0.007** | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 07/09/09 | **0.0064** | **0.0063** | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 7/9/09 (DUP) | **0.0065** | **0.0062** | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 01/12/10 | **0.0082** | **0.0077** | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |

**Table 15-11**
**Summary of Groundwater Analytical Results for Metals, (mg/L)**
**Building 40-24**
**Boeing Everett Plant**

| Well ID | Sample Date | Arsenic | | Barium | | Cadmium | | Chromium | | Copper | | Lead | | Mercury | | Nickel | | Selenium | | Silver | | Strontium | | Zinc | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | **Total** | **Dissolved** | **Total** | **Dissolved** | **Total** | **Dissolved** | **Total** | **Dissolved** | **Total** | **Dissolved** | **Total** | **Dissolved** | **Total** | **Dissolved** | **Total** | **Dissolved** | **Total** | **Dissolved** | **Total** | **Dissolved** | **Total** | **Dissolved** | **Total** | **Dissolved** |
| MTCA Method A or B Groundwater Screening Level | | 0.005 (A) 0.0000583 (B) | | 3.2 (B) | | 0.005 (A) 0.008 (B) | | 0.05 (A) 24 ($Cr^{+3}$) (B) 0.048 ($Cr^{+6}$) (B) | | 0.592 (B) | | 0.015 (A) | | 0.002 (A) 0.0048 (B) | | 0.32 (B) | | 0.080 (B) | | 0.080 (B) | | 9.6 (B) | | 4.8 (B) | |
| **EGW074** | 08/08/02 | **0.019** | **0.020** | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 11/20/02 | **0.020** | **0.020** | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 02/11/03 | **0.012** | **0.015** | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 05/13/03 | **0.013** | **0.011** | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 05/13/03 (DUP) | **0.013** | **0.013** | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 07/25/03 | **0.010** | **0.008** | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 11/11/03 | **0.022** | **0.020** | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 01/27/04 | **0.010** | **0.014** | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 04/26/04 | **0.007** | **0.009** | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 07/27/04 | **0.014** | **0.021** | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 10/10/04 | **0.014** | **0.015** | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 01/18/05 | **0.009** | **0.014** | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 04/14/05 | **0.010** | **0.010** | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 10/25/05 | **0.012** | **0.013** | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 01/18/06 | **0.014** | **0.017** | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 07/18/06 | **0.020** | **0.023** | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 01/20/07 | **0.009** | **0.015** | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 07/09/07 | **0.009** | **0.013** | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 01/17/08 | **0.010** | **0.010** | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 07/21/08 | **0.016** | **0.018** | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 01/07/09 | **0.017** | **0.017** | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 07/09/09 | **0.0079** | **0.0083** | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | 01/12/10 | **0.0069** | **0.0083** | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |

**Notes:**

Values in **bold** font indicate that the result reported exceeds the most current MTCA levels based on the Ecology website.

Model Toxics Control Act (MTCA) Cleanup Regulation, WAC 173-340. MTCA Method A and B values are from Ecology website CLARC tables downloaded as of June 2010. (https://fortress.wa.gov/ecy/clarc/reporting/CLARCReporting.aspx).

(A) - MTCA Method A

(B) - MTCA Method B

U - Compound was analyzed for but not detected above the reporting limit shown.

NA - Not analyzed

*Total arsenic result for 4th Quarter 2002 appears anomolous.

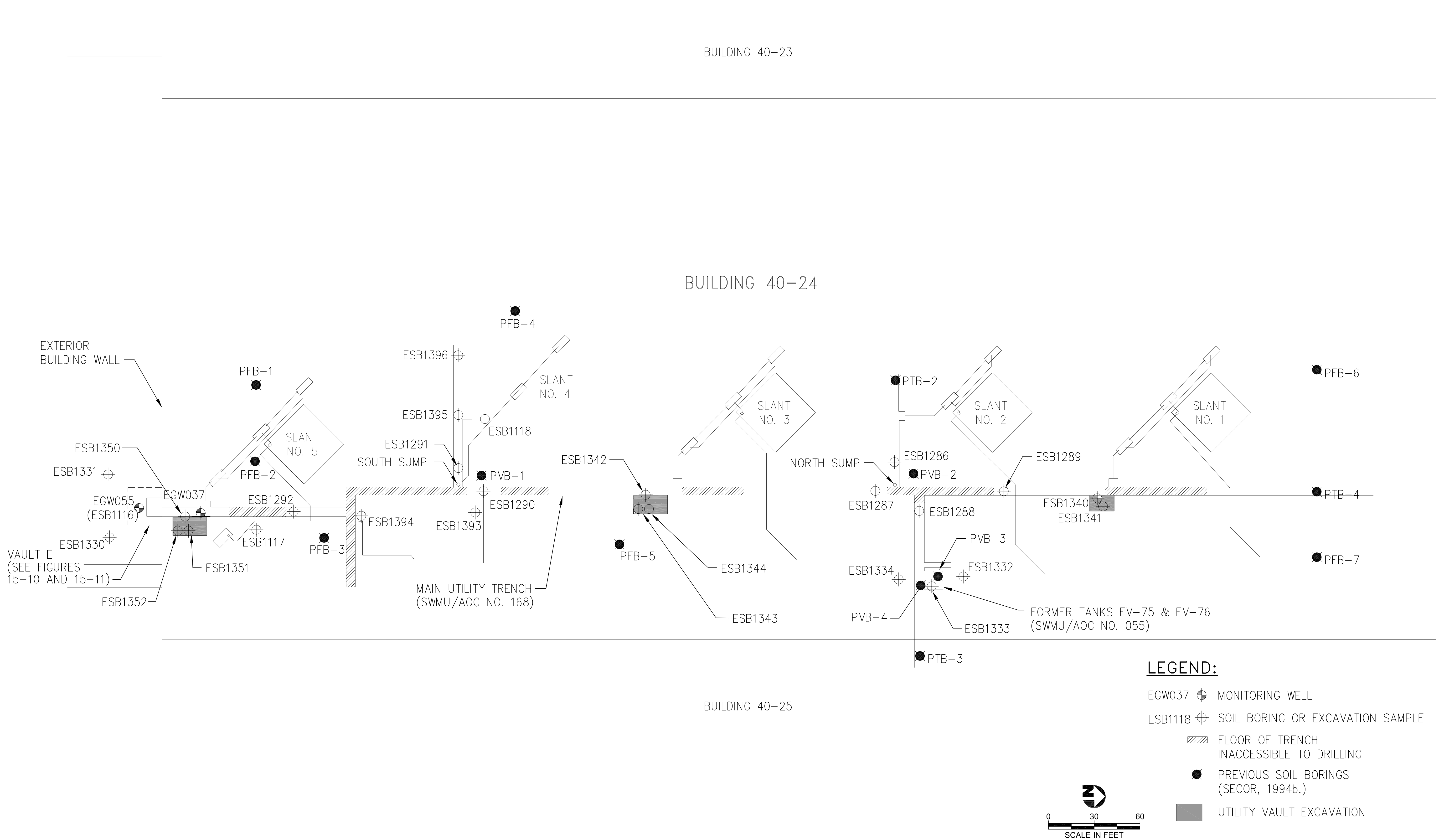


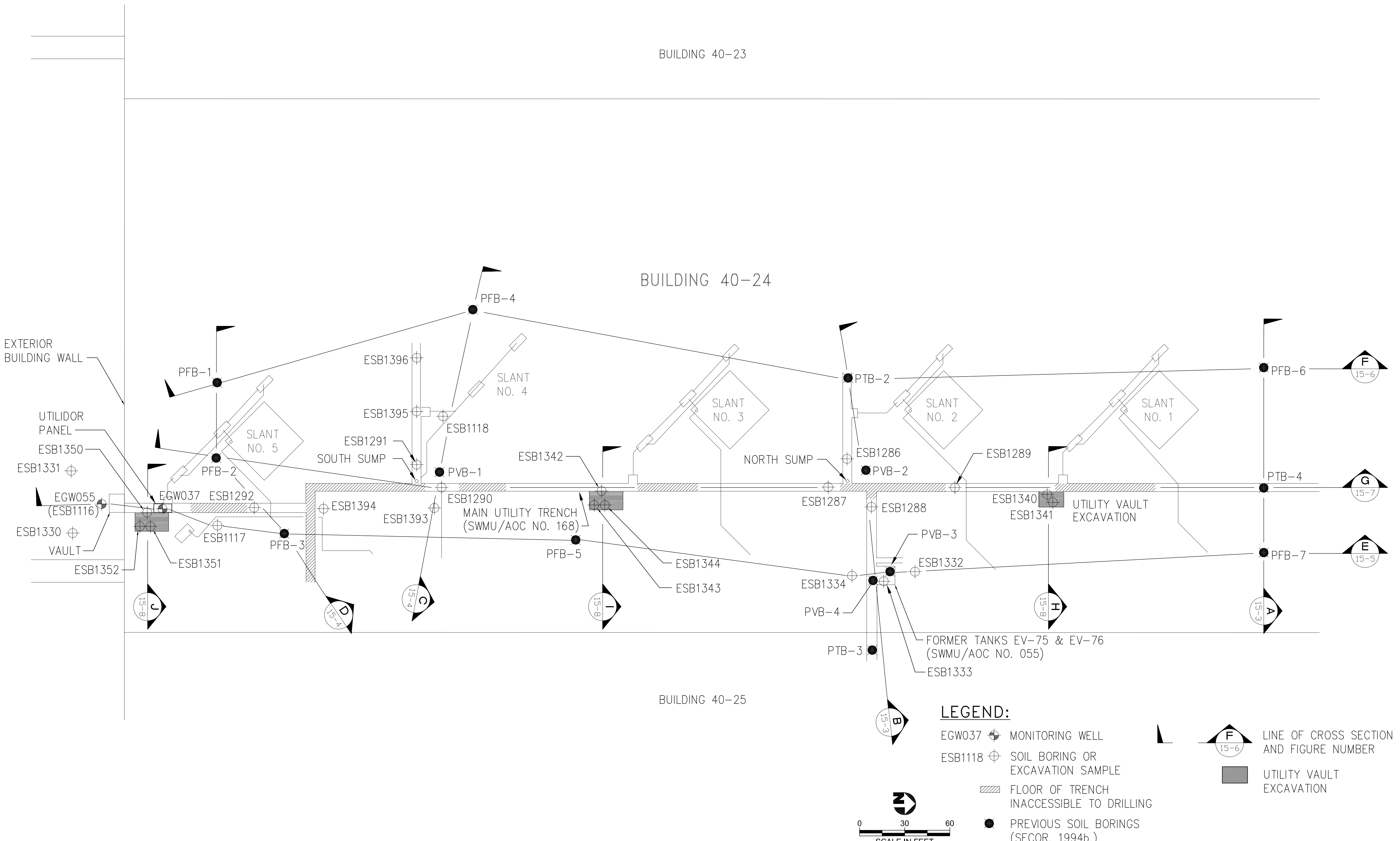

Figure 15-1

**BUILDING 40-24 MONITORING WELL AND SOIL BORING LOCATIONS**

Job No. 33761927

URS Q:\geo\Boeing\Everett\GW Monitoring Report\2010 RI06 Report\Fig 15-1.dwg
Mod: 08/11/2010, 14:20 | Plotted: 08/11/2010, 14:20 | john_knobbs

Boeing Commercial Airplanes, Everett Plant
REMEDIAL INVESTIGATION REPORT

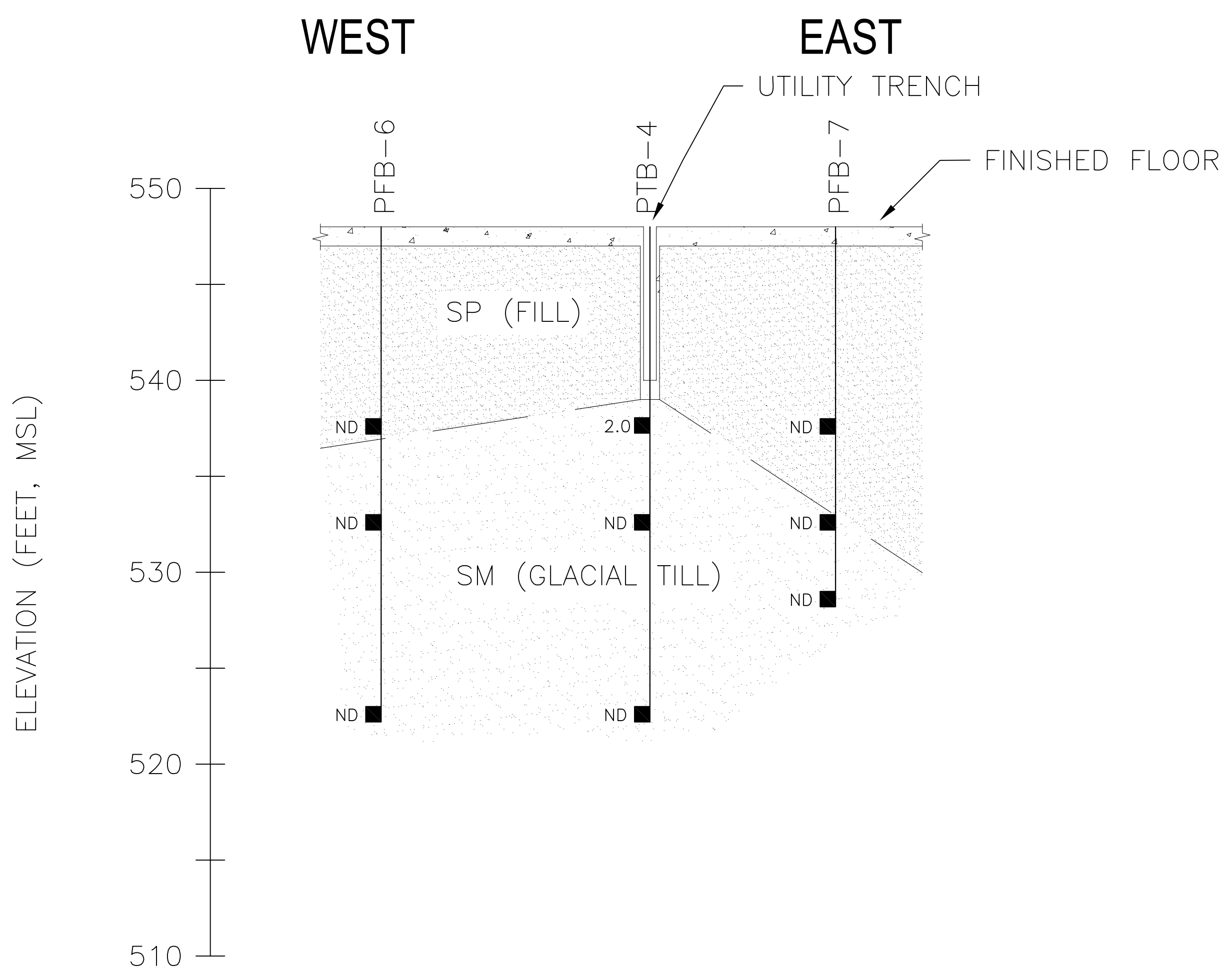



Job No. 33761927

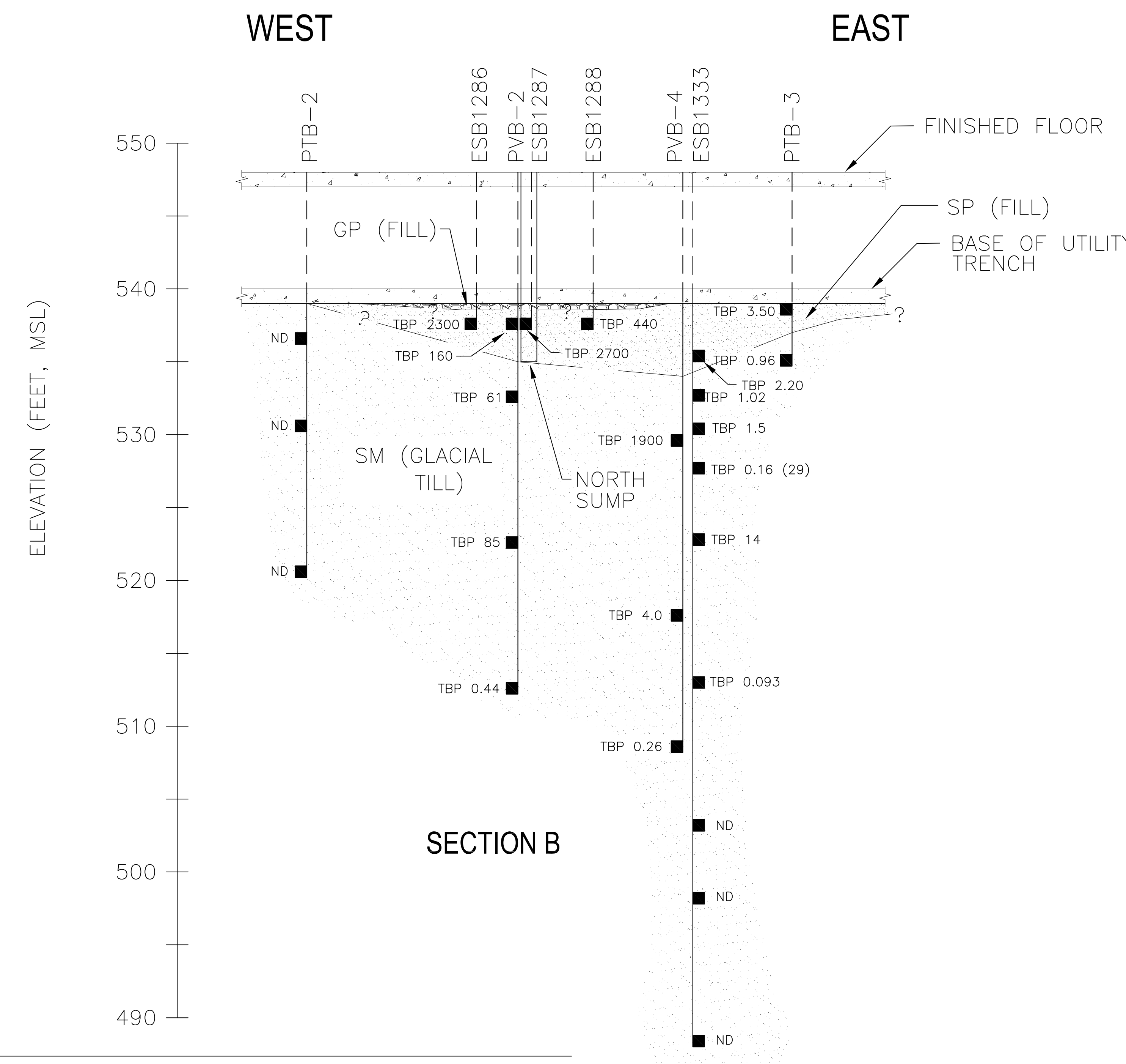
Figure 15-2
**BUILDING 40-24 CROSS SECTION LOCATIONS**

Boeing Commercial Airplanes, Everett Plant
REMEDIAL INVESTIGATION REPORT

Q:\geo\Boeing\Everett\GW Monitoring Report\2010 RI\06 Report\Fig 15-2.dwg
Mod: 08/11/2010, 14:37 | Plotted: 08/11/2010, 14:37 | john_knobbs




SECTION A




SECTION B

LEGEND:

| | | | |
|---|---|---|---|
| ■ | SAMPLE COLLECTED AND ANALYZED | PFB-2 | SOIL BORING (SECOR, 1994b) |
| | SP = FINE TO COARSE SAND AND GRAVEL | | |
| | SM = SILTY FINE TO MEDIUM SAND AND SANDY SILT WITH OCCASIONAL GRAVEL | TBP | TRIBUTYL PHOSPHATE |
| | GP = GRAVEL | ND | TBP NOT DETECTED ABOVE METHOD REPORTING LIMITS |
| | CONCRETE | 160 | TBP CONCENTRATION IN mg/kg |
| ESB1296 | SOIL BORING | | |
| ( ) | DUPLICATE SAMPLE ANALYSIS | | |

0 30 60
SCALE IN FEET

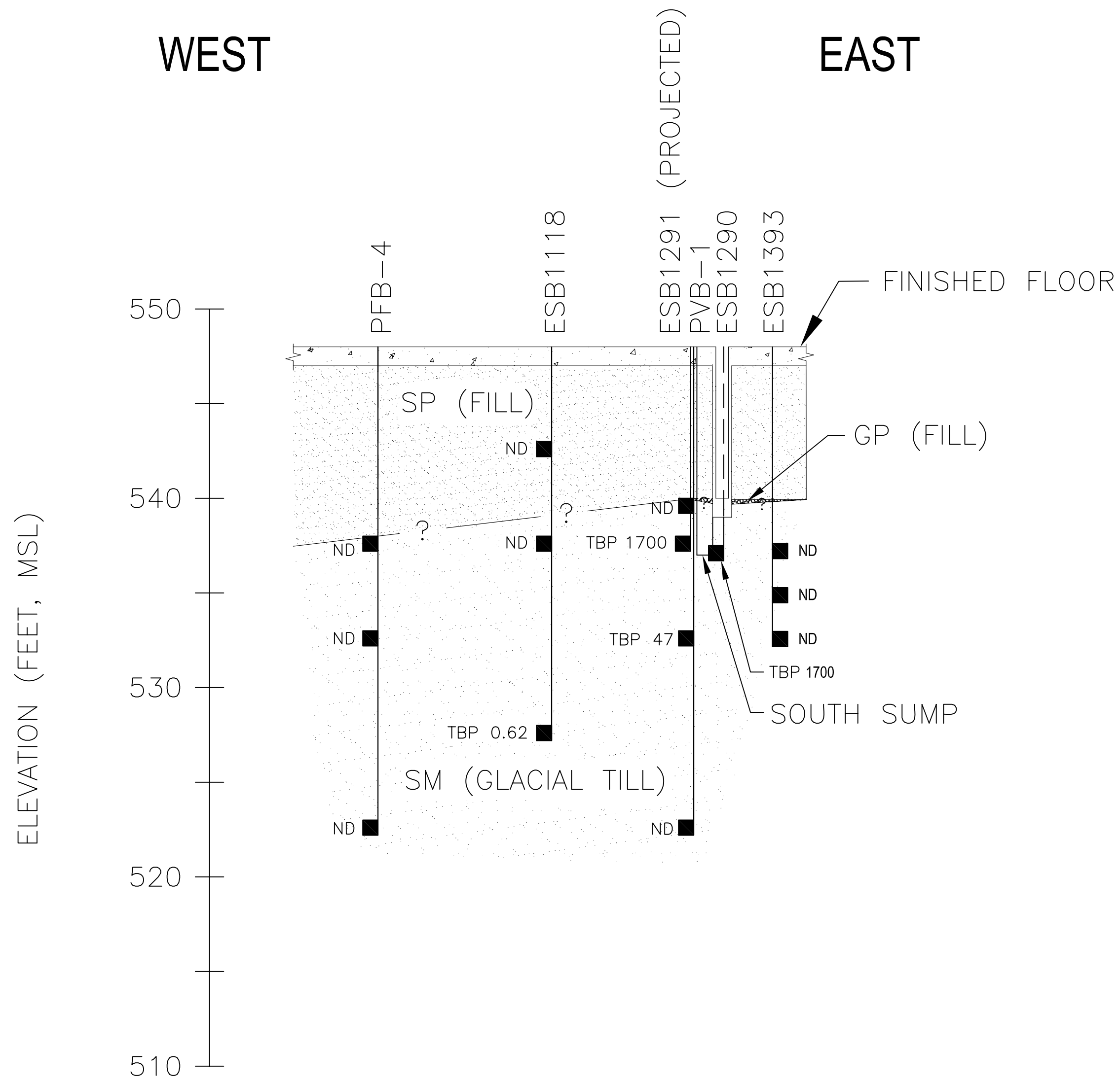
Job No. 33761927

Figure 15-3

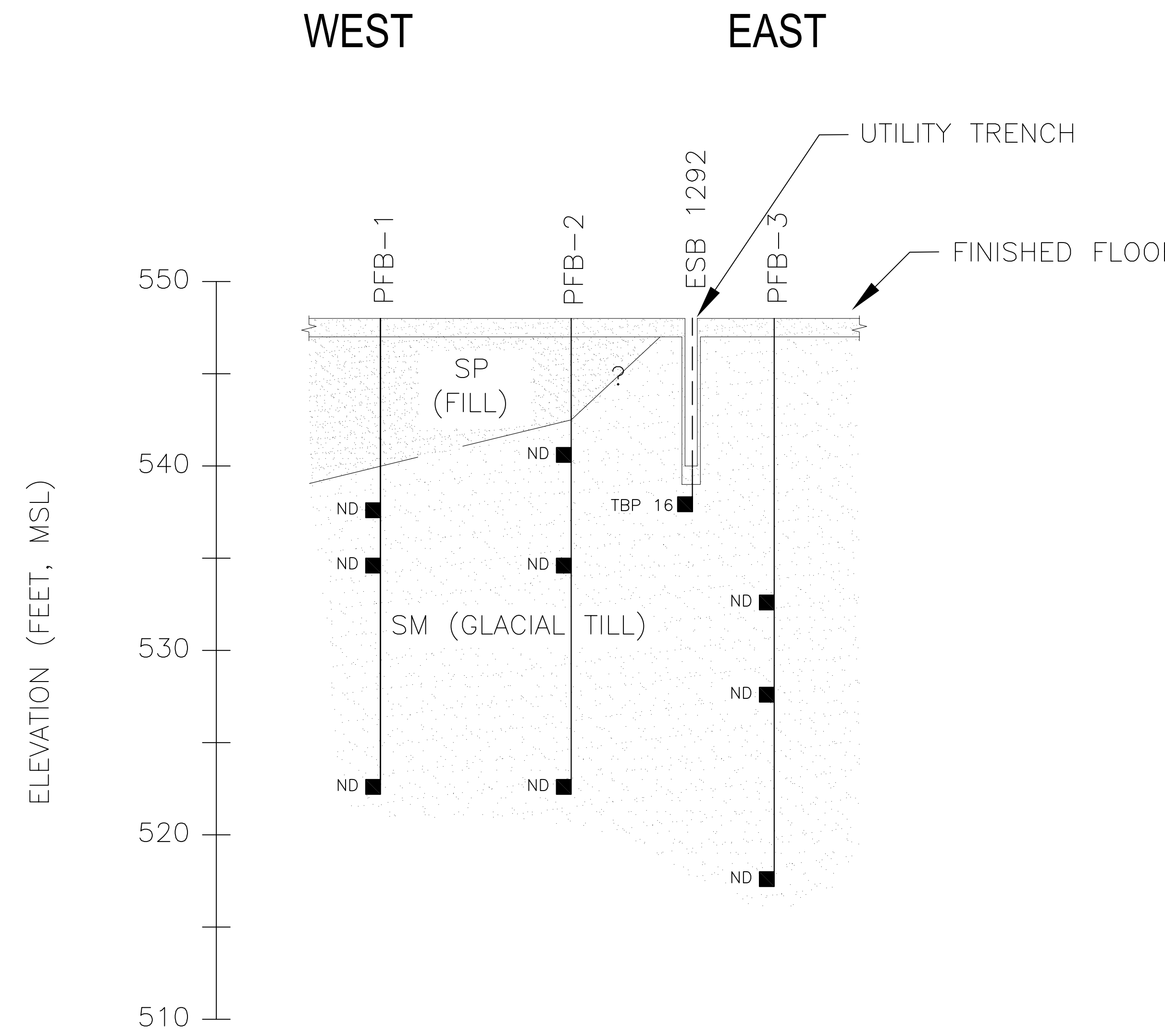
**BUILDING 40-24 CROSS SECTIONS A AND B**

Boeing Commercial Airplanes, Everett Plant
REMEDIAL INVESTIGATION REPORT

URS
Q:\geo\Boeing\Everett\GW Monitoring Report\2010 RI\06 Report\Fig 15-3.dwg
Mod: 08/11/2010, 14:43 | Plotted: 08/11/2010, 14:43 | john_knobbs




SECTION C




SECTION D

LEGEND:

- ■ SAMPLE COLLECTED AND ANALYZED
- SP = FINE TO COARSE SAND AND GRAVEL
- SM = SILTY FINE TO MEDIUM SAND AND SANDY SILT WITH OCCASIONAL GRAVEL
- GP = GRAVEL
- CONCRETE
- ESB1118 | SOIL BORING
- PFB-2 | SOIL BORING (SECOR, 1994b)
- TBP TRIBUTYL PHOSPHATE
- ND TBP NOT DETECTED ABOVE METHOD REPORTING LIMITS
- 1700 TBP CONCENTRATION IN mg/kg

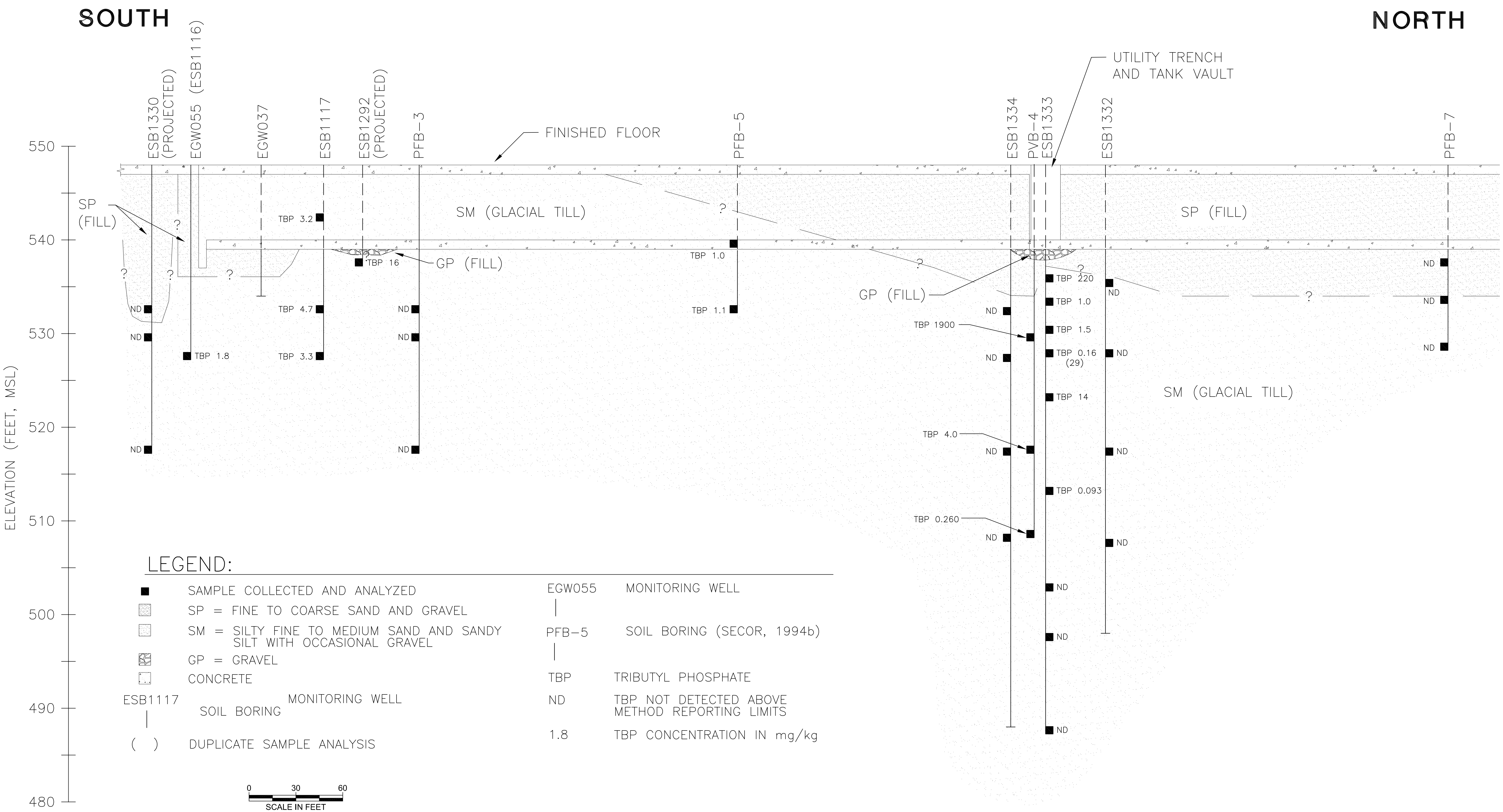
0 30 60
SCALE IN FEET

Job No. 33761927

**Figure 15-4**
**BUILDING 40-24 CROSS SECTIONS C AND D**

Boeing Commercial Airplanes, Everett Plant
REMEDIAL INVESTIGATION REPORT

URS Q:\geo\Boeing\Everett\GW Monitoring Report\2010 RI\06 Report\Fig 15-4.dwg
Mod: 07/07/2006, 12:11 | Plotted: 08/11/2010, 15:26 | john_knobbs




LEGEND:

| | | | |
|---|---|---|---|
| ■ | SAMPLE COLLECTED AND ANALYZED | EGW055 | MONITORING WELL |
| | SP = FINE TO COARSE SAND AND GRAVEL | PFB-5 | SOIL BORING (SECOR, 1994b) |
| | SM = SILTY FINE TO MEDIUM SAND AND SANDY SILT WITH OCCASIONAL GRAVEL | TBP | TRIBUTYL PHOSPHATE |
| | GP = GRAVEL | ND | TBP NOT DETECTED ABOVE METHOD REPORTING LIMITS |
| | CONCRETE | 1.8 | TBP CONCENTRATION IN mg/kg |
| ESB1117 | SOIL BORING / MONITORING WELL | | |
| ( ) | DUPLICATE SAMPLE ANALYSIS | | |

Job No. 33761927

Figure 15-5
**BUILDING 40-24 CROSS SECTION E**

URS
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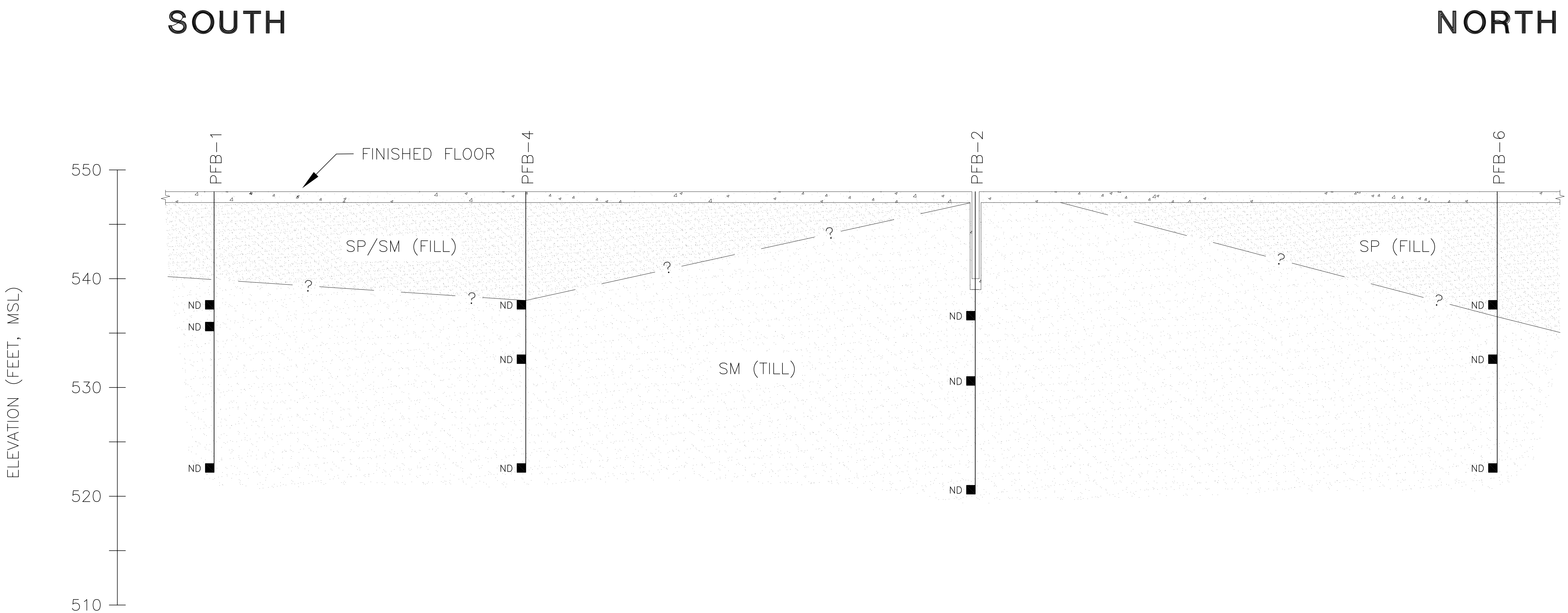
Mod: 08/11/2010, 15:33 | Plotted: 08/11/2010, 15:33 | john_knobbs

Boeing Commercial Airplanes, Everett Plant
REMEDIAL INVESTIGATION REPORT




LEGEND:

■ SAMPLE COLLECTED AND ANALYZED

SP = FINE TO COARSE SAND AND GRAVEL

SM = SILTY FINE TO MEDIUM SAND AND SANDY SILT WITH OCCASIONAL GRAVEL

CONCRETE

PFB-1 SOIL BORING (SECOR, 1994b)

TBP TRIBUTYL PHOSPHATE

ND TBP NOT DETECTED ABOVE METHOD REPORTING LIMITS

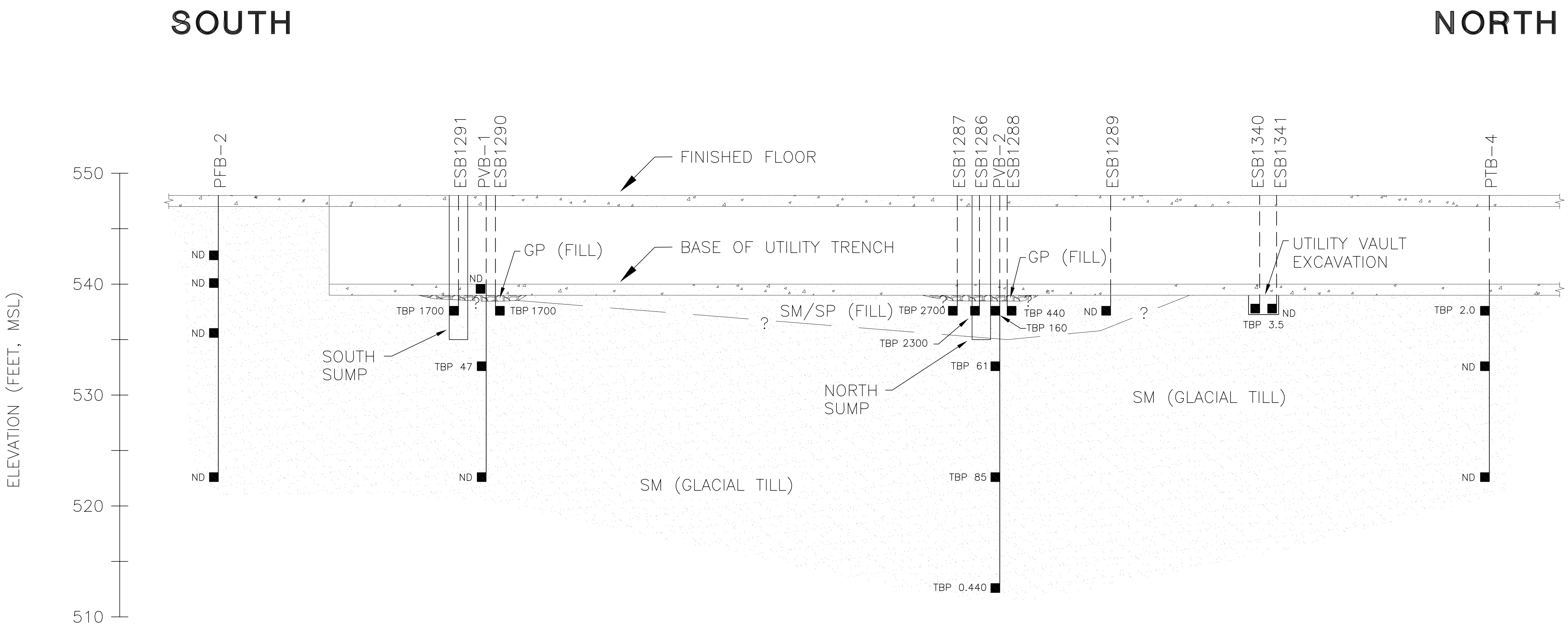
0 30 60
SCALE IN FEET

Job No. 33761927

Figure 15-6
**BUILDING 40-24 CROSS SECTION F**

URS
Q:\geo\Boeing\Everett\GW Monitoring Report\2010 RI\06 Report\Fig 15-6.dwg
Mod: 08/11/2010, 15:44 | Plotted: 08/11/2010, 15:44 | john_knobbs

Boeing Commercial Airplanes, Everett Plant
REMEDIAL INVESTIGATION REPORT




LEGEND:

■ SAMPLE COLLECTED AND ANALYZED

SP = FINE TO COARSE SAND AND GRAVEL

SM = SILTY FINE TO MEDIUM SAND AND SANDY SILT WITH OCCASIONAL GRAVEL

GP = GRAVEL

CONCRETE

ESB1290 SOIL BORING

PFB-2 SOIL BORING (SECOR, 1994b)

TBP TRIBUTYL PHOSPHATE

ND TBP NOT DETECTED ABOVE METHOD REPORTING LIMITS

85 TBP CONCENTRATION IN mg/kg

0 30 60
SCALE IN FEET

Job No. 33761927

Figure 15-7

**BUILDING 40-24 CROSS SECTION G**

Boeing Commercial Airplanes, Everett Plant
REMEDIAL INVESTIGATION REPORT

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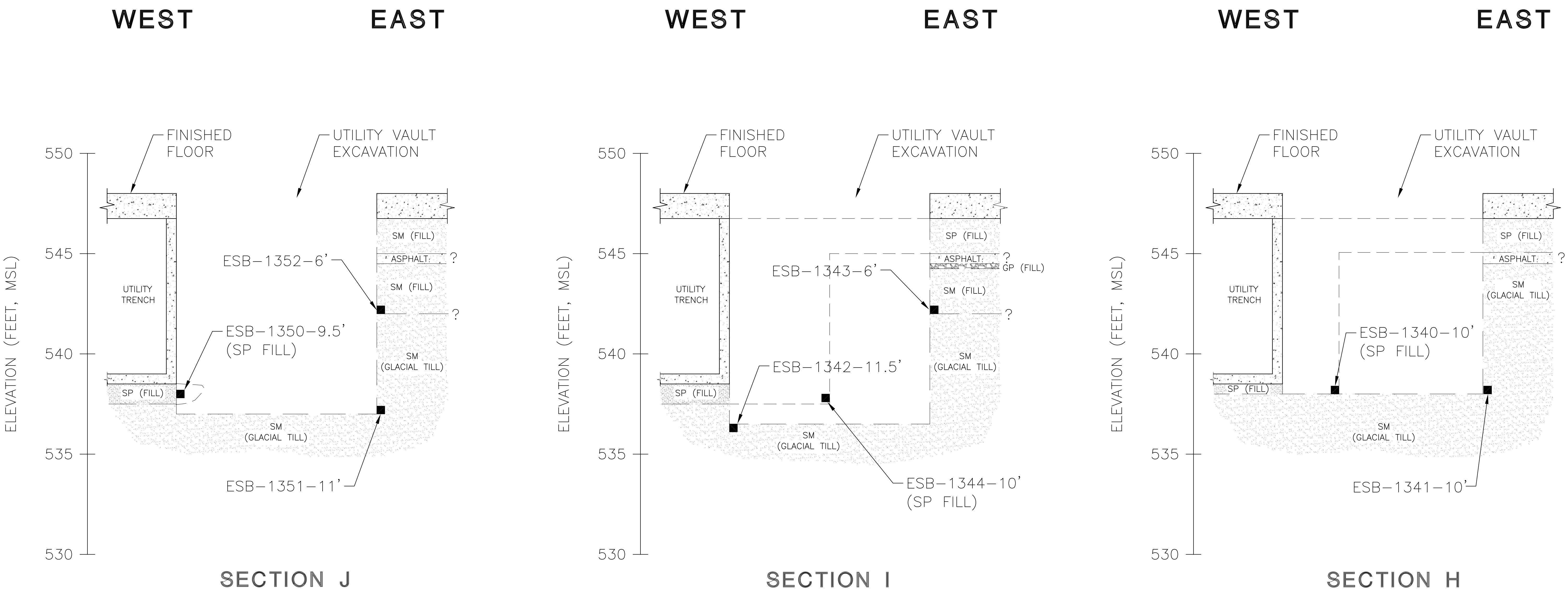



LEGEND:

| | |
|---|---|
| ■ | SAMPLE COLLECTED AND ANALYZED |
| | SP = FINE TO COARSE SAND AND GRAVEL |
| | SM = SILTY FINE TO MEDIUM SAND AND SANDY SILT WITH OCCASIONAL GRAVEL |
| | GP = GRAVEL |
| | CONCRETE OR ASPHALT |
| ESB1296 | SOIL BORING |
| ( ) | DUPLICATE SAMPLE ANALYSIS |
| — — — | AREA OF SP FILL PRIOR TO EXCAVATION |

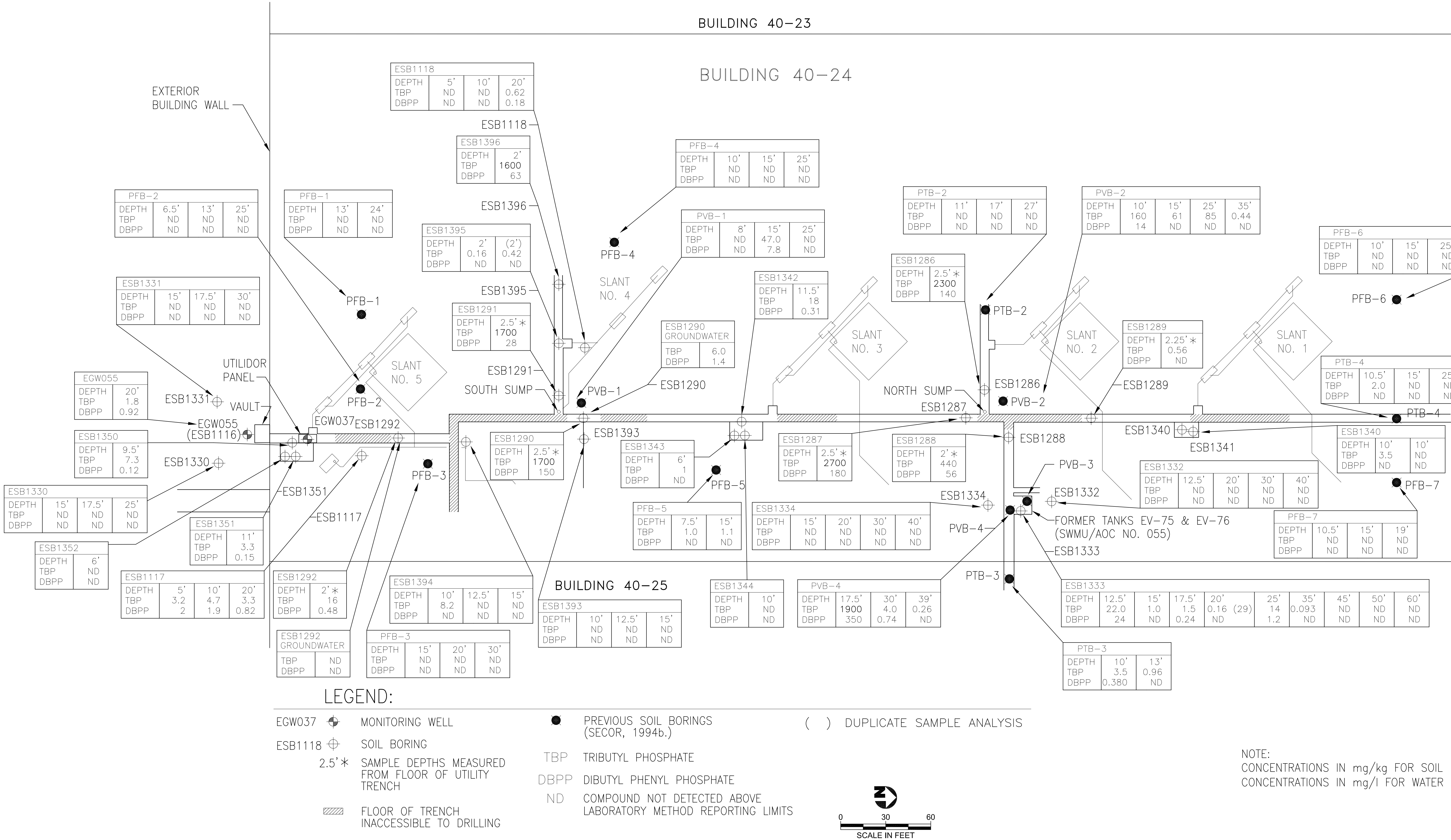
0 2.5 5
SCALE IN FEET

Job No. 33761927

Figure 15-8
**BUILDING 40-24 CROSS SECTIONS H, I AND J**

Boeing Commercial Airplanes, Everett Plant
REMEDIAL INVESTIGATION REPORT

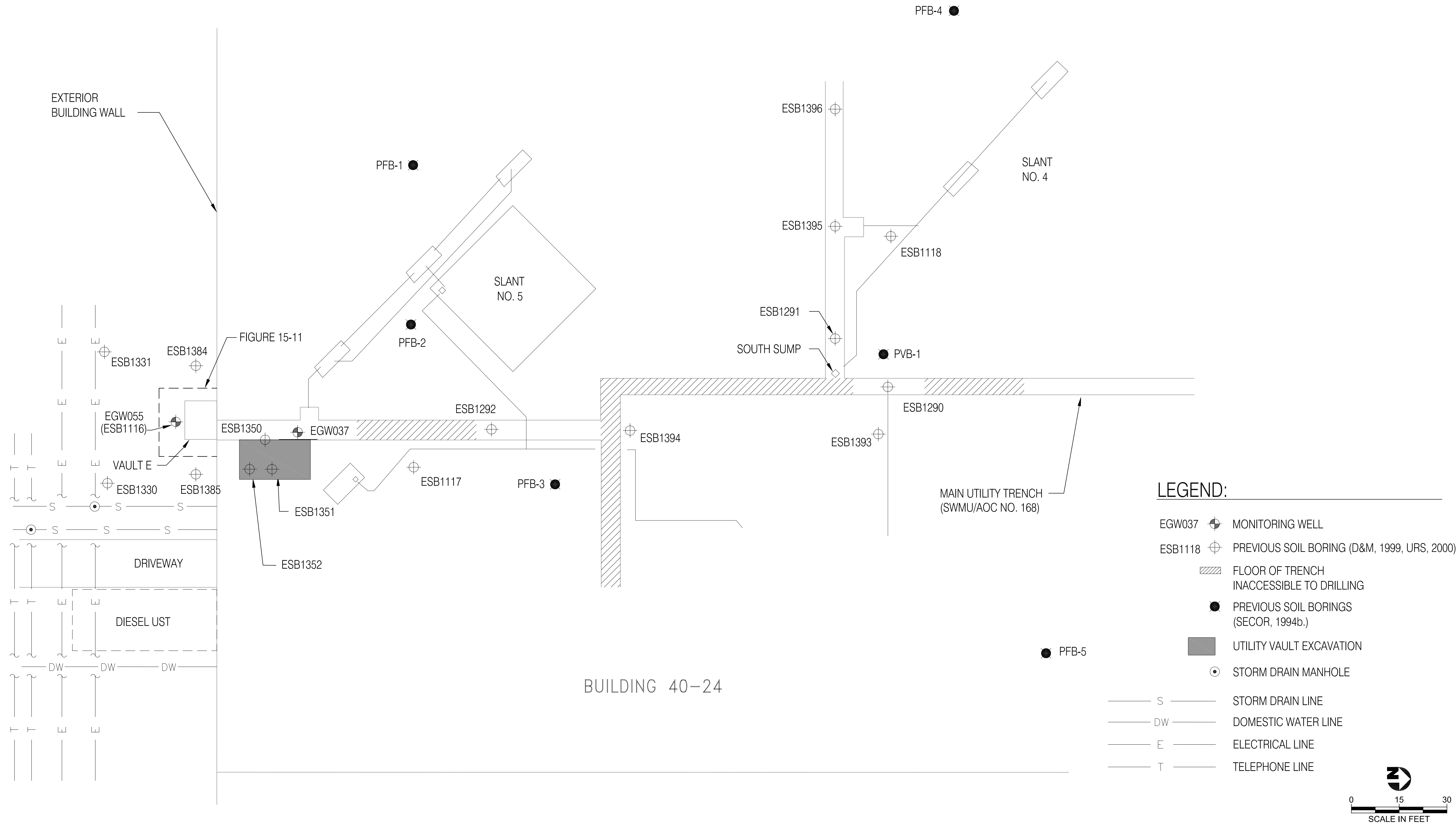
URS ...\geo\Boeing\Everett\GW Monitoring Report\2010 RI\06 Report\Fig 15-8.dwg
...od: 07/07/2006, 11:49 | Plotted: 08/11/2010, 16:06 | john_knobbs




Job No. 33761927

Figure 15-9
**SELECTED ANALYTICAL RESULTS OF SOIL INVESTIGATIONS**

Boeing Commercial Airplanes, Everett Plant
REMEDIAL INVESTIGATION REPORT




Job No. 33761927

**Figure 15-10**

**BUILDING 40-24 VAULT E SITE PLAN**

Boeing Commercial Airplanes, Everett Plant
REMEDIAL INVESTIGATION REPORT

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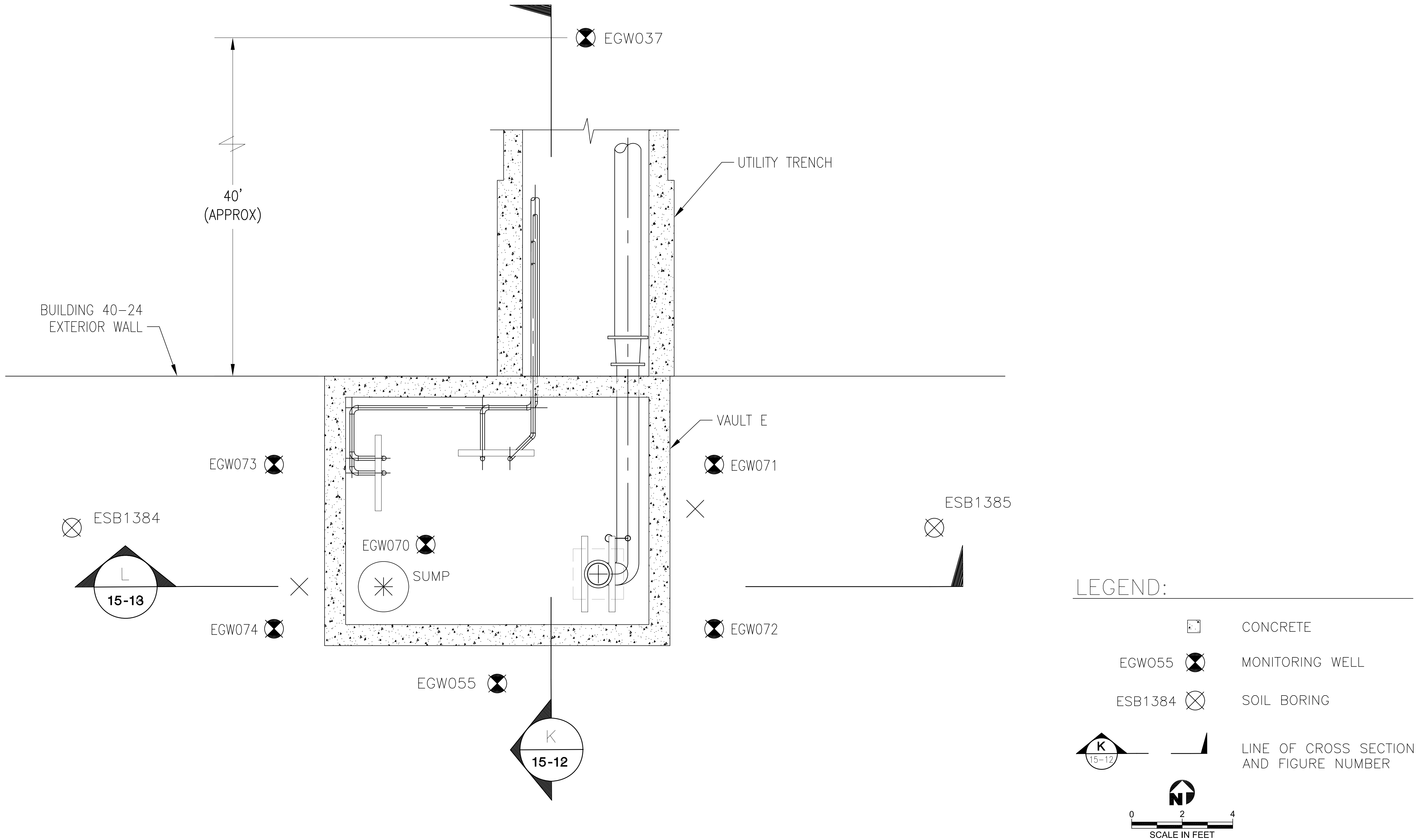


Job No. 33761927

**Figure 15-11**
**BUILDING 40-24 VAULT E**
**SOIL BORING/WELL LOCATIONS**

URS Q:\geo\Boeing\Everett\GW Monitoring Report\2010 RI\06 Report\Fig 15-11.dwg
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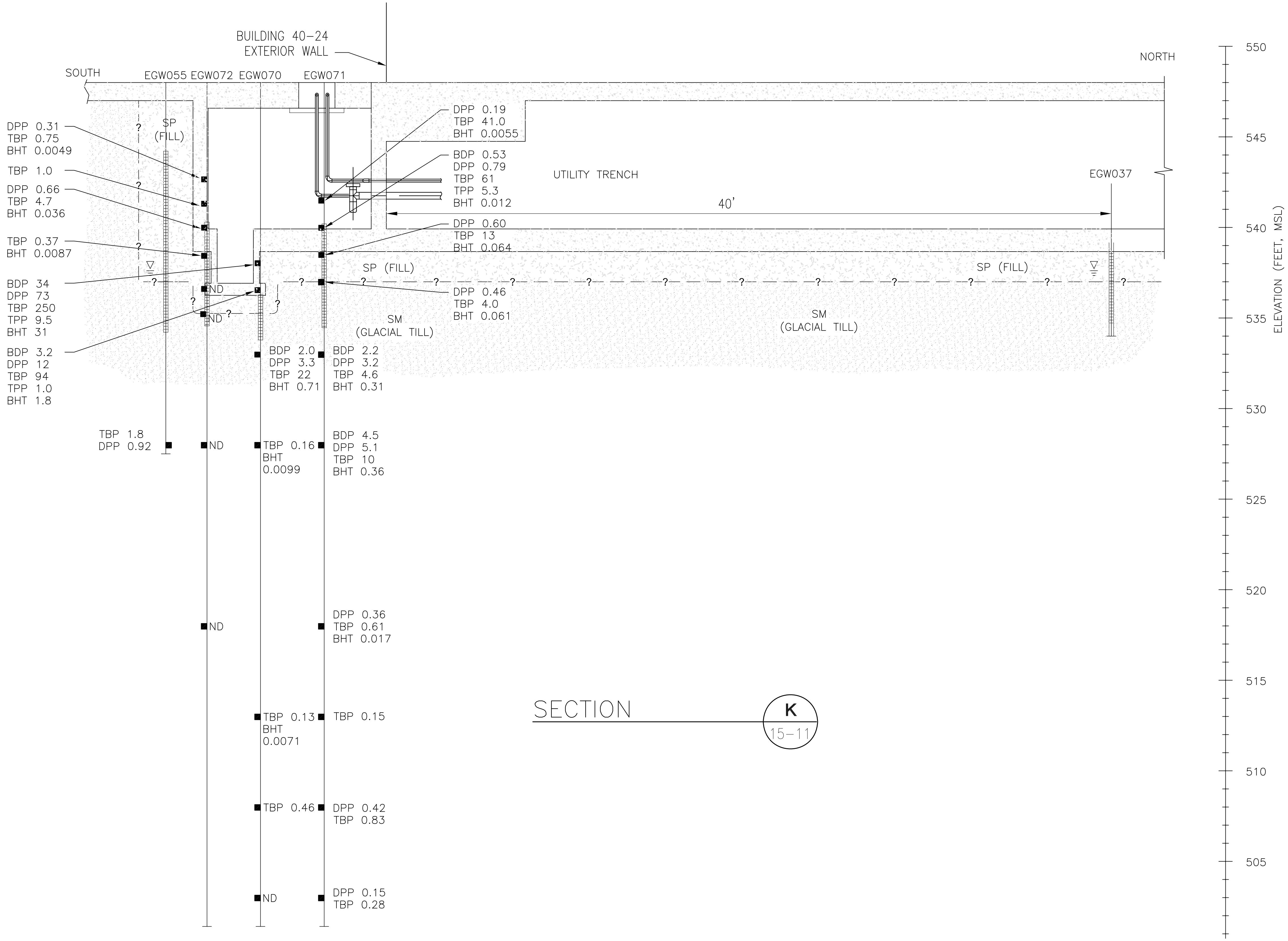
Boeing Commercial Airplanes, Everett Plant
REMEDIAL INVESTIGATION REPORT




LEGEND:

| | |
|---|---|
| ■ | SAMPLE COLLECTED AND ANALYZED |
| | SP = FINE TO COARSE SAND AND GRAVEL |
| □ | SM = SILTY FINE TO MEDIUM SAND AND SANDY SILT WITH OCCASIONAL GRAVEL |
| | CONCRETE OR ASPHALT |
| ESB1296 | SOIL BORING |
| ( ) | DUPLICATE SAMPLE ANALYSIS |
| | WELL SCREEN INTERVAL |
| BDP | BUTYL DIPHENYL PHOSPHATE |
| TBP | TRIBUTYL PHOSPHATE |
| DPP | DIBUTYL PHENYL PHOSPHATE |
| TPP | TRIPHENYL PHOSPHATE |
| BHT | BUTYLATED HYDROXYTOLUENE |
| ND | TBP AND OTHER PHOSPHATE COMPOUNDS NOT DETECTED ABOVE METHOD REPORTING LIMITS |
| 160 | CONCENTRATION IN SOIL mg/kg |
| ▽ | PERCHED GROUNDWATER LEVEL |

0 3 6
SCALE IN FEET

Job No. 33761927

Figure 15-12
**BUILDING 40-24 CROSS SECTION K**

URS
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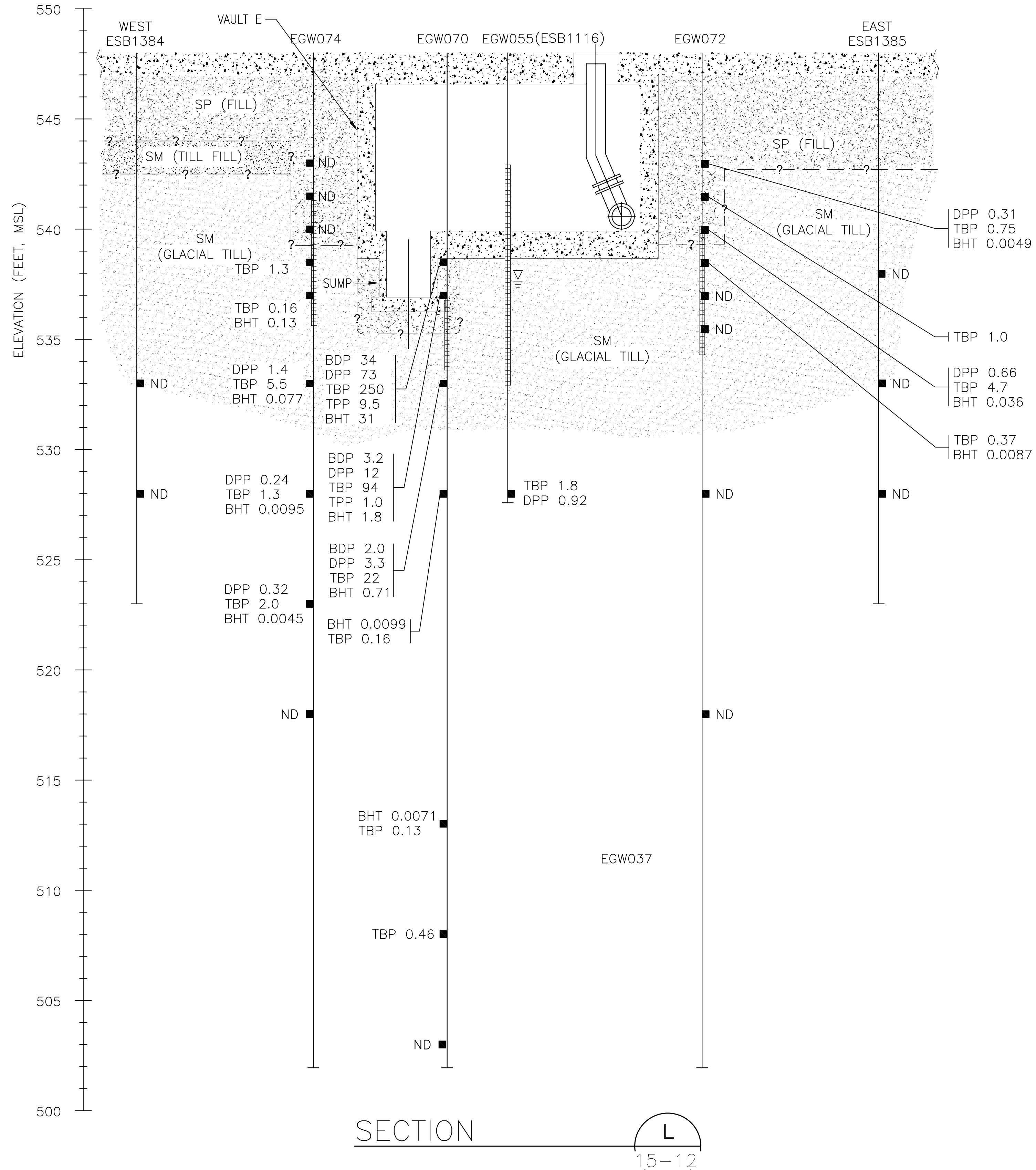
Boeing Commercial Airplanes, Everett Plant
REMEDIAL INVESTIGATION REPORT




# LEGEND:

| | |
|---|---|
| ■ | SAMPLE COLLECTED AND ANALYZED |
| | SP = FINE TO COARSE SAND AND GRAVEL |
| | SM = SILTY FINE TO MEDIUM SAND AND SANDY SILT WITH OCCASIONAL GRAVEL |
| | CONCRETE OR ASPHALT |
| ESB1296 | SOIL BORING |
| ( ) | DUPLICATE SAMPLE ANALYSIS |
| | WELL SCREEN INTERVAL |
| BDP | BUTYL DIPHENYL PHOSPHATE |
| TBP | TRIBUTYL PHOSPHATE |
| DPP | DIBUTYL PHENYL PHOSPHATE |
| TPP | TRIPHENYL PHOSPHATE |
| BHT | BUTYLATED HYDROXYTOLUENE |
| ND | TBP AND OTHER PHOSPHATE COMPOUNDS NOT DETECTED ABOVE METHOD REPORTING LIMITS |
| 160 | CONCENTRATION IN SOIL mg/kg |
| | PERCHED GROUNDWATER LEVEL |

0 3 6
SCALE IN FEET

Job No. 33761927

**Figure 15-13**

**BUILDING 40-24 CROSS SECTION L**

Boeing Commercial Airplanes, Everett Plant
REMEDIAL INVESTIGATION REPORT

URS
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## 16.0 BUILDING 40-56

Presented in this section are the results of the subsurface investigation of soil and groundwater and groundwater monitoring performed as part of the interim actions for five SWMUs/AOCs located at Building 40-56 at the Everett Plant (Figure 16-1). These SWMUs/AOCs include:

- No. 067 - Former Solvent Recycling Unit
- No. 071 - EV-153, Former Silkscreen UST
- No. 086 - EV-41, Former Waste Acid UST
- No. 089 - EV-42, Former Waste Silkscreen UST
- No. 094 - EV-43, Former Silkscreen Product UST

SWMUs/AOCs No. 067 and No. 071 were located inside the building. SWMUs/AOCs No. 086, No. 089 and No. 094 were located outside the building and are the focus of this investigation. The subsurface conditions, prior investigations, and description of these five SWMUs/AOCs are presented in Section 4.0 of the IAWP. This investigation was performed in accordance with Section 4.4.3 of the RIWP, and Section 3.6 of the Supplemental RIWP.

### 16.1 SWMU/AOC DESCRIPTIONS

All of the SWMUs/AOCs were used to store silkscreen solvent product, waste solvent, or recycle waste solvent. All of these units were removed between 1986 and 1991. Potentially dangerous constituents in the silkscreen solvent are VOCs. The principal VOCs in the solvent (xylene, toluene, and ethylbenzene) have been previously detected in soil and/or groundwater near several of these SWMUs/AOCs. Methyl ethyl ketone (MEK), methyl isobutyl ketone (MIBK), vinyl chloride, and several other VOCs have also been detected. Monitoring of shallow perched groundwater present in fill soils south of the western portion of Building 40-56 has been conducted on a quarterly or semiannual basis since February 1995 (Dames & Moore, 1998a). Two extraction wells (EGW043 and EGW044) were installed in 1986 and 1987, respectively, in this area to provide hydraulic control of the perched groundwater. These wells were operated intermittently between 1987 and 1994, and continuously since 1994 except for periods of equipment malfunction or maintenance.

#### 16.1.1 SWMU/AOC NO. 067 Former Solvent Recycling Unit and NO. 071 Former Silkscreen UST and Sump

SWMU/AOC No. 067 was located in the silkscreen shop to the east of SWMU/AOC No. 071(former UST EV-153). The solvent recycling still was an above-ground unit that was connected to UST EV-153 through a drainpipe. It was removed in 1991 because of operational problems. Former UST EV-153 had a 150-gallon capacity and was located underneath the silkscreen washroom within Building 40-56 (Figure 16-1). UST EV-153 began operation in 1980 and was removed in 1991. To the extent practicable, soil containing silkscreen solvent was removed from beneath the floor in the area of SWMUs/AOCs No. 067 and No. 071 in conjunction with remodeling of the silkscreen shop in 1991 and 1992. However, silkscreen solvent constituents in post-excavation samples were detected at concentrations above the applicable MTCA Method A or B soil cleanup levels (GeoEngineers, 1992). Details of this cleanup action are presented in

Section 4.2.2 of the IAWP and a report by GeoEngineers (1992). Ecology did not require additional remedial investigation of soils in this area. Based on these prior results, this area is recommended for inclusion in the FS for evaluation of the direct contact and vapor intrusion potential exposure pathways.

### 16.1.2 SWMU/AOC NO. 086 Former Waste Acid UST

SWMU/AOC No. 086 (former UST EV-41) was a single-wall steel UST with a 500-gallon capacity. UST EV-41 was located in the paved area directly south of Building 40-56 (Figure 16-1). The exact purpose of the tank is unknown but may have been used to store waste acid from the silkscreen washroom area. It was installed in 1969 and removed in 1986.

### 16.1.3 SWMU/AOC NO. 089 and NO. 094 Former Silkscreen USTs

SWMU/AOC No. 089 (former UST EV-42) was a single-wall steel UST with a 1,000-gallon capacity. UST EV-42 was located south of Building 40-56 and was used to store waste solvents generated by activities in the silkscreen washroom (Figure 16-1). It was removed in 1986. SWMU/AOC No. 094 (Former UST EV-43) was a single-wall steel UST with a 1,000-gallon capacity. UST EV-43 was located adjacent to EV-42 and supplied new solvent product to the silkscreen washroom. It was removed from service and replaced with a 1,500-gallon double-wall steel UST equipped with leak detection monitoring (EV-43-1) in 1986. During removal of these USTs, silkscreen solvent was observed in the subsurface soils. Investigations to determine the extent of solvent in soil and perched groundwater were conducted in 1986-87, 1994, and 1996. Monitoring wells were installed in 1987 and 1994. Groundwater samples have been collected from these wells and analyzed on a quarterly or semiannual basis since 1995.

Based on the data available in 1994, one deep (approximately 220 feet bgs) monitoring well (EGW040) was completed in the Esperance Sand aquifer with the intent of assessing Esperance Sand groundwater near the former USTs south of Building 40-56. VOCs have not been detected in this groundwater to date with the exception of a single detection of vinyl chloride during the second quarterly sampling round in 1997. Vinyl chloride was not detected during subsequent sampling rounds.

UST EV-43-1 was removed in 1997 as an interim action in accordance with an Ecology-approved work plan pursuant to the Agreed Order. During UST removal, approximately 285 tons of soil containing one or more VOCs at concentrations above the applicable MTCA Method B soil cleanup levels were removed and disposed offsite at a permitted landfill (Dames & Moore, 1998b). The area of excavation is shown on Figure 16-1. The silkscreen cleaning operation that used solvent from UST EV-43-1 is still present in the building but operates at a lower rate and does not need a storage tank.

## 16.2 PURPOSE AND SCOPE

The investigation area is situated south of the western portion of Building 40-56 in the area of former USTs EV-41, EV-42, and EV-43. The purpose of the soil and groundwater investigation was to supplement data obtained by previous investigations in this area to better delineate (1) the lateral and vertical extent of soil and groundwater containing VOCs and (2) determine the extent of soil to be excavated during removal of UST EV-43-1. The scope of investigation was in general accordance with Section 4.4.3 of the IAWP and supplemental work plan approved by Ecology (Dames & Moore, 1997). The scope included the following:

- Drilled 25 soil borings to depths of 12 to 19 feet bgs in an area south of Building 40-56 using StrataProbe and Geoprobe hydraulic push probe equipment
- Collected soil samples at prescribed depth intervals
- Collected samples of groundwater from probe borings at selected locations where it was encountered
- Collected groundwater samples from new and existing monitoring wells on a quarterly or semiannual basis
- Field screened samples for organic vapors
- Submitted selected soil and groundwater samples for analysis for VOCs and RCRA metals

Based on the results of the initial RI, further investigation was conducted to assess the north and northeastern extent of the silkscreen solvent constituents previously detected in the soil and perched groundwater. The scope of investigation was conducted in general accordance with Section 3.6 of the Supplemental RIWP (Dames & Moore, 2000) and Section 2.2 of Supplemental RIWP Addendum (URS 2000). The supplemental scope of work included the following:

- Drilled six soil probe borings to depths of 15 to 18 feet bgs using StrataProbe and Geoprobe hydraulic push probe equipment. Four borings are located within the building, and two borings outside of the building.
- Collected soil samples at prescribed depth intervals
- Collected samples of perched groundwater at selected locations where it was encountered
- Field screened samples for organic vapors
- Submitted selected soil and groundwater samples for analysis for VOCs
- Removed and replaced monitoring well EGW005 in same location with a new stainless steel well
- Installed two monitoring wells on the northeast portion of the VOC plume

In June 2002, additional borings were completed to further assess the vertical extent of VOCs in the glacial till soils beneath the perched groundwater in fill on the south side of Building 40-56. The scope of investigation was in general accordance with Section 2.0 of the supplemental RIWP (URS, 2002). The scope of work included the following:

- Drilled three soil borings to depths of 30 to 35 bgs using hollow-stem auger
- Collected soil samples at specified depths for field laboratory analysis for BTEX
- Submitted soil samples to ARI for confirmatory analysis for VOCs

## 16.3 DOCUMENTATION OF DRILLING AND SAMPLING

The RI and supplemental investigation were conducted in four phases by Dames & Moore and URS as summarized below. The boring and monitoring well locations are shown on Figure 16-1:

- Phase 1 - consisted of drilling 15 probe borings (ESB1086 through ESB1100) and collection of soil samples on July 7-8, 1997. The borings were completed to obtain data principally in the area of UST EV-43-1 prior to its removal and associated soil cleanup action.
- Phase 2 - consisted of 10 probe borings (ESB1293 through ESB1302) completed on July 27-28 and August 7, 1998, to further delineate the perimeter of the area of soil and groundwater containing VOCs (Figure 16-1). The borings were completed to depths of between 12 feet and 19 feet bgs, and were typically terminated due to probe refusal in very dense glacial till soil.
- Phase 3 was conducted on April 3 through April 5, 2000, and consisted of drilling and collection of soil samples from six probe borings (ESB1366, ESB1367, ESB1374, ESB1376, ESB1377 and ESB1378). Probe borings ESB1366, ESB1367, ESB1374, and ESB1376 were located within the building, and borings ESB1377 and ESB1378 were completed outside of Building 40-56. Borings were terminated at depths between approximately 6 feet and 14 feet bgs due to drilling refusal in the dense glacial soil.
- Phase 4 was conducted on June 5 and 6, 2002 to assess the vertical extent of VOCs in glacial till soils at three locations (ESB1401, ESB1402, and ESB1403). The borings were completed to depths of 30 to 35 feet bgs at locations where relatively high concentrations of VOCs had been previously detected at the fill/glacial till interface.

In addition to the investigations outlined above, Dames & Moore monitored the drilling and installation of two monitoring wells (EGW062 and EGW063) and a replacement monitoring well (EGW005) on June 12, 2000. Monitoring wells were installed in general accordance with Section 3.6 of the supplemental RIWP, as per Boeing and Ecology negotiations. Wells EGW062 and EGW063 were completed to 22½ feet bgs, and 17 feet bgs respectively, and replacement well EGW005 was re-installed to 20 feet bgs.

Soil samples collected in the 1997, 1998, and 2000 investigations were collected using StrataProbe and Geoprobe split spoon samplers. Soil samples were collected from the monitoring well borings and 2002 soil borings using a Dames & Moore U-type sampler fitted with stainless steel rings. Groundwater samples were collected using a peristaltic pump. After sampling was completed, the borings were backfilled with hydrated bentonite chips and capped with concrete or asphalt as appropriate. Drilling techniques and sampling procedures utilized were in general accordance with the SAP presented in Appendix B of the IAWP, as well as the two Draft Supplemental RIWPs (Dames & Moore, 2000; URS, 2002). Groundwater samples from existing wells with dedicated pumps were collected in accordance with the Groundwater Monitoring Plan presented in Appendix A of the IAWP.

## 16.4 FIELD OBSERVATIONS AND SAMPLE ANALYSIS RESULTS

Presented in this section are the field observations and sample analysis results associated with probe borings ESB1086 through ESB1100, ESB1293 through ESB1302, ESB1366, ESB1367, ESB1374, ESB1376 through ESB1378, and monitoring wells EGW005, EGW062, and EGW063. Geologic logs of the borings are presented in Appendix O1. The chain-of-custody forms and analytical laboratory reports for the 1997, 1998, and 2000 samples are presented in Appendix O2. Data validation reports for the 1997, 1998, and 2000 samples are in Appendix O3. Geologic logs of the borings, chain-of-custody forms and analytical laboratory reports, and data validation reports for 2002 are in the Supplemental Appendices O1, O2, and O3, respectively. Soil sample analytical results from 1997 through 2000 are summarized in Tables 16-1 through 16-4. Soil sample analytical results from 2002 are summarized in Tables 16-5 and 16-6. Groundwater probe and monitoring sample analytical results from 1995 through April 2010 are summarized in Tables 16-7 and 16-8, respectively. Analytical reports for the groundwater monitoring samples have been submitted previously to Ecology separate from this report.

### 16.4.1 Field Observations

The area investigated is covered with 3-inch to 5-inch thick asphalt pavement or 6-inch thick concrete pavement. Underlying the pavement is fill soil consisting of either: (1) fine to medium sand or sand and gravel placed as backfill along utility pipes and in former UST excavations, or (2) silty fine to medium sand (re-compacted glacial till). The fill extends to depths ranging from 7 feet to 17½ feet. Six-inch thick crushed asphalt layers and concrete debris were encountered within the fill in several soil borings. Very dense glacial till or weathered glacial till was encountered at depths ranging from 7 feet (ESB1295) to 17½ feet (ESB1095). The location of geologic cross sections A, B, and C in this area are shown on Figure 16-1. These cross-sections are based on previous borings and the RI borings, and are presented on Figures 16-2, 16-3, and 16-4, respectively. Prior to construction of Building 40-56, the head of the Powder Mill Gulch drainage extended into the building area. The portion of the former drainage in the area of excavation was filled with re-compacted glacial till soil cut from other areas of the Everett Plant. A contour map of the elevation of the interface between fill and native glacial soils is shown on Figure 16-5.

Staining or other visual indications of dangerous constituents were observed in all of the borings completed in the first phase near the former USTs. Visual evidence of dangerous constituents was not observed in second phase borings with the exception of soil boring ESB1297. At this boring, a sheen was observed on the perched water sample collected at the fill/till soil interface. The April 2000 borings did not contain visual evidence of dangerous constituents. PID readings indicating elevated organic vapors were detected in soil samples from soil borings ESB1086 through ESB1100, ESB1297, and ESB1302. PID readings for first phase borings ESB1086 through ESB1100 are presented in Table 16-1. At second phase boring ESB1297, PID readings ranged from 13 to 2,000 ppmv with the maximum PID reading obtained at 15 feet bgs (Table 16-2). Second phase boring ESB1302 had elevated PID readings at depths of 13 feet (300 ppmv) and 15 feet (190 ppmv). The April 2000 borings had negligible organic vapors, with exception of ESB1378, which had slightly elevated organic vapors (50 to 57 ppmv) at 5 to 7 feet bgs. Elevated organic vapors (25 to >2,000 ppmv) were detected in the fill soils and uppermost glacial till in the June 2002 borings; however the readings decreased significantly or to non-detect within the uppermost 3 to 5 feet of glacial till soils. Monitoring well EGW063 also contained elevated organic vapors (20 to >1000 ppmv) at depths of 10 to 17 feet bgs. PID readings for all the borings are presented on the boring logs (Appendix O1).

At the time of drilling, perched groundwater was present near the base of the fill in borings ESB1095, ESB1096, ESB1297, EGW005, EGW062, EGW063, and ESB1401-through ESB1403. Based on field observations, a ≤½ foot thick zone of perched groundwater was encountered at the base of fill at borings ESB1294, ESB1299, ESB1301, and ESB1302. The perched groundwater is discontinuous and typically is most prevalent where coarse fill is present along utility corridors and in former tank excavations. It should be noted that the thickness of perched water at a specific boring location may be variable due to seasonal effects. Subsequent monitoring of groundwater levels in wells in this area indicates typical water level variations of less than 2½ feet.  The greatest variations typically occur in wells located closest to extraction well EGW043.  The depth to groundwater, where present in this area, typically occurs at depths of between 10 to 17 feet bgs (see Figures 16-2, 16-3, and 16-4).  Where glacial till soils were encountered below coarse fill or till fill, these soils did not appear to be saturated.  In addition, till fill soils did not appear to be saturated in areas away from utility corridors and former tank excavations.

### 16.4.2 Sample Analysis Results

Presented in the following section are the analytical results for soil and groundwater samples submitted for analysis. Soil sample results are discussed in Section 16.4.2.1 and groundwater results are discussed in Section 16.4.2.2.  Analytical results for all samples collected are compared to applicable MTCA Method A and/or B cleanup levels to assess whether the detected concentrations are above these RI screening levels.

#### 16.4.2.1Soil

Selected soil samples were submitted for analysis in general accordance with the sample selection criteria specified in Section 4.4.3 of the IAWP and the supplemental work plan (Dames & Moore, 1997).  For the 1997, 1998, and 2000 sampling events, between one and four soil samples per boring from depths ranging from 2 to 18½ feet bgs were submitted for analysis for VOCs (Tables 16-1, 16-2, and 16-3).  In addition, six soil samples collected from borings completed in July 1997 were analyzed for the eight RCRA metals (Table 16-4).

Soil analytical data for VOCs detected in one or more soil samples collected from borings completed in July 1997 are presented in Table 16-1.  Table 16-2 summarizes data for soil samples collected in July-August 1998.  Analytical results for the April and July 2000 soil samples are summarized in Table 16-3. Metals results from samples collected in 1997 are summarized in Table 16-4.  These tables also list the applicable MTCA Method A and B soil cleanup levels for the detected compounds.

Samples of till fill or glacial till soil were collected from six borings (ESB1089 through ESB1091, ESB1095, ESB1097 and ESB1098) in 1997 and were analyzed for the eight RCRA metals.  At the request of Ecology, these borings were located adjacent to the former USTs.  Metals concentrations detected are below the applicable MTCA Method A and B soil cleanup levels except for arsenic and chromium.  Arsenic concentrations ranged from 1.3 to 3.1 mg/kg and are above the applicable MTCA Method B soil cleanup level (0.667 mg/kg), but below the Puget Sound regional background concentration of 7.3 mg/kg (Table 16-4) and the MTCA Method A soil cleanup level protective of groundwater (20 mg/kg).  Total chromium concentrations ranged from 37.0 mg/kg to 46.0 mg/kg, and are below the applicable MTCA Method A and B soil cleanup levels for trivalent chromium (2,000 mg/kg and 120,000 mg/kg, respectively) and the applicable MTCA Method B cleanup level for hexavalent chromium (240 mg/kg).  The concentrations are above the applicable MTCA Method A cleanup level (19 mg/kg) and the most conservative preliminary soil cleanup level protective of groundwater (18 mg/kg) for hexavalent chromium, but below the Puget Sound background concentration for total chromium of 48.2 mg/kg (Ecology, 1994).

Selected soil analytical results of constituents most frequently detected at concentrations above cleanup levels during the 1997-2000 and previous soil investigations are presented on Figure 16-6.  The analytical results indicate that several VOCs detected were at concentrations below the applicable MTCA Method A or B soil cleanup levels.  Toluene, ethylbenzene, and/or xylenes were detected in one or more samples at concentrations less than the applicable MTCA Method B soil cleanup levels but above the applicable MTCA Method A unrestricted soil cleanup levels. However, the presence of discontinuous LNAPL (see Section 16.4.2.2) indicates that the soil VOC concentrations are locally not protective of groundwater under the MTCA Method B soil cleanup levels per WAC 173-340-747(3)(g). These samples were collected from borings ESB1086, ESB1087, ESB1089, ESB1090, ESB1091, ESB1092, ESB1093, ESB1094, ESB1095, ESB1097, ESB1098, ESB1099, ESB1100, and ESB1297) located south of or adjacent to the former UST excavations except for ESB 1297 which is located approximately 35 feet northeast of the former UST EV-41 excavation (Figure 16-6). VOCs above the applicable MTCA Method A or B soil cleanup levels were not detected in soil samples collected from other supplemental soil probe borings located north and northeast of the former USTs; however, several of these borings could not be completed to the intended depth due to refusal. Therefore, several of these samples were collected above the depths where soil contamination is expected (at or slightly above the water table).

For many of the soil samples, relatively high concentrations of one or more volatile compounds resulted in elevated reporting limits for other VOCs in the same sample. In several such cases, the elevated reporting limit of specific VOCs exceeds the applicable soil cleanup levels protective of groundwater as follows. The concentration of 4-methyl-2-pentanone in the soil sample from 13 feet bgs in ESB1086 (9,000 µg/kg) exceeded the soil cleanup level protective of groundwater (2,560 µg/kg), but not the soil cleanup level protective of direct contact (6,400,000 µg/kg). The concentration of acetone in the soil sample from 12 feet bgs in ESB1091 (4,700 µg/kg) exceeded the soil cleanup level protective of groundwater (3,211 µg/kg), but not the soil cleanup level protective of direct contact (8,000,000 µg/kg). The concentration of vinyl chloride in the soil samples from 12 feet bgs in ESB1367 (0.59 µg/kg) and from 7 feet bgs in ESB1378 (0.21 µg/kg) exceeded the most conservative soil cleanup level protective of groundwater (0.18 µg/kg), but not the MTCA Method B soil cleanup level protective of direct contact (667 µg /kg) and Method A level protective of groundwater (1.26 µg/kg).

The analytical results for soil samples from the 2002 borings (ESB1401, ESB1402, and ESB1403) are presented in Tables 16-5 and 16-6. Analytical results for BTEX using ESN Northwest's mobile laboratory are summarized in Table 16-5. Analytical results summarized in Table 16-6 are for BTEX and the additional VOCs specified in the Supplemental RI Work Plan (URS, 2002) for the samples analyzed by ARI's fixed laboratory. Selected analytical results from the 2002 soil borings are presented on Figure 16-7. Toluene, ethylbenzene, and/or xylenes were detected in one or more samples at concentrations less than the applicable MTCA Method B soil cleanup levels but above the applicable MTCA Method A unrestricted soil cleanup levels protective of direct contact and groundwater. However, the presence of discontinuous LNAPL (see Section 16.4.2.2) indicates that the soil VOC concentrations are locally not protective of groundwater under the MTCA Method B soil cleanup levels per WAC 173-340-747(3)(g). These samples were collected from 15 feet bgs in boring ESB1401, 17.5 feet bgs from boring ESB-1402, and 11 feet bgs from boring ESB-1403. These VOCs were either not detected or detected at concentrations less than the applicable MTCA Method A soil cleanup levels in samples collected at depths greater than 15 feet, 17.5 feet, and 11 feet, respectively, in these three borings. The reporting limit for benzene in the 2002 samples analyzed by the mobile laboratory (50 µg/kg), exceeded the cleanup levels for direct contact (Method A only) and protection of groundwater (Method A and Method B). Glacial till was encountered at a depth of approximately 15 feet below ground surface (bgs) at boring ESB1401, 17 feet bgs at ESB1402, and 11 feet bgs at ESB1403. The analytical data from the 2002 borings further support URS' previous interpretation that the vertical extent of VOCs at concentrations above the applicable screening levels is typically limited to less than 5 feet below the interface between fill soils and the underlying native glacial till soils present in this area (Figures 16-2 through 16-4, and Figure 16-7). There was good correlation between the mobile laboratory and fixed laboratory results for the duplicate samples from 15 feet bgs in boring ESB1403.

### 16.4.2.2Groundwater

Perched groundwater occurs within granular fill soils along subsurface utilities and in former UST excavations. In addition, discontinuous perched groundwater was encountered at the interface between the fill and the underlying glacial till at a depth of 10 to 17 feet bgs north and east of former UST EV-41. Figure 16-8 shows locations where groundwater is present in monitoring wells or was previously detected in probe borings at sufficient thickness for sample collection and analysis. Figures 16-9 through 16-12 show interpreted groundwater elevation contours for four quarters between July 2009 and April 2010. Groundwater flow is towards extraction well EGW043 except when it is not operating due to mechanical shut-downs due to malfunction or maintenance. Table 16-7 summarizes the groundwater analytical data for VOCs detected in groundwater samples collected from three borings (ESB1095, ESB1096, and ESB1297) during the RI and supplemental RI. Table 16-8 summarizes groundwater analytical data for samples collected from the monitoring wells from 1995 through April 2010. In addition, these tables list the applicable MTCA Method A and/or B groundwater cleanup levels for the detected VOCs.

Groundwater analytical data from discrete samples collected from the three borings (ESB1095, ESB1096, and ESB1297) installed during the RI and supplemental RI and the six borings (ESB1010, ESB1011, ESB1012, ESB1013, ESB1015, ESB1017) installed during previous investigations indicate that ethylbenzene, toluene, xylenes, and vinyl chloride are present in groundwater in one or more borings at concentrations above the applicable MTCA Method A and B groundwater cleanup levels. Concentrations in these borings ranged from 0.11 to 270 mg/L for ethylbenzene, 1.1 to 7.9 mg/L for toluene, 0.0051 to 396 mg/L for xylenes, and 0.000024 to 0.000082 mg/L for vinyl chloride. Ethylbenzene was detected above the applicable MTCA Method A cleanup level (0.7 mg/L) in samples collected from all borings except ESB1010 and ESB1017. Toluene was detected above the applicable MTCA Method B cleanup level (0.64 mg/L) in samples collected from all borings except ESB1010, ESB015, ESB1017, and ESB1297. Xylenes were detected above the applicable MTCA Method A cleanup level (1 mg/L) in samples collected from all borings except ESB1017. Vinyl chloride was detected in ESB1095 (0.000082 mg/L) at a concentration above the applicable MTCA Method B cleanup level for this compound (0.0000292 mg/L). It was either not detected or detected at concentrations lower than the applicable MTCA Method B cleanup level at the two other locations where it was tested for. Due to the elevated concentrations of ethylbenzene and xylenes, the method reporting limits for several other VOCs previously detected in groundwater were greater than the applicable MTCA Method B groundwater cleanup levels for these other compounds during the RI activities. Consequently, these compounds are also listed in Table 16-7 for reference.

Groundwater analytical data for VOCs in samples collected from the monitoring wells are summarized in Table 16-8. Benzene, chloroform, ethylbenzene, styrene, tetrachlorethene (PCE), toluene, trichloroethene (TCE), xylenes, and/or vinyl chloride have been detected in groundwater samples collected from one or more of the monitoring wells (Table 16-8) during the last two years of monitoring at concentrations above the applicable MTCA Method A and B groundwater cleanup levels. The highest concentrations of ethylbenzene, styrene, PCE, toluene, TCE, xylenes, and vinyl chloride are in EGW007 and in the vicinity of the former UST EV-41 excavation (Figure 16-8) in wells EGW050, EGW051, or EGW063. It should be noted that LNAPL has been detected previously in wells EGW007, EGW050, and EGW051. Concentrations of vinyl chloride greater than the MTCA A and/or B groundwater cleanup levels are consistently detected in EGW006 samples, but have only been detected once in wells EGW002 and EGW005 during the last two years of monitoring. Styrene has been detected only once in one well

(EGW007) at a concentration higher than the Method B groundwater cleanup level. Benzene has been consistently detected at concentrations less than the MTCA Method A groundwater cleanup level but above the MTCA Method B cleanup level in EGW002, although concentrations appear to be declining. The highest concentration of chloroform was detected in well EGW009 and it has been sporadically detected at concentrations above the MTCA Method B cleanup level in this well. Other VOCs such as chloroethane, MIBK, and/or MEK were previously detected in one or more wells at concentrations above applicable MTCA Method B groundwater cleanup levels, but these have declined to below the cleanup levels over time. For specific VOCs in individual wells, the concentrations have decreased over time or have fluctuated within a range of relatively consistent concentrations.

LNAPL on the groundwater surface has been detected periodically with varying thickness of up to 1¼ feet in wells EGW050 and EGW051. A summary of this data is provided to Ecology in quarterly groundwater monitoring data reports. Trace amounts of LNAPL have been detected in well EGW007 as well. In order to further assess the potential for LNAPL presence on the perched groundwater south of Building 40-56, groundwater analytical results for toluene, ethylbenzene, and total xylenes were converted to a percent saturation based on the published aqueous solubility for these compounds in the CLARC Version 3.1 (Ecology 2001). Percent saturation was calculated for borings ESB1010, ESB1011, ESB1096, and ESB1297 using the one time sampling data for these locations (April 1996 through July 1998). Percent saturation was calculated for the monitoring wells using the May 2001 data and using the maximum concentration detected in the well over the last two years of monitoring (July 2008 through April 2010). These results are summarized in Table 16-9 and the calculated percent saturation values are shown on Figure 16-13 using the April 1996 through July 1998 data for the borings and the July 2008 through April 2010 data for the monitoring wells. A cumulative percent saturation close to or above 100% indicates LNAPL is likely to be present. These results indicate that LNAPL is likely to be present in the vicinity of wells EGW007, EGW050, EGW051, and EGW063, and borings ESB1096, ESB1011, and ESB1297. As part of the FS, Boeing will evaluate the potential for the presence of LNAPL, which could include areas of less than 100% saturation.

#### 16.4.2.3 Physical Testing

Two samples of glacial till and one sample of re-compacted till fill collected in the Building 40-56 area were tested for various physical parameters including moisture content, effective porosity, percent saturation, and hydraulic conductivity. The laboratory reports are presented in Appendix S and pertinent results are described below. The moisture content (9% to 11% dry weight), effective porosity (30% to 34% volume), and percent saturation (53% to 61% volume) are similar in all three samples. Vertical hydraulic conductivity values for the three samples are also similar and range from $5.60 \times 10^{-6}$ to $3.85 \times 10^{-5}$ cm/sec (0.016 to 0.11 ft/ day). Horizontal hydraulic conductivity values for these samples range from $1.30 \times 10^{-6}$ to $5.75 \times 10^{-6}$ cm/sec (0.004 to 0.016 ft/day).

### 16.5 CONCLUSIONS AND RECOMMENDATIONS

The results of drilling and previous excavations on the south side of the western portion of Building 40-56 indicate fill soils extend to depths ranging from 7 to 17½ feet bgs. Very dense glacial till underlies the fill to the depth explored of 35 feet bgs. Groundwater is locally present in the lower portion of the fill perched on the glacial till. The occurrence of perched groundwater is approximately coincident with the presence of sand and gravel backfilled around subgrade utility pipes and in former UST excavations. Measurable groundwater was not detected south of the utilidor or near the south edge of the building except at borings ESB1095 and ESB1297 and well EGW063 (Figure 16-8). Groundwater estimated to be < ½ foot was encountered at boring locations ESB1294, ESB1299, ESB1301and ESB1302 at the time of drilling. Subsequent borings ESB1374 and ESB1376 completed inside the building north and northeast of ESB1095 and ESB1297 did not contain perched groundwater; however, these borings could not be completed to the expected depth of perched groundwater due to refusal.

VOCs detected in soil samples were at concentrations less than the applicable MTCA Method A and B soil cleanup levels for direct contact except for toluene, ethylbenzene, and xylenes. One or more of these three compounds were detected at concentrations below the applicable MTCA Method B soil cleanup level, but above the applicable MTCA Method A unrestricted soil cleanup level in 40 of the more than 100 samples analyzed for VOCs. The 40 samples were collected from depths of between 4 feet and 18½ feet bgs from sixteen borings located in the vicinity of the former USTs, and one boring to the west of the former USTs (ESB1403). However, the presence of discontinuous LNAPL (see Section 16.4.2.2) indicates that the soil VOC concentrations are locally not protective of groundwater under the MTCA Method B soil cleanup levels per WAC 173-340-747(3)(g). The area of soils containing VOC concentrations above the applicable MTCA Method A unrestricted soil cleanup levels is shown on Figures 16-6 and 16-7. At several locations, concentrations of toluene, ethylbenzene, and xylenes were above the applicable MTCA Method A soil cleanup levels in the deepest samples collected.

Soil borings ESB1374, ESB1376, ESB1377, and ESB1378 were located within the building and limited access equipment was required. These borings could not be advanced to the planned depths to the fill/till interface or to groundwater depth due to refusal. Therefore, there is insufficient data to assess the lateral and vertical extent of silkscreen solvent constituents in soil and/or perched groundwater beneath the building floor. The possibility exists for silkscreen solvent to be present under the building based on the VOC concentrations detected in soil and perched groundwater in the area approximately 10 feet south of the building (ESB1092, ESB1093, ESB1095 and EGW063).

VOC concentrations in glacial till soil samples decrease with depth relative to VOC concentrations in overlying fill soil and/or perched groundwater in fill. The analytical results from the supplemental 2002 investigation to assess vertical depth of VOCs in soil indicate that vertical migration of VOCs at concentrations above the applicable screening levels is typically limited to less than 5 feet below the interface between fill soils and the underlying native glacial till soils present in this area (Figures 16-2 through 16-4, and Figure 16-7). Where concentrations or reporting limits of individual VOCs exceeded preliminary soil cleanup levels protective of groundwater, other VOCs were detected that exceeded soil cleanup levels protective of direct contact and thus drive cleanup of the location.

Samples of till fill or glacial till soil were collected from six borings (ESB1089 through ESB1091, ESB1095, ESB1097 and ESB1098) and were analyzed for the eight RCRA metals. These borings were adjacent to the former USTs, one of which (EV-41) may have stored acids. Metals were either reported as not detected at concentrations above method reporting limits, or were detected at concentrations less than either (1) the applicable MTCA Method A or B soil cleanup level or (2) the Puget Sound regional background concentration.

Perched groundwater is present at the interface between the fill and the underlying glacial till. Groundwater was not apparent in the glacial till to the depth investigated (35 feet bgs) and there is no evidence that there is hydraulic connection between the perched groundwater and deeper groundwater (approximately 200 feet bgs) in the Esperance Sand. Current data has shown that the silkscreen solvents have partially penetrated the glacial till unit. The potential for deeper migration through the unsaturated glacial till into the Esperance Sand Aquifer will be assessed as part of the FS and selection of a final remedy.

Based on data from this and previous investigations, perched groundwater is localized in the area along subgrade utility pipes and former UST excavations, and east-northeast of former UST EV-41. The perched groundwater flows south toward recovery well EGW043. It is Boeing's opinion that perched groundwater containing VOC concentrations above applicable MTCA cleanup levels does not extend south of the utilidor or north beneath the building, except probably in the area north of former UST EV-41 between well EGW063 and boring ESB1297 (Figure 16-8). The inferred extent of perched groundwater beneath the building is limited by prior borings and observations and samples from the former USTs EV-42 and EV-43 excavation (Figure 16-8). In addition, geotechnical and geoenvironmental investigations within the building north of former USTs EV-42, EV-43, and EV-43-1 did not encounter groundwater in fill or glacial till soils. However, Ecology believes there is a potential for VOC-contaminated groundwater to be present beneath the building north of the former UST EV-42 and EV-43 excavation and this will be evaluated in the FS.

Benzene, chloroform, ethylbenzene, styrene, PCE, toluene, TCE, xylenes, and/or vinyl chloride have been detected in groundwater samples collected from one or more of the monitoring wells (Table 16-8) during the last two years of monitoring at concentrations above the applicable MTCA Method A and B groundwater cleanup levels. The highest concentrations of ethylbenzene, styrene, PCE, toluene, TCE, xylenes, and vinyl chloride are in EGW007 and wells (EGW050, EGW051, or EGW063) in the vicinity of the former UST EV-41 excavation (Figure 16-8). Concentrations of vinyl chloride greater than the MTCA A and/or B groundwater cleanup levels are consistently detected in EGW006 samples, but have only been detected once in wells EGW002 and EGW005 during the last two years of monitoring. Styrene has been detected only once in one well (EGW007) at a concentration higher than the Method B groundwater cleanup level. Benzene has been consistently detected at concentrations less than the MTCA Method A groundwater cleanup level but above the MTCA Method B cleanup level in EGW002, although concentrations appear to be declining. The highest concentration of chloroform was detected in well EGW009 and it has been sporadically detected at concentrations above the MTCA Method B cleanup level in this well. Other VOCs such as chloroethane, MIBK, and/or MEK were previously detected in one or more wells at concentrations above applicable MTCA Method B groundwater cleanup levels, but these have declined to below the cleanup levels over time. For specific VOCs in individual wells, the concentrations have decreased over time or have fluctuated within a range of relatively consistent concentrations. LNAPL is or has been previously present on the perched groundwater surface at wells EGW007, EGW050, and EGW051, and is likely present at boring locations ESB1011, ESB1096, and ESB1297 (Figure 16-13).

For the purposes of the RI, the lateral and vertical extent of VOCs in soil and perched groundwater south of Building 40-56 has been sufficiently delineated. The potential for VOC-contaminated, perched groundwater to be present beneath the south end of the building will be further evaluated in the FS. The existing monitoring wells are sufficient to monitor groundwater levels and quality, and the two extraction wells provide hydraulic control of affected groundwater in the source area but do not have hydraulic control of the VOC groundwater plume east of EGW05l and west of EGW005. The FS will include further evaluation of the extent of perched groundwater containing VOCs and assessment of the hydraulic control.

There are no current exposure pathways for the ingestion of contaminated perched groundwater and contaminated subsurface soils unless construction or utility replacement/repair will expose soils and/or groundwater containing VOCs. However, because VOCs are present in perched groundwater and fill soil at concentrations above applicable MTCA cleanup levels, it is recommended that the area near former SWMUs/AOCs No. 086, No. 089, and No. 094 be evaluated in the FS including potential exposure pathways such as vapor intrusion and protection of groundwater. Application of the Preliminary Assessment step of the VI guidance to the Building 40-56 SWMUs/AOCs shows that chemicals present in soil and groundwater beneath these SWMUs/AOCs are sufficiently volatile to be a potential VI source. The potential VI pathway and uncertainty regarding the extent of VOCs in soil beneath the building in the area of former SWMUs/AOCs No. 067 and No. 071 will be evaluated in the FS per Ecology's request. It is also recommended that Boeing continue operation of the extraction wells and periodic groundwater monitoring until a remedial action is completed, or approval is obtained from Ecology to terminate these interim actions per the Agreed Order.

## 16.6 REFERENCES


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Dames & Moore, 1998a, 1997 Groundwater Monitoring, Boeing Commercial Airplane Group, Everett Plant, prepared for Boeing Company, May 28, 1998.

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URS, 2000, Supplemental Remedial Investigation Work Plan, Monitoring Well Installation Addendum, BCAG Everett Plant, Everett, Washington , May 30, 2000.

URS, 2002, Supplemental Remedial Investigation Work Plan, Building 40-56 Area (Revision 1.0), BCAG Everett Plant, Everett, Washington, May 30, 2002.

**Table 16-1**
**Summary of 1997 Soil Sample Analytical Results for VOCs, (ug/kg)**
**Building 40-56**
**Boeing Everett Plant Remedial Investigation**

| **Sample ID/Date** | | **Chloroethane** | **Acetone** | **Carbon Disulfide** | **1,1-Dichloroethane** | **1,1,1-Trichloroethane** | **4-Methyl-2-Pentanone (MIBK)** | **Toluene** | **Ethylbenzene** | **Total Xylenes** | **OVM Field Screening Value (ppmv)** |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1996 MTCA Method B Soil Cleanup Level | | NE | 8,000,000 | 8,000,000 | 8,000,000 | 72,000,000 | 64,000,000 | 16,000,000 | 8,000,000 | 160,000,000 | - |
| 1996 MTCA Method B 100x GW Soil Cleanup Level | | NE | 80,000 | 80,000 | 80,000 | 720,000 | 64,000 | 160,000 | 80,000 | 1,600,000 | - |
| 2001 MTCA Method A or B Soil Cleanup Level | | 345,000 (B*) | 8,000,000 (B) | 8,000,000 (B) | 8,000,000 (B)<br>16,000,000 (B*) | 2,000 (A)<br>72,000,000 (B)<br>160,000,000 (B*) | 6,400,000 (B) | 7,000 (A)<br>16,000,000 (B)<br>6,400,000 (B*) | 6,000 (A)<br>8,000,000 (B) | 9,000 (A)<br>160,000,000 (B) | - |
| MTCA Method A or B Protection of Groundwater | | 60 (B) | 3,211 (B) | 5,651 (B) | 8,734 (B) | 2,000 (A)<br>126,752 (B) | 2,560 (B) | 7,000 (A)<br>4,654 (B) | 6,000 (A)<br>6,912 (B) | 9,000 (A)<br>14,630 (B) | - |
| ESB1086-10' | 07/07/97 | 2.1 U | 12 | 1.0 U | 5.9 | 1.0 U | 5.2 U | 1.1 | 650 | 272 | 2.5 |
| ESB1086-13' | 07/07/97 | 220 U | 550 U | 110 U | 110 U | 110 U | 9,000 | 120 | 1,200 | **9,000** | 40.4 |
| ESB1087-7' | 07/07/97 | 11 U | 34 | 5.6 U | 5.6 U | 5.6 U | 28 U | 5.6 U | 220 | 1,141 | 9.7 |
| ESB1087-10' | 07/07/97 | 970 U | 2,400 U | 490 U | 490 U | 490 U | 2,400 U | 490 U | **9,500** | **91,000** | 320 |
| ESB1087-13' | 07/07/97 | 890 U | 2,200 U | 450 U | 450 U | 450 U | 2,200 U | 450 U | 2,900 | **28,700** | 295 |
| ESB1088-10' | 07/07/97 | 2.1 U | 450 | 1.5 | 1.1 U | 1.3 | 5.3 U | 3.0 | 15 | 33 | 0.7 |
| ESB1088-13' | 07/07/97 | 11 U | 680 | 5.4 U | 5.4 U | 5.4 U | 27 U | 5.4 U | 1,200 | 43 | 6.6 |
| ESB1089-5' | 07/07/97 | 1.7 U | 4.4 | 0.8 U | 0.8 U | 0.8 U | 4.2 U | 0.9 | 0.8 U | 0.9 | 0.2 |
| ESB1089-8' | 07/07/97 | 830 U | 2,100 U | 410 U | 410 U | 410 U | 2,100 U | 410 U | 2,700 | **33,100** | 56.9 |
| ESB1089-13' | 07/07/97 | 210 U | 520 U | 100 U | 100 U | 100 U | 520 U | 440 | 2,400 | **26,100** | 719 |
| ESB1090-4' | 07/07/97 | 920 U | 2,300 U | 460 U | 460 U | 460 U | 2,300 U | 460 U | **6,400** | **67,400** | 0.2 |
| ESB1090-7' | 07/07/97 | 710 U | 1,800 U | 360 U | 360 U | 360 U | 1,800 U | 360 U | 2,500 | **32,000** | 187 |
| ESB1090-10' | 07/07/97 | 1,900 U | 4,700 U | 930 U | 930 U | 930 U | 4,700 U | **73,000** | **160,000** | **2,840,000** | 1,278 |
| ESB1090-13' | 07/07/97 | 1,800 U | 4,600 U | 920 U | 920 U | 920 U | 4,600 U | **80,000** | **150,000** | **1,270,000** | 457 |
| ESB1091-4' | 07/07/97 | 1.9 U | 360 | 0.9 U | 0.9 U | 0.9 U | 4.7 U | 2.40 | 5.30 | 146 | 242 |
| ESB1091-7' | 07/07/97 | 1,600 U | 4,100 U | 820 U | 820 U | 820 U | 4,100 U | 820 U | **8,200** | **126,000** | 343 |
| ESB1091-10' | 07/07/97 | 160 U | 770 | 82 U | 82 U | 82 U | 2,200 | 1,600 | 1,300 | **13,000** | 93.9 |
| ESB1091-12' | 07/07/97 | 240 U | 4,700 | 120 U | 120 U | 120 U | 590 U | 150 | 780 | **13,560** | 18.8 |
| ESB1092-4' | 07/07/97 | 1.9 U | 48 | 1.0 U | 2.0 | 2.8 | 4.8 U | 1.0 U | 1.0 U | 1.2 | 2.6 |
| ESB1092-7' | 07/07/97 | 18 | 140 | 8.9 U | 8.9 U | 8.9 U | 44 U | 8.9 U | 210 | 1,541 | 13.4 |
| ESB1092-13' | 07/07/97 | 1,700 U | 4,300 U | 870 U | 870 U | 870 U | 4,300 U | **54,000** | **120,000** | **1,040,000** | 1,296 |
| ESB1093-7' | 07/07/97 | 15 U | 100 | 7.4 U | 7.4 U | 7.4 U | 460 | 22 | 220 | 3,670 | 91.8 |
| ESB1093-9' | 07/07/97 | 1,700 U | 4,300 U | 870 U | 870 U | 870 U | 4,300 U | 1,300 | **41,000** | **426,000** | 700 |
| ESB1093-12' | 07/07/97 | 32,000 U | 79,000 U | 16,000 U | 16,000 U | 16,000 U | 79,000 U | **53,000** | **380,000** | **3,600,000** | 1,799 |
| ESB1093-18' | 07/07/97 | 16 U | 53 | 8.2 U | 8.2 U | 8.2 U | 41 U | 8.2 U | 1,100 | **9,683** | 16.8 |
| ESB1094-6' | 07/07/97 | 2 U | 9.2 | 1.0 U | 1.0 U | 1.0 U | 5.1 U | 1.0 U | 190 | 206 | 1.2 |
| ESB1094-10' | 07/07/97 | 32,000 U | 79,000 U | 16,000 U | 16,000 U | 16,000 U | 79,000 | **45,000** | **370,000** | **2,630,000** | 1,200 |
| ESB1094-13.5' | 07/07/97 | 68,000 U | 170,000 U | 34,000 U | 34,000 U | 34,000 U | 170,000 U | **75,000** | **1,300,000** | **8,900,000** | 900 |
| ESB1094-15' | 07/07/97 | 830 U | 2,100 U | 410 U | 410 U | 410 U | 2,100 U | 410 U | 4,600 | **36,800** | 55.7 |
| ESB1094-15' (DUP) | 07/07/97 | 930 U | 2,300 U | 460 U | 460 U | 460 U | 2,300 U | 460 U | **9,700** | **73,500** | 55.7 |

**Table 16-1**
**Summary of 1997 Soil Sample Analytical Results for VOCs, (ug/kg)**
**Building 40-56**
**Boeing Everett Plant Remedial Investigation**

| Sample ID/Date | | Chloroethane | Acetone | Carbon Disulfide | 1,1-Dichloroethane | 1,1,1-Trichloroethane | 4-Methyl-2-Pentanone (MIBK) | Toluene | Ethylbenzene | Total Xylenes | OVM Field Screening Value (ppmv) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1996 MTCA Method B Soil Cleanup Level | | NE | 8,000,000 | 8,000,000 | 8,000,000 | 72,000,000 | 64,000,000 | 16,000,000 | 8,000,000 | 160,000,000 | - |
| 1996 MTCA Method B 100x GW Soil Cleanup Level | | NE | 80,000 | 80,000 | 80,000 | 720,000 | 64,000 | 160,000 | 80,000 | 1,600,000 | - |
| 2001 MTCA Method A or B Soil Cleanup Level | | 345,000 (B*) | 8,000,000 (B) | 8,000,000 (B) | 8,000,000 (B)<br>16,000,000 (B*) | 2,000 (A)<br>72,000,000 (B)<br>160,000,000 (B*) | 6,400,000 (B) | 7,000 (A)<br>16,000,000 (B)<br>6,400,000 (B*) | 6,000 (A)<br>8,000,000 (B) | 9,000 (A)<br>160,000,000 (B) | - |
| ESB1095-5' | 07/08/97 | 1.9 U | 430 | 1.0 | 0.9 U | 0.9 U | 4.7 U | 0.9 U | 1.8 | 10.8 | 0.0 |
| ESB1095-9' | 07/08/97 | 270 U | 670 U | 130 U | 130 U | 130 U | 670 U | 130 U | 3,700 | **27,000** | 58.3 |
| ESB1095-12' | 07/08/97 | 23,000 U | 56,000 U | 11,000 U | 11,000 U | 11,000 U | 56,000 U | 11,000 U | **75,000** | **769,000** | 697 |
| ESB1095-17.5' | 07/08/97 | 250 U | 620 U | 120 U | 120 U | 120 U | 620 U | 120 U | 2,200 | **18,200** | 101 |
| ESB1096-10' | 07/08/97 | 1.9 U | 70 | 0.9 U | 0.9 U | 0.9 U | 4.6 U | 0.9 U | 0.9 U | 5.2 | 0.0 |
| ESB1096-13' | 07/08/97 | 270 U | 960 | 140 U | 140 U | 140 U | 680 U | 140 U | 160 | 1,600 | 54.2 |
| ESB1097-6' | 07/08/97 | 2 U | 88 | 1.0 U | 1 U | 1.0 U | 5.0 U | 1.0 U | 16 | 226 | 0.0 |
| ESB1097-9' | 07/08/97 | 260 U | 640 U | 130 U | 130 U | 130 U | 640 U | 130 U | 140 | 1,100 | 34 |
| ESB1097-12' | 07/08/97 | 280 U | 700 U | 140 U | 140 U | 140 U | 700 U | 140 U | 4,600 | **31,200** | 45.7 |
| ESB1097-17' | 07/08/97 | 540 U | 1,400 U | 270 U | 270 U | 270 U | 1,400 U | 270 U | 3,400 | 3,500 | 112.7 |
| ESB1098-7' | 07/08/97 | 12 U | 130 | 6.1 U | 6.1 U | 6.1 U | 30 U | 6.1 U | 140 | 960 | 0.0 |
| ESB1098-8' | 07/08/97 | 260 U | 640 U | 130 U | 130 U | 130 U | 640 U | 170 | 4,400 | **35,400** | 31.0 |
| ESB1098-12' | 07/08/97 | 2,800 U | 6,900 U | 1,400 U | 1,400 U | 1,400 U | 6,900 U | 1,400 U | **45,000** | **341,000** | 122 |
| ESB1098-16' | 07/08/97 | 51,000 U | 130,000 U | 25,000 U | 25,000 U | 25,000 U | 130,000 U | **110,000** | **2,300,000** | **10,700,000** | 899 |
| ESB1099-5' | 07/08/97 | 270 U | 680 U | 140 U | 140 U | 140 U | 680 U | 140 U | 5,200 | **34,400** | 20.2 |
| ESB1099-11' | 07/08/97 | 50,000 U | 130,000 U | 25,000 U | 25,000 U | 25,000 U | 130,000 U | **39,000** | **1,400,000** | **10,300,000** | 820 |
| ESB1099-15' | 07/08/97 | 51,000 U | 130,000 U | 25,000 U | 25,000 U | 25,000 U | 130,000 U | **31,000** | **680,000** | **4,530,000** | 1,299 |
| ESB1100-5' | 07/08/97 | 1.8 U | 58 | 0.9 U | 0.9 U | 0.9 U | 4.5 U | 1.1 | 9.8 | 59 | 36.2 |
| ESB1100-9' | 07/08/97 | 46,000 U | 120,000 U | 23,000 U | 23,000 U | 23,000 U | 120,000 U | 23,000 U | **740,000** | **7,030,000** | 2,200 |
| ESB1100-11' | 07/08/97 | 51,000 U | 130,000 U | 25,000 U | 25,000 U | 25,000 U | 1,30000 U | 25,000 U | **580,000** | **7,500,000** | 1,500 |
| ESB1100-16' | 07/08/97 | 500 U | 1,200 U | 250 U | 250 U | 250 U | 1,200 U | 500 | **9,700** | **71,000** | 253 |

**Notes:**
MTCA - Model Toxics Control Act
(A) - MTCA Method A soil cleanup level for unrestricted land use
(B) - MTCA Method B soil cleanup level
(B*) Revised 2001 MTCA Method B value from Ecology website CLARC tables downloaded June 2010 (https://fortress.wa.gov/ecy/clarc/reporting/CLARCReporting.aspx).
1996 - Indicates MTCA soil cleanup levels, published 1996.
2001 - Indicates MTCA version 3.1 soil cleanup levels, published 2001.
(DUP) - Field duplicate
NE - Not established
U - Compound was analyzed for but not detected above the reporting limit shown.
Numbers in **bold** font indicate that the result reported exceeds the most current MTCA cleanup level as of June 2010.
Numbers in grey shading indicate reporting limits that exceed a MTCA protection of groundwater level, but do not exceed the current lowest MTCA soil cleanup level protective of direct contact.

**Table 16-2**
**Summary of 1998 Soil Sample Analytical Results for Volatile Organic Compounds, (ug/kg)**
**Building 40-56**
**Boeing Everett Plant Remedial Investigation**

| Sample ID/Date | | 1,2,4-Trimethylbenzene | 1,3,5-Trimethylbenzene | 2-Butanone | 4-Methyl-2-Pentanone (MIBK) | Acetone | Benzene | cis-1,2-Dichloroethene | Ethylbenzene | Iso-propylbenzene | n-Propylbenzene | Toluene | Total Xylenes | Trichloroethene | OVM Field Screening Value (ppmv) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1996 MTCA Method B Soil Cleanup Level | | NE | NE | 48,000,000 | 6,400,000 | 8,000,000 | 34,500 | 800,000 | 8,000,000 | NE | NE | 16,000,000 | 160,000,000 | 90,900 | - |
| MTCA Method B 100x GW Soil Cleanup Level | | NE | NE | 480,000 | 64,000 | 80,000 | 151 | 8,000 | 80,000 | NE | NE | 160,000 | 1,600,000 | 398 | - |
| 2001 MTCA Method A or B Soil Cleanup Level | | 4,000,000 (B*) | 4,000,000 (B*) | 48,000,000 (B) | 6,400,000 (B) | 8,000,000 (B) | 30 (A)<br>18,200 (B) | 800,000 (B) | 6,000 (A)<br>8,000,000 (B) | NE | NE | 7,000 (A)<br>16,000,000 (B)<br>6,400,000 (B*) | 9,000 (A)<br>160,000,000 (B) | 30 (A)<br>90,900 (B)<br>11,000 (B*) | - |
| MTCA Method A or B Protection of Groundwater | | 1,600 (B) | 1,600 (B) | 19,200 (B) | 2,560 (B) | 3,211 (B) | 30 (A)<br>4.5 (B) | 400 (B) | 6,000 (A)<br>6,912 (B) | 3,200 (B) | NE | 7,000 (A)<br>4,654 (B) | 9,000 (A)<br>14,630 (B) | 30 (A)<br>3.2 (B) | - |
| ESB1293-11' | 07/27/98 | 1.1 U | 1.1 U | 5.6 U | 5.6 U | 5.6 U | 1.1 UJ | 4.4 | 1.1 UJ | 1.1 U | 1.1 U | 1.4 J | 1.1 U | 8.0 J | 0.0 |
| ESB1293-12 1/2' | 07/27/98 | 1.1 U | 1.1 U | 5.4 U | 5.4 U | 5.4 U | 1.4 J | 12 | 1.1 UJ | 1.1 U | 1.1 U | 1.6 J | 1.1 U | 22 J | 0.0 |
| ESB1293-15 1/2' | 07/27/98 | 1.1 U | 1.1 U | 5.4 U | 5.4 U | 8.8 | 1.6 J | 6.4 | 1.1 UJ | 1.1 U | 1.1 U | 2.1 J | 1.1 U | 2.5 J | 0.0 |
| ESB1294-9 1/2' | 07/27/98 | 1.1 U | 1.1 U | 5.5 U | 5.5 U | 5.5 U | 1.1 UJ | 1.1 U | 1.1 UJ | 1.1 U | 1.1 U | 1.1 UJ | 1.1 U | 1.1 UJ | 0.0 |
| ESB1294-11' | 07/27/98 | 1.1 U | 1.1 U | 5.4 U | 5.4 U | 5.4 U | 1.1 UJ | 2.0 | 1.1 UJ | 1.1 U | 1.1 U | 1.1 UJ | 1.1 U | 1.1 UJ | 0.0 |
| ESB1294-14' | 07/27/98 | 1.1 U | 1.1 U | 5.3 U | 5.3 U | 5.3 U | 1.1 UJ | 1.1 U | 1.1 UJ | 1.1 U | 1.1 U | 1.1 UJ | 1.1 U | 1.1 UJ | 0.0 |
| ESB1295-9' | 07/27/98 | 1.2 U | 1.2 U | 6.0 U | 6.0 U | 14 | 1.2 U | 1.2 U | 1.2 U | 1.2 U | 1.2 U | 1.2 U | 1.2 U | 1.2 U | 0.0 |
| ESB1295-11 1/2' | 07/27/98 | 1.1 U | 1.1 U | 5.4 U | 5.4 U | 8.0 | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 0.0 |
| ESB1295-13 1/2' | 07/27/98 | 1.1 U | 1.1 U | 5.6 U | 5.6 U | 12 | 1.1 UJ | 1.1 U | 1.1 UJ | 1.1 U | 1.1 U | 1.1 UJ | 1.1 U | 1.1 UJ | 0.0 |
| ESB1296-4 1/2' | 07/27/98 | 1.1 U | 1.1 U | 5.3 U | 5.3 U | 5.3 U | 1.1 UJ | 1.1 U | 1.1 UJ | 1.1 U | 1.1 UJ | 1.1 UJ | 1.1 U | 1.1 UJ | 15 |
| ESB1296-9 1/2' | 07/27/98 | 1.2 U | 1.2 U | 5.8 U | 5.8 U | 7.4 | 1.2 UJ | 1.2 U | 1.2 UJ | 1.2 U | 1.2 U | 1.2 UJ | 1.2 U | 1.2 UJ | 3 |
| ESB1296-10 1/2' | 07/27/98 | 1.1 U | 1.1 U | 5.6 U | 5.6 U | 5.6 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 2 |
| ESB1297-7' | 07/28/98 | 140 U | 140 U | 690 U | 690 U | 690 U | 140 U | 140 U | 850 | 140 U | 140 U | 140 U | 5,390 | 140 U | 120 |
| ESB1297-12' | 07/28/98 | 140 U | 140 U | 690 U | 690 U | 690 U | 140 U | 140 U | 2,200 | 140 U | 140 U | 140 U | **15,500** | 140 U | 13 |
| ESB1297-15 1/2' | 07/28/98 | 140 U | 140 U | 2,400 | 700 U | 700 U | 140 U | 140 U | 4,200 | 140 U | 140 U | 170 | **37,600** | 140 U | 2,000 |
| ESB1297-15 1/2' (DUP) | 07/28/98 | 140 U | 140 U | 1,700 | 680 U | 680 U | 140 U | 140 U | 3,900 | 140 U | 140 U | 170 | **35,000** | 140 U | 2,000 |
| ESB1297-18 1/2' | 07/28/98 | 130 U | 130 U | 640 U | 640 U | 640 U | 130 U | 130 U | 1,000 | 130 U | 130 U | 130 U | **10,100** | 130 U | 260 |
| ESB1298-9 1/2' | 07/28/98 | 1.1 U | 1.1 U | 5.7 U | 5.7 U | 19 | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 0.0 |
| ESB1298-11 1/2' | 07/28/98 | 1.1 U | 1.1 U | 5.6 U | 5.6 U | 17 | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 0.0 |
| ESB1299-9 1/2' | 07/28/98 | 1.1 U | 1.1 U | 5.4 U | 5.4 U | 13 | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 2.6 | 1.1 U | 0.0 |
| ESB1299-11' | 07/28/98 | 1.2 U | 1.2 U | 5.8 U | 5.8 U | 11 | 1.2 U | 1.2 U | 1.2 U | 1.2 U | 1.2 U | 1.2 U | 1.2 U | 1.2 U | 0.0 |
| ESB1299-11 1/2' | 07/28/98 | 1.2 U | 1.2 U | 5.8 U | 5.8 U | 14 | 1.2 U | 1.2 U | 1.2 U | 1.2 U | 1.2 U | 1.2 U | 1.2 U | 1.2 U | 0.0 |
| ESB1300-10 1/2' | 07/28/98 | 1.1 U | 1.1 U | 5.5 U | 5.5 U | 14 | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 5 |
| ESB1300-11 1/2' | 07/28/98 | 1.1 U | 1.1 U | 5.6 U | 5.6 U | 12 | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 10 |
| ESB1300-12 1/2' | 07/28/98 | 1.1 U | 1.1 U | 5.4 U | 5.4 U | 5.4 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 10 |
| ESB1301-9 1/2' | 07/28/98 | 1.1 U | 1.1 U | 5.5 U | 5.5 U | 11 | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 15 |
| ESB1301-12 1/2' | 07/28/98 | 1.1 U | 1.1 U | 5.6 U | 5.6 U | 20 | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 3 |
| ESB1301-13 1/2' | 07/28/98 | 1.2 U | 1.2 U | 6.0 U | 6.0 U | 10 | 1.2 U | 1.2 U | 1.2 U | 1.2 U | 1.2 U | 1.2 U | 1.2 U | 1.2 U | 0.0 |
| ESB1302-11' | 07/28/98 | 140 U | 140 U | 680 U | 680 U | 680 U | 140 U | 140 U | 200 | 140 U | 140 U | 140 U | 680 | 140 U | 0.0 |
| ESB1302-12' | 07/28/98 | 130 U | 130 U | 670 U | 670 U | 670 U | 130 U | 130 U | 990 | 130 U | 130 U | 130 U | 4,480 | 130 U | 0.0 |
| ESB1302-13 1/2' | 07/28/98 | 1,300 U | 1,300 U | 6,300 U | 6,300 U | 6,300 U | 1,300 U | 1,300 U | 1,200 J | 1,300 U | 1,300 U | 1,300 U | 6,500 | 1,300 U | 300 |
| ESB1302-15 1/2' * | 08/07/98 | 1.3 | 4.2 | 380 | 26 | 100 | 1.1 U | 1.1 U | 270 E | 1.8 | 1.2 J | 3.6 | 1,050 | 1.1 U | 190 |

**Notes:**
MTCA - Model Toxics Control Act
(A) - MTCA Method A soil cleanup level for unrestricted land use
(B) MTCA Method B soil cleanup level
(B*) Revised 2001 MTCA Method B value from Ecology website CLARC tables downloaded June 2010 (https://fortress.wa.gov/ecy/clarc/reporting/CLARCReporting.aspx)
1996 - Indicates MTCA soil cleanup levels, published 1996.
2001 - Indicates MTCA version 3.1 soil cleanup levels, published 2001.
(DUP) - Field duplicate
*1,1,1-Trichloro-1,2,2-trifluoroethane and methylene chloride were detected in this sample, but qualified as not detected due to method blank contamination.
E - Indicates a value exceeds the calibration range of the instrument.
J - Estimated value
U - Compound was analyzed for but not detected above the reporting limit shown.
UJ - Compound was analyzed for but not detected above the reporting limit shown. Reporting limit is an estimated value.
Numbers in **bold** font indicate that the result reported exceeds the most current MTCA cleanup level as of June 2010.
Numbers in grey shading indicate results or reporting limits that exceed a MTCA protection of groundwater level, but results do not exceed the current lowest MTCA soil cleanup level protective of direct contact.

**Table 16-3**
**Summary of 2000 Soil Sample Analytical Results for Volatile Organic Compounds, (ug/kg)**
**Building 40-56**
**Boeing Everett Plant Remedial Investigation**

| Sample ID/Date | | 1,1-Dichloroethane | 1,1-Dichloroethene | 1,2,4-Trimethylbenzene | 1,3,5-Trimethylbenzene | 2-Butanone | 4-Isopropyl toluene | 4-Methyl-2-Pentanone (MIBK) | Acetone | Carbon Disulfide | Chloroethane | Ethylbenzene | Iso-propylbenzene | N-Propylbenzene | Naphthalene | Toluene | Total Xylenes | Vinyl Chloride |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1996 MTCA Method B Soil Cleanup Level | | 8,000,000 | 1670 | NE | NE | 48,000,000 | NE | 6,400,000 | 8,000,000 | 8,000,000 | NE | 8,000,000 | NE | NE | 3,200,000 | 16,000,000 | 160,000,000 | 526 |
| 1996 MTCA Method B 100x GW Soil Cleanup Level | | 80,000 | 7.29 | NE | NE | 480,000 | NE | 64,000 | 80,000 | 80,000 | NE | 80,000 | NE | NE | 32,000 | 160,000 | 1,600,000 | 0.23 |
| 2001 MTCA Method A or B Soil Cleanup Level | | 8,000,000 (B)<br>16,000,000 (B*) | 1,670 (B)<br>4,000,000 (B*) | 4,000,000 (B*) | 4,000,000 (B*) | 48,000,000 (B) | NE | 6,400,000 (B) | 8,000,000 (B) | 8,000,000 (B) | 345,000 (B*) | 6,000 (A)<br>8,000,000 (B) | NE | NE | 5,000 (A)**<br>1,600,000 (B) | 7,000 (A)<br>16,000,000 (B)<br>6,400,000 (B*) | 9,000 (A)<br>160,000,000 (B) | 667 (B) |
| MTCA Method A or B Protection of Groundwater | | 8,734 (B) | 2,862 (B) | 1,600 (B) | 1,600 (B) | 19,200 (B) | NE | 2,560 (B) | 3,211 (B) | 5,651 (B) | 60 (B) | 6,000 (A)<br>6,912 (B) | 3,200 (B) | NE | 5,000 (A)<br>4,457 (B) | 7,000 (A)<br>4,654 (B) | 9,000 (A)<br>14,630 (B) | 1.26 (A)<br>0.18 (B) |
| ESB1366-5' | 4/3/00 | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 5.6 U | 1.1 U | 5.6 U | 6.4 | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 5.6 U | 1.1 U | 1.1 U | 0.053 U |
| ESB1366-12 1/2' | 4/3/00 | 9.8 U | 9.8 U | 9.8 U | 9.8 U | 49 U | 9.8 U | 49 U | 50 | 9.8 U | 9.8 U | 630 | 9.8 U | 9.8 U | 49 U | 9.8 U | 570 | 0.054 U |
| ESB1366-14' | 4/3/00 | 8.3 U | 8.3 U | 8.3 U | 8.3 U | 42 U | 8.3 U | 42 U | 58 | 8.3 U | 8.3 U | 280 | 8.3 U | 8.3 U | 42 U | 8.3 U | 1,855 | 0.056 U |
| ESB1367-7 1/2' | 4/3/00 | 1.1 U | 1.1 U | 1.2 | 1.1 U | 5.4 U | 1.1 U | 5.4 U | 21 | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 5.4 U | 1.1 U | 1.1 U | 0.053 U |
| ESB1367-10' | 4/3/00 | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 5.7 U | 1.1 U | 5.7 U | 15 | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 5.7 U | 1.1 U | 1.1 U | 0.054 U |
| ESB1367-12' | 4/3/00 | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 5.5 U | 1.1 U | 5.5 U | 9.9 | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 5.5 U | 1.1 U | 1.1 U | 0.59 |
| ESB1374-2' | 4/4/00 | 1.0 U | 1.0 U | 1.0 U | 1.0 U | 5.1 U | 1.0 U | 5.1 U | 5.1 U | 1.0 U | 1.0 U | 1.0 U | 1.0 U | 1.0 U | 5.1 U | 1.0 U | 1.0 U | 0.051 U |
| ESB1374-5' | 4/4/00 | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 5.7 U | 1.1 U | 5.7 U | 22 | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 5.7 U | 1.1 U | 1.1 U | 0.11 |
| ESB1374-6' | 4/4/00 | 1.1 U | 1.1 U | 1.1 UJ | 1.1 UJ | 5.7 U | 1.1 UJ | 5.7 U | 20 | 1.1 U | 1.1 U | 1.1 UJ | 1.1 U | 1.1 UJ | 5.7 UJ | 1.1 U | 1.1 UJ | 0.058 U |
| ESB1376-5 1/2' | 4/5/00 | 0.9 U | 0.9 U | 0.9 U | 0.9 U | 4.6 U | 0.9 UJ | 4.6 U | 10 | 0.9 U | 0.9 U | 0.9 U | 0.9 U | 0.9 UJ | 4.6 UJ | 0.9 U | 0.9 U | 0.057 U |
| ESB1377-6' | 4/5/00 | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 6.5 | 1.1 U | 5.4 U | 59 | 1.1 U | 1.1 U | 43 | 1.6 | 1.1 U | 5.4 U | 1.1 U | 100.4 | 0.087 J |
| ESB1378-6' | 4/5/00 | 0.9 U | 0.9 U | 140 | 90 | 5.7 | 5.1 | 4.6 U | 48 | 0.9 U | 2.7 | 97 | 17 | 38 | 14 | 1.9 | 650 | 0.16 J |
| ESB1378-6' (DUP) | 4/5/00 | 1.1 U | 1.1 U | 220 | 170 | 5.6 | 7.2 | 5.6 U | 42 | 1.1 U | 2.3 | 120 | 36 | 89 | 53 | 1.1 U | 404 | 0.080 J |
| ESB1378-7' | 4/5/00 | 1.1 | 1.2 | 120 | 70 | 7.2 | 2.4 | 5.0 U | 56 | 1.0 U | 5.1 | 130 | 20 | 23 | 5.0 U | 8.2 | 830 | 0.21 |
| EGW062-10' | 6/12/00 | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 5.7 U | 1.1 U | 5.7 U | 26 U* | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 5.7 U | 1.1 U | 1.4 | 0.056 U |
| EGW062-15' | 6/12/00 | 1.1 U | 1.1 U | 1.1 U | 1.1 U | 5.4 U | 1.1 U | 5.4 U | 16 U* | 1.1 U | 1.1 U | 3.7 | 1.1 U | 1.1 U | 5.4 U | 1.1 U | 309.5 | 0.055 UJ |
| EGW062-17 1/2' | 6/12/00 | 1.2 U | 1.2 U | 1.2 U | 1.2 U | 5.8 U | 1.2 U | 5.8 U | 24 U* | 1.2 U | 1.2 U | 1.2 U | 1.2 U | 1.2 U | 5.8 U | 1.2 U | 1.2 U | 0.056 U |
| EGW063-15' | 6/12/00 | 1.2 U | 1.2 U | 4.1 | 2.4 | 7.0 U* | 3.1 | 5.9 U | 32 U* | 1.7 | 1.2 U | 400 | 1.2 U | 7.0 | 5.9 U | 4.2 | 4,330 | 0.055 UJ |
| EGW063-17 1/2' | 6/12/00 | 1.1 U | 1.1 U | 1.6 | 1.1 U | 19 U* | 1.1 U | 18 | 26 U* | 1.1 U | 1.1 U | 550 | 1.1 U | 2.8 | 5.7 U | 44 | 4,970 | 0.058 UJ |

**Notes:**
MTCA - Model Toxics Control Act
(A) - MTCA Method A soil cleanup level for unrestricted land use
(B) MTCA Method B soil cleanup level
(B*) Revised 2001 MTCA Method B value from Ecology website CLARC tables downloaded June 2010 (https://fortress.wa.gov/ecy/clarc/reporting/CLARCReporting.aspx).
1996 - Indicates MTCA soil cleanup levels, published 1996.
2001 - Indicates MTCA version 3.1 soil cleanup levels, published 2001.
(DUP) - Field duplicate
NE = Not established
J - Estimated value
U - Compound was analyzed for but not detected above the reporting limit shown.
UJ - Compound was analyzed for but not detected above the reporting limit shown. Reporting limit is an estimated value.
U* - Result qualified as not detected due to method blank contamination.
**2001 MTCA Method A cleanup level is based on the total of naphthalene, 1-methylnaphthalene, and 2-methylnaphthalene
Numbers in grey shading indicate results that exceed a MTCA protection of groundwater level, but do not exceed the current lowest MTCA soil cleanup level protective of direct contact.

**Table 16-4**
**Summary of 1997 Soil Sample Analytical Results for Metals, (mg/kg)**
**Building 40-56**
**Boeing Everett Plant Remedial Investigation**

| Sample ID | Sample Date | Arsenic | Barium | Cadmium | Chromium | Lead | Selenium |
|---|---|---|---|---|---|---|---|
| 1996 MTCA Method A, AI, or B Soil Cleanup Level | | 1.67 (B) | 5,600 (B) | 80 (B) | 100 (A)<br>500 (AI) | 250 (A)<br>1,000 (AI) | 400 (B) |
| 1996 MTCA Method B 100x GW Soil Cleanup Level | | 0.00583 | 112 | 1.6 | 1,600 ($Cr^{+3}$) | NE | 8.0 |
| 2001 MTCA Method A, AI, or B Soil Cleanup Level | | 20 (A)<br>0.667 (B) | 5,600 (B)<br>16,000 (B*) | 2 (A)<br>80 (B) | 2,000($Cr^{+3}$) / 19 ($Cr^{+6}$) (A)<br>120,000($Cr^{+3}$) / 240 ($Cr^{+6}$) (B) | 250 (A)<br>1,000 (AI) | 400 (B) |
| MTCA Method A or B Protection of Groundwater | | 20 (A)<br>0.03 (B) | 2,637 (B) | 2 (A)<br>1.1 (B) | 2,000 ($Cr^{+3}$) / 19 ($Cr^{+6}$) (A)<br>480,096 ($Cr^{+3}$) / 18 ($Cr^{+6}$) (B) | 250 (A) | 8.3 (B) |
| WA Department of Ecology - Puget Sound Regional Background Concentration | | 7.30 | NE | 0.8 | 48.2 | 24.0 | NE |
| ESB1089-13' | 07/07/97 | **3.1** | 62.0 | 0.3 | **46.0** | 4 | 5 U |
| ESB1090-13' | 07/07/97 | **2.5** | 63.2 | 0.2 U | **37.0** | 4 | 6 U |
| ESB1091-12' | 07/07/97 | **1.24** | 56.6 | 0.2 U | **44.4** | 4 | 5 |
| ESB1095-15' | 07/08/97 | **2.9** | 59.2 | 0.2 U | **41.3** | 3 | 5 U |
| ESB1097-17' | 07/08/97 | **1.9** | 70.6 | 0.2 U | **40.7** | 4 | 6 |
| ESB1098-16' | 07/08/97 | **1.3** | 53.6 | 0.2 U | **39.9** | 3 | 5 U |

**Notes:**
MTCA - Model Toxics Control Act
(A) - MTCA Method A soil cleanup level for unrestricted land use
(AI) - MTCA Method A soil cleanup level for industrial property
(B) - MTCA Method B soil cleanup level
(B*) Revised 2001 MTCA Method B value from Ecology website CLARC tables downloaded June 2010 (https://fortress.wa.gov/ecy/clarc/reporting/CLARCReporting.aspx).
1996 - Indicates MTCA soil cleanup levels, published 1996.
2001 - Indicates MTCA version 3.1 soil cleanup levels, published 2001.
NE - Not established
J - Estimated value
U - Compound was analyzed for but not detected above the reporting limit shown.
Samples were analyzed for mercury and silver, but these metals were not detected in any of the samples.
Numbers in **bold** font indicate that the result reported exceeds the most current MTCA cleanup level as of June 2010.

**Table 16-5**
**Summary of 2002 Soil Sample Field Laboratory Analytical Results for Volatile Organic Compounds, (ug/kg)**
**Building 40-56**
**Boeing Everett Plant Remedial Investigation**

| Sample ID | Sample Date | Benzene | Ethylbenzene | Toluene | Total Xylenes |
|---|---|---|---|---|---|
| 2001 MTCA Method A or B Soil Cleanup Level | | 30 (A)<br>18,200 (B) | 6,000 (A)<br>8,000,000 (B) | 7,000 (A)<br>16,000,000 (B)<br>6,400,000 (B*) | 9,000 (A)<br>160,000,000 (B) |
| MTCA Method A or B Protection of Groundwater | | 30 (A)<br>4.5 (B) | 6,000 (A)<br>6,912 (B) | 7,000 (A)<br>4,654 (B) | 9,000 (A)<br>14,630 (B) |
| ESB1401-20 | 6/6/2002 | 50 U | 110 | 50 U | 930 |
| ESB1401-25 | 6/6/2002 | 50 U | 50 U | 50 U | 50 U |
| ESB1401-30 | 6/6/2002 | 50 U | 50 U | 50 U | 50 U |
| ESB1402-20 | 6/6/2002 | 50 U | 590 | 50 U | 5,600 |
| ESB1402-25 | 6/6/2002 | 50 U | 50 U | 50 U | 50 U |
| ESB1402-25 (DUP) | 6/6/2002 | 50 U | 50 U | 50 U | 50 U |
| ESB1402-30 | 6/6/2002 | 50 U | 50 U | 50 U | 50 U |
| ESB1402-35 | 6/6/2002 | 50 U | 50 U | 50 U | 50 U |
| ESB1403-15 | 6/6/2002 | 50 U | 920 | 50 U | 4,600 |
| ESB1403-20 | 6/6/2002 | 50 U | 440 | 50 U | 1,900 |
| ESB1403-25 | 6/6/2002 | 50 U | 50 | 50 U | 400 |
| ESB1403-30 | 6/6/2002 | 50 U | 50 U | 50 U | 50 U |
| ESB1403-30 (DUP) | 6/6/2002 | 50 U | 50 U | 50 U | 50 U |

MTCA - Model Toxics Control Act
(A) - MTCA Method A soil cleanup level for unrestricted land use
(B) - MTCA Method B soil cleanup level
(B*) Revised 2001 MTCA Method B value from Ecology website CLARC tables downloaded June 2010
(https://fortress.wa.gov/ecy/clarc/reporting/CLARCReporting.aspx).
2001 - Indicates MTCA version 3.1 soil cleanup levels, published 2001.
bgs - below ground surface
(DUP) - Field duplicate
J - Estimated value
U - Compound was analyzed for but not detected above the reporting limit shown.
Numbers in grey shading indicate reporting limits that exceed a MTCA protection of groundwater level and the current lowest MTCA soil cleanup level protective of direct contact.

**Table 16-6**
**Summary of 2002 Soil Sample Analytical Results for Volatile Organic Compounds, (ug/kg)**
**Building 40-56**
**Boeing Everett Plant Remedial Investigation**

| Sample ID | Sample Date | Acetone | Ethylbenzene | Isopropylbenzene | Methylene Chloride | 2-Butanone (MEK) | n-Propyl benzene | Toluene | Total Xylenes |
|---|---|---|---|---|---|---|---|---|---|
| 2001 MTCA Method A or B Soil Cleanup Level | | 8,000,000 (B) | 6,000 (A)<br>8,000,000 (B) | NE | 20 (A)<br>133,000 (B) | 48,000,000 (B) | NE | 7,000 (A)<br>16,000,000 (B)<br>6,400,000 (B*) | 9,000 (A)<br>160,000,000 (B) |
| MTCA Method A or B Protection of Groundwater | | 3,211 (B) | 6,000 (A)<br>6,912 (B) | 3,200 (B) | 20 (A)<br>25 (B) | 19,200 (B) | NE | 7,000 (A)<br>4,654 (B) | 9,000 (A)<br>14,630 (B) |
| ESB1401-15 | 6/5/2002 | 360,000 U | **1,200,000** | 73,000 U | 150,000 U | 360,000 U | 73,000 U | **59,000 J** | **11,000,000** |
| ESB1401-30 | 6/6/2002 | 150 | 1.1 U | 1.1 U | 2.3 U | 850 | 1.1 U | 1.1 U | 2.3 U |
| ESB1402-17.5 | 6/5/2002 | 1,400 U | 2,100 | 280 U | 560 U | 1,400 U | 280 U | 280 U | **18,000** |
| ESB1402-35 | 6/6/2002 | 14 U | 1.1 U | 1.1 U | 2.2 U | 26 | 1.1 U | 1.1 U | 4.1 |
| ESB1403-11 | 6/5/2002 | 1,400 U | 4,500 | 290 U | 570 U | 1,400 U | 290 U | 290 U | **27,000** |
| ESB1403-15 | 6/6/2002 | 61 | 1,400 | 15 | 17 | 39 U | 9.5 | 12 | 5,100 |
| ESB1403-30 | 6/6/2002 | 6.9 U | 1.1 U | 1.1 U | 2.2 U | 5.6 U | 1.1 U | 1.1 U | 2.5 |

MTCA - Model Toxics Control Act
(A) - MTCA Method A soil cleanup level for unrestricted land use
(B) - MTCA Method B soil cleanup level
(B*) Revised 2001 MTCA Method B value from Ecology website CLARC tables downloaded June 2010 (https://fortress.wa.gov/ecy/clarc/reporting/CLARCReporting.aspx).
2001 - Indicates MTCA version 3.1 soil cleanup levels, published 2001.
bgs - Below ground surface
J - Estimated value
U - Compound was analyzed for but not detected above the reporting limit shown.
Numbers in **bold** font indicate that the result reported exceeds the most current MTCA cleanup level as of June 2010.
Numbers in grey shading indicate reporting limits that exceed a MTCA protection of groundwater level, but may or may not exceed the current lowest MTCA soil cleanup level protective of direct contact.

**Table 16-7**
**Summary of Groundwater Sample Analytical Results from Borings for Volatile Organic Compounds, (mg/L)**
**Building 40-56**
**Boeing Everett Plant Remedial Investigation**

| Sample ID/Date | | Acetone | 2-Butanone | Carbon Disulfide | Chloroethane | 1,1-Dichloro-ethane | Ethyl-benzene | 4-Methyl-2-Pentanone (MIBK) | Toluene | 1,1,1-Trichloro-ethane | Vinyl Chloride | Total Xylenes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1996 MTCA Method A or B Groundwater Cleanup Level | | 0.8 (B) | 4.8 (B) | 0.8 (B) | NE | 0.8 (B) | 0.03 (A)<br>0.8 (B) | 0.64 (B) | 0.04 (A)<br>1.6 (B) | 0.2 (A)<br>7.2 (B) | 0.0002 (A)<br>0.000023 (B) | 0.02 (A)<br>16 (B) |
| 2001 MTCA Method A or B Groundwater Cleanup Level | | 0.8 (B) | 4.8 (B) | 0.8 (B) | 0.015 (B*) | 0.8 (B)<br>1.6 (B*) | 0.7 (A)<br>0.8 (B) | 0.64 (B) | 1 (A)<br>1.6 (B)<br>0.64 (B*) | 0.2 (A)<br>7.2 (B)<br>16 (B*) | 0.0002 (A)<br>0.0000292 (B) | 1 (A)<br>16 (B) |
| ESB1095-14' | 07/08/97 | 0.25 U | 0.26 | 0.05 U | 0.1 U | 0.05 U | **12** | 0.6 | **1.1** | 0.05 U | **0.000082** | **89** |
| ESB1096-14' | 07/08/97 | 5.0 U | 5.0 U | 1.0 U | 2.0 U | 1.0 U | **270** | 5.0 U | **7.9** | 1.0 U | **0.000024** | **2,480** |
| ESB1297-14' | 07/28/98 | 23 U | 23 U | 4.5 U | 9.0 U | 4.5 U | **40** | 23 U | 4.5 U | 4.5 U | 9.0 U | **349** |

**Notes:**
MTCA - Model Toxics Control Act
(A) - MTCA Method A groundwater cleanup level
(B) - MTCA Method B groundwater cleanup level
(B*) Revised 2001 MTCA Method B value from Ecology website CLARC tables downloaded January 2006 (https://fortress.wa.gov/ecy/clarc/reporting/CLARCReporting.aspx).
1996 - Indicates MTCA soil cleanup levels, published 1996.
2001 - Indicates MTCA version 3.1 soil cleanup levels, published 2001.
NE - Not established
U - Compound was analyzed for but not detected above the reporting limit shown.
Numbers in **bold** font indicate that the result reported exceeds the most current MTCA cleanup level as of January 2006.

**Table 16-8**

**Summary of Groundwater Analytical Results for Volatile Organic Compounds, (mg/L)**

**Building 40-56**

**Boeing Everett Plant**

| Well ID | Sample Date | Chloromethane | Bromomethane | Vinyl Chloride | Chloroethane | Methylene Chloride | Acetone | Carbon Disulfide | 1,1-DCE | 1,1-DCA | cis-1,2-DCE | Chloroform | 1,2-DCA | MEK |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MTCA Method A or B Groundwater Screening Level | | 0.00337 (B) | 0.0112 (B) | 0.0002 (A)<br>0.0000292 (B) | 0.015 (B) | 0.005 (A)<br>0.00583 (B) | 0.8 (B) | 0.8 (B) | 0.4 (B) | 1.6 (B) | 0.08 (B) | 0.00717 (B) | 0.005 (A)<br>0.000481 (B) | 4.8 (B) |
| **EGW002** | 02/02/95 | 0.002 U | 0.002 U | 0.002 U | **0.15** | 0.002 U | **1.6** | 0.001 U | 0.001 U | 0.044 | 0.001 U | 0.001 U | NA | 3.9 |
| | 05/01/95 | 0.002 U | 0.002 U | 0.002 U | **0.16** | 0.0038 | 0.005 U | 0.001 U | 0.001 U | 0.012 | 0.001 U | 0.001 U | NA | 0.35 |
| | 08/11/95 | 0.1 U | 0.1 U | 0.1 U | 0.1 U | 0.01 U | 0.25 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | NA | 0.25 U |
| | 11/09/95 | 0.2 U | 0.2 U | 0.2 U | 0.2 U | 0.02 U | 0.5 U | 0.1 U | 0.1 U | 0.1 U | 0.1 U | 0.1 U | NA | 0.5 U |
| | 02/29/96 | 0.36 U | 0.36 U | 0.36 U | 0.36 U | 0.36 U | 0.9 U | 0.18 U | 0.18 U | 0.18 U | 0.18 U | 0.18 U | NA | 0.9 U |
| | 05/30/96 | 0.4 U | 0.4 U | 0.4 U | 0.4 U | 0.4 U | 1 U | 0.2 U | 0.2 U | 0.2 U | 0.2 U | 0.2 U | NA | 1 U |
| | 08/27/96 | 0.4 U | 0.4 U | 0.4 U | 0.4 U | 0.4 U | 1 U | 0.2 U | 0.2 U | 0.2 U | 0.2 U | 0.2 U | NA | 1 U |
| | 12/03/96 | 0.4 U | 0.4 U | 0.4 U | 0.4 U | 0.4 U | **3.5** | 0.2 U | 0.2 U | 0.2 U | 0.2 U | 0.2 U | NA | 2.4 |
| | 03/10/97 | 0.4 U | 0.4 U | 0.4 U | 0.4 U | 0.4 U | 1 U | 0.2 U | 0.2 U | 0.2 U | 0.2 U | 0.2 U | NA | 1 U |
| | 05/22/97 | 0.4 U | 0.4 U | **0.00093** | 0.4 U | 0.4 U | 1 U | 0.2 U | 0.2 U | 0.2 U | 0.2 U | 0.2 U | NA | 1 U |
| | 08/12/97 | 0.36 U | 0.36 U | 0.36 U | 0.36 U | 0.36 U | 0.9 U | 0.18 U | 0.18 U | 0.18 U | 0.18 U | 0.18 U | NA | 0.9 U |
| | 11/17/97 | 0.2 U | 0.2 U | 0.001 U | 0.2 U | 0.2 U | 0.5 U | 0.1 U | 0.1 U | 0.1 U | 0.1 U | 0.1 U | NA | 0.5 U |
| | 03/10/98 | 0.1 U | 0.1 U | 0.0005 U | 0.1 U | 0.1 U | 0.25 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.25 U |
| | 05/13/98 | 1 U | 1 U | 0.001 U | 1 U | 1 U | 2.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 2.5 U |
| | 08/10/98 | 0.2 U | 0.2 U | 0.001 U | 0.2 U | 0.2 U | 0.5 U | 0.1 U | 0.1 U | 0.1 U | 0.1 U | 0.1 U | 0.1 U | 0.5 U |
| | 11/10/98 | 0.3 U | 0.3 U | **0.00053** | 0.3 U | 0.3 U | 0.75 U | 0.15 U | 0.15 U | 0.15 U | 0.15 U | 0.15 U | 0.15 U | 0.75 U |
| | 02/01/99 | 0.1 U | 0.1 U | **0.00083** | 0.1 U | 0.1 U | 0.25 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.25 U |
| | 05/11/99 | 0.1 U | 0.1 U | **0.0004** | 0.1 U | 0.2 U | 0.5 U | 0.1 U | 0.1 U | 0.1 U | 0.1 U | 0.1 U | 0.1 U | 0.5 U |
| | 08/02/99 | 0.001 U | 0.001 U | 0.0005 U | **0.057** | 0.002 U | 0.005 U | 0.0022 | 0.001 U | 0.019 | 0.001 U | 0.001 U | 0.001 U | 0.005 U |
| | 11/09/99 | 0.05 U | 0.05 U | **0.00026** | 0.05 U | 0.1 U | 0.25 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.25 U |
| | 01/31/00 | 0.05 U | 0.05 U | **0.00032** | **0.05** | 0.1 U | 0.25 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.25 U |
| | 05/02/00 | 0.1 U | 0.1 U | **0.00028 J** | 0.1 U | 0.2 U | 0.5 U | 0.1 U | 0.1 U | 0.1 U | 0.1 U | 0.1 U | 0.1 U | 0.5 U |
| | 07/31/00 | 0.06 U | 0.06 U | 0.0006 U | 0.06 U | 0.12 U | 0.3 U | 0.06 U | 0.06 U | 0.06 U | 0.06 U | 0.06 U | 0.06 U | 0.3 U |
| | 11/13/00 | 0.02 U | 0.02 U | **0.00028** | **0.044** | 0.04 U | 0.1 U | 0.02 U | 0.02 U | 0.02 U | 0.02 U | 0.02 U | 0.02 U | 0.1 U |
| | 02/05/01 | 0.05 UJ | 0.05 UJ | **0.00035** | **0.064 J** | 0.1 UJ | 0.25 UJ | 0.05 UJ | 0.05 UJ | 0.05 UJ | 0.05 UJ | 0.05 UJ | 0.05 UJ | 0.25 UJ |
| | 05/01/01 | 0.05 U | 0.05 U | **0.00030** | **0.056** | 0.1 U | 0.25 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.25 U |
| | 08/06/01 | 0.05 U | 0.05 U | **0.00018** | 0.05 U | 0.1 U | 0.25 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.25 U |
| | 11/12/01 | 0.05 U | 0.05 U | **0.00012** | **0.052** | 0.1 U | 0.25 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.25 U |
| | 02/05/02 | 0.005 U | 0.005 U | **0.00026** | **0.029** | 0.01 U | 0.025 U | 0.005 U | 0.00002 U | 0.005 U | 0.005 U | 0.005 U | 0.005 U | 0.025 U |
| | 05/06/02 | 0.025 U | 0.025 U | **0.00019** | 0.025 U | 0.05 U | 0.12 U | 0.025 U | 0.00002 U | 0.025 U | 0.025 U | 0.025 U | 0.025 U | 0.12 U |
| | 08/06/02 | 0.03 U | 0.03 U | **0.00017 J** | 0.030 U | 0.06 U | 0.15 U | 0.03 U | 0.00002 U | 0.03 U | 0.03 U | 0.03 U | 0.03 U | 0.15 U |
| | 11/16/02 | 0.002 U | 0.002 U | **0.00018** | **0.025** | 0.004 U | 0.01 U | 0.002 U | 0.00002 U | 0.002 U | 0.002 U | 0.002 U | 0.002 U | 0.01 U |
| | 11/16/02 (DUP) | 0.003 U | 0.003 U | **0.00017** | **0.024** | 0.006 U | 0.015 U | 0.003 U | 0.00002 U | 0.003 U | 0.003 U | 0.003 U | 0.003 U | 0.015 U |
| | 02/04/03 | 0.003 U | 0.003 U | **0.00018** | **0.027** | 0.0045 U | 0.015 U | 0.003 U | 0.00002 U | 0.003 U | 0.003 U | 0.003 U | 0.003 U | 0.015 U |
| | 05/05/03 | 0.001 U | 0.001 U | **0.00018** | **0.028** | 0.0029 | 0.005 U | 0.001 U | 0.00002 U | 0.0015 | 0.001 U | 0.001 U | 0.001 U | 0.005 U |
| | 07/22/03 | 0.003 U | 0.003 U | **0.00014** | **0.024** | 0.006 U | 0.015 U | 0.003 U | 0.00002 U | 0.003 U | 0.003 U | 0.003 U | 0.003 U | 0.015 U |
| | 11/04/03 | 0.001 U | 0.001 U | **0.00012** | **0.018** | 0.002 U | 0.0077 U | 0.001 U | 0.00002 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U |
| | 01/21/04 | 0.02 U | 0.02 U | **0.00019** | **0.021** | 0.04 U | 0.1 U | 0.02 U | 0.00002 U | 0.02 U | 0.02 U | 0.02 U | 0.02 U | 0.1 U |
| | 04/14/04 | 0.01 U | 0.01 U | **0.00012** | **0.018** | 0.02 U | 0.05 U | 0.01 U | 0.00002 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.05 U |
| | 4/14/04 (DUP) | 0.01 U | 0.01 U | **0.000087** | 0.010 U | 0.02 U | 0.05 U | 0.01 U | 0.00002 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.05 U |
| | 07/13/04 | 0.01 U | 0.01 U | **0.000098** | **0.027** | 0.02 U | 0.05 U | 0.01 U | 0.00002 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.05 U |
| | 10/01/04 | 0.001 U | 0.001 U | **0.00011** | **0.026** | 0.002 U | 0.005 U | 0.001 U | 0.00002 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U |
| | 01/12/05 | 0.0002 U | 0.0002 U | **0.000073** | **0.022 D** | 0.0006 U | 0.002 J | 0.0002 U | 0.00002 U | 0.0005 J | 0.0004 J | 0.0002 U | 0.0002 J | 0.001 U |
| | 1/12/05 (DUP) | 0.0002 U | 0.0002 U | **0.000075** | **0.022 D** | 0.0006 U | 0.0022 J | 0.0002 U | 0.00002 U | 0.0006 J | 0.0004 J | 0.0002 U | 0.0002 U | 0.001 U |
| | 04/11/05 | 0.001 U | 0.001 U | **0.000072** | **0.022** | 0.0044** | 0.0093 | 0.001 U | 0.00002 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U |
| | 07/12/05 | 0.001 U | 0.001 U | **0.000088** | **0.019** | 0.002 U | 0.005 U | 0.001 U | 0.00002 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U |
| | 10/17/05 | 0.0002 U | 0.0002 U | **0.000044** | **0.015** | 0.0005 U | 0.0034 U | 0.0002 U | 0.00002 U | 0.0006 | 0.0003 | 0.0002 U | 0.00020 | 0.001 U |
| | 01/12/06 | 0.0002 U | 0.0002 U | **0.000052** | **0.019** | 0.0006 | 0.0055 | 0.0002 U | 0.00002 U | 0.001 | 0.0004 | 0.0002 U | 0.00020 | 0.001 U |
| | 04/19/06 | 0.01 U | 0.01 U | **0.000057** | **0.019** | **0.044**** | 0.05 U | 0.01 U | 0.00002 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.05 U |
| | 07/05/06 | 0.01 U | 0.01 U | **0.000055** | **0.015** | 0.02 U | 0.05 U | 0.01 U | 0.00002 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.05 U |
| | 10/17/06 | 0.001 U | 0.001 U | 0.000028 J | 0.010 | 0.002 U | 0.005 U | 0.001 U | 0.00002 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U |
| | 01/04/07 | 0.0002 U | 0.0002 U | 0.000026 | 0.0082 | 0.0003 U | 0.003 U | 0.0002 U | 0.00002 U | 0.001 | 0.0003 | 0.0002 U | 0.0002 U | 0.001 U |
| | 1/4/07 (DUP) | 0.0002 U | 0.0002 U | 0.000028 | 0.0079 | 0.0003 | 0.003 U | 0.0002 U | 0.00002 U | 0.001 | 0.0003 | 0.0002 U | 0.0002 U | 0.001 U |
| | 04/03/07 | 0.0002 U | 0.0002 U | **0.000065** | 0.0077 | 0.0003 | 0.003 U | 0.0002 U | 0.00002 U | 0.0007 | 0.0004 | 0.0002 U | 0.0002 U | 0.001 U |
| | 4/3/07 (DUP) | 0.0002 U | 0.0002 U | **0.000080** | 0.0073 | 0.0003 | 0.003 | 0.0002 U | 0.00002 U | 0.0007 | 0.0004 | 0.0002 U | 0.0002 U | 0.001 U |
| | 07/02/07 | 0.0002 U | 0.0002 U | **0.00003** | 0.0062 | 0.0003 U | 0.003 U | 0.0002 U | 0.00002 U | 0.0007 | 0.0003 | 0.0002 U | 0.0002 U | 0.001 U |
| | 10/25/07 | 0.0002 U | 0.0002 U | 0.00002 U | 0.0078 | 0.0003 U | 0.005 | 0.0002 U | 0.00002 U | 0.001 | 0.0003 | 0.0002 U | 0.0002 U | 0.001 U |
| | 01/03/08 | 0.0002 U | 0.0002 U | 0.00002 U | 0.0054 | 0.0003 U | 0.003 U | 0.0002 U | 0.00002 U | 0.0008 | 0.0003 | 0.0002 U | 0.0002 U | 0.001 U |
| | 04/01/08 | 0.0002 U | 0.0005 U | 0.00002 U | 0.0064 J | 0.0005 U | 0.027 J | 0.0002 U | 0.00002 U | 0.0012 J | 0.00031 | 0.0002 U | 0.0002 U | 0.0025 U |
| | 4/1/08 (DUP) | 0.0002 U | 0.0005 U | 0.00002 U | 0.0068 J | 0.0005 U | 0.03 J | 0.0002 U | 0.00002 U | 0.0013 J | 0.00029 | 0.0002 U | 0.0002 U | 0.0025 U |
| | 07/07/08 | 0.0002 U | 0.0005 U | 0.000026 | 0.0036 | 0.0005 U | 0.0032 | 0.0002 U | 0.00002 U | 0.0008 | 0.0003 | 0.0002 U | 0.0002 U | 0.0025 U |
| | 10/07/08 | 0.0002 U | 0.0005 U | 0.000021 | 0.0042 | 0.0005 U | 0.003 U | 0.0002 U | 0.00002 U | 0.0006 | 0.0003 | 0.0002 U | 0.0002 U | 0.0025 U |
| | 10/7/08 (DUP) | 0.0002 U | 0.0005 U | 0.00002 U | 0.0038 | 0.0005 U | 0.003 U | 0.0002 U | 0.00002 U | 0.0006 | 0.0002 | 0.0002 U | 0.0002 U | 0.0025 U |
| | 01/05/09 | 0.0002 U | 0.0005 U | 0.00002 U | 0.0036 J | 0.0005 U | 0.0044 | 0.0002 U | 0.00002 U | 0.0006 | 0.0003 | 0.0002 U | 0.0002 U | 0.0025 U |
| | 04/06/09 | 0.0002 U | 0.0005 U | 0.00002 U | 0.004 | 0.0005 U | 0.0037 | 0.0002 U | 0.00002 U | 0.0005 | 0.0002 | 0.0002 U | 0.0002 U | 0.0025 U |
| | 07/08/09 | 0.0005 U | 0.0005 U | **0.000032** | 0.0035 | 0.0005 U | 0.005 U | 0.0002 U | 0.00002 U | 0.0006 | 0.0003 | 0.0002 U | 0.0002 U | 0.0050 U |
| | 10/27/09 | 0.0005 U | 0.0005 U | 0.00002 U | 0.0029 | 0.0005 U | 0.005 U | 0.0002 U | 0.00002 U | 0.0004 | 0.0002 | 0.0002 U | 0.0002 U | 0.005 U |
| | 01/13/10 | 0.0005 U | 0.0005 U | 0.00002 U | 0.0018 | 0.0005 U | 0.005 U | 0.0002 U | 0.00002 U | 0.0004 | 0.0002 | 0.0002 U | 0.0002 U | 0.005 U |
| | 04/06/10 | 0.0005 U | 0.0005 U | 0.00002 U | 0.0012 | 0.0005 U | 0.005 U | 0.0002 U | 0.00002 U | 0.0004 | 0.0002 | 0.0002 U | 0.0002 U | 0.005 U |

| Well ID | Sample Date | 1,1,1-TCA | BDCM | TCE | Benzene | Bromoform | MIBK | 2-Hexanone | PCE | Toluene | Ethylbenzene | Styrene | TCFM | Total Xylenes | Cyclohexanone |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MTCA Method A or B Groundwater Screening Level | | 0.2 (A)<br>7.2 (B)<br>16 (B*) | 0.000706 (B) | 0.005 (A)<br>0.00049 (B) | 0.005 (A)<br>0.000795 (B) | 0.00554 (B) | 0.64 (B) | NE | 0.005 (A)<br>0.000081 (B) | 1 (A)<br>0.64 (B) | 0.7 (A)<br>0.8 (B) | 0.0015 (B) | 2.4 (B) | 1 (A)<br>1.6 (B) | 40 (B) |
| **EGW002** | 02/02/95 | NA | NA | NA | 0.001 U | NA | **130** | 0.005 U | NA | **1.9** | **2.4** | NA | NA | **32.5** | NA |
| | 05/01/95 | NA | NA | NA | **0.0092** | NA | **72** | 0.005 U | NA | **1.1** | **2.9** | NA | NA | **18.4** | 4 U |
| | 08/11/95 | NA | NA | NA | 0.05 U | NA | **5.1** | 0.25 U | NA | 0.24 | **2.9** | NA | NA | **22.2** | 5 U |
| | 11/09/95 | NA | NA | NA | 0.1 U | NA | 0.5 U | 0.5 U | NA | 0.1 U | **3.0** | NA | NA | **21.5** | 10 U |
| | 02/29/96 | NA | NA | NA | 0.18 U | NA | **6.3** | 0.9 U | NA | 0.18 U | **3.9** | NA | NA | **25.84** | 18 U |
| | 05/30/96 | NA | NA | NA | 0.2 U | NA | **4.7** | 1 U | NA | 0.2 U | **3.3** | NA | NA | **22.43** | 20 U |
| | 08/27/96 | NA | NA | NA | 0.2 U | NA | **7.7** | 1 U | NA | 0.2 U | **3.6** | NA | NA | **23.49** | 20 U |
| | 12/03/96 | NA | NA | NA | 0.2 U | NA | **41** | 1 U | NA | 0.54 | **3.5** | NA | NA | **25.6** | 20 U |
| | 03/10/97 | NA | NA | NA | 0.2 U | NA | **28** | 1 U | NA | 0.43 | **4.0** | NA | NA | **25.6** | 20 U |
| | 05/22/97 | NA | NA | NA | 0.2 U | NA | **5.3** | 1 U | NA | 0.2 U | **4.3** | NA | NA | **28.86** | 20 U |
| | 08/12/97 | NA | NA | NA | 0.18 U | NA | 0.9 U | 0.9 U | NA | 0.18 U | **4.3** | NA | NA | **23.26** | 18 U |
| | 11/17/97 | NA | NA | NA | 0.1 U | NA | 0.5 U | 0.5 U | NA | 0.1 U | **3.0** | NA | NA | **14.17** | 10 U |
| | 03/10/98 | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.25 U | 0.25 U | 0.05 U | 0.05 U | **2.1** | 0.1 U | 0.1 U | **9.57** | 5 U |
| | 05/13/98 | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 2.5 U | 2.5 U | 0.5 U | 0.5 U | **15** | 1 U | 1 U | **65** | 50 U |
| | 08/10/98 | 0.1 U | 0.1 U | 0.1 U | 0.1 U | 0.1 U | **1.4** | 0.5 U | 0.1 U | 0.1 U | **2.2** | 0.2 U | 0.2 UJ | **9.8** | 10 U |
| | 11/10/98 | 0.15 U | 0.15 U | 0.15 UJ | 0.15 U | 0.15 U | 0.75 U | 0.75 U | 0.15 U | 0.15 UJ | **0.82** | 0.3 U | 0.3 UJ | **12** | 15 U |
| | 02/01/99 | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.25 U | 0.25 U | 0.05 U | 0.05 U | 0.19 | 0.1 U | 0.1 U | **7.3** | 5 U |
| | 05/11/99 | 0.1 U | 0.1 U | 0.1 U | 0.1 U | 0.1 U | **2** | 0.5 U | 0.1 U | 0.1 U | 0.34 | 0.1 U | 0.1 UJ | **14.2** | 10 U |
| | 08/02/99 | 0.001 U | 0.001 U | 0.001 U | **0.0067** | 0.001 U | **0.86** | 0.005 U | 0.001 U | 0.0072 | 0.27 | 0.001 U | 0.001 U | **18** | 0.1 U |
| | 11/09/99 | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | **3.2 J** | 0.25 U | 0.05 U | 0.13 J | **1.6 J** | 0.05 U | 0.05 U | **23.9** | 5 U |
| | 01/31/00 | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.25 U | 0.25 U | 0.05 U | 0.05 U | 0.19 | 0.05 U | 0.05 U | **19.1** | 5 U |
| | 05/02/00 | 0.1 U | 0.1 U | 0.1 U | 0.1 U | 0.1 U | 0.5 U | 0.5 U | 0.1 U | 0.1 U | 0.1 U | 0.1 U | 0.1 U | **13** | 10 U |
| | 07/31/00 | 0.06 U | 0.06 U | 0.06 U | 0.06 U | 0.06 U | 0.3 U | 0.3 U | 0.06 U | 0.06 U | 0.06 U | 0.06 U | 0.06 U | **11** | 6 U |
| | 11/13/00 | 0.02 U | 0.02 U | 0.02 U | 0.02 U | 0.02 U | 0.14 | 0.1 U | 0.02 U | 0.02 U | 0.02 U | 0.02 U | 0.02 U | **4.4** | 2 U |
| | 02/05/01 | 0.05 UJ | 0.05 UJ | 0.05 UJ | 0.05 UJ | 0.05 UJ | 0.25 UJ | 0.25 UJ | 0.05UJ | 0.05 UJ | 0.05 UJ | 0.05 UJ | 0.05 UJ | **7.4** | 5 UJ |
| | 05/01/01 | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.26 | 0.25 U | 0.05 U | 0.05 U | 0.22 | 0.05 U | 0.05 U | **11.1** | 5 U |
| | 08/06/01 | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.25 U | 0.25 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | **6.6** | 5 U |
| | 11/12/01 | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.25 U | 0.25 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | **2.7** | 5 U |
| | 02/05/02 | 0.005 U | 0.005 U | 0.005 U | 0.005 U | 0.005 U | 0.025 U | 0.025 U | 0.005 U | 0.005 U | 0.018 | 0.005 U | 0.005 U | **1.3** | 0.5 U |
| | 05/06/02 | 0.025 U | 0.025 U | 0.025 U | 0.025 U | 0.025 U | 0.12 U | 0.12 U | 0.025 U | 0.025 U | 0.025 U | 0.025 U | 0.025 U | **3.5** | 2.5 U |
| | 08/06/02 | 0.03 U | 0.03 U | 0.03 U | 0.03 U | 0.03 U | 0.15 U | 0.15 U | 0.03 U | 0.03 U | 0.03 U | 0.03 U | 0.03 U | **3.2** | 3 U |
| | 11/16/02 | 0.002 U | 0.002 U | 0.002 U | **0.0035** | 0.002 U | 0.01 U | 0.01 U | 0.002 U | 0.002 U | 0.002 U | 0.002 U | 0.002 U | 0.35 | 0.2 U |
| | 11/16/02 (DUP) | 0.003 U | 0.003 U | 0.003 U | **0.0035** | 0.003 U | 0.015 U | 0.015 U | 0.003 U | 0.003 U | 0.003 U | 0.003 U | 0.003 U | 0.38 | 0.3 U |
| | 02/04/03 | 0.003 U | 0.003 U | 0.003 U | **0.0033** | 0.003 U | 0.015 U | 0.015 U | 0.003 U | 0.003 U | 0.003 U | 0.003 U | 0.003 U | 0.32 | 0.3 U |
| | 05/05/03 | 0.001 U | 0.001 U | 0.001 U | **0.0039** | 0.001 U | 0.046 | 0.005 U | 0.001 U | 0.001 U | 0.0054 | 0.001 U | 0.001 U | **1.6 D** | 0.1 U |
| | 07/22/03 | 0.003 U | 0.003 U | 0.003 U | **0.0033** | 0.003 U | 0.015 U | 0.015 U | 0.003 U | 0.003 U | 0.003 U | 0.003 U | 0.003 U | 0.70 | 0.3 U |
| | 11/04/03 | 0.001 U | 0.001 U | 0.001 U | **0.0022** | 0.001 U | 0.005 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.076 | 0.1 U |
| | 01/21/04 | 0.02 U | 0.02 U | 0.02 U | 0.02 U | 0.02 U | 0.1 U | 0.1 U | 0.02 U | 0.02 U | 0.02 U | 0.02 U | 0.02 U | 0.97 | 2 U |
| | 04/14/04 | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.05 U | 0.05 U | 0.01 U | 0.01 U | 0.01 | 0.01 U | 0.01 U | **2.0** | 1 U |
| | 4/14/04 (DUP) | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.05 U | 0.05 U | 0.01 U | 0.01 U | 0.12 | 0.01 U | 0.01 U | **1.32** | 1 U |
| | 07/13/04 | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.05 U | 0.05 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | **1.2** | 1 U |
| | 10/01/04 | 0.001 U | 0.001 U | 0.001 U | **0.0028** | 0.001 U | 0.005 U | 0.005 U | 0.001 U | 0.001 U | 0.0062 | 0.001 U | 0.001 U | 0.18 | 0.1 U |
| | 01/12/05 | 0.0002 U | 0.0002 U | 0.0002 U | **0.0023 J** | 0.0002 U | 0.0044 J | 0.001 U | 0.0002 U | 0.0002 U | 0.0003 J | 0.0002 U | 0.0002 U | 0.0126 J | 0.04 U |
| | 1/12/05 (DUP) | 0.0002 U | 0.0002 U | 0.0002 U | **0.0023 J** | 0.0002 U | 0.0049 J | 0.001 U | 0.0002 U | 0.0002 U | 0.0004 J | 0.0002 U | 0.0002 U | 0.0126 J | 0.04 U |
| | 04/11/05 | 0.001 U | 0.001 U | 0.001 U | **0.0023** | 0.001 U | 0.0076 | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.096 | 0.1 U |
| | 07/12/05 | 0.001 U | 0.001 U | 0.001 U | **0.0022** | 0.001 U | 0.023 | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.074 | 0.1 U |
| | 10/17/05 | 0.0002 U | 0.0002 U | 0.0002 U | **0.0024** | 0.0002 U | 0.019 | 0.001 U | 0.0002 U | 0.0002 U | 0.0004 | 0.0002 U | 0.0002 U | 0.0075 | 0.075 U |
| | 01/12/06 | 0.0002 U | 0.0002 U | 0.0002 U | **0.0025** | 0.0002 U | 0.013 | 0.001 U | 0.0002 U | 0.0025 | 0.006 | 0.0002 U | 0.0002 U | 0.746 | 0.04 U |
| | 04/19/06 | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.05 U | 0.05 U | 0.01 U | 0.01 U | 0.055 | 0.01 U | 0.01 U | **2.3** | 1 U |
| | 07/05/06 | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.05 U | 0.05 U | 0.01 U | 0.01 U | 0.031 | 0.01 U | 0.01 U | **1.8** | 1 U |
| | 10/17/06 | 0.001 U | 0.001 U | 0.00002 U | **0.0017** | 0.001 U | 0.005 U | 0.005 U | 0.00002 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.012 | 0.1 U |
| | 01/04/07 | 0.0002 U | 0.0002 U | 0.00002 U | **0.0018** | 0.0002 U | 0.0017 | 0.003 U | 0.00002 U | 0.0002 U | 0.0003 | 0.0002 U | 0.0002 U | 0.0038 | 0.04 U |
| | 1/4/07 (DUP) | 0.0002 U | 0.0002 U | 0.00002 U | **0.0018** | 0.0002 U | 0.0019 | 0.003 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0030 | 0.04 U |
| | 04/03/07 | 0.0002 U | 0.0002 U | 0.00002 U | **0.0016** | 0.0002 U | 0.0027 | 0.003 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0031 | 0.04 U |
| | 4/3/07 (DUP) | 0.0002 U | 0.0002 U | 0.00002 U | **0.0015** | 0.0002 U | 0.0030 | 0.003 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0020 | 0.04 U |
| | 07/02/07 | 0.0002 U | 0.0002 U | 0.00002 U | **0.0014** | 0.0002 U | 0.0073 | 0.003 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0023 | 0.04 U |
| | 10/25/07 | 0.0002 U | 0.0002 U | 0.00002 U | **0.0015** | 0.0002 U | 0.0041 | 0.003 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0032 | 0.04 U |
| | 01/03/08 | 0.0002 U | 0.0002 U | 0.00002 U | **0.0012** | 0.0002 U | 0.001 U | 0.003 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0024 | 0.04 U |
| | 04/01/08 | 0.0002 U | 0.0002 U | 0.00002 U | **0.0015 J** | 0.0002 U | 0.0039 J | 0.0025 U | 0.00002 U | 0.0003 J | 0.0011 J | 0.0002 U | 0.0002 U | 0.21 D | 0.04 UJ |
| | 4/1/08 (DUP) | 0.0002 U | 0.0002 U | 0.00002 U | **0.0016 J** | 0.0002 U | 0.0045 J | 0.0025 U | 0.00002 U | 0.0003 J | 0.0011 J | 0.0002 U | 0.0002 U | 0.20 D | 0.04 UJ |
| | 07/07/08 | 0.0002 U | 0.0002 U | 0.00002 U | **0.0010** | 0.0002 U | 0.0025 U | 0.0025 U | 0.00002 U | 0.0002 U | 0.0003 | 0.0002 U | 0.0002 U | 0.20 | 0.04 U |
| | 10/07/08 | 0.0002 U | 0.0002 U | 0.00002 U | **0.0010** | 0.0002 U | 0.0025 U | 0.0025 U | 0.00002 U | 0.0002 U | 0.0003 | 0.0002 U | 0.0002 U | 0.0101 | 0.04 U |
| | 10/7/08 (DUP) | 0.0002 U | 0.0002 U | 0.00002 U | **0.0010** | 0.0002 U | 0.0025 U | 0.0025 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0080 | 0.04 U |
| | 01/05/09 | 0.0002 U | 0.0002 U | 0.00002 U | **0.0010** | 0.0002 U | 0.0025 U | 0.0025 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0034 | 0.04 U |
| | 04/06/09 | 0.0002 U | 0.0002 U | 0.00002 U | **0.0010** | 0.0002 U | 0.0025 U | 0.0025 U | 0.00002 U | 0.0002 U | 0.0002 | 0.0002 U | 0.0002 U | 0.0028 | 0.02 U |
| | 07/08/09 | 0.0002 U | 0.0002 U | 0.00002 U | **0.0011** | 0.0002 U | 0.005 U | 0.005 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0038 | 0.02 U |
| | 10/27/09 | 0.0002 U | 0.0002 U | 0.00002 U | **0.0010** | 0.0002 U | 0.005 U | 0.005 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0038 | 0.02 U |
| | 01/13/10 | 0.0002 U | 0.0002 U | 0.00002 U | **0.0008** | 0.0002 U | 0.005 U | 0.005 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0016 | 0.02 U |
| | 04/06/10 | 0.0002 U | 0.0002 U | 0.00002 U | 0.0006 | 0.0002 U | 0.005 U | 0.005 U | 0.00002 U | 0.0002 U | 0.0003 | 0.0002 U | 0.0002 U | 0.0032 | 0.02 U |

**Table 16-8**
**Summary of Groundwater Analytical Results for Volatile Organic Compounds, (mg/L)**
**Building 40-56**
**Boeing Everett Plant**

| Well ID | Sample Date | Chloromethane | Bromomethane | Vinyl Chloride | Chloroethane | Methylene Chloride | Acetone | Carbon Disulfide | 1,1-DCE | 1,1-DCA | cis-1,2-DCE | Chloroform | 1,2-DCA | MEK | 1,1,1-TCA | BDCM | TCE | Benzene | Bromoform | MIBK | 2-Hexanone | PCE | Toluene | Ethylbenzene | Styrene | TCFM | Total Xylenes | Cyclohexanone |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MTCA Method A or B Groundwater Screening Level | | 0.00337 (B) | 0.0112 (B) | 0.0002 (A)<br>0.0000292 (B) | 0.015 (B) | 0.005 (A)<br>0.00583 (B) | 0.8 (B) | 0.8 (B) | 0.4 (B) | 1.6 (B) | 0.08 (B) | 0.00717 (B) | 0.005 (A)<br>0.000481 (B) | 4.8 (B) | 0.2 (A)<br>7.2 (B)<br>16 (B*) | 0.000706 (B) | 0.005 (A)<br>0.00049 (B) | 0.005 (A)<br>0.000795 (B) | 0.00554 (B) | 0.64 (B) | NE | 0.005 (A)<br>0.000081 (B) | 1 (A)<br>0.64 (B) | 0.7 (A)<br>0.8 (B) | 0.0015 (B) | 2.4 (B) | 1 (A)<br>1.6 (B) | 40 (B) |
| **EGW005** | 02/02/95 | 0.1 U | 0.1 U | 0.1 U | 0.1 U | 0.1 U | 0.25 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | NA | 0.25 U | NA | NA | NA | 0.05 U | NA | 0.35 | 0.25 U | NA | 0.065 | **2.3** | NA | NA | **28.9** | NA |
| | 05/01/95 | 0.1 U | 0.1 U | 0.1 U | 0.1 U | 0.1 U | 0.034 | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | NA | 0.25 U | NA | NA | NA | 0.05 U | NA | **2.3** | 0.25 U | NA | 0.17 | **4.6** | NA | NA | **47.7** | 5 U |
| | 08/11/95 | 0.1 U | 0.1 U | 0.1 U | 0.1 U | 0.1 U | 0.25 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | NA | 0.25 U | NA | NA | NA | 0.05 U | NA | 0.62 | 0.25 U | NA | 0.14 | **5.1** | NA | NA | **41.9** | 5 U |
| | 11/09/95 | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 1.2 U | 0.25 U | 0.25 U | 0.25 U | 0.25 U | 0.25 U | NA | 1.2 U | NA | NA | NA | 0.25 U | NA | 1.2 U | 1.2 U | NA | 0.25 U | **8.0** | NA | NA | **76.4** | 25 U |
| | 02/29/96 | 1.5 U | 1.5 U | 1.5 U | 1.5 U | 1.5 U | 3.7 U | 0.75 U | 0.75 U | 0.75 U | 0.75 U | 0.75 U | NA | 3.7 U | NA | NA | NA | 0.75 U | NA | 3.7 U | 3.7 U | NA | 0.75 U | **9.7** | NA | NA | **105** | 75 U |
| | 05/30/96 | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 1.2 U | 0.25 U | 0.25 U | 0.25 U | 0.25 U | 0.25 U | NA | 1.2 U | NA | NA | NA | 0.25 U | NA | 1.2 U | 1.2 U | NA | 0.34 | **11** | NA | NA | **106** | 25 U |
| | 08/27/96 | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 1.2 U | 0.25 U | 0.25 U | 0.25 U | 0.25 U | 250 U | NA | 1.2 U | NA | NA | NA | 0.25 U | NA | 1.2 U | 1.2 U | NA | 0.25 U | **8.8** | NA | NA | **111** | 25 U |
| | 12/03/96 | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 1.2 U | 0.25 U | 0.25 U | 0.25 U | 0.25 U | 250 U | NA | 1.2 U | NA | NA | NA | 0.25 U | NA | 1.2 U | 1.2 U | NA | 0.25 U | **8.2** | NA | NA | **79** | 25 U |
| | 12/03/96 (DUP) | 2 U | 2 U | 2 U | 2 U | 2 U | 5 U | 1 U | 1 U | 1 U | 1 U | 1 U | NA | 5 U | NA | NA | NA | 1 U | NA | 5 U | 5 U | NA | 1 U | **7.2** | NA | NA | **92** | 100 U |
| | 03/10/97 | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 1.2 U | 0.25 U | 0.25 U | 0.25 U | 0.25 U | 0.25 U | NA | 1.2 U | NA | NA | NA | 0.25 U | NA | 1.2 U | 1.2 U | NA | 0.25 U | **6.4** | NA | NA | **71.7** | 25 U |
| | 05/22/97 | 0.5 U | 0.5 U | **0.00015** | 0.5 U | 0.5 U | 1.2 U | 0.25 U | 0.25 U | 0.25 U | 0.25 U | 0.25 U | NA | 1.2 U | NA | NA | NA | 0.25 U | NA | 1.2 U | 1.2 U | NA | 0.25 U | **8.7** | NA | NA | **99.9** | 25 U |
| | 08/12/97 | 1 U | 1 U | 1 U | 1 U | 1 U | 2.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | NA | 2.5 U | NA | NA | NA | 0.5 U | NA | 2.5 U | 2.5 U | NA | 0.5 U | **8.7** | NA | NA | **88.4** | 50 U |
| | 11/17/97 | 0.6 U | 0.6 U | 0.005 U | 0.6 U | 0.6 U | 1.5 U | 0.3 U | 0.3 U | 0.3 U | 0.3 U | 0.3 U | NA | 1.5 U | NA | NA | NA | 0.3 U | NA | 1.5 U | 1.5 U | NA | 0.45 | **15** | NA | NA | **158** | 30 U |
| | 03/10/98 | 0.6 U | 0.6 U | **0.00038** | 0.6 U | 0.6 U | 1.5 U | 0.3 U | 0.3 U | 0.3 U | 0.3 U | 0.3 U | 0.3 U | 1.5 U | 0.3 U | 0.3 U | 0.3 U | 0.3 U | 0.3 U | 1.5 U | 1.5 U | 0.3 U | 0.3 U | **5.1 J** | 0.6 U | 0.6 U | **60.7 J** | 30 U |
| | 03/10/98 (DUP) | 2 U | 2 U | **0.00029** | 2 U | 2 U | 5 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 5 U | 1 U | 1 U | 1 U | 1 U | 1 U | 5 U | 5 U | 1 U | 1 U | **18 J** | 2 U | 2 U | **190 J** | 100 U |
| | 05/13/98 | 1 U | 1 U | 0.01 U | 1 U | 1 U | 2.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 2.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 2.5 U | 2.5 U | 0.5 U | 0.5 U | **9.2** | 1 U | 1 U | **93** | 50 U |
| | 08/10/98 | 1 U | 1 U | 0.005 U | 1 U | 1 U | 2.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 2.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 2.5 U | 2.5 U | 0.5 U | 0.5 U | **7.0** | 1 U | 1 UJ | **55** | 50 U |
| | 08/10/98 (DUP) | 1 U | 1 U | 0.005 U | 1 U | 1 U | 2.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 2.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 2.5 U | 2.5 U | 0.5 U | 0.5 U | **7.2** | 1 U | 1 UJ | **54.1** | 50 U |
| | 11/10/98 | 2 U | 2 U | **0.000092** | 2 U | 2 U | 5 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 5 U | 1 U | 1 U | 1 UJ | 1 U | 1 U | 5 U | 5 U | 1 U | 1 UJ | **7.8** | 2 U | 2 UJ | **69.3** | 100 U |
| | 02/01/99 | 1 U | 1 U | 0.0005 U | 1 U | 1 U | 2.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 2.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 2.5 U | 2.5 U | 0.5 U | 0.5 U | **4.5** | 1 U | 1 U | **43.7** | 50 U |
| | 02/01/99 (DUP) | 1 U | 1 U | 0.001 U | 1 U | 1 U | 2.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 2.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 2.5 U | 2.5 U | 0.5 U | 0.5 U | **4.7** | 1 U | 1 U | **43.7** | 50 U |
| | 05/10/99 | 0.5 U | 0.5 U | **0.000035** | 0.5 U | 1 U | 2.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 2.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 2.5 U | 2.5 U | 0.5 U | 0.5 U | **5.4** | 0.5 U | 0.5 U | **58.9** | 50 U |
| | 08/02/99 | 0.001 U | 0.001 U | 0.005 U | 0.0027 | 0.002 U | 0.021 | 0.001 U | 0.001 U | 0.019 | 0.001 U | 0.001 U | 0.001 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | **0.001 J** | 0.001 U | 0.12 | 0.005 U | 0.001 U | 0.11 | **7.2** | 0.001 U | 0.001 U | **71** | 0.1 U |
| | 11/09/99 | 0.3 U | 0.3 U | 0.00002 | 0.3 U | 0.6 U | 1.5 U | 0.3 U | 0.3 U | 0.3 U | 0.3 U | 0.3 U | 0.3 U | 1.5 U | 0.3 U | 0.3 U | 0.3 U | 0.3 U | 0.3 U | 1.5 U | 1.5 U | 0.3 U | 0.3 U | **3.0** | 0.3 U | 0.3 U | **28.6** | 30 U |
| | 11/09/99 (DUP) | 0.3 U | 0.3 U | 0.00002 U | 0.3 U | 0.6 U | 1.5 U | 0.3 U | 0.3 U | 0.3 U | 0.3 U | 0.3 U | 0.3 U | 1.5 U | 0.3 U | 0.3 U | 0.3 U | 0.3 U | 0.3 U | 1.5 U | 1.5 U | 0.3 U | 0.3 U | **3.6** | 0.3 U | 0.3 U | **34.1** | 30 U |
| | 01/31/00 | 0.3 U | 0.3 U | 0.0006 U | 0.3 U | 0.6 U | 1.5 U | 0.3 U | 0.3 U | 0.3 U | 0.3 U | 0.3 U | 0.3 U | 1.5 U | 0.3 U | 0.3 U | 0.3 U | 0.3 U | 0.3 U | 1.5 U | 1.5 U | 0.3 U | 0.3 U | **2.1** | 0.3 U | 0.3 U | **19.2** | 30 U |
| | 05/02/00 | 0.2 U | 0.2 U | 0.0004 UJ | 0.2 U | 0.4 U | 1 U | 0.2 U | 0.2 U | 0.2 U | 0.2 U | 0.2 U | 0.2 U | 1 U | 0.2 U | 0.2 U | 0.2 U | 0.2 U | 0.2 U | 1 U | 1 U | 0.2 U | 0.2 U | **3.5** | 0.2 U | 0.2 U | **28.1** | 20 U |
| | 05/02/00 (DUP) | 0.15 U | 0.15 U | 0.002 UJ | 0.15 U | 0.3 U | 0.75 U | 0.15 U | 0.15 U | 0.15 U | 0.15 U | 0.15 U | 0.15 U | 0.75 U | 0.15 U | 0.15 U | 0.15 U | 0.15 U | 0.15 U | 0.75 U | 0.75 U | 0.15 U | 0.15 U | **4.2** | 0.15 U | 0.15 U | **32.6** | 15 U |
| | 06/27/00 | 0.2 U | 0.2 U | **0.000045** | 0.2 U | 0.4 U | 1 U | 0.2 U | 0.2 U | 0.2 U | 0.2 U | 0.2 U | 0.2 U | 1 U | 0.2 U | 0.2 U | 0.2 U | 0.2 U | 0.2 U | 1 U | 1 U | 0.2 U | 0.2 U | **1.5** | 0.2 U | 0.2 U | **23.1** | 20 U |
| | 07/31/00 | 0.1 U | 0.1 U | 0.0006 U | 0.1 U | 0.2 U | 0.5 U | 0.1 U | 0.1 U | 0.1 U | 0.1 U | 0.1 U | 0.1 U | 0.5 U | 0.1 U | 0.1 U | 0.1 U | 0.1 U | 0.1 U | 0.5 U | 0.5 U | 0.1 U | 0.1 U | **2.6** | 0.1 U | 0.1 U | **23.8** | 10 U |
| | 07/31/00 (DUP) | 0.1 U | 0.1 U | 0.002 U | 0.1 U | 0.2 U | 0.5 U | 0.1 U | 0.1 U | 0.1 U | 0.1 U | 0.1 U | 0.1 U | 0.5 U | 0.1 U | 0.1 U | 0.1 U | 0.1 U | 0.1 U | 0.5 U | 0.5 U | 0.1 U | 0.1 U | **2.3** | 0.1 U | 0.1 U | **21.6** | 10 U |
| | 11/13/00 | 0.1 U | 0.1 U | 0.00002 U | 0.1 U | 0.2 U | 0.5 U | 0.1 U | 0.1 U | 0.1 U | 0.1 U | 0.1 U | 0.1 U | 0.5 U | 0.1 U | 0.1 U | 0.1 U | 0.1 U | 0.1 U | 0.5 U | 0.5 U | 0.1 U | 0.1 U | **2.0** | 0.1 U | 0.1 U | **15.93** | 10 U |
| | 02/05/01 | 0.2 UJ | 0.2 UJ | **0.000033** | 0.2 UJ | 0.4 UJ | 1.0 UJ | 0.2 UJ | 0.2 UJ | 0.2 UJ | 0.2 UJ | 0.2 UJ | 0.2 UJ | 1.0 UJ | 0.2 UJ | 0.2 UJ | 0.2 UJ | 0.2 UJ | 0.2 UJ | 1.0 UJ | 1.0 UJ | 0.2 UJ | 0.2 UJ | **4.4** | 0.2 UJ | 0.2 UJ | **38.6** | 20 UJ |
| | 05/01/01 | 0.2 U | 0.2 U | 0.00002 U | 0.2 U | 0.4 U | 1.0 U | 0.2 U | 0.2 U | 0.2 U | 0.2 U | 0.2 U | 0.2 U | 1.0 U | 0.2 U | 0.2 U | 0.2 U | 0.2 U | 0.2 U | 1.0 U | 1.0 U | 0.2 U | 0.2 U | **4.8** | 0.2 U | 0.2 U | **38.5** | 20 U |
| | 08/06/01 | 0.1 U | 0.1 U | 0.000028 | 0.1 U | 0.2 U | 0.5 U | 0.1 U | 0.1 U | 0.1 U | 0.1 U | 0.1 U | 0.1 U | 0.5 U | 0.1 U | 0.1 U | 0.1 U | 0.1 U | 0.1 U | 0.5 U | 0.5 U | 0.1 U | 0.1 U | **3.3** | 0.1 U | 0.1 U | **18.16** | 10 U |
| | 11/12/01 | 0.25 U | 0.25 U | 0.000022 | 0.25 U | 0.5 U | 1.2 U | 0.25 U | 0.25 U | 0.25 U | 0.25 U | 0.25 U | 0.25 U | 1.2 U | 0.25 U | 0.25 U | 0.25 U | 0.25 U | 0.25 U | 1.2 U | 1.2 U | 0.25 U | 0.25 U | **5.4** | 0.25 U | 0.25 U | **43.5** | 25 U |
| | 02/05/02 | 0.02 U | 0.02 U | 0.000027 | 0.02 U | 0.04 U | 0.1 U | 0.02 U | 0.000051 | 0.02 U | 0.02 U | 0.02 U | 0.02 U | 0.1 U | 0.02 U | 0.02 U | 0.02 U | 0.02 U | 0.02 U | 0.1 U | 0.1 U | 0.02 U | 0.02 U | **1.9** | 0.02 U | 0.02 U | **7.023** | 2 U |
| | 02/05/02 (DUP) | 0.02 U | 0.02 U | 0.00002 U | 0.02 U | 0.04 U | 0.1 U | 0.02 U | 0.000039 | 0.02 U | 0.02 U | 0.02 U | 0.02 U | 0.1 U | 0.02 U | 0.02 U | 0.02 U | 0.02 U | 0.02 U | 0.1 U | 0.1 U | 0.02 U | 0.02 U | **1.9** | 0.02 U | 0.02 U | **6.723** | 2 U |
| | 05/06/02 | 0.003 U | 0.003 U | 0.00002 U | 0.003 U | 0.006 U | 0.015 U | 0.003 U | 0.00002 U | 0.0033 | 0.003 U | 0.003 U | 0.003 U | 0.015 U | 0.003 U | 0.003 U | 0.003 U | 0.003 U | 0.003 U | 0.015 U | 0.015 U | 0.003 U | 0.003 U | 0.36 | 0.003 U | 0.003 U | 0.55 | 0.3 U |
| | 08/06/02 | 0.02 U | 0.02 U | 0.00002 U | 0.02 U | 0.04 U | 0.1 U | 0.02 U | 0.00002 U | 0.02 U | 0.02 U | 0.02 U | 0.02 U | 0.1 U | 0.02 U | 0.02 U | 0.02 U | 0.02 U | 0.02 U | 0.1 U | 0.1 U | 0.02 U | 0.02 U | 0.44 | 0.02 U | 0.02 U | **1.6** | 2 U |
| | 11/16/02 | 0.01 U | 0.01 U | 0.00002 U | 0.01 U | 0.02 U | 0.05 U | 0.01 U | 0.000028 J | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.05 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.05 U | 0.05 U | 0.01 U | 0.01 U | **1.1** | 0.01 U | 0.01 U | 0.951 | 1 U |
| | 02/04/03 | 0.06 U | 0.06 U | 0.00002 U | 0.06 U | 0.09 U | 0.3 U | 0.06 U | 0.000025 J | 0.06 U | 0.06 U | 0.06 U | 0.06 U | 0.3 U | 0.06 U | 0.06 U | 0.06 U | 0.06 U | 0.06 U | 0.3 U | 0.3 U | 0.06 U | 0.06 U | **1.8** | 0.06 U | 0.06 U | **9.7** | 6 U |
| | 05/05/03 | 0.05 U | 0.05 U | 0.0002 U | 0.05 U | 0.1 U | 0.25 U | 0.05 U | 0.0002 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.25 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.25 U | 0.25 U | 0.05 U | 0.05 U | **3.1** | 0.05 U | 0.05 U | **16.8** | 5 U |
| | 05/05/03 (DUP) | 0.05 U | 0.05 U | 0.002 U | 0.05 U | 0.1 U | 0.25 U | 0.05 U | 0.002 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.25 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.25 U | 0.25 U | 0.05 U | 0.05 U | **3.2** | 0.05 U | 0.05 U | **17.8** | 5 U |
| | 07/22/03 | 0.075 U | 0.075 U | 0.000023 J | 0.075 U | 0.15 U | 0.37 U | 0.075 U | 0.000034 | 0.075 U | 0.075 U | 0.075 U | 0.075 U | 0.37 U | 0.075 U | 0.075 U | 0.075 U | 0.075 U | 0.075 U | 0.37 U | 0.37 U | 0.075 U | 0.075 U | **4.1** | 0.075 U | 0.075 U | **23.4** | 7.5 U |
| | 07/22/03 (DUP) | 0.1 U | 0.1 U | 0.000022 J | 0.1 U | 0.2 U | 0.5 U | 0.1 U | 0.000034 | 0.1 U | 0.1 U | 0.1 U | 0.1 U | 0.5 U | 0.1 U | 0.1 U | 0.1 U | 0.1 U | 0.1 U | 0.5 U | 0.5 U | 0.1 U | 0.1 U | **4.2** | 0.1 U | 0.1 U | **24.4** | 10 U |
| | 11/04/03 | 0.075 U | 0.075 U | 0.00002 U | 0.075 U | 0.15 U | 0.37 U | 0.075 U | 0.000024 | 0.075 U | 0.075 U | 0.075 U | 0.075 U | 0.37 U | 0.075 U | 0.075 U | 0.075 U | 0.075 U | 0.075 U | 0.37 U | 0.37 U | 0.075 U | 0.075 U | **5.1** | 0.075 U | 0.075 U | **48.4 D** | 7.5 U |
| | 01/21/04 | 0.75 U | 0.75 U | 0.00002 U | 0.75 U | 1.5 U | 3.7 U | 0.75 U | 0.000039 | 0.75 U | 0.75 U | 0.75 U | 0.75 U | 3.7 U | 0.75 U | 0.75 U | 0.75 U | 0.75 U | 0.75 U | 3.7 U | 3.7 U | 0.75 U | 0.75 U | **5.8** | 0.75 U | 0.75 U | **43.8** | 75 U |
| | 04/14/04 | 0.1 U | 0.1 U | 0.00002 U | 0.1 U | 0.2 U | 0.5 U | 0.1 U | 0.000020 | 0.1 U | 0.1 U | 0.1 U | 0.1 U | 0.5 U | 0.1 U | 0.1 U | 0.1 U | 0.1 U | 0.1 U | 0.5 U | 0.5 U | 0.1 U | 0.1 U | **2.0** | 0.1 U | 0.1 U | **12.1** | 10 U |
| | 07/13/04 | 0.1 U | 0.1 U | 0.00002 U | 0.1 U | 0.2 U | 0.5 U | 0.1 U | 0.000023 | 0.1 U | 0.1 U | 0.1 U | 0.1 U | 0.5 U | 0.1 U | 0.1 U | 0.1 U | 0.1 U | 0.1 U | 0.5 U | 0.5 U | 0.1 U | 0.1 U | **2.4** | 0.1 U | 0.1 U | **20.17** | 10 U |
| | 10/01/04 | 0.2 U | 0.2 U | 0.00002 U | 0.2 U | 0.4 U | 1.0 U | 0.2 U | 0.000023 | 0.2 U | 0.2 U | 0.2 U | 0.2 U | 1.0 U | 0.2 U | 0.2 U | 0.2 U | 0.2 U | 0.2 U | 1.0 U | 1.0 U | 0.2 U | 0.2 U | **5.2** | 0.2 U | 0.2 U | **48.4** | 20 U |
| | 01/12/05 | 0.1 U | 0.1 U | 0.00002 U | 0.1 U | 0.2 U | 0.5 U | 0.1 U | 0.00002 U | 0.1 U | 0.1 U | 0.1 U | 0.1 U | 0.5 U | 0.1 U | 0.1 U | 0.1 U | 0.1 U | 0.1 U | 0.5 U | 0.5 U | 0.1 U | 0.1 U | **3.7** | 0.1 U | 0.1 U | **22.4** | 10 U |
| | 04/11/05 | 0.5 U | 0.5 U | 0.00002 U | 0.5 U | **1.6**** | 2.5 U | 0.5 U | 0.00002 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 2.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 2.5 U | 2.5 U | 0.5 U | 0.5 U | **2.1** | 0.5 U | 0.5 U | **12.0** | 50 U |
| | 10/17/05 | 0.05 U | 0.05 U | 0.00002 U | 0.05 U | 0.1 U | 0.25 U | 0.05 U | 0.00002 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.25 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.25 U | 0.25 U | 0.05 U | 0.05 U | **0.77** | 0.05 U | 0.05 U | **14.1** | 5 U |
| | 04/19/06 | 0.01 U | 0.01 U | 0.00002 U | 0.01 U | 0.02 U | 0.05 U | 0.01 U | 0.00002 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.05 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.05 U | 0.05 U | 0.01 U | 0.01 U | 0.11 | 0.01 U | 0.01 U | **1.6** | 1 U |
| | 10/17/06 | 0.1 U | 0.1 U | 0.00002 UJ | 0.1 U | 0.2 U | 0.5 U | 0.1 U | 0.00002 UJ | 0.1 U | 0.1 U | 0.1 U | 0.1 U | 0.5 U | 0.1 U | 0.1 U | 0.00010 J | 0.1 U | 0.1 U | 0.5 U | 0.5 U | 0.00022 UJ | 0.1 U | 0.14 | 0.1 U | 0.1 U | **7.0** | 10 U |
| | 04/03/07 | 0.001 U | 0.001 U | 0.0002 U | 0.001 U | 0.002 U | 0.005 U | 0.001 U | 0.0002 U | 0.0016 | 0.001 U | 0.001 U | 0.001 U | 0.005 U | 0.001 U | 0.001 U | 0.0002 U | 0.001 U | 0.001 U | 0.005 U | 0.005 U | 0.0002 U | 0.001 U | 0.0087 | 0.001 U | 0.001 U | 0.34 | 0.1 UJ |
| | 10/25/07 | 0.005 U | 0.005 U | 0.00002 U | 0.005 U | 0.01 U | 0.025 U | 0.005 U | 0.00002 U | 0.005 U | 0.005 U | 0.005 U | 0.005 U | 0.025 U | 0.005 U | 0.005 U | 0.000081 | 0.005 U | 0.005 U | 0.025 U | 0.025 U | 0.000069 | 0.005 U | 0.16 | 0.005 U | 0.005 U | **2.218 J** | 0.5 U |
| | 04/01/08 | 0.01 U | 0.01 U | 0.0002 U | 0.01 U | 0.02 U | 0.05 U | 0.01 U | 0.0002 U | 0.01 U | 0.00021 | 0.01 U | 0.01 U | 0.05 U | 0.01 U | 0.01 U | 0.0002 U | 0.01 U | 0.01 U | 0.05 U | 0.05 U | 0.0002 U | 0.01 U | 0.55 | 0.01 U | 0.01 U | **6.39 D** | 20 UJ |
| | 10/07/08 | 0.001 U | 0.001 U | 0.00002 U | 0.001 U | 0.002 U | 0.005 U | 0.001 U | 0.00002 U | 0.0027 | 0.001 U | 0.001 U | 0.001 U | 0.005 U | 0.001 U | 0.001 U | 0.00005 | 0.001 U | 0.001 U | 0.005 U | 0.005 U | 0.000034 | 0.001 U | 0.0051 | 0.001 U | 0.001 U | 0.26 | 0.1 U |
| | 04/06/09 | 0.001 U | 0.001 U | 0.00020 U | 0.001 U | 0.002 U | 0.01 U | 0.001 U | 0.0002 U | 0.0026 | 0.001 U | 0.001 U | 0.001 U | 0.005 U | 0.001 U | 0.001 U | 0.00020 U | 0.001 U | 0.001 U | 0.005 U | 0.005 U | 0.00020 U | 0.0012 | 0.18 | 0.001 U | 0.001 U | **3.715 D** | 0.1 U |
| | 10/27/09 | 0.0005 U | 0.0005 U | 0.00002 U | 0.0003 | 0.0005 U | 0.005 U | 0.0002 U | 0.00002 U | 0.0024 | 0.0002 | 0.0002 U | 0.0002 U | 0.005 U | 0.0002 U | 0.0002 U | 0.000048 | 0.0002 U | 0.0002 U | 0.005 U | 0.005 U | 0.000024 | 0.0002 U | 0.0014 | 0.0002 U | 0.0002 U | 0.0616 | 0.02 UJ |
| | 10/27/09 (DUP) | 0.0005 U | 0.0005 U | 0.00002 U | 0.0004 | 0.0005 U | 0.005 U | 0.0002 U | 0.00002 U | 0.0024 | 0.0002 | 0.0002 U | 0.0002 U | 0.005 U | 0.0002 U | 0.0002 U | 0.000047 | 0.0002 U | 0.0002 U | 0.005 U | 0.005 U | 0.000024 | 0.0002 U | 0.0013 | 0.0002 U | 0.0002 U | 0.0706 | 0.02 U |
| | 04/06/10 | 0.0005 U | 0.0005 U | 0.00002 U | 0.0002 U | 0.0005 U | 0.005 U | 0.0002 U | 0.00002 U | 0.0021 | 0.0002 U | 0.0002 U | 0.0002 U | 0.005 U | 0.0002 U | 0.0002 U | 0.000034 | 0.0002 U | 0.0002 U | 0.005 U | 0.005 U | 0.00002 U | 0.0002 U | 0.0003 | 0.0002 U | 0.0002 U | 0.0034 | 0.02 U |

**Table 16-8**

**Summary of Groundwater Analytical Results for Volatile Organic Compounds, (mg/L)**

**Building 40-56**

**Boeing Everett Plant**

| Well ID | Sample Date | Chloromethane | Bromomethane | Vinyl Chloride | Chloroethane | Methylene Chloride | Acetone | Carbon Disulfide | 1,1-DCE | 1,1-DCA | cis-1,2-DCE | Chloroform | 1,2-DCA | MEK | 1,1,1-TCA | BDCM | TCE | Benzene | Bromoform | MIBK | 2-Hexanone | PCE | Toluene | Ethylbenzene | Styrene | TCFM | Total Xylenes | Cyclohexanone |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MTCA Method A or B Groundwater Screening Level | | 0.00337 (B) | 0.0112 (B) | 0.0002 (A)<br>0.0000292 (B) | 0.015 (B) | 0.005 (A)<br>0.00583 (B) | 0.8 (B) | 0.8 (B) | 0.4 (B) | 1.6 (B) | 0.08 (B) | 0.00717 (B) | 0.005 (A)<br>0.000481 (B) | 4.8 (B) | 0.2 (A)<br>7.2 (B)<br>16 (B*) | 0.000706 (B) | 0.005 (A)<br>0.00049 (B) | 0.005 (A)<br>0.000795 (B) | 0.00554 (B) | 0.64 (B) | NE | 0.005 (A)<br>0.000081 (B) | 1 (A)<br>0.64 (B) | 0.7 (A)<br>0.8 (B) | 0.0015 (B) | 2.4 (B) | 1 (A)<br>1.6 (B) | 40 (B) |
| **EGW006** | 01/31/95 | 0.002 U | 0.002 U | 0.002 U | 0.002 U | 0.002 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | NA | 0.005 U | NA | NA | NA | 0.001 U | NA | 0.005 U | 0.005 U | NA | 0.001 U | 0.57 | NA | NA | **3.85** | |
| | 05/01/95 | 0.002 U | 0.002 U | **0.0029** | 0.02 | 0.002 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | NA | 0.0087 | NA | NA | NA | 0.001 U | NA | 0.005 U | 0.005 U | NA | 0.0015 | **1.2** | NA | NA | **9.27** | 0.1 U |
| | 08/11/95 | 0.002 U | 0.002 U | 0.002 U | 0.013 | 0.002 U | 0.005 U | 0.0069 | 0.007 | 0.007 | 0.001 U | 0.001 U | NA | 0.005 U | NA | NA | NA | 0.001 U | NA | 0.005 U | 0.005 U | NA | 0.001 U | **0.8** | NA | NA | **3.57** | 0.1 U |
| | 11/09/95 | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.12 U | 0.025 U | 0.025 U | 0.025 U | 0.025 U | 0.025 U | NA | 0.12 U | NA | NA | NA | 0.025 U | NA | 0.12 U | 0.12 U | NA | 0.025 U | **0.99** | NA | NA | **3.7** | 2.5 U |
| | 11/09/95 (DUP) | 0.002 U | 0.002 U | **0.003** | 0.012 | 0.002 U | 0.005 U | 0.001 U | 0.0078 | 0.0078 | 0.001 U | 0.001 U | NA | 0.005 U | NA | NA | NA | 0.025 U | NA | 0.005 U | 0.005 U | NA | 0.001 U | **1.2** | NA | NA | **4.71** | 0.1 U |
| | 02/29/96 | 0.1 U | 0.1 U | 0.1 U | 0.1 U | 0.1 U | 0.25 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | NA | 0.25 U | NA | NA | NA | 0.05 U | NA | 0.25 U | 0.25 U | NA | 0.05 U | **0.81** | NA | NA | **3.1** | 5 U |
| | 05/30/96 | 0.04 U | 0.04 U | 0.04 U | 0.04 U | 0.04 U | 0.1 U | 0.02 U | 0.02 U | 0.02 U | 0.02 U | 0.02 U | NA | 0.1 U | NA | NA | NA | 0.02 U | NA | 0.1 U | 0.1 U | NA | 0.02 U | **0.97** | NA | NA | **4.5** | 2 U |
| | 08/27/96 | 0.1 U | 0.1 U | 0.1 U | 0.1 U | 0.1 U | 0.25 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | NA | 0.25 U | NA | NA | NA | 0.05 U | NA | 0.25 U | 0.25 U | NA | 0.05 U | **1.2** | NA | NA | **4.6** | 5 U |
| | 12/03/96 | 0.02 U | 0.02 U | 0.02 U | 0.02 U | 0.02 U | 0.05 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | NA | 0.05 U | NA | NA | NA | 0.01 U | NA | 0.05 U | 0.05 U | NA | 0.01 U | 0.52 | NA | NA | **1.4** | 1 U |
| | 03/07/97 | 0.02 U | 0.02 U | 0.02 U | 0.02 U | 0.02 U | 0.05 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | NA | 0.05 U | NA | NA | NA | 0.01 U | NA | 0.05 U | 0.05 U | NA | 0.01 U | 0.6 | NA | NA | **1.2** | 1 U |
| | 05/22/97 | 0.02 U | 0.02 U | **0.0024** | 0.02 U | 0.02 U | 0.05 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | NA | 0.05 U | NA | NA | NA | 0.01 U | NA | 0.05 U | 0.05 U | NA | 0.01 U | **0.97** | NA | NA | **2.8** | 1 U |
| | 08/12/97 | 0.03 U | 0.03 U | **0.0022** | 0.03 U | 0.03 U | 0.075 U | 0.015 U | 0.015 U | 0.015 U | 0.015 U | 0.015 U | NA | 0.075 U | NA | NA | NA | 0.015 U | NA | 0.075 U | 0.075 U | NA | 0.015 U | **1.3** | NA | NA | **3** | 1.5 U |
| | 11/17/97 | 0.03 U | 0.03 U | 0.00001 U | 0.03 U | 0.03 U | 0.075 U | 0.015 U | 0.015 U | 0.015 U | 0.015 U | 0.015 U | NA | 0.075 U | NA | NA | NA | 0.015 U | NA | 0.075 U | 0.075 U | NA | 0.015 U | **1.2** | NA | NA | **2.1** | 1.5 U |
| | 03/10/98 | 0.002 U | 0.002 U | **0.0016** | 0.002 U | 0.002 U | 0.005 U | 0.001 U | 0.001 U | 0.0037 | 0.001 U | 0.001 U | 0.001 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | 0.005 U | 0.001 U | 0.001 U | 0.065 | 0.002 U | 0.002 U | 0.061 | 0.1 U |
| | 05/12/98 | 0.03 U | 0.03 U | **0.0015** | 0.03 U | 0.03 U | 0.075 U | 0.015 U | 0.015 U | 0.015 U | 0.015 U | 0.015 U | 0.015 U | 0.075 U | 0.015 U | 0.015 U | 0.015 U | 0.015 U | 0.015 U | 0.075 U | 0.075 U | 0.015 U | 0.015 U | **1.1** | 0.03 U | 0.03 U | **2.4** | 1.5 U |
| | 05/12/98 (DUP) | 0.03 U | 0.03 U | **0.0021** | 0.03 U | 0.03 U | 0.075 U | 0.015 U | 0.015 U | 0.015 U | 0.015 U | 0.015 U | 0.015 U | 0.075 U | 0.015 U | 0.015 U | 0.015 U | 0.015 U | 0.015 U | 0.075 U | 0.075 U | 0.015 U | 0.015 U | **1.1** | 0.03 U | 0.03 U | **2.3** | 1.5 U |
| | 08/10/98 | 0.03 U | 0.03 U | **0.0017** | 0.03 U | 0.03 U | 0.075 U | 0.015 U | 0.015 U | 0.015 U | 0.015 U | 0.015 U | 0.015 U | 0.075 U | 0.015 U | 0.015 U | 0.015 U | 0.015 U | 0.015 U | 0.075 U | 0.075 U | 0.015 U | 0.015 U | **1.2** | 0.03 U | 0.03 UJ | **2.4** | 1.5 U |
| | 11/09/98 | 0.002 U | 0.002 U | **0.0016** | 0.0026 | 0.002 U | 0.005 U | 0.001 U | 0.001 U | 0.004 | 0.001 U | 0.001 U | 0.001 U | 0.005 U | 0.001 U | 0.001 U | 0.001 UJ | 0.001 U | 0.001 U | 0.005 U | 0.005 U | 0.001 U | 0.001 UJ | 0.54 | 0.002 U | 0.002 UJ | 0.42 | 0.1 U |
| | 11/09/98 (DUP) | 0.002U | 0.002U | **0.0015** | 0.0026 | 0.002U | 0.005U | 0.001U | 0.001U | 0.0038 | 0.001U | 0.001U | 0.001 U | 0.005U | 0.001 U | 0.001 U | 0.001 UJ | 0.001 U | 0.001 U | 0.005 U | 0.005U | 0.001 U | 0.001UJ | 0.48 | 0.002 U | 0.002 UJ | 0.33 | 0.1U |
| | 02/01/99 | 0.002 U | 0.002 U | **0.0019** | 0.002 U | 0.002 U | 0.005 U | 0.001 U | 0.001 U | 0.0028 | 0.001 U | 0.001 U | 0.001 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | 0.005 U | 0.001 U | 0.001 U | 0.17 | 0.002 U | 0.002 U | 0.13 | 0.1 U |
| | 05/10/99 | 0.005 U | 0.005 U | **0.0014** | 0.005 U | 0.01 U | 0.025 U | 0.005 U | 0.005 U | 0.005 U | 0.005 U | 0.005 U | 0.005 U | 0.025 U | 0.005 U | 0.005 U | 0.005 U | 0.005 U | 0.005 U | 0.025 U | 0.025 U | 0.005 U | 0.005 U | 0.29 | 0.005 U | 0.005 U | 0.18 | 0.5 U |
| | 05/10/99 (DUP) | 0.001 U | 0.001 U | **0.0014** | 0.0033 | 0.002 U | 0.005 U | 0.001 U | 0.001 U | 0.0034 | 0.001 U | 0.001 U | 0.001 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | 0.005 U | 0.001 U | 0.001 U | 0.33 | 0.001 U | 0.001 U | 0.3 | 0.1 U |
| | 08/02/99 | 0.003 U | 0.003 U | **0.0012** | 0.003 U | 0.006 U | 0.015 U | 0.003 U | 0.003 U | 0.004 | 0.003 U | 0.003 U | 0.003 U | 0.015 U | 0.003 U | 0.003 U | 0.003 U | 0.003 U | 0.003 U | 0.015 U | 0.015 U | 0.003 U | 0.003 U | 0.29 | 0.003 U | 0.003 U | 0.2 | 0.3 U |
| | 11/08/99 | 0.001 U | 0.001 U | **0.0012** | 0.0015 | 0.002 U | 0.005 U | 0.001 U | 0.001 U | 0.0026 | 0.001 U | 0.001 U | 0.001 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | 0.005 U | 0.001 U | 0.001 U | 0.0035 | 0.001 U | 0.001 U | 0.001 U | 0.1 U |
| | 01/31/00 | 0.001 U | 0.001 U | **0.0012** | 0.0018 | 0.002 U | 0.005 U | 0.001 U | 0.001 U | 0.0028 | 0.001 U | 0.001 U | 0.001 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | 0.005 U | 0.001 U | 0.001 U | 0.0012 | 0.001 U | 0.001 U | 0.001 U | 0.1 U |
| | 05/01/00 | 0.001 U | 0.001 U | **0.0011 J** | 0.0016 | 0.002 U | 0.005 U | 0.001 U | 0.001 U | 0.0023 | 0.001 U | 0.001 U | 0.001 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.1 U |
| | 07/31/00 | 0.001 U | 0.001 U | **0.0013 J** | 0.0024 | 0.002 U | 0.005 U | 0.001 U | 0.001 U | 0.0026 | 0.001 U | 0.001 U | 0.001 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.1 U |
| | 11/13/00 | 0.001 U | 0.001 U | **0.0012** | 0.001 U | 0.002 U | 0.005 U | 0.001 U | 0.001 U | 0.0026 | 0.001 U | 0.001 U | 0.001 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.1 U |
| | 02/01/01 | 0.001 U | 0.001 U | **0.0012** | 0.001 U | 0.002 U | 0.0099 | 0.001 U | 0.001 U | 0.0024 | 0.001 U | 0.001 U | 0.001 U | 0.005 U | 0.001 U | 0.001 U | 0.001 UJ | 0.001 UJ | 0.001 U | 0.005 U | 0.005 U | 0.001 U | 0.001 UJ | 0.001 U | 0.001 U | 0.001 UJ | 0.001 U | 0.1 U |
| | 05/01/01 | 0.001 U | 0.001 U | **0.0015** | 0.0021 | 0.002 U | 0.0087 | 0.001 U | 0.001 U | 0.0024 | 0.001 U | 0.001 U | 0.001 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.1 U |
| | 05/01/01 (DUP) | 0.001 U | 0.001 U | **0.00099** | 0.002 | 0.002 U | 0.0095 | 0.001 U | 0.001 U | 0.0025 | 0.001 U | 0.001 U | 0.001 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.1 U |
| | 08/06/01 | 0.001 U | 0.001 U | **0.0011** | 0.0022 | 0.002 U | 0.008 | 0.001 U | 0.001 U | 0.0024 | 0.001 U | 0.001 U | 0.001 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.1 U |
| | 11/12/01 | 0.001 U | 0.001 U | **0.001** | 0.0027 | 0.002 U | 0.0074 | 0.001 U | 0.001 U | 0.0026 | 0.001 U | 0.001 U | 0.001 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.1 U |
| | 11/12/01 (DUP) | 0.005 U | 0.005 U | **0.00076 J** | 0.005 U | 0.01 U | 0.025 U | 0.005 U | 0.005 U | 0.005 U | 0.005 U | 0.005 U | 0.005 U | 0.025 U | 0.005 U | 0.005 U | 0.005 U | 0.005 U | 0.005 U | 0.025 U | 0.025 U | 0.005 U | 0.005 U | 0.005 U | 0.005 U | 0.005 U | 0.005 U | 0.5 U |
| | 02/05/02 | 0.0002 U | 0.0002 U | **0.0015** | 0.0021 | 0.0005 | 0.002 UJ | 0.0002 U | 0.000038 | 0.0026 | 0.0003 | 0.0002 U | 0.0002 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0003 | 0.0002 U | 0.001 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U | 0.02 U |
| | 05/06/02 | 0.0002 U | 0.0002 U | **0.00098** | 0.002 | 0.0005 | 0.01 | 0.0002 U | 0.00002 U | 0.0024 | 0.0002 U | 0.0002 U | 0.0002 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 | 0.0002 U | 0.001 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U | 0.02 U |
| | 05/06/02 (DUP) | 0.0002 U | 0.0002 U | **0.00075** | 0.0018 | 0.0004 | 0.007 | 0.0002 U | 0.00002 U | 0.0021 | 0.0002 U | 0.0002 U | 0.0002 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.001 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U | 0.02 U |
| | 08/05/02 | 0.0002 U | 0.0002 U | **0.00074** | 0.0022 | 0.0003 U | 0.0045 U | 0.0002 U | 0.00002 U | 0.0022 | 0.0002 U | 0.0002 U | 0.0002 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0003 | 0.0002 U | 0.001 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U | 0.02 U |
| | 11/16/02 | 0.0002 U | 0.0002 U | **0.0013** | 0.0018 | 0.0003 U | 0.0042 J | 0.0002 U | 0.000035 | 0.0026 | 0.0002 | 0.0002 U | 0.0002 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0003 | 0.0002 U | 0.001 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U | 0.02 U |
| | 02/04/03 | 0.0002 U | 0.0002 U | **0.0009** | 0.001 | 0.0003 U | 0.0098 | 0.0002 U | 0.00002 U | 0.0021 | 0.0002 U | 0.0002 U | 0.0002 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.001 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U | 0.02 U |
| | 05/05/03 | 0.0002 U | 0.0002 U | **0.0009** | 0.0017 | 0.0003 U | 0.0062 | 0.0002 U | 0.000021 | 0.0025 | 0.0002 U | 0.0002 U | 0.0002 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.001 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U | 0.02 U |
| | 07/22/03 | 0.0002 U | 0.0002 U | **0.00098** | 0.0017 | 0.0003 U | 0.0052 | 0.0002 U | 0.000036 | 0.0018 | 0.0002 | 0.0002 U | 0.0002 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0003 | 0.0002 U | 0.001 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U | 0.02 U |
| | 11/04/03 | 0.0002 U | 0.0002 U | **0.00096** | 0.0008 | 0.0003 U | 0.0038 U | 0.0002 U | 0.00002 U | 0.0024 | 0.0002 U | 0.0002 U | 0.0002 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.001 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U | 0.04 U |
| | 01/21/04 | 0.0002 U | 0.0002 U | **0.001** | 0.0009 | 0.0003 U | 0.0053 | 0.0002 U | 0.000023 | 0.0021 | 0.0002 U | 0.0002 U | 0.0002 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.001 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U | 0.04 U |
| | 04/14/04 | 0.0002 U | 0.0002 U | **0.00086** | 0.0016 | 0.0003 U | 0.012 | 0.0002 U | 0.000028 | 0.0019 | 0.0002 U | 0.0002 U | 0.0002 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0003 | 0.0002 U | 0.001 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U | 0.04 U |
| | 07/13/04 | 0.0002 U | 0.0002 U | **0.00080** | 0.0011 | 0.0003 U | 0.0068 | 0.0002 U | 0.000024 | 0.0020 | 0.0002 | 0.0002 U | 0.0002 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0003 | 0.0002 U | 0.001 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U | 0.04 U |
| | 7/13/04 (DUP) | 0.0002 U | 0.0002 U | **0.00090** | 0.0016 | 0.0003 U | 0.0088 | 0.0002 U | 0.000030 | 0.0023 | 0.0002 | 0.0002 U | 0.0002 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0003 | 0.0002 U | 0.001 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U | 0.04 U |
| | 10/01/04 | 0.0002 U | 0.0002 U | **0.0011** | 0.0017 | 0.0003 U | 0.029 | 0.0002 U | 0.000036 | 0.0018 | 0.0002 U | 0.0002 U | 0.0002 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 | 0.0002 U | 0.001 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U | 0.04 U |
| | 10/01/04 (DUP) | 0.0002 U | 0.0002 U | **0.00078** | 0.0020 | 0.0003 U | 0.026 | 0.0002 U | 0.000026 | 0.0020 | 0.0002 U | 0.0002 U | 0.0002 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0003 | 0.0002 U | 0.001 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U | 0.04 U |
| | 01/11/05 | 0.0002 U | 0.0002 U | **0.0014** | 0.0013 | 0.0003 U | 0.0092 | 0.0002 U | 0.000020 | 0.0021 | 0.0002 U | 0.0002 U | 0.0002 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.001 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U | 0.04 U |
| | 04/09/05 | 0.0002 U | 0.0002 U | **0.00098** | 0.0009 | 0.0003 U | 0.025 | 0.0002 U | 0.00002 U | 0.0017 | 0.0002 U | 0.0002 U | 0.0002 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.001 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U | 0.04 U |
| | 10/17/05 | 0.0002 U | 0.0002 U | **0.00087** | 0.0011 | 0.0003 U | 0.0012 U | 0.0002 U | 0.000022 | 0.0019 | 0.0002 | 0.0002 U | 0.0002 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0003 | 0.0002 U | 0.001 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U | 0.04 U |
| | 04/19/06 | 0.0002 U | 0.0002 U | **0.00077** | 0.0008 | 0.0003 U | 0.0071 U | 0.0002 U | 0.00002 U | 0.0019 | 0.0002 | 0.0002 U | 0.0002 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.001 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U | 0.04 U |
| | 4/19/06 (DUP) | 0.0002 U | 0.0002 U | **0.00084** | 0.0008 | 0.0003 U | 0.0048 U | 0.0002 U | 0.00002 U | 0.0019 | 0.0002 | 0.0002 U | 0.0002 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.001 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U | 0.04 U |
| | 10/17/06 | 0.0002 U | 0.0002 U | **0.00075** | 0.0008 | 0.0003 U | 0.0033 | 0.0002 U | 0.000031 | 0.0017 | 0.0002 | 0.0002 U | 0.0002 U | 0.001 U | 0.0002 U | 0.0002 U | 0.00002 U | 0.0002 | 0.0002 U | 0.001 U | 0.003 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U | 0.04 U |
| | 10/17/06 (DUP) | 0.0002 U | 0.0002 U | **0.00054** | 0.0009 | 0.0003 U | 0.003 U | 0.0002 U | 0.000025 J | 0.0017 | 0.0002 | 0.0002 U | 0.0002 U | 0.001 U | 0.0002 U | 0.0002 U | 0.00002 U | 0.0003 | 0.0002 U | 0.001 U | 0.003 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U | 0.04 U |
| | 04/03/07 | 0.0002 U | 0.0002 U | **0.00066** | 0.0004 | 0.0003 U | 0.011 | 0.0002 U | 0.00002 U | 0.0012 | 0.0002 | 0.0002 U | 0.0002 U | 0.001 U | 0.0002 U | 0.0002 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.001 U | 0.003 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U | 0.04 U |
| | 10/25/07 | 0.0002 U | 0.0002 U | **0.00074** | 0.0009 J | 0.0003 U | 0.003 U | 0.0002 U | 0.000046 | 0.0031 J | 0.0004 J | 0.0002 U | 0.0002 U | 0.001 U | 0.0002 U | 0.0002 U | 0.000032 | **0.0019 J** | 0.0002 U | 0.001 U | 0.003 U | 0.00002 U | 0.022 J | 0.23 | 0.0002 U | 0.0002 U | **2.81 D** | 0.04 U |
| | 04/01/08 | 0.003 U | 0.0075 U | **0.0008** | 0.003 U | 0.0075 U | 0.045 U | 0.003 U | 0.0002 U | 0.003 U | 0.00025 | 0.003 U | 0.003 U | 0.038 U | 0.003 U | 0.003 U | 0.0002 U | 0.003 U | 0.003 U | 0.038 U | 0.038 U | 0.0002 U | 0.003 U | 0.003 U | 0.003 U | 0.003 U | 0.435 D | 0.6 UJ |
| | 10/07/08 | 0.001 U | 0.001 U | **0.00083 J** | 0.001 U | 0.002 U | 0.018 | 0.001 U | 0.0002 UJ | 0.0015 | 0.001 U | 0.001 U | 0.001 U | 0.005 U | 0.001 U | 0.001 U | 0.0002 UJ | 0.001 U | 0.001 U | 0.005 U | 0.005 U | 0.0002 UJ | 0.001 U | 0.07 | 0.001 U | 0.001 U | 0.102 | 0.1 U |
| | 04/06/09 | 0.0002 U | 0.0005 U | **0.00073** | 0.0002 U | 0.0005 U | 0.01 | 0.0002 U | 0.00002 U | 0.0014 | 0.0002 U | 0.0002 U | 0.0002 U | 0.0025 U | 0.0002 U | 0.0002 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.0025 U | 0.0025 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0076 | 0.02 U |
| | 10/27/09 | 0.0005 U | 0.0005 U | **0.00042** | 0.0007 | 0.0005 U | 0.005 U | 0.0002 U | 0.00002 U | 0.0016 | 0.0002 | 0.0002 U | 0.0002 U | 0.005 U | 0.0002 U | 0.0002 U | 0.00002 U | 0.0003 | 0.0002 U | 0.005 U | 0.005 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0009 | 0.02 UJ |
| | 04/06/10 | 0.0005 U | 0.0005 U | **0.00040** | 0.0003 | 0.0005 U | 0.005 U | 0.0002 U | 0.00002 U | 0.0011 | 0.0002 U | 0.0002 U | 0.0002 U | 0.005 U | 0.0002 U | 0.0002 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.005 U | 0.005 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0005 | 0.02 U |

**Table 16-8**
**Summary of Groundwater Analytical Results for Volatile Organic Compounds, (mg/L)**
**Building 40-56**
**Boeing Everett Plant**

| Well ID | Sample Date | Chloromethane | Bromomethane | Vinyl Chloride | Chloroethane | Methylene Chloride | Acetone | Carbon Disulfide | 1,1-DCE | 1,1-DCA | cis-1,2-DCE | Chloroform | 1,2-DCA | MEK | 1,1,1-TCA |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MTCA Method A or B Groundwater Screening Level | | 0.00337 (B) | 0.0112 (B) | 0.0002 (A) 0.0000292 (B) | 0.015 (B) | 0.005 (A) 0.00583 (B) | 0.8 (B) | 0.8 (B) | 0.4 (B) | 1.6 (B) | 0.08 (B) | 0.00717 (B) | 0.005 (A) 0.000481 (B) | 4.8 (B) | 0.2 (A) 7.2 (B) 16 (B*) |
| **EGW007** | 02/02/95 | 0.2 U | 0.2 U | 0.2 U | 0.2 U | 0.2 U | 0.5 U | 0.1 U | 0.1 U | 0.1 U | 0.1 U | 0.1 U | NA | **8.6** | NA |
| | 05/02/95 | 0.2 U | 0.2 U | 0.2 U | 0.2 U | 0.2 U | 0.5 U | 0.1 U | 0.1 U | 0.1 U | 0.1 U | 0.1 U | NA | **5.9** | NA |
| | 08/11/95 | 0.1 U | 0.1 U | 0.1 U | 0.1 U | 0.1 U | 0.25 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | NA | **10** | NA |
| | 11/09/95 | 1 U | 1 U | 1 U | 1 U | 1 U | 2.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | NA | **6.1** | NA |
| | 02/29/96 | 2 U | 2 U | 2 U | 2 U | 2 U | 5 U | 1 U | 1 U | 1 U | 1 U | 1 U | NA | **5.8** | NA |
| | 02/29/96 (DUP) | 0.36 U | 0.36 U | 0.36 U | 0.36 U | 0.36 U | 0.9 U | 0.18 U | 0.18 U | 0.18 U | 0.18 U | 0.18 U | NA | 3.5 | NA |
| | 05/30/96 | 1 U | 1 U | 1 U | 1 U | 1 U | 2.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | NA | 3.3 | NA |
| | 08/27/96 | 2 U | 2 U | 2 U | 2 U | 2 U | 5 U | 1 U | 1 U | 1 U | 1 U | 1 U | NA | 5 U | NA |
| | 12/03/96 | 2 U | 2 U | 2 U | 2 U | 2 U | 5 U | 1 U | 1 U | 1 U | 1 U | 1 U | NA | 5 U | NA |
| | 03/10/97 | 2 U | 2 U | 2 U | 2 U | 2 U | 5 U | 1 U | 1 U | 1 U | 1 U | 1 U | NA | 5 U | NA |
| | 03/10/97 (DUP) | 2 U | 2 U | 2 U | 2 U | 2 U | 5 U | 1 U | 1 U | 1 U | 1 U | 1 U | NA | 5 U | NA |
| | 05/22/97 | 1 U | 2 U | 0.0001 U | 2 U | 2 U | 5 U | 1 U | 1 U | 1 U | 1 U | 1 U | NA | 5 U | NA |
| | 08/12/97 | 2 U | 2 U | 2 U | 2 U | 2 U | 5 U | 1 U | 1 U | 1 U | 1 U | 1 U | NA | 5 U | NA |
| | 08/12/97 (DUP) | 2 U | 2 U | 2 U | 2 U | 2 U | 5 U | 1 U | 1 U | 1 U | 1 U | 1 U | NA | 5 U | NA |
| | 11/17/97 | 1 U | 1 U | 0.005 U | 1 U | 1 U | 2.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | NA | 2.5 U | NA |
| | 11/17/97 (DUP) | 1 U | 1 U | 0.005 U | 1 U | 1 U | 2.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | NA | 2.5 U | NA |
| | 03/09/98 | 0.1 U | 0.1 U | 0.01 U | 0.1 U | 0.1 U | 0.42 | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 1.6 | 0.05 U |
| | 05/12/98 | 2 U | 2 U | 0.005 U | 2 U | 2 U | 5 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 5 U | 1 U |
| | 08/10/98 | 1 U | 1 U | 0.005 U | 1 U | 1 U | 2.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 2.5 U | 0.5 U |
| | 11/09/98 | 2 U | 2 U | **0.00014** | 2 U | 2 U | 5 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 5 U | 1 U |
| | 02/01/99 | 2 U | 2 U | 0.001 U | 2 U | 2 U | 5 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 5 U | 1 UJ |
| | 05/10/99 | 0.5 U | 0.5 U | 0.002 U | 0.5 U | 1 U | 2.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 2.5 U | 0.5 U |
| | 08/02/99 | 0.01 U | 0.01 U | 0.005 U | 0.01 U | 0.02 U | 0.13 | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.83 | 0.01 U |
| | 11/09/99 | 1 U | 1 U | 0.00002 U | 1 U | 2 U | 5 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 5 U | 1 U |
| | 01/31/00 | 1 U | 1 U | 0.002 U | 1 U | 2 U | 5 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 5 U | 1 U |
| | 01/31/00 (DUP) | 0.5 U | 0.5 U | 0.002 U | 0.5 U | 1 U | 2.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 2.5 U | 0.5 U |
| | 05/02/00 | 1 U | 1 U | 0.002 UJ | 1 U | 2 U | 5 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 5 U | 1 U |
| | 07/31/00 | 1 U | 1 U | 0.002 U | 1 U | 2 U | 5 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 5 U | 1 U |
| | 11/13/00 | 1 U | 1 U | **0.00024** | 1 U | 2 U | 5 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 5 U | 1 U |
| | 02/01/01 | 1 U | 1 U | **0.00018** | 1 U | 2 U | 5 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 5 U | 1 U |
| | 05/01/01 | 0.5 U | 0.5 U | **0.000079** | 0.5 U | 1 U | 2.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 2.5 U | 0.5 U |
| | 08/06/01 | 1 U | 1 U | **0.00018** | 1 U | 2 U | 5 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 5 U | 1 U |
| | 08/06/01 (DUP) | 0.5 U | 0.5 U | **0.000093** | 0.5 U | 1 U | 2.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 2.5 U | 0.5 U |
| | 11/12/01 | 1 U | 1 U | **0.00023** | 1 U | 2 U | 5 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 5 U | 1 U |
| | 02/05/02 | 0.5 U | 0.5 U | **0.000083** | 0.5 U | 1 U | 2.5 U | 0.5 U | 0.000021 | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 2.5 U | 0.5 U |
| | 05/06/02 | 1.5 U | 1.5 U | 0.00002 U | 1.5 U | 3 U | 7.5 U | 1.5 U | 0.00002 U | 1.5 U | 1.5 U | 1.5 U | 1.5 U | 7.5 U | 1.5 U |
| | 08/06/02 | 1 U | 1 U | 0.00002 U | 1 U | 2 U | 5 U | 1 U | 0.00002 U | 1 U | 1 U | 1 U | 1 U | 5 U | 1 U |
| | 11/16/02 | 0.75 U | 0.75 U | **0.00032** | 0.75 U | 1.5 U | 3.7 U | 0.75 U | 0.00002 U | 0.75 U | 0.75 U | 0.75 U | 0.75 U | 3.7 U | 0.75 U |
| | 02/04/03 | 1.5 U | 1.5 U | **0.00024** | 1.5 U | 2.2 U | 7.5 U | 1.5 U | 0.00002 U | 1.5 U | 1.5 U | 1.5 U | 1.5 U | 7.5 U | 1.5 U |
| | 05/05/03 | 0.5 U | 0.5 U | 0.002 U | 0.5 U | 1 U | 2.5 U | 0.5 U | 0.002 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 2.5 U | 0.5 U |
| | 07/22/03 | 0.5 U | 0.5 U | 0.0002 U | 0.5 U | 1 U | 2.5 U | 0.5 U | 0.0002 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 2.5 U | 0.5 U |
| | 11/04/03 | DRY | DRY | DRY | DRY | DRY | DRY | DRY | DRY | DRY | DRY | DRY | DRY | DRY | DRY |
| | 01/21/04 | 1.5 U | 1.5 U | 0.0002 U | 1.5 U | 3 U | 7.5 U | 1.5 U | 0.0002 U | 1.5 U | 1.5 U | 1.5 U | 1.5 U | 7.5 U | 1.5 U |
| | 04/14/04 | 1 U | 1 U | 0.0002 U | 1 U | 2 U | 5 U | 1 U | 0.0002 U | 1 U | 1 U | 1 U | 1 U | 5 U | 1 U |
| | 07/13/04 | 1 U | 1 U | 0.0002 U | 1 U | 2 U | 5 U | 1 U | 0.0002 U | 1 U | 1 U | 1 U | 1 U | 5 U | 1 U |
| | 10/01/04 | 0.5 U | 0.5 U | 0.0002 U | 0.5 U | 1 U | 2.5 U | 0.5 U | 0.0002 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 2.5 U | 0.5 U |
| | 01/12/05 | 1 U | 1 U | 0.0002 U | 1 U | 2 U | 5 U | 1 U | 0.0002 U | 1 U | 1 U | 1 U | 1 U | 5 U | 1 U |
| | 04/11/05 | 1 U | 1 U | 0.0002 U | 1 U | 3.4** | 5 U | 1 U | 0.0002 U | 1 U | 1 U | 1 U | 1 U | 5 U | 1 U |
| | 4/11/05 (DUP) | 1 U | 1 U | **0.00003** | 1 U | 4.2** | 5 U | 1 U | 0.00002 U | 1 U | 1 U | 1 U | 1 U | 5 U | 1 U |
| | 07/12/05 | 1 U | 1 U | 0.0002 U | 1 U | 2.0 U | 5 U | 1 U | 0.0002 U | 1 U | 1 U | 1 U | 1 U | 5 U | 1 U |
| | 10/17/05 | 0.5 U | 0.5 U | 0.0002 UJ | 0.5 U | 1 U | 2.5 U | 0.5 U | 0.0002 UJ | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 2.5 U | 0.5 U |
| | 01/12/06 | 0.5 U | 0.5 U | 0.0002 UJ | 0.5 U | 1 U | 2.5 U | 0.5 U | 0.0002 UJ | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 2.5 U | 0.5 U |
| | 04/19/06 | 0.5 U | 0.5 U | 0.0002 U | 0.5 U | 1 U | 2.5 U | 0.5 U | 0.0002 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 2.5 U | 0.5 U |
| | 07/05/06 | 0.5 U | 0.5 U | 0.0002 UJ | 0.5 U | 1 U | 2.5 U | 0.5 U | 0.0002 UJ | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 2.5 U | 0.5 U |
| | 10/17/06 | 0.5 U | 0.5 U | 0.0002 UJ | 0.5 U | 1 U | 2.5 U | 0.5 U | 0.0002 UJ | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 2.5 U | 0.5 U |
| | 01/04/07 | 0.5 U | 0.5 U | 0.0002 U | 0.5 U | 1 U | 2.5 U | 0.5 U | 0.0002 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 2.5 U | 0.5 U |
| | 04/03/07 | 0.5 U | 0.5 U | **0.00024** | 0.5 U | 1 U | 2.5 U | 0.5 U | 0.0002 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 2.5 U | 0.5 U |
| | 07/02/07 | 1 U | 1 U | 0.0002 U | 1 U | 2 U | 5 U | 1 U | 0.0002 U | 1 U | 1 U | 1 U | 1 U | 5 U | 1 U |
| | 10/25/07 | 2 U | 2 U | 0.0002 U | 2 U | 4 U | 10 U | 2 U | 0.0002 U | 2 U | 2 U | 2 U | 2 U | 10 U | 2 U |
| | 01/03/08 | 0.5 U | 0.5 U | 0.0002 U | 0.5 U | 1 U | 2.5 U | 0.5 U | 0.0002 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 2.5 U | 0.5 U |
| | 04/01/08 | 0.4 U | 0.4 U | 0.0002 U | 0.4 U | 0.8 U | 2 U | 0.4 U | 0.0002 U | 0.4 U | 0.0002 U | 0.4 U | 0.4 U | 2 U | 0.4 U |
| | 07/07/08 | 0.2 U | 0.2 U | 0.002 U | 0.2 U | 0.4 U | 1 U | 0.2 U | 0.002 U | 0.2 U | 0.2 U | 0.2 U | 0.2 U | 1 U | 0.2 U |
| | 7/7/2008 (DUP) | 0.2 U | 0.2 U | 0.002 U | 0.2 U | 0.4 U | 2 U | 0.2 U | 0.002 U | 0.2 U | 0.2 U | 0.2 U | 0.2 U | 2 U | 0.2 U |
| | 10/07/08 | 0.5 U | 0.5 U | 0.001 U | 0.5 U | 1 U | 2.5 U | 0.5 U | 0.001 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 2.5 U | 0.5 U |
| | 01/05/09 | 0.5 U | 0.5 U | 0.0002 U | 0.5 U | 1 U | 2.5 U | 0.5 U | 0.0002 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 2.5 U | 0.5 U |
| | 1/5/09 (DUP) | 0.5 U | 0.5 U | 0.0002 U | 0.5 U | 1 U | 2.5 U | 0.5 U | 0.0002 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 2.5 U | 0.5 U |
| | 04/06/09 | 0.1 U | 0.1 U | 0.0010 U | 0.1 U | 0.2 U | 1.0 U | 0.1 U | 0.0010 U | 0.1 U | 0.1 U | 0.1 U | 0.1 U | 0.5 U | 0.1 U |
| | 07/08/09 | 1 U | 1 U | 0.0002 U | 0.4 U | 1 U | 10 U | 0.4 U | 0.0002 U | 0.4 U | 0.4 U | 0.4 U | 0.4 U | 10 U | 0.4 U |
| | 10/27/09 | 1 U | 1 U | 0.0002 U | 0.4 U | 1 U | 10 U | 0.4 U | 0.0002 U | 0.4 U | 0.4 U | 0.4 U | 0.4 U | 10 U | 0.4 U |
| | 01/13/10 | 0.003 U | 0.003 U | 0.00002 U | 0.0012 U | 0.003 U | 0.03 U | 0.0012 U | 0.00002 U | 0.0012 U | 0.0012 U | 0.0012 U | 0.0012 U | 0.03 U | 0.0012 U |
| | 04/06/10 | 0.025 U | 0.025 U | 0.0002 U | 0.01 U | 0.025 U | 0.250 U | 0.01 U | 0.0002 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.25 U | 0.01 U |

| Well ID | Sample Date | BDCM | TCE | Benzene | Bromoform | MIBK | 2-Hexanone | PCE | Toluene | Ethylbenzene | Styrene | TCFM | Total Xylenes | Cyclohexanone |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MTCA Method A or B Groundwater Screening Level | | 0.000706 (B) | 0.005 (A) 0.00049 (B) | 0.005 (A) 0.000795 (B) | 0.00554 (B) | 0.64 (B) | NE | 0.005 (A) 0.000081 (B) | 1 (A) 0.64 (B) | 0.7 (A) 0.8 (B) | 0.0015 (B) | 2.4 (B) | 1 (A) 1.6 (B) | 40 (B) |
| **EGW007** | 02/02/95 | NA | NA | 0.1 U | NA | 0.5 U | 0.5 U | NA | **1.7** | **33** | NA | NA | **179** | |
| | 05/02/95 | NA | NA | 0.1 U | NA | 0.5 U | 0.5 U | NA | **1.6** | **23** | NA | NA | **111** | 10 U |
| | 08/11/95 | NA | NA | 0.05 U | NA | 0.25 U | 0.25 U | NA | **1.4** | **22** | NA | NA | **100** | 5 U |
| | 11/09/95 | NA | NA | 0.5 U | NA | 2.5 U | 2.5 U | NA | **1.3** | **29** | NA | NA | **130** | 50 U |
| | 02/29/96 | NA | NA | 1 U | NA | 5 U | 5 U | NA | **1.2** | **28** | NA | NA | **128** | 100 U |
| | 02/29/96 (DUP) | NA | NA | 0.18 U | NA | 0.9 U | 0.9 U | NA | **1.3** | **32** | NA | NA | **144** | 18 U |
| | 05/30/96 | NA | NA | 0.5 U | NA | 2.5 U | 2.5 U | NA | **1.1** | **26** | NA | NA | **126** | 50 U |
| | 08/27/96 | NA | NA | 1 U | NA | 5 U | 5 U | NA | 1 U | **24** | NA | NA | **111** | 100 U |
| | 12/03/96 | NA | NA | 1 U | NA | 5 U | 5 U | NA | 1.2 U | **25** | NA | NA | **121** | 100 U |
| | 03/10/97 | NA | NA | 1 U | NA | 5 U | 5 U | NA | 1 U | **27** | NA | NA | **121** | 100 U |
| | 03/10/97 (DUP) | NA | NA | 1 U | NA | 5 U | 5 U | NA | **1.0** | **27** | NA | NA | **123** | 100 U |
| | 05/22/97 | NA | NA | 1 U | NA | 5 U | 5 U | NA | 1 U | **27** | NA | NA | **121** | 100 U |
| | 08/12/97 | NA | NA | 1 U | NA | 5 U | 5 U | NA | 1 U | **25** | NA | NA | **109** | 100 U |
| | 08/12/97 (DUP) | NA | NA | 1 U | NA | 5 U | 5 U | NA | 1 U | **31** | NA | NA | **131** | 100 U |
| | 11/17/97 | NA | NA | 0.5 U | NA | 2.5 U | 2.5 U | NA | **1.0** | **31** | NA | NA | **129** | 50 U |
| | 11/17/97 (DUP) | NA | NA | 0.5 U | NA | 2.5 U | 2.5 U | NA | **1.0** | **31** | NA | NA | **127** | 50 U |
| | 03/09/98 | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.25 U | 0.25 U | 0.05 U | **0.99** | **25** | 0.1 U | 0.1 U | **127** | 5 U |
| | 05/12/98 | 1 U | 1 U | 1 U | 1 U | 5 U | 5 U | 1 U | **1.0** | **33** | 2 U | 2 U | **153** | 100 U |
| | 08/10/98 | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 2.5 U | 2.5 U | 0.5 U | **0.88** | **28** | 1 U | 1 UJ | **121** | 50 U |
| | 11/09/98 | 1 U | 1 UJ | 1 U | 1 U | 5 U | 5 U | 1 U | **1.0 J** | **27** | 2 U | 2 UJ | **130** | 100 U |
| | 02/01/99 | 1 UJ | 1 U | 1 U | 1 U | 5 U | 5 U | 1 U | **1.0** | **25** | 2 U | 2 UJ | **115** | 100 U |
| | 05/10/99 | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 2.5 U | 2.5 U | 0.5 U | **0.81** | **32** | 0.5 U | 0.5 U | **174** | 50 U |
| | 08/02/99 | 0.01 U | 0.01 U | **0.015** | 0.01 U | 0.061 | 0.05 U | 0.01 U | **1.1** | **28 J** | 0.01 U | 0.01 U | **140 J** | 1 U |
| | 11/09/99 | 1 U | 1 U | 1 U | 1 U | 5 U | 5 U | 1 U | 1 U | **23** | 1 U | 1 U | **112** | 100 U |
| | 01/31/00 | 1 U | 1 U | 1 U | 1 U | 5 U | 5 U | 1 U | 1 U | **28** | 1 U | 1 U | **128** | 100 U |
| | 01/31/00 (DUP) | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 2.5 U | 2.5 U | 0.5 U | **0.74** | **29** | 0.5 U | 0.5 U | **129** | 50 U |
| | 05/02/00 | 1 U | 1 U | 1 U | 1 U | 5 U | 5 U | 1 U | 1 U | **27** | 1 U | 1 U | **122** | 100 U |
| | 07/31/00 | 1 U | 1 U | 1 U | 1 U | 5 U | 5 U | 1 U | 1 U | **29** | 1 U | 1 U | **130** | 100 U |
| | 11/13/00 | 1 U | 1 U | 1 U | 1 U | 5 U | 5 U | 1 U | 1 U | **32** | 1 U | 1 U | **142** | 100 U |
| | 02/01/01 | 1 U | 1 UJ | 1 UJ | 1 U | 5 U | 5 U | 1 U | 1 UJ | **28** | 1 U | 1 UJ | **142** | 100 U |
| | 05/01/01 | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 2.5 U | 2.5 U | 0.5 U | **0.86** | **32** | 0.5 U | 0.5 U | **143** | 50 U |
| | 08/06/01 | 1 U | 1 U | 1 U | 1 U | 5 U | 5 U | 1 U | 1 U | **28** | 1 U | 1 U | **121** | 100 U |
| | 08/06/01 (DUP) | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 2.5 U | 2.5 U | 0.5 U | **0.93** | **31** | 0.5 U | 0.5 U | **129** | 50 U |
| | 11/12/01 | 1 U | 1 U | 1 U | 1 U | 5 U | 5 U | 1 U | 1 U | **30** | 1 U | 1 U | **152** | 100 U |
| | 02/05/02 | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 2.5 U | 2.5 U | 0.5 U | **0.88** | **33** | 0.5 U | 0.5 U | **187** | 50 U |
| | 05/06/02 | 1.5 U | 1.5 U | 1.5 U | 1.5 U | 7.5 U | 7.5 U | 1.5 U | 1.5 U | **29** | 1.5 U | 1.5 U | **140** | 150 U |
| | 08/06/02 | 1 U | 1 U | 1 U | 1 U | 5 U | 5 U | 1 U | 1 U | **36** | 1 U | 1 U | **168** | 100 U |
| | 11/16/02 | 0.75 U | 0.75 U | 0.75 U | 0.75 U | 3.7 U | 3.7 U | 0.75 U | 1.0 | **35** | 0.75 U | 0.75 U | **166** | 75 U |
| | 02/04/03 | 1.5 U | 1.5 U | 1.5 U | 1.5 U | 7.5 U | 7.5 U | 1.5 U | 1.5 U | **30** | 1.5 U | 1.5 U | **131** | 150 U |
| | 05/05/03 | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 2.5 U | 2.5 U | 0.5 U | **1** | **34** | 0.5 U | 0.5 U | **145** | 50 U |
| | 07/22/03 | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 2.5 U | 2.5 U | 0.5 U | **0.94** | **30** | 0.5 U | 0.5 U | **129** | 50 U |
| | 11/04/03 | DRY | DRY | DRY | DRY | DRY | DRY | DRY | DRY | DRY | DRY | DRY | DRY | DRY |
| | 01/21/04 | 1.5 U | 1.5 U | 1.5 U | 1.5 U | 7.5 U | 7.5 U | 1.5 U | 1.5 U | **40** | 1.5 U | 1.5 U | **189** | 150 U |
| | 04/14/04 | 1 U | 1 U | 1 U | 1 U | 5 U | 5 U | 1 U | 1 U | **33** | 1 U | 1 U | **154** | 100 U |
| | 07/13/04 | 1 U | 1 U | 1 U | 1 U | 5 U | 5 U | 1 U | 1 U | **32** | 1 U | 1 U | **141** | 100 UJ |
| | 10/01/04 | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 2.5 U | 2.5 U | 0.5 U | **1.1** | **40** | 0.5 U | 0.5 U | **176** | 50 U |
| | 01/12/05 | 1 U | 1 U | 1 U | 1 U | 5 U | 5 U | 1 U | 1 U | **27** | 1 U | 1 U | **124** | 100 U |
| | 04/11/05 | 1 U | 1 U | 1 U | 1 U | 5 U | 5 U | 1 U | **1.2** | **39** | 1 U | 1 U | **181** | 100 U |
| | 4/11/05 (DUP) | 1 U | 1 U | 1 U | 1 U | 5 U | 5 U | 1 U | 1 U | **28** | 1 U | 1 U | **141** | 100 U |
| | 07/12/05 | 1 U | 1 U | 1 U | 1 U | 5 U | 5 U | 1 U | 1 U | **29** | 1 U | 1 U | **141** | 100 U |
| | 10/17/05 | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 2.5 U | 2.5 U | 0.5 U | **0.89** | **36** | 0.5 U | 0.5 U | **165** | 50 U |
| | 01/12/06 | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 2.5 U | 2.5 U | 0.5 U | **0.68** | **28** | 0.5 U | 0.5 U | **131** | 50 U |
| | 04/19/06 | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 2.5 U | 2.5 U | 0.5 U | **0.70** | **34** | 0.5 U | 0.5 U | **155** | 50 U |
| | 07/05/06 | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 2.5 U | 2.5 U | 0.5 U | 0.5 U | **32** | 0.5 U | 0.5 U | **171** | 50 U |
| | 10/17/06 | 0.5 U | **0.00059 J** | 0.5 U | 0.5 U | 2.5 U | 2.5 U | 0.00095 J | 0.5 U | **27** | 0.5 U | 0.5 U | **126** | 50 U |
| | 01/04/07 | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 2.5 U | 2.5 U | 0.5 U | 0.5 U | **23** | 0.5 U | 0.5 U | **119** | 50 U |
| | 04/03/07 | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 2.5 U | 2.5 U | 0.5 U | 0.5 U | **25** | 0.5 U | 0.5 U | **117** | 50 UJ |
| | 07/02/07 | 1 U | 1 U | 1 U | 1 U | 5 U | 5 U | 1 U | 1 U | **23** | 1 U | 1 U | **125** | 100 U |
| | 10/25/07 | 2 U | 2 U | 2 U | 2 U | 10 U | 10 U | 2 U | 2 U | **28** | 2 U | 2 U | **138** | 200 U |
| | 01/03/08 | 0.5 U | 0.00024 | 0.5 U | 0.5 U | 2.5 U | 2.5 U | **0.0006** | 0.5 U | **23** | 0.5 U | 0.5 U | **116** | 50 U |
| | 04/01/08 | 0.4 U | 0.00035 | 0.4 U | 0.4 U | 2 U | 2 U | **0.00069** | 0.4 U | **23 J** | 0.4 U | 0.4 U | **101 J** | 20 UJ |
| | 07/07/08 | 0.2 U | 0.2 U | 0.2 U | 0.2 U | 1 U | 1 U | 0.2 U | 0.24 | **23** | 0.2 U | 0.2 U | **104** | 20 U |
| | 7/7/2008 (DUP) | 0.2 U | 0.002 U | 0.2 U | 0.2 U | 1 U | 1 U | 0.002 U | 0.23 | **22** | 0.2 U | 0.2 U | **103** | 20 U |
| | 10/07/08 | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 2.5 U | 2.5 U | 0.5 U | 0.5 U | **26** | 0.5 U | 0.5 U | **139** | 50 U |
| | 01/05/09 | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 2.5 U | 2.5 U | 0.5 U | 0.5 U | **25** | 0.5 U | 0.5 U | **128** | 50 U |
| | 1/5/09 (DUP) | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 2.5 U | 2.5 U | 0.5 U | 0.5 U | **26** | 0.5 U | 0.5 U | **138** | 50 U |
| | 04/06/09 | 0.1 U | **0.0012** | 0.1 U | 0.1 U | 0.5 U | 0.5 U | 0.0013 | 0.24 | **30 D** | 0.1 U | 0.1 U | **152 D** | 10 U |
| | 07/08/09 | 0.4 U | 0.00026 | 0.4 U | 0.4 U | 10 U | 10 U | **0.00052** | 0.4 U | **21** | 0.4 U | 0.4 U | **172** | 40 U |
| | 10/27/09 | 0.4 U | 0.4 U | 0.4 U | 0.4 U | 10 U | 10 U | 0.4 U | 0.4 U | **25** | 0.4 U | 0.4 U | **123** | 40 UJ |
| | 01/13/10 | 0.0012 U | 0.0012 U | 0.0012 U | 0.0012 U | 0.03 U | 0.03 U | 0.0012 U | 0.0012 U | 0.0012 U | 0.0012 U | 0.0012 U | 0.4 | 0.12 U |
| | 04/06/10 | 0.01 U | 0.0002 U | 0.01 U | 0.01 U | 0.25 U | 0.25 U | **0.00045** | 0.15 | **20 D** | **0.62** | 0.01 U | **103 D** | 1 U |

**Table 16-8**
**Summary of Groundwater Analytical Results for Volatile Organic Compounds, (mg/L)**
**Building 40-56**
**Boeing Everett Plant**

| Well ID | Sample Date | Chloromethane | Bromomethane | Vinyl Chloride | Chloroethane | Methylene Chloride | Acetone | Carbon Disulfide | 1,1-DCE | 1,1-DCA | cis-1,2-DCE | Chloroform | 1,2-DCA | MEK | 1,1,1-TCA | BDCM | TCE | Benzene | Bromoform | MIBK | 2-Hexanone | PCE | Toluene | Ethylbenzene | Styrene | TCFM | Total Xylenes | Cyclohexanone |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MTCA Method A or B Groundwater Screening Level | | 0.00337 (B) | 0.0112 (B) | 0.0002 (A) 0.0000292 (B) | 0.015 (B) | 0.005 (A) 0.00583 (B) | 0.8 (B) | 0.8 (B) | 0.4 (B) | 1.6 (B) | 0.08 (B) | 0.00717 (B) | 0.005 (A) 0.000481 (B) | 4.8 (B) | 0.2 (A) 7.2 (B) 16 (B*) | 0.000706 (B) | 0.005 (A) 0.00049 (B) | 0.005 (A) 0.000795 (B) | 0.00554 (B) | 0.64 (B) | NE | 0.005 (A) 0.000081 (B) | 1 (A) 0.64 (B) | 0.7 (A) 0.8 (B) | 0.0015 (B) | 2.4 (B) | 1 (A) 1.6 (B) | 40 (B) |
| **EGW008** | 01/31/95 | 0.002 U | 0.002 U | 0.002 U | 0.002 U | 0.002 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | NA | 0.005 U | NA | NA | NA | 0.001 U | NA | 0.005 U | 0.005 U | NA | 0.001 U | 0.001 U | NA | NA | 0.002 U | NA |
| | 05/01/95 | 0.002 U | 0.0031 | 0.002 U | 0.002 U | 0.002 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.0027 | NA | 0.005 U | NA | NA | NA | 0.001 U | NA | 0.005 U | 0.005 U | NA | 0.001 U | 0.001 U | NA | NA | 0.002 U | 0.1 U |
| | 08/10/95 | **0.0052** | **0.016** | 0.002 U | 0.002 U | 0.002 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | **0.0095** | NA | 0.005 U | NA | NA | NA | 0.001 U | NA | 0.005 U | 0.005 U | NA | 0.001 U | 0.001 U | NA | NA | 0.002 U | 0.1 U |
| | 11/09/95 | 0.002 U | 0.002 U | 0.002 U | 0.002 U | 0.002 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.0061 | NA | 0.005 U | NA | NA | NA | 0.001 U | NA | 0.005 U | 0.005 U | NA | 0.001 U | 0.001 U | NA | NA | 0.002 U | 0.1 U |
| | 02/29/96 | 0.002 U | 0.002 U | 0.002 U | 0.002 U | 0.002 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | NA | 0.005 U | NA | NA | NA | 0.001 U | NA | 0.005 U | 0.005 U | NA | 0.001 U | 0.001 U | NA | NA | 0.001 U | 0.1 U |
| | 05/30/96 | 0.002 U | 0.002 U | 0.002 U | 0.002 U | 0.002 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | NA | 0.005 U | NA | NA | NA | 0.001 U | NA | 0.005 U | 0.005 U | NA | 0.001 U | 0.001 U | NA | NA | 0.001 U | 0.1 U |
| | 05/30/96 (DUP) | 0.002 U | 0.002 U | 0.002 U | 0.002 U | 0.002 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | NA | 0.005 U | NA | NA | NA | 0.001 U | NA | 0.005 U | 0.005 U | NA | 0.001 U | 0.001 U | NA | NA | 0.001 U | 0.1 U |
| | 08/27/96 | 0.002 U | 0.0048 | 0.002 U | 0.002 U | 0.002 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | **0.0093** | NA | 0.005 U | NA | NA | NA | 0.001 U | NA | 0.005 U | 0.005 U | NA | 0.001 U | 0.001 U | NA | NA | 0.001 U | 0.1 U |
| | 12/03/96 | 0.002 U | 0.002 U | 0.002 U | 0.002 U | 0.002 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.003 | NA | 0.005 U | NA | NA | NA | 0.001 U | NA | 0.005 U | 0.005 U | NA | 0.001 U | 0.001 U | NA | NA | 0.001 U | 0.1 U |
| | 03/10/97 | 0.002 U | 0.002 U | 0.002 U | 0.002 U | 0.002 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | NA | 0.005 U | NA | NA | NA | 0.001 U | NA | 0.005 U | 0.005 U | NA | 0.001 U | 0.001 U | NA | NA | 0.001 U | 0.1 U |
| | 05/21/97 | 0.002 U | 0.002 U | 0.00001 U | 0.002 U | 0.002 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.0016 | NA | 0.005 U | NA | NA | NA | 0.001 U | NA | 0.005 U | 0.005 U | NA | 0.001 U | 0.001 U | NA | NA | 0.001 U | 0.1 U |
| | 08/12/97 | 0.002 U | 0.002 U | 0.00001 U | 0.002 U | 0.002 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.0067 | NA | 0.005 U | NA | NA | NA | 0.001 U | NA | 0.005 U | 0.005 U | NA | 0.001 U | 0.001 U | NA | NA | 0.001 U | 0.1 U |
| | 11/17/97 | 0.002 U | 0.002 U | 0.00001 U | 0.002 U | 0.002 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | NA | 0.005 U | NA | NA | NA | 0.001 U | NA | 0.005 U | 0.005 U | NA | 0.001 U | 0.001 U | NA | NA | 0.001 U | 0.1 U |
| | 03/09/98 | 0.002 U | 0.002 U | 0.00001 U | 0.002 U | 0.002 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.002 U | 0.002 U | 0.001 U | 0.1 U |
| | 05/12/98 | 0.002 U | 0.002 U | 0.00001 U | 0.002 U | 0.002 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.0016 | 0.001 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.002 U | 0.002 U | 0.001 U | 0.1 U |
| | 08/11/98 | 0.002 U | 0.002 U | 0.00001 U | 0.002 U | 0.002 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.0061 | 0.001 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.002 U | 0.002 U | 0.001 U | 0.1 U |
| | 11/09/98 | 0.002 U | 0.002 U | 0.00001 U | 0.002 U | 0.002 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.0024 | 0.001 U | 0.005 U | 0.001 U | 0.001 U | 0.001 UJ | 0.001 U | 0.001 U | 0.005 U | 0.005 U | 0.001 U | 0.001 UJ | 0.001 U | 0.002 U | 0.002 UJ | 0.001 U | 0.1 U |
| | 02/01/99 | 0.002 U | 0.002 U | 0.00001 U | 0.002 U | 0.002 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.002 U | 0.002 U | 0.001 U | 0.1 U |
| | 05/10/99 | 0.001 U | 0.001 U | 0.00002 U | 0.001 U | 0.002 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.1 U |
| | 08/02/99 | 0.001 U | 0.001 U | 0.00002 U | 0.001 U | 0.002 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.1 U |
| | 11/09/99 | 0.001 U | 0.001 U | 0.00002 U | 0.001 U | 0.002 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.0014 | 0.001 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.1 U |
| | 02/01/00 | 0.001 U | 0.001 U | 0.00002 U | 0.001 U | 0.002 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 UJ | 0.001 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 UJ | 0.001 U | 0.005 U | 0.005 U | 0.001 U | 0.001 UJ | 0.001 UJ | 0.001 U | 0.001 U | 0.001 U | 0.1 U |
| | 05/01/00 | 0.001 U | 0.001 U | 0.00002 UJ | 0.001 U | 0.002 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.1 U |
| | 07/31/00 | 0.001 U | 0.001 U | 0.00002 U | 0.001 U | 0.002 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.0057 J | 0.001 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.1 U |
| | 11/14/00 | 0.001 U | 0.001 U | 0.00002 U | 0.001 U | 0.002 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.0051 J | 0.001 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.1 U |
| | 02/01/01 | 0.001 U | 0.001 U | 0.00002 U | 0.001 U | 0.002 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | 0.001 U | 0.001 U | 0.001 UJ | 0.001 UJ | 0.001 U | 0.005 U | 0.005 U | 0.001 U | 0.001 UJ | 0.001 U | 0.001 U | 0.001 UJ | 0.001 U | 0.1 U |
| | 05/01/01 | 0.001 U | 0.001 U | 0.00002 U | 0.001 U | 0.002 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.1 U |
| | 08/06/01 | 0.001 U | 0.001 U | 0.00002 U | 0.001 U | 0.002 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.0017 | 0.001 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.1 U |
| | 11/12/01 | 0.001 U | 0.001 U | 0.00002 U | 0.001 U | 0.002 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.0016 | 0.001 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.1 U |
| | 02/04/02 | 0.0002 U | 0.0002 U | 0.00002 U | 0.0002 U | 0.0003 U | 0.001 U | 0.0002 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.0008 | 0.0002 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.001 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U | 0.02 U |
| | 05/06/02 | 0.0002 U | 0.0002 U | 0.00002 U | 0.0002 U | 0.0003 U | 0.001 U | 0.0002 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.0002 | 0.0002 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.001 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U | 0.02 U |
| | 08/05/02 | 0.0002 U | 0.0002 U | 0.00002 U | 0.0002 U | 0.0003 U | 0.0025 UJ | 0.0002 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.0021 | 0.0002 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.001 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U | 0.02 U |
| | 11/16/02 | 0.0002 U | 0.0002 U | 0.00002 U | 0.0002 U | 0.0003 U | 0.001 U | 0.0002 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.004 | 0.0002 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.001 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0003 | 0.0004 U | 0.02 U |
| | 02/04/03 | 0.0002 U | 0.0002 U | 0.00002 U | 0.0002 U | 0.0003 U | 0.001 U | 0.0002 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.0011 | 0.0002 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.001 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U | 0.02 U |
| | 05/05/03 | 0.0002 U | 0.0002 U | 0.00002 U | 0.0002 U | 0.0003 U | 0.0016 | 0.0002 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.0006 | 0.0002 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.001 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U | 0.02 U |
| | 07/22/03 | 0.0002 U | 0.0002 U | 0.00002 U | 0.0002 U | 0.0003 U | 0.001 U | 0.0002 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.0032 | 0.0002 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.001 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 | 0.0004 U | 0.02 U |
| | 11/04/03 | 0.0002 U | 0.0002 U | 0.00002 U | 0.0002 U | 0.0003 U | 0.0017 U | 0.0002 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.0048 | 0.0002 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.001 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U | 0.04 U |
| | 01/21/04 | 0.0002 U | 0.0002 U | 0.00002 U | 0.0002 U | 0.0003 U | 0.001 U | 0.0002 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.002 | 0.0002 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.001 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U | 0.04 U |
| | 04/14/04 | 0.0002 U | 0.0002 U | 0.00002 U | 0.0002 U | 0.0003 U | 0.001 U | 0.0002 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.0008 | 0.0002 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.001 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U | 0.04 U |
| | 07/13/04 | 0.0002 U | 0.0002 U | 0.00002 U | 0.0002 U | 0.0003 U | 0.001 U | 0.0002 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.0009 | 0.0002 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.001 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U | 0.04 U |
| | 10/01/04 | 0.0002 U | 0.0002 U | 0.00002 U | 0.0002 U | 0.0003 U | 0.001 U | 0.0002 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.0054 | 0.0002 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.001 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0005 | 0.0004 U | 0.04 U |
| | 01/11/05 | 0.0002 U | 0.0002 U | 0.000021 J | 0.0002 U | 0.0003 U | 0.001 U | 0.0002 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.0004 | 0.0002 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.001 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U | 0.04 U |
| | 04/11/05 | 0.0002 U | 0.0002 U | 0.00002 U | 0.0002 U | 0.0003 U | 0.001 U | 0.0002 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.0005 | 0.0002 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.001 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U | 0.04 U |
| | 10/17/05 | 0.0002 U | 0.0002 U | 0.00002 U | 0.0002 U | 0.0003 U | 0.0013 U | 0.0002 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.001 | 0.0002 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.001 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U | 0.04 U |
| | 04/19/06 | 0.0002 U | 0.0002 U | 0.00002 U | 0.0002 U | 0.0003 U | 0.001 U | 0.0002 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.0003 | 0.0002 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.001 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U | 0.04 U |
| | 10/17/06 | 0.0002 U | 0.0002 U | 0.00002 U | 0.0002 U | 0.0003 U | 0.003 U | 0.0002 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.0008 | 0.0002 U | 0.001 U | 0.0002 U | 0.0002 U | 0.000097 | 0.0002 U | 0.0002 U | 0.001 U | 0.003 U | 0.000041 | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U | 0.04 U |
| | 04/03/07 | 0.0002 U | 0.0002 U | 0.00002 U | 0.0002 U | 0.0003 U | 0.003 U | 0.0002 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.001 U | 0.0002 U | 0.0002 U | 0.000022 | 0.0002 U | 0.0002 U | 0.001 U | 0.003 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U | 0.04 U |
| | 10/25/07 | 0.0002 U | 0.0002 U | 0.00002 U | 0.0002 U | 0.0003 U | 0.003 U | 0.0002 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.0022 | 0.0002 U | 0.001 U | 0.0002 U | 0.0002 U | 0.000091 | 0.0002 U | 0.0002 U | 0.001 U | 0.003 U | 0.000022 | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U | 0.04 U |
| | 04/01/08 | 0.0002 U | 0.0005 U | 0.00002 U | 0.0002 U | 0.0005 U | 0.003 U | 0.0002 U | 0.00002 U | 0.0002 U | 0.00002 U | 0.0003 | 0.0002 U | 0.0025 U | 0.0002 U | 0.0002 U | 0.000023 | 0.0002 U | 0.0002 U | 0.0025 U | 0.0025 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U | 0.04 UJ |
| | 10/07/08 | 0.0002 U | 0.0005 U | 0.00002 U | 0.0002 U | 0.0005 U | 0.003 U | 0.0002 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.0022 | 0.0002 U | 0.0025 U | 0.0002 U | 0.0002 U | 0.00008 | 0.0002 U | 0.0002 U | 0.0025 U | 0.0025 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U | 0.04 U |
| | 04/06/09 | 0.0002 U | 0.0005 U | 0.00002 U | 0.0002 U | 0.0005 U | 0.0025 U | 0.0002 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0025 U | 0.0002 U | 0.0002 U | 0.00003 | 0.0002 U | 0.0002 U | 0.0025 U | 0.0025 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U | 0.02 U |
| | 10/27/09 | 0.0005 U | 0.0005 U | 0.00002 U | 0.0002 U | 0.0005 U | 0.005 U | 0.0002 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.0005 | 0.0002 U | 0.005 U | 0.0002 U | 0.0002 U | 0.00011 | 0.0002 U | 0.0002 U | 0.005 U | 0.005 U | 0.000024 | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U | 0.02 UJ |
| | 04/06/10 | 0.0005 U | 0.0005 U | 0.00002 U | 0.0002 U | 0.0005 U | 0.005 U | 0.0002 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.005 U | 0.0002 U | 0.0002 U | 0.000024 | 0.0002 U | 0.0002 U | 0.005 U | 0.005 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U | 0.02 U |

**Table 16-8**

**Summary of Groundwater Analytical Results for Volatile Organic Compounds, (mg/L)**

**Building 40-56**

**Boeing Everett Plant**

| Well ID | Sample Date | Chloromethane | Bromomethane | Vinyl Chloride | Chloroethane | Methylene Chloride | Acetone | Carbon Disulfide | 1,1-DCE | 1,1-DCA | cis-1,2-DCE | Chloroform | 1,2-DCA | MEK | 1,1,1-TCA | BDCM | TCE | Benzene | Bromoform | MIBK | 2-Hexanone | PCE | Toluene | Ethylbenzene | Styrene | TCFM | Total Xylenes | Cyclohexanone |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MTCA Method A or B Groundwater Screening Level | | 0.00337 (B) | 0.0112 (B) | 0.0002 (A)<br>0.0000292 (B) | 0.015 (B) | 0.005 (A)<br>0.00583 (B) | 0.8 (B) | 0.8 (B) | 0.4 (B) | 1.6 (B) | 0.08 (B) | 0.00717 (B) | 0.005 (A)<br>0.000481 (B) | 4.8 (B) | 0.2 (A)<br>7.2 (B)<br>16 (B*) | 0.000706 (B) | 0.005 (A)<br>0.00049 (B) | 0.005 (A)<br>0.000795 (B) | 0.00554 (B) | 0.64 (B) | NE | 0.005 (A)<br>0.000081 (B) | 1 (A)<br>0.64 (B) | 0.7 (A)<br>0.8 (B) | 0.0015 (B) | 2.4 (B) | 1 (A)<br>1.6 (B) | 40 (B) |
| **EGW009** | 01/31/95 | 0.002 U | 0.002 U | 0.002 U | 0.002 U | 0.002 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | NA | 0.005 U | NA | NA | NA | 0.001 U | NA | 0.005 U | 0.005 U | NA | 0.001 U | 0.072 | NA | NA | 0.0125 | 0.1 U |
| | 05/01/95 | 0.002 U | 0.002 U | 0.002 U | 0.002 U | 0.002 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | NA | 0.005 U | NA | NA | NA | 0.001 U | NA | 0.005 U | 0.005 U | NA | 0.001 U | 0.094 | NA | NA | 0.0172 | 0.1 U |
| | 08/10/95 | 0.002 U | 0.002 U | 0.002 U | 0.002 U | 0.002 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | NA | 0.005 U | NA | NA | NA | 0.001 U | NA | 0.005 U | 0.005 U | NA | 0.001 U | 0.044 | NA | NA | 0.0193 | 0.1 U |
| | 11/09/95 | 0.002 U | 0.002 U | 0.002 U | 0.002 U | 0.002 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | NA | 0.005 U | NA | NA | NA | 0.001 U | NA | 0.005 U | 0.005 U | NA | 0.001 U | 0.052 | NA | NA | 0.0189 | 0.1 U |
| | 02/29/96 | 0.002 U | 0.002 U | 0.002 U | 0.002 U | 0.002 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | NA | 0.005 U | NA | NA | NA | 0.001 U | NA | 0.005 U | 0.005 U | NA | 0.001 U | 0.0087 | NA | NA | 0.004 | 0.1 U |
| | 05/30/96 | 0.002 U | 0.002 U | 0.002 U | 0.002 U | 0.002 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | NA | 0.005 U | NA | NA | NA | 0.001 U | NA | 0.005 U | 0.005 U | NA | 0.001 U | 0.022 | NA | NA | 0.007 | 0.1 U |
| | 08/27/96 | 0.002 U | 0.002 U | 0.002 U | 0.002 U | 0.002 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | NA | 0.005 U | NA | NA | NA | 0.001 U | NA | 0.005 U | 0.005 U | NA | 0.001 | 0.017 | NA | NA | 0.0064 | 0.1 U |
| | 12/03/96 | 0.002 U | 0.002 U | 0.002 U | 0.002 U | 0.002 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | NA | 0.005 U | NA | NA | NA | 0.001 U | NA | 0.005 U | 0.005 U | NA | 0.001 U | 0.0079 | NA | NA | 0.0018 | 0.1 U |
| | 03/07/97 | 0.002 U | 0.002 U | 0.002 U | 0.002 U | 0.002 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | NA | 0.005 U | NA | NA | NA | 0.001 U | NA | 0.005 U | 0.005 U | NA | 0.001 U | 0.023 | NA | NA | 0.0041 | 0.1 U |
| | 05/22/97 | 0.002 U | 0.002 U | 0.00001 U | 0.002 U | 0.002 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | NA | 0.005 U | NA | NA | NA | 0.001 U | NA | 0.005 U | 0.005 U | NA | 0.001 U | 0.0052 | NA | NA | 0.0035 | 0.1 U |
| | 08/12/97 | 0.002 U | 0.002 U | 0.00001 U | 0.002 U | 0.002 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | NA | 0.005 U | NA | NA | NA | 0.001 U | NA | 0.005 U | 0.005 U | NA | 0.001 U | 0.037 | NA | NA | 0.0135 | 0.1 U |
| | 11/17/97 | 0.002 U | 0.002 U | 0.00001 U | 0.002 U | 0.002 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | NA | 0.005 U | NA | NA | NA | 0.001 U | NA | 0.005 U | 0.005 U | NA | 0.001 U | 0.016 | NA | NA | 0.0076 | 0.1 U |
| | 03/10/98 | 0.002 U | 0.002 U | 0.00001 U | 0.002 U | 0.002 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | 0.005 U | 0.001 U | 0.001 U | 0.015 | 0.002 U | 0.002 U | 0.0064 | 0.1 U |
| | 05/12/98 | 0.002 U | 0.002 U | 0.00001 U | 0.002 U | 0.002 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | 0.005 U | 0.001 U | 0.001 U | 0.0082 | 0.002 U | 0.002 U | 0.003 | 0.1 U |
| | 08/10/98 | 0.002 U | 0.002 U | 0.00001 U | 0.002 U | 0.002 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | 0.005 U | 0.001 U | 0.001 U | 0.0085 | 0.002 U | 0.002 UJ | 0.0011 | 0.1 U |
| | 11/09/98 | 0.002 U | 0.002 U | 0.00001 U | 0.002 U | 0.002 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | 0.001 U | 0.001 U | 0.001 UJ | 0.001 U | 0.001 U | 0.005 U | 0.005 U | 0.001 U | 0.001 UJ | 0.0019 | 0.002 U | 0.002 UJ | 0.001 U | 0.1 U |
| | 02/01/99 | 0.002 U | 0.002 U | 0.00001 U | 0.002 U | 0.002 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | 0.005 U | 0.001 U | 0.001 U | 0.014 | 0.002 U | 0.002 U | 0.001 U | 0.1 U |
| | 05/10/99 | 0.001 U | 0.001 U | 0.00002 U | 0.001 U | 0.002 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.1 U |
| | 08/02/99 | 0.001 U | 0.001 U | 0.00002 U | 0.001 U | 0.002 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.1 U |
| | 08/02/99 (DUP) | 0.001 U | 0.001 U | 0.00002 U | 0.001 U | 0.002 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.0021 U | 0.1 U |
| | 11/08/99 | 0.001 U | 0.001 U | 0.00002 U | 0.001 U | 0.002 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | 0.005 U | 0.001 U | 0.001 U | 0.019 | 0.001 U | 0.001 U | 0.0027 | 0.1 U |
| | 02/01/00 | 0.001 U | 0.001 U | 0.00002 U | 0.001 U | 0.002 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 UJ | 0.001 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 UJ | 0.001 U | 0.005 U | 0.005 U | 0.001 U | 0.001 UJ | 0.0098 J | 0.001 U | 0.001 U | 0.004 | 0.1 U |
| | 05/01/00 | 0.001 U | 0.001 U | 0.00002 UJ | 0.001 U | 0.002 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | 0.005 U | 0.001 U | 0.001 U | 0.022 | 0.001 U | 0.001 U | 0.0094 | 0.1 U |
| | 07/31/00 | 0.001 U | 0.001 U | 0.00002 U | 0.001 U | 0.002 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | 0.005 U | 0.001 U | 0.001 U | 0.021 | 0.001 U | 0.001 U | 0.012 | 0.1 U |
| | 11/14/00 | 0.001 U | 0.001 U | 0.00002 U | 0.001 U | 0.002 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | 0.005 U | 0.001 U | 0.001 U | 0.012 | 0.001 U | 0.001 U | 0.001 U | 0.1 U |
| | 02/01/01 | 0.001 U | 0.001 U | **0.00015** | 0.001 U | 0.002 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | 0.001 U | 0.001 U | 0.001 UJ | 0.001 UJ | 0.001 U | 0.005 U | 0.005 U | 0.001 U | 0.001 UJ | 0.014 | 0.001 U | 0.001 UJ | 0.0012 | 0.1 U |
| | 05/01/01 | 0.001 U | 0.001 U | 0.00002 U | 0.001 U | 0.002 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | 0.005 U | 0.001 U | 0.001 U | 0.0089 | 0.001 U | 0.001 U | 0.001 U | 0.1 U |
| | 08/06/01 | 0.001 U | 0.001 U | 0.00002 U | 0.001 U | 0.002 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | 0.005 U | 0.001 U | 0.001 U | 0.014 | 0.001 U | 0.001 U | 0.0022 | 0.1 U |
| | 11/12/01 | 0.001 U | 0.001 U | 0.00002 U | 0.001 U | 0.002 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | 0.005 U | 0.001 U | 0.001 U | 0.01 | 0.001 U | 0.001 U | 0.001 U | 0.1 U |
| | 02/05/02 | 0.0002 U | 0.0002 U | 0.00002 U | 0.0002 U | 0.0003 U | 0.001 U | 0.0002 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.0003 | 0.0002 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.001 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 | 0.0004 U | 0.02 U |
| | 05/02/02 | 0.0002 U | 0.0002 U | 0.00002 U | 0.0002 U | 0.0003 U | 0.001 U | 0.0002 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.0003 | 0.0002 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.001 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0065 | 0.0002 U | 0.0002 | 0.0011 | 0.02 U |
| | 08/05/02 | 0.0002 U | 0.0002 U | 0.00002 U | 0.0002 U | 0.0003 U | 0.0021 UJ | 0.0002 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.0003 | 0.0002 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 | 0.0002 U | 0.0002 U | 0.001 U | 0.001 U | 0.0002 U | 0.0002 U | 0.018 J | 0.0002 U | 0.0002 U | 0.0085 | 0.02 U |
| | 11/16/02 | 0.0004 U | 0.0004 U | 0.00002 U | 0.0004 U | 0.0006 U | 0.002 U | 0.0004 U | 0.00002 U | 0.0004 U | 0.0004 U | 0.0004 U | 0.0004 U | 0.002 U | 0.0004 U | 0.0004 U | 0.0004 U | 0.0004 U | 0.0004 U | 0.002 U | 0.002 U | 0.0004 U | 0.0004 U | 0.016 | 0.0004 U | 0.0004 U | 0.004 | 0.04 U |
| | 02/04/03 | 0.0004 U | 0.0004 U | 0.00002 U | 0.0004 U | 0.0006 U | 0.002 U | 0.0004 U | 0.00002 U | 0.0004 U | 0.0004 U | 0.0004 U | 0.0004 U | 0.002 U | 0.0004 U | 0.0004 U | 0.0004 U | 0.0004 U | 0.0004 U | 0.002 U | 0.002 U | 0.0004 U | 0.0004 U | 0.016 | 0.0004 U | 0.0004 U | 0.0008 U | 0.04 U |
| | 05/05/03 | 0.0002 U | 0.0002 U | 0.00002 U | 0.0002 U | 0.0003 U | 0.0015 | 0.0002 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.0002 | 0.0002 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.001 U | 0.001 U | 0.0002 U | 0.0002 U | 0.010 | 0.0002 U | 0.0003 | 0.0004 U | 0.02 U |
| | 07/22/03 | 0.0004 U | 0.0004 U | 0.00002 U | 0.0004 U | 0.0006 U | 0.002 U | 0.0004 U | 0.00002 U | 0.0004 U | 0.0004 U | 0.0004 U | 0.0004 U | 0.002 U | 0.0004 U | 0.0004 U | 0.0004 U | 0.0004 U | 0.0004 U | 0.002 U | 0.002 U | 0.0004 U | 0.0004 U | 0.022 | 0.0004 U | 0.0004 U | 0.0056 | 0.04 U |
| | 11/04/03 | 0.0004 U | 0.0004 U | 0.00002 U | 0.0004 U | 0.0006 U | 0.003 U | 0.0004 U | 0.00002 U | 0.0004 U | 0.0004 U | 0.0004 U | 0.0004 U | 0.002 U | 0.0004 U | 0.0004 U | 0.0004 U | 0.0004 U | 0.0004 U | 0.002 U | 0.002 U | 0.0004 U | 0.0004 U | 0.023 | 0.0004 U | 0.0004 U | 0.0077 | 0.08 U |
| | 01/21/04 | 0.0002 U | 0.0002 U | 0.00002 U | 0.0002 U | 0.0003 U | 0.001 U | 0.0002 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.0002 | 0.0002 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.001 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0005 | 0.0004 U | 0.04 U |
| | 04/14/04 | 0.0002 U | 0.0002 U | 0.00002 U | 0.0002 U | 0.0003 U | 0.001 U | 0.0002 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.0002 | 0.0002 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.001 U | 0.001 U | 0.0002 U | 0.0002 U | 0.015 | 0.0002 U | 0.0004 | 0.0004 U | 0.04 U |
| | 07/13/04 | 0.0002 U | 0.0002 U | 0.00002 U | 0.0002 U | 0.0003 U | 0.001 U | 0.0002 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.0002 | 0.0002 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 | 0.0002 U | 0.0002 U | 0.001 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0094 | 0.0002 U | 0.0002 U | 0.0004 | 0.04 U |
| | 10/01/04 | 0.0002 U | 0.0002 U | 0.00002 U | 0.0002 U | 0.0003 U | 0.001 U | 0.0002 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.0002 | 0.0002 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.001 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0034 | 0.0002 U | 0.0005 | 0.0004 U | 0.04 U |
| | 01/12/05 | 0.0002 U | 0.0002 U | **0.000079 J** | 0.0002 U | 0.0003 U | 0.001 U | 0.0002 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.001 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0029 | 0.0002 U | 0.0003 | 0.0004 U | 0.04 U |
| | 04/09/05 | 0.0002 U | 0.0002 U | 0.00002 U | 0.0002 U | 0.0003 U | 0.001 U | 0.0002 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.001 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0031 | 0.0002 U | 0.0002 | 0.0013 | 0.04 U |
| | 10/17/05 | 0.0002 U | 0.0002 U | 0.00002 U | 0.0002 U | 0.0003 U | 0.001 U | 0.0002 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.0004 | 0.0002 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.001 U | 0.001 U | 0.0002 U | 0.0002 U | 0.015 | 0.0002 U | 0.0002 U | 0.0124 | 0.04 U |
| | 04/19/06 | 0.0002 U | 0.0002 U | 0.00002 U | 0.0002 U | 0.0003 U | 0.001 U | 0.0002 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.0009 | 0.0002 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.001 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0028 | 0.0002 U | 0.0002 | 0.0004 U | 0.04 U |
| | 10/17/06 | 0.0002 U | 0.0002 U | 0.00002 U | 0.0002 U | 0.0003 U | 0.003 U | 0.0002 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.0007 | 0.0002 U | 0.001 U | 0.0002 U | 0.0002 U | 0.00016 | 0.0002 U | 0.0002 U | 0.001 U | 0.003 U | 0.00002 U | 0.0002 U | 0.017 D | 0.0002 U | 0.0002 U | 0.0063 | 0.04 U |
| | 04/03/07 | 0.0002 U | 0.0002 U | 0.00002 U | 0.0002 U | 0.0003 U | 0.003 U | 0.0002 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.0015 | 0.0002 U | 0.001 U | 0.0002 U | 0.0002 U | 0.000051 | 0.0002 U | 0.0002 U | 0.001 U | 0.003 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 | 0.0004 U | 0.04 U |
| | 10/25/07 | 0.0002 U | 0.0002 U | 0.00002 U | 0.0002 U | 0.0003 U | 0.003 U | 0.0002 U | 0.00002 U | 0.0002 U | 0.0002 U | **0.013** | 0.0002 U | 0.001 U | 0.0002 U | 0.0002 U | 0.00016 | 0.0002 U | 0.0002 U | 0.001 U | 0.003 U | 0.000039 | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0006 | 0.04 U |
| | 04/01/08 | 0.0002 U | 0.0005 U | 0.00002 U | 0.0002 U | 0.0005 U | 0.003 U | 0.0002 U | 0.00002 U | 0.0002 U | 0.00002 U | 0.0016 | 0.0002 U | 0.0025 U | 0.0002 U | 0.0002 U | 0.00015 | 0.0002 U | 0.0002 U | 0.0025 U | 0.0025 U | 0.000062 | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U | 0.04 UJ |
| | 10/07/08 | 0.0002 U | 0.0005 U | 0.00002 U | 0.0002 U | 0.0005 U | 0.003 U | 0.0002 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.0026 | 0.0002 U | 0.0025 U | 0.0002 U | 0.0002 U | 0.00011 | 0.0002 U | 0.0002 U | 0.0025 U | 0.0025 U | 0.000021 | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 | 0.0004 U | 0.04 U |
| | 04/06/09 | 0.0002 U | 0.0005 U | 0.00002 U | 0.0002 U | 0.0005 U | 0.0025 U | 0.0002 U | 0.00002 U | 0.0002 U | 0.0002 U | **0.013** | 0.0002 U | 0.0025 U | 0.0002 U | 0.0004 | 0.00005 | 0.0002 U | 0.0002 U | 0.0025 U | 0.0025 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U | 0.02 U |
| | 10/27/09 | 0.0005 U | 0.0005 U | 0.00002 U | 0.0002 U | 0.0005 U | 0.0051 U | 0.0002 U | 0.00002 U | 0.0002 U | 0.0002 U | **0.015** | 0.0002 U | 0.005 U | 0.0002 U | 0.0004 | 0.000058 | 0.0002 U | 0.0002 U | 0.005 U | 0.005 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0006 | 0.0004 U | 0.02 UJ |
| | 04/06/10 | 0.0005 U | 0.0005 U | 0.00002 U | 0.0002 U | 0.0005 U | 0.005 U | 0.0002 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.0036 | 0.0002 U | 0.005 U | 0.0002 U | 0.0002 U | 0.000084 | 0.0002 U | 0.0002 U | 0.005 U | 0.005 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 | 0.0004 U | 0.02 U |

**Table 16-8**
**Summary of Groundwater Analytical Results for Volatile Organic Compounds, (mg/L)**
**Building 40-56**
**Boeing Everett Plant**

| Well ID | Sample Date | Chloromethane | Bromomethane | Vinyl Chloride | Chloroethane | Methylene Chloride | Acetone | Carbon Disulfide | 1,1-DCE | 1,1-DCA | cis-1,2-DCE | Chloroform | 1,2-DCA | MEK |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MTCA Method A or B Groundwater Screening Level | | 0.00337 (B) | 0.0112 (B) | 0.0002 (A) 0.0000292 (B) | 0.015 (B) | 0.005 (A) 0.00583 (B) | 0.8 (B) | 0.8 (B) | 0.4 (B) | 1.6 (B) | 0.08 (B) | 0.00717 (B) | 0.005 (A) 0.000481 (B) | 4.8 (B) |
| **EGW010** | 01/31/95 | **0.033** | **0.081** | 0.002 U | 0.002 U | 0.002 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | **0.012** | NA | 0.005 U |
| | 05/01/95 | **0.029** | **0.039** | 0.002 U | 0.002 U | 0.002 U | 0.012 J | 0.001 U | 0.001 U | 0.001 U | 0.001 U | **0.012** | NA | 0.005 U |
| | 08/10/95 | **0.014** | **0.06** | 0.002 U | 0.002 U | 0.002 U | 0.011 | 0.001 U | 0.001 U | 0.001 U | 0.001 U | **0.01** | NA | 0.005 U |
| | 11/09/95 | **0.021** | **0.015** | 0.002 U | 0.002 U | 0.002 U | 0.008 | 0.001 U | 0.001 U | 0.001 U | 0.001 U | **0.012** | NA | 0.005 U |
| | 02/29/96 | **0.097** | 0.0084 | 0.002 U | 0.002 U | 0.002 U | 0.0078 | 0.001 U | 0.001 U | 0.001 U | 0.001 U | **0.01** | NA | 0.005 U |
| | 08/27/96 | **0.0041** | 0.0091 | 0.002 U | 0.002 U | 0.002 U | 0.0054 | 0.001 U | 0.001 U | 0.001 U | 0.001 U | **0.012** | NA | 0.005 U |
| | 12/03/96 | **0.0039** | **0.019** | 0.002 U | 0.002 U | 0.002 U | 0.0076 | 0.001 U | 0.001 U | 0.001 U | 0.001 U | **0.01** | NA | 0.005 U |
| | 03/10/97 | **0.01** | **0.053** | 0.002 U | 0.002 U | 0.002 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | **0.015** | NA | 0.005 U |
| | 05/22/97 | **0.0062** | **0.017** | **0.00048 J** | 0.002 U | 0.002 U | 0.007 | 0.001 U | 0.001 U | 0.001 U | 0.001 U | **0.013** | NA | 0.005 U |
| | 08/12/97 | 0.002 | **0.0073** | **0.00048 J** | 0.002 U | 0.002 U | 0.0056 | 0.001 U | 0.001 U | 0.001 U | 0.001 U | **0.02** | NA | 0.005 U |
| | 11/17/97 | **0.0052** | **0.012** | 0.00001 U | 0.002 U | 0.002 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | **0.017** | NA | 0.005 U |
| | 03/09/98 | **0.0039** | 0.0029 | 0.00001 U | 0.002 U | 0.002 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | **0.016** | 0.001 U | 0.005 U |
| | 05/12/98 | 0.0022 | 0.0032 | 0.00001 U | 0.002 U | 0.002 U | 0.0071 U* | 0.001 U | 0.001 U | 0.001 U | 0.001 U | **0.017** | 0.001 U | 0.005 U |
| | 08/11/98 | 0.002 U | 0.0021 | 0.00001 U | 0.002 U | 0.002 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | **0.014** | 0.001 U | 0.005 U |
| | 11/09/98 | 0.002 U | 0.0022 | 0.00001 U | 0.002 U | 0.002 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | **0.016** | 0.001 U | 0.005 U |
| | 02/01/99 | 0.0044 | 0.0052 | 0.00001 U | 0.002 U | 0.002 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | **0.015** | 0.001 U | 0.005 U |
| | 05/10/99 | 0.001 U | 0.001 U | 0.00002 U | 0.001 U | 0.002 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | **0.016** | 0.001 U | 0.005 U |
| | 08/02/99 | **0.0094** | 0.0035 | 0.00002 U | 0.001 U | 0.002 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | **0.015** | 0.001 U | 0.005 U |
| | 11/08/99 | 0.001 U | 0.001 U | 0.00002 U | 0.001 U | 0.002 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | **0.014** | 0.001 U | 0.005 U |
| | 01/31/00 | 0.003 | 0.01 | **0.0017** | 0.001 U | 0.002 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | **0.015** | 0.001 U | 0.005 U |
| | 05/01/00 | 0.001 U | 0.001 U | 0.00002 UJ | 0.001 U | 0.002 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | **0.015** | 0.001 U | 0.005 U |
| | 08/07/00 | 0.001 U | 0.0016 | 0.00002 U | 0.001 U | 0.002 U | 0.005 U | 0.0058 J | 0.001 U | 0.001 U | 0.001 U | **0.016** | 0.001 U | 0.005 U |
| | 11/13/00 | 0.0028 | **0.012** | 0.00002 U | 0.001 U | 0.002 U | 0.005 U | 0.0021 | 0.001 U | 0.001 U | 0.001 U | **0.018** | 0.001 U | 0.005 U |
| | 02/01/01 | 0.0036 | 0.001 U | 0.00002 U | 0.001 U | 0.002 U | 0.005 U | 0.002 | 0.001 U | 0.001 U | 0.001 U | **0.018** | 0.001 U | 0.005 U |
| | 05/01/01 | **0.0072** | **0.014** | 0.00002 U | 0.001 U | 0.002 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | **0.017** | 0.001 U | 0.005 U |
| | 08/06/01 | 0.001 U | 0.001 U | 0.00002 U | 0.001 U | 0.002 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | **0.015** | 0.001 U | 0.005 U |
| | 11/12/01 | 0.0016 | 0.0035 | 0.00002 U | 0.001 U | 0.002 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | **0.017** | 0.001 U | 0.005 U |
| | 02/04/02 | 0.0002 U | 0.0002 U | 0.00002 U | 0.0002 U | 0.0004 | 0.0011 UJ | 0.0002 | 0.00002 U | 0.0002 | 0.0004 | **0.013** | 0.0002 U | 0.001 U |
| | 05/06/02 | 0.0002 U | 0.0002 U | 0.00002 U | 0.0002 U | 0.0003 U | 0.002 | 0.0002 U | 0.00002 U | 0.0002 | 0.0004 | **0.014** | 0.0002 U | 0.001 U |
| | 08/05/02 | 0.0002 U | 0.0002 U | 0.00002 U | 0.0002 U | 0.0003 U | 0.001 U | 0.0002 U | 0.00002 U | 0.0002 U | 0.0003 | **0.011** | 0.0002 U | 0.001 U |
| | 11/16/02 | 0.0002 U | 0.0002 U | 0.00002 U | 0.0002 U | 0.0003 U | 0.001 UJ | 0.0002 U | 0.00002 U | 0.0002 U | 0.0002 | **0.0084** | 0.0002 U | 0.001 U |
| | 02/04/03 | 0.0002 U | 0.0002 U | 0.00002 U | 0.0002 U | 0.0003 U | 0.0012 J | 0.0002 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.0027 | 0.0002 U | 0.001 U |
| | 05/05/03 | 0.0002 U | 0.0002 U | 0.00002 U | 0.0002 U | 0.0003 U | 0.0014 | 0.0002 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.0006 | 0.0002 U | 0.001 U |
| | 07/22/03 | 0.0002 U | 0.0002 U | 0.00002 U | 0.0002 U | 0.0003 U | 0.001 U | 0.0002 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.0007 | 0.0002 U | 0.001 U |
| | 11/04/03 | 0.0002 U | 0.0002 U | 0.00002 U | 0.0002 U | 0.0003 U | 0.001 U | 0.0002 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.0007 | 0.0002 U | 0.001 U |
| | 01/21/04 | 0.0002 U | 0.0002 U | 0.00002 U | 0.0002 U | 0.0003 U | 0.001 U | 0.0002 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.0008 | 0.0002 U | 0.001 U |
| | 04/14/04 | 0.0002 U | 0.0002 U | 0.00002 U | 0.0002 U | 0.0003 U | 0.001 U | 0.0002 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.0005 | 0.0002 U | 0.001 U |
| | 07/13/04 | 0.0002 U | 0.0002 U | 0.00002 U | 0.0002 U | 0.0003 U | 0.001 U | 0.0002 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.0005 | 0.0002 U | 0.001 U |
| | 10/01/04 | 0.0002 U | 0.0002 U | 0.00002 U | 0.0002 U | 0.0003 U | 0.001 U | 0.0002 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.0002 | 0.0002 U | 0.001 U |
| | 01/11/05 | 0.0002 U | 0.0002 U | 0.00002 U | 0.0002 U | 0.0003 U | 0.001 U | 0.0002 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.001 U |
| | 04/11/05 | 0.0002 U | 0.0002 U | 0.00002 U | 0.0002 U | 0.0003 U | 0.001 U | 0.0002 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.001 U |
| | 10/17/05 | 0.0002 U | 0.0002 U | 0.00002 U | 0.0002 U | 0.0003 U | 0.002 U | 0.0002 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.001 U |
| | 04/19/06 | 0.0002 U | 0.0002 U | 0.00002 U | 0.0002 U | 0.0003 U | 0.001 U | 0.0002 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.001 U |
| | 10/17/06 | 0.0002 U | 0.0002 U | 0.00002 U | 0.0002 U | 0.0003 U | 0.003 U | 0.0002 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.001 U |
| | 04/03/07 | 0.0002 U | 0.0002 U | 0.00002 U | 0.0002 U | 0.0003 U | 0.003 U | 0.0002 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.001 U |
| | 10/25/07 | 0.0002 U | 0.0002 U | 0.00002 U | 0.0002 U | 0.0003 U | 0.003 U | 0.0002 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.001 U |
| | 04/01/08 | 0.0002 U | 0.0005 U | 0.00002 U | 0.0002 U | 0.0005 U | 0.003 U | 0.0002 U | 0.00002 U | 0.0002 U | 0.000054 | 0.0002 U | 0.0002 U | 0.0025 U |
| | 10/07/08 | 0.0002 U | 0.0005 U | 0.00002 U | 0.0002 U | 0.0005 U | 0.003 U | 0.0002 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0025 U |
| | 04/06/09 | 0.0002 U | 0.0005 U | 0.00002 U | 0.0002 U | 0.0005 U | 0.0025 U | 0.0002 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0025 U |
| | 10/27/09 | 0.0005 U | 0.0005 U | 0.00002 U | 0.0002 U | 0.0005 U | 0.005 U | 0.0002 U | 0.00002 U | 0.0002 U | 0.0002 | 0.0002 U | 0.0002 U | 0.005 U |
| | 04/06/10 | 0.0005 U | 0.0005 U | 0.00002 U | 0.0002 U | 0.0005 U | 0.005 U | 0.0002 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.005 U |

| Well ID | Sample Date | 1,1,1-TCA | BDCM | TCE | Benzene | Bromoform | MIBK | 2-Hexanone | PCE | Toluene | Ethylbenzene | Styrene | TCFM | Total Xylenes | Cyclohexanone |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MTCA Method A or B Groundwater Screening Level | | 0.2 (A) 7.2 (B) 16 (B*) | 0.000706 (B) | 0.005 (A) 0.00049 (B) | 0.005 (A) 0.000795 (B) | 0.00554 (B) | 0.64 (B) | NE | 0.005 (A) 0.000081 (B) | 1 (A) 0.64 (B) | 0.7 (A) 0.8 (B) | 0.0015 (B) | 2.4 (B) | 1 (A) 1.6 (B) | 40 (B) |
| **EGW010** | 01/31/95 | NA | NA | NA | 0.001 U | NA | 0.005 U | 0.005 U | NA | 0.001 U | 0.001 U | NA | NA | 0.002 U | 0.1 U |
| | 05/01/95 | NA | NA | NA | 0.001 U | NA | 0.005 U | 0.005 U | NA | 0.001 U | 0.001 U | NA | NA | 0.002 U | 0.1 U |
| | 08/10/95 | NA | NA | NA | 0.001 U | NA | 0.005 U | 0.005 U | NA | 0.001 U | 0.001 U | NA | NA | 0.002 U | 0.1 U |
| | 11/09/95 | NA | NA | NA | 0.001 U | NA | 0.005 U | 0.005 U | NA | 0.001 U | 0.001 U | NA | NA | 0.002 U | 0.1 U |
| | 02/29/96 | NA | NA | NA | 0.001 U | NA | 0.005 U | 0.005 U | NA | 0.001 U | 0.001 U | NA | NA | 0.001 U | 0.1 U |
| | 08/27/96 | NA | NA | NA | 0.001 U | NA | 0.005 U | 0.005 U | NA | 0.001 U | 0.001 U | NA | NA | 0.001 U | 0.1 U |
| | 12/03/96 | NA | NA | NA | 0.001 U | NA | 0.005 U | 0.005 U | NA | 0.001 U | 0.001 U | NA | NA | 0.001 U | 0.1 U |
| | 03/10/97 | NA | NA | NA | 0.001 U | NA | 0.005 U | 0.005 U | NA | 0.001 U | 0.001 U | NA | NA | 0.001 U | 0.1 U |
| | 05/22/97 | NA | NA | NA | 0.001 U | NA | 0.005 U | 0.005 U | NA | 0.001 U | 0.001 U | NA | NA | 0.001 U | 0.1 U |
| | 08/12/97 | NA | NA | NA | 0.001 U | NA | 0.005 U | 0.005 U | NA | 0.001 U | 0.001 U | NA | NA | 0.001 U | 0.1 U |
| | 11/17/97 | NA | NA | NA | 0.001 U | NA | 0.005 U | 0.005 U | NA | 0.001 U | 0.001 U | NA | NA | 0.001 U | 0.1 U |
| | 03/09/98 | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.002 U | 0.002 U | 0.001 U | 0.1 U |
| | 05/12/98 | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.002 U | 0.002 U | 0.001 U | 0.1 U |
| | 08/11/98 | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.002 U | 0.002 UJ | 0.001 U | 0.1 U |
| | 11/09/98 | 0.001 U | 0.001 U | 0.001 UJ | 0.001 U | 0.001 U | 0.005 U | 0.005 U | 0.001 U | 0.001 UJ | 0.001 U | 0.002 U | 0.002 UJ | 0.001 U | 0.1 U |
| | 02/01/99 | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.002 U | 0.001 U | 0.1 U |
| | 05/10/99 | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.1 U |
| | 08/02/99 | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.1 U |
| | 11/08/99 | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.0012 | 0.001 U | 0.1 U |
| | 01/31/00 | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.0014 | 0.001 U | 0.1 U |
| | 05/01/00 | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.0012 | 0.001 U | 0.1 U |
| | 08/07/00 | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.1 U |
| | 11/13/00 | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.1 U |
| | 02/01/01 | 0.001 U | 0.001 U | 0.001 UJ | 0.001 UJ | 0.001 U | 0.005 U | 0.005 U | 0.001 U | 0.001 UJ | 0.001 U | 0.001 U | 0.001 UJ | 0.001 U | 0.1 U |
| | 05/01/01 | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.1 U |
| | 08/06/01 | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.1 U |
| | 11/12/01 | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.1 U |
| | 02/04/02 | 0.0003 | 0.0003 | 0.0002 | 0.0002 U | 0.0002 U | 0.001 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0012 | 0.0004 U | 0.02 U |
| | 05/06/02 | 0.0002 | 0.0002 | 0.0002 U | 0.0002 U | 0.0002 U | 0.001 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0007 | 0.0002 U | 0.02 U |
| | 08/05/02 | 0.0002 U | 0.0002 U | 0.0002 | 0.0002 U | 0.0002 U | 0.001 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0005 | 0.0002 U | 0.02 U |
| | 11/16/02 | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.001 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 | 0.0004 U | 0.02 U |
| | 02/04/03 | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.001 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U | 0.02 U |
| | 05/05/03 | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.001 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U | 0.02 U |
| | 07/22/03 | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.001 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U | 0.02 U |
| | 11/04/03 | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.001 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U | 0.04 U |
| | 01/21/04 | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.001 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U | 0.04 U |
| | 04/14/04 | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.001 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U | 0.04 U |
| | 07/13/04 | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.001 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U | 0.04 U |
| | 10/01/04 | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.001 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U | 0.04 U |
| | 01/11/05 | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.001 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U | 0.04 U |
| | 04/11/05 | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.001 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U | 0.04 U |
| | 10/17/05 | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.001 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U | 0.04 U |
| | 04/19/06 | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.001 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U | 0.04 U |
| | 10/17/06 | 0.0002 U | 0.0002 U | 0.00013 | 0.0002 U | 0.0002 U | 0.001 U | 0.003 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U | 0.04 U |
| | 04/03/07 | 0.0002 U | 0.0002 U | 0.00011 | 0.0002 U | 0.0002 U | 0.001 U | 0.003 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U | 0.04 U |
| | 10/25/07 | 0.0002 U | 0.0002 U | 0.000084 | 0.0002 U | 0.0002 U | 0.001 U | 0.003 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U | 0.04 U |
| | 04/01/08 | 0.0002 U | 0.0002 U | 0.00009 | 0.0002 U | 0.0002 U | 0.0025 U | 0.0025 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U | 0.04 UJ |
| | 10/07/08 | 0.0002 U | 0.0002 U | 0.00011 | 0.0002 U | 0.0002 U | 0.0025 U | 0.0025 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U | 0.04 U |
| | 04/06/09 | 0.0002 U | 0.0002 U | 0.000073 | 0.0002 U | 0.0002 U | 0.0025 U | 0.0025 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U | 0.02 U |
| | 10/27/09 | 0.0002 U | 0.0002 U | 0.0001 | 0.0002 U | 0.0002 U | 0.005 U | 0.005 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U | 0.02 UJ |
| | 04/06/10 | 0.0002 U | 0.0002 U | 0.000081 | 0.0002 U | 0.0002 U | 0.005 U | 0.005 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U | 0.02 U |

**Table 16-8**

**Summary of Groundwater Analytical Results for Volatile Organic Compounds, (mg/L)**

**Building 40-56**

**Boeing Everett Plant**

| Well ID | Sample Date | Chloromethane | Bromomethane | Vinyl Chloride | Chloroethane | Methylene Chloride | Acetone | Carbon Disulfide | 1,1-DCE | 1,1-DCA | cis-1,2-DCE | Chloroform | 1,2-DCA | MEK | 1,1,1-TCA | BDCM | TCE | Benzene | Bromoform | MIBK | 2-Hexanone | PCE | Toluene | Ethylbenzene | Styrene | TCFM | Total Xylenes | Cyclohexanone |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MTCA Method A or B Groundwater Screening Level | | 0.00337 (B) | 0.0112 (B) | 0.0002 (A)<br>0.0000292 (B) | 0.015 (B) | 0.005 (A)<br>0.00583 (B) | 0.8 (B) | 0.8 (B) | 0.4 (B) | 1.6 (B) | 0.08 (B) | 0.00717 (B) | 0.005 (A)<br>0.000481 (B) | 4.8 (B) | 0.2 (A)<br>7.2 (B)<br>16 (B*) | 0.000706 (B) | 0.005 (A)<br>0.00049 (B) | 0.005 (A)<br>0.000795 (B) | 0.00554 (B) | 0.64 (B) | NE | 0.005 (A)<br>0.000081 (B) | 1 (A)<br>0.64 (B) | 0.7 (A)<br>0.8 (B) | 0.0015 (B) | 2.4 (B) | 1 (A)<br>1.6 (B) | 40 (B) |
| **EGW040**[2] | 02/14/95 | 0.002 U | 0.002 U | 0.002 U | 0.002 U | 0.002 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | NA | 0.005 U | NA | NA | NA | 0.001 U | NA | 0.005 U | 0.005 U | NA | 0.001 U | 0.001 U | NA | NA | 0.001 U | 0.1 U |
| | 04/28/95 | 0.002 U | 0.002 U | 0.002 U | 0.002 U | 0.002 U | 0.005 UJ | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | NA | 0.005 U | NA | NA | NA | 0.001 U | NA | 0.005 U | 0.005 U | NA | 0.001 U | 0.001 U | NA | NA | 0.001 U | 0.1 U |
| | 08/02/95 | 0.002 U | 0.002 U | 0.002 U | 0.002 U | 0.002 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | NA | 0.005 U | NA | NA | NA | 0.001 U | NA | 0.005 U | 0.005 U | NA | 0.001 U | 0.001 U | NA | NA | 0.001 U | 0.1 U |
| | 11/14/95 | 0.002 U | 0.002 U | 0.002 U | 0.002 U | 0.002 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | NA | 0.005 U | NA | NA | NA | 0.001 U | NA | 0.005 U | 0.005 U | NA | 0.001 U | 0.001 U | NA | NA | 0.001 U | 0.1 U |
| | 03/06/96 | 0.002 U | 0.002 U | 0.002 U | 0.002 U | 0.002 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | NA | 0.005 U | NA | NA | NA | 0.001 U | NA | 0.005 U | 0.005 U | NA | 0.001 U | 0.001 U | NA | NA | 0.001 U | 0.1 U |
| | 06/05/96 | 0.002 U | 0.002 U | 0.002 U | 0.002 U | 0.002 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | NA | 0.005 U | NA | NA | NA | 0.001 U | NA | 0.005 U | 0.005 U | NA | 0.001 U | 0.001 U | NA | NA | 0.001 U | 0.1 U |
| | 08/21/96 | 0.002 U | 0.002 U | 0.002 U | 0.002 U | 0.002 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | NA | 0.005 U | NA | NA | NA | 0.001 U | NA | 0.005 U | 0.005 U | NA | 0.001 U | 0.001 U | NA | NA | 0.001 U | 0.1 U |
| | 12/02/96 | 0.002 U | 0.002 U | 0.002 U | 0.002 U | 0.002 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | NA | 0.005 U | NA | NA | NA | 0.001 U | NA | 0.005 U | 0.005 U | NA | 0.001 U | 0.001 U | NA | NA | 0.001 U | 0.1 U |
| | 03/04/97 | 0.002 U | 0.002 U | 0.002 U | 0.002 U | 0.002 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | NA | 0.005 U | NA | NA | NA | 0.001 U | NA | 0.005 U | 0.005 U | NA | 0.001 U | 0.001 U | NA | NA | 0.001 U | 0.1 U |
| | 05/22/97 | 0.002 U | 0.002 U | 0.000015 | 0.002 U | 0.002 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | NA | 0.005 U | NA | NA | NA | 0.001 U | NA | 0.005 U | 0.005 U | NA | 0.001 U | 0.001 U | NA | NA | 0.001 U | 0.1 U |
| | 08/11/97 | 0.002 U | 0.002 U | 0.00001 UJ | 0.002 U | 0.002 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | NA | 0.005 U | NA | NA | NA | 0.001 U | NA | 0.005 U | 0.005 U | NA | 0.001 U | 0.001 U | NA | NA | 0.001 U | 0.1 U |
| | 08/11/97 (DUP) | 0.002 U | 0.002 U | 0.00001 UJ | 0.002 U | 0.002 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | NA | 0.005 U | NA | NA | NA | 0.001 U | NA | 0.005 U | 0.005 U | NA | 0.001 U | 0.001 U | NA | NA | 0.001 U | 0.1 U |
| | 11/17/97 | 0.002 U | 0.002 U | 0.00001 U | 0.002 U | 0.002 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | NA | 0.005 U | NA | NA | NA | 0.001 U | NA | 0.005 U | 0.005 U | NA | 0.001 U | 0.001 U | NA | NA | 0.001 U | 0.1 U |
| | 11/17/97 (DUP) | 0.002 U | 0.002 U | 0.00001 U | 0.002 U | 0.002 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | NA | 0.005 U | NA | NA | NA | 0.001 U | NA | 0.005 U | 0.005 U | NA | 0.001 U | 0.001 U | NA | NA | 0.001 U | 0.1 U |
| | 03/09/98 | 0.002 U | 0.002 U | 0.00001 U | 0.002 U | 0.002 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.002 U | 0.002 U | 0.001 U | 0.1 U |
| | 05/12/98 | 0.002 U | 0.002 U | 0.00001 U | 0.002 U | 0.002 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.002 U | 0.002 U | 0.001 U | 0.1 U |
| | 08/10/98 | 0.002 U | 0.002 U | 0.00001 U | 0.002 U | 0.002 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.002 U | 0.002 UJ | 0.001 U | 0.1 U |
| | 11/09/98 | 0.002 U | 0.002 U | 0.00001 U | 0.002 U | 0.002 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | 0.001 U | 0.001 U | 0.001 UJ | 0.001 U | 0.001 U | 0.005 U | 0.005 U | 0.001 U | 0.001 UJ | 0.001 U | 0.002 U | 0.002 UJ | 0.001 U | 0.1 U |
| **EGW043** | 05/02/95 | 0.002 | 0.002 U | 0.002 U | 0.013 | 0.0023 | 0.63 | 0.001 U | 0.22 | 0.22 | 0.001 U | 0.001 U | NA | 1.7 | NA | NA | NA | **0.0068** | NA | **4.2** | 0.005 U | NA | **6.2** | **5.3** | NA | NA | **49.8** | 3.50 J |
| | 11/13/95 | 0.002 UJ | 0.002 U | 0.002 UJ | 0.0083 | 0.0036 | **0.92** | 0.0017 | 0.14 | 0.14 | 0.002 | 0.001 U | NA | 1.4 | NA | NA | NA | **0.0047** | NA | **2.2** | 0.005 U | NA | **3.3** | **3.8** | NA | NA | **40.8** | 2 |
| | 02/29/96 | 0.36 U | 0.36 U | 0.36 U | 0.36 U | 0.36 U | **1** | 0.18 U | 0.18 U | 0.18 U | 0.18 U | 0.18 U | NA | 1.6 | NA | NA | NA | 0.18 U | NA | **2** | 0.9 U | NA | **3.0** | **3.3** | NA | NA | **36.2** | 18 U |
| | 06/04/96 | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 1.2 U | 0.25 U | 0.25 U | 0.25 U | 0.25 U | 0.25 U | NA | 1.2 U | NA | NA | NA | 0.25 U | NA | 1.2 U | 1.2 U | NA | **4.0** | **1.8** | NA | NA | **19** | 25 U |
| | 12/09/96 | 0.1 U | 0.1 U | 0.1 U | 0.1 U | 0.1 U | 0.25 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | NA | 0.25 U | NA | NA | NA | 0.05 U | NA | 0.25 U | 0.25 U | NA | **0.78** | 0.66 | NA | NA | **8.5** | 5 U |
| | 03/07/97 | 0.1 U | 0.1 U | 0.1 U | 0.1 U | 0.1 U | 0.53 | 0.05 U | 0.05 U | 0.18 | 0.05 U | 0.05 U | NA | 1.1 | NA | NA | NA | 0.05 U | NA | **2.8** | 0.25 U | NA | **4.8** | **5.6** | NA | NA | **51.9** | 5 U |
| | 05/22/97 | 0.5 U | 0.5 U | **0.00046** | 0.5 U | 0.5 U | 1.2 U | 0.25 U | 0.25 U | 0.25 U | 0.25 U | 0.25 U | NA | 1.2 U | NA | NA | NA | 0.25 U | NA | **2.3** | 1.2 U | NA | **5.0** | **5.5** | NA | NA | **57.6** | 25 U |
| | 08/11/97 | 0.36 U | 0.36 U | 0.36 U | 0.36 U | 0.36 U | 0.9 U | 0.18 U | 0.18 U | 0.27 | 0.18 U | 0.18 U | NA | 0.93 | NA | NA | NA | 0.18 U | NA | **2.4** | 0.9 U | NA | **6.3** | **5.6** | NA | NA | **52.9** | 18 U |
| | 11/17/97 | 0.3 U | 0.3 U | 0.002 U | 0.3 U | 0.3 U | 0.75 U | 0.15 U | 0.15 U | 0.18 | 0.15 U | 0.15 U | NA | 0.75 U | NA | NA | NA | 0.15 U | NA | **1.7** | 0.75 U | NA | **4.2** | **3.6** | NA | NA | **37.5** | 15 U |
| | 03/10/98 | 0.6 U | 0.6 U | 0.0025 U | 0.6 U | 0.6 U | 1.5 U | 0.3 U | 0.3 U | 0.3 U | 0.3 U | 0.3 U | 0.3 U | 1.5 U | 0.3 U | 0.3 U | 0.3 U | 0.3 U | 0.3 U | **1.8** | 1.5 U | **0.4** | **5.2** | **5.2** | 0.6 U | 0.6 U | **56.6** | 30 U |
| | 05/12/98 | 1 U | 1 U | 0.005 U | 1 U | 1 U | 2.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 2.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 2.5 U | 2.5 U | 0.5 U | **5.8** | **7.9** | 1 U | 1 U | **70.2** | 50 U |
| | 08/11/98 | 0.5 U | 0.5 U | 0.0025 U | 0.5 U | 0.5 U | 1.2 U | 0.25 U | 0.25 U | 0.25 U | 0.25 U | 0.25 U | 0.25 U | 1.2 U | 0.25 U | 0.25 U | 0.25 U | 0.25 U | 0.25 U | 1.2 U | 1.2 U | 0.25 U | **2.5** | **3.1** | 0.5 U | 0.5 UJ | **26.7** | 25 U |
| | 11/10/98 | 0.6 U | 0.6 U | **0.00027** | 0.6 U | 0.6 U | 1.5 U | 0.3 U | 0.3 U | 0.3 U | 0.3 U | 0.3 U | 0.3 U | 1.5 U | 0.3 U | 0.3 U | 0.3 U | 0.3 U | 0.3 U | 1.5 U | 1.5 U | 0.3 U | **2.8** | **4.0** | 0.6 U | 0.6 U | **38.9** | 30 U |
| | 02/02/99 | 0.6 U | 0.6 U | 0.0005 U | 0.6 U | 0.6 U | 1.5 U | 0.3 U | 0.3 U | 0.3 U | 0.3 U | 0.3 U | 0.3 U | 1.5 U | 0.3 U | 0.3 U | 0.3 U | 0.3 U | 0.3 U | 1.5 U | 1.5 U | 0.3 U | **2.6** | **3.1** | 0.6 U | 0.6 U | **29.9** | 30 U |
| | 05/11/99 | 0.05 U | 0.05 U | 0.0002 U | 0.05 U | 0.1 U | 0.25 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.25 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.25 U | 0.25 U | 0.05 U | **0.68** | **1.1** | 0.05 U | 0.05 UJ | **13.6** | 5 U |
| | 08/03/99 | 0.25 U | 0.25 U | 0.005 U | 0.25 U | 0.5 U | 1.2 U | 0.25 U | 0.25 U | 0.25 U | 0.25 U | 0.25 U | 0.25 U | 1.2 U | 0.25 U | 0.25 U | 0.25 U | 0.25 U | 0.25 U | **1.5** | 1.2 U | 0.25 U | **4.4** | **7.0** | 0.25 U | 0.25 U | **55** | 25 U |
| | 11/09/99 | 0.3 U | 0.3 U | **0.00027** | 0.3 U | 0.6 U | 1.5 U | 0.3 U | 0.3 U | 0.3 U | 0.3 U | 0.3 U | 0.3 U | 1.5 U | 0.3 U | 0.3 U | 0.3 U | 0.3 U | 0.3 U | 1.5 U | 1.5 U | 0.3 U | **2.4** | **3.4** | 0.3 U | 0.3 U | **35.5** | 30 U |
| | 02/01/00 | 0.3 U | 0.3 U | 0.0006 U | 0.3 U | 0.6 U | 1.5 U | 0.3 U | 0.3 U | 0.3 U | 0.3 U | 0.3 UJ | 0.3 U | 1.5 U | 0.3 U | 0.3 U | 0.3 U | 0.3 UJ | 0.3 U | 1.5 U | 1.5 U | 0.3 U | **3.0 J** | **4.9 J** | 0.3 U | 0.3 U | **45.9** | 30 U |
| | 05/02/00 | 0.3 U | 0.3 U | 0.0006 UJ | 0.3 U | 0.6 U | 1.5 U | 0.3 U | 0.3 U | 0.3 U | 0.3 U | 0.3 U | 0.3 U | 1.5 U | 0.3 U | 0.3 U | 0.3 U | 0.3 U | 0.3 U | 1.5 U | 1.5 U | 0.3 U | **2.9** | **5.2** | 0.3 U | 0.3 U | **44.6** | 30 U |
| | 07/31/00 | 0.3 U | 0.3 U | 0.00002 U | 0.3 U | 0.6 U | 1.5 U | 0.3 U | 0.3 U | 0.3 U | 0.3 U | 0.3 U | 0.3 U | 1.5 U | 0.3 U | 0.3 U | 0.3 U | 0.3 U | 0.3 U | 1.5 U | 1.5 U | 0.3 U | **2.9** | **4.2** | 0.3 U | 0.3 U | **45.4** | 30 U |
| | 11/14/00 | 0.3 U | 0.3 U | **0.00024** | 0.3 U | 0.6 U | 1.5 U | 0.3 U | 0.3 U | 0.3 U | 0.3 U | 0.3 U | 0.3 U | 1.5 U | 0.3 U | 0.3 U | 0.3 U | 0.3 U | 0.3 U | 1.5 U | 1.5 U | 0.3 U | **2.4** | **4.7** | 0.3 U | 0.3 U | **42.3** | 30 U |
| | 02/01/01 | 0.2 U | 0.2 U | **0.00023** | 0.2 U | 0.4 U | 1 U | 0.2 U | 0.2 U | 0.2 U | 0.2 U | 0.2 U | 0.2 U | 1 U | 0.2 U | 0.2 U | 0.2 UJ | 0.2 UJ | 0.2 U | 1 U | 1 U | 0.2 U | **2.3 J** | **4.3** | 0.2 U | 0.2 UJ | **46.2** | 20 U |
| | 05/01/01 | 0.25 U | 0.25 U | **0.00016** | 0.25 U | 0.5 U | 1.2 U | 0.25 U | 0.25 U | 0.25 U | 0.25 U | 0.25 U | 0.25 U | 1.2 U | 0.25 U | 0.25 U | 0.25 U | 0.25 U | 0.25 U | 1.2 U | 1.2 U | 0.25 U | **2.1** | **4.6** | 0.25 U | 0.25 U | **37.7** | 25 U |
| | 08/07/01 | 0.1 U | 0.1 U | **0.00014** | 0.1 U | 0.2 U | 0.5 U | 0.1 U | 0.1 U | 0.1 U | 0.1 U | 0.1 U | 0.1 U | 0.5 U | 0.1 U | 0.1 U | 0.1 U | 0.1 U | 0.1 U | 0.5 U | 0.5 U | 0.1 U | **1.6** | **3.4** | 0.1 U | 0.1 U | **25** | 10 U |
| | 11/13/01 | 0.25 U | 0.25 U | **0.00026** | 0.25 U | 0.5 U | 1.2 U | 0.25 U | 0.25 U | 0.25 U | 0.25 U | 0.25 U | 0.25 U | 1.2 U | 0.25 U | 0.25 U | 0.25 U | 0.25 U | 0.25 U | 1.2 U | 1.2 U | 0.25 U | **2.0** | **3.4** | 0.25 U | 0.25 U | **36.2** | 25 U |
| | 02/05/02 | 0.15 U | 0.15 U | **0.00013** | 0.15 U | 0.3 U | 0.75 U | 0.15 U | 0.0019 | 0.15 U | 0.15 U | 0.15 U | 0.15 U | 0.75 U | 0.15 U | 0.15 U | 0.15 U | 0.15 U | 0.15 U | 0.75 U | 0.75 U | 0.15 U | **0.96** | **1.7** | 0.15 U | 0.15 U | **19** | 15 U |
| | 05/02/02 | 0.15 U | 0.15 U | **0.00026** | 0.15 U | 0.3 U | 0.75 U | 0.15 U | 0.0044 | 0.15 U | 0.15 U | 0.15 U | 0.15 U | 0.75 U | 0.15 U | 0.15 U | 0.15 U | 0.15 U | 0.15 U | 0.75 U | 0.75 U | 0.15 U | **2.1** | **4.9** | 0.15 U | 0.15 U | **46.5** | 15 U |
| | 08/06/02 | 0.3 U | 0.3 U | 0.0002 U | 0.3 U | 0.6 U | 1.5 U | 0.3 U | 0.0032 J | 0.3 U | 0.3 U | 0.3 U | 0.3 U | 1.5 U | 0.3 U | 0.3 U | 0.3 U | 0.3 U | 0.3 U | 1.5 U | 1.5 U | 0.3 U | 0.3 U | **10** | 0.3 U | 0.3 U | **49** | 30 U |
| | 11/16/02 | 0.2 U | 0.2 U | **0.00031** | 0.2 U | 0.4 U | 1 U | 0.2 U | 0.00077 J | 0.2 U | 0.2 U | 0.2 U | 0.2 U | 1 U | 0.2 U | 0.2 U | 0.2 U | 0.2 U | 0.2 U | 1 U | 1 U | 0.2 U | **0.85** | **1.6** | 0.2 U | 0.2 U | **21.3** | 20 U |
| | 02/04/03 | 0.2 U | 0.2 U | **0.000099** | 0.2 U | 0.3 U | 1 U | 0.2 U | 0.00091 | 0.2 U | 0.2 U | 0.2 U | 0.2 U | 1 U | 0.2 U | 0.2 U | 0.2 U | 0.2 U | 0.2 U | 1 U | 1 U | 0.2 U | **0.86** | **1.4** | 0.2 U | 0.2 U | **18.1** | 20 U |
| | 05/06/03 | 0.1 U | 0.1 U | 0.0004 U | 0.1 U | 0.2 U | 0.5 U | 0.1 U | 0.0018 | 0.1 U | 0.1 U | 0.1 U | 0.1 U | 0.5 U | 0.1 U | 0.1 U | 0.1 U | 0.1 U | 0.1 U | 0.5 U | 0.5 U | 0.1 U | **2.0** | **4.3** | 0.1 U | 0.1 U | **34.7** | 10 U |
| | 07/22/03 | 0.15 U | 0.15 U | 0.00035 | 0.15 U | 0.3 U | 0.75 U | 0.15 U | 0.0032 | 0.15 U | 0.15 U | 0.15 U | 0.15 U | 0.75 U | 0.15 U | 0.15 U | 0.15 U | 0.15 U | 0.15 U | 0.75 U | 0.75 U | 0.15 U | **2.1** | **5.4** | 0.15 U | 0.15 U | **42.3** | 15 U |
| | 11/04/03 | 0.15 U | 0.15 U | **0.00012** | 0.15 U | 0.3 U | 0.75 U | 0.15 U | 0.00059 | 0.15 U | 0.15 U | 0.15 U | 0.15 U | 0.75 U | 0.15 U | 0.15 U | 0.15 U | 0.15 U | 0.15 U | 0.75 U | 0.75 U | 0.15 U | 0.54 | **2.6** | 0.15 U | 0.15 U | **28.4** | 15 U |
| | 01/21/04 | 0.2 U | 0.2 U | **0.000096** | 0.2 U | 0.4 U | 1 U | 0.2 U | 0.0011 | 0.2 U | 0.2 U | 0.2 U | 0.2 U | 1 U | 0.2 U | 0.2 U | 0.2 U | 0.2 U | 0.2 U | 1 U | 1 U | 0.2 U | **0.66** | **1.4** | 0.2 U | 0.2 U | **17.9** | 20 U |
| | 04/14/04 | 0.1 U | 0.1 U | **0.000090** | 0.1 U | 0.2 U | 0.5 U | 0.1 U | 0.0012 | 0.1 U | 0.1 U | 0.1 U | 0.1 U | 0.5 U | 0.1 U | 0.1 U | 0.1 U | 0.1 U | 0.1 U | 0.5 U | 0.5 U | 0.1 U | **1.2** | **3.7** | 0.1 U | 0.1 U | **30.9** | 10 U |
| | 07/13/04 | 0.2 U | 0.2 U | **0.00032** | 0.2 U | 0.4 U | 1 U | 0.2 U | 0.0034 | 0.2 U | 0.2 U | 0.2 U | 0.2 U | 1 U | 0.2 U | 0.2 U | 0.2 U | 0.2 U | 0.2 U | 1 U | 1 U | 0.2 U | **2.1** | **36** | 0.2 U | 0.2 U | **61.4** | 20 U |
| | 10/01/04 | 0.3 U | 0.3 U | **0.0004** | 0.3 U | 0.6 U | 1.5 U | 0.3 U | 0.0028 | 0.3 U | 0.3 U | 0.3 U | 0.3 U | 1.5 U | 0.3 U | 0.3 U | 0.3 U | 0.3 U | 0.3 U | 1.5 U | 1.5 U | 0.3 U | **2.5** | **8.1** | 0.3 U | 0.3 U | **68.6** | 30 U |
| | 01/12/05 | 0.3 U | 0.3 U | **0.00016** | 0.3 U | 0.6 U | 1.5 U | 0.3 U | 0.0013 | 0.3 U | 0.3 U | 0.3 U | 0.3 U | 1.5 U | 0.3 U | 0.3 U | 0.3 U | 0.3 U | 0.3 U | 1.5 U | 1.5 U | 0.3 U | **1.1** | **3.4** | 0.3 U | 0.3 U | **28** | 30 U |
| | 04/11/05 | 0.1 U | 0.1 U | **0.000078** | 0.1 U | **0.41**** | 0.5 | 0.1 U | 0.00063 | 0.1 U | 0.1 U | 0.1 U | 0.1 U | 0.5 U | 0.1 U | 0.1 U | 0.1 U | 0.1 U | 0.1 U | 0.5 U | 0.5 U | 0.1 U | **0.96** | **3.1** | 0.1 U | 0.1 U | **31.5** | 10 U |
| | 10/17/05 | 0.15 U | 0.15 U | **0.00065 J** | 0.15 U | 0.3 U | 0.75 U | 0.15 U | 0.0010 J | 0.15 U | 0.15 U | 0.15 U | 0.15 U | 0.75 U | 0.15 U | 0.15 U | 0.15 U | 0.15 U | 0.15 U | 0.75 U | 0.75 U | 0.15 U | **0.94** | **5.0** | 0.15 U | 0.15 U | **45.4** | 15 U |
| | 04/19/06 | 0.2 U | 0.2 U | **0.00023** | 0.2 U | **0.64**** | 1 U | 0.2 U | 0.0015 | 0.2 U | 0.2 U | 0.2 U | 0.2 U | 1 U | 0.2 U | 0.2 U | 0.2 U | 0.2 U | 0.2 U | 1 U | 1 U | 0.2 U | **1.2** | **3.7** | 0.2 U | 0.2 U | **37.5** | 20 U |
| | 10/17/06 | 0.2 U | 0.2 U | **0.00089 J** | 0.2 U | 0.4 U | 1 U | 0.2 U | 0.00073 J | 0.2 U | 0.2 U | 0.2 U | 0.2 U | 1 U | 0.2 U | 0.2 U | **0.0012 J** | 0.2 U | 0.2 U | 1 U | 1 U | **0.00044 J** | 0.56 | **3.2** | 0.2 U | 0.2 U | **36.0** | 20 U |
| | 04/18/07 | 0.1 U | 0.1 U | **0.00012** | 0.1 U | 0.2 U | 0.5 U | 0.1 U | 0.00086 | 0.1 U | 0.1 U | 0.1 U | 0.1 U | 0.5 U | 0.1 U | 0.1 U | 0.1 U | 0.1 U | 0.1 U | 0.5 U | 0.5 U | 0.1 U | **1.5** | **2.4** | 0.1 U | 0.1 U | **29.4** | 10 U |
| | 10/25/07 | 0.005 U | 0.005 U | 0.00002 | 0.005 U | 0.01 U | 0.025 U | 0.005 U | 0.00016 | 0.005 U | 0.005 U | **0.01** | 0.005 U | 0.025 U | 0.005 U | 0.005 U | 0.005 U | 0.005 U | 0.005 U | 0.025 U | 0.025 U | 0.005 U | 0.18 | 0.4 | 0.005 U | 0.005 U | **2.42 J** | 0.5 U |
| | 04/01/08 | 0.02 U | 0.02 U | 0.0002 U | 0.02 U | 0.04 U | 0.1 U | 0.02 U | 0.00023 | 0.02 U | 0.0002 U | 0.02 U | 0.02 U | 0.1 U | 0.02 U | 0.02 U | 0.00039 | 0.02 U | 0.02 U | 0.1 U | 0.1 U | 0.0002 U | 0.1 | 0.02 U | 0.02 U | 0.02 U | **3.24** | 8 UJ |
| | 10/07/08 | 0.03 U | 0.03 U | 0.0002 U | 0.03 U | 0.06 U | 0.15 U | 0.03 U | 0.0002 U | 0.03 U | 0.03 U | 0.03 U | 0.03 U | 0.15 U | 0.03 U | 0.03 U | 0.03 U | 0.03 U | 0.03 U | 0.15 U | 0.15 U | 0.03 U | 0.27 | 0.56 | 0.03 U | 0.03 U | **6.6** | 3 U |
| | 04/06/09 | 0.05 U | 0.05 U | 0.00020 U | 0.05 U | 0.1 U | 0.5 U | 0.05 U | 0.00020 U | 0.05 U | 0.05 U | 0.05 U | 0.05 U | 0.25 U | 0.05 U | 0.05 U | 0.00033 | 0.05 U | 0.05 U | 0.25 U | 0.25 U | 0.00020 U | 0.4 | **0.75** | 0.05 U | 0.05 U | **7.9** | 5.0 U |
| | 10/27/09 | 0.01 U | 0.01 U | 0.00002 U | 0.004 U | 0.01 U | 0.1 U | 0.004 U | 0.00002 U | 0.004 U | 0.004 U | 0.004 U | 0.004 U | 0.1 U | 0.004 U | 0.004 U | 0.004 U | 0.004 U | 0.004 U | 0.1 U | 0.1 U | 0.004 U | 0.004 U | 0.004 U | 0.004 U | 0.004 U | **1.07** | 0.4 U |
| | 04/06/10 | 0.01 U | 0.01 U | 0.00002 U | 0.004 U | 0.01 U | 0.1 U | 0.004 U | 0.000023 | 0.004 U | 0.004 U | 0.004 U | 0.004 U | 0.1 U | 0.004 U | 0.004 U | 0.0001 | 0.004 U | 0.004 U | 0.1 U | 0.1 U | **0.000085** | 0.11 | 0.13 | 0.004 U | 0.004 U | **3.69 D** | 0.4 U |

**Table 16-8**

**Summary of Groundwater Analytical Results for Volatile Organic Compounds, (mg/L)**

**Building 40-56**

**Boeing Everett Plant**

| Well ID | Sample Date | Chloromethane | Bromomethane | Vinyl Chloride | Chloroethane | Methylene Chloride | Acetone | Carbon Disulfide | 1,1-DCE | 1,1-DCA | cis-1,2-DCE | Chloroform | 1,2-DCA | MEK | 1,1,1-TCA | BDCM | TCE | Benzene | Bromoform | MIBK | 2-Hexanone | PCE | Toluene | Ethylbenzene | Styrene | TCFM | Total Xylenes | Cyclohexanone |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MTCA Method A or B Groundwater Screening Level | | 0.00337 (B) | 0.0112 (B) | 0.0002 (A)<br>0.0000292 (B) | 0.015 (B) | 0.005 (A)<br>0.00583 (B) | 0.8 (B) | 0.8 (B) | 0.4 (B) | 1.6 (B) | 0.08 (B) | 0.00717 (B) | 0.005 (A)<br>0.000481 (B) | 4.8 (B) | 0.2 (A)<br>7.2 (B)<br>16 (B*) | 0.000706 (B) | 0.005 (A)<br>0.00049 (B) | 0.005 (A)<br>0.000795 (B) | 0.00554 (B) | 0.64 (B) | NE | 0.005 (A)<br>0.000081 (B) | 1 (A)<br>0.64 (B) | 0.7 (A)<br>0.8 (B) | 0.0015 (B) | 2.4 (B) | 1 (A)<br>1.6 (B) | 40 (B) |
| **EGW044** | 05/02/95 | 0.002 U | 0.002 U | 0.002 U | 0.002 U | 0.002 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.0052 | NA | 0.005 U | NA | NA | NA | 0.001 U | NA | 0.005 U | 0.005 U | NA | 0.001 U | 0.001 U | NA | NA | 0.002 U | 0.1 U |
| | 11/13/95 | 0.002 UJ | 0.002 U | 0.002 UJ | 0.002 U | 0.002 U | 0.0056 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.0037 | NA | 0.005 U | NA | NA | NA | 0.001 U | NA | 0.005 U | 0.005 U | NA | 0.001 U | 0.001 U | NA | NA | 0.0012 | 0.1 U |
| | 02/29/96 | 0.002 U | 0.002 U | 0.002 U | 0.002 U | 0.0031 | 0.017 | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.002 | NA | 0.027 | NA | NA | NA | 0.001 U | NA | 0.005 U | 0.005 U | NA | 0.001 U | 0.001 U | NA | NA | 0.0021 | 0.1 U |
| | 06/04/96 | 0.002 U | 0.002 U | 0.002 U | 0.002 U | 0.002 U | 0.01 | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.005 | NA | 0.0073 | NA | NA | NA | 0.001 U | NA | 0.005 U | 0.005 U | NA | 0.001 U | 0.001 U | NA | NA | 0.001 U | 0.1 U |
| | 06/04/96 (DUP) | 0.002 U | 0.002 U | 0.002 U | 0.002 U | 0.002 U | 0.0092 | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.0058 | NA | 0.0058 | NA | NA | NA | 0.001 U | NA | 0.005 U | 0.005 U | NA | 0.001 U | 0.001 U | NA | NA | 0.001 U | 0.1 U |
| | 08/28/96 | 0.002 U | 0.002 U | 0.002 U | 0.002 U | 0.002 U | 0.0066 | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.0032 | NA | 0.005 U | NA | NA | NA | 0.001 U | NA | 0.005 U | 0.005 U | NA | 0.001 U | 0.001 U | NA | NA | 0.001 U | 0.1 U |
| | 12/03/96 | 0.002 U | 0.002 U | 0.002 U | 0.002 U | 0.002 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.0025 | NA | 0.005 U | NA | NA | NA | 0.001 U | NA | 0.005 U | 0.005 U | NA | 0.001 U | 0.001 U | NA | NA | 0.001 U | 0.1 U |
| | 03/07/97 | 0.002 U | 0.002 U | 0.002 U | 0.002 U | 0.002 U | 0.0062 | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.0016 | NA | 0.005 U | NA | NA | NA | 0.001 U | NA | 0.005 U | 0.005 U | NA | 0.001 U | 0.001 U | NA | NA | 0.001 U | 0.1 U |
| | 05/22/97 | 0.002 U | 0.002 U | 0.000015 | 0.002 U | 0.002 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.0062 | NA | 0.005 U | NA | NA | NA | 0.001 U | NA | 0.005 U | 0.005 U | NA | 0.001 U | 0.001 U | NA | NA | 0.001 U | 0.1 U |
| | 05/22/97 (DUP) | 0.002 U | 0.002 U | **0.00011** | 0.002 U | 0.002 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.0056 | NA | 0.005 U | NA | NA | NA | 0.001 U | NA | 0.005 U | 0.005 U | NA | 0.001 U | 0.001 U | NA | NA | 0.001 U | 0.1 U |
| | 08/11/97 | 0.002 U | 0.002 U | 0.00001 UJ | 0.002 U | 0.002 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.007 | NA | 0.005 U | NA | NA | NA | 0.001 U | NA | 0.005 U | 0.005 U | NA | 0.001 U | 0.001 U | NA | NA | 0.001 U | 0.1 U |
| | 11/19/97 | 0.002 U | 0.002 U | 0.00001 U | 0.002 U | 0.002 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.0032 | NA | 0.005 U | NA | NA | NA | 0.001 U | NA | 0.005 U | 0.005 U | NA | 0.001 U | 0.001 U | NA | NA | 0.001 U | 0.1 U |
| | 03/10/98 | 0.002 U | 0.002 U | 0.00001 U | 0.002 U | 0.002 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.0021 | 0.001 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.002 U | 0.002 U | 0.001 U | 0.1 U |
| | 05/12/98 | 0.002 U | 0.002 U | 0.000015 | 0.002 U | 0.002 U | 0.0072 U* | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.002 U | 0.002 U | 0.001 U | 0.1 U |
| | 08/11/98 | 0.002 U | 0.002 U | 0.00001 U | 0.002 U | 0.002 U | 0.073 | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.002 U | 0.002 UJ | 0.0012 | 0.1 U |
| | 11/10/98 | 0.002 U | 0.002 U | 0.00001 U | 0.002 U | 0.002 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.002 U | 0.002 U | 0.001 U | 0.1 U |
| | 02/02/99 | 0.002 U | 0.002 U | 0.00001 U | 0.002 U | 0.002 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.002 U | 0.002 U | 0.001 U | 0.1 U |
| | 05/11/99 | 0.001 U | 0.001 U | 0.00002 U | 0.001 U | 0.002 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 UJ | 0.001 U | 0.1 U |
| | 08/03/99 | 0.001 U | 0.001 U | 0.00002 U | 0.001 U | 0.002 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.1 U |
| | 11/09/99 | 0.001 U | 0.001 U | 0.00002 U | 0.001 U | 0.002 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.1 U |
| | 02/01/00 | 0.001 U | 0.001 U | 0.00002 U | 0.001 U | 0.002 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 UJ | 0.001 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 UJ | 0.001 U | 0.005 U | 0.005 U | 0.001 U | 0.001 UJ | 0.001 UJ | 0.001 U | 0.001 U | 0.001 U | 0.1 U |
| | 05/02/00 | 0.001 U | 0.001 U | 0.00002 UJ | 0.001 U | 0.002 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.1 U |
| | 07/31/00 | 0.001 U | 0.001 U | 0.00002 U | 0.001 U | 0.002 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.1 U |
| | 11/14/00 | 0.001 U | 0.001 U | 0.00002 U | 0.001 U | 0.002 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.1 U |
| | 02/01/01 | 0.001 U | 0.001 U | 0.00002 U | 0.001 U | 0.002 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | 0.001 U | 0.001 U | 0.001 UJ | 0.001 UJ | 0.001 U | 0.005 U | 0.005 U | 0.001 U | 0.001 UJ | 0.001 U | 0.001 U | 0.001 UJ | 0.001 U | 0.1 U |
| | 05/01/01 | 0.001 U | 0.001 U | 0.00002 U | 0.001 U | 0.002 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.0016 | 0.001 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.1 U |
| | 08/07/01 | 0.001 U | 0.001 U | 0.00002 U | 0.001 U | 0.002 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.1 U |
| | 11/13/01 | 0.001 U | 0.001 U | 0.00002 U | 0.001 U | 0.002 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.1 U |
| | 02/05/02 | 0.0002 U | 0.0002 U | 0.00002 U | 0.0002 U | 0.0003 U | 0.0027 | 0.0002 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.0005 | 0.0002 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.001 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U | 0.02 U |
| | 05/02/02 | 0.0002 U | 0.0002 U | 0.00002 U | 0.0002 U | 0.0003 U | 0.0023 | 0.0002 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.0004 | 0.0002 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.001 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U | 0.02 U |
| | 08/06/02 | 0.0002 U | 0.0002 U | 0.00002 U | 0.0002 U | 0.0003 U | 0.0021 UJ | 0.0002 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.001 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U | 0.02 U |
| | 11/16/02 | 0.0002 U | 0.0002 U | 0.00002 U | 0.0002 U | 0.0003 U | 0.0014 UJ | 0.0002 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.001 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U | 0.02 U |
| | 02/04/03 | 0.0002 U | 0.0002 U | 0.00002 U | 0.0002 U | 0.0003 U | 0.0016 | 0.0002 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.001 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U | 0.02 U |
| | 05/06/03 | 0.0002 U | 0.0002 U | 0.00002 U | 0.0002 U | 0.0003 U | 0.0016 U | 0.0002 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.001 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U | 0.02 U |
| | 07/22/03 | 0.0002 U | 0.0002 U | 0.00002 U | 0.0002 U | 0.0003 U | 0.0032 | 0.0002 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.001 U | 0.001 U | 0.0002 U | 0.0005 | 0.0023 | 0.0002 U | 0.0002 U | 0.022 | 0.02 U |
| | 11/04/03 | 0.0002 U | 0.0002 U | 0.00002 U | 0.0002 U | 0.0003 U | 0.0024 U | 0.0002 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.001 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U | 0.04 U |
| | 01/21/04 | 0.0002 U | 0.0002 U | 0.00002 U | 0.0002 U | 0.0003 U | 0.001 U | 0.0002 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.0007 | 0.0002 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.001 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U | 0.04 U |
| | 04/14/04 | 0.0002 U | 0.0002 U | 0.00002 U | 0.0002 U | 0.0003 U | 0.001 U | 0.0002 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.0014 | 0.0002 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.001 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 | 0.0004 U | 0.04 U |
| | 07/13/04 | 0.0002 U | 0.0002 U | 0.00002 U | 0.0002 U | 0.0003 U | 0.001 U | 0.0002 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.001 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U | 0.04 U |
| | 10/01/04 | 0.0002 U | 0.0002 U | 0.00002 U | 0.0002 U | 0.0003 U | 0.0025 U | 0.0002 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.001 U | 0.001 U | 0.0002 U | 0.0002 U | 0.001 | 0.0002 U | 0.0002 U | 0.0106 | 0.04 U |
| | 01/12/05 | 0.0002 U | 0.0002 U | 0.00002 U | 0.0002 U | 0.0003 U | 0.0019 | 0.0002 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.001 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U | 0.04 U |
| | 04/11/05 | 0.0002 U | 0.0002 U | 0.00002 U | 0.0002 U | 0.0003 U | 0.001 U | 0.0002 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.001 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U | 0.04 U |
| | 10/17/05 | 0.0002 U | 0.0002 U | 0.00002 U | 0.0002 U | 0.0003 U | 0.0015 U | 0.0002 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.001 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U | 0.04 U |
| | 04/19/06 | 0.0002 U | 0.0002 U | 0.00002 U | 0.0002 U | 0.0003 U | 0.0013 U | 0.0002 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.0004 | 0.0002 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.001 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0005 | 0.0002 U | 0.0002 U | 0.0056 | 0.04 U |
| | 10/17/06 | 0.0002 U | 0.0002 U | 0.00002 U | 0.0002 U | 0.0003 U | 0.003 U | 0.0002 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.0002 | 0.0002 U | 0.001 U | 0.0002 U | 0.0002 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.001 U | 0.003 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U | 0.04 U |
| | 04/03/07 | 0.0002 U | 0.0002 U | **0.000028** | 0.0002 U | 0.0003 U | 0.003 U | 0.0002 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.001 U | 0.0002 U | 0.0002 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.001 U | 0.003 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U | 0.04 U |
| | 10/25/07 | 0.0002 UJ | 0.0002 UJ | 0.00002 U | 0.0002 UJ | 0.0003 UJ | 0.003 UJ | 0.0002 UJ | 0.00002 U | 0.0002 UJ | 0.0002 UJ | 0.0016 J | 0.0002 UJ | 0.001 UJ | 0.0002 UJ | 0.0002 UJ | 0.00002 U | 0.0002 UJ | 0.0002 UJ | 0.001 UJ | 0.003 UJ | 0.00002 U | 0.0002 UJ | 0.0002 UJ | 0.0002 UJ | 0.0002 UJ | 0.0004 UJ | 0.04 UJ |
| | 04/01/08 | 0.0002 U | 0.0005 U | 0.00002 U | 0.0002 U | 0.0005 U | 0.003 U | 0.0002 U | 0.00002 U | 0.0002 U | 0.00002 U | 0.0002 | 0.0002 U | 0.0025 U | 0.0002 U | 0.0002 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.0025 U | 0.0025 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0005 | 0.04 UJ |
| | 10/07/08 | 0.0002 U | 0.0005 U | 0.00002 U | 0.0002 U | 0.0005 U | 0.003 U | 0.0002 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.0003 | 0.0002 U | 0.0025 U | 0.0002 U | 0.0002 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.0025 U | 0.0025 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U | 0.04 U |
| | 04/06/09 | 0.0002 U | 0.0005 U | 0.00002 U | 0.0002 U | 0.0005 U | 0.0025 U | 0.0002 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0025 U | 0.0002 U | 0.0002 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.0025 U | 0.0025 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0007 | 0.02 U |
| | 10/27/09 | 0.0005 U | 0.0005 U | 0.00002 U | 0.0002 U | 0.0005 U | 0.005 U | 0.0002 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.005 U | 0.0002 U | 0.0002 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.005 U | 0.005 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0029 | 0.02 U |
| | 04/06/10 | 0.0005 U | 0.0005 U | 0.00002 U | 0.0002 U | 0.0005 U | 0.005 U | 0.0002 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.005 U | 0.0002 U | 0.0002 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.005 U | 0.005 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0004 U | 0.02 U |

**Table 16-8**

**Summary of Groundwater Analytical Results for Volatile Organic Compounds, (mg/L)**

**Building 40-56**

**Boeing Everett Plant**

| Well ID | Sample Date | Chloromethane | Bromomethane | Vinyl Chloride | Chloroethane | Methylene Chloride | Acetone | Carbon Disulfide | 1,1-DCE | 1,1-DCA | cis-1,2-DCE | Chloroform | 1,2-DCA | MEK |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MTCA Method A or B Groundwater Screening Level | | 0.00337 (B) | 0.0112 (B) | 0.0002 (A)<br>0.0000292 (B) | 0.015 (B) | 0.005 (A)<br>0.00583 (B) | 0.8 (B) | 0.8 (B) | 0.4 (B) | 1.6 (B) | 0.08 (B) | 0.00717 (B) | 0.005 (A)<br>0.000481 (B) | 4.8 (B) |
| **EGW050[1]** | 05/30/96 | 1 U | 1 U | 1 U | 1 U | 1 U | 2.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | NA | 2.5 U |
| | 08/27/96 | 1 U | 1 U | 1 U | 1 U | 1 U | 2.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | NA | 2.5 U |
| | 08/27/96 (DUP) | 2 U | 2 U | 2 U | 2 U | 2 U | 5 U | 1 U | 1 U | 1 U | 1 U | 1 U | NA | 5 U |
| | 12/09/96 | 1 U | 1 U | 1 U | 1 U | 1 U | 2.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | NA | 2.5 U |
| | 03/07/97 | 1 U | 1 U | 1 U | 1 U | 1 U | 2.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | NA | 2.5 U |
| | 03/07/97 (DUP) | 1 U | 1 U | 1 U | 1 U | 1 U | 2.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | NA | 2.5 U |
| | 05/22/97 | 2 U | 2 U | **0.00018** | 2 U | 2 U | 5 U | 1 U | 1 U | 1 U | 1 U | 1 U | NA | 5 U |
| | 08/12/97 | 2 U | 2 U | 2 U | 2 U | 2 U | 5 U | 1 U | 1 U | 1 U | 1 U | 1 U | NA | 5 U |
| | 11/17/97 | 0.36 U | 0.36 U | 0.005 U | 0.36 U | 0.36 U | 0.9 U | 0.18 U | 0.18 U | 0.18 U | 0.18 U | 0.18 U | NA | 0.9 U |
| | 03/10/98 | 2 U | 2 U | 0.00001 U | 2 U | 2 U | 5 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 5 U |
| | 05/13/98 | 2 U | 2 U | 0.01 U | 2 U | 2 U | 5 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 5 U |
| | 08/11/98 | 2 U | 2 U | 0.01 U | 2 U | 2 U | 5 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 5 U |
| | 11/10/98 | 3 U | 3 U | **0.000059** | 3 U | 3 U | 7.5 U | 1.5 U | 1.5 U | 1.5 U | 1.5 U | 1.5 U | 1.5 U | 7.5 U |
| | 02/01/99 | 2 U | 2 U | 0.002 U | 2 U | 2 U | 5 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 5 U |
| | 05/11/99 | 1 U | 1 U | 0.002 U | 1 U | 2 U | 5 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 5 U |
| | 08/02/99 | 0.5 U | 0.5 U | 0.005 U | 0.5 U | 1 U | 2.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 2.5 U |
| | 11/09/99 | 1 U | 1 U | **0.000037** | 1 U | 2 U | 5 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 5 U |
| | 02/01/00 | 1 U | 1 U | 0.002 U | 1 U | 2 U | 5 U | 1 U | 1 U | 1 U | 1 U | 1 UJ | 1 U | 5 U |
| | 05/02/00 | 1 U | 1 U | 0.002 UJ | 1 U | 2 U | 5 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 5 U |
| | 07/31/00 | 1 U | 1 U | 0.002 U | 1 U | 2 U | 5 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 5 U |
| | 11/14/00 | 1 U | 1 U | **0.000034** | 1 U | 2 U | 5 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 5 U |
| | 02/05/01 | 1 U | 1 U | **0.000033** | 1 U | 2 U | 5 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 5 U |
| | 05/01/01 | 0.5 U | 0.5 U | 0.00002 U | 0.5 U | 1 U | 2.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 2.5 U |
| | 08/07/01 | 0.5 U | 0.5 U | 0.00002 U | 0.5 U | 1 U | 2.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 2.5 U |
| | 11/12/01 | 1.5 U | 1.5 U | 0.00002 U | 1.5 U | 3 U | 7.5 U | 1.5 U | 1.5 U | 1.5 U | 1.5 U | 1.5 U | 1.5 U | 7.5 U |
| | 02/05/02 | 0.5 U | 0.5 U | 0.00002 U | 0.5 U | 1 U | 2.5 U | 0.5 U | 0.00002 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 2.5 U |
| | 05/06/02 | 1.5 U | 1.5 U | 0.00002 U | 1.5 U | 3 U | 7.5 U | 1.5 U | 0.000098 J | 1.5 U | 1.5 U | 1.5 U | 1.5 U | 7.5 U |
| | 08/06/02 | 1 U | 1 U | 0.0002 U | 1 U | 2 U | 5 U | 1 U | 0.00002 U | 1 U | 1 U | 1 U | 1 U | 5 U |
| | 11/16/02 | 0.75 U | 0.75 U | 0.000023 | 0.75 U | 1.5 U | 3.7 U | 0.75 U | 0.00013 | 0.75 U | 0.75 U | 0.75 U | 0.75 U | 3.7 U |
| | 02/04/03 | 1.5 U | 1.5 U | 0.00002 U | 1.5 U | 2.2 U | 7.5 U | 1.5 U | 0.000091 | 1.5 U | 1.5 U | 1.5 U | 1.5 U | 7.5 U |
| | 05/05/03 | 0.5 U | 0.5 U | 0.0025 U | 0.5 U | 1 U | 2.5 U | 0.5 U | 0.0025 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 2.5 U |
| | 07/22/03 | 0.5 U | 0.5 U | 0.0002 U | 0.5 U | 1 U | 2.5 U | 0.5 U | 0.0002 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 2.5 U |
| | 11/04/03 | 0.5 U | 0.5 U | 0.0002 U | 0.5 U | 1 U | 2.5 U | 0.5 U | 0.0002 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 2.5 U |
| | 01/21/04 | 2 U | 2 U | 0.0002 U | 2 U | 4 U | 10 U | 2 U | 0.0002 U | 2 U | 2 U | 2 U | 2 U | 10 U |
| | 04/14/04 | 1 U | 1 U | 0.0002 U | 1 U | 2 U | 5 U | 1 U | 0.0002 U | 1 U | 1 U | 1 U | 1 U | 5 U |
| | 07/13/04 | 1 U | 1 U | 0.0002 U | 1 U | 2 U | 5 U | 1 U | 0.0002 U | 1 U | 1 U | 1 U | 1 U | 5 U |
| | 10/01/04 | 0.75 U | 0.75 U | 0.0002 U | 0.75 U | 1.5 U | 3.7 U | 0.75 U | 0.0002 U | 0.75 U | 0.75 U | 0.75 U | 0.75 U | 3.7 U |
| | 01/12/05 | 1 U | 1 U | 0.0002 U | 1 U | 2 U | 5 U | 1 U | 0.0002 U | 1 U | 1 U | 1 U | 1 U | 5 U |
| | 04/11/05 | 1 U | 1 U | 0.0002 U | 1 U | 4** | 5 U | 1 U | 0.0002 U | 1 U | 1 U | 1 U | 1 U | 5 U |
| | 10/17/05 | 1 U | 1 U | 0.0002 UJ | 1 U | 2 U | 5 U | 1 U | 0.0002 UJ | 1 U | 1 U | 1 U | 1 U | 5 U |
| | 04/19/06 | 1 U | 1 U | 0.0002 U | 1 U | 2 U | 5 U | 1 U | 0.0002 U | 1 U | 1 U | 1 U | 1 U | 5 U |
| | 10/17/06 | 0.75 U | 0.75 U | 0.0002 UJ | 0.75 U | 1.5 U | 3.8 U | 0.75 U | 0.0002 UJ | 0.75 U | 0.75 U | 0.75 U | 0.75 U | 3.8 U |
| | 04/03/07 | 0.5 U | 0.5 U | 0.0002 U | 0.5 U | 1.0 U | 2.5 U | 0.5 U | 0.0002 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 2.5 U |
| | 10/25/07 | 2 U | 2 U | 0.0002 U | 2 U | 4 U | 10 U | 2 U | 0.0002 U | 2 U | 2 U | 2 U | 2 U | 10 U |
| | 04/01/08 | 0.5 U | 0.5 U | 0.0002 U | 0.5 U | 1 U | 2.5 U | 0.5 U | 0.0002 U | 0.5 U | 0.00028 | 0.5 U | 0.5 U | 2.5 U |
| | 10/07/08 | 0.5 U | 0.5 U | 0.001 U | 0.5 U | 1 U | 2.5 U | 0.5 U | 0.001 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 2.5 U |
| | 04/06/09 | 0.5 U | 0.5 U | **0.001** | 0.5 U | 1.0 U | 5.0 U | 0.5 U | 0.0010 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 2.5 U |
| | 10/27/09 | 1 U | 1 U | 0.0002 UJ | 0.4 U | 1 U | 10 U | 0.4 U | 0.0002 UJ | 0.4 U | 0.4 U | 0.4 U | 0.4 U | 10 U |
| | 04/06/10 | 1 U | 1 U | 0.0002 U | 0.4 U | 1 U | 10 U | 0.4 U | 0.0002 U | 0.4 U | 0.4 U | 0.4 U | 0.4 U | 10 U |

| Well ID | Sample Date | 1,1,1-TCA | BDCM | TCE | Benzene | Bromoform | MIBK | 2-Hexanone | PCE | Toluene | Ethylbenzene | Styrene | TCFM | Total Xylenes | Cyclohexanone |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MTCA Method A or B Groundwater Screening Level | | 0.2 (A)<br>7.2 (B)<br>16 (B*) | 0.000706 (B) | 0.005 (A)<br>0.00049 (B) | 0.005 (A)<br>0.000795 (B) | 0.00554 (B) | 0.64 (B) | NE | 0.005 (A)<br>0.000081 (B) | 1 (A)<br>0.64 (B) | 0.7 (A)<br>0.8 (B) | 0.0015 (B) | 2.4 (B) | 1 (A)<br>1.6 (B) | 40 (B) |
| **EGW050[1]** | 05/30/96 | NA | NA | NA | 0.5 U | NA | 2.5 U | 2.5 U | NA | **2.3** | **14** | NA | NA | **148** | 50 U |
| | 08/27/96 | NA | NA | NA | 0.5 U | NA | 2.5 U | 2.5 U | NA | **2.2** | **15** | NA | NA | **159** | 50 U |
| | 08/27/96 (DUP) | NA | NA | NA | 1 U | NA | 5 U | 5 U | NA | **2.8** | **16** | NA | NA | **159** | 100 U |
| | 12/09/96 | NA | NA | NA | 0.5 U | NA | 2.5 U | 2.5 U | NA | **2.3** | **14** | NA | NA | **147** | 50 U |
| | 03/07/97 | NA | NA | NA | 0.5 U | NA | 2.5 U | 2.5 U | NA | **2.3** | **17** | NA | NA | **149** | 50 U |
| | 03/07/97 (DUP) | NA | NA | NA | 0.5 U | NA | 2.5 U | 2.5 U | NA | **2.6** | **18** | NA | NA | **160** | 50 U |
| | 05/22/97 | NA | NA | NA | 1 U | NA | 5 U | 5 U | NA | **2.5** | **18** | NA | NA | **171** | 100 U |
| | 08/12/97 | NA | NA | NA | 1 U | NA | 5 U | 5 U | NA | **2.7** | **21** | NA | NA | **174** | 100 U |
| | 11/17/97 | NA | NA | NA | 0.18 U | NA | 0.9 U | 0.9 U | NA | **3.0** | **19** | NA | NA | **202** | 18 U |
| | 03/10/98 | 1 U | 1 U | 1 U | 1 U | 1 U | 5 U | 5 U | 1 U | **3.2** | **19** | 2 U | 2 U | **204** | 100 U |
| | 05/13/98 | 1 U | 1 U | 1 U | 1 U | 1 U | 5 U | 5 U | 1 U | **2.6** | **22** | 2 U | 2 U | **183** | 100 U |
| | 08/11/98 | 1 U | 1 U | 1 U | 1 U | 1 U | 5 U | 5 U | 1 U | **2.6** | **18** | 2 U | 2 UJ | **149** | 100 U |
| | 11/10/98 | 1.5 U | 1.5 U | 1.5 UJ | 1.5 U | 1.5 U | 7.5 U | 7.5 U | 1.5 U | **3 J** | **19** | 3 U | 3 UJ | **171** | 150 U |
| | 02/01/99 | 1 U | 1 U | 1 U | 1 U | 1 U | 5 U | 5 U | 1 U | **2.6** | **15** | 2 U | 2 U | **160** | 100 U |
| | 05/11/99 | 1 U | 1 U | 1 U | 1 U | 1 U | 5 U | 5 U | 1 U | **2.7** | **18** | 1 U | 1 UJ | **182** | 100 U |
| | 08/02/99 | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 2.5 U | 2.5 U | 0.5 U | **3.4** | **21** | 0.5 U | 0.5 U | **217** | 50 U |
| | 11/09/99 | 1 U | 1 U | 1 U | 1 U | 1 U | 5 U | 5 U | 1 U | **2.5** | **16** | 1 U | 1 U | **139** | 100 U |
| | 02/01/00 | 1 U | 1 U | 1 U | 1 UJ | 1 U | 5 U | 5 U | 1 U | **3.0 J** | **20 J** | 1 U | 1 U | **183** | 100 U |
| | 05/02/00 | 1 U | 1 U | 1 U | 1 U | 1 U | 5 U | 5 U | 1 U | **2.6** | **17** | 1 U | 1 U | **150** | 100 U |
| | 07/31/00 | 1 U | 1 U | 1 U | 1 U | 1 U | 5 U | 5 U | 1 U | **2.5** | **16** | 1 U | 1 U | **150** | 100 U |
| | 11/14/00 | 1 U | 1 U | 1 U | 1 U | 1 U | 5 U | 5 U | 1 U | **2.7** | **17** | 1 U | 1 U | **162** | 100 U |
| | 02/05/01 | 1 U | 1 U | 1 U | 1 U | 1 U | 5 U | 5 U | 1 U | **2.7** | **20** | 1 U | 1 U | **194** | 100 U |
| | 05/01/01 | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 2.5 U | 2.5 U | 0.5 U | **2.7** | **17** | 0.5 U | 0.5 U | **152** | 50 U |
| | 08/07/01 | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 2.5 U | 2.5 U | 0.5 U | **2.7** | **15** | 0.5 U | 0.5 U | **115** | 50 U |
| | 11/12/01 | 1.5 U | 1.5 U | 1.5 U | 1.5 U | 1.5 U | 7.5 U | 7.5 U | 1.5 U | **2.4** | **14** | 1.5 U | 1.5 U | **148** | 150 U |
| | 02/05/02 | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 2.5 U | 2.5 U | 0.5 U | **2.3** | **15** | 0.5 U | 0.5 U | **180** | 50 U |
| | 05/06/02 | 1.5 U | 1.5 U | 1.5 U | 1.5 U | 1.5 U | 7.5 U | 7.5 U | 1.5 U | **2.4** | **14** | 1.5 U | 1.5 U | **148** | 150 U |
| | 08/06/02 | 1 U | 1 U | 1 U | 1 U | 1 U | 5 U | 5 U | 1 U | **2.5** | **15** | 1 U | 1 U | **148** | 100 U |
| | 11/16/02 | 0.75 U | 0.75 U | 0.75 U | 0.75 U | 0.75 U | 3.7 U | 3.7 U | 0.75 U | **2.8** | **16** | 0.75 U | 0.75 U | **161** | 75 U |
| | 02/04/03 | 1.5 U | 1.5 U | 1.5 U | 1.5 U | 1.5 U | 7.5 U | 7.5 U | 1.5 U | **2.2** | **13** | 1.5 U | 1.5 U | **137** | 150 U |
| | 05/05/03 | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 2.5 U | 2.5 U | 0.5 U | **3.0** | **19** | 0.5 U | 0.5 U | **153** | 50 U |
| | 07/22/03 | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 2.5 U | 2.5 U | 0.5 U | **2.7** | **15** | 0.5 U | 0.5 U | **140** | 50 U |
| | 11/04/03 | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 2.5 U | 2.5 U | 0.5 U | **2.9** | **18** | 0.5 U | 0.5 U | **185** | 50 U |
| | 01/21/04 | 2 U | 2 U | 2 U | 2 U | 2 U | 10 U | 10 U | 2 U | **3.2** | **20** | 2 U | 2 U | **203** | 200 U |
| | 04/14/04 | 1 U | 1 U | 1 U | 1 U | 1 U | 5 U | 5 U | 1 U | **2.6** | **17** | 1 U | 1 U | **160** | 100 U |
| | 07/13/04 | 1 U | 1 U | 1 U | 1 U | 1 U | 5 U | 5 U | 1 U | **2.6** | **15** | 1 U | 1 U | **148** | 100 U |
| | 10/01/04 | 0.75 U | 0.75 U | 0.75 U | 0.75 U | 0.75 U | 3.7 U | 3.7 U | 0.75 U | **3.3** | **21** | 0.75 U | 0.75 U | **204** | 75 U |
| | 01/12/05 | 1 U | 1 U | 1 U | 1 U | 1 U | 5 U | 5 U | 1 U | **2.4** | **16** | 1 U | 1 U | **138** | 100 U |
| | 04/11/05 | 1 U | 1 U | 1 U | 1 U | 1 U | 5 U | 5 U | 1 U | **3.4** | **21** | 1 U | 1 U | **217** | 100 U |
| | 10/17/05 | 1 U | 1 U | 1 U | 1 U | 1 U | 5 U | 5 U | 1 U | **2.7** | **17** | 1 U | 1 U | **170** | 100 U |
| | 04/19/06 | 1 U | 1 U | 1 U | 1 U | 1 U | 5 U | 5 U | 1 U | **5.3** | **49** | 1 U | 1 U | **453** | 100 U |
| | 10/17/06 | 0.75 U | 0.75 U | **0.012 J** | 0.75 U | 0.75 U | 3.8 U | 3.8 U | **0.0047 J** | **2.1** | **14** | 0.75 U | 0.75 U | **156** | 75 U |
| | 04/03/07 | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 2.5 U | 2.5 U | 0.5 U | **2.2** | **14** | 0.5 U | 0.5 U | **139** | 50 UJ |
| | 10/25/07 | 2 U | 2 U | 2 U | 2 U | 2 U | 10 U | 10 U | 2 U | **2.6** | **15** | 2 U | 2 U | **147** | 200 U |
| | 04/01/08 | 0.5 U | 0.5 U | **0.0079** | 0.5 U | 0.5 U | 2.5 U | 2.5 U | **0.0025** | **2.1 J** | **14 J** | 0.5 U | 0.5 U | **118 J** | 400 UJ |
| | 10/07/08 | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 2.5 U | 2.5 U | 0.5 U | **3.0** | **18** | 0.5 U | 0.5 U | **186 D** | 50 U |
| | 04/06/09 | 0.5 U | 0.5 U | **0.0084** | 0.5 U | 0.5 U | 2.5 U | 2.5 U | **0.0031** | **2.7** | **19** | 0.5 U | 0.5 U | **207** | 50 U |
| | 10/27/09 | 0.4 U | 0.4 U | 0.4 U | 0.4 U | 0.4 U | 10 U | 10 U | 0.4 U | **2.8** | **16** | 0.4 U | 0.4 U | **162** | 40 U |
| | 04/06/10 | 0.4 U | 0.4 U | **0.0058** | 0.4 U | 0.4 U | 10 U | 10 U | **0.0016** | **2.1** | **14** | 0.4 U | 0.4 U | **161** | 40 U |

**Table 16-8**
**Summary of Groundwater Analytical Results for Volatile Organic Compounds, (mg/L)**
**Building 40-56**
**Boeing Everett Plant**

| Well ID | Sample Date | Chloromethane | Bromomethane | Vinyl Chloride | Chloroethane | Methylene Chloride | Acetone | Carbon Disulfide | 1,1-DCE | 1,1-DCA | cis-1,2-DCE | Chloroform | 1,2-DCA | MEK | 1,1,1-TCA | BDCM | TCE | Benzene | Bromoform | MIBK | 2-Hexanone | PCE | Toluene | Ethylbenzene | Styrene | TCFM | Total Xylenes | Cyclohexanone |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MTCA Method A or B Groundwater Screening Level | | 0.00337 (B) | 0.0112 (B) | 0.0002 (A) 0.0000292 (B) | 0.015 (B) | 0.005 (A) 0.00583 (B) | 0.8 (B) | 0.8 (B) | 0.4 (B) | 1.6 (B) | 0.08 (B) | 0.00717 (B) | 0.005 (A) 0.000481 (B) | 4.8 (B) | 0.2 (A) 7.2 (B) 16 (B*) | 0.000706 (B) | 0.005 (A) 0.00049 (B) | 0.005 (A) 0.000795 (B) | 0.00554 (B) | 0.64 (B) | NE | 0.005 (A) 0.000081 (B) | 1 (A) 0.64 (B) | 0.7 (A) 0.8 (B) | 0.0015 (B) | 2.4 (B) | 1 (A) 1.6 (B) | 40 (B) |
| EGW051[1] | 05/30/96 | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 1.2 U | 0.25 U | 0.25 U | 0.25 U | 0.25 U | 0.25 U | NA | 1.2 U | NA | NA | NA | 0.25 U | NA | 1.2 U | 1.2 U | NA | 1.8 | 10 | NA | NA | 109 | 25 U |
| | 08/27/96 | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 1.2 U | 0.25 U | 0.25 U | 0.25 U | 0.25 U | 0.25 U | NA | 1.2 U | NA | NA | NA | 0.25 U | NA | 1.2 U | 1.2 U | NA | 2.0 | 14 | NA | NA | 127 | 25 U |
| | 12/03/96 | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 1.2 U | 0.25 U | 0.25 U | 0.25 U | 0.25 U | 0.25 U | NA | 1.2 U | NA | NA | NA | 0.25 U | NA | 1.2 U | 1.2 U | NA | 2.3 | 14 | NA | NA | 139 | 25 U |
| | 03/07/97 | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 1.2 U | 0.25 U | 0.25 U | 0.25 U | 0.25 U | 0.25 U | NA | 1.2 U | NA | NA | NA | 0.25 U | NA | 1.2 U | 1.2 U | NA | 2.3 | 16 | NA | NA | 159 | 25 U |
| | 05/22/97 | 2 U | 2 U | 0.00001 U | 2 U | 2 U | 5 U | 1 U | 1 U | 1 U | 1 U | 1 U | NA | 5 U | NA | NA | NA | 1 U | NA | 5 U | 5 U | NA | 2.3 | 15 | NA | NA | 158 | 100 U |
| | 08/12/97 | 2 U | 2 U | 2 U | 2 U | 2 U | 5 U | 1 U | 1 U | 1 U | 1 U | 1 U | NA | 5 U | NA | NA | NA | 1 U | NA | 5 U | 5 U | NA | 2.7 | 20 | NA | NA | 183 | 100 U |
| | 11/17/97 | 3 U | 3 U | 0.01 U | 3 U | 3 U | 7.5 U | 1.5 U | 1.5 U | 1.5 U | 1.5 U | 1.5 U | NA | 7.5 U | NA | NA | NA | 1.5 U | NA | 7.5 U | 7.5 U | NA | 2.1 | 16 | NA | NA | 160 | 150 U |
| | 03/10/98 | 1.5 U | 1.5 U | 0.005 U | 1.5 U | 1.5 U | 3.7 U | 0.75 U | 0.75 U | 0.75 U | 0.75 U | 0.75 U | 0.75 U | 3.7 U | 0.75 U | 0.75 U | 0.75 U | 0.75 U | 0.75 U | 3.7 U | 3.7 U | 0.75 U | 2.5 | 17 | 1.5 U | 1.5 U | 192 | 75 U |
| | 05/13/98 | 2 U | 2 U | 0.01 U | 2 U | 2 U | 5 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 5 U | 1 U | 1 U | 1 U | 1 U | 1 U | 5 U | 5 U | 1 U | 2.6 | 23 | 2 U | 2 U | 182 | 100 U |
| | 08/11/98 | 2 U | 2 U | 0.00001 U | 2 U | 2 U | 5 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 5 U | 1 U | 1 U | 1 U | 1 U | 1 U | 5 U | 5 U | 1 U | 2.0 | 15 | 2 U | 2 U | 126 | 100 U |
| | 11/10/98 | 3 U | 3 U | 0.00001 U | 3 U | 3 U | 7.5 U | 1.5 U | 1.5 U | 1.5 U | 1.5 U | 1.5 U | 1.5 U | 7.5 U | 1.5 U | 1.5 U | 1.5 UJ | 1.5 U | 1.5 U | 7.5 U | 7.5 U | 1.5 U | 2.6 J | 18 | 3 U | 3 UJ | 171 | 150 U |
| | 02/01/99 | 2 U | 2 U | 0.0056 U | 2 U | 2 U | 5 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 5 U | 1 U | 1 U | 1 U | 1 U | 1 U | 5 U | 5 U | 1 U | 2.2 | 13 | 2 U | 2 U | 158 | 100 U |
| | 05/11/99 | 1 U | 1 U | 0.002 U | 1 U | 2 U | 5 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 5 U | 1 U | 1 U | 1 U | 1 U | 1 U | 5 U | 5 U | 1 U | 2.3 | 17 | 1 U | 1 UJ | 181 | 100 U |
| | 08/02/99 | 0.5 U | 0.5 U | 0.005 U | 0.5 U | 1 U | 2.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 2.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 2.5 U | 2.5 U | 0.5 U | 3.0 | 21 | 0.5 U | 0.5 U | 227 | 50 U |
| | 11/09/99 | 1 U | 1 U | 0.00002 U | 1 U | 2 U | 5 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 5 U | 1 U | 1 U | 1 U | 1 U | 1 U | 5 U | 5 U | 1 U | 2.1 | 14 | 1 U | 1 U | 138 | 100 U |
| | 02/01/00 | 1 U | 1 U | 0.002 U | 1 U | 2 U | 5 U | 1 U | 1 U | 1 U | 1 U | 1 UJ | 1 U | 5 U | 1 U | 1 U | 1 U | 1 UJ | 1 U | 5 U | 5 U | 1 U | 2.3 J | 16 J | 1 U | 1 U | 171 | 100 U |
| | 05/02/00 | 1 U | 1 U | 0.002 UJ | 1 U | 2 U | 5 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 5 U | 1 U | 1 U | 1 U | 1 U | 1 U | 5 U | 5 U | 1 U | 2.3 | 15 | 1 U | 1 U | 149 | 100 U |
| | 07/31/00 | 1 U | 1 U | 0.002 U | 1 U | 2 U | 5 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 5 U | 1 U | 1 U | 1 U | 1 U | 1 U | 5 U | 5 U | 1 U | 2.2 | 15 | 1 U | 1 U | 160 | 100 U |
| | 11/14/00 | 1 U | 1 U | 0.00002 U | 1 U | 2 U | 5 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 5 U | 1 U | 1 U | 1 U | 1 U | 1 U | 5 U | 5 U | 1 U | 2.1 | 14 | 1 U | 1 U | 160 | 100 U |
| | 02/05/01 | 1 U | 1 U | 0.00002 U | 1 U | 2 U | 5 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 5 U | 1 U | 1 U | 1 U | 1 U | 1 U | 5 U | 5 U | 1 U | 2.1 | 17 | 1 U | 1 U | 182 | 100 U |
| | 05/01/01 | 1 U | 1 U | 0.00002 U | 1 U | 2 U | 5 U | 1 U | 1 U | 1 U | 1 U | 1 U | 1 U | 5 U | 1 U | 1 U | 1 U | 1 U | 1 U | 5 U | 5 U | 1 U | 2.0 | 14 | 1 U | 1 U | 149 | 100 U |
| | 08/07/01 | 0.5 U | 0.5 U | 0.00002 U | 0.5 U | 1 U | 2.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 2.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 2.5 U | 2.5 U | 0.5 U | 2.2 | 15 | 0.5 U | 0.5 U | 120 | 50 U |
| | 11/12/01 | 1.5 U | 1.5 U | 0.00002 U | 1.5 U | 3 U | 7.5 U | 1.5 U | 1.5 U | 1.5 U | 1.5 U | 1.5 U | 1.5 U | 7.5 U | 1.5 U | 1.5 U | 1.5 U | 1.5 U | 1.5 U | 7.5 U | 7.5 U | 1.5 U | 1.9 | 13 | 1.5 U | 1.5 U | 158 | 150 U |
| | 02/05/02 | 0.5 U | 0.5 U | 0.00002 U | 0.5 U | 1 U | 2.5 U | 0.5 U | 0.00002 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 2.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 2.5 U | 2.5 U | 0.5 U | 1.9 | 13 | 0.5 U | 0.5 U | 189 | 50 U |
| | 05/06/02 | 1.5 U | 1.5 U | 0.00002 U | 1.5 U | 3 U | 7.5 U | 1.5 U | 0.00002 U | 1.5 U | 1.5 U | 1.5 U | 1.5 U | 7.5 U | 1.5 U | 1.5 U | 1.5 U | 1.5 U | 1.5 U | 7.5 U | 7.5 U | 1.5 U | 1.9 | 12 | 1.5 U | 1.5 U | 146 | 150 U |
| | 08/06/02 | 1 U | 1 U | 0.0002 U | 1 U | 2 U | 5 U | 1 U | 0.00002 U | 1 U | 1 U | 1 U | 1 U | 5 U | 1 U | 1 U | 1 U | 1 U | 1 U | 5 U | 5 U | 1 U | 2.8 | 16 | 1 U | 1 U | 148 | 100 U |
| | 11/16/02 | 0.75 U | 0.75 U | 0.00002 U | 0.75 U | 1.5 U | 3.7 U | 0.75 U | 0.00002 U | 0.75 U | 0.75 U | 0.75 U | 0.75 U | 3.7 U | 0.75 U | 0.75 U | 0.75 U | 0.75 U | 0.75 U | 3.7 U | 3.7 U | 0.75 U | 2.4 | 15 | 0.75 U | 0.75 U | 160 | 75 U |
| | 02/04/03 | 1.5 U | 1.5 U | 0.00002 U | 1.5 U | 2.2 U | 7.5 U | 1.5 U | 0.00002 U | 1.5 U | 1.5 U | 1.5 U | 1.5 U | 7.5 U | 1.5 U | 1.5 U | 1.5 U | 1.5 U | 1.5 U | 7.5 U | 7.5 U | 1.5 U | 2.3 | 15 | 1.5 U | 1.5 U | 171 | 150 U |
| | 05/05/03 | 0.5 U | 0.5 U | 0.003 U | 0.5 U | 1 U | 2.5 U | 0.5 U | 0.003 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 2.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 2.5 U | 2.5 U | 0.5 U | 2.3 | 16 | 0.5 U | 0.5 U | 152 | 50 U |
| | 07/22/03 | 0.5 U | 0.5 U | 0.0002 U | 0.5 U | 1 U | 2.5 U | 0.5 U | 0.0002 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 2.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 2.5 U | 2.5 U | 0.5 U | 2.2 | 14 | 0.5 U | 0.5 U | 139 | 50 U |
| | 11/04/03 | 0.5 U | 0.5 U | 0.0002 U | 0.5 U | 1 U | 2.5 U | 0.5 U | 0.0002 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 2.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 2.5 U | 2.5 U | 0.5 U | 2.2 | 15 | 0.5 U | 0.5 U | 184 | 50 U |
| | 01/21/04 | 2 U | 2 U | 0.0002 U | 2 U | 4 U | 10 U | 2 U | 0.0002 U | 2 U | 2 U | 2 U | 2 U | 10 U | 2 U | 2 U | 2 U | 2 U | 2 U | 10 U | 10 U | 2 U | 2.4 | 18 | 2 U | 2 U | 213 | 200 U |
| | 04/14/04 | 1 U | 1 U | 0.0002 U | 1 U | 2 U | 5 U | 1 U | 0.0002 U | 1 U | 1 U | 1 U | 1 U | 5 U | 1 U | 1 U | 1 U | 1 U | 1 U | 5 U | 5 U | 1 U | 2.0 | 14 | 1 U | 1 U | 159 | 100 U |
| | 07/13/04 | 1 U | 1 U | 0.0002 U | 1 U | 2 U | 5 U | 1 U | 0.0002 U | 1 U | 1 U | 1 U | 1 U | 5 U | 1 U | 1 U | 1 U | 1 U | 1 U | 5 U | 5 U | 1 U | 2.0 | 14 | 1 U | 1 U | 158 | 100 U |
| | 10/01/04 | 0.75 U | 0.75 U | 0.0002 U | 0.75 U | 1.5 U | 3.7 U | 0.75 U | 0.0002 U | 0.75 U | 0.75 U | 0.75 U | 0.75 U | 3.7 U | 0.75 U | 0.75 U | 0.75 U | 0.75 U | 0.75 U | 3.7 U | 3.7 U | 0.75 U | 2.6 | 18 | 0.75 U | 0.75 U | 202 | 75 U |
| | 01/12/05 | 1 U | 1 U | 0.0002 U | 1 U | 2 U | 5 U | 1 U | 0.0002 U | 1 U | 1 U | 1 U | 1 U | 5 U | 1 U | 1 U | 1 U | 1 U | 1 U | 5 U | 5 U | 1 U | 2.0 | 14 | 1 U | 1 U | 137 | 100 U |
| | 04/11/05 | 1 U | 1 U | 0.0002 U | 1 U | 4.4** | 5 U | 1 U | 0.0002 U | 1 U | 1 U | 1 U | 1 U | 5 U | 1 U | 1 U | 1 U | 1 U | 1 U | 5 U | 5 U | 1 U | 2.7 | 19 | 1 U | 1 U | 215 | 100 U |
| | 10/17/05 | 1 U | 1 U | 0.0002 UJ | 1 U | 2 U | 5 U | 1 U | 0.0002 UJ | 1 U | 1 U | 1 U | 1 U | 5 U | 1 U | 1 U | 1 U | 1 U | 1 U | 5 U | 5 U | 1 U | 2.2 | 15 | 1 U | 1 U | 169 | 100 U |
| | 04/19/06 | 1 U | 1 U | 0.0002 U | 1 U | 2 U | 5 U | 1 U | 0.0002 U | 1 U | 1 U | 1 U | 1 U | 5 U | 1 U | 1 U | 1 U | 1 U | 1 U | 5 U | 5 U | 1 U | 2.9 | 22 | 1 U | 1 U | 238 | 100 U |
| | 10/17/06 | 0.6 U | 0.6 U | 0.0002 UJ | 0.6 U | 1.2 U | 3.0 U | 0.6 U | 0.0002 UJ | 0.6 U | 0.6 U | 0.6 U | 0.6 U | 3.0 U | 0.6 U | 0.6 U | 0.0033 J | 0.6 U | 0.6 U | 3.0 U | 3.0 U | 0.0026 J | 1.8 | 13 | 0.6 U | 0.6 U | 157 | 60 U |
| | 04/03/07 | 0.5 U | 0.5 U | 0.0002 U | 0.5 U | 1.0 U | 2.5 U | 0.5 U | 0.0002 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 2.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 2.5 U | 2.5 U | 0.5 U | 1.8 | 13 | 0.5 U | 0.5 U | 138 | 50 UJ |
| | 10/25/07 | 2 U | 2 U | 0.0002 U | 2 U | 4 U | 10 U | 2 U | 0.0002 U | 2 U | 2 U | 2 U | 2 U | 10 U | 2 U | 2 U | 2 U | 2 U | 2 U | 10 U | 10 U | 2 U | 2 U | 12 | 2 U | 2 U | 147 | 200 U |
| | 04/01/08 | 0.5 U | 0.5 U | 0.0002 U | 0.5 U | 1 U | 2.5 U | 0.5 U | 0.0002 U | 0.5 U | 0.0002 U | 0.5 U | 0.5 U | 2.5 U | 0.5 U | 0.5 U | 0.0036 | 0.5 U | 0.5 U | 2.5 U | 2.5 U | 0.0031 | 1.8 J | 13 J | 0.5 U | 0.5 U | 117 J | 400 UJ |
| | 10/07/08 | 0.5 U | 0.5 U | 0.001 U | 0.5 U | 1 U | 2.5 U | 0.5 U | 0.001 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 2.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 2.5 U | 2.5 U | 0.5 U | 2.4 | 16 | 0.5 U | 0.5 U | 174 D | 50 U |
| | 04/06/09 | 0.5 U | 0.5 U | 0.0010 U | 0.5 U | 1.0 U | 5.0 U | 0.5 U | 0.0010 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 2.5 U | 0.5 U | 0.5 U | 0.0042 | 0.5 U | 0.5 U | 2.5 U | 2.5 U | 0.0037 | 2.5 | 17 | 0.5 U | 0.5 U | 217 | 50 U |
| | 10/27/09 | 1 U | 1 U | 0.0002 UJ | 0.4 U | 1 U | 10 U | 0.4 U | 0.0002 UJ | 0.4 U | 0.4 U | 0.4 U | 0.4 U | 10 U | 0.4 U | 0.4 U | 0.4 U | 0.4 U | 0.4 U | 10 U | 10 U | 0.4 U | 2.1 | 14 | 0.4 U | 0.4 U | 161 | 40 UJ |
| | 04/06/10 | 1 U | 1 U | 0.0002 U | 0.4 U | 1 U | 10 U | 0.4 U | 0.0002 U | 0.4 U | 0.4 U | 0.4 U | 0.4 U | 10 U | 0.4 U | 0.4 U | 0.0023 | 0.4 U | 0.4 U | 10 U | 10 U | 0.0020 | 1.7 | 12 | 0.4 U | 0.4 U | 148 | 40 U |

**Table 16-8**
**Summary of Groundwater Analytical Results for Volatile Organic Compounds, (mg/L)**
**Building 40-56**
**Boeing Everett Plant**

| Well ID | Sample Date | Chloromethane | Bromomethane | Vinyl Chloride | Chloroethane | Methylene Chloride | Acetone | Carbon Disulfide | 1,1-DCE | 1,1-DCA | cis-1,2-DCE | Chloroform | 1,2-DCA | MEK | 1,1,1-TCA | BDCM | TCE | Benzene | Bromoform | MIBK | 2-Hexanone | PCE | Toluene | Ethylbenzene | Styrene | TCFM | Total Xylenes | Cyclohexanone |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MTCA Method A or B Groundwater Screening Level | | 0.00337 (B) | 0.0112 (B) | 0.0002 (A)<br>0.0000292 (B) | 0.015 (B) | 0.005 (A)<br>0.00583 (B) | 0.8 (B) | 0.8 (B) | 0.4 (B) | 1.6 (B) | 0.08 (B) | 0.00717 (B) | 0.005 (A)<br>0.000481 (B) | 4.8 (B) | 0.2 (A)<br>7.2 (B)<br>16 (B*) | 0.000706 (B) | 0.005 (A)<br>0.00049 (B) | 0.005 (A)<br>0.000795 (B) | 0.00554 (B) | 0.64 (B) | NE | 0.005 (A)<br>0.000081 (B) | 1 (A)<br>0.64 (B) | 0.7 (A)<br>0.8 (B) | 0.0015 (B) | 2.4 (B) | 1 (A)<br>1.6 (B) | 40 (B) |
| **EGW062** | 06/27/00 | 0.001 U | 0.001 U | 0.00002 U | 0.001 U | 0.002 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | 0.005 U | 0.001 U | 0.001 U | 0.024 | 0.001 U | 0.0011 | **0.214** | 0.1 U |
| | 07/31/00 | 0.01 U | 0.01 U | 0.002 U | 0.01 U | 0.02 U | 0.05 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.05 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.05 U | 0.05 U | 0.01 U | 0.01 U | 0.18 | 0.01 U | 0.01 U | **1.571** | 1 U |
| | 11/13/00 | 0.01 U | 0.01 U | 0.00002 U | 0.01 U | 0.02 U | 0.05 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.05 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.05 U | 0.05 U | 0.01 U | 0.01 U | 0.35 | 0.01 U | 0.01 U | **2.81** | 1 U |
| | 02/05/01 | 0.03 UJ | 0.03 UJ | 0.00002 U | 0.03 UJ | 0.06 UJ | 0.15 UJ | 0.03 UJ | 0.03 UJ | 0.03 UJ | 0.03 UJ | 0.03 UJ | 0.03 UJ | 0.15 UJ | 0.03 UJ | 0.03 UJ | 0.03 UJ | 0.03 UJ | 0.03 UJ | 0.15 UJ | 0.15 UJ | 0.03 UJ | 0.03 UJ | 0.5 | 0.03 UJ | 0.03 UJ | **3.9** | 3 UJ |
| | 05/01/01 | 0.005 U | 0.005 U | 0.00002 U | 0.005 U | 0.01 U | 0.025 U | 0.005 U | 0.005 U | 0.005 U | 0.005 U | 0.005 U | 0.005 U | 0.025 U | 0.005 U | 0.005 U | 0.005 U | 0.005 U | 0.005 U | 0.025 U | 0.025 U | 0.005 U | 0.005 U | 0.38 | 0.005 U | 0.005 U | **2.77** | 0.5 U |
| | 08/06/01 | 0.02 U | 0.02 U | 0.00002 U | 0.02 U | 0.04 U | 0.1 U | 0.02 U | 0.02 U | 0.02 U | 0.02 U | 0.02 U | 0.02 U | 0.1 U | 0.02 U | 0.02 U | 0.02 U | 0.02 U | 0.02 U | 0.1 U | 0.1 U | 0.02 U | 0.02 U | 0.48 | 0.02 U | 0.02 U | **2.947** | 2 U |
| | 11/12/01 | 0.025 U | 0.025 U | 0.00002 U | 0.025 U | .05 U | 0.12 U | 0.025 U | 0.025 U | 0.025 U | 0.025 U | 0.025 U | 0.025 U | 0.12 U | 0.025 U | 0.025 U | 0.025 U | 0.025 U | 0.025 U | 0.12 U | 0.12 U | 0.025 U | 0.025 U | 0.45 | 0.025 U | 0.025 U | **4.06** | 2.5 U |
| | 02/05/02 | 0.01 U | 0.01 U | 0.00002 U | 0.01 U | 0.02 U | 0.05 U | 0.01 U | 0.00002 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.05 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.05 U | 0.05 U | 0.01 U | 0.01 U | 0.42 | 0.01 U | 0.01 U | **3.4** | 1 U |
| | 05/06/02 | 0.015 U | 0.015 U | 0.00002 U | 0.015 U | 0.03 U | 0.075 U | 0.015 U | 0.00002 U | 0.015 U | 0.015 U | 0.015 U | 0.015 U | 0.075 U | 0.015 U | 0.015 U | 0.015 U | 0.015 U | 0.015 U | 0.075 U | 0.075 U | 0.015 U | 0.015 U | 0.3 | 0.015 U | 0.015 U | **2.2** | 1.5 U |
| | 08/05/02 | 0.02 U | 0.02 U | 0.00002 U | 0.02 U | 0.04 U | 0.1 U | 0.02 U | 0.00002 U | 0.02 U | 0.02 U | 0.02 U | 0.02 U | 0.1 U | 0.02 U | 0.02 U | 0.02 U | 0.02 U | 0.02 U | 0.1 U | 0.1 U | 0.02 U | 0.02 U | 0.44 | 0.02 U | 0.02 U | **3.5** | 2 U |
| | 11/16/02 | 0.02 U | 0.02 U | 0.00002 U | 0.02 U | 0.04 U | 0.1 U | 0.02 U | 0.00002 U | 0.02 U | 0.02 U | 0.02 U | 0.02 U | 0.1 U | 0.02 U | 0.02 U | 0.02 U | 0.02 U | 0.02 U | 0.1 U | 0.1 U | 0.02 U | 0.02 U | 0.41 | 0.02 U | 0.02 U | **4.229** | 2 U |
| | 02/04/03 | 0.04 U | 0.04 U | 0.00002 U | 0.04 U | 0.06 U | 0.2 U | 0.04 U | 0.00002 U | 0.04 U | 0.04 U | 0.04 U | 0.04 U | 0.2 U | 0.04 U | 0.04 U | 0.04 U | 0.04 U | 0.04 U | 0.2 U | 0.2 U | 0.04 U | 0.04 U | 0.24 | 0.04 U | 0.04 U | **4.0** | 4 U |
| | 05/05/03 | 0.02 U | 0.02 U | 0.00006 U | 0.02 U | 0.04 U | 0.1 U | 0.02 U | 0.00006 U | 0.02 U | 0.02 U | 0.02 U | 0.02 U | 0.1 U | 0.02 U | 0.02 U | 0.02 U | 0.02 U | 0.02 U | 0.1 U | 0.1 U | 0.02 U | 0.02 U | 0.27 | 0.02 U | 0.02 U | **4.4** | 2 U |
| | 07/22/03 | 0.02 U | 0.02 U | 0.00002 U | 0.02 U | 0.04 U | 0.1 U | 0.02 U | 0.00002 U | 0.02 U | 0.02 U | 0.02 U | 0.02 U | 0.1 U | 0.02 U | 0.02 U | 0.02 U | 0.02 U | 0.02 U | 0.1 U | 0.1 U | 0.02 U | 0.02 U | 0.099 | 0.02 U | 0.02 U | **4.3** | 2 U |
| | 11/04/03 | 0.02 U | 0.02 U | 0.00002 U | 0.02 U | 0.04 U | 0.1 U | 0.02 U | 0.00002 U | 0.02 U | 0.02 U | 0.02 U | 0.02 U | 0.1 U | 0.02 U | 0.02 U | 0.02 U | 0.02 U | 0.02 U | 0.1 U | 0.1 U | 0.02 U | 0.02 U | 0.02 U | 0.02 U | 0.02 U | **2.1** | 2 U |
| | 01/21/04 | 0.1 U | 0.1 U | 0.00002 U | 0.1 U | 0.2 U | 0.5 U | 0.1 U | 0.00002 U | 0.1 U | 0.1 U | 0.1 U | 0.1 U | 0.5 U | 0.1 U | 0.1 U | 0.1 U | 0.1 U | 0.1 U | 0.5 U | 0.5 U | 0.1 U | 0.1 U | 0.1 U | 0.1 U | 0.1 U | **6.5** | 10 U |
| | 04/14/04 | 0.03 U | 0.03 U | 0.00002 U | 0.03 U | 0.06 U | 0.15 U | 0.03 U | 0.00002 U | 0.03 U | 0.03 U | 0.03 U | 0.03 U | 0.15 U | 0.03 U | 0.03 U | 0.03 U | 0.03 U | 0.03 U | 0.15 U | 0.15 U | 0.03 U | 0.03 U | 0.03 U | 0.03 U | 0.03 U | **4.4** | 3 U |
| | 07/13/04 | 0.02 U | 0.02 U | 0.00002 U | 0.02 U | 0.04 U | 0.1 U | 0.02 U | 0.00002 U | 0.02 U | 0.02 U | 0.02 U | 0.02 U | 0.1 U | 0.02 U | 0.02 U | 0.02 U | 0.02 U | 0.02 U | 0.1 U | 0.1 U | 0.02 U | 0.02 U | **3.1** | 0.02 U | 0.02 U | **4.2** | 2 U |
| | 10/01/04 | 0.02 U | 0.02 U | 0.00002 U | 0.02 U | 0.04 U | 0.1 U | 0.02 U | 0.00002 U | 0.02 U | 0.02 U | 0.02 U | 0.02 U | 0.1 U | 0.02 U | 0.02 U | 0.02 U | 0.02 U | 0.02 U | 0.1 U | 0.1 U | 0.02 U | 0.02 U | 0.02 U | 0.02 U | 0.02 U | **4.6** | 2 U |
| | 01/12/05 | 0.015 U | 0.015 U | 0.00002 U | 0.015 U | 0.03 U | 0.075 U | 0.015 U | 0.00002 U | 0.015 U | 0.015 U | 0.015 U | 0.015 U | 0.075 U | 0.015 U | 0.015 U | 0.015 U | 0.015 U | 0.015 U | 0.075 U | 0.075 U | 0.015 U | 0.015 U | 0.015 U | 0.015 U | 0.015 U | **2.6** | 1.5 U |
| | 04/11/05 | 0.01 U | 0.01 U | 0.00002 U | 0.01 U | **0.038**** | 0.05 U | 0.01 U | 0.00002 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.05 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.05 U | 0.05 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | **3.1** | 1 U |
| | 07/12/05 | 0.005 U | 0.005 U | 0.00002 U | 0.005 U | 0.01 U | 0.025 U | 0.005 U | 0.00002 U | 0.005 U | 0.005 U | 0.005 U | 0.005 U | 0.025 U | 0.005 U | 0.005 U | 0.005 U | 0.005 U | 0.005 U | 0.025 U | 0.025 U | 0.005 U | 0.005 U | 0.005 U | 0.005 U | 0.005 U | 0.6 | 0.5 U |
| | 10/17/05 | 0.010 U | 0.010 U | 0.00002 U | 0.010 U | 0.02 U | 0.05 U | 0.010 U | 0.00002 U | 0.010 U | 0.010 U | 0.010 U | 0.010 U | 0.05 U | 0.010 U | 0.010 U | 0.010 U | 0.010 U | 0.010 U | 0.05 U | 0.05 U | 0.010 U | 0.010 U | 0.010 U | 0.010 U | 0.010 U | **2.6** | 1 U |
| | 01/12/06 | 0.01 U | 0.01 U | 0.00002 U | 0.01 U | 0.02 U | 0.05 U | 0.01 U | 0.00002 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.05 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.05 U | 0.05 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | **2.4** | 1 U |
| | 04/19/06 | 0.01 U | 0.01 U | 0.00002 U | 0.01 U | **0.024**** | 0.05 U | 0.01 U | 0.00002 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.05 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.05 U | 0.05 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | **1.8** | 1 U |
| | 07/05/06 | 0.005 U | 0.005 U | 0.00002 U | 0.005 U | 0.01 U | 0.025 U | 0.005 U | 0.00002 U | 0.005 U | 0.005 U | 0.005 U | 0.005 U | 0.025 U | 0.005 U | 0.005 U | 0.005 U | 0.005 U | 0.005 U | 0.025 U | 0.025 U | 0.005 U | 0.005 U | 0.005 U | 0.005 U | 0.005 U | 0.83 | 0.5 U |
| | 10/17/06 | 0.001 U | 0.001 U | 0.00002 UJ | 0.001 U | 0.002 U | 0.005 U | 0.001 U | 0.00002 UJ | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | 0.001 U | 0.001 U | 0.000050 J | 0.001 U | 0.001 U | 0.005 U | 0.005 U | 0.00002 UJ | 0.001 U | 0.001 U | 0.001 U | 0.001 U | **1.6 D** | 0.1 U |
| | 01/04/07 | 0.010 U | 0.010 U | 0.00010 U | 0.010 U | 0.020 U | 0.050 U | 0.010 U | 0.00010 U | 0.010 U | 0.010 U | 0.010 U | 0.010 U | 0.050 U | 0.010 U | 0.010 U | 0.00010 U | 0.010 U | 0.010 U | 0.050 U | 0.050 U | 0.00010 U | 0.010 U | 0.010 U | 0.010 U | 0.010 U | **1.4** | 1 U |
| | 04/03/07 | 0.010 U | 0.010 U | **0.000032** | 0.010 U | 0.020 U | 0.050 U | 0.010 U | 0.00002 U | 0.010 U | 0.010 U | 0.010 U | 0.010 U | 0.050 U | 0.010 U | 0.010 U | 0.000041 | 0.010 U | 0.010 U | 0.050 U | 0.050 U | 0.00002 U | 0.010 U | 0.018 | 0.010 U | 0.010 U | **1.2** | 1 UJ |
| | 07/02/07 | 0.001 U | 0.001 U | 0.00002 U | 0.001 U | 0.002 U | 0.005 U | 0.001 U | 0.00002 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | 0.001 U | 0.001 U | 0.000034 | 0.001 U | 0.001 U | 0.005 U | 0.005 U | 0.00002 U | 0.001 U | 0.036 | 0.001 U | 0.001 U | 0.484 | 0.1 U |
| | 10/25/07 | 0.0002 U | 0.0002 U | 0.00002 U | 0.0002 U | 0.0003 U | 0.0033 | 0.0002 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.001 U | 0.0002 U | 0.0002 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.001 U | 0.003 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.099 D | 0.04 U |
| | 01/03/08 | 0.001 U | 0.001 U | 0.00002 U | 0.001 U | 0.002 U | 0.005 U | 0.001 U | 0.00002 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | 0.001 U | 0.001 U | 0.000034 | 0.001 U | 0.001 U | 0.005 U | 0.005 U | 0.00002 U | 0.001 U | 0.046 | 0.001 U | 0.001 U | 0.756 D | 0.1 U |
| | 04/01/08 | 0.005 U | 0.005 U | 0.0002 U | 0.005 U | 0.01 U | 0.025 U | 0.005 U | 0.0002 U | 0.005 U | 0.0002 U | 0.005 U | 0.005 U | 0.025 U | 0.005 U | 0.005 U | 0.0002 U | 0.005 U | 0.005 U | 0.025 U | 0.025 U | 0.0002 U | 0.005 U | 0.14 | 0.005 U | 0.005 U | **1.4** | 4 UJ |
| | 07/07/08 | 0.005 U | 0.005 U | 0.00002 U | 0.005 U | 0.01 U | 0.025 U | 0.005 U | 0.00002 U | 0.005 U | 0.005 U | 0.005 U | 0.005 U | 0.025 U | 0.005 U | 0.005 U | 0.000066 | 0.005 U | 0.005 U | 0.025 U | 0.025 U | 0.00002 U | 0.005 U | 0.097 | 0.005 U | 0.005 U | **1.7** | 0.5 U |
| | 10/07/08 | 0.01 U | 0.01 U | 0.0002 U | 0.01 U | 0.02 U | 0.05 U | 0.01 U | 0.0002 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.05 U | 0.01 U | 0.01 U | 0.0002 U | 0.01 U | 0.01 U | 0.05 U | 0.05 U | 0.0002 U | 0.01 U | 0.017 | 0.01 U | 0.01 U | **2.4** | 1 U |
| | 01/05/09 | 0.01 U | 0.01 U | 0.00002 U | 0.01 U | 0.02 U | 0.05 U | 0.01 U | 0.00002 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.05 U | 0.01 U | 0.01 U | 0.000056 | 0.01 U | 0.01 U | 0.05 U | 0.05 U | 0.00002 U | 0.01 U | 0.041 | 0.01 U | 0.01 U | **1.9** | 1 U |
| | 04/06/09 | 0.01 U | 0.01 U | 0.00002 U | 0.01 U | 0.02 U | 0.1 U | 0.01 U | 0.00002 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.05 U | 0.01 U | 0.01 U | 0.000057 | 0.01 U | 0.01 U | 0.05 U | 0.05 U | 0.00002 U | 0.01 U | 0.085 | 0.01 U | 0.01 U | **2.1** | 1 U |
| | 07/08/09 | 0.025 U | 0.025 U | 0.00002 U | 0.01 U | 0.025 U | 0.25 U | 0.01 U | 0.00002 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | 0.25 U | 0.01 U | 0.01 U | 0.000051 | 0.01 U | 0.01 U | 0.25 U | 0.25 U | 0.00002 U | 0.01 U | 0.01 U | 0.01 U | 0.01 U | **2.0** | 1 U |
| | 10/27/09 | 0.005 U | 0.005 U | 0.00002 U | 0.002 U | 0.005 U | 0.05 U | 0.002 U | 0.00002 U | 0.002 U | 0.002 U | 0.002 U | 0.002 U | 0.05 U | 0.002 U | 0.002 U | 0.000041 | 0.002 U | 0.002 U | 0.05 U | 0.05 U | 0.00002 U | 0.002 U | 0.002 U | 0.002 U | 0.002 U | 0.69 | 0.2 U |
| | 01/13/10 | 0.0005 U | 0.0005 U | 0.00002 U | 0.0002 U | 0.0005 U | 0.005 U | 0.0002 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.0002 | 0.0002 U | 0.005 U | 0.0002 U | 0.0002 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.005 U | 0.005 U | 0.000024 | 0.0002 U | 0.0006 | 0.0002 U | 0.0002 U | 0.0107 | 0.02 U |
| | 04/06/10 | 0.0005 U | 0.0005 U | 0.00002 U | 0.0002 U | 0.0005 U | 0.005 U | 0.0002 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.005 U | 0.0002 U | 0.0002 U | 0.000038 | 0.0002 U | 0.0002 U | 0.005 U | 0.005 U | 0.00002 U | 0.0002 U | 0.011 | 0.0002 U | 0.0002 U | 0.9 D | 0.02 U |

**Table 16-8**

**Summary of Groundwater Analytical Results for Volatile Organic Compounds, (mg/L)**

**Building 40-56**

**Boeing Everett Plant**

| Well ID | Sample Date | Chloromethane | Bromomethane | Vinyl Chloride | Chloroethane | Methylene Chloride | Acetone | Carbon Disulfide | 1,1-DCE | 1,1-DCA | cis-1,2-DCE | Chloroform | 1,2-DCA | MEK |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MTCA Method A or B Groundwater Screening Level | | 0.00337 (B) | 0.0112 (B) | 0.0002 (A)<br>0.0000292 (B) | 0.015 (B) | 0.005 (A)<br>0.00583 (B) | 0.8 (B) | 0.8 (B) | 0.4 (B) | 1.6 (B) | 0.08 (B) | 0.00717 (B) | 0.005 (A)<br>0.000481 (B) | 4.8 (B) |
| **EGW063** | 06/27/00 | 2 U | 2 U | 0.00002 U | 2 U | 4 U | 10 U | 2 U | 2 U | 2 U | 2 U | 2 U | 2 U | 10 U |
| | 07/31/00 | 0.5 U | 0.5 U | 0.002 U | 0.5 U | 1 U | 2.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 2.5 U |
| | 11/13/00 | 0.1 U | 0.1 U | 0.00002 U | 0.1 U | 0.2 U | 0.5 U | 0.1 U | 0.1 U | 0.1 U | 0.1 U | 0.1 U | 0.1 U | 0.5 U |
| | 11/13/00 (DUP) | 0.2 U | 0.2 U | 0.00002 U | 0.2 U | 0.4 U | 1 U | 0.2 U | 0.2 U | 0.2 U | 0.2 U | 0.2 U | 0.2 U | 1 U |
| | 02/05/01 | 0.15 UJ | 0.15 UJ | 0.00002 U | 0.15 UJ | 0.3 UJ | 0.75 UJ | 0.15 UJ | 0.15 UJ | 0.15 UJ | 0.15 UJ | 0.15 UJ | 0.2 UJ | 0.75 UJ |
| | 02/05/01 (DUP) | 0.2 UJ | 0.2 UJ | 0.00002 U | 0.2 UJ | 0.4 UJ | 1 UJ | 0.2 UJ | 0.2 UJ | 0.2 UJ | 0.2 UJ | 0.2 UJ | 0.15 UJ | 1 UJ |
| | 05/01/01 | 0.1 U | 0.1 U | 0.00002 U | 0.1 U | 0.2 U | 0.5 U | 0.1 U | 0.1 U | 0.1 U | 0.1 U | 0.1 U | 0.1 U | 0.5 U |
| | 08/06/01 | 0.5 U | 0.5 U | 0.00002 U | 0.5 U | 1 U | 2.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 2.5 U |
| | 11/12/01 | 0.25 U | 0.25 U | 0.00002 U | 0.25 U | 0.5 U | 1.2 U | 0.25 U | 0.25 U | 0.25 U | 0.25 U | 0.25 U | 0.25 U | 1.2 U |
| | 02/05/02 | 0.03 U | 0.03 U | 0.00002 U | 0.03 U | 0.06 U | 0.15 U | 0.03 U | 0.00002 U | 0.03 U | 0.03 U | 0.03 U | 0.03 U | 0.15 U |
| | 05/06/02 | 0.001 U | 0.001 U | 0.00002 U | 0.001 U | 0.002 U | 0.005 U | 0.001 U | 0.00002 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U |
| | 08/06/02 | 0.5 U | 0.5 U | 0.0002 U | 0.5 U | 1 U | 2.5 U | 0.5 U | 0.00002 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 2.5 U |
| | 08/06/02 (DUP) | 1 U | 1 U | 0.00002 U | 1 U | 2 U | 5 U | 1 U | 0.00002 U | 1 U | 1 U | 1 U | 1 U | 5 U |
| | 11/16/02 | 0.5 U | 0.5 U | 0.00002 U | 0.5 U | 1 U | 2.5 U | 0.5 U | 0.00002 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 2.5 U |
| | 02/04/03 | 0.15 U | 0.15 U | 0.00002 U | 0.15 U | 0.22 U | 0.75 U | 0.15 U | 0.00002 U | 0.15 U | 0.15 U | 0.15 U | 0.15 U | 0.75 U |
| | 02/04/03 (DUP) | 0.06 U | 0.06 U | 0.00002 U | 0.06 U | 0.09 U | 0.3 U | 0.06 U | 0.00002 U | 0.06 U | 0.06 U | 0.06 U | 0.06 U | 0.3 U |
| | 05/05/03 | 0.03 U | 0.03 U | 0.0001 U | 0.03 U | 0.06 U | 0.15 U | 0.03 U | 0.0001 U | 0.03 U | 0.03 U | 0.03 U | 0.03 U | 0.15 U |
| | 07/22/03 | 0.03 U | 0.03 U | 0.00002 U | 0.03 U | 0.06 U | 0.15 U | 0.03 U | 0.00002 U | 0.03 U | 0.03 U | 0.03 U | 0.03 U | 0.15 U |
| | 11/04/03 | 0.5 U | 0.5 U | 0.00002 U | 0.5 U | 1 U | 2.5 U | 0.5 U | 0.00002 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 2.5 U |
| | 11/4/03 (DUP) | 0.1 U | 0.1 U | 0.00002 U | 0.1 U | 0.2 U | 0.5 U | 0.1 U | 0.00002 U | 0.1 U | 0.1 U | 0.1 U | 0.1 U | 0.5 U |
| | 01/21/04 | 0.015 U | 0.015 U | 0.00002 U | 0.015 U | 0.03 U | 0.075 U | 0.015 U | 0.00002 U | 0.015 U | 0.015 U | 0.015 U | 0.015 U | 0.075 U |
| | 1/21/04 (DUP) | 0.015 U | 0.015 U | 0.00002 U | 0.015 U | 0.03 U | 0.075 U | 0.015 U | 0.00002 U | 0.015 U | 0.015 U | 0.015 U | 0.015 U | 0.075 U |
| | 04/14/04 | 0.3 U | 0.3 U | 0.00002 U | 0.3 U | 0.6 U | 1.5 U | 0.3 U | 0.000025 | 0.3 U | 0.3 U | 0.3 U | 0.3 U | 1.5 U |
| | 07/13/04 | 0.25 U | 0.25 U | 0.00002 U | 0.25 U | 0.5 U | 1.2 U | 0.25 U | 0.00002 U | 0.25 U | 0.25 U | 0.25 U | 0.25 U | 1.2 U |
| | 10/01/04 | 0.3 U | 0.3 U | 0.00002 U | 0.3 U | 0.6 U | 1.5 U | 0.3 U | 0.00002 U | 0.3 U | 0.3 U | 0.3 U | 0.3 U | 1.5 U |
| | 01/12/05 | 0.001 U | 0.001 U | 0.00002 U | 0.001 U | 0.002 U | 0.005 U | 0.001 U | 0.00002 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U |
| | 04/11/05 | 0.0004 UJ | 0.0004 UJ | 0.00002 U | 0.0004 UJ | 0.0006 UJ | 0.0036 J | 0.0004 UJ | 0.00002 U | 0.0004 UJ | 0.0004 UJ | 0.0022 J | 0.0004 UJ | 0.002 UJ |
| | 07/12/05 | 0.5 U | 0.5 U | 0.00002 U | 0.5 U | 1 U | 2.5 U | 0.5 U | 0.00002 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 2.5 U |
| | 10/17/05 | 0.15 U | 0.15 U | 0.00002 UJ | 0.15 U | 0.3 U | 0.75 U | 0.15 U | 0.00002 UJ | 0.15 U | 0.15 U | 0.15 U | 0.15 U | 0.75 U |
| | 10/17/05 (DUP) | 0.5 U | 0.5 U | 0.00002 UJ | 0.5 U | 1 U | 2.5 U | 0.5 U | 0.00002 UJ | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 2.5 U |
| | 01/12/06 | 0.005 U | 0.005 U | 0.00002 U | 0.005 U | 0.01 U | 0.025 U | 0.005 U | 0.00002 U | 0.005 U | 0.005 U | 0.005 U | 0.005 U | 0.025 U |
| | 04/19/06 | 0.0002 U | 0.0002 U | 0.00002 U | 0.0002 U | 0.0003 U | 0.0026 U | 0.0002 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.001 U |
| | 07/05/06 | 0.20 U | 0.20 U | 0.00002 UJ | 0.20 U | 0.4 U | 1.0 U | 0.20 U | 0.00002 UJ | 0.20 U | 0.20 U | 0.20 U | 0.20 U | 1.0 U |
| | 7/5/06 (DUP) | 0.25 U | 0.25 U | 0.00002 UJ | 0.25 U | 0.5 U | 1.2 U | 0.25 U | 0.00002 UJ | 0.25 U | 0.25 U | 0.25 U | 0.25 U | 1.2 U |
| | 10/17/06 | 0.50 U | 0.50 U | 0.00002 UJ | 0.50 U | 1 U | 2.5 U | 0.50 U | 0.000021 J | 0.50 U | 0.50 U | 0.50 U | 0.50 U | 2.5 U |
| | 01/04/07 | 0.0002 U | 0.0002 U | 0.00002 U | 0.0002 U | 0.0003 U | 0.003 U | 0.0002 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.0006 | 0.0002 U | 0.001 U |
| | 04/03/07 | 0.0002 U | 0.0002 U | 0.00002 J | 0.0002 U | 0.0003 U | 0.003 U | 0.0002 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.001 U |
| | 07/02/07 | 0.0002 U | 0.0002 U | 0.00002 U | 0.0002 U | 0.0003 U | 0.0079 | 0.0002 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.001 U |
| | 10/25/07 | 0.0002 U | 0.0002 U | 0.00002 U | 0.0002 U | 0.0003 U | 0.003 U | 0.0002 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.001 U |
| | 10/25/07 (DUP) | 0.0002 U | 0.0002 U | 0.00002 U | 0.0002 U | 0.0003 U | 0.003 U | 0.0002 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.001 U |
| | 01/03/08 | 0.0006 U | 0.0006 U | 0.00002 U | 0.0006 U | 0.0011 | 0.0097 | 0.0006 U | 0.00002 U | 0.0006 U | 0.0006 U | 0.0006 U | 0.0006 U | 0.003 U |
| | 04/01/08 | 0.0002 U | 0.0005 U | 0.00002 U | 0.0002 U | 0.0005 U | 0.003 U | 0.0002 U | 0.00002 U | 0.0002 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.0025 U |
| | 07/07/08 | 0.001 U | 0.001 U | 0.00002 U | 0.001 U | 0.002 U | 0.005 U | 0.001 U | 0.00002 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U |
| | 10/07/08 | 0.29 U | 0.29 U | 0.0002 U | 0.29 U | 0.59 U | 1.5 U | 0.29 U | 0.0002 U | 0.29 U | 0.29 U | 0.29 U | 0.29 U | 1.5 U |
| | 01/05/09 | 0.001 U | 0.001 U | 0.00002 U | 0.001 U | 0.002 U | 0.005 U | 0.001 U | 0.00002 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U |
| | 04/06/09 | 0.0002 U | 0.0005 U | 0.00002 U | 0.0002 U | 0.0005 U | 0.0025 U | 0.0002 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0025 U |
| | 4/6/09 (DUP) | 0.0002 U | 0.0005 U | 0.00002 U | 0.0002 U | 0.0005 U | 0.0025 U | 0.0002 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0025 U |
| | 07/08/09 | 0.25 U | 0.25 U | 0.00002 U | 0.1 U | 0.25 U | 2.5 U | 0.1 U | 0.00002 U | 0.1 U | 0.1 U | 0.1 U | 0.1 U | 2.5 U |
| | 10/27/09 | 0.25 U | 0.25 U | 0.0002 U | 0.1 U | 0.25 U | 2.5 U | 0.1 U | 0.0002 U | 0.1 U | 0.1 U | 0.1 U | 0.1 U | 2.5 U |
| | 01/13/10 | 0.25 U | 0.25 U | 0.00002 U | 0.1 U | 0.25 U | 2.5 U | 0.1 U | 0.00002 U | 0.1 U | 0.1 U | 0.1 U | 0.1 U | 2.5 U |
| | 04/06/10 | 0.0005 U | 0.0005 U | 0.00002 U | 0.0002 U | 0.0005 U | 0.005 U | 0.0002 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.005 U |
| | 4/6/10 (DUP) | 0.0005 U | 0.0005 U | 0.00002 U | 0.0002 U | 0.0005 U | 0.005 U | 0.0002 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.005 U |

| Well ID | Sample Date | 1,1,1-TCA | BDCM | TCE | Benzene | Bromoform | MIBK | 2-Hexanone | PCE | Toluene | Ethylbenzene | Styrene | TCFM | Total Xylenes | Cyclohexanone |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MTCA Method A or B Groundwater Screening Level | | 0.2 (A)<br>7.2 (B)<br>16 (B*) | 0.000706 (B) | 0.005 (A)<br>0.00049 (B) | 0.005 (A)<br>0.000795 (B) | 0.00554 (B) | 0.64 (B) | NE | 0.005 (A)<br>0.000081 (B) | 1 (A)<br>0.64 (B) | 0.7 (A)<br>0.8 (B) | 0.0015 (B) | 2.4 (B) | 1 (A)<br>1.6 (B) | 40 (B) |
| **EGW063** | 06/27/00 | 2 U | 2 U | 2 U | 2 U | 2 U | 10 U | 10 U | 2 U | 2 U | **11** | 2 U | 2 U | **113** | 200 U |
| | 07/31/00 | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 2.5 U | 2.5 U | 0.5 U | 0.5 U | **6.5** | 0.5 U | 0.5 U | **85** | 50 U |
| | 11/13/00 | 0.1 U | 0.1 U | 0.1 U | 0.1 U | 0.1 U | 0.5 U | 0.5 U | 0.1 U | 0.18 | **5.4** | 0.1 U | 0.1 U | **45.7** | 10 U |
| | 11/13/00 (DUP) | 0.2 U | 0.2 U | 0.2 U | 0.2 U | 0.2 U | 1 U | 1 U | 0.2 U | 0.2 U | **5.3** | 0.2 U | 0.2 U | **52.7** | 20 U |
| | 02/05/01 | 0.2 UJ | 0.2 UJ | 0.2 UJ | 0.15 UJ | 0.2 UJ | 0.75 UJ | 0.75 UJ | 0.15 UJ | 0.15 UJ | **2.4** | 0.15 UJ | 0.15 UJ | **30.1** | 15 UJ |
| | 02/05/01 (DUP) | 0.15 UJ | 0.15 UJ | 0.15 UJ | 0.2 UJ | 0.15 UJ | 1 UJ | 1 UJ | 0.2 UJ | 0.02 U | **2.7** | 0.2 UJ | 0.2 UJ | **33.3** | 20 UJ |
| | 05/01/01 | 0.1 U | 0.1 U | 0.1 U | 0.1 U | 0.1 U | 0.5 U | 0.5 U | 0.1 U | 0.1 | **5.9** | 0.1 U | 0.1 U | **62.7** | 10 U |
| | 08/06/01 | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 2.5 U | 2.5 U | 0.5 U | 0.5 U | **8.6** | 0.5 U | 0.5 U | **80** | 50 U |
| | 11/12/01 | 0.25 U | 0.25 U | 0.25 U | 0.25 U | 0.25 U | 1.2 U | 1.2 U | 0.25 U | 0.25 U | **5.0** | 0.25 U | 0.25 U | **66.6** | 25 U |
| | 02/05/02 | 0.03 U | 0.03 U | 0.03 U | 0.03 U | 0.03 U | 0.15 U | 0.15 U | 0.03 U | 0.03 U | 0.2 | 0.03 U | 0.03 U | **10.37** | 3 U |
| | 05/06/02 | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.011 | 0.005 U | 0.005 U | 0.001 U | 0.001 U | 0.003 | 0.001 U | 0.001 U | **113** | 0.100 U |
| | 08/06/02 | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 2.5 U | 2.5 U | 0.5 U | 0.5 U | **9.2** | 0.5 U | 0.5 U | **97.2** | 50 U |
| | 08/06/02 (DUP) | 1 U | 1 U | 1 U | 1 U | 1 U | 5 U | 5 U | 1 U | 1 U | **7.8** | 1 U | 1 U | **84.6** | 100 U |
| | 11/16/02 | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 2.5 U | 2.5 U | 0.5 U | 0.5 U | **5.5** | 0.5 U | 0.5 U | **61.8** | 50 U |
| | 02/04/03 | 0.15 U | 0.15 U | 0.15 U | 0.15 U | 0.15 U | 0.75 U | 0.75 U | 0.15 U | 0.15 U | 0.47 | 0.15 U | 0.15 U | **6.37** | 15 U |
| | 02/04/03 (DUP) | 0.06 U | 0.06 U | 0.06 U | 0.06 U | 0.06 U | 0.3 U | 0.3 U | 0.06 U | 0.06 U | 0.56 | 0.06 U | 0.06 U | **7.23** | 6 U |
| | 05/05/03 | 0.03 U | 0.03 U | 0.03 U | 0.03 U | 0.03 U | 0.15 U | 0.15 U | 0.03 U | 0.03 U | 0.69 | 0.03 U | 0.03 U | **6.6** | 3 U |
| | 07/22/03 | 0.03 U | 0.03 U | 0.03 U | 0.03 U | 0.03 U | 0.15 U | 0.15 U | 0.03 U | 0.18 | **9.0 D** | 0.03 U | 0.03 U | **84.6 D** | 3 U |
| | 11/04/03 | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 2.5 U | 2.5 U | 0.5 U | 0.5 U | **7.0** | 0.5 U | 0.5 U | **82.2** | 50 U |
| | 11/4/03 (DUP) | 0.1 U | 0.1 U | 0.1 U | 0.1 U | 0.1 U | 0.5 U | 0.5 U | 0.1 U | 0.2 | **8.1** | 0.1 U | 0.1 U | **82 D** | 10 U |
| | 01/21/04 | 0.015 U | 0.015 U | 0.015 U | 0.015 U | 0.015 U | 0.075 U | 0.075 U | 0.015 U | 0.015 U | 0.1 | 0.015 U | 0.015 U | **1.4** | 1.5 U |
| | 1/21/04 (DUP) | 0.015 U | 0.015 U | 0.015 U | 0.015 U | 0.015 U | 0.075 U | 0.075 U | 0.015 U | 0.015 U | 0.099 | 0.015 U | 0.015 U | **1.28** | 1.5 U |
| | 04/14/04 | 0.3 U | 0.3 U | 0.3 U | 0.3 U | 0.3 U | 1.5 U | 1.5 U | 0.3 U | 0.3 U | **1.0** | 0.3 U | 0.3 U | **14** | 30 U |
| | 07/13/04 | 0.25 U | 0.25 U | 0.25 U | 0.25 U | 0.25 U | 1.2 U | 1.2 U | 0.25 U | 0.25 U | **5.3** | 0.25 U | 0.25 U | **55** | 25 U |
| | 10/01/04 | 0.3 U | 0.3 U | 0.3 U | 0.3 U | 0.3 U | 1.5 U | 1.5 U | 0.3 U | 0.3 U | **8.4** | 0.3 U | 0.3 U | **88** | 30 U |
| | 01/12/05 | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | 0.005 U | 0.001 U | 0.001 U | 0.011 | 0.001 U | 0.001 U | 0.105 | 0.1 U |
| | 04/11/05 | 0.0004 UJ | 0.0004 UJ | 0.0004 UJ | 0.0004 UJ | 0.0004 UJ | 0.002 UJ | 0.002 UJ | 0.0004 UJ | 0.0004 UJ | 0.0014 J | 0.0004 UJ | 0.0004 UJ | 0.0455 J | 0.08 UJ |
| | 07/12/05 | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 2.5 U | 2.5 U | 0.5 U | 0.5 U | **3.0** | 0.5 U | 0.5 U | **34.9** | 50 U |
| | 10/17/05 | 0.15 U | 0.15 U | 0.15 U | 0.15 U | 0.15 U | 0.75 U | 0.75 U | 0.15 U | 0.15 U | **6.8** | 0.15 U | 0.15 U | **79.0 D** | 15 U |
| | 10/17/05 (DUP) | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 0.5 U | 2.5 U | 2.5 U | 0.5 U | 0.5 U | **6.4** | 0.5 U | 0.5 U | **73.1** | 50 U |
| | 01/12/06 | 0.005 U | 0.005 U | 0.005 U | 0.005 U | 0.005 U | 0.025 U | 0.025 U | 0.005 U | 0.005 U | 0.0074 | 0.005 U | 0.005 U | 0.0704 | 0.5 U |
| | 04/19/06 | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0011 | 0.001 U | 0.001 U | 0.0002 U | 0.0002 U | 0.0004 | 0.0002 U | 0.0002 U | 0.0087 | 0.04 U |
| | 07/05/06 | 0.20 U | 0.20 U | 0.20 U | 0.20 U | 0.20 U | 1.0 U | 1.0 U | 0.20 U | 0.20 U | **4.8** | 0.20 U | 0.20 U | **59.2** | 20 U |
| | 7/5/06 (DUP) | 0.25 U | 0.25 U | 0.25 U | 0.25 U | 0.25 U | 1.2 U | 1.2 U | 0.25 U | 0.25 U | **4.5** | 0.25 U | 0.25 U | **57.9** | 25 U |
| | 10/17/06 | 0.50 U | 0.50 U | 0.00032 J | 0.50 U | 0.50 U | 2.5 U | 2.5 U | **0.0015 J** | 0.50 U | **4.4** | 0.50 U | 0.50 U | **52.3** | 50 U |
| | 01/04/07 | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.001 U | 0.003 U | 0.0002 U | 0.0002 U | 0.0011 | 0.0002 U | 0.0002 U | 0.0186 | 0.04 U |
| | 04/03/07 | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.001 U | 0.003 U | 0.0002 U | 0.0002 U | 0.0021 | 0.0002 U | 0.0002 U | 0.0165 | 0.04 U |
| | 07/02/07 | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.001 U | 0.003 U | 0.0002 U | 0.0002 U | 0.059 D | 0.0002 U | 0.0002 U | 0.364 | 0.04 U |
| | 10/25/07 | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.001 U | 0.003 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0032 | 0.04 U |
| | 10/25/07 (DUP) | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.001 U | 0.003 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0002 U | 0.0034 | 0.04 U |
| | 01/03/08 | 0.0006 U | 0.0006 U | 0.00002 U | 0.0006 U | 0.0006 U | 0.003 U | 0.009 U | 0.00004 | 0.0006 U | 0.013 | 0.0006 U | 0.0006 U | 0.044 | 0.12 U |
| | 04/01/08 | 0.0002 U | 0.0002 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.0025 U | 0.0025 U | 0.000026 | 0.0002 U | 0.0017 | 0.0002 U | 0.0002 U | 0.0352 D | 0.04 UJ |
| | 07/07/08 | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | 0.005 U | 0.001 U | 0.0024 | **1.3 D** | 0.001 U | 0.001 U | **12.4 D** | 0.10 U |
| | 10/07/08 | 0.29 U | 0.29 U | 0.29 U | 0.29 U | 0.29 U | 1.5 U | 1.5 U | 0.29 U | 0.29 U | **5.5** | 0.29 U | 0.29 U | **60.4** | 29 U |
| | 01/05/09 | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.001 U | 0.005 U | 0.005 U | 0.001 U | 0.001 U | 0.02 | 0.001 U | 0.001 U | 0.145 | 0.1 U |
| | 04/06/09 | 0.0002 U | 0.0002 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.0025 U | 0.0025 U | 0.000028 J | 0.0002 U | 0.0024 | 0.0002 U | 0.0002 U | 0.0406 | 0.02 U |
| | 4/6/09 (DUP) | 0.0002 U | 0.0002 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.0025 U | 0.0025 U | 0.000061 J | 0.0002 U | 0.0024 | 0.0002 U | 0.0002 U | 0.0394 | 0.02 U |
| | 07/08/09 | 0.1 U | 0.1 U | 0.0002 | 0.1 U | 0.1 U | 2.5 U | 2.5 U | **0.00056** | 0.1 U | **1.9** | 0.1 U | 0.1 U | **44.3 J** | 10 U |
| | 10/27/09 | 0.1 U | 0.1 U | 0.1 U | 0.1 U | 0.1 U | 2.5 U | 2.5 U | 0.1 U | 0.1 U | **2.7** | 0.1 U | 0.1 U | **27.8** | 10 UJ |
| | 01/13/10 | 0.1 U | 0.1 U | 0.1 U | 0.1 U | 0.1 U | 2.5 U | 2.5 U | 0.1 U | 0.18 | **20** | 0.1 U | 0.1 U | **99 D** | 10 U |
| | 04/06/10 | 0.0002 U | 0.0002 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.005 U | 0.005 U | 0.000040 | 0.0002 U | 0.019 | 0.0002 U | 0.0002 U | 0.027 | 0.02 U |
| | 4/6/10 (DUP) | 0.0002 U | 0.0002 U | 0.00002 U | 0.0002 U | 0.0002 U | 0.005 U | 0.005 U | 0.000041 | 0.0002 U | 0.019 | 0.0002 U | 0.0002 U | 0.026 | 0.02 U |

**Notes:**

Values in **bold** font indicate that the result reported exceeds the most current MTCA levels based on the Ecology website.
Model Toxics Control Act (MTCA) Cleanup Regulation, WAC 173-340. MTCA Method A and B values are from Ecology website CLARC tables downloaded June 2010. (https://fortress.wa.gov/ecy/clarc/reporting/CLARCReporting.aspx).
(A) - MTCA Method A
(B) - MTCA Method B
[1] EGW050 & EGW051 installed in May, 1996.
[2] EGW040 analytical data presented in data summary table for Esperance Sand wells beginning with February 1999 sampling round.
* Sample result was qualified as not detected due to method blank contamination.
**Sample results are suspected laboratory contamination.

cis-1,2-DCE - cis-1,2-Dichloroethene
D - Dilution required to quantitate analyte within linear range of detector. This flag was not used prior to August, 2001.
1,1-DCA - 1,1-Dichloroethane
1,1-DCE - 1,1-Dichloroethene
1,2-DCA - 1,2-Dichloroethane
(DUP) - Field duplicate
J - Estimated value
MEK - 2-Butanone (Methyl ethyl ketone)
MIBK - 4-Methyl-2-Pentanone (Methyl isobutyl ketone)

NA - Not available, the 1995-1997 data predates the RI and is not included in the project database.
NE - Not Established
PCE - Tetrachloroethene
1,1,1-TCA - 1,1,1-Trichloroethane
TCE - Trichloroethene
TCFM - Trichlorofluoromethane
U - Compound was analyzed for but not detected above the reporting limit shown.
UJ - Parameter was analyzed for, but not detected. Detection limit is an estimated value.

**Table 16-9**
**Percent Saturation of Selected Constituents in Groundwater**
**Building 40-56**
**Boeing Everett Plant Remedial Investigation**

| Well ID | Sample Date | Analytical Result (mg/L) | | | % Aqueous Solubility | | | | Sample Date | Analytical Result (mg/L) | | | % Aqueous Solubility | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Ethylbenzene | Toluene | Total Xylenes | Ethylbenzene | Toluene | Total Xylenes | Total | | Ethylbenzene | Toluene | Total Xylenes | Ethylbenzene | Toluene | Total Xylenes | Total |
| **EGW002** | 05/01/01 | 0.22 | 0.05 U | 11.1 | 0.1% | -- | 6.9% | 7.0% | Various [1] | 0.0003 | 0.0002 U | 0.2 | 0.0% | -- | 0.1% | 0.1% |
| **EGW005** | 05/01/01 | 4.8 | 0.2 U | 38.5 | 2.8% | -- | 23.9% | 26.8% | Various [1] | 0.18 | 0.0012 | 3.715 | 0.1% | 0.0% | 2.3% | 2.4% |
| **EGW006** | 05/01/01 | 0.001 U | 0.001 U | 0.001 U | -- | -- | -- | 0.0% | Various [1] | 0.07 | 0.0002 U | 0.102 | 0.0% | -- | 0.1% | 0.1% |
| **EGW007** | 05/01/01 | 32 | 0.86 | 143 | 18.9% | 0.2% | 88.8% | 108% | Various [1] | 30 | 0.24 | 172 | 17.8% | 0.0% | 106.8% | 125% |
| **EGW009** | 05/01/01 | 0.0089 | 0.001 U | 0.001 U | 0.0% | -- | -- | 0.0% | Various [1] | 0.0002 U | 0.0002 U | 0.004 U | -- | -- | -- | 0.0% |
| **EGW043** | 05/01/01 | 4.6 | 2.1 | 37.7 | 2.7% | 0.4% | 23.4% | 26.5% | Various [1] | 0.75 | 0.4 | 7.9 | 0.4% | 0.1% | 4.9% | 5.4% |
| **EGW044** | 05/01/01 | 0.001 U | 0.001 U | 0.001 U | -- | -- | -- | 0.0% | Various [1] | 0.002 U | 0.002 U | 0.0029 | -- | -- | 0.0% | 0.0% |
| **EGW050** | 05/01/01 | 17 | 2.7 | 152 | 10.1% | 0.5% | 94.4% | 105% | Various [1] | 19 | 3 | 207 | 11.2% | 0.6% | 128.6% | 140% |
| **EGW051** | 05/01/01 | 14 | 2.0 | 149 | 8.3% | 0.4% | 92.5% | 101% | Various [1] | 17 | 2.5 | 217 | 10.1% | 0.5% | 134.8% | 145% |
| **EGW062** | 05/01/01 | 0.38 | 0.005 U | 2.77 | 0.2% | -- | 1.7% | 1.9% | Various [1] | 0.097 | 0.002 U | 2.4 | 0.1% | -- | 1.5% | 1.5% |
| **EGW063** | 05/01/01 | 5.9 | 0.1 | 62.7 | 3.5% | 0.0% | 38.9% | 42.5% | Various [1] | 20 | 0.18 | 99 | 11.8% | 0.0% | 61.5% | 73.4% |
| **ESB1010** | 04/29/96 | 0.11 | 0.01U | 2.38 | -- | -- | 1.5% | 1.5% | NA | NA | NA | NA | NA | NA | NA | NA |
| **ESB1011** | 04/29/96 | 21 | 2.2 | 255 | 12.4% | 0.4% | 158% | 171% | NA | NA | NA | NA | NA | NA | NA | NA |
| **ESB1015** | 04/29/96 | 11 | 1.0U | 49.3 | 6.5% | -- | 30.6% | 37.1% | NA | NA | NA | NA | NA | NA | NA | NA |
| **ESB1096** | 07/08/97 | 270 | 7.9 | 2480 | 160% | 1.5% | 1540% | 1702% | NA | NA | NA | NA | NA | NA | NA | NA |
| **ESB1297** | 07/28/98 | 40 | 4.5U | 349 | 23.7% | -- | 217% | 240% | NA | NA | NA | NA | NA | NA | NA | NA |
| Aqueous Solubility [2] | | 169 | 526 | 161 [3] | | | | | | 169 | 526 | 161 [3] | | | | |

**Notes:**

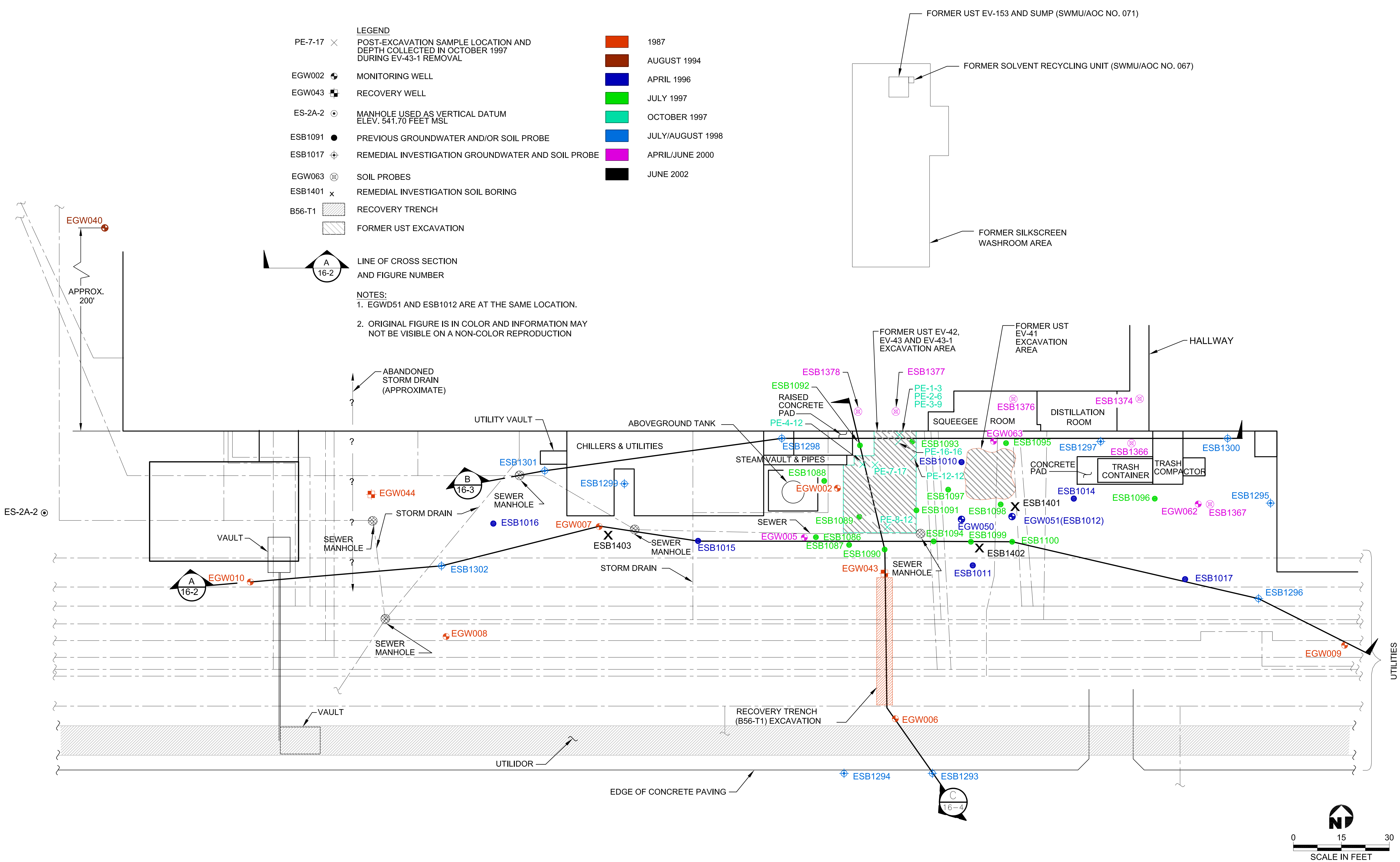
[1] Analytical results shown are the maximum concentration over the last two years of monitoring (July 2008 through April 2010).

[2] As referenced in Cleanup Levels and Risk Calculations (CLARC) under MTCA, Version 3.1, November 2001.

[3] Value is for m-xylene. Solubility values for o-xylene (178 mg/L) and p-xylene (185 mg/L) are also availabl

NA -Not applicable, borings only sampled once

U - Compound was analyzed for but not detected above the reporting limit shown.




Job No. 33761927

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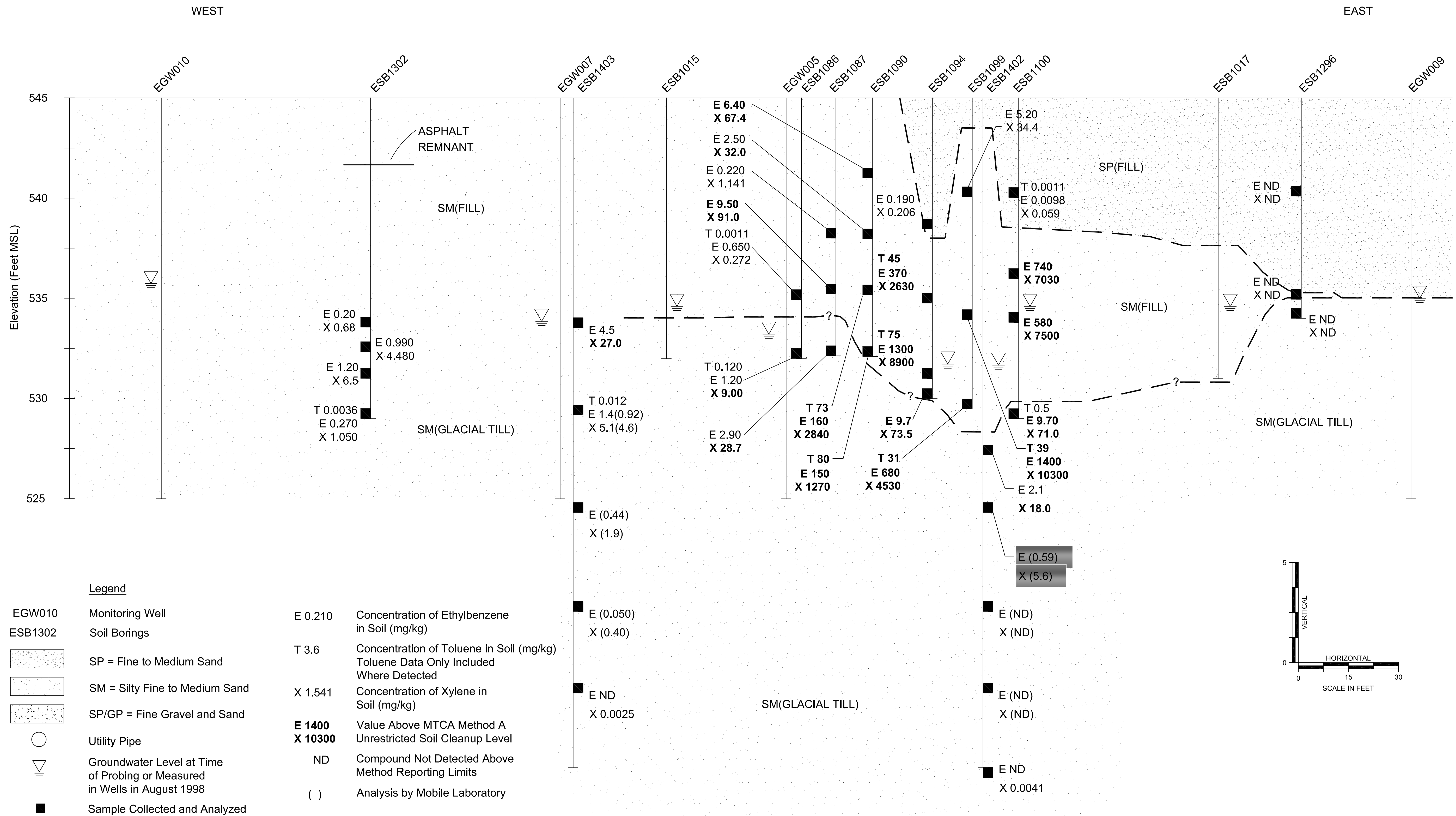
Q:\geo\Boeing\Everett\RI\2010\Fig 16-1 (40-56 Site Plan).dwg
Mod: 11/15/2010, 13:54 | Plotted: 12/02/2010, 14:13 | john_knobbs

Figure 16-1
**Building 40-56 - Site Plan**

Boeing Commercial Airplanes, Everett Plant
REMEDIAL INVESTIGATION REPORT




Q:\geo\Boeing\Everett\RI\2010\Fig 16-2 (40-56 Section A).dwg
Mod: 12/02/2010, 14:14 | Plotted: 12/06/2010, 09:06 | John_Knobbs

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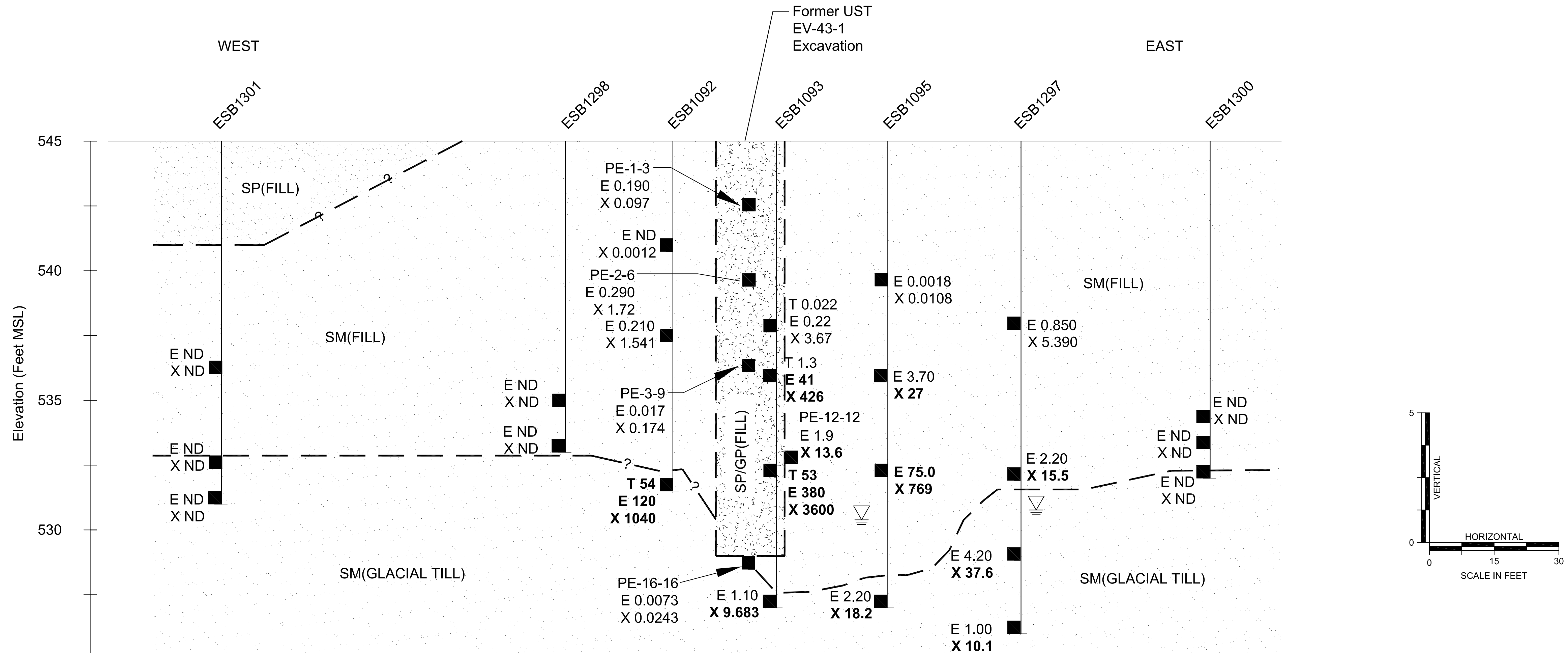
Figure 16-2
**Building 40-56 Geologic Cross Section A**

Boeing Commercial Airplanes, Everett Plant
REMEDIAL INVESTIGATION REPORT




Legend

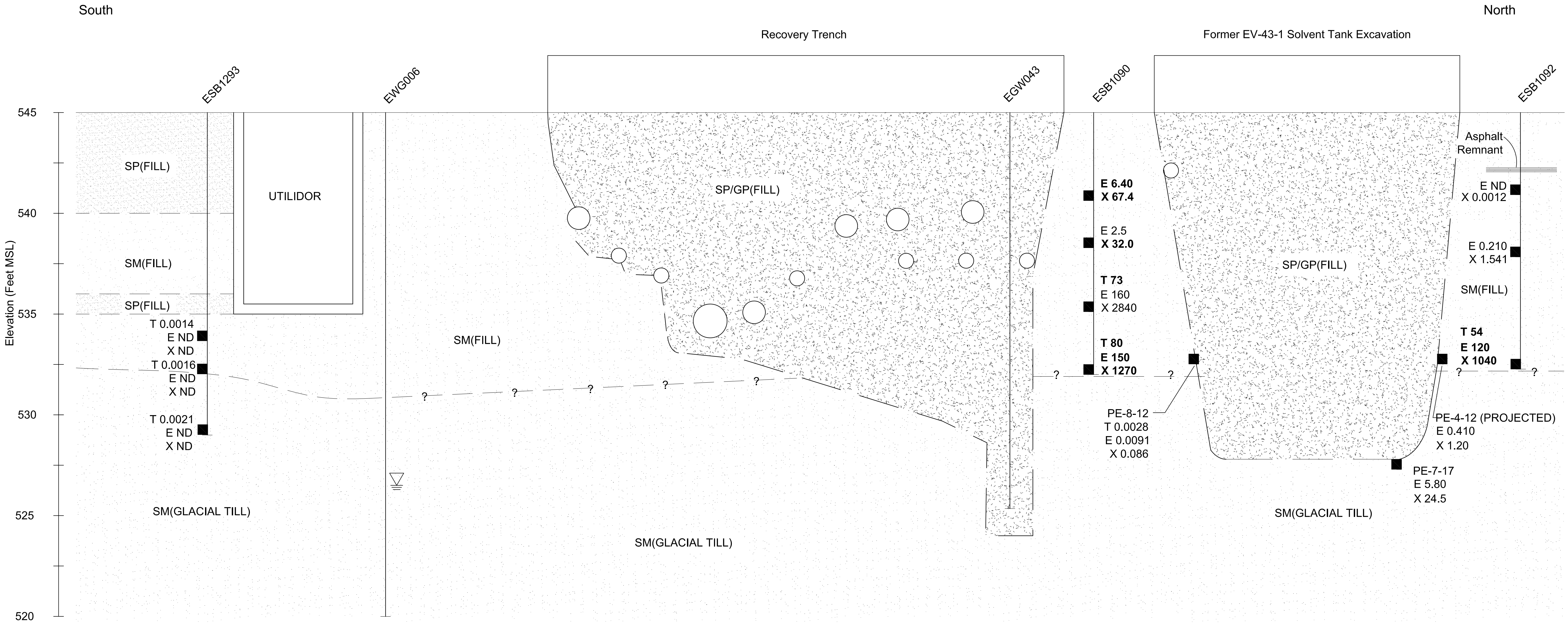
| | | | |
|---|---|---|---|
| ESB1302 | Soil Borings | E 0.210 | Concentration of Ethylbenzene in Soil (mg/kg) |
| | SP = Fine to Medium Sand | T 54 | Concentration of Toluene in Soil (mg/kg) Toluene Data Only Included Where Detected |
| | SM = Silty Fine to Medium Sand | | |
| | SP/GP = Fine Gravel and Sand | X 1.541 | Concentration of Xylene in Soil (mg/kg) |
| | Utility Pipe | **E 120** | Value Above MTCA Method A Unrestricted Soil Cleanup Level |
| | Groundwater Level at Time of Probing or Measured in Wells in August 1998 | ND | Compound Not Detected Above Method Reporting Limits |
| | Sample Collected and Analyzed | PE-16-16 | Post-Excavation Sample Location And Depth Collected In October 1997 During Ev-43-1Removal |

Note:
Absence of groundwater level symbol indicates groundwater was not encountered during probing.



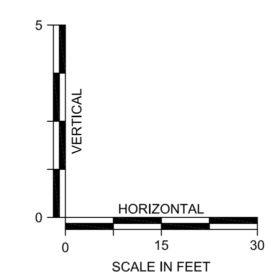
Figure 16-3
**Building 40-56 Geologic Cross Section B**

Boeing Commercial Airplanes, Everett Plant
REMEDIAL INVESTIGATION REPORT




Legend

| | | | |
|---|---|---|---|
| EGW010 | Monitoring Well | E 0.210 | Concentration of Ethylbenzene in Soil (mg/kg) |
| ESB1302 | Soil Borings | T 3.6 | Concentration of Toluene in Soil (mg/kg) Toluene Data Only Included Where Detected |
| | SP = Fine to Medium Sand | X 1.541 | Concentration of Xylene in Soil (mg/kg) |
| | SM = Silty Fine to Medium Sand | **E 1400** **X 10300** | Value Above MTCA Method A Unrestricted Soil Cleanup Level |
| | SP/GP = Fine Gravel and Sand | ND | Compound Not Detected Above Method Reporting Limits |
| | Utility Pipe | PE-7-17 | Post-Excavation Sample Location And Depth Collected In October 1997 During Ev-43-1Removal |
| | Groundwater Level at Time of Probing or Measured in Wells in August 1998 | | |
| | Sample Collected and Analyzed | | |




Q:\geo\Boeing\Everett\RI\2010\Fig 16-4 (40-56 Section C).dwg
Mod: 12/02/2010, 14:16 | Plotted: 12/06/2010, 09:08 | John_Knobbs

Figure 16-4
**Building 40-56 Geologic Cross Section C**

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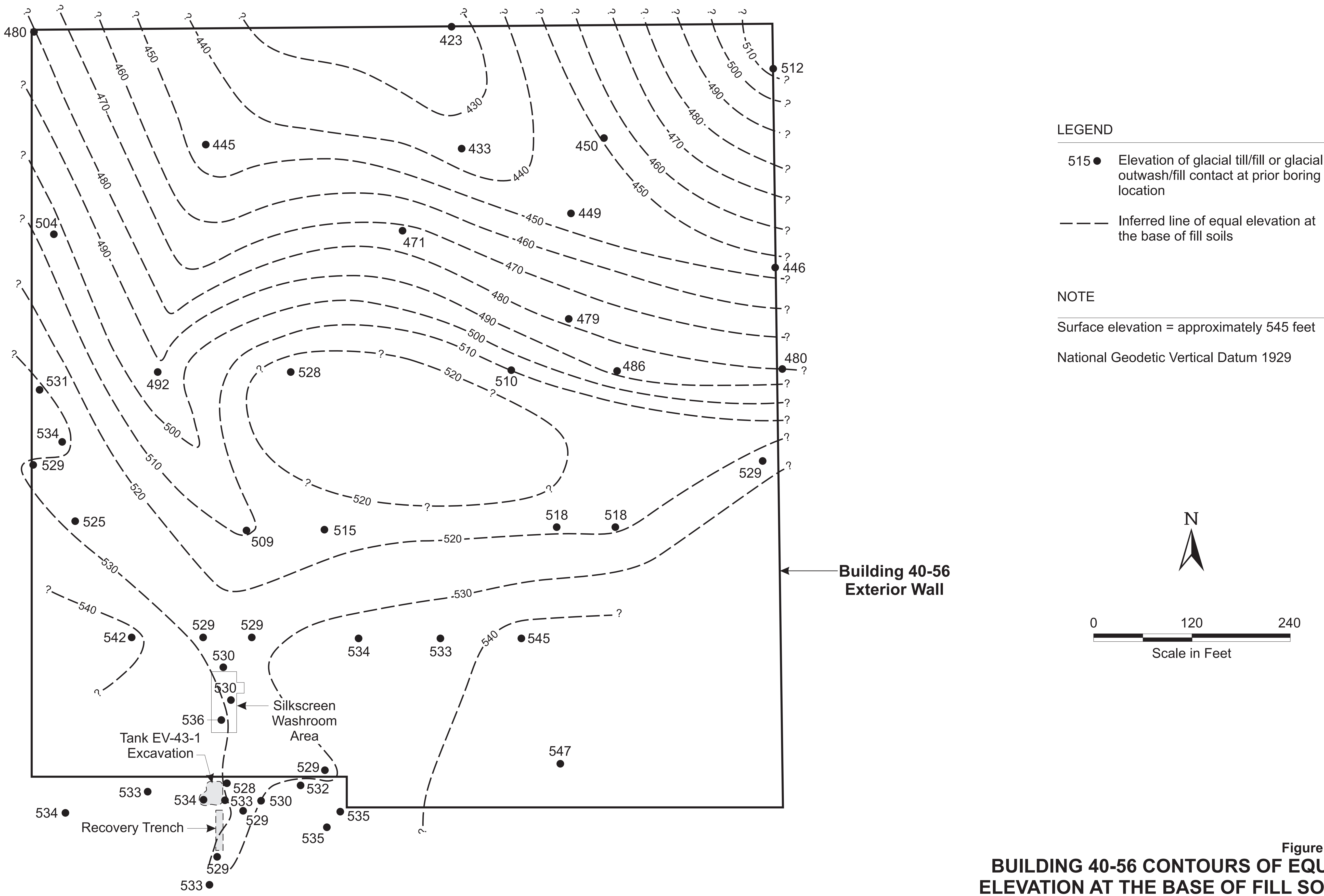
Boeing Commercial Airplanes, Everett Plant
REMEDIAL INVESTIGATION REPORT

33761927_18.CDR




Job No. 33761927

Figure 16-5
**BUILDING 40-56 CONTOURS OF EQUAL ELEVATION AT THE BASE OF FILL SOILS**

URS

Boeing Commercial Airplanes, Everett Plant
REMEDIAL INVESTIGATION REPORT

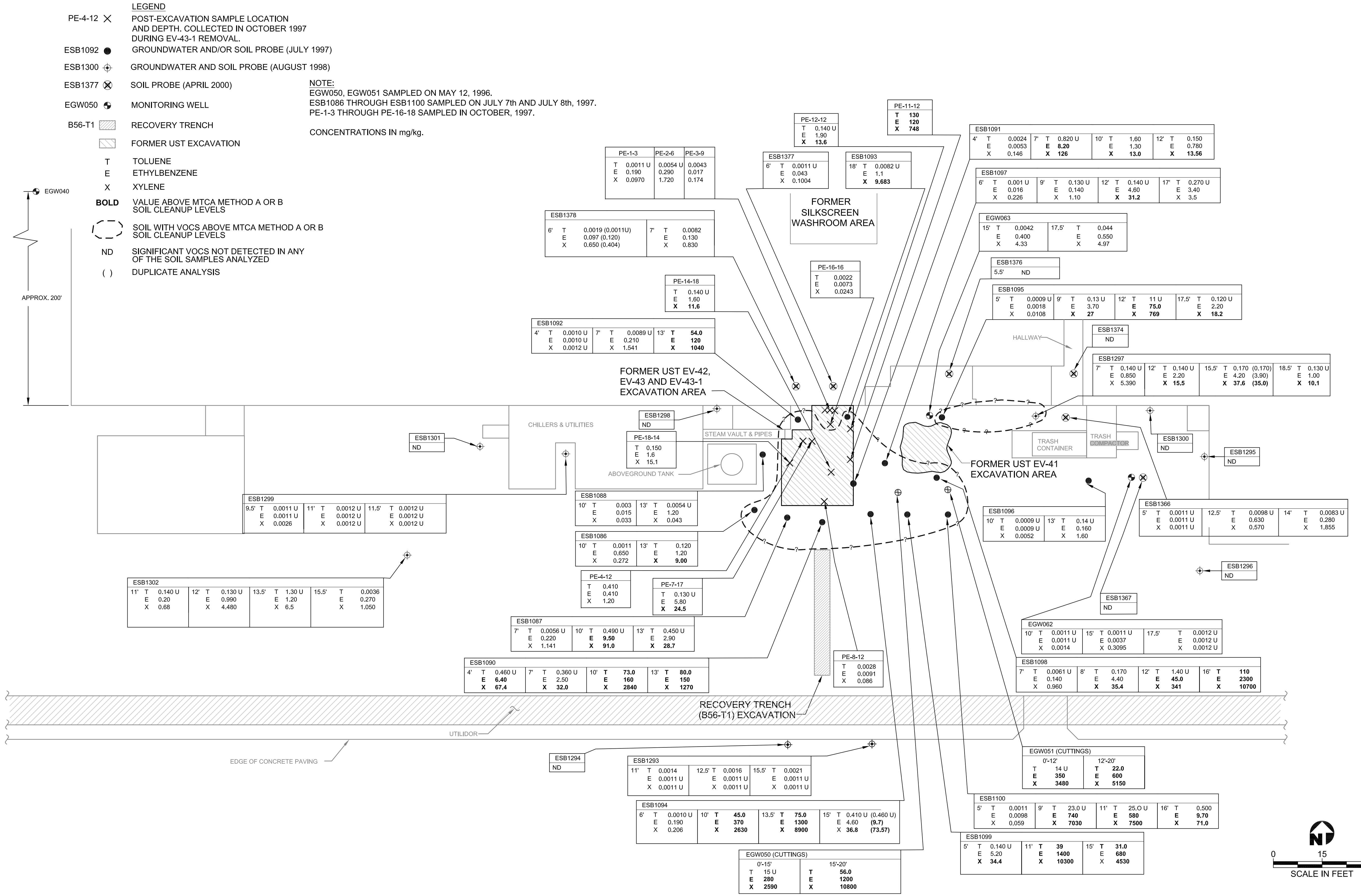



Figure 16-6
**Building 40-56 Selected Analytical Results Of 1997-2000 Soil Investigations**

Q:\geo\Boeing\Everett\RI\2010\Fig 16-6 (1997-2000 Soil Results).dwg
Mod: 10/08/2010, 08:56 | Plotted: 12/02/2010, 14:23 | john_knobbs

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REMEDIAL INVESTIGATION REPORT

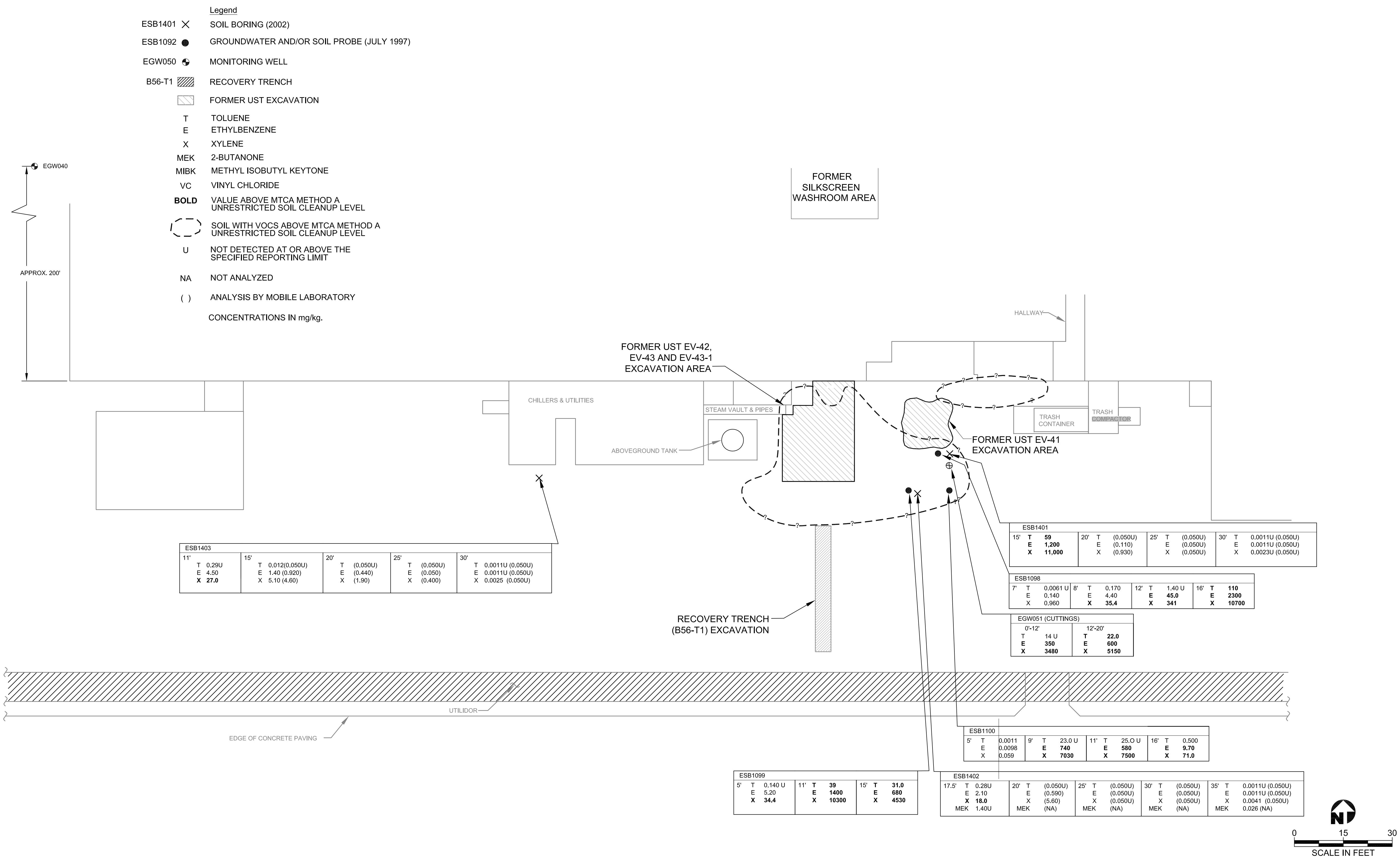


Figure 16-7
**Building 40-56 Selected Analytical Results Of 1997-2002 Soil Investigations**

Q:\geo\Boeing\Everett\RI\2010\Fig 16-7 (1997-2002 Soil Results).dwg
Mod: 10/08/2010, 08:59 | Plotted: 12/02/2010, 14:24 | john_knobbs

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Boeing Commercial Airplanes, Everett Plant
REMEDIAL INVESTIGATION REPORT

LEGEND

| | |
|---|---|
| ESB1092 | GROUNDWATER AND/OR SOIL PROBE (APRIL 1996 & JULY 1997) |
| ESB1300 | GROUNDWATER AND SOIL PROBES (JULY 1998) |
| EGW050 | GROUNDWATER MONITORING WELL |
| PE-16-16 X | SOIL EXCAVATION (OCTOBER 1997) |
| EGW044 | RECOVERY WELL |
| B56-T1 | RECOVERY TRENCH |
| | FORMER UST EXCAVATION |

| | | | |
|---|---|---|---|
| T | TOLUENE | C | CHLOROFORM |
| E | ETHYLBENZENE | S | STYRENE |
| X | XYLENE | TCE | TRICHLOROETHENE |
| B | BENZENE | PCE | TETRACHLOROETHENE |
| VC | VINYL CHLORIDE | | |

| | |
|---|---|
| **BOLD** | VALUE ABOVE MTCA METHOD A AND/OR B GROUNDWATER CLEANUP LEVEL |
| | INFERRED AREA OF GROUNDWATER WITH ONE OR MORE VOCS ABOVE MTCA A AND/OR METHOD B GROUNDWATER CLEANUP LEVEL |
| NGW | NO GROUNDWATER WAS ENCOUNTERED DURING DRILLING |
| TR | TRACE (< 1/2 FOOT) OF GROUNDWATER WAS ENCOUNTERED DURING DRILLING |

NOTES:

1. MAXIMUM DETECTED CONCENTRATIONS IN MONITORING WELLS SINCE JULY OF 2008 SHOWN.
2. EGW051 AND ESB1012 ARE AT THE SAME LOCATION.
3. CONCENTRATIONS IN mg/l

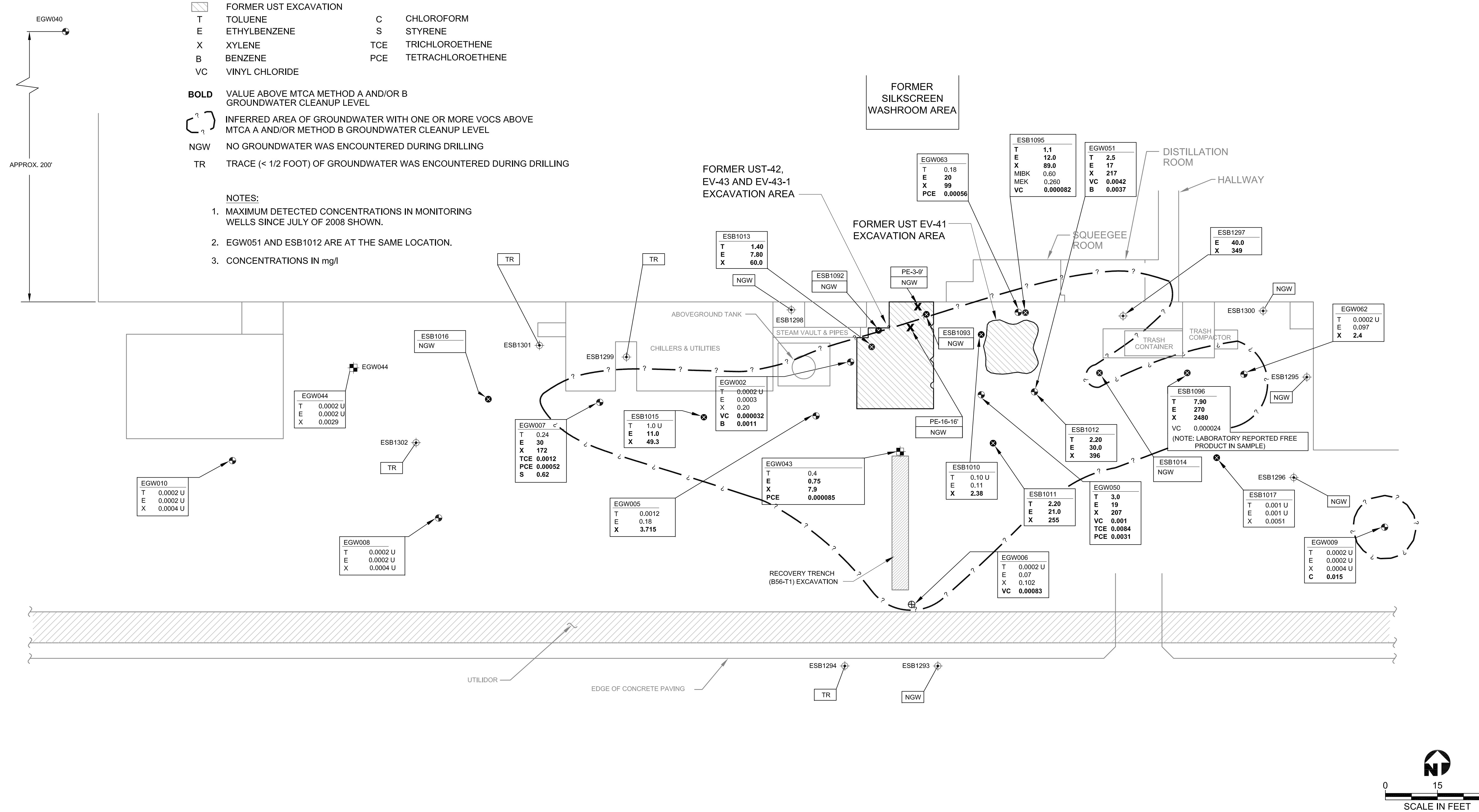


Figure 16-8

## Building 40-56 Selected Analytical Results Of Groundwater Investigation And Monitoring

Boeing Commercial Airplanes, Everett Plant
REMEDIAL INVESTIGATION REPORT

Q:\geo\Boeing\Everett\RI\2010\Fig 16-8 (GW Results).dwg
Mod: 10/08/2010, 09:01 | Plotted: 12/02/2010, 14:26 | john_knobbs

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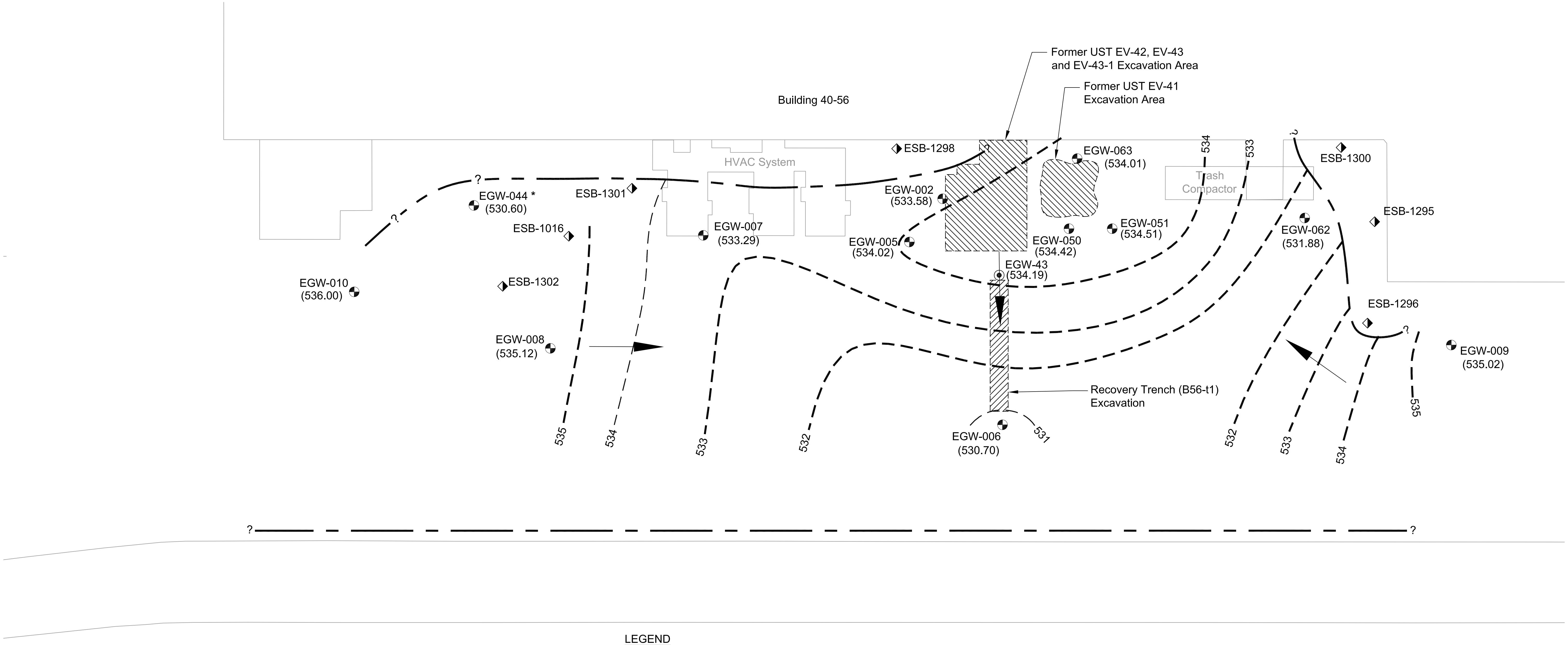


LEGEND

EGW-025 (00.00) Monitoring Well and Groundwater Elevation (Feet Above MSL)

EGW-043 (00.00) Recovery Well and Groundwater Elevation (Feet Above MSL)

ESB-1300 Probe Boring (1996-1998)

535 Groundwater Elevation Contour

? ? Inferred Margin of Perched Groundwater

Groundwater Flow Direction

(NM) Groundwater Not Measured

* Well Not Used to Contour Groundwater Elevation



Figure 16-9

**Groundwater Elevations Contour Map**
**Building 40-56 - July 2009**

Q:\geo\Boeing\Everett\RI\2010\Fig 16-9 40-56 July 09.dwg
Mod: 12/02/2010, 15:17 | Plotted: 10/14/2011, 11:30 | john_knobbs

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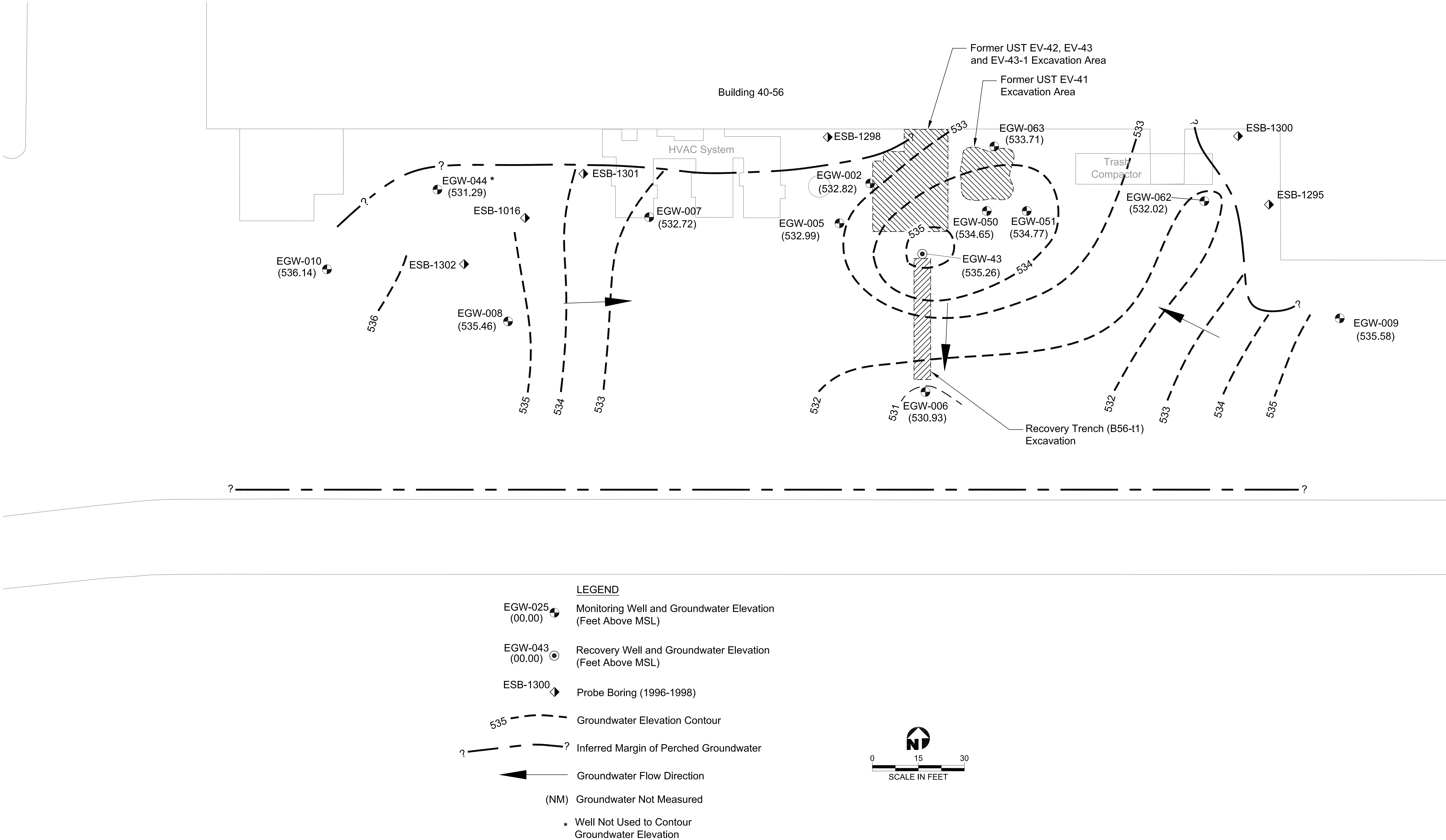
Boeing Commercial Airplanes, Everett Plant
REMEDIAL INVESTIGATION REPORT




Q:\geo\Boeing\Everett\RI\2010\Fig 16-10 40-56 October 09.dwg
Mod: 12/02/2010, 15:18 | Plotted: 10/14/2011, 11:25 | john_knobbs

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**Figure 16-10**
**Groundwater Elevations Contour Map**
**Building 40-56 - October 2009**

Boeing Commercial Airplanes, Everett Plant
REMEDIAL INVESTIGATION REPORT

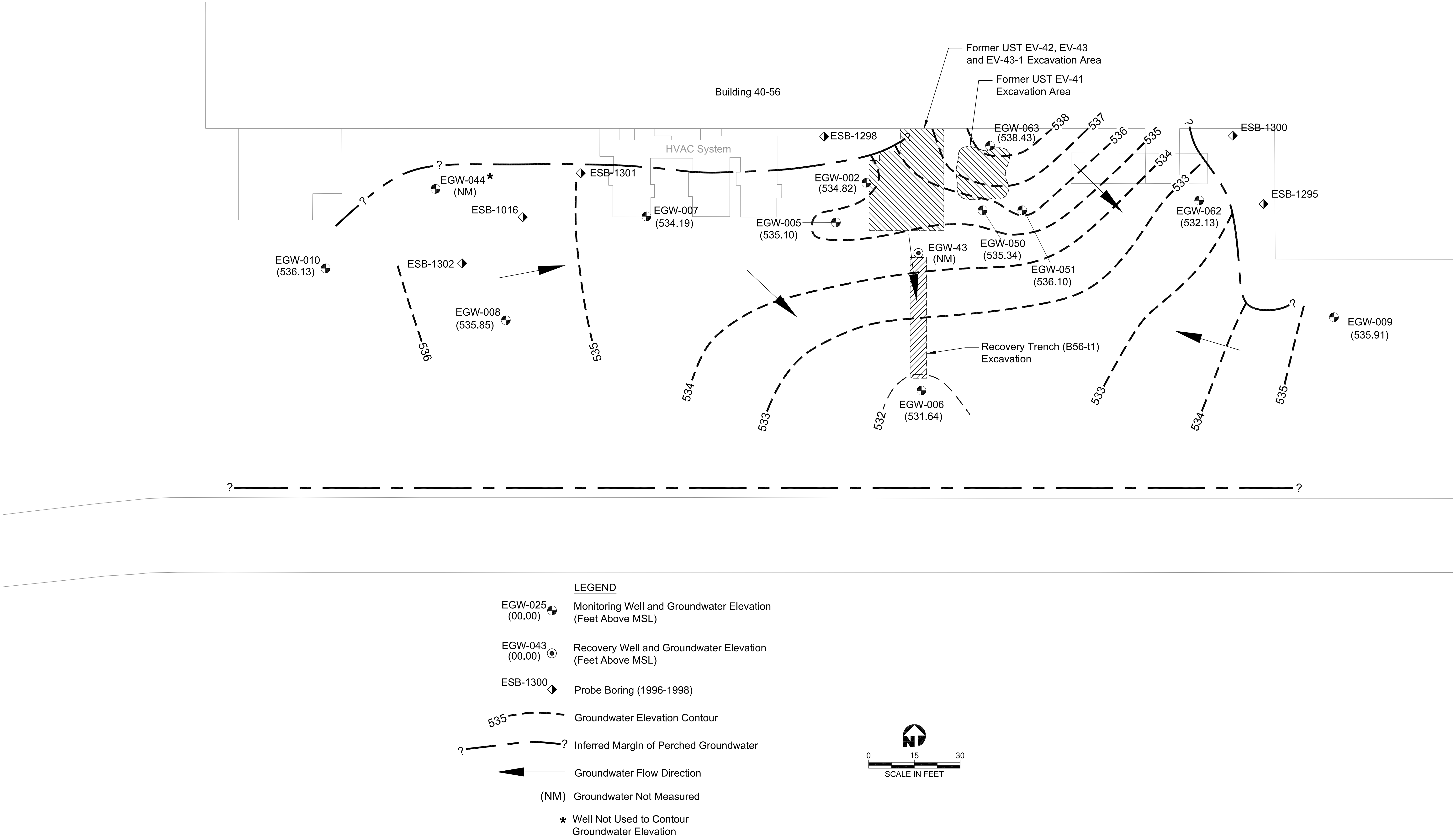


**Figure 16-11**
**Groundwater Elevations Contour Map**
**Building 40-56 - January 2010**

Q:\geo\Boeing\Everett\RI\2010\Fig 16-11 40-56 January 2010).dwg
Mod: 12/02/2010, 15:19 | Plotted: 10/14/2011, 11:19 | john_knobbs

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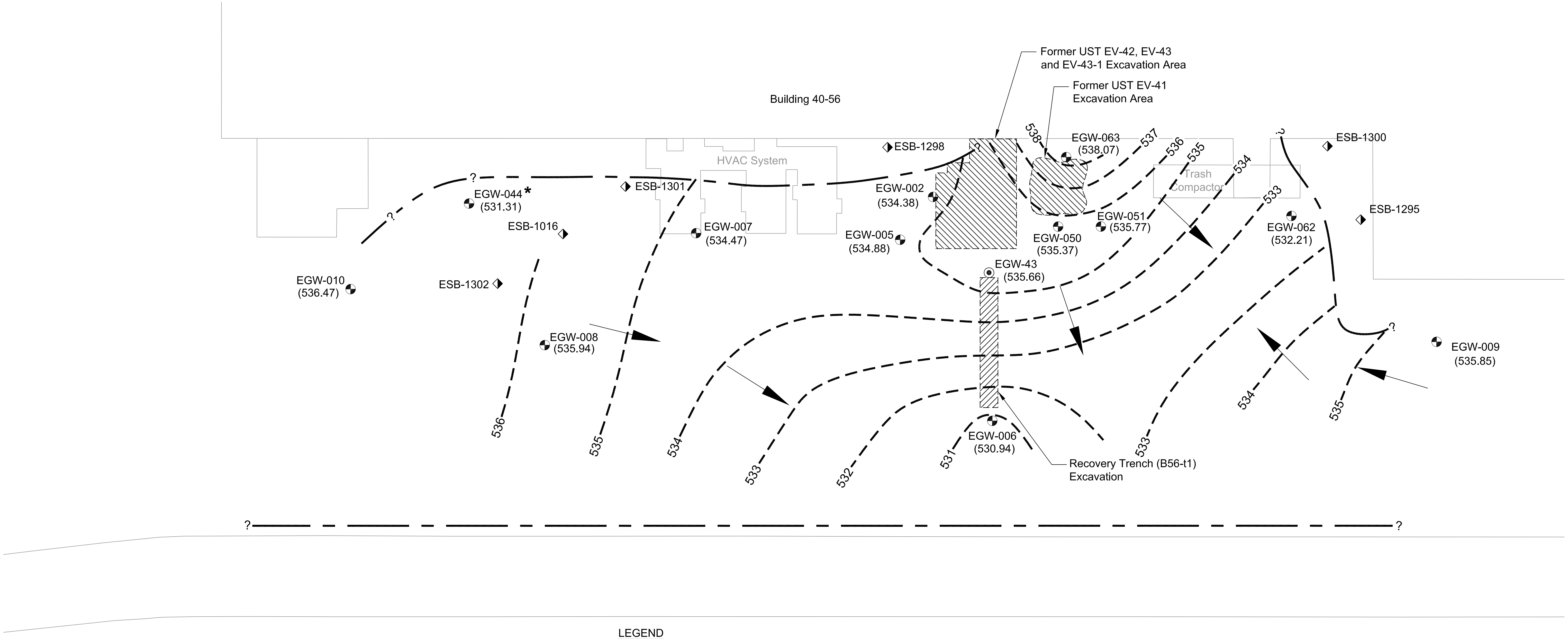
Boeing Commercial Airplanes, Everett Plant
REMEDIAL INVESTIGATION REPORT




LEGEND

EGW-025 (00.00) Monitoring Well and Groundwater Elevation (Feet Above MSL)

EGW-043 (00.00) Recovery Well and Groundwater Elevation (Feet Above MSL)

ESB-1300 Probe Boring (1996-1998)

535 Groundwater Elevation Contour

? ? Inferred Margin of Perched Groundwater

Groundwater Flow Direction

(NM) Groundwater Not Measured

* Well Not Used to Contour Groundwater Elevation

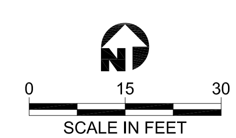



Figure 16-12
**Groundwater Elevations Contour Map**
**Building 40-56 - April 2010**

Boeing Commercial Airplanes, Everett Plant
REMEDIAL INVESTIGATION REPORT

Q:\geo\Boeing\Everett\RI\2010\Fig 16-12 40-56 April 2010.dwg
Mod: 10/14/2011, 11:21 | Plotted: 10/14/2011, 11:21 | john_knobbs

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LEGEND:

ESB1092 — GROUNDWATER AND/OR SOIL PROBE (APRIL 1996 & JULY, 1997)
ESB1300 — GROUNDWATER AND SOIL PROBES (JULY, 1998)
EGW050 — GROUNDWATER MONITORING WELL
EGW043 — RECOVERY WELL
B56-T1 — RECOVERY TRENCH
FORMER UST EXCAVATION
T — TOLUENE
E — ETHYLBENZENE
X — XYLENE
TOTAL — SUM OF TOLUENE (T), ETHYLBENZENE (E) AND XYLENE (X)
25 — INFERRED CONTOUR OF TOTAL % AQUEOUS SOLUBILITIES FOR E, T & X GREATER THAN 100%
INFERRED AREA OF GROUNDWATER WITH VOCS
NGW — NO GROUNDWATER WAS ENCOUNTERED DURING DRILLING
TR — TRACE (< 1/2 FOOT) OF GROUNDWATER WAS ENCOUNTERED DURING DRILLING

NOTES:
1. MONITORING WELL GROUNDWATER SAMPLES COLLECTED MAY 01, 2001.
2. EGW051 AND ESB1012 ARE AT THE SAME LOCATION.
3. VALUES ARE THE RATIOS OF T, E, X CONCENTRATION TO T, E, X AQUEOUS SOLUBILITIES.

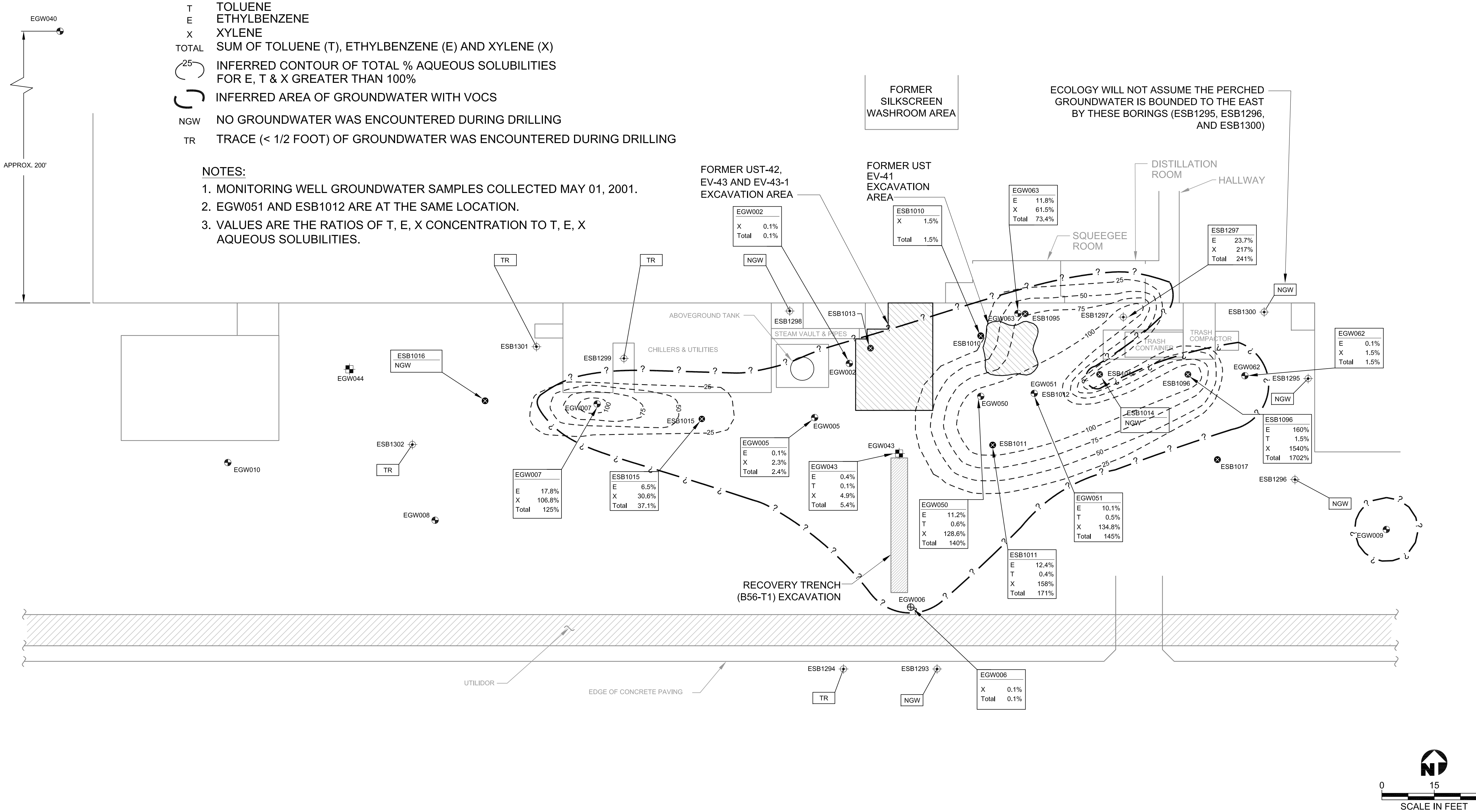


Figure 16-13
**Building 40-56 Percent Saturation of Groundwater Investigation And Monitoring**

Q:\geo\Boeing\Everett\RI\2010\Fig 16-13 (GW Constituents)dwg.dwg
Mod: 10/14/2011, 11:03 | Plotted: 10/14/2011, 11:03 | john_knobbs

URS

Boeing Commercial Airplanes, Everett Plant
REMEDIAL INVESTIGATION REPORT