DRAFT

Interim Action Work Plan

Jacobson Terminals Property

Seattle, Washington

Prepared for
Washington State
Department of Ecology

June 19, 2014
17800-43

HARTCROWSER

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1.0 INTRODUCTION

This report presents the results of a remedial investigation (RI) and remedial alternatives evaluation performed for the Washington State Department of Ecology (Ecology) for the Jacobson Terminals Site (site) in Seattle, Washington (Figure 1). The interim action work plan (IAWP) focuses on soil remediation at the north end of the site, which contains polychlorinated biphenyls (PCBs), chlorinated benzenes, and chlorinated solvents in exceedance of regulatory criteria. The IAWP is limited to this area of concern (AOC) and does not include adjacent properties, other areas of the site, or the aquatic environment (Figure 2).

The Jacobson Terminals facility has been enrolled in Ecology’s Voluntary Cleanup Program (VCP) since 2001 under VCP number NW0611. Aspect Consulting (Aspect) has been the owner’s environmental consultant since 2003. The work for this report follows previous investigations and remedial actions conducted by Aspect and Hart Crowser at the site beginning in 1996. Hart Crowser’s work for this Interim Action (IA) was conducted under contract to Ecology.

1.1 Purpose

The purpose of this IA is to develop and evaluate remedial alternatives for the AOC and to recommend the most appropriate alternative based on chemical and physical conditions in this area. This IA is intended to achieve cleanup standards per Washington Administrative Code (WAC) 173-340-430(2). The focus of this interim action is to remove or stabilize elevated PCB concentrations in soil within the AOC to reduce the risk of contaminant migration to the Lake Washington Ship Canal. This IA does not directly address other COCs at the site and will result in partial remediation of PCB-impacted media.

1.2 Interim Action Approach and Report Organization

The preparation of this IAWP involved completing a Remedial Investigation (RI) and developing, evaluating, and recommending an appropriate remedial action for the AOC that would meet MTCA requirements specified in WAC 173-340-430. Specific tasks for this IAWP included:

- Completing an RI in accordance with WAC 173-340-430(7)(b);
- Identifying the AOC for remediation;
- Reviewing existing site information to assess soil conditions in the AOC, previous remediation activities completed at the site, and potential exposure pathways;

- Developing remedial action objectives and remediation goals based on the cleanup levels established for the AOC;

- Developing remediation alternatives for the AOC from applicable technologies;

- Evaluating alternatives following the evaluation criteria specified in WAC 173-340-360; and

- Recommending a cleanup alternative for the AOC.

This IAWP is organized into the following sections:

- **Section 2.0 – Site Description and Background.** This section provides the general description of the site, its location, historical and current activities, and previous investigations.

- **Section 3.0 – Cleanup Objectives.** This section details the remedial action objectives, cleanup standards to be used, identifies the AOC, and outlines the applicable or relevant and appropriate requirements (ARARS). This section provides the framework for evaluating remediation alternatives described later in this IAWP, and for selecting a preferred alternative.

- **Section 4.0 – Remedial Investigation**. This section details the findings of the soil, groundwater, and sediment investigation.

- **Section 5.0 – Conceptual Site Model.** This section provides a conceptual understanding of the site derived primarily from the results of the historical research, RI, and previous remedial activities at the site. Included is a discussion of the constituents and media of concern, the fate and transport characteristics of the constituents of concern, potential exposure pathways, and potential receptors at the site.

- **Section 6.0 – Development of Remediation Alternatives.** This section describes the details of each remediation alternative. Candidate remedial technologies were identified to develop potential cleanup alternatives for further evaluation in this IAWP.

- **Section 7.0 – Remediation Alternatives Selection.** Remediation alternatives are evaluated in this section by comparative analysis. A disproportionate cost analysis is used to determine whether the cleanup action uses cost-effective solutions to the maximum practicable extent. Finally, a recommendation is provided based on the results of the evaluation and disproportionate cost analysis.

Supporting information is provided in the tables, figures, and appendices at the end of the IAWP text.

2.0 SITE DESCRIPTION AND BACKGROUND

2.1 Location and Site Description

The Jacobson Terminals facility is located at 5350 30th Avenue NW in the Ballard district of Seattle (Figure 1). The property boundaries are the Lake Washington Ship Canal (Ship Canal) to the east and south, Seaborn property to the east, Army Corps of Engineers (Corps) property to the west, and City of Seattle (City) property to the north.

The site is generally flat. The northwest corner, which is used for parking, is approximately 5 feet above the elevation of the rest of the property, at the approximate elevation of the City property and railroad tracks.

Large boat storage racks are located along the Lake Washington Ship Canal. Offices and small warehouses border the US Army Corps of Engineers (Corps) property to the west.

Numerous utilities run through the site and the AOC. A municipal sewer line located approximately 10 feet below ground surface (bgs) runs west to east within the AOC. A private sewer connects to the municipal line from the on-site business. Other utilities include a fire hydrant, two underground water lines, high- and low-voltage overhead power, and communication lines that are located in the AOC.

Fencing and gates control access to the site. (A site map is provided on Figure 2.) The Terminals property is zoned industrial (IGlU/45).

2.1.1 Current Conditions at Surrounding Properties

The Corps property contains offices, maintenance buildings, and a tourist facility for the Ship Canal Locks. The Seaborn property is used for boat moorage and office space. The City property consists of a former Burlington Northern Railroad right of way and contains active railroad tracks. North of the City property and railroad tracks, at 2801 NW Market Street, is the Market Street property, which consists of a climbing gym and other commercial businesses.

2.1.2 Historical Site Use

Terminals Property

The property is located on a former estuarine tideflat. In the 1920s, the area was filled with sand dredged from the Lake Washington Ship Canal, wood waste, and construction debris. The property was the site of a lumber mill from approximately 1890 to the 1930s. Starting around 1940, the property was used for loading and unloading boats and for storage. Alan and Brian Jacobson (partners in A&B Jacobson, LLC) purchased the property in 1975 and the property has been used as a marine support facility since that date.

Market Street Property

Approximately 14 interconnected buildings were constructed on the Market Street property from 1946 to 1955. Fuel tanks and shell casings were reportedly manufactured at the property before the factory switched to steel window frame manufacturing in the late 1940s. In 1955, the factory stopped producing steel frames and began producing aluminum window frames. This manufacturing process used extrusion presses, an anodizing circuit of 21 aboveground steel or concrete tanks, a paint room, ten underground storage tanks (USTs), and an interior drainage system that included 24 floor drains, trench drains, and sumps.

Wastewater from the Market Street property was discharged to the Lake Washington Ship Canal from approximately 1948 to 1978; in later years, the wastewater was treated on the property and discharged to the King County Metro wastewater collection system. Violations of the Metro permit for pH and metal discharge exceedances are documented in the project file. A video inspection of the sewer lines was conducted in the late 1970s and severe deterioration and disintegration of the lines was observed. The former owner of the property reportedly replaced the lines. Window manufacturing operations ceased at the Market Street property in 1989 (Hart Crowser 2000).

2.2 Summary of Previous Environmental Characterization and Remediation Activities

A number of environmental investigations and remedial actions have been completed at the site and the adjacent Corps, City, and Market Street properties. A summary of contaminants of concern and remedial activities are provided below.

2.2.1 Contaminants of Concern

Based on the results of historical environmental investigations and this RI, the major contaminants of concern (COCs) include:

- PCBs in soil at the Terminals property;
- Tri-, di-, and chlorobenzene in soil and groundwater at the Terminals property;
- Petroleum hydrocarbons in soil at the Terminals property;
- Chlorinated solvents (PCE, TCE, cis-DCE, and vinyl chloride) in soil and groundwater on the Market Street, City, Corps, and Terminals properties; and
- Metals in soil and groundwater on the Terminals, Market Street, and City properties.

PCBs are the focus of this IAWP, and their nature and extent is the sole basis for evaluation of the remediation alternatives.

2.2.2 Historical Environmental Characterization

Groundwater monitoring was first conducted to delineate a vinyl chloride plume identified at the upgradient Market Street property. Historical releases of metals, low- and high-pH solutions, and solvents occurred on the Market Street and City properties during operations by Fentron Industries (Fentron). The releases created localized exceedances of metals in soil and groundwater and an extensive groundwater plume of tetrachloroethene (PCE) and associated degradation products (primarily trichloroethene [TCE], cis-1,2-dichloroethene [cis-DCE], and vinyl chloride). Prior to installation of a treatment wall in 1999, the plume extended from the Market Street and City properties onto the Corps and Terminals properties.

A separate area of chlorinated solvents, located on the City property downgradient of the Market Street treatment wall, was identified as the likely source of chlorinated solvent impacts on the Terminals property, although elevated chlorinated solvent concentrations observed during this RI in the northeast corner of the site suggest that there are still soil impacts downgradient of the Market Street treatment wall.

A historical release of transformer oil containing PCBs and trichlorobenzene on the northern portion of the Terminals property created a plume of PCBs and several chlorinated benzene compounds in groundwater (Figure 2). Elevated concentrations of PCBs and chlorinated benzenes above applicable cleanup levels (see section 3.2) have been identified in soil samples up to 30 feet bgs downgradient of where the presumed transformer oil release occurred.

During construction activities in the early 1990s, a separate area of PCB- and petroleum-impacted soil was discovered at the Terminals property in an alley that borders the Corps property (Figure 2).

2.2.2 Historical Remediation Activities

A number of remedial actions have been completed at the site to address potential human and ecological exposure to the COCs described above. These cleanup actions were conducted under the Voluntary Cleanup Program (VCP) by the Jacobsons.

In 1996, PCB- and petroleum-contaminated soil was removed from between two buildings bordering the Corps property. Much of the source material was removed, but confirmation sampling showed that petroleum hydrocarbon concentrations remained above cleanup levels in sidewall and bottom samples (Hart Crowser 1997).

In 2001 and 2002, Fenton’s Reagent (acidified hydrogen peroxide and ferrous iron) was injected in the AOC to provide source area treatment of the PCB/chlorinated benzene plume and to provide a more aggressive oxygen enhancement for degrading cis-DCE and vinyl chloride. In December 2003, a continuous permeable treatment wall containing granular activated carbon and zero-valent iron was installed along the Lake Washington Ship Canal to remove PCBs and chlorinated benzenes from groundwater (Aspect 2003).

2.3 Environmental Setting

This section describes the environmental setting of the property including geology, hydrogeology, and surface water hydrology.

2.3.1 Geology

Terminals property soil generally consists of approximately 10 feet of fill overlying native estuarine sediment. The fill is a diverse mixture of silty sand, silt, wood waste, and occasional debris. A layer of wood waste approximately 6 to 10 feet deep has been identified over much of the northern portion of the property. Below the fill layer is native sand or silty sand to 16 to 18 feet deep. Beneath the sand layer is a layer of discontinuous silt and clay, typically 1 to 4 feet thick. Below this layer are discontinuous layers of sand and silt of increasing density. Two generalized geologic cross sections are provided on Figures 3 and 4.

During the RI investigation, the silt and clay layer was not observed at MW-200 and JT-US-33. This suggests that the layer may not be continuous.

2.3.2 Hydrogeology

Groundwater Flow Patterns

Shallow groundwater in the area generally flows toward the south-southeast before discharging into the Lake Washington Ship Canal. Groundwater elevations on the Terminals property are typically 7 to 8 feet relative to the city of Seattle elevation datum. Groundwater is typically encountered 4 to 7 feet bgs on the site. The groundwater elevation fluctuates approximately 2 feet seasonally and depends largely on the elevation of the Ship Canal, which is adjusted seasonally by the Corps of Engineers. A map showing site groundwater elevation contours measured in 2005 is provided on Figure 5.

Groundwater elevations have typically been lower near the sewer line in the JT-9 area than the rest of the property. A sewer camera survey in April 2003 indicated that a connection to the side sewer was located in this area. The camera noted water flowing in at the side sewer connection with significant scale buildup. The sewer line is located below the water table (see Figure 3 and 4); therefore, leakage of shallow groundwater into the sewer could result in the observed groundwater depression (Aspect 2003).

Groundwater Flow Rates

An upward gradient has been reportedly identified between the deeper water-bearing zone (beneath the silty clay layer) and the shallower water-bearing zone, with the hydrostatic head typically 1 to 2 feet greater at wells JT-5, MW-8D, MW-100, and MW-00 than at adjacent shallower wells.

Saturated-zone soil at the site is reported to have generally low hydraulic conductivity. Slug tests performed in 2003 indicated that at five of six wells tested, the average hydraulic horizontal gradient was 0.02 foot per foot across the property, and assuming a porosity of 0.4, the estimated groundwater flow rate is 0.1 foot per day (40 feet per year). Using the maximum calculated hydraulic conductivity in the remaining well, the groundwater flow rate would be 0.7 foot per day (250 feet per year). Using vinyl chloride (a very mobile compound in groundwater) as a conservative tracer, groundwater velocity was calculated at approximately 0.4 foot per day, or 150 feet per year (Aspect 2003).

2.3.3 Ship Canal Surface Water Hydrology

In 1914, Lake Union was hydraulically connected to Lake Washington by construction of the Montlake Cut between Portage Bay and Union Bay. Lake Union was also connected to the then-marine waters of Salmon Bay by construction of the Fremont Cut. The connection to Shilshole Bay and Puget Sound, and a means to control water levels, was established by constructing the Hiram M. Chittenden Locks. The Fremont Cut and Montlake Cut make up the Lake Washington Ship Canal. The locks and dam maintain the Ship Canal water level.

These modifications increased inflow to Lake Union by diverting the outflow from Lake Washington into the Montlake Cut and, hence, Lake Union, which now drains west into Salmon Bay. During periods of high water flow, the north part of Lake Union can flush (completely exchange water) in about 7 days. However, the southern part of Lake Union does not completely flush and remains relatively stagnant. Opening the locks also allows a periodic influx of dense salt water from Puget Sound into the Ship Canal. Because the saltwater is heavier than freshwater, it sinks to the bottom of the canal and moves eastward following the density gradient into Lake Union. The balance between the saltwater intrusion and the flushing rate at a given time varies. During the rainy season and spring thaw, runoff from the Cascade foothills is high and the lake is flushed. In the summer, as the runoff flow decreases and lock openings increase, saltwater intrusion increases.

The Corps maintains the water level in Lake Washington and Lake Union by regulating flow through the locks on the western end of Salmon Bay. Lake Union water levels vary by roughly 2 feet during the year, from 20 feet during the winter months to 22 feet during the summer months.

The Lake Washington Ship Canal from the locks (river mile 1.0) to Lake Washington (river mile 8.6) is designated as “lake class” by Ecology, stipulating that water quality must meet the requirements for most, if not all of the following uses: wildlife habitat; general recreation; fish reproduction, rearing, and harvest; water supply; and stock watering. However, it should be noted that elevated salinity levels within the portion of the Ship Canal adjacent to the Terminals property would likely severely limit its potential use as a source for potable water.

3.0 CLEANUP OBJECTIVES

3.1 Remedial Action Objectives

The remedial action objectives (RAOs) of the interim remedial action is to remove PCB and chlorinated benzene source material. Following removal of the impacted soil, a reduction in PCB and chlorinated benzene concentrations in groundwater is expected. The long-term goal is to reduce COC concentrations in groundwater to levels protective of surface water, so the treatment wall is no longer necessary. Depending on the remediation alternative selected, follow-up cleanup activities may be necessary to achieve the cleanup standards described in section 3.2.

3.2 Cleanup Standards

Cleanup levels for soil, groundwater, and sediment are presented below.

3.2.1 Soil

Soil screening levels have historically been compared to MTCA Method A Industrial screening levels or MTCA Method C Direct Contact Levels for Industrial Sites (Hart Crowser 1999).

To evaluate whether COC concentrations in soil are protective of adjacent surface waters, screening levels were calculated using Ecology's Three-Phase Partitioning Model (WAC 173-340-747). This model provides a conservative estimate for establishing a soil concentration that will not cause groundwater contamination above an acceptable level. Surface water screening values presented in Table 3 were used to compute soil screening levels protective of the groundwater exposure pathway.

For chemicals with no freshwater screening values, the MTCA Method A or B cleanup level was used. For this IA, PCB concentrations were also compared to the MTCA Method A unrestricted cleanup level of 1 mg/kg and the MTCA Method A industrial cleanup level of 10 mg/kg for evaluation of remediation alternatives costs. Soil screening levels are shown in Tables 1 and 2.

3.2.2 Groundwater

Groundwater screening levels have historically been compared to surface water protection criteria. Depending on the COC, either MTCA Method B freshwater screening criteria or State freshwater screening criteria as defined in WAC 173-201A were used (Hart Crowser 1999).

Due to the proximity to the Lake Washington Ship Canal, as defined in WAC 173-430-720 and 173-430-730, screening levels were updated based on the most conservative freshwater screening levels for consumption of organisms: Federal Clean Water Act Section 304, National Toxics Rule 40 CFR 131, or MTCA Method B surface water criteria, whichever is lower. For chemicals with no freshwater screening values, MTCA Method A cleanup levels were used. Groundwater screening levels are shown in Table 3.

3.2.3 Sediment

Sediment data was compared to the Washington State Freshwater Sediment Cleanup Objective Criteria and Freshwater Sediment Cleanup Screening Levels as defined in WAC 173-204. Sediment screening levels are shown in Table 4.

3.3 Area of Concern

The area of concern for this IA is the PCB-impacted area shown on Figure 6. For the purpose of our remediation alternatives evaluation, three potential remediation areas have been delineated on Figure 6. The three areas of concern are:

- **Area exceeding the MTCA Method A industrial cleanup level (>10 mg/kg)**
  - Area – ~3,420 square feet
  - Depth – 0 to ~19 feet
  - Volume – ~2050 cubic yards

- **Greater than MTCA Method A Unrestricted (>1 mg/kg)**
  - Area – ~4,600 square feet
  - Depth – 0 to ~21 feet
  - Volume – ~2800 cubic yards

- **Area exceeding surface water protection criteria (>0.0000787 mg/kg)**
  - Area – Not delineated (>13,000 square feet)
  - Depth – Not delineated (0 to 30+ feet)
  - Volume – Unknown (>14,500 cubic yards)

Note that areas and volumes are based on potential excavation areas discussed in section 6. A detailed discussion of RI analytical results can be found in section 4.0.

3.4 ARARs and Applicable Regulations

This section identifies potential applicable or relevant and appropriate requirements (ARARs) to be used in assessing and implementing remedial actions at the site. The potential ARARs focus on federal or state statutes, regulations, criteria, and guidelines. The specific types of potential ARARs evaluated include contaminant-, location-, and action-specific ARARs. Each type of potential ARAR is evaluated for the site AOC and summarized in Table 5.

In general, only the substantive requirements of ARARs are applied to MTCA cleanup sites being conducted by Ecology (WAC 173-340-710[9][b]). Thus, cleanup actions under a formal agreement with Ecology are exempt from the administrative and procedural requirements specified in state and federal laws. This exemption also applies to permits or approvals required by local governments.

Contaminant-Specific ARARs

Contaminant-specific ARARs are usually health- or risk-based numerical values or methodologies that, when applied to site-specific conditions, result in the establishment of numerical contaminant values that are generally recognized by the regulatory agencies as allowable to protect human health and the environment. As noted in Section 3.2, Ecology has established MTCA cleanup levels and Sediment Management Standards for site COCs.

Action-Specific ARARs

Action-specific ARARs are pertinent to particular remediation methods and technologies, and to actions conducted to support cleanup. Action-specific ARARs are requirements that may need to be satisfied during the performance of specific remedial actions because they prescribe how certain activities (e.g., treatment and disposal practices, media monitoring programs) must occur. Typically, action-specific ARARs are not fully defined until a preferred response action has been selected and the corresponding remedial action can be more completely refined. However, preliminary consideration of the range of potential action-specific ARARs may help focus the process of selecting a preferred remedial action alternative.

Location-Specific ARARs

Location-specific ARARs are restrictions placed on the concentration of hazardous substances or the conduct of activities solely because they are in a specific location. Some examples of special locations include floodplains, wetlands, historic sites, and sensitive ecosystems or habitats.

4.0 REMEDIAL INVESTIGATION

In January 2013, in general accordance with the Soil, Groundwater, and Sediment Characterization Work Plan dated December 19, 2013, Hart Crowser conducted a soil, groundwater, and sediment investigation to characterize and delineate the PCB and chlorinated benzene impacted area at the site. Analytical data from this investigation indicated that impacted soil extended beyond the limits of the investigation.

To address these data gaps, a supplemental soil and groundwater investigation was completed in March 2013, in general accordance with the Supplemental Soil and Groundwater Characterization Work Plan dated March 6, 2013.

A detailed description of field activities including departures from the proposed SAP/QAPP are presented in Appendix A.

4.1 Remedial Investigation Activities

A summary of investigation activities is provided below. A detailed description of processes used to complete the RI is included in Appendix A. Exploration locations are shown on Figure 2.

4.1.1 Push Probes

Thirty-eight push-probe borings were completed to depths ranging from 10 to 30 feet bgs at locations shown on Figure 2. Push-probe borings were logged at 5-foot intervals and field-screened using headspace and water sheen tests to determine the appropriate interval for collecting discrete samples. Based on the field indications, and when sufficient soil recovery allowed, a single discrete soil sample was collected from most 5-foot samples. If there was no field indication of contamination, the soil at the groundwater interface was typically selected for analysis. Each sample was analyzed for:

- Volatile Organic Compounds (VOCs) by EPA Method 8260C; and
- Polychlorinated Biphenyls (PCBs) by EPA Method 8082A.

Selected samples were analyzed for:

- Metals by EPA Method 6020A/7471;
- Dioxin/furans by EPA Method 1613B;
- Diesel- and oil-range petroleum hydrocarbon analysis by Northwest Test Method NWTPH-Dx;
- Total solids by EPA Method 160.3M/SM 2540B; and
- TOC by Plumb (1981).

The first round of push probes were advanced on January 2, 3, and 6, 2014, the second round of push probes were advanced on March 11 and March 12. All samples were delivered to Analytical Resources, Inc., of Tukwila, Washington. Boring logs are presented in Appendix A.

4.1.2 Monitoring Well Installation

Two hollow-stem auger borings were completed as monitoring wells to 30 feet bgs at locations shown on Figure 2. Monitoring wells were screened from 25 to 30 feet bgs. Borings were generally logged at 1.5-foot intervals from samples collected every 5 feet. Samples were field-screened using headspace and water sheen tests. Samples selected for analysis were based on field screening and/or from below 18 feet bgs, beneath the silt/clay layer. Four soil samples were collected and analyzed for:

- Volatile Organic Compounds (VOCs) by EPA Method 8260C;
- Polychlorinated Biphenyls (PCBs) by EPA Method 8082A; and
- Total solids by EPA Method 160.3M/SM 2540B.

Hollow-stem auger and well installation was completed on March 13 and March 14, 2014. All samples were delivered to Analytical Resources, Inc. of Tukwila, Washington. Boring logs are presented in Appendix A.

4.1.3 Groundwater Sampling

On January 7, 8, 9, and 11, 2014, select existing monitoring wells were sampled to assess groundwater conditions. Groundwater samples were collected from within the source area (IP-9, IP-14, and JT-8), four downgradient wells (JT-3, JT-7, JT-11, and SRW-1), one upgradient well (MW-8D), and the two compliance wells (JT-6 and JT-12). Groundwater samples collected during the first investigation were analyzed for:

- VOCs by EPA Method 8260C;
- PCBs by EPA Method 8082A;
- Total Metals (including arsenic, cadmium, chromium, lead, and mercury) by EPA Methods 6010/6020/7470A;
- Dissolved Metals and Inorganics (including arsenic, calcium, cadmium, chromium, lead, magnesium, and mercury) by EPA Methods 6010/6020/7470A;
- TOC by SM5410;
- Alkalinity by SM2320B; and
- Nitrate, Sulfate, and Chloride by EPA Methods 353.2/375.2/325.2.

The two deep monitoring wells (MW-100 and MW-200) described in section 4.1.2, and the two other existing deep wells (JT-5 and MW-8D) were sampled on March 18, 2014. Groundwater samples collected during this investigation were analyzed for:

- VOCs by EPA Method 8260C;
- PCBs by EPA Method 8082A; and
- Total Suspended Solids by SM240D.

All samples were delivered to Analytical Resources, Inc. Well construction logs for the sampled wells are presented in Appendix A.

4.1.4 Sediment Sampling

On January 14, 2014, five vibracores (JT-SS-01 thru JT-SS-05) were advanced approximately 2 to 4 feet below the mud line. Cores were logged and select samples were analyzed for:

- VOCs by EPA Method 8260C;
- PCBs by EPA Method 8082;
- Metals (including arsenic, cadmium, chromium, lead, and mercury) by EPA Method 200.8/6010/7470; and
- TOC by Plumb (1981).

Select sediment samples were archived for possible PCB congener analysis by EPA Method 1668 and dioxins/furans analysis by EPA Method 1613B. All samples were delivered to Analytical Resources, Inc., of Tukwila, Washington.

On January 14, 2014, three surface samples were collected using power Van Veen sediment sampling equipment for a limited benthic survey. Samples were submitted to Rhithron Associates, Inc., in Missoula, Montana, for aquatic invertebrate analysis.

4.2 Remedial Investigation Results

Hart Crowser's investigation found PCB- and chlorinated benzene-impacted soil extending beyond the area previously identified in the 2013 Data Gaps Report (Hart Crowser 2013a). Concentrations of PCBs in soil were above screening levels protective of surface water in all 40 borings. PCB impacts above MTCA Method A Unrestricted and/or Industrial cleanup levels were found to extend north, east, and west of the previously identified source area. Dioxin concentrations in three samples collected from the source area were also above the surface water screening level, but below expected local urban background concentrations (Ecology, 2011).

Groundwater sampling found PCB concentrations above surface water screening levels in all monitoring wells. Free-phase PCB oil was also found in monitoring wells IP-9 and JT-8. PCB concentrations above surface water screening levels were also found in the four deep wells at the site, MW-8D, JT-5, MW-100, and MW-200.

Sediment adjacent to the site, collected from just below the mud line, contained PCB concentrations below the sediment cleanup screening level, but above the sediment cleanup objective level. Salinity and aquatic invertebrate sampling indicates that at the time of our investigation, the portion of the Lake Washington Ship Canal adjacent to the site appears to be a freshwater environment.

A detailed description of the remedial investigation results is presented in sections 4.2.1 thru 4.2.3.

4.2.1 Soil Investigation Results

Numerous volatile organic compounds (VOCs) and/or PCBs were detected in all 103 soil samples collected from the 38 push probes and two monitoring wells. PCBs were found above concentrations protective of surface water in all 40 explorations. The chlorinated benzenes 1,4-dichlorbenzene, 1,2,4-trichlorobenzene, and/or chlorobenzene were detected in 51, 54, and 37 samples, respectively. Chlorinated ethenes including tetrachloroethene, trichloroethene, and/or vinyl chloride were also detected in a number of soil samples. These compounds represent the primary COCs at the site. Other VOCs, metals, and dioxins/furans were also detected in soil samples.

A discussion of the RI soil analytical data is presented below. Soil analytical data can be found in Tables 1 and 2. A site plan showing exploration locations is presented on Figure 2. Analytical data for select COCs is displayed on Figures 6 thru 6c (PCBs), Figure 7 (chlorinated benzene), and Figure 8 (chlorinated ethene).

PCBs

All 40 explorations advanced during the RI contained PCB concentrations in soil above levels protective of surface water (0.0000787 mg/kg). The screening level protective of surface water is below the laboratory method detection limit. A total of 91 samples contained detectable concentrations of PCBs. Aroclor 1260 was the most frequently detected PCB; it was detected in 88 of the 91 samples. Only two other Aroclors were detected in site soil. Aroclor 1248 was detected in four borings and Aroclor 1254 were detected in three. The extent of PCB impacts is shown on Figure 6 and PCB occurrences are displayed by depth intervals on Figure 6a (0 to 10 feet bgs), Figure 6b (10 to 18 feet bgs), and Figure 6c (over 18 feet bgs)

PCB concentrations were compared to three screening levels for remediation budgeting purposes. The following cleanup levels were used to evaluate PCB impacts at the site:

- MTCA Method A Industrial cleanup level of 10 mg/kg PCBs
- MTCA Method A unrestricted use cleanup level of 1 mg/kg PCBs
- MTCA protection of surface water for PCBs of 0.0000787 mg/kg, discussed in section 3.2.1.

The MTCA Method A Industrial cleanup level was exceeded in ten borings (JT-US-01, JT-US-02, JT-US-05, JT-US-08, JT-US-11, JT-US-14, JT-US-18, JT-US-19, JT-US-20, and JT-US-27). PCB concentrations ranged from 22 mg/kg in JT-US-11-S2 to 30,000 mg/kg in JT-US-27-S2. These elevated concentrations were generally observed just below the groundwater table from 6 to 11 feet bgs and are likely associated with the reported past transformer oil release. Deeper exceedances were observed in JT-US-05-S3 (1,800 mg/kg), collected from 17.5 to 18.25 feet bgs and JT-US-08-S4 (1,400 mg/kg), collected from 15 to 16 feet bgs. One near-surface exceedance (340 mg/kg) was located 2.5 to 3 feet bgs in JT-US-18-S1.

In general, exceedances of the MTCA Method A Industrial cleanup level were shallower in the western and northern portions of the AOC. Deeper impacts were generally observed in the southern and eastern portions of the plume. The exceedance in sample JT-US-05-S3 was collected from within the silt/clay layer.

The MTCA Method A Unrestricted cleanup level was exceed in six additional samples from borings JT-US-03, JT-US-05, JT-US-12, JT-US-28, JT-US-31, and JT-US-34. Three of the exceedances were from borings located outside of the area with PCB concentrations above MTCA Method A industrial cleanup levels, including JT-US-12, JT-US-28, and JT-US-31. These three borings are located along the north and western edges of the main plume and generally located at or below the water table.

One exceedance was located below the silt/clay layer. Soil sample JT-US-34-S3, collected from 20 to 21 feet bgs contained PCBs at 1.6 mg/kg. And soil sample JT-US-03-S3, collected within the silt/clay layer from 17.5 to 18 feet bgs contained PCBs at 1.2 mg/kg.

The MTCA screening level protective of surface water was exceeded in all 40 borings. Exceedances extended from the near-surface to 30 feet bgs in MW-200-S6 where PCBs were measured at 0.277 mg/kg. PCB concentrations above this screening level likely extend beyond the areas shown on Figures 6 thru 6c. The widespread and relatively low PCB concentrations indicate that these detections may be related to historical regional sources and are likely ubiquitous within this industrial area of Seattle.

Chlorinated Benzenes

Chlorobenzene, 1,4-dichlorobenzene, and 1,2,4-trichlorobenzene were detected throughout the study area. Their presence is likely related to the transformer oil release and generally co-occur in areas with elevated PCB concentrations. Chlorobenzene was detected in 54 samples, 1,4-dichlorobenzene was detected in 51 samples, and 1,2,4-trichlorobenzene was detected in 37 samples. The frequency of detections and the elevated chlorobenzene concentrations may suggest some anaerobic degradation of 1,2,4-trichlorobenzene. A discussion of the RI chlorinated benzene occurrences is presented below.

1,2,4-trichlorobenzene was detected at concentrations ranging from 0.0063 mg/kg to 370 mg/kg. The calculated MTCA Method B screening level protective of surface water is 0.0054 mg/kg. Numerous other detections were reported, but at concentrations below the laboratory reporting limit; those values were flagged with a T in Table 1. All detections were below the MTCA Method B cleanup level of 800 mg/kg. Elevated detections were generally observed near or below the water table at depths ranging from 7 to 18.25 feet bgs.

1,4-dichlorobenzene was detected at concentrations ranging from 0.0013 mg/kg to 52 mg/kg. Thirty-three samples exceeded the calculated MTCA Method B screening level protective of surface water of 0.22 mg/kg. All detections were below the MTCA Method B cleanup level of 5,600 mg/kg. The elevated concentrations were generally located near or below the water table.

Chlorobenzene was detected at concentrations ranging from to 0.0024 mg/kg to 3,800 mg/kg. Twenty-five samples exceed the calculated MTCA Method B screening level protective of surface water of 0.84 mg/kg. Chlorobenzene concentrations exceeded the MTCA Method B cleanup level of

1,600 mg/kg in one sample, JT-US-27-S2 (3,800 mg/kg). The elevated concentrations were generally located near or below the water table.

Chlorinated Ethenes

Tetrachloroethene, trichloroethene, and vinyl chloride were detected throughout the study area. Their occurrence is likely related to chlorinated ethene impacts documented within the upgradient Market Street Property. A discussion of the RI chlorinated ethene occurrences is presented below.

Tetrachloroethene (PCE) was detected in 11 samples above laboratory reporting limits. Seven samples contained PCE concentrations above the calculated MTCA Method B screening level protective of surface water of 0.0018 mg/kg. Concentrations in the seven samples ranged from 0.0027 mg/kg to 2.7 mg/kg. The highest concentration was detected in JT-US-32-S2 at 5 to 6 feet bgs. The elevated PCE concentrations were primarily observed in the northern and western parts of the AOC.

Trichloroethene (TCE) was detected above the laboratory detection limit in 14 samples. Seven samples contained TCE concentrations above the calculated MTCA Method B screening level protective of surface water of 0.0042 mg/kg. TCE concentrations in the seven samples ranged from 0.0053 mg/kg to 1.9 mg/kg. The highest concentration was detected in JT-US-018-S2 at 11 to 11.5 feet bgs. The elevated TCE concentrations were primarily observed in the northern and western portions of the AOC and generally observed at or below the water table. TCE was measured in JT-US-30-S4 at 0.0012 mg/kg at 20 to 21 feet bgs, below the silt/clay layer.

Vinyl Chloride was detected above the laboratory detection limit in 23 samples. Twenty-one samples contained concentrations above the calculated MTCA Method B screening level protective of surface water of 0.00076 mg/kg, which is below the laboratory method detection limit. Vinyl chloride was measured in sample JT-US-018-S2 at 23 mg/kg, at a depth of 11 to 11.5 feet bgs. The other 20 vinyl chloride detections ranged from 0.0021 mg/kg to 0.41 mg/kg. The detections were observed throughout the study area at or below the water table. Vinyl chloride was not detected below the silt/clay layer and elevated detections were generally concentrated in the northern part of the AOC.

Metals

Thirty-three soil samples were analyzed for arsenic, cadmium, chromium, lead, and mercury. Samples were collected for waste profiling. Elevated lead, mercury, arsenic, and cadmium were detected in fill material at concentrations above their respective screening levels. Screening levels for metals are based on concentrations protective of surface water as described in section 3.2.1. For metals with no surface water screening levels, MTCA Method A unrestricted cleanup levels were used.

Lead was detected in all 33 samples analyzed. Only two samples exceeded the MTCA Method A unrestricted cleanup level of 250 mg/kg. Samples JT-US-003-S2 and JT-US-018-S2 had concentrations of 422 mg/kg and 1,050 mg/kg, respectively.

Arsenic was detected in all 33 samples analyzed. Six samples contained arsenic concentrations above the Puget Sound regional background 90th percentile level of 7 mg/kg (Ecology 1994). Sample JT-US-

018-S2 contained arsenic at 196 mg/kg. Arsenic concentrations in the other 32 samples ranged from 1.3 to 17.8 mg/kg.

Mercury was detected in 22 of the 33 samples analyzed at concentrations generally within the Puget Sound regional background 90th percentile level of 0.07 mg/kg. One sample exceeded the calculated MTCA Method B screening level protective of surface water of 0.157 mg/kg. Sample JT-US-012-S1 contained mercury at a concentration of 0.39 mg/kg. Concentrations in the other 21 samples ranged from 0.02 mg/kg to 0.13 mg/kg.

Cadmium was detected in 14 of the 33 samples analyzed. One sample exceeded the concentration protective of surface water of 5.6 mg/kg. Sample JT-US-018-S2 contained cadmium at 26 mg/kg.

Chromium was detected in all 22 samples analyzed at concentrations well below the MTCA Method A unrestricted cleanup level of 2,000 mg/kg.

Petroleum hydrocarbons

Petroleum hydrocarbons were initially analyzed for evaluation of potential *in situ* polishing following the PCB remedial action, but additional petroleum hydrocarbon identification was performed to identify whether impacted soil identified during field screening was a result of a PCB or petroleum release. Petroleum hydrocarbons concentrations were compared to MTCA Method A unrestricted cleanup levels.

Diesel-range organics, electrical insulating oil, lube oil, and gasoline-range organics were detected in fill material throughout the study area. Only one sample, JT-US-003-S2, which contained lube oil at 3,500 mg/kg, exceeded the MTCA Method A unrestricted cleanup level for lube oil of 2,000 mg/kg.

Dioxins/Furans

Three samples, JT-US-003-S2, JT-US005-S2, and JT-US-005-S2 were analyzed for dioxins/furans. All exceeded the toxicity equivalency quotient protective of surface water of 0.049 pg/g, but do not exceed the local background concentration of 47 pg/g (Ecology 2011). The toxicity equivalency quotient ranged from 1.59 pg/g to 5.53 pg/g.

Soil Results Summary

Our investigation found PCB impacts extending beyond the area previously identified in the Data Gaps Report (Hart Crowser 2013). PCB concentrations above MTCA Method A unrestricted cleanup levels extend to 21 feet bgs and concentrations above surface water protection criteria extend to 31 feet bgs. The lateral extent of PCB soil concentrations above MTCA Method A unrestricted cleanup levels have not been completely delineated to the north and east, but impacts related to the historical transformer oil release are unlikely to extend significantly further in either direction. PCB soil concentrations exceeding MTCA Method A industrial levels appear to be delineated. PCB concentrations exceeding levels protective of surface water have not been delineated. As noted previously, these low-level concentrations may be related to historical industrial operations.

Chlorinated benzene concentrations exceed calculated MTCA Method B screening levels protective of surface water throughout the AOC and appear to be co-located with elevated PCB occurrences. Elevated chlorinated ethene concentrations appear to be concentrated in the northern portion of the PCB-impacted area and were not detected in deeper samples from below the silt/clay layer. Scattered areas of petroleum, metals, and solvent related contaminants were observed in fill material within the study area.

4.2.2 Groundwater Investigation Results

Shallow groundwater wells and one deep well were sampled in January 2013. Following a review of the soil and groundwater data, deep wells JT-5 and MW-8D and two additional newly installed deep wells (MW-100 and MW-200) were sampled in March 2013, to determine if groundwater COC impacts extend to the lower aquifer.

PCBs were detected above MTCA Method B freshwater surface water protection screening levels (0.000064 µg/L for Total PCBs which is below the PQL) in all 14 groundwater samples, including the compliance wells JT-6 and JT-12 and the four deep wells, JT-5, MW-8D, MW-100, and MW-200. PCB free-phase product was found in shallow wells IP-9 and JT-8.

Chlorinated benzenes were detected above MTCA Method B freshwater surface water protection screening levels in three shallow wells located within the AOC.

A discussion of the RI groundwater analytical data is presented below. Groundwater analytical data can be found in Table 3. A site plan showing select groundwater COC concentrations is presented on Figure 9.

PCBs

Aroclor 1260 was the only Aroclor detected and it was found in all groundwater samples at concentrations ranging from 0.018 µg/L to 280 µg/L. Monitoring wells IP-9 and JT-8 contained the highest concentrations of Aroclor 1260, 18 µg/L and 280 µg/L, respectively. A viscous product was observed at the bottom of both wells during development. A sample of the product was collected from JT-8 and analyzed for diesel- and oil-range organics. The results were quantified by the lab as diesel- and residual-range organics at concentrations of 3,600 mg/L and 1,400 mg/L, respectively. A review of the chromatogram indicated the detections were due to the presence of PCBs, not diesel- and oil-range organics.

Three shallow wells downgradient of the PCB-impacted soil area, JT-3, JT-7, and JT-11 contained Aroclor 1260 concentrations of 0.76 µg/L, 0.17 µg/L, and 0.91 µg/L. These wells are located upgradient of the wall. Aroclor 1260 was measured at 0.13 µg/L in SRW-1, located within the treatment wall. Downgradient compliance wells JT-12 and JT-6 contained Aroclor 1260 concentrations of 0.018 µg/L and 0.05 µg/L, respectively.

Deep wells JT-5, MW-100, and MW-200, screened from 25 to 30 feet bgs, contained Aroclor 1260 concentrations of 0.91 µg/L, 1.1 µg/L, and 0.057 µg/L, respectively. A slight sheen was noted on the groundwater during development and purging of well JT-6. Deep well MW-8 was sampled twice, in

January and March; Aroclor 1260 concentrations were 0.49 µg/L and 0.18 µg/L, respectively. Monitoring well MW-8D is located on the northern edge of the PCB AOC. Monitoring well MW-200 is located adjacent to monitoring well JT-8 where PCB product was observed in the upper aquifer. Wells MW-100 and JT-5 are located down gradient of the treatment wall.

Chlorinated Benzenes

The chlorinated benzenes 1,4-dichlorobenzene, and 1,2,4-trichlorobenzene were detected above MTCA Method B freshwater surface water protection screening levels in AOC monitoring wells. Chlorinated benzenes were detected at concentrations below surface water screening levels downgradient of the AOC and in both compliance wells.

1,4-dichlorobenzene was detected in AOC wells IP-14, and JT-8 at concentrations of 680 µg/L and 730 µg/L, respectively, above the Method B freshwater protection screening level of 190 µg/L.

Compliance well JT-12 contained 1,4-dichlorobenzene at 1.5 µg/L. It was not detected above screening levels in compliance well JT-6. Downgradient wells JT-3, JT-11, and JT-7 contained 1,4-dichlorobenzene concentrations of 1.7 µg/L, 1.8 µg/L, 2.3 µg/L, respectively. It was not detected above laboratory detection limits in SRW-1.

Deep well MW-200 contained 1,4-dichlorobenzene at 4 µg/L, and it was detected in well MW-100, but at concentrations below the laboratory reporting limit. Concentrations were below laboratory detection limits in MW-8D and JT-6.

1,2,4-trichlorobenzene was detected within the AOC in wells IP-14, IP-9, and JT-8 at concentrations of 960 µg/L, 130 µg/L, and 9,900 µg/L, respectively, above the Method B freshwater protection screening level of 1.96 µg/L. Deep well MW-200 contained 1,2,4-trichlorobenzene at a concentration (100 µg/L) exceeding the screening level.

Concentrations of 1,2,4-trichlorobenzene in downgradient wells JT-3 and JT-7 were measured at 0.86 µg/L and 0.58 µg/L, respectively, below the freshwater screening level. 1,2,4-trichlorobenzene was detected in deep wells MW-8D and JT-5, but at estimated concentrations below laboratory reporting limits.

Chlorobenzene was detected in 11 of the 13 wells sampled. Concentrations ranged from 0.28 µg/L to 1200 µg/L, below the Method B freshwater protection screening level of 1,600 µg/L. Concentrations in wells located in the PCB impacted area (IP-14, IP-9, and JT-8) ranged from 150 µg/L to 1,200 µg/L. Downgradient and compliance wells exhibited chlorobenzene concentrations ranging from 42 µg/L to 300 µg/L. Deep wells MW-8D, MW-100, and MW-200 contained concentrations between 0.28 µg/L and 16 µg/L. Chlorobenzene was not detected in deep well JT-5.

Chlorinated Ethenes

No chlorinated ethenes were detected above Method B freshwater protection screening levels. Vinyl chloride was detected in eight wells, PCE and TCE were only detected in JT-8. Detected vinyl chloride concentrations ranged between 0.21 µg/L and 1.1 µg/L. PCE was measured at 0.29 µg/L in JT-8 and TCE was detected at estimated concentrations below the laboratory reporting limit.

Metals

Arsenic was the only metal detected above Method B freshwater protection screening levels. Dissolved arsenic was detected in nine of the ten wells sampled for metals at concentrations ranging from 4.8 µg/L to 25.1 µg/L. Total arsenic was detected in all wells tested at concentrations ranging from 0.2 µg/L to 21.8 µg/L.

No other metals were quantified above their respective screening levels. Metals were not analyzed for in wells JT-5, MW-100, and MW-200.

Total Petroleum Hydrocarbons

Diesel- and residual-range organics were detected in a sample of product collected from well JT-8. A review of the chromatogram showed the thick, viscous sample had a PCB signature, not petroleum.

Conventionals

Alkalinity, chloride, nitrate, sulfate, total organic carbon (TOC), and total suspended solids (TSS) were analyzed during the first round of sampling to assess whether soil and groundwater conditions were favorable for conducting supplemental *in situ* treatment following the IA. Analytical data suggest that conditions at the site are suitable for anaerobic bioremediation, including a mix of reductive and oxidative processes. A detailed analysis of potential post-interim action treatment options will be conducted following selection and implementation of the IA.

Groundwater Summary

Groundwater PCB concentrations exceeded the MTCA Method B freshwater surface water protection screening level in all wells sampled, including the four deep wells. The highest PCB concentrations were observed upgradient of the treatment wall near the PCB remediation area. Free-phase PCB product was observed in wells JT-8 and IP-9. Chlorinated benzenes only exceed surface water screening levels within the AOC.

Deep well MW-200 contained 1,2,4-trichlorobenzene concentrations approximately 50 times above the surface water screening level. No silt or clay was observed while drilling MW-200, suggesting that groundwater from the upper aquifer may be mixing with the lower aquifer at this location.

4.3.3 Sediment Investigation Results

The sediment investigation found PCB and arsenic impacts above Washington Sediment Management Standards (SMS) freshwater Sediment Cleanup Objective (SCO) levels but below Cleanup Screening Levels (CSL). There are no freshwater sediment management standards for chlorinated benzene and chlorinated ethene COCs.

Sediment analytical data can be found in Table 4 and sediment PCB analytical data is presented on Figure 10. The benthic survey is included in Appendix C.

Salinity

Salinity calculations from conductivity and temperature measurements were consistently 0.05 parts per thousand (ppt) at vibracore locations JT-SS-01, JT-SS03, and JT-SS-05. Measurements were collected within the water column at 3-foot intervals from just above the mud line to just below the water surface. The low salinity levels indicate that freshwater conditions were present at the time of the measurements.

A limited benthic survey was performed on three surface sediment samples collected from sediment sampling locations JT-SS-01, JT-SS-02, and JT-SS-03. The benthic community in the three samples was identified as a freshwater population. None of the organisms identified were characteristic of a marine environment. The results of the benthic survey are presented in Appendix C.

The results of these surveys support the conclusion that the Lake Washington Ship Canal adjacent to the site is a freshwater environment and state freshwater sediment management standards should be used to evaluate sediment COCs.

PCBs

Total PCBs were detected in all eight sediment samples at concentrations ranging from 0.0072 mg/kg to 0.405 mg/kg. The SCO and CSL for total PCBs is 0.11 mg/kg and 2.5 mg/kg, respectively. Surface samples collected from 0 to 1 foot below the mud line were above the PCB SCO in JT-SS-01 (0.283 mg/kg), JT-SS-02 (0.133 mg/kg), JT-SS-03 (0.346 mg/kg), and JT-SS-05 (0.292 mg/kg). The 1- to 2-foot sample at JT-SS-5 (0.405 mg/kg) also exceeded the SCO.

Unlike upland soil and groundwater samples, Aroclor 1254 was the most frequently detected Aroclor and generally had the highest concentrations. Aroclor 1248 and 1260 were also detected in most of samples, but at concentrations below Aroclor 1254. The varying distribution of Aroclors between the upland AOC soil and groundwater matrices versus the Ship Canal sediments may indicate differing sources.

Metals

Arsenic exceeded the SCO of 14 mg/kg in surface samples collected 0 to 1 foot below mud line at core locations JT-SS-03 (17.2 mg/kg), JT-SS-04 (71.8 mg/kg), and JT-SS-05 (23.5 mg/kg). Arsenic was detected in the other five sediment samples collected at concentrations ranging from 4.7 to 13 mg/kg. No other metals analyzed for were detected above their respective sediment screening levels

Chlorinated Benzenes

Chlorobenzene and 1,4-dichlorobenzene were the only chlorinated benzene COCs detected in the eight sediment samples. Freshwater sediment management standards have not been established for either chemical. 1,4-dichlorobenzene was measured at 1.4 mg/kg in JT-SS-03-S1, collected from 0 to 1 feet below the mud line, and it was detected below the reporting limit in JT-SS-04-S1. Chlorobenzene was detected below the reporting limit in samples JT-SS-03-S1, JT-SS-04-S1, and JT-SS-05-S1.

Chlorinated Solvents

Vinyl Chloride and TCE were not detected above laboratory detection limits. PCE was detected below the laboratory reporting limit in JT-SS-03-S2, collected from 1 to 2 feet bgs. PCE was not detected above laboratory detection limits in the other seven samples.

Summary

Sediment adjacent to the site are impacted with PCBs and arsenic above Washington State Department of Ecology freshwater sediment cleanup objective screening levels. In order to determine whether remediation is warranted, a sediment bioassay would likely be needed to determine the site-specific risk. Based on the distribution of PCB Aroclors detected in the sediment, it does not appear that discharges from the AOC are the primary source of PCBs to shallow sediment within the Lake Washington Ship Canal.

4.3.4 Data Gaps

The extent of impacted soil, groundwater, and sediment above screening levels has not been delineated. Additional investigations will be needed to assess the extent of the impacted media.

RI analytical data indicates that the PCB-impacted soil exceeding MTCA Method A Industrial cleanup levels has been delineated. The vertical and lateral extent of PCB soil concentrations exceeding the calculated MTCA Method B screening level protective of surface water have not been defined. Additional sampling may be needed to delineate PCB impacts exceeding surface water screening levels or assess whether these low-level PCB detections are characteristic of local background levels.

Additional sediment assessments, including a bioassay, may be needed to determine if the observed contaminants pose a risk to the aquatic environment.

Groundwater concentrations above surface water screening levels are present downgradient of the treatment wall and within the deeper aquifer. Additional characterization may be needed to assess the extent of the COC impacts and the effectiveness of the IA.

5.0 CONCEPTUAL SITE MODEL

A conceptual site model (CSM) presents the links between contaminant sources, release mechanisms, exposure pathways and routes, and receptors to summarize the current understanding of the risk to human health and the environment. Figure 11 graphically illustrates the preliminary CSM developed for the PCB/chlorinated benzene area.

A historical release of transformer oil resulted in introduction of PCBs and chlorinated benzenes to Terminals property soil, creating a secondary source. Secondary release mechanisms include fugitive dust, plant uptake, infiltration and leaching to groundwater, and volatilization. Groundwater discharge can also potentially impact surface water. Exposure routes potentially include inhalation, ingestion, and dermal contact.

Potential human receptors include workers inside the Terminals property buildings, potential workers during future development of the site, and utility workers. Terrestrial ecological receptors include plants and animals exposed to impacted media, as well as secondary food chain consumers such as birds and mammals.

A Terrestrial Ecological Evaluation (TEE) was not completed for the Terminals property because it qualifies for a TEE exemption. As detailed in WAC 173-340-7491, the property is covered by asphalt, creating a physical barrier between contaminated media and plants and wildlife, qualifying the property for exemption from TEE requirements. To formally qualify for this exemption, institutional controls to maintain the asphalt will need to be put in place, requiring a formal written agreement between the property owner and Ecology. Assuming these steps are taken, a TEE is not required for the Terminals property.

For a contaminant to present a risk to human health and/or the environment, the pathway from the contaminant to the receptor must be complete. The potential exposure pathways and whether they are considered complete are summarized below.

Soil. On-site soil may contain elevated concentrations of PCBs, metals, chlorinated benzenes, and chlorinated ethenes. The site is paved and, therefore, there is no exposure pathway unless the pavement is removed. Workers digging in the soil for future development or utility work may be exposed to contaminants without adequate personal protective equipment and safety procedures. Routes of exposure include incidental ingestion and direct contact. Available data indicate that soil contamination does not extend off-property.

Groundwater. Three potential exposure routes exist for groundwater: inhalation of vapors, incidental ingestion, and direct contact. Complete pathways for incidental ingestion and direct contact only exist if workers are digging in soil below the water table. Volatile aromatic compounds dissolved in Terminals property groundwater may volatilize out of the liquid phase and migrate upward into unsaturated soil pore spaces. Given that the nearest Terminal buildings are located over 80 feet upgradient of the PCB/chlorinated benzene plume, indoor air impacts are unlikely. There is a potential for on-site and off-site utility workers to be exposed to vapors.

Surface Water. Shallow groundwater beneath the property migrates to the Lake Washington Ship Canal. There is a potential for dissolved contaminants to impact the aquatic environment.

Sediment. Arsenic and PCBs in sediment can impact the aquatic environment. Additional data will need to be collected to see if concentrations truly pose a risk to the environment.

Soil Gas. Volatilization of chlorinated benzenes in the soil can lead to concentrations in soil gas that may migrate to the surface. Impacts to indoor air within existing Terminal buildings is unlikely given their distance from the plume. However, this pathway may exist for utility workers.

Fugitive Dust. The fugitive dust pathway does not exist while the site it paved. Fugitive dust could be a potential pathway if the pavement is removed and workers are digging in the soil.

Plant Uptake. The PCB/chlorinated benzene area and surrounding Terminals property are predominantly paved or covered by building foundations. Plants are not grown for human consumption within the impacted areas and, therefore, the pathway is incomplete.

The main exposure pathways that exist at the site that are not currently mediated are migration of dissolved contaminants to adjacent surface water beneath or around the existing treatment wall and inhalation risk to utility workers. Several pathways are potentially complete only if property or utility work includes digging in the soil or groundwater.

6.0 DEVELOPMENT OF REMEDIATION ALTERNATIVES

The remedial actions considered in this interim action work plan are intended to address residual contaminants in site soils that were not removed by the prior *in situ* chemical oxidation remedial actions. Remedial technologies potentially applicable for addressing the residual site contaminants are identified and screened to eliminate those that are not effective at achieving the RAOs (see Section 3.0 Cleanup Objectives) and to select process options that are the most implementable and/or cost effective. The retained technologies and preferred process options are then combined into remedial alternatives and descriptions of their conceptual designs and implementation details are developed for subsequent detailed evaluation.

6.1 Remediation Technology Screening

The remediation technologies considered for addressing the source area soils at this site are (1) *in situ* solidification/stabilization and (2) excavation with off-site disposal. *In situ* solidification/stabilization is intended to lock up contaminants within the soil matrix and prevent mobilization to the groundwater, while excavation with off-site disposal would physically remove the contaminated soil so further mobilization of contaminants to groundwater could not occur. These two remediation technologies and process options potentially applicable to site conditions are discussed below.

6.1.1 In Situ Solidification/Stabilization

In situ solidification/stabilization consists of mixing Portland cement, fly ash, or other pozzolonic agent with the contaminated soil to form a solid, cemented mass. Because the contaminants are incorporated within the cemented mass they are no longer in contact with percolating water or groundwater and, therefore, cannot migrate to potential human or ecological receptors.

Advantages of this remediation technology are that remedial activities are largely limited to the site, and:

- Site dewatering is not necessary, avoiding the trouble and expense of treating and disposing of this water;
- Off-site traffic to transport contaminated soil and import backfill is avoided; and
- The expense of off-site transport and disposal of contaminated soil and the import and backfilling of replacement is avoided.

Disadvantages of this remediation technology are:

- Site contaminants are not destroyed and remain in place, (although immobilized);
- Future site uses may be restricted by the cemented soil mass (e.g., excavation for future building foundations or the placement of subsurface utilities may be impractical);
- Groundwater flow patterns may be disturbed and may limit effectiveness of the zero-valent iron/granular activated carbon wall on impacts from upgradient sources outside of the treatment area;
- Treatability studies would be required to determine solidification mixture; and
- Institutional controls including a restrictive covenant would likely be required.

The equipment used for mixing the cement with site soil is typically a large-diameter (3 to 10 feet) auger. A cement and grout mixture is injected through the hollow stem of the auger while it is advanced to depth and then reversed to mix the soil and cement and to remove the auger. Sequential auger borings are overlapped to assure complete site coverage. An optional process is to use a bank of (usually three) counter-rotating, large-diameter augers to provide greater assurance of auger overlap and mixing than the single-auger process option provides. Single and triple augers and soil mixing techniques are shown in Illustration 1, below.

Single Auger Soil Mixer

Triple Auger Soil Mixer

Illustration 1. Examples of soil mixing equipment and techniques.

Site conditions that could affect implementation of this remediation technology include the presence of a high-voltage overhead power line through the remediation area. The drilling equipment typically used for the large-diameter augers is generally too tall to allow sufficient vertical clearance for safety reasons. Seattle City Light has stated that rerouting this power line or temporarily disrupting power through this line is not possible.

An optional process that could solve this dilemma is continuous trenching technology or specialized low-clearance drilling equipment. Continuous trenching equipment uses belt, chain, or auger mechanisms that are deployed at a low angle and brought to a vertical position in the subsurface. Illustration 2 shows an example of continuous trenching.

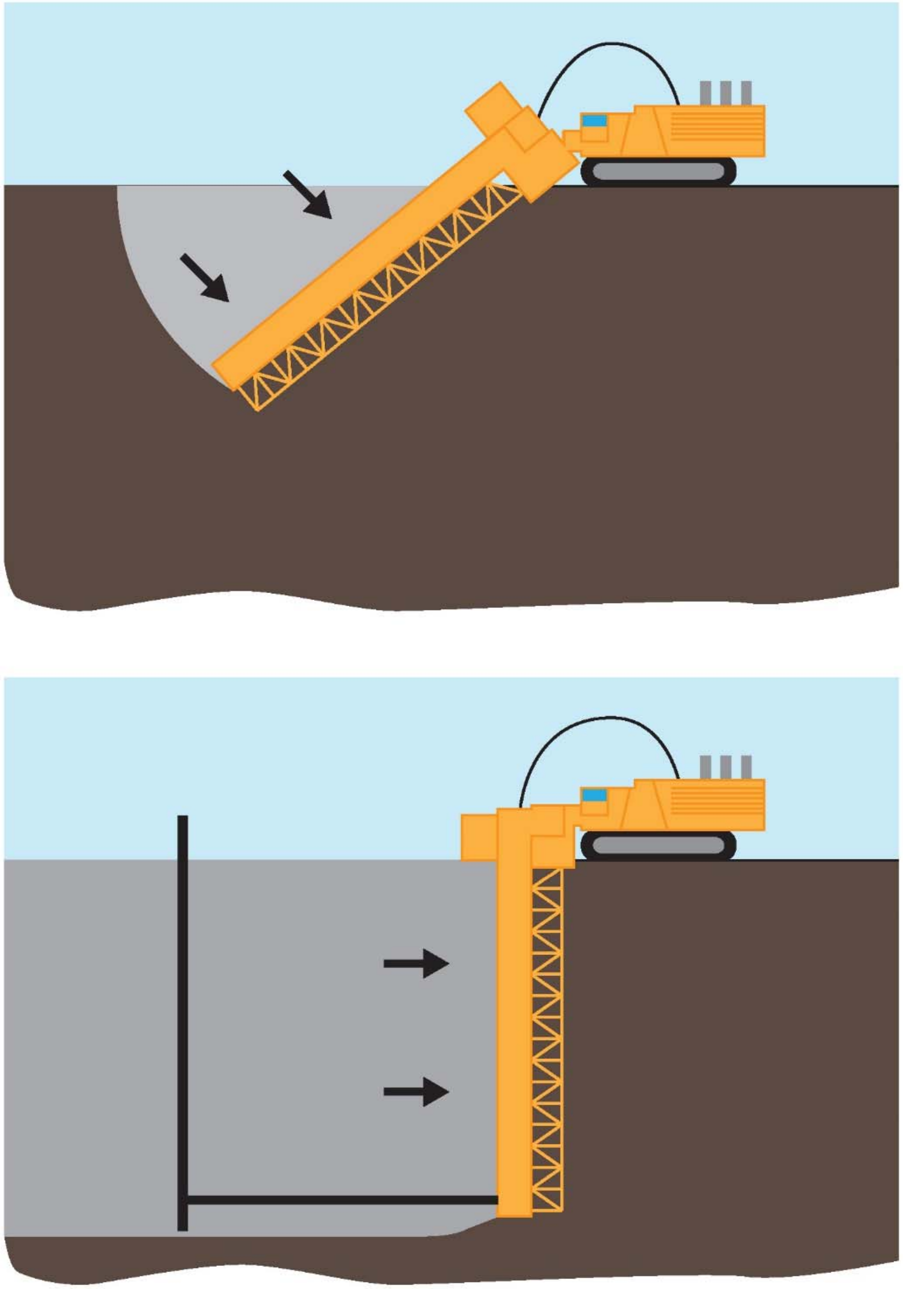

Illustration 2. Continuous trenching.

Continuous trenchers do not have a high vertical profile and would be able to meet the overhead power line clearance safety requirements. Because of the overhead power line safety concerns, the continuous trenching process option is retained for this remediation technology.

6.1.2 Excavation and Off-Site Disposal

Excavation and off-site disposal is a commonly used remediation technology that would permanently remove the source area contaminated soil for disposal in an appropriately designed and permitted off-site landfill. Soils containing PCBs that exceed 50 mg/kg would be disposed of at a TSCA landfill, and soil containing PCBs below 50 mg/kg would be disposed of at a RCRA hazardous waste landfill. It is possible that after waste profiling, some material may not be suitable for a landfill and may require incineration.

Conventional excavation at this site would require shoring to protect adjacent properties and ongoing site operations. Similar to the vertical clearance restrictions discussed for the *in situ* solidification technology, the overhead power line that traverses the site presents a dilemma for high-profile equipment commonly used to build excavation shoring (e.g., drill rigs and sheet pile drivers) and to perform the excavation (e.g., long-reach bucket excavators). Process options that were considered included:

- **Large-diameter augers.** Large-diameter augers (3 to 10 feet) would be advanced inside temporary casings, removing the contaminated soil as drill cuttings, and backfilling with clean fill as the casing is removed. These borings would be sequentially advanced in an overlapping manner until the entire site was addressed. Although potentially implementable, this alternative was eliminated because of uncertainties associated with the height requirements of the drill rig, the vertical clearance restrictions of the overhead power lines, and extra soil volume generated when overlapping the borings.

- **Sheet pile shoring and long-reach excavator.** This commonly used alternative was eliminated because of the height requirements of the sheet pile driving equipment and the vertical clearance restrictions of the overhead power lines. The vertical clearance of the long-reach excavator was also a significant safety concern but one that could potentially be addressed by careful attention to excavator placement during excavation.

- **Soil freezing for shoring and long reach excavator.** Soil freezing is achieved by installing closely spaced vertical pipes around the excavation perimeter that are connected by a manifold into a refrigerant circuit. This shoring option was identified as a possible way to avoid the height requirements of sheet piles. Low-clearance drilling rigs would be used to install the refrigerant piping. Although potentially implementable, this alternative was eliminated because of uncertainties associated with being able to achieve the power line clearance requirements with the long-reach excavator coupled with the high costs required to implement this technology.

- **Continuous trenching.** This technology was described for *in situ* solidification/stabilization, but instead of mixing site soil with an added cement, the soil would be removed and clean soil continuously backfilled as the trencher advances. Trenches 3 to 5 feet wide would be installed side by side until the entire area of interest is addressed. Costs for this technology are considered high, roughly equivalent to the soil freezing/long-reach excavator process option.

Because of safety concerns for the overhead power line, the continuous trenching process option is considered to be the most implementable of the excavation options and is retained for use in this remediation alternative. However, specialized equipment or procedures could be identified for the other process options that would address these concerns and allow them to be implemented.

6.2 Remediation Alternative Descriptions

The retained remedial technologies are *in situ* stabilization (Alternative 1) and excavation with off-site transport and disposal (Alternative 2). For this evaluation, both of these alternatives will use a continuous trenching process because of site constraints (high voltage power lines) that prevent the use of taller equipment. Additional variations of these alternatives are identified to address the following cleanup levels:

- MTCA industrial cleanup level of 10 mg/kg PCBs;
- MTCA unrestricted use cleanup level of 1 mg/kg PCBs; and
- MTCA protection of surface water to below detection level for PCBs (0.0000787 mg/kg).

Descriptions of these two primary remedial alternatives and their cleanup level variations (total of six remedial alternatives) are presented below. These include descriptions of conceptual designs, discussions of implementation procedures and schedules, and estimated costs. Costs have been estimated using RACER cost estimating software supplemented with vendor-supplied estimates and recent Hart Crowser experience for similar items on other projects. Because this is considered an interim action, long-term monitoring, and site closure activities are not included in the cost estimates prepared for these alternatives. Site monitoring is an ongoing site activity that is expected to continue after the interim action has been completed and site closure will be addressed as part of any final remedies implemented for the site.

The cleanup level variations for each of the alternatives involve increasing areal extent and volume with decreasing (stricter) cleanup levels. The estimated contaminant extent for these cleanup level variations are shown on Figure 6 and proposed excavation areas for the 10 mg/kg and 1 mg/kg remediation scenarios are presented on Figures 12 and 13, respectively. The resulting area and volume estimates are summarized in section 3.3.

6.2.1 Alternative 1 – In Situ Stabilization

Alternative 1 uses solidification techniques to encapsulate site contaminants in a solid soil matrix that will be left in place. Although site contaminants will not be destroyed, the intention is to permanently immobilize them, thus preventing migration to potential human and ecological receptors. The implementation of this alternative will require:

- Removal of site obstructions such as pavement, existing wells, and buried utilities;

- Temporary rerouting of subsurface utilities (e.g., water and sewer lines) around the treated area;

- Permanently replacing the underground utilities following treatment;

- Mobilization, operation, and subsequent demobilization of *in situ* soil mixing and supporting materials and equipment (e.g., decontamination equipment, temporary fencing, continuous trencher or other low clearance equipment, Portland cement mixture); and

- Site restoration and disposal of implementation-derived waste materials (e.g., decontamination water, disposable PPE, construction debris).

Permits (or associated substantive requirements) and approvals required prior to the implementation of Alternative 1 are expected to include:

- A stormwater control permit from the City of Seattle for construction activities;

- Construction permits from the Seattle Public Utilities Department and King County for water line and sewer rerouting and replacement;

- A grading permit from the City of Seattle for pavement replacement after completion of the remedial activities;

- A shoreline conditional use permit from King County for conducting construction activities within 200 feet of a shoreline; and

- Well abandonment and well construction permits from Ecology for abandonment of existing on-site monitoring wells and subsequent replacement.

Because site dewatering is not necessary for the implementation of Alternative 1, no dewatering treatment system (or associated sewer connection and discharge permit) is included. Wastes generated from decontamination operations will be containerized and transported to an off-site facility approved for disposal of PCB-contaminated materials.

The schedule for implementation of Alternative 1 assumes that site preparation activities including rerouting site utilities, removing site obstructions, erecting temporary fencing, mobilizing equipment and materials, and constructing decontamination facilities can be completed in a month. For the purpose of this IAWP, the operation of the continuous trenching/solidification activities is estimated to proceed at a rate of approximately 100 to 200 cubic yards per day, which will require 10 to 20 construction days for the 10 mg/kg cleanup level and 14 to 27 construction days for the 1 mg/kg cleanup level. The area exceeding MTCA Method B surface water protection criteria has not been delineated, so construction duration has not been estimated. The site will be restored immediately after completing the solidification activities and is expected to be completed within a week.

Cost estimates for the three cleanup levels are presented in Table 6. Details of these estimates are included in Appendix D.

Table 6 – Alternative 1 Cost Summary

Alternative	Cleanup Level	Total Estimated Cost
1A	MTCA Method A Unrestricted 10 mg/kg	$1.36 million
1B	MTCA Method A Unrestricted 1 mg/kg	$1.63 million
1C	Protection of Surface Water 0.0000787 mg/kg	>$5.8 million

Note: Detailed cost estimates are included in Appendix D.

6.2.2 Alternative 2 – Excavation and Off-Site Disposal

Alternative 2 excavates contaminated soil for transport to an off-site facility approved for disposal of PCB-contaminated materials. The excavation will be backfilled with clean imported fill. This alternative permanently removes PCB-contaminated soil at the site. Implementation of this alternative will require:

- Removing site obstructions such as pavement, existing wells, and buried utilities.
- Dewatering the site before excavation or dewatering of excavated material.
- Treating dewatering water prior to discharge to the sanitary sewer system. The conceptual design for the dewatering treatment system envisions a storage/flow-equalization tank followed by solids filtration and granular activated carbon filtration.
- Mobilizing, operating, and subsequent demobilizing of soil excavation and supporting materials and equipment (e.g., decontamination equipment, temporary fencing, continuous trencher or similar low-clearance equipment, loading facilities, dump trucks, backfill materials).
- Temporarily rerouting subsurface utilities around the excavated area.
- Permanently replacing underground utilities following excavation and backfill.
- Transporting and disposal of excavated contaminated soil.
- Restoring the site, and disposing of implementation-derived waste materials.

Permits and approvals required before implementation of Alternative 2 are expected to include the same as listed above for Alternative 1, plus permits from the King County Industrial Waste Program for the dewatering treatment system for sewer connection and discharge. Liquid waste generated from decontamination operations will be treated by the dewatering treatment system for discharge to the sanitary sewer. Solid waste generated during construction will be containerized and transported to an off-site facility approved for disposal of PCB-contaminated materials.

The schedule for implementation of Alternative 2 assumes that site preparation activities including site dewatering, rerouting site utilities, removing site obstructions, erecting temporary fencing, mobilizing equipment and materials, and constructing decontamination facilities can be completed in a month.

For the purpose of this IAWP, the operation of the continuous trenching/backfilling activities is expected to be similar to the trenching/solidification operations for Alternative 1 and is estimated to proceed at a similar rate of approximately 100 to 200 cubic yards per day. The estimated construction schedule for Alternative 2 is, therefore, the same as Alternative 1: excavation using the continuous trencher will require 10 to 20 construction days for the 10 mg/kg cleanup level; 14 to 27 construction days for the 1 mg/kg cleanup level. The area exceeding MTCA Method B surface water protection criteria has not been delineated, so construction duration has not been estimated. The site will be restored immediately after completing the excavation and backfill activities and is expected to be completed within a week.

Cost estimates for the three cleanup level variations of Alternative 2 are shown in Table 7. Details of these estimates are included in Appendix D.

Table 7 – Alternative 2 Cost Summary

Alternative	Cleanup Level	Total Capital Costs
2A	MTCA Method A Unrestricted 10 mg/kg	2.9 million
2B	MTCA Method A Unrestricted 1 mg/kg	3.7 million
2C	Protection of Surface Water 0.0000787 mg/kg	>9.4 million

Note: Detailed cost estimates are included in Appendix D.

7.0 REMEDIATION ALTERNATIVE SELECTION

Alternative 2 was selected as the preferred interim cleanup action for the Site. The selection criteria and evaluation are described below.

7.1 Selection Criteria

The process for selecting a cleanup action is described in WAC 173-340-360. However, this cleanup is being completed as an Interim Action and none of the alternatives presented in Section 6.2 are expected to comply with cleanup standards as described in the MTCA Threshold Requirements presented in WAC 173-340-360(2)(a)(ii). However, in combination with the existing zero-valent iron/granular activated carbon wall and restrictive covenant, the alternatives are considered to be protective of human health and the environment.

In order to select an alternative, a disproportionate cost analysis (DCA) was completed on the two alternatives. MTCA provides a methodology to determine whether the costs associated with each cleanup alternative are disproportionate relative to the incremental benefit of a lower-cost alternative. The following criteria, listed in WAC 173-340-360(3)(f), are used to evaluate and compare cleanup action alternatives when conducting a disproportionate cost analysis:

- **Protectiveness.** Overall protectiveness of human health and the environment, including the degree to which existing risks are reduced, time required to reduce risk at the facility and attain cleanup standards, on-site and off-site risks resulting from implementing the alternative, and improvement of the overall environmental quality.

- **Permanence.** The degree to which the alternative permanently reduces the toxicity, mobility, or volume of hazardous substances, including the adequacy of the alternative in destroying the hazardous substances, the reduction or elimination of hazardous substance releases and sources of releases, the degree of irreversibility of waste treatment process, and the characteristics and quantity of treatment residuals generated.

- **Cost.** The cost to implement the alternative. Long-term costs including operation and maintenance costs, monitoring costs, and the cost of maintaining institutional controls were not included in this evaluation.

- **Effectiveness Over the Long Term.** Long-term effectiveness includes the degree of certainty that the alternative will be successful, the reliability of the alternative during the period of time hazardous substances are expected to remain on-site at concentrations that exceed cleanup levels, the magnitude of residual risk with the alternative in place, and the effectiveness of controls required to manage treatment residues or remaining wastes. The following cleanup action components may be used as a guide, in descending order, when assessing the relative degree of long-term effectiveness:

    - Reusing or recycling;
    - Destruction or detoxification;
    - Immobilization or solidification;
    - On-site or off-site disposal in an engineered, lined, and monitored facility;
    - On-site isolation or containment with attendant engineering controls; and
    - Institutional controls and monitoring.

- **Management of Short-Term Risks.** The risk to human health and the environment that is associated with the alternative during construction and implementation, and the effectiveness of measures that will be taken to manage such risks.

- **Technical and Administrative Implementability.** Ability to be implemented including consideration of whether the alternative is technically possible; availability of necessary off-site facilities, services and materials; administrative and regulatory requirements; scheduling; size; complexity; monitoring requirements; access for construction and monitoring; and integration with existing facility operations and other current or potential remedial actions.

- **Consideration of Public Concerns.** Consideration of public concerns is mandated under the MTCA cleanup regulation for an Ecology-led or potentially liable person-led cleanup action under an Agreed Order or Consent Decree. This criterion will be addressed during the public review and comment period and was not used to evaluate the proposed alternatives.

7.2 Alternative Evaluation and Selection

The site is currently protective of human health and the environment with the existing treatment wall and surface pavement. Both alternatives will eliminate the soil to groundwater pathway in the treatment area and eliminate the direct contact risk. Additional treatment will reduce the need for the treatment wall and potentially eliminate the need for future maintenance of the treatment wall.

Alternative 1 provides little additional benefit beyond the existing remedies that are currently in place at the site. In addition, Alternative 1 may reduce the effectiveness of the treatment wall by modifying the groundwater flow path and potentially causing impacted groundwater from areas outside the treatment area or upgradient areas to flow around or under instead of through the existing treatment wall.

Based on our evaluation, Alternative 2 was selected as the preferred interim remedial action. Table 8 presents the results of the DCA. Alternatives were compared assuming that the same area was being treated by both alternatives. Alternative 2 also provides greater protection, permanence, and long-term effectiveness. While there are slightly higher short-term risks associated with Alternative 2, it is considered easier to implement because it does not require treatability studies.

Figure 14 shows how the costs of Alternative 2 changes for each of the proposed cleanup levels.

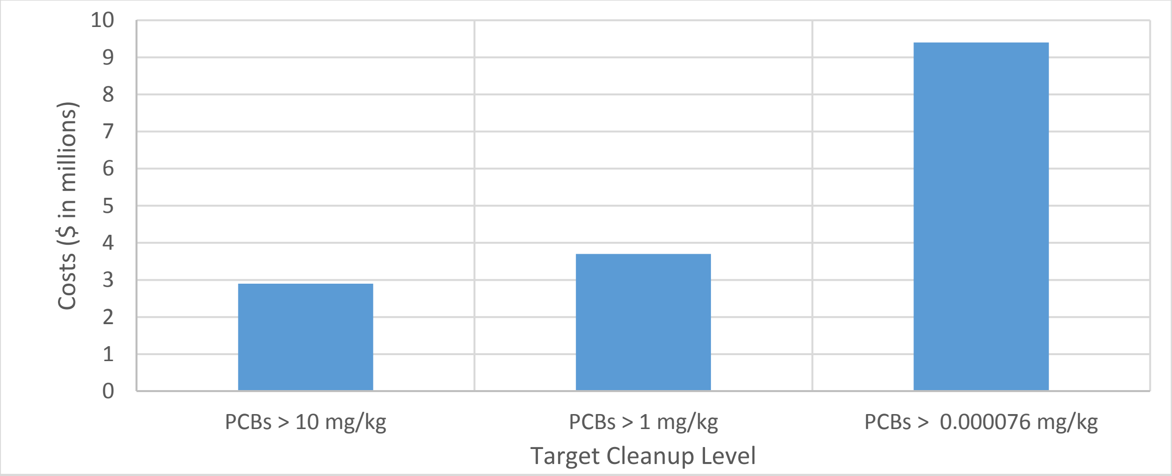

Figure 14. Comparison of Costs for Each Proposed Cleanup Level.

The recommended variation is Alternative 2B, excavation to the MTCA unrestricted use cleanup level of 1 mg/kg for PCBs. The incremental costs from Alternative 2A ($2.9 million) to Alternative 2B ($3.7 million) is not considered disproportionate to the incremental benefit that it will provide. Alternative 2B would provide additional protection to groundwater quality. The incremental costs for Alternative 2C are considered disproportionate to the incremental benefits. The extent of impacts greater than the soil concentration considered protective of surface water have not been delineated and likely extend well beyond the property boundary and to areas where treatment or removal are not feasible. The existing treatment wall currently prevents PCBs from reaching the surface water at concentrations above the surface water criteria.

8.0 SCHEDULE

The proposed schedule is outlined below.

- Finalize IAWP – July 2014
- Complete Plans and Specs – December 2014
- Submit Bid Package – March 2015
- Construction – November 2015 thru February 2016
- Complete Interim Action Report – May 2016

9.0 REFERENCES

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Table 1 - Soil Sample Analytical Results

Sample ID	MTCA Method B Soil Screening Level[a]	JT-US-001-S2	JT-US-001-S3	JT-US-002-S2	JT-US-003-S2	JT-US-003-S3	JT-US-004-S2	JT-US-004-S3	JT-US-004-S4	JT-US-005-S2	JT-US-005-S3
Sampling Date		1/2/14	1/2/14	1/2/14	1/2/14	1/3/2014	1/2/14	1/2/14	1/2/14	1/2/14	1/2/14
Depth in feet		11 to 11.5	15.5 to 16	6.5 to 7	7.5 to 8	17 to 17.5	7 to 7.5	13 to 13.5	17.75 to 18.5	10 to 10.5	17.5 to 18.25
Conventionals in %											
Total Organic Carbon											
Metals in mg/kg											
Arsenic	7*	5.7		5.2	**17.8**		5.5			4.4	6
Cadmium	5.6	0.5		0.1	1.1		0.1 U			0.2	0.1 U
Chromium	2000**	26		35	35		24.4			26.1	26.6
Lead	250**	49.5		40	**422**		9.4			60	1.9
Mercury	0.157	0.09		0.04	0.13		0.07			0.03	0.02 U
TPH in mg/kg											
Diesel Range Organics	2000**	960 U, C		71 U, C	1200		18			1600 U, C	
Electrical Insulating Oil	2000**	980 U, C		74 U, C	1700		20			1600 U, C	
Lube Oil	2000**	710 U, C		54 U, C	**3500**		29			560 U, C	
Gasoline Range Organics	30**										
PCBs in mg/kg											
Aroclor 1016		100 U	0.019 U	9.2 U	0.0038 U	0.078 U	0.0039 U	0.0037 U	0.0039 U	0.43 U	120 U
Aroclor 1221		100 U	0.019 U	9.2 U	0.0038 U	0.078 U	0.0039 U	0.0037 U	0.0039 U	0.43 U	120 U
Aroclor 1232		100 U	0.023 U	9.2 U	0.0038 U	0.078 U	0.0058 U	0.0056 U	0.0039 U	0.43 U	120 U
Aroclor 1242		100 U	0.019 U	9.2 U	0.0038 U	0.078 U	0.0039 U	0.0037 U	0.0039 U	0.43 U	120 U
Aroclor 1248		100 U	0.019 U	9.2 U	0.038 U	0.078 U	0.0039 U	0.0037 U	0.0039 U	0.43 U	120 U
Aroclor 1254		300 U	0.023 U	28 U	0.038 U	0.48 U	0.0039 U	0.0037 U	0.0058 U	2.1 U	730 U
Aroclor 1260	0.0000787****	870	0.051	74	0.068	1.2	0.0073	0.0037 U	0.015	5.1	1800
Aroclor 1262		100 U	0.019 U	9.2 U	0.0038 U	0.078 U	0.0039 U	0.0037 U	0.0039 U	0.43 U	120 U
Aroclor 1268		100 U	0.019 U	9.2 U	0.0038 U	0.078 U	0.0039 U	0.0037 U	0.0039 U	0.43 U	120 U
Total PCBs	0.0000787****	**870**	**0.051**	**74**	**0.068**	**1.2**	**0.0073**	0.0037 U	**0.015**	**5.1**	**1800**
Select Detected Volatiles in mg/kg											
1,1-Dichloroethene	0.0011	4.4 U	0.001 U	0.063 U	0.0024 U		0.076 U	0.069 U	0.0007 U	0.0019 U	0.1 U
1,2,3-Trichlorobenzene		22 U	0.0048 U	0.31 U	0.012 U		0.38 U	0.34 U	0.0035 U	0.0041 T	1
1,2,4-Trichlorobenzene	0.0054	22 U	0.0048 U	**0.27 T**	0.012 U		**1.1**	**0.12 T**	0.0011 T	**0.033**	**13**
1,2,4-Trimethylbenzene		4.4 U	0.001 U	0.063 U	0.0013 JT		0.076 U	0.069 U	0.0007 U	0.0019 U	0.1 U
1,2-Dichlorobenzene	1.01	4.4 U	0.001 U	0.063 U	0.0024 U		**1.8**	0.089	0.0007 U	0.0011 T	0.74
1,3,5-Trimethylbenzene		4.4 U	0.001 U	0.063 U	0.0024 U		0.076 U	0.069 U	0.0007 U	0.0019 U	0.1 U
1,3-Dichlorobenzene	1.06	4.4 U	0.001 U	0.17	0.0013 JT		**7**	0.97	0.0007 U	0.0053	**4.7**
1,4-Dichlorobenzene	0.22	**5.1**	0.001 U	**0.33**	0.0027		**8.3**	**1.2**	0.0007 U	0.0096	**4.6**
2-Butanone		22 U	0.0048 U	0.31 U	0.011 T		0.38 U	0.34 U	0.0035 U	0.0097 U	0.51 U
4-Isopropyltoluene		4.4 U	0.001 U	0.063 U	0.0024 U		0.062 T	0.069 U	0.0007 U	0.0019 U	0.1 U
Acetone	24,100	22 U	0.0076	0.31 U	0.03 J		0.38 U	0.34 U	0.0072	0.047	0.51 U
Benzene	0.0064	2.7 T	0.001 U	0.034 T	0.0015 T		**0.42**	0.069 U	0.0007 U	**0.0026**	0.1 U
Bromomethane	7.08	4.4 U	0.001 U	0.063 U	0.0024 U		0.076 U	0.055 T	0.0007 U	0.0019 U	0.1 U
Carbon Disulfide	170	4.4 U	0.001 U	0.063 U	0.0058		0.076 U	0.069 U	0.0008	0.0027	0.1 U
Chlorobenzene	0.87	**170**	0.0006 T	**2.8**	0.036		**14**	0.36	0.0007 U	0.027	**2.9**
cis-1,2-Dichloroethene		4.4 U	0.002	0.063 U	0.0024 U		7.8	0.069 U	0.0007 U	0.0016 T	0.1 U
Ethylbenzene	0.907	4.4 U	0.001 U	0.063 U	0.0024 U		0.076 U	0.069 U	0.0007 U	0.0019 U	0.1 U
Hexachlorobutadiene	13***	22 U	0.0048 U	0.31 U	0.012 U		0.38 U	0.34 U	0.0035 U	0.0097 U	0.51 U
Iodomethane		4.4 U	0.001 U	0.063 U	0.0024 U		0.076 U	0.069 U	0.0007 U	0.0019 U	0.1 U
Isopropylbenzene		4.4 U	0.001 U	0.063 U	0.0024 U		0.076 U	0.069 U	0.0007 U	0.0019 U	0.1 U
Methylene Chloride	2.63	8.8 U	0.0013 T	0.13 U	0.0048 UJ		0.15 U	0.14 U	0.0022	0.0039 U	0.21 U
Naphthalene	6.88	*22 U*	0.0048 U	0.31 U	0.012 U		0.38 U	0.34 U	0.0035 U	0.0097 U	0.51 U
sec-Butylbenzene		4.4 U	0.001 U	0.063 U	0.0024 U		0.076 U	0.069 U	0.0007 U	0.0019 U	0.1 U
Tetrachloroethene	0.0018	4.4 U	0.001 U	0.063 U	0.0024 U		0.076 U	0.069 U	0.0007 U	0.0019 U	0.1 U
Toluene	5.45	4.4 U	0.001 U	0.063 U	0.0024 U		0.11	0.069 U	0.0007 U	0.0012 T	0.1 U
trans-1,2-Dichloroethene	2.7	4.4 U	0.001 U	0.063 U	0.0024 U		0.44	0.069 U	0.0007 U	0.0019 U	0.1 U
Trichloroethene	0.0042	4.4 U	0.001 U	0.063 U	0.0024 U		**0.44**	0.069 U	0.0007 U	0.0019 U	0.1 U
Vinyl Chloride	0.00076****	4.4 U	**0.0082**	0.063 U	0.0024 U		**0.41**	0.069 U	0.0007 U	0.0019 U	0.1 U
Total Xylenes	9**	4.4 U	0.001 U	0.063 U	0.0024 U		0.11	0.069 U	0.0007 U	0.0019 U	0.1 U

Table 1 - Soil Sample Analytical Results

Sample ID	MTCA	JT-US-006-S2	JT-US-006-S3	JT-US-007-S2	JT-US-007-S3	JT-US-007-S4	JT-US-008-S2	JT-US-008-S4	JT-US-008-S5	JT-US-009-S1	JT-US-009-S2
Sampling Date	Method B Soil	1/2/14	1/2/14	1/2/14	1/2/14	1/2/2014	1/2/14	1/2/14	1/2/14	1/3/14	1/3/14
Depth in feet	Screening Level[a]	6.5 to 7	15.5 to 16	7.5 to 8	11.5 to 12	16.5 to 17	6.5 to 7	15.5 to 16	18 to 18.5	1 to 2	6.5 to 7.5
Conventionals in %											
Total Organic Carbon					1.16			0.09			
Metals in mg/kg											
Arsenic	7*	3.1		2.4	5.9			5.3			2.9
Cadmium	5.6	0.1 U		0.1 U	0.1 U			0.1 U			0.1 U
Chromium	2000**	29.6		23.1	26			25.2			43
Lead	250**	3.1		2.1	1.9			1.7			2.4
Mercury	0.157	0.03		0.02	0.03 U			0.02 U			0.03
TPH in mg/kg											
Diesel Range Organics	2000**				6.2 U			660 U, C			
Electrical Insulating Oil	2000**				12 U			650 U, C			
Lube Oil	2000**				12 U			250 U, C			
Gasoline Range Organics	30**										
PCBs in mg/kg											
Aroclor 1016		0.018 U	0.004 U	0.0038 U	0.0038 U	0.0038 U	0.0038 U	240 U	0.079 U	0.0037 U	0.0039 U
Aroclor 1221		0.018 U	0.004 U	0.0038 U	0.0038 U	0.0038 U	0.0038 U	240 U	0.079 U	0.0037 U	0.0039 U
Aroclor 1232		0.018 U	0.006 U	0.0038 U	0.0057 U	0.0038 U	0.0038 U	240 U	0.079 U	0.0037 U	0.0039 U
Aroclor 1242		0.018 U	0.004 U	0.0038 U	0.0038 U	0.0038 U	0.0038 U	240 U	0.079 U	0.0037 U	0.0039 U
Aroclor 1248		0.018 U	0.004 U	0.0038 U	0.0038 U	0.0038 U	0.0038 U	240 U	0.079 U	0.0074 U	0.0039 U
Aroclor 1254		0.018 U	0.02 U	0.0038 U	0.0038 U	0.0038 U	0.0038 U	610 U	0.36 U	0.037 U	0.0039 U
Aroclor 1260	0.0000787****	0.018 U	0.054	0.0046	0.0025 T	0.0034 T	0.0038 U	1400	0.81	0.12	0.0039 U
Aroclor 1262		0.018 U	0.004 U	0.0038 U	0.0038 U	0.0038 U	0.0038 U	240 U	0.079 U	0.0037 U	0.0039 U
Aroclor 1268		0.018 U	0.004 U	0.0038 U	0.0038 U	0.0038 U	0.0038 U	240 U	0.079 U	0.0037 U	0.0039 U
Total PCBs	0.0000787****	0.018 U	**0.054**	**0.0046**	**0.0025 J**	**0.0034 J**	0.0038 U	**1400**	**0.81**	**0.12**	0.0039 U
Select Detected Volatiles in mg/kg											
1,1-Dichloroethene	0.0011	0.059 U	0.068 U	0.0009 U	0.001 U		0.056 U	0.0012 U	0.0007 U	0.0015 U	0.06 U
1,2,3-Trichlorobenzene		0.29 U	0.34 U	0.0047 U	0.0051 U		0.28 U	1.5 T	0.0035 U	0.0074 U	0.3 U
1,2,4-Trichlorobenzene	0.0054	**0.11 T**	**0.086 T**	0.0047 U	0.0051 U		**0.22 T**	**43**	0.0035 U	**0.002 T**	**0.41**
1,2,4-Trimethylbenzene		0.059 U	0.068 U	0.0009 U	0.001 U		0.056 U	0.0012 U	0.0007 U	0.0013 T	0.06 U
1,2-Dichlorobenzene	1.01	0.059 U	0.082	0.0009 U	0.001 U		0.046 T	**1.5**	0.0007 U	0.0015 U	0.078
1,3,5-Trimethylbenzene		0.059 U	0.068 U	0.0009 U	0.001 U		0.056 U	0.0012 U	0.0007 U	0.0015 U	0.06 U
1,3-Dichlorobenzene	1.06	0.14	0.73	0.0009 U	0.0032		0.37	0.22	0.0007 U	0.0015 U	0.67
1,4-Dichlorobenzene	0.22	**0.23**	**1.5**	0.0009 U	0.0049		**0.59**	**5.6**	0.0007 U	0.0015 U	**1**
2-Butanone		0.29 U	0.34 U	0.0047 U	0.0051 U		0.28 U	0.0037 T	0.0035 U	0.0074 U	0.3 U
4-Isopropyltoluene		0.059 U	0.068 U	0.0009 U	0.001 U		0.056 U	0.0012 U	0.0007 U	0.0015 U	0.06 U
Acetone	24,100	0.29 U	0.34 U	0.025	0.026 J		0.28 U	0.035 J	0.0089	0.028 J	0.3 U
Benzene	0.0064	0.059 U	0.068 U	0.0009 U	0.001 T		0.056 U	0.0009 T	0.0007 U	0.0015 U	0.06 U
Bromomethane	7.08	0.06	0.068 U	0.0009 U	0.001 U		0.062	0.0012 U	0.0007 U	0.0015 U	0.083
Carbon Disulfide	170	0.059 U	0.068 U	0.0016	0.014		0.056 U	0.015	0.0008	0.0026	0.06 U
Chlorobenzene	0.87	0.34	**3.2**	0.0009 U	0.085		0.8	0.031	0.0007 U	0.001 T	0.79
cis-1,2-Dichloroethene		0.059 U	0.15	0.0009 U	0.001 U		0.056 U	0.0016	0.0007 U	0.0015 U	0.06 U
Ethylbenzene	0.907	0.059 U	0.068 U	0.0009 U	0.001 U		0.056 U	0.0012 U	0.0007 U	0.0015 U	0.06 U
Hexachlorobutadiene	13***	0.29 U	0.34 U	0.0047 U	0.0051 U		0.28 U	0.0062 U	0.0035 U	0.0074 U	0.3 U
Iodomethane		0.059 U	0.043 T	0.0009 U	0.001 U		0.056 U	0.0012 U	0.0007 U	0.0015 U	0.049 T
Isopropylbenzene		0.059 U	0.068 U	0.0009 U	0.001 U		0.056 U	0.0012 U	0.0007 U	0.0015 U	0.06 U
Methylene Chloride	2.63	0.12 U	0.14 U	0.0039	0.0034 J		0.1 T	0.0035 J	0.0019	0.0036	0.12 U
Naphthalene	6.88	0.29 U	0.34 U	0.0047 U	0.0051 U		0.28 U	0.0062 U	0.0035 U	0.19	0.3 U
sec-Butylbenzene		0.059 U	0.068 U	0.0009 U	0.001 U		0.056 U	0.0012 U	0.0007 U	0.0015 U	0.06 U
Tetrachloroethene	0.0018	0.059 U	0.068 U	0.0009 U	0.001 U		0.056 U	0.0012 U	0.0007 U	0.0015 U	0.06 U
Toluene	5.45	0.059 U	0.068 U	0.0009 U	0.001 U		0.056 U	0.0012 U	0.0007 U	0.0015 U	0.06 U
trans-1,2-Dichloroethene	2.7	0.059 U	0.068 U	0.0009 U	0.001 U		0.056 U	0.0012 U	0.0007 U	0.0015 U	0.06 U
Trichloroethene	0.0042	0.059 U	0.068 U	0.0009 U	0.001 U		0.056 U	0.0012 U	0.0007 U	0.0015 U	0.06 U
Vinyl Chloride	0.00076****	0.059 U	0.068 U	0.0009 U	0.001 U		0.056 UJ	0.0008 T	0.0007 U	0.0015 U	0.06 U
Total Xylenes	9**	0.059 U	0.068 U	0.0009 U	0.001 U		0.056 U	0.0012 U	0.0007 U	0.0015 U	0.06 U

Table 1 - Soil Sample Analytical Results

Sample ID	MTCA	JT-US-009-S3	JT-US-009-S4	JT-US-010-S2	JT-US-010-S3	JT-US-011-S2	JT-US-011-S3	JT-US-011-S4	JT-US-012-S1	JT-US-012-S2	JT-US-012-S3
Sampling Date	Method B Soil	1/3/14	1/3/2014	1/3/14	1/3/14	1/3/14	1/3/14	1/3/14	1/6/14	1/6/14	1/6/14
Depth in feet	Screening Level[a]	12.75 to 13.5	18 to 18.75	10.5 to 11	16.5 to 17	7 to 7.5	11.5 to 12	15.5 to 16	0.5 to 2	5 to 7	10 to 11
Conventionals in %											
Total Organic Carbon											
Metals in mg/kg											
Arsenic	7*	1.3		4.1		5.3	1.5		**8.3**	4.3	
Cadmium	5.6	0.1 U		0.1 U		0.1	0.1 U		2	0.4	
Chromium	2000**	22		20		47	22.2		41.9	24.9	
Lead	250**	1.3		60.1		9.4	1.4		167	12.3	
Mercury	0.157	0.02 U		0.12		0.03 U	0.02 U		**0.39**	0.03	
TPH in mg/kg											
Diesel Range Organics	2000**										
Electrical Insulating Oil	2000**										
Lube Oil	2000**										
Gasoline Range Organics	30**										
PCBs in mg/kg											
Aroclor 1016		0.0038 U	0.0037 U	0.0038 U	0.004 U	1 U	0.0039 U	0.0038 U	0.01 U	0.0038 U	0.0038 U
Aroclor 1221		0.0038 U	0.0037 U	0.0038 U	0.004 U	1 U	0.0039 U	0.0038 U	0.01 U	0.0038 U	0.0038 U
Aroclor 1232		0.0038 U	0.0037 U	0.0038 U	0.004 U	1 U	0.0039 U	0.0038 U	0.01 U	0.0038 U	0.0095 U
Aroclor 1242		0.0038 U	0.0037 U	0.0038 U	0.004 U	1 U	0.0039 U	0.0038 U	0.01 U	0.0038 U	0.0038 U
Aroclor 1248		0.0038 U	0.0037 U	0.0038 U	0.004 U	1 U	0.077 U	0.0094 U	3.8 U	0.038 U	0.0038 U
Aroclor 1254		0.0038 U	0.0037 U	0.0038 U	0.004 U	15 U	0.097 U	0.0094 U	2.5 U	0.019 U	0.0095 U
Aroclor 1260	0.0000787****	0.0038 U	0.0037 U	0.004	0.0042	22	0.11	0.017	1.5	0.023	0.016
Aroclor 1262		0.0038 U	0.0037 U	0.0038 U	0.004 U	1 U	0.0039 U	0.0038 U	0.01 U	0.0038 U	0.0038 U
Aroclor 1268		0.0038 U	0.0037 U	0.0038 U	0.004 U	1 U	0.0039 U	0.0038 U	0.01 U	0.0038 U	0.0038 U
Total PCBs	0.0000787****	0.0038 U	0.0037 U	**0.004**	**0.0042**	**22**	**0.11**	**0.017**	**1.5**	**0.023**	**0.016**
Select Detected Volatiles in mg/kg											
1,1-Dichloroethene	0.0011	0.067 U		0.001 U	0.06 U	0.072 U	0.069 U	0.077 U	0.063 U	0.001 U	**0.0012**
1,2,3-Trichlorobenzene		0.34 U		0.0052 U	0.3 U	0.36 U	0.34 U	0.39 U	0.32 U	0.0048 U	0.0053 U
1,2,4-Trichlorobenzene	0.0054	**0.29 T**		**0.0014 JT**	0.3 U	**1.8**	0.34 U	0.39 U	0.32 U	0.0048 U	0.0053 U
1,2,4-Trimethylbenzene		0.067 U		0.001 U	0.06 U	0.072 U	0.069 U	0.077 U	0.063 U	0.001 U	0.0011 U
1,2-Dichlorobenzene	1.01	0.22		0.001 U	0.06 U	0.16	0.069 U	0.28	0.034 T	0.001 U	0.0011 U
1,3,5-Trimethylbenzene		0.067 U		0.001 U	0.06 U	0.072 U	0.069 U	0.077 U	0.063 U	0.001 U	0.0011 U
1,3-Dichlorobenzene	1.06	**1.6**		0.001 U	0.17	**1.2**	0.075	**1.4**	0.1	0.001 U	0.0011 U
1,4-Dichlorobenzene	0.22	**1.7**		0.001 U	**3**	**3.6**	**0.19**	**1.9**	**0.3**	0.001 U	0.0011 U
2-Butanone		0.34 U		0.0052 U	0.3 U	0.36 U	0.34 U	0.39 U	0.32 U	0.0048 U	0.0053 U
4-Isopropyltoluene		0.067 U		0.001 U	0.06 U	0.072 U	0.069 U	0.077 U	0.063 U	0.001 U	0.0011 U
Acetone	24,100	0.34 U		0.026 J	0.3 U	0.36 U	0.34 U	0.39 U	0.32 U	0.021	0.0053 U
Benzene	0.0064	0.067 U		0.0006 T	0.06 U	**0.065 T**	0.069 U	0.077 U	0.063 U	0.001 U	0.0011 U
Bromomethane	7.08	0.067		0.001 U	0.065	0.062 T	0.07	0.081	0.062 T	0.001 U	0.0011 U
Carbon Disulfide	170	0.067 U		0.001 U	0.06 U	0.072 U	0.069 U	0.077 U	0.063 U	0.0009 T	0.0031
Chlorobenzene	0.87	0.39		0.0008 T	**2.4**	**12**	0.75	0.47	0.14	0.001 U	0.0011 U
cis-1,2-Dichloroethene		0.067 U		0.0085	0.06 U	0.072 U	0.069 U	0.14	0.063 U	0.001	0.16
Ethylbenzene	0.907	0.067 U		0.001 U	0.06 U	0.072 U	0.069 U	0.077 U	0.063 U	0.001 U	0.0011 U
Hexachlorobutadiene	13***	0.34 U		0.0052 U	0.3 U	0.36 U	0.34 U	0.39 U	0.32 U	0.0048 U	0.0053 U
Iodomethane		0.036 T		0.001 U	0.047 T	0.044 T	0.061 T	0.077 U	0.063 U	0.001 U	0.0011 U
Isopropylbenzene		0.067 U		0.001 U	0.06 U	0.072 U	0.069 U	0.077 U	0.37	0.001 U	0.0011 U
Methylene Chloride	2.63	0.13 U		0.0021 U	0.12 U	0.14 U	0.14 U	0.16 U	0.13 U	0.0019 U	0.0022
Naphthalene	6.88	0.34 U		0.0052 U	0.3 U	0.36 U	0.34 U	0.39 U	0.32 U	0.0048 U	0.0053 U
sec-Butylbenzene		0.067 U		0.001 U	0.06 U	0.072 U	0.069 U	0.077 U	0.7	0.001 U	0.0011 U
Tetrachloroethene	0.0018	0.067 U		0.001 U	0.06 U	0.072 U	0.069 U	0.077 U	0.063 U	0.0008 T	0.0012
Toluene	5.45	0.067 U		0.001 U	0.06 U	0.072 U	0.069 U	0.077 U	0.063 U	0.001 U	0.0011 U
trans-1,2-Dichloroethene	2.7	0.067 U		0.001 U	0.06 U	0.072 U	0.069 U	0.077 U	0.063 U	0.001 U	0.0018
Trichloroethene	0.0042	0.067 U		0.001 U	0.06 U	0.072 U	0.069 U	0.077 U	0.063 U	0.0006 T	0.0037
Vinyl Chloride	0.00076****	0.067 U		**0.058**	0.06 U	0.072 U	0.069 U	0.077 U	0.063 U	0.001 U	**0.038**
Total Xylenes	9**	0.067 U		0.001 U	0.06 U	0.072 U	0.069 U	0.077 U	0.036 J	0.001 U	0.0011 U

Table 1 - Soil Sample Analytical Results

Sample ID	MTCA	JT-US-012-S5	JT-US-013-S2	JT-US-013-S3	JT-US-013-S4	JT-US-014-S2	JT-US-014-S3	JT-US-014-S4	JT-US-015-S1	JT-US-015-S2	JT-US-016-S2
Sampling Date	Method B Soil	1/6/2014	1/3/14	1/3/14	1/3/14	1/3/14	1/3/14	1/3/14	1/3/14	1/3/14	1/3/14
Depth in feet	Screening Level[a]	16.5 to 17.5	6 to 7	11 to 12	16 to 16.5	7 to 8	15 to 16	16 to 17	5.5 to 6	16 to 16.5	7.5 to 8.5
Conventionals in %											
Total Organic Carbon						4.54					
Metals in mg/kg											
Arsenic	7*		**8.1**	5.8						6	
Cadmium	5.6		0.2	0.1 U						0.1 U	
Chromium	2000**		35	22						31	
Lead	250**		22.1	1.5						2.3	
Mercury	0.157		0.05	0.03 U						0.03 U	
TPH in mg/kg											
Diesel Range Organics	2000**					490 U, C					
Electrical Insulating Oil	2000**					460 U, C					
Lube Oil	2000**					220 U, C					
Gasoline Range Organics	30**										
PCBs in mg/kg											
Aroclor 1016		0.0039 U	0.0038 U	0.0038 U	0.0039 U	100 U	0.0039 U	0.004 U	0.0039 U	0.0038 U	0.0038 U
Aroclor 1221		0.0039 U	0.0038 U	0.0038 U	0.0039 U	100 U	0.0039 U	0.004 U	0.0039 U	0.0038 U	0.0038 U
Aroclor 1232		0.0039 U	0.0038 U	0.0038 U	0.0039 U	100 U	0.0039 U	0.005 U	0.0039 U	0.013 U	0.0038 U
Aroclor 1242		0.0039 U	0.0038 U	0.0038 U	0.0039 U	100 U	0.0039 U	0.004 U	0.0039 U	0.0038 U	0.0038 U
Aroclor 1248		0.0039 U	0.0096 U	0.0038 U	0.0039 U	100 U	0.0058 U	0.004 U	0.0077 U	0.0038 U	0.0038 U
Aroclor 1254		0.0039 U	0.012 U	0.038 U	0.0039 U	210 U	0.039 U	0.006 U	0.019 U	0.0095 U	0.077 U
Aroclor 1260	0.0000787****	0.0027 T	0.014	0.11	0.005	400	0.12	0.013	0.051	0.026	0.14
Aroclor 1262		0.0039 U	0.0038 U	0.0038 U	0.0039 U	100 U	0.0039 U	0.004 U	0.0039 U	0.0038 U	0.0038 U
Aroclor 1268		0.0039 U	0.0038 U	0.0038 U	0.0039 U	100 U	0.0039 U	0.004 U	0.0039 U	0.0038 U	0.0038 U
Total PCBs	0.0000787****	0.0027 J	**0.014**	**0.11**	**0.005**	**400**	**0.12**	**0.013**	**0.051**	**0.026**	**0.14**
Select Detected Volatiles in mg/kg											
1,1-Dichloroethene	0.0011		0.0025 U	0.0011 U	0.0017 U	21 U	0.0011 U	0.0014 U	0.066 U	0.001 U	0.0018 U
1,2,3-Trichlorobenzene			0.012 U	0.0057 U	0.0086 U	100 U	0.0056 U	0.0071 U	0.33 U	0.0048 U	0.0088 U
1,2,4-Trichlorobenzene	0.0054		0.012 U	0.0019 T	0.0086 U	**370**	0.0056 U	0.0071 U	**0.28 T**	0.0048 U	0.0088 U
1,2,4-Trimethylbenzene			0.0025 U	0.0011 U	0.0017 U	21 U	0.0011 U	0.0014 U	0.066 U	0.001 U	0.0018 U
1,2-Dichlorobenzene	1.01		0.0025 U	0.0011 U	0.0017 U	21 U	0.0011 U	0.0014 U	0.066 U	0.001 U	0.0018 U
1,3,5-Trimethylbenzene			0.0025 U	0.0011 U	0.0017 U	21 U	0.0011 U	0.0014 U	0.066 U	0.001 U	0.0018 U
1,3-Dichlorobenzene	1.06		0.0025 U	0.0011 T	0.0017 U	**22**	0.0011 U	0.0014 U	0.066 U	0.001 U	0.0018 U
1,4-Dichlorobenzene	0.22		0.0025 U	0.0013	0.0017 U	**52**	0.0011 U	0.0014 U	0.066 U	0.0009 T	0.0018 U
2-Butanone			0.058	0.0057 U	0.0086 U	100 U	0.0056 U	0.0071 U	0.33 U	0.0048 U	0.018
4-Isopropyltoluene			0.0025 U	0.0011 U	0.0017 U	21 U	0.0011 U	0.0014 U	0.066 U	0.001 U	0.0018 U
Acetone	24,100		0.31 J	0.016 J	0.0086 UJ	100 UJ	0.0056 UJ	0.017 J	0.33 UJ	0.0048 UJ	0.13
Benzene	0.0064		0.0025 U	0.0011 U	0.0053	21 U	0.0011 U	0.0014 U	0.066 U	0.001 U	0.0018 U
Bromomethane	7.08		0.0025 U	0.0011 U	0.0017 U	21 U	0.0011 U	0.0014 U	0.066 U	0.001 U	0.0018 U
Carbon Disulfide	170		0.011	0.0053	0.001 T	21 U	0.0011 U	0.0014 U	0.066 U	0.001	0.04
Chlorobenzene	0.87		0.0025 U	0.0009 T	0.0017 U	21 U	0.0011 U	0.0014 U	0.066 U	0.0005 T	0.0018 U
cis-1,2-Dichloroethene			0.0025 U	0.0026	0.0046	21 U	0.0009 T	0.0014 U	2.6	0.0056	0.0018 U
Ethylbenzene	0.907		0.0025 U	0.0011 U	0.0017 U	21 U	0.0011 U	0.0014 U	0.066 U	0.001 U	0.0018 U
Hexachlorobutadiene	13***		0.012 U	0.0057 U	0.0086 U	100 U	0.0056 U	0.0071 U	0.33 U	0.0048 U	0.0088 U
Iodomethane			0.0025 U	0.0011 U	0.0017 U	21 U	0.0011 U	0.0014 U	0.056 T	0.001 U	0.0018 U
Isopropylbenzene			0.0025 U	0.0011 U	0.0017 U	21 U	0.0011 U	0.0014 U	0.066 U	0.001 U	0.0018 U
Methylene Chloride	2.63		0.003 T	0.0023	0.0036	42 U	0.0017 T	0.0028 U	0.13 U	0.0015 T	0.0035 U
Naphthalene	6.88		0.012 U	0.0057 U	0.0086 U	100 U	0.0056 U	0.0071 U	0.33 U	0.0048 U	0.0088 U
sec-Butylbenzene			0.0025 U	0.0011 U	0.0017 U	21 U	0.0011 U	0.0014 U	0.066 U	0.001 U	0.0018 U
Tetrachloroethene	0.0018		0.0025 U	0.0018	0.0017 U	21 U	0.0011 U	0.0014 U	**0.45**	0.001 U	0.0018 U
Toluene	5.45		0.0025 U	0.0011 U	0.0017 U	21 U	0.0011 U	0.0014 U	0.066 U	0.001 U	0.0018 U
trans-1,2-Dichloroethene	2.7		0.0025 U	0.0011 U	0.0017 U	21 U	0.0011 U	0.0014 U	0.066 U	0.001 U	0.0018 U
Trichloroethene	0.0042		0.0025 U	0.0009 T	0.0017 U	21 U	0.0011 U	0.0014 U	**2**	0.001 U	0.0018 U
Vinyl Chloride	0.00076****		0.0025 U	**0.033**	0.0021 J	21 U	0.0024 J	0.0014 U	**0.11**	0.006 J	**0.004**
Total Xylenes	9**	0	0 0.0025 U	0.0011 U	0.0017 U	21 U	0.0011 U	0.0014 U	0.066 U	0.001 U	0.0018 U

Table 1 - Soil Sample Analytical Results

Sample ID	MTCA	JT-US-016-S3	JT-US-017-S4	JT-US-017-S5	JT-US-018-S1	JT-US-018-S2	JT-US-018-S3	JT-US-018-S4	JT-US-019-S2	JT-US-019-S3	JT-US-019-S4
Sampling Date	Method B Soil	1/3/14	1/6/14	1/6/14	1/3/14	1/3/14	1/3/14	1/3/14	1/3/14	1/3/14	1/3/14
Depth in feet	Screening Level[a]	12 to 12.5	17.5 to 18.5	20.5 to 21.5	2.5 to 3	11 to 11.5	15 to 15.5	16.5 to 17	10.5 to 11.5	14 to 14.5	16.5 to 17
Conventionals in %											
Total Organic Carbon									2.64		
Metals in mg/kg											
Arsenic	7*	6	4.1			**196**	1.8		**7.4**		
Cadmium	5.6	0.1 U	0.2 U			**26**	0.1 U		0.4		
Chromium	2000**	33	26			32.4	24.6		46.2		
Lead	250**	1.7	33.1			**1050**	1.6		13.9		
Mercury	0.157	0.03 U	0.18			0.2	0.03		0.07		
TPH in mg/kg											
Diesel Range Organics	2000**								290 U, C		
Electrical Insulating Oil	2000**								320 U, C		
Lube Oil	2000**								260 U, C		
Gasoline Range Organics	30**										
PCBs in mg/kg											
Aroclor 1016		0.0039 U	0.0039 U	0.004 U	93 U	0.0039 U	0.0038 U	0.0038 U	150 U	0.024 U	0.0039 U
Aroclor 1221		0.0039 U	0.0039 U	0.004 U	93 U	0.0039 U	0.0038 U	0.0038 U	150 U	0.024 U	0.0039 U
Aroclor 1232		0.0039 U	0.0058 U	0.006 U	93 U	0.0039 U	0.0038 U	0.0038 U	150 U	0.024 U	0.0039 U
Aroclor 1242		0.0039 U	0.0039 U	0.004 U	93 U	0.0039 U	0.0038 U	0.0038 U	150 U	0.024 U	0.0039 U
Aroclor 1248		0.0039 U	0.0039 U	0.004 U	93 U	0.097 U	0.0038 U	0.0057 U	150 U	0.036 U	0.0039 U
Aroclor 1254		0.0039 U	0.0039 U	0.004 U	140 U	0.039 U	0.0038 U	0.038 U	230 U	0.36 U	0.029 U
Aroclor 1260	0.0000787****	0.0022 T	0.0021 T	0.0052	340	0.073	0.02	0.093	580	0.27	0.046
Aroclor 1262		0.0039 U	0.0039 U	0.004 U	93 U	0.0039 U	0.0038 U	0.0038 U	150 U	0.024 U	0.0039 U
Aroclor 1268		0.0039 U	0.0039 U	0.004 U	93 U	0.0039 U	0.0038 U	0.0038 U	150 U	0.024 U	0.0039 U
Total PCBs	0.0000787****	**0.0022 J**	**0.0021 J**	**0.0052**	**340**	**0.073**	**0.02**	**0.093**	**580**	**0.27**	**0.046**
Select Detected Volatiles in mg/kg											
1,1-Dichloroethene	0.0011	0.0011 U	0.0021 U	0.001 U	0.061 U	**0.56**	0.0011 U	0.001 U	1.4 U	0.063 U	0.0012 U
1,2,3-Trichlorobenzene		0.0054 U	0.01 U	0.0051 U	0.16 T	0.86 U	0.0055 U	0.0052 U	7 U	0.31 U	0.0058 U
1,2,4-Trichlorobenzene	0.0054	0.0054 U	0.01 U	0.0051 U	**0.34**	0.86 U	0.0055 U	0.0052 U	**13**	**0.17 T**	0.0058 U
1,2,4-Trimethylbenzene		0.0011 U	0.0021 U	0.001 U	0.061 U	0.17 U	0.0011 U	0.001 U	1.4 U	0.063 U	0.0012 U
1,2-Dichlorobenzene	1.01	0.0011 U	0.0021 U	0.001 U	0.094	0.17 U	0.0011 U	0.001 U	**1.7**	0.05 T	0.0012 U
1,3,5-Trimethylbenzene		0.0011 U	0.0021 U	0.001 U	0.061 U	0.17 U	0.0011 U	0.001 U	1.4 U	0.063 U	0.0012 U
1,3-Dichlorobenzene	1.06	0.0011 U	0.0021 U	0.001 U	**1.1**	0.17 U	0.0011 U	0.001 U	**7.6**	0.42	0.0012 U
1,4-Dichlorobenzene	0.22	0.0011 U	0.0021 U	0.001 U	**8.5**	0.17 U	0.0011 U	0.001 U	**15**	**0.7**	0.0012 U
2-Butanone		0.0054 U	0.01 U	0.0051 U	0.3 U	0.86 U	0.0055 U	0.0052 U	7 U	0.31 U	0.0058 U
4-Isopropyltoluene		0.0011 U	0.0021 U	0.001 U	0.061 U	0.17 U	0.0011 U	0.001 U	1.4 U	0.063 U	0.0012 U
Acetone	24,100	0.049	0.036	0.011	0.3 UJ	0.86 UJ	0.0055 U	0.0052 U	7 U	0.31 U	0.021 J
Benzene	0.0064	0.0011 U	0.0021 U	0.001 U	0.061 U	**0.3**	0.0011 U	0.001 U	1.4 U	0.063 U	0.0012 U
Bromomethane	7.08	0.0011 U	0.0021 U	0.001 U	0.059 T	0.16 T	0.0011 U	0.001 U	1.4 U	0.063 U	0.0012 U
Carbon Disulfide	170	0.0073	0.013	0.001 U	0.061 U	0.17 U	0.0011 U	0.001 U	1.4 U	0.063 U	0.0012
Chlorobenzene	0.87	0.0011 U	0.0021 U	0.001 U	**0.98**	0.17 U	0.0011 U	0.001 U	**57**	0.27	0.0012 U
cis-1,2-Dichloroethene		0.005	0.0019 T	0.01	0.061 U	190	0.0015	0.0014	1.4 U	0.063 U	0.0079
Ethylbenzene	0.907	0.0011 U	0.0021 U	0.001 U	0.061 U	0.17 U	0.0011 U	0.001 U	1.4 U	0.063 U	0.0012 U
Hexachlorobutadiene	13***	0.0054 U	0.01 U	0.0051 U	0.3 U	0.86 U	0.0055 U	0.0052 U	7 U	0.31 U	0.0058 U
Iodomethane		0.0011 U	0.0021 U	0.001 U	0.061 U	0.17 U	0.0011 U	0.001 U	1.4 U	0.063 U	0.0012 U
Isopropylbenzene		0.0011 U	0.0021 U	0.001 U	0.061 U	0.17 U	0.0011 U	0.001 U	1.4 U	0.063 U	0.0012 U
Methylene Chloride	2.63	0.0023	0.0042	0.0023	0.12 U	0.35 U	0.0023	0.0011 T	2.8 U	0.13 U	0.0018 T
Naphthalene	6.88	0.0054 U	0.01 U	0.0051 U	0.098 T	0.86 U	0.0055 U	0.0052 U	7 U	0.31 U	0.0058 U
sec-Butylbenzene		0.0011 U	0.0021 U	0.001 U	0.061 U	0.17 U	0.0011 U	0.001 U	1.4 U	0.063 U	0.0012 U
Tetrachloroethene	0.0018	**0.0066**	0.0021 U	0.001 U	0.061 U	**0.82**	0.0011 U	0.001 U	1.4 U	0.063 U	0.0012 U
Toluene	5.45	0.0011 U	0.0021 U	0.001 U	0.061 U	0.17 U	0.0011 U	0.001 U	1.4 U	0.063 U	0.0012 U
trans-1,2-Dichloroethene	2.7	0.0011 U	0.0021 U	0.001 U	0.061 U	0.75	0.0011 U	0.001 U	1.4 U	0.063 U	0.0012 U
Trichloroethene	0.0042	**0.0053**	0.0021 U	0.001 U	0.061 U	**4.6**	0.0011 U	0.001 U	1.4 U	0.063 U	0.0012 U
Vinyl Chloride	0.00076****	0.0011 U	0.0021 U	**0.014**	0.061 U	**23**	0.0006 T	**0.011**	1.4 U	0.063 U	**0.014**
Total Xylenes	9**	0.0011 U	0.0021 U	0.001 U	0.061 U	0.17 U	0.0011 U	0.001 U	1.4 U	0.063 U	0.0012 U

Table 1 - Soil Sample Analytical Results

Sample ID	MTCA	JT-US-020-S2	JT-US-020-S3	JT-US-020-S4	JT-US-021-S1	JT-US-021-S2	JT-US-021-S3	JT-US-022-S1	JT-US-022-S2	JT-US-022-S3	JT-US-023-S2
Sampling Date	Method B Soil	1/6/14	1/6/14	1/6/14	1/6/14	1/6/14	1/6/14	1/6/14	1/6/14	1/6/14	1/6/14
Depth in feet	Screening Level[a]	5.5 to 6.5	10.5 to 11.5	16 to 17	2 to 3	10 to 11	15 to 15.75	2 to 3	10 to 11.5	15 to 16	6 to 7
Conventionals in %											
Total Organic Carbon		11.1									
Metals in mg/kg											
Arsenic	7*	5.3			3.3			2.8			**11.8**
Cadmium	5.6	0.1 U			0.2			0.2 U			0.5
Chromium	2000**	23.6			19			23			16
Lead	250**	1.4			23.3			14.1			75.3
Mercury	0.157	0.02 U			0.03 U			0.05			0.14
TPH in mg/kg											
Diesel Range Organics	2000**	1000 U, C									
Electrical Insulating Oil	2000**	1300 U, C									
Lube Oil	2000**	1500 J, C									
Gasoline Range Organics	30**										
PCBs in mg/kg											
Aroclor 1016		0.27 U	0.0038 U	0.004 U	0.004 U	0.0038 U	0.0038 U	0.0038 U	0.004 U	0.0038 U	0.0038 U
Aroclor 1221		0.27 U	0.0038 U	0.004 U	0.004 U	0.0038 U	0.0038 U	0.0038 U	0.004 U	0.0038 U	0.0038 U
Aroclor 1232		0.27 U	0.0038 U	0.004 U	0.004 U	0.0038 U	0.0038 U	0.0038 U	0.004 U	0.0038 U	0.019 U
Aroclor 1242		0.27 U	0.0038 U	0.004 U	0.004 U	0.0038 U	0.0038 U	0.0038 U	0.004 U	0.013 U	0.0038 U
Aroclor 1248		20 U	0.0076 U	0.004 U	0.004 U	0.0077 U	0.013 U	0.0038 U	0.004 U	0.0038 U	0.0038 U
Aroclor 1254		20 U	0.011 U	0.004 U	0.016 U	0.0077 U	0.038 U	0.0076 U	0.004 U	0.0095 U	0.0038 U
Aroclor 1260	0.0000787****	59	0.005	0.004 U	0.035	0.0049 U	0.064	0.015 U	0.004 U	0.015	0.0038 U
Aroclor 1262		0.27 U	0.0038 U	0.004 U	0.004 U	0.0038 U	0.0038 U	0.0038 U	0.004 U	0.0038 U	0.0038 U
Aroclor 1268		0.27 U	0.0038 U	0.004 U	0.004 U	0.0038 U	0.0038 U	0.0038 U	0.004 U	0.0038 U	0.0038 U
Total PCBs	0.0000787****	**59**	**0.005**	0.004 U	**0.035**	0.0049 U	**0.064**	0.015 U	0.004 U	**0.015**	0.019 U
Select Detected Volatiles in mg/kg											
1,1-Dichloroethene	0.0011	0.39 U	0.0011 U	0.001 U	0.0012 U	0.066 U	0.057 U	0.0029 U	0.001 U	0.072 U	0.18 U
1,2,3-Trichlorobenzene		1.9 U	0.0055 U	0.0052 U	0.0058 U	0.33 U	0.28 U	0.014 U	0.0052 U	0.36 U	0.92 U
1,2,4-Trichlorobenzene	0.0054	**1 T**	0.0029 T	0.0052 U	0.0058 U	**0.17 T**	0.28 U	**0.0061 T**	0.0046 T	**0.27 T**	0.92 U
1,2,4-Trimethylbenzene		0.39 U	0.0011 U	0.001 U	0.0007 T	0.066	0.057 U	0.022	0.001 U	0.072 U	0.18 U
1,2-Dichlorobenzene	1.01	0.22 T	0.0011 U	0.001 U	0.0012 U	0.064 T	0.057 U	0.0054	0.0008 T	0.072 U	0.4
1,3,5-Trimethylbenzene		0.39 U	0.0011 U	0.001 U	0.0012 U	0.036 T	0.057 U	0.0036	0.001 U	0.072 U	0.18 U
1,3-Dichlorobenzene	1.06	**1.5**	0.0018	0.001 U	0.0008 T	0.31	0.76	0.031	0.0043	0.15	**2.6**
1,4-Dichlorobenzene	0.22	**4.1**	0.0035	0.001 U	0.0024	**0.58**	**0.91**	0.053	0.0084	**0.85**	**4.6**
2-Butanone		1.9 U	0.0055 U	0.0052 U	0.0037 T	0.33 U	0.28 U	0.0089 T	0.0052 U	0.36 U	0.92 U
4-Isopropyltoluene		0.39 U	0.0011 U	0.001 U	0.0012 U	0.066 U	0.057 U	0.013	0.001 U	0.072 U	0.18 U
Acetone	24,100	1.9 U	0.033 J	0.01 J	0.02 J	0.33 U	0.28 U	0.12 J	0.0052 U	0.36 U	0.92 U
Benzene	0.0064	**0.43**	0.0026	0.001 U	0.0012 U	**0.054 T**	0.057 U	0.0056	0.0008 T	0.072 U	0.18 U
Bromomethane	7.08	0.39 U	0.0011 U	0.001 U	0.0012 U	0.1	0.057 U	0.0029 U	0.001 U	0.051 T	0.16 T
Carbon Disulfide	170	0.39 U	0.012	0.0013	0.0007 T	0.066 U	0.057 U	0.0029 U	0.0057	0.072 U	0.18 U
Chlorobenzene	0.87	**33**	0.066	0.001 U	0.012	**1.2**	**1.2**	0.22	0.061	0.72	**12**
cis-1,2-Dichloroethene		0.39 U	0.0009 T	0.013	0.0012 U	0.53	0.057 U	0.0029 U	0.0006 T	0.072 U	0.18 U
Ethylbenzene	0.907	0.39 U	0.0011 U	0.001 U	0.0012 U	0.079	0.057 U	0.0022 T	0.001 U	0.072 U	0.18 U
Hexachlorobutadiene	13***	1.9 U	0.0055 U	0.0052 U	0.0058 U	0.33 U	0.28 U	0.014 U	0.0052 U	0.36 U	0.92 U
Iodomethane		0.39 U	0.0011 U	0.001 U	0.0012 U	0.1 J	0.057 U	0.0029 U	0.001 U	0.072 U	0.18 U
Isopropylbenzene		0.39 U	0.0011 U	0.001 U	0.0012 U	0.066 U	0.057 U	0.0026 T	0.001 U	0.072 U	0.18 U
Methylene Chloride	2.63	0.78 U	0.0025	0.0016 T	0.003	0.13 U	0.11 U	0.0062	0.0023	0.17	0.37 U
Naphthalene	6.88	1.9 U	0.0055 U	0.0052 U	0.058	0.33 U	0.28 U	1.4	0.0052 U	0.36 U	1.2
sec-Butylbenzene		0.39 U	0.0011 U	0.001 U	0.0012 U	0.066 U	0.057 U	0.0029 U	0.001 U	0.072 U	0.18 U
Tetrachloroethene	0.0018	0.39 U	0.0011 U	0.001 U	0.0012 U	**0.057 T**	0.057 U	0.0029 U	0.001 U	0.072 U	0.18 U
Toluene	5.45	0.39 U	0.0011 U	0.001 U	0.0012 U	0.13	0.057 U	0.0024 T	0.001 U	0.072 U	0.45
trans-1,2-Dichloroethene	2.7	0.39 U	0.0011 U	0.001 U	0.0012 U	0.092	0.057 U	0.0029 U	0.001 U	0.072 U	0.18 U
Trichloroethene	0.0042	0.39 U	0.0011 U	0.001 U	0.0012 U	**0.24**	0.057 U	0.0029 U	0.001 U	0.072 U	0.18 U
Vinyl Chloride	0.00076****	0.39 U	0.0011 U	**0.0034**	0.0012 U	0.066 U	0.057 U	0.0029 U	0.001 U	0.072 U	0.18 U
Total Xylenes	9**	0.39 U	0.0011 U	0.001 U	0.0012 U	0.287	0.057 U	0.0074 J	0.001 U	0.072 U	0.18 U

Table 1 - Soil Sample Analytical Results

Sample ID Sampling Date Depth in feet	MTCA Method B Soil Screening Level[a]	JT-US-023-S3 1/6/14 10 to 11.5	JT-US-023-S4 1/6/14 15 to 16	JT-US-024-S2 1/6/14 6 to 7	JT-US-024-S3 1/6/14 11 to 12	JT-US-024-S4 1/6/14 16 to 17	JT-US-025-S2 1/6/14 6.5 to 7.5	JT-US-025-S3 1/6/14 10 to 12	JT-US-025-S5 1/6/2014 16 to 17	JT-US-26-S2 3/11/2014 5 to 6	JT-US-26-S3 3/11/2014 12 to 13
Conventionals in %											
Total Organic Carbon				3.5							
Metals in mg/kg											
Arsenic	7*			**7.1**	6.8		5.3	4.4			
Cadmium	5.6			0.2	0.1 U		0.2	0.1 U			
Chromium	2000**			38.6	24.4		20.9	27.6			
Lead	250**			33.4	1.7		54.6	3.3			
Mercury	0.157			0.05	0.02		0.07	0.04			
TPH in mg/kg											
Diesel Range Organics	2000**			64							
Electrical Insulating Oil	2000**			54 U							
Lube Oil	2000**			15							
Gasoline Range Organics	30**										
PCBs in mg/kg											
Aroclor 1016		0.0039 U	0.0038 U	0.004 U	0.0038 U	0.0039 U	0.0039 U	0.0038 U	0.0038 U	0.039 U	0.0039 U
Aroclor 1221		0.0039 U	0.0038 U	0.004 U	0.0038 U	0.0039 U	0.0039 U	0.0038 U	0.0038 U	0.039 U	0.0039 U
Aroclor 1232		0.02 U	0.019 U	0.004 U	0.0094 U	0.0039 U	0.0078 U	0.0038 U	0.0038 U	0.039 U	0.0039 U
Aroclor 1242		0.0039 U	0.0038 U	0.0059 U	0.0038 U	0.016 U	0.0039 U	0.0038 U	0.0038 U	0.039 U	0.0039 U
Aroclor 1248		0.0039 U	0.0038 U	0.004 U	0.0038 U	0.0039 U	0.0039 U	0.019 U	0.0038 U	0.2 U	0.0039 U
Aroclor 1254		0.0039 U	0.0038 U	0.004 U	0.0038 U	0.0039 U	0.012 U	0.058	0.0038 U	0.59 U	0.0059 U
Aroclor 1260	0.0000787****	0.0039 U	0.0025 T	0.0028 T	0.0068	0.0039 U	0.031	0.077	0.0056	0.94	0.014
Aroclor 1262		0.0039 U	0.0038 U	0.004 U	0.0038 U	0.0039 U	0.0039 U	0.0038 U	0.0038 U	0.039 U	0.0039 U
Aroclor 1268		0.0039 U	0.0038 U	0.004 U	0.0038 U	0.0039 U	0.0039 U	0.0038 U	0.0038 U	0.039 U	0.0039 U
Total PCBs	0.0000787****	0.02 U	**0.019**	**0.0028 J**	**0.0068**	0.0039 U	**0.031**	**0.077**	**0.0056**	**0.94**	**0.014**
Select Detected Volatiles in mg/kg											
1,1-Dichloroethene	0.0011	0.0011 U	0.061 U	0.077 U	0.001 U	0.0013 U	0.0011 U	0.062 UJ		0.063 U	0.0011 U
1,2,3-Trichlorobenzene		0.0053 U	0.31 U	0.38 U	0.0051 U	0.0064 U	0.0055 U	0.31 U		0.31 U	0.0054 U
1,2,4-Trichlorobenzene	0.0054	0.0051 T	**0.12 T**	**0.14 T**	**0.0063**	0.0064 U	0.0055 U	**0.062 T**		**0.11** T	0.0035 T
1,2,4-Trimethylbenzene		0.0011 U	0.061 U	0.077 U	0.001 U	0.0013 U	0.0011 U	0.062 U		0.063 U	0.0011 U
1,2-Dichlorobenzene	1.01	0.0008 T	0.16	0.35	0.0006 T	0.0013 U	0.0011 U	0.062 U		0.063 U	0.003
1,3,5-Trimethylbenzene		0.0011 U	0.061 U	0.077 U	0.001 U	0.0013 U	0.0011 U	0.062 U		0.063 U	0.0011 U
1,3-Dichlorobenzene	1.06	0.008	**2**	**2.3**	0.0066	0.0013 U	0.0011 U	0.17		0.2	0.042
1,4-Dichlorobenzene	0.22	0.014	**3.6**	**3.9**	0.0077	0.0013 U	0.0011 U	**0.28**		**0.32**	0.071
2-Butanone		0.006	0.31 U	0.38 U	0.0069	0.0064 U	0.0055 U	0.31 U		0.31 U	0.0054 U
4-Isopropyltoluene		0.0011 U	0.061 U	0.077 U	0.001 U	0.0013 U	0.0011 U	0.062 U		0.063 U	0.0011 U
Acetone	24,100	0.06	0.31 U	0.38 U	0.051	0.0064 U	0.021	0.31 U		0.31 U	0.017 J
Benzene	0.0064	0.001 T	0.061 U	**0.12**	0.001 U	0.0013 U	0.0011 U	0.062 U		0.063 U	0.0011 U
Bromomethane	7.08	0.0011 U	0.037 T	0.077 U	0.001 U	0.0013 U	0.0011 U	0.088		0.063 UJ	0.0011 UJ
Carbon Disulfide	170	0.062	0.061 U	0.077 U	0.024	0.0013 U	0.0045	0.062 U		0.063 U	0.0011 U
Chlorobenzene	0.87	0.14	1.7	**3.2**	0.059	0.0013 U	0.0011 U	**1.7** J		0.64	0.011
cis-1,2-Dichloroethene		0.0021	0.061 U	0.071 T	0.0016	0.0064	0.0011 U	0.062 U		0.063 U	0.0017
Ethylbenzene	0.907	0.0011 U	0.061 U	0.077 U	0.001 U	0.0013 U	0.0011 U	0.062 U		0.063 U	0.0011 U
Hexachlorobutadiene	13***	0.0053 U	0.31 U	0.38 U	0.0051 U	0.0064 U	0.0055 U	0.31 U		0.31 U	0.0054 U
Iodomethane		0.0011 U	0.045 JT	0.077 U	0.001 U	0.0013 U	0.0011 U	0.062 J		0.063 U	0.0011 U
Isopropylbenzene		0.0011 U	0.061 U	0.077 U	0.001 U	0.0013 U	0.0011 U	0.062 U		0.063 U	0.0011 U
Methylene Chloride	2.63	0.0025	0.12 U	0.15 U	0.0024	0.0023 T	0.0024	0.12 UJ		0.13 U	0.0041
Naphthalene	6.88	0.0053 U	0.31 U	0.38 U	0.0015 T	0.0064 U	0.0055 U	0.31 U		0.31 U	0.0054 U
sec-Butylbenzene		0.0011 U	0.061 U	0.077 U	0.001 U	0.0013 U	0.0011 U	0.062 U		0.063 U	0.0011 U
Tetrachloroethene	0.0018	0.0011 U	0.061 U	0.077 U	0.001 U	0.0013 U	0.0011 U	0.062 U		0.063 U	0.0011 U
Toluene	5.45	0.0011 U	0.061 U	0.074 T	0.001 U	0.0013 U	0.0011 U	0.062 U		0.063 U	0.0006 T
trans-1,2-Dichloroethene	2.7	0.0011 U	0.061 U	0.077 U	0.001 U	0.0013 U	0.0011 U	0.062 UJ		0.063 U	0.0011 U
Trichloroethene	0.0042	0.0011 U	0.061 U	0.077 U	0.001 U	0.0013 U	0.0011 U	0.062 U		0.063 U	0.0011 U
Vinyl Chloride	0.00076****	0.0011 U	0.061 U	0.077 U	0.001 U	**0.0044**	0.0011 U	0.062 UJ		0.063 U	0.0011 U
Total Xylenes	9**	0.0011 U	0.061 U	0.077 U	0.001 U	0.0013 U	0.0011 U	0.062 U		0.063 U	0.0011 U

Table 1 - Soil Sample Analytical Results

Sample ID	MTCA	JT-US-27-S2	JT-US-27-S3	JT-US-27-S4	JT-US-28-S1	JT-US-28-S2	JT-US-28-S3	JT-US-29-S1	JT-US-29-S2	JT-US-30-S2	JT-US-30-S4
Sampling Date	Method B Soil	3/11/2014	3/11/2014	3/11/2014	3/12/2014	3/12/2014	3/12/2014	3/11/2014	3/11/2014	3/12/2014	3/12/2014
Depth in feet	Screening Level[a]	6.5 to 7.5	11 to 12	15 to 16	5 to 6	10 to 11	15.5 to 16.5	1.5 to 2.5	6 to 7	10.5 to 11.5	20 to 21
Conventionals in %											
Total Organic Carbon											
Metals in mg/kg											
Arsenic	7*										
Cadmium	5.6										
Chromium	2000**										
Lead	250**										
Mercury	0.157										
TPH in mg/kg											
Diesel Range Organics	2000**	74 U			50			50			
Electrical Insulating Oil	2000**										
Lube Oil	2000**	150 U, C			100			100			
Gasoline Range Organics	30**	30			20			20			
PCBs in mg/kg											
Aroclor 1016		2400 U	0.094 U	0.038 U	0.12 U	0.011 U	0.0039 U	0.02 U	0.019 U	0.0039 U	0.0038 U
Aroclor 1221		2400 U	0.094 U	0.038 U	0.12 U	0.011 U	0.0039 U	0.02 U	0.019 U	0.0039 U	0.0038 U
Aroclor 1232		2400 U	0.094 U	0.038 U	0.12 U	0.011 U	0.0039 U	0.02 U	0.019 U	0.0039 U	0.0038 U
Aroclor 1242		2400 U	0.094 U	0.038 U	0.12 U	0.011 U	0.0039 U	0.02 U	0.019 U	0.0039 U	0.0038 U
Aroclor 1248		2400 U	0.094 U	0.038 U	0.14 U	0.011 U	0.0039 U	0.02 U	0.019 U	0.0039 U	0.0038 U
Aroclor 1254		9400 U	0.094 U	0.038 U	2.3 U	0.029 U	0.0039 U	0.049 U	0.038 U	0.0039 U	0.0038 U
Aroclor 1260	0.0000787****	30000	0.16	0.075	2	0.039	0.0023 T	0.15 U	0.12	0.0082	0.0061
Aroclor 1262		2400 U	0.094 U	0.038 U	0.12 U	0.011 U	0.0039 U	0.02 U	0.019 U	0.0039 U	0.0038 U
Aroclor 1268		2400 U	0.094 U	0.038 U	0.12 U	0.011 U	0.0039 U	0.02 U	0.019 U	0.0039 U	0.0038 U
Total PCBs	0.0000787****	**30000**	**0.16**	**0.075**	**2**	**0.039**	**0.0023 J**	0.15 U	**0.12**	**0.0082**	**0.0061**
Select Detected Volatiles in mg/kg											
1,1-Dichloroethene	0.0011	32 U	0.001 U	0.001 U	0.001 U	0.0043 U	0.0011 U	0.088 U	0.0009 U	0.001 U	0.0011 U
1,2,3-Trichlorobenzene		160 U	0.0051 U	0.0052 U	0.0048 U	0.022 U	0.0054 U	0.44 U	0.0044 U	0.0049 U	0.0054 U
1,2,4-Trichlorobenzene	0.0054	160 U	0.0032 T	**0.038**	0.0021 T	0.022 U	0.0054 U	0.44 U	0.0044 U	0.0049 U	0.0054 U
1,2,4-Trimethylbenzene		32 U	0.001 U	0.001 U	0.001 U	0.0043 U	0.0011 U	0.088 U	0.0009 U	0.001 U	0.0011 U
1,2-Dichlorobenzene	1.01	32 U	0.006	0.0036	0.001 U	0.0043 U	0.0011 U	0.088 U	0.0009 U	0.001 U	0.0011 U
1,3,5-Trimethylbenzene		32 U	0.001 U	0.001 U	0.001 U	0.0043 U	0.0011 U	0.088 U	0.0009 U	0.001 U	0.0011 U
1,3-Dichlorobenzene	1.06	32 U	0.046	0.12	0.0005 T	0.0043 U	0.0011 U	0.088 U	0.0009 U	0.001 U	0.0011 U
1,4-Dichlorobenzene	0.22	**19** T	0.067	0.095	0.0008 T	0.0043 U	0.0011 U	0.088 U	0.0009 U	0.001 U	0.0011 U
2-Butanone		160 U	0.0051 U	0.0052 U	0.0048 U	0.022 U	0.0054 U	0.44 U	0.0044 U	0.0031 T	0.0054 U
4-Isopropyltoluene		32 U	0.001 U	0.001 U	0.0055	0.0043 U	0.0011 U	0.088 U	0.0009 U	0.001 U	0.0011 U
Acetone	24,100	160 U	0.013 J	0.016 J	0.029 J	0.28 J	0.022 J	0.44 U	0.021 J	0.039 J	0.034 J
Benzene	0.0064	**170**	**0.018**	0.001 U	0.001 U	0.0043 U	0.0011 U	0.088 U	0.0009 U	0.001 U	0.0011 U
Bromomethane	7.08	32 UJ	0.001 UJ	0.001 UJ	0.001 UJ	0.0043 UJ	0.0011 UJ	0.088 UJ	0.0009 UJ	0.001 UJ	0.0011 UJ
Carbon Disulfide	170	32 U	0.0027	0.001 U	0.0009 T	0.007	0.0043	0.061 T	0.002	0.001 U	0.0011 U
Chlorobenzene	0.87	**3800**	**1.2**	0.013	0.001 U	0.0043 U	0.0011 U	0.088 U	0.0009 U	0.001 U	0.0011 U
cis-1,2-Dichloroethene		32 U	0.0008 T	0.0063	0.001 U	0.0043 U	0.001 T	0.088 U	0.0009 U	0.0015	0.015
Ethylbenzene	0.907	32 U	0.001 U	0.001 U	0.001 U	0.0043 U	0.0011 U	0.088 U	0.0009 U	0.001 U	0.0011 U
Hexachlorobutadiene	13***	160 U	0.0051 U	0.0052 U	0.0048 U	0.022 U	0.0054 U	0.44 U	0.0044 U	0.0049 U	0.0054 U
Iodomethane		32 U	0.001 U	0.001 U	0.001 U	0.0043 U	0.0011 U	0.088 U	0.0009 U	0.001 U	0.0011 U
Isopropylbenzene		32 U	0.001 U	0.001 U	0.0006 T	0.0043 U	0.0011 U	0.088 U	0.0009 U	0.001 U	0.0011 U
Methylene Chloride	2.63	64 U	0.0039	0.0039	0.0017 T	0.0087 U	0.0037	0.18 U	0.0023	0.0033	0.0036
Naphthalene	6.88	160 U	0.0051 U	0.0052 U	0.0048 U	0.022 U	0.0054 U	0.44 U	0.0044 U	0.0049 U	0.0054 U
sec-Butylbenzene		32 U	0.001 U	0.001 U	0.0015	0.0043 U	0.0011 U	0.088 U	0.0009 U	0.001 U	0.0011 U
Tetrachloroethene	0.0018	32 U	0.001 U	0.001 U	0.001 U	0.0043 U	0.0011 U	0.088 U	0.0009 U	**0.016**	0.0011 U
Toluene	5.45	32 U	0.001 U	0.001 U	0.001 U	0.0043 U	0.0011 U	0.088 U	0.0009 U	0.001 U	0.0011 U
trans-1,2-Dichloroethene	2.7	32 U	0.001 U	0.001 U	0.001 U	0.0043 U	0.0011 U	0.088 U	0.0009 U	0.001 U	0.0011 U
Trichloroethene	0.0042	32 U	0.001 U	0.001 U	0.001 U	0.0043 U	0.0011 U	0.088 U	0.0009 U	0.0039	0.0012
Vinyl Chloride	0.00076****	32 U	0.001 U	**0.0038** J	0.001 U	0.0043 U	**0.032** J	0.088 U	0.0009 U	0.001 U	**0.0041** J
Total Xylenes	9**	32 U	0.001 U	0.001 U	0.0008 T	0.0043 U	0.0011 U	0.088 U	0.0009 U	0.001 U	0.0011 U

Table 1 - Soil Sample Analytical Results

Sample ID	MTCA	JT-US-31-S2	JT-US-31-S3	JT-US-31-S5	JT-US-32-S2	JT-US-32-S4	JT-US-33-S2	JT-US-33-S3	JT-US-33-S4	JT-US-33-S5	JT-US-34-S1
Sampling Date	Method B Soil	3/12/2014	3/12/2014	3/12/2014	3/12/2014	3/12/2014	3/11/2014	3/11/2014	3/11/2014	3/11/2014	3/11/2014
Depth in feet	Screening Level[a]	5 to 6	12 to 13	21 to 22	5 to 6	15.5 to 16.5	6.5 to 7.5	10 to 11	16 to 17	20 to 21	17 to 18
Conventionals in %											
Total Organic Carbon											
Metals in mg/kg											
Arsenic	7*										
Cadmium	5.6										
Chromium	2000**										
Lead	250**										
Mercury	0.157										
TPH in mg/kg											
Diesel Range Organics	2000**										
Electrical Insulating Oil	2000**										
Lube Oil	2000**										
Gasoline Range Organics	30**										
PCBs in mg/kg											
Aroclor 1016		0.15 U	0.019 U	0.0039 U	0.0038 U	0.0039 U	0.0038 U	0.0038 U	0.0038 U	0.0039 U	0.0039 U
Aroclor 1221		0.15 U	0.019 U	0.0039 U	0.0038 U	0.0039 U	0.0038 U	0.0038 U	0.0038 U	0.0039 U	0.0039 U
Aroclor 1232		0.15 U	0.019 U	0.0039 U	0.0038 U	0.0039 U	0.0038 U	0.0038 U	0.0038 U	0.0039 U	0.0078 U
Aroclor 1242		0.15 U	0.019 U	0.0039 U	0.0038 U	0.0039 U	0.0038 U	0.0038 U	0.0038 U	0.0039 U	0.0039 U
Aroclor 1248		0.15 U	0.019 U	0.0039 U	0.0038 U	0.0039 U	0.0038 U	0.0038 U	0.0038 U	0.0039 U	0.0039 U
Aroclor 1254		1.1 U	0.019 U	0.0078 U	0.028 U	0.0039 U	0.0038 U	0.0076 U	0.0038 U	0.0039 U	0.078 U
Aroclor 1260	0.0000787****	3.7	0.035	0.024	0.076	0.0029 T	0.0045	0.017	0.0034 T	0.0032 T	0.26
Aroclor 1262		0.15 U	0.019 U	0.0039 U	0.0038 U	0.0039 U	0.0038 U	0.0038 U	0.0038 U	0.0039 U	0.0039 U
Aroclor 1268		0.15 U	0.019 U	0.0039 U	0.0038 U	0.0039 U	0.0038 U	0.0038 U	0.0038 U	0.0039 U	0.0039 U
Total PCBs	0.0000787****	**3.7**	**0.035**	**0.024**	**0.076**	**0.0029 J**	**0.0045**	**0.017**	**0.0034 J**	**0.0032 J**	**0.26**
Select Detected Volatiles in mg/kg											
1,1-Dichloroethene	0.0011	0.0011 U	0.001 U	0.0008 U	0.086 U	0.0011 U	0.071 U	0.081 U	0.0011 U	0.0009 U	0.0016 U
1,2,3-Trichlorobenzene		0.0054 U	0.0051 U	0.0042 U	0.43 U	0.0054 U	0.35 U	0.4 U	0.0053 U	0.0043 U	0.0081 U
1,2,4-Trichlorobenzene	0.0054	0.0054 U	0.0051 U	0.0042 U	0.43 U	0.0054 U	0.35 U	0.4 U	0.0053 U	0.0043 U	0.0081 U
1,2,4-Trimethylbenzene		0.0011 U	0.001 U	0.0008 U	0.086 U	0.0011 U	0.071 U	0.081 U	0.0011 U	0.0009 U	0.0016 U
1,2-Dichlorobenzene	1.01	0.0011 U	0.001 U	0.0008 U	0.086 U	0.0011 U	0.071 U	0.081 U	0.0011 U	0.0009 U	0.0016 U
1,3,5-Trimethylbenzene		0.0011 U	0.001 U	0.0008 U	0.086 U	0.0011 U	0.071 U	0.081 U	0.0011 U	0.0009 U	0.0016 U
1,3-Dichlorobenzene	1.06	0.0011 U	0.001 U	0.0008 U	0.086 U	0.0011 U	0.19	0.081 U	0.0011 U	0.0009 U	0.0016 U
1,4-Dichlorobenzene	0.22	0.001 T	0.001 U	0.0008 U	0.086 U	0.0011 U	**0.4**	0.081 U	0.0011 U	0.0009 U	0.0016 U
2-Butanone		0.0054 U	0.0051 U	0.0042 U	0.43 U	0.0054 U	0.35 U	0.4 U	0.0053 U	0.0043 U	0.0081 U
4-Isopropyltoluene		0.0011 U	0.001 U	0.0008 U	0.086 U	0.0011 U	0.071 U	0.081 U	0.0011 U	0.0009 U	0.0016 U
Acetone	24,100	0.052 J	0.02 J	0.0042 U	0.43 U	0.019 J	0.35 U	0.68 J	0.03 J	0.016 J	0.0081 U
Benzene	0.0064	**0.02**	0.001 U	0.0008 U	0.086 U	0.0014	0.071 U	**0.64**	0.0011 U	0.0009 U	0.0016 U
Bromomethane	7.08	0.0011 UJ	0.001 UJ	0.0008 U	0.092	0.0011 U	0.071 U	0.081 U	0.0011 U	0.0009 U	0.0016 U
Carbon Disulfide	170	0.001 T	0.0007 T	0.0008 U	0.086 U	0.0025	0.071 U	0.081 U	0.0037	0.0009 U	0.0016 U
Chlorobenzene	0.87	0.012	0.001 U	0.0008 U	0.086 U	0.0011 U	2.7	0.33	0.0011 U	0.0009 U	0.0016 U
cis-1,2-Dichloroethene		0.01	0.014	0.0008 U	0.59	0.0015	0.071 U	1.5	0.002	0.0009 U	0.0016 U
Ethylbenzene	0.907	0.0011 U	0.001 U	0.0008 U	0.086 U	0.0011 U	0.071 U	0.081 U	0.0011 U	0.0009 U	0.0016 U
Hexachlorobutadiene	13***	0.0054 U	0.0051 U	0.0042 U	0.43 U	0.0054 U	0.35 U	0.4 U	0.0053 U	0.0043 U	0.0081 U
Iodomethane		0.0011 U	0.001 U	0.0008 U	0.086 U	0.0011 U	0.071 U	0.081 U	0.0011 U	0.0009 U	0.0016 U
Isopropylbenzene		0.0011 U	0.001 U	0.0008 U	0.086 U	0.0011 U	0.071 U	0.081 U	0.0011 U	0.0009 U	0.0016 U
Methylene Chloride	2.63	0.0023	0.0024	0.0017	0.17 U	0.0026	0.14 U	0.16 U	0.0031	0.0022	0.0032 U
Naphthalene	6.88	0.0054 U	0.0051 U	0.0042 U	0.43 U	0.0054 U	0.35 U	0.4 U	0.0053 U	0.0043 U	0.0081 U
sec-Butylbenzene		0.0011 U	0.001 U	0.0008 U	0.086 U	0.0011 U	0.071 U	0.081 U	0.0011 U	0.0009 U	0.0016 U
Tetrachloroethene	0.0018	0.0011 U	0.001 U	0.0008 U	**2.7**	0.0011 U	0.071 U	0.081 U	**0.0027**	0.0009 U	0.0016 U
Toluene	5.45	0.0085	0.001 U	0.0008 U	0.086 U	0.0011 U	0.071 U	0.081 U	0.0011 U	0.0009 U	0.0016 U
trans-1,2-Dichloroethene	2.7	0.0011 U	0.001 U	0.0008 U	0.086 U	0.0011 U	0.071 U	0.12	0.0011 U	0.0009 U	0.0016 U
Trichloroethene	0.0042	0.0024	0.001 U	0.0008 U	**1.9**	0.0011 U	0.071 U	**0.11**	0.0011 U	0.0009 U	0.0016 U
Vinyl Chloride	0.00076****	0.0011 U	**0.035**	0.0008 U	0.086 U	**0.015**	0.071 U	0.081 U	0.0011 U	0.0009 U	0.0016 U
Total Xylenes	9**	0.0011	0.001 U	0.0008 U	0.086 U	0.0011 U	0.071 U	0.081 U	0.0011 U	0.0009 U	0.0016 U

Table 1 - Soil Sample Analytical Results

Sample ID	MTCA	JT-US-34-S3	JT-US-35-S1	JT-US-35-S2	JT-US-36-S1	JT-US-36-S2	JT-US-37-S1	JT-US-37-S2	JT-US-38-S1	JT-US-38-S2	JT-MW-100-S2
Sampling Date	Method B Soil	3/11/2014	3/11/2014	3/12/2014	3/12/2014	3/12/2014	3/12/2014	3/12/2014	3/12/2014	3/12/2014	3/13/2014
Depth in feet	Screening Level[a]	20 to 21	16 to 17	20 to 21	0.7 to 1.7	6 to 7	2 to 3	5 to 6	0.5 to 1.5	6.5 to 7.5	15 to 15.75
Conventionals in %											
Total Organic Carbon											
Metals in mg/kg											
Arsenic	7*										
Cadmium	5.6										
Chromium	2000**										
Lead	250**										
Mercury	0.157										
TPH in mg/kg											
Diesel Range Organics	2000**				50						
Electrical Insulating Oil	2000**										
Lube Oil	2000**				100						
Gasoline Range Organics	30**				20						
PCBs in mg/kg											
Aroclor 1016		0.0056 U	0.0038 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.0038 U	0.0038 U	0.0038 U
Aroclor 1221		0.0056 U	0.0038 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.0038 U	0.0038 U	0.0038 U
Aroclor 1232		0.0056 U	0.0038 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.0038 U	0.0095 U	0.0038 U
Aroclor 1242		0.0056 U	0.0038 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.0038 U	0.0038 U	0.0038 U
Aroclor 1248		0.007 U	0.0096 U	0.004 U	0.0086	0.004 U	0.004 U	0.028	0.0094 U	0.0038 U	0.015
Aroclor 1254		0.42 U	0.048 U	0.004 U	0.012 U	0.004 U	0.004 U	0.3 U	0.076 U	0.0057 U	0.024
Aroclor 1260	0.0000787****	1.6	0.15	0.0036 T	0.028	0.0072	0.0043	0.94	0.29	0.012	0.0095
Aroclor 1262		0.0056 U	0.0038 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.0038 U	0.0038 U	0.0038 U
Aroclor 1268		0.0056 U	0.0038 U	0.004 U	0.004 U	0.004 U	0.004 U	0.004 U	0.0038 U	0.0038 U	0.0038 U
Total PCBs	0.0000787****	**1.6**	**0.15**	**0.0036 J**	**0.0366**	**0.0072**	**0.0043**	**0.968**	**0.29**	**0.012**	**0.0485**
Select Detected Volatiles in mg/kg											
1,1-Dichloroethene	0.0011	0.0009 U	0.0012 U	0.0008 U	0.056 U	0.0011 U	0.059 U	0.061 U	3.4 U	0.082 U	0.001 UJ
1,2,3-Trichlorobenzene		0.0043 U	0.0059 U	0.0042 U	0.28 U	0.0055 U	0.3 U	0.31 U	17 U	0.41 U	0.0051 UJ
1,2,4-Trichlorobenzene	0.0054	0.0043 U	0.0059 U	0.0042 U	0.28 U	0.0055 U	0.3 U	0.31 U	17 U	0.41 U	0.0051 UJ
1,2,4-Trimethylbenzene		0.0009 U	0.0012 U	0.0008 U	0.056 U	0.0011 U	0.059 U	0.061 U	3.4 U	0.082 U	0.001 UJ
1,2-Dichlorobenzene	1.01	0.0009 U	0.0012 U	0.0008 U	0.056 U	0.0011 U	0.059 U	0.061 U	3.4 U	0.082 U	0.001 UJ
1,3,5-Trimethylbenzene		0.0009 U	0.0012 U	0.0008 U	0.056 U	0.0011 U	0.059 U	0.061 U	3.4 U	0.082 U	0.001 UJ
1,3-Dichlorobenzene	1.06	0.0009 U	0.0012 U	0.0008 U	0.056 U	0.0011 U	0.059 U	0.11	3.4 U	0.37	0.0027 J
1,4-Dichlorobenzene	0.22	0.0009 U	0.0012 U	0.0008 U	0.056 U	0.0011 U	**0.38**	**0.73**	3.4 U	**0.96**	0.0024 J
2-Butanone		0.0043 U	0.0059 U	0.0042 U	0.28 U	0.0055 U	0.3 U	0.31 U	17 U	0.41 U	0.0051 UJ
4-Isopropyltoluene		0.0009 U	0.0012 U	0.0008 U	0.056 U	0.0011 U	0.059 U	0.061 U	3.4 U	0.082 U	0.024 J
Acetone	24,100	0.0043 U	0.0059 U	0.013 J	0.28 U	0.042 J	0.3 U	0.81 J	17 U	0.64 J	0.049 J
Benzene	0.0064	0.0009 U	0.0012 U	0.0008 U	0.056 U	0.0011 U	0.059 U	0.061 U	3.4 U	0.082 U	0.001 JT
Bromomethane	7.08	0.0009 U	0.0012 U	0.0008 U	0.056 U	0.0011 U	0.059 U	0.061 U	3.4 U	0.082 U	0.001 UJ
Carbon Disulfide	170	0.0009 U	0.0018	0.0008 U	0.056 U	0.0011 U	0.059 U	0.061 U	3.4 U	0.082 U	0.0064 J
Chlorobenzene	0.87	0.0009 U	0.0035	0.0008 U	0.056 U	0.0011 U	0.42	**1.4**	3.4 U	0.11	0.054 J
cis-1,2-Dichloroethene		0.0009 U	0.0012 U	0.0008 U	0.056 U	0.0011 U	0.059 U	0.061 U	3.4 U	0.082 U	0.0011 J
Ethylbenzene	0.907	0.0009 U	0.0012 U	0.0008 U	0.056 U	0.0011 U	0.059 U	0.061 U	3.4 U	0.082 U	0.001 UJ
Hexachlorobutadiene	13***	0.0043 U	0.0059 U	0.0042 U	0.28 U	0.0055 U	0.3 U	0.31 U	17 U	0.41 U	0.0051 UJ
Iodomethane		0.0009 U	0.0012 U	0.0008 U	0.056 U	0.0011 U	0.059 U	0.061 U	3.4 U	0.082 U	0.001 UJ
Isopropylbenzene		0.0009 U	0.0012 U	0.0008 U	0.056 U	0.0011 U	0.059 U	0.061 U	3.4 U	0.082 U	0.001 UJ
Methylene Chloride	2.63	0.0017 U	0.0032	0.0023	0.11 U	0.0023	0.12 U	0.12 U	6.7 U	0.16 U	0.0068 J
Naphthalene	6.88	0.0043 U	0.0059 U	0.0042 U	0.28 U	0.0055 U	0.3 U	0.59	**130**	0.41 U	0.0051 UJ
sec-Butylbenzene		0.0009 U	0.0012 U	0.0008 U	0.056 U	0.0011 U	0.059 U	0.061 U	3.4 U	0.082 U	0.001 UJ
Tetrachloroethene	0.0018	0.0009 U	0.0012 U	0.0008 U	0.056 U	0.0011 U	0.059 U	0.061 U	3.4 U	0.082 U	0.0013 J
Toluene	5.45	0.0009 U	0.0012 U	0.0008 U	0.056 U	0.0011 U	0.059 U	0.061 U	3.4 U	0.082 U	0.0005 JT
trans-1,2-Dichloroethene	2.7	0.0009 U	0.0012 U	0.0008 U	0.056 U	0.0011 U	0.059 U	0.061 U	3.4 U	0.082 U	0.001 UJ
Trichloroethene	0.0042	0.0009 U	0.0012 U	0.0008 U	0.056 U	0.0011 U	0.059 U	0.061 U	3.4 U	0.082 U	0.0005 JT
Vinyl Chloride	0.00076****	0.0009 U	0.0012 U	0.0008 U	0.056 U	0.0011 U	0.059 U	0.061 U	3.4 U	0.082 U	0.001 UJ
Total Xylenes	9**	0.0009 U	0.0012 U	0.0008 U	0.056 U	0.0011 U	0.059 U	0.062	3.4 U	0.082 U	0.001 UJ

Table 1 - Soil Sample Analytical Results

Sample ID Sampling Date Depth in feet	MTCA Method B Soil Screening Level[a]	JT-MW-100-S3 3/13/2014 25 to 25.75	JT-MW-200-S5 3/13/2014 25 to 26	JT-MW-200-S6 3/13/2014 30 to 30.7
Conventionals in %				
Total Organic Carbon				
Metals in mg/kg				
Arsenic	7*			
Cadmium	5.6			
Chromium	2000**			
Lead	250**			
Mercury	0.157			
TPH in mg/kg				
Diesel Range Organics	2000**			
Electrical Insulating Oil	2000**			
Lube Oil	2000**			
Gasoline Range Organics	30**			
PCBs in mg/kg				
Aroclor 1016		0.004 U	0.0039 U	0.004 U
Aroclor 1221		0.004 U	0.0039 U	0.004 U
Aroclor 1232		0.004 U	0.0039 U	0.004 U
Aroclor 1242		0.004 U	0.0039 U	0.004 U
Aroclor 1248		0.0033 T	0.0039 U	0.057
Aroclor 1254		0.0044	0.024 U	0.11
Aroclor 1260	0.0000787****	0.004 U	0.06	0.11
Aroclor 1262		0.004 U	0.0039 U	0.004 U
Aroclor 1268		0.004 U	0.0039 U	0.004 U
Total PCBs	0.0000787****	**0.0077 J**	**0.06**	**0.277**
Select Detected Volatiles in mg/kg				
1,1-Dichloroethene	0.0011	0.0009 UJ	0.0011 UJ	0.0009 UJ
1,2,3-Trichlorobenzene		0.0043 UJ	0.0057 UJ	0.0045 UJ
1,2,4-Trichlorobenzene	0.0054	0.0043 UJ	0.0057 UJ	0.0045 UJ
1,2,4-Trimethylbenzene		0.0009 UJ	0.0011 UJ	0.0009 UJ
1,2-Dichlorobenzene	1.01	0.0009 UJ	0.0011 UJ	0.0009 UJ
1,3,5-Trimethylbenzene		0.0009 UJ	0.0011 UJ	0.0009 UJ
1,3-Dichlorobenzene	1.06	0.0009 UJ	0.0011 UJ	0.0009 UJ
1,4-Dichlorobenzene	0.22	0.0009 UJ	0.0011 UJ	0.0009 UJ
2-Butanone		0.0043 UJ	0.0057 UJ	0.0045 UJ
4-Isopropyltoluene		0.027 J	0.0011 UJ	0.0009 UJ
Acetone	24,100	0.031 J	0.028 J	0.025 J
Benzene	0.0064	0.0009 UJ	0.0011 UJ	0.0009 UJ
Bromomethane	7.08	0.0009 UJ	0.0011 UJ	0.0009 UJ
Carbon Disulfide	170	0.0005 JT	0.0011 UJ	0.0009 UJ
Chlorobenzene	0.87	0.0009 UJ	0.0011 UJ	0.0009 UJ
cis-1,2-Dichloroethene		0.0009 UJ	0.0011 UJ	0.0009 UJ
Ethylbenzene	0.907	0.0009 UJ	0.0011 UJ	0.0009 UJ
Hexachlorobutadiene	13***	0.0043 UJ	0.0057 UJ	0.0045 UJ
Iodomethane		0.0009 UJ	0.0011 UJ	0.0009 UJ
Isopropylbenzene		0.0009 UJ	0.0011 UJ	0.0009 UJ
Methylene Chloride	2.63	0.0027 J	0.0027 J	0.005 J
Naphthalene	6.88	0.0043 UJ	0.0057 UJ	0.0045 UJ
sec-Butylbenzene		0.0009 UJ	0.0011 UJ	0.0009 UJ
Tetrachloroethene	0.0018	0.0009 UJ	0.0011 UJ	0.0009 UJ
Toluene	5.45	0.0009 UJ	0.0011 UJ	0.0009 UJ
trans-1,2-Dichloroethene	2.7	0.0009 UJ	0.0011 UJ	0.0009 UJ
Trichloroethene	0.0042	0.0009 UJ	0.0011 UJ	0.0009 UJ
Vinyl Chloride	0.00076****	0.0009 UJ	0.0011 UJ	0.0009 UJ
Total Xylenes	9**	0.0009 UJ	0.0011 UJ	0.0009 UJ

Notes

BOLD - Exceeds Screening Level

a - Value provided is the Three-Phase Partitioning Model screening level calculated with MTCA equation 747-1 using the lowest

are based on potential for groundwater migration to surface water.

* - Value based on regional natural background for Puget Sound (Ecology, 1994)

** - MTCA Method A Soil Unrestricted Land Use table value.

*** - MTCA Method B Soil Unrestricted Land Use Direct Contact formula value, carcinogen.

**** - The screening level is lower than the method PQL; MTCA defaults the screening level up to the PQL.

U = Not detected at the reporting limit indicated.

J = Estimated value.

T = Value is between the MDL and MRL.

C = The chromatogram indicates the presence of PCBs, not DRO or RRO. Laboratory reported results were updated to non-detect (U) for DRO/RRO.

Table 2 -Analytical Results for Dioxins and Furans in Soil Samples

Sample ID	MTCA Method B	JT-US-003-S2		JT-US-004-S2		JT-US-005-S2	
Depth in feet	Screening Level[a]	7.5 to 8		7 to 7.5		10 to 10.5	
Sampling Date		1/2/14		1/2/14		1/2/14	
Dioxins in pg/g							
2,3,7,8-TCDD		0.287	U	0.303	U	0.518	U
1,2,3,7,8-PeCDD		0.599	U	0.771	T	1.56	
1,2,3,4,7,8-HxCDD		0.747	U	0.332	T	0.445	T
1,2,3,6,7,8-HxCDD		0.803	T	0.532	U	1.13	
1,2,3,7,8,9-HxCDD		1.19		0.597	T	0.862	T
1,2,3,4,6,7,8-HpCDD		4.95	U	3.15	U	3.53	U
OCDD		25.2	U	8.02	U	17.1	U
2,3,7,8-TCDF		5.96		1.26		1.7	
1,2,3,7,8-PeCDF		2.16	JL	0.916	T	1.05	JL
2,3,4,7,8-PeCDF		1.55		1.12		1.56	
1,2,3,4,7,8-HxCDF		2.95		0.855	T	20.5	
1,2,3,6,7,8-HxCDF		1.12	U	0.831	T	2.51	
1,2,3,7,8,9-HxCDF		1.43		0.331	T	2.2	
2,3,4,6,7,8-HxCDF		1.05		0.932	T	1.02	
1,2,3,4,6,7,8-HpCDF		3.45		1.83		30.1	
1,2,3,4,7,8,9-HpCDF		2.55		0.322	T	32	
OCDF		38.1		1.14	U	204	
Total TCDD		4.28	J	10.9	J	20.9	J
Total PeCDD		4.82	J	10.1		21.8	J
Total HxCDD		9.37	J	9.17	J	17.2	J
Total HpCDD		12.4	J	6.76		8.76	
Total TCDF		23.5	J	29.1	J	27.1	J
Total PeCDF		11.2	J	14.2	J	27.6	J
Total HxCDF		10.8	J	7.4	J	54.5	J
Total HpCDF		8.44	J	2.91		125	
TEQ Equivalent	0.049	**1.94**		**1.59**		**5.53**	

BOLD - Exceeds Screening Level.
U = Not detected at the reporting limit indicated.
J = Estimated value.
T = Value is between the MDL and MRL.
JL = Analyte was positively identified and the value may be less than the reported estimate.
a - Value provided is the Three-Phase Partitioning Model screening level calculated with MTCA equation 747-1 using the lowest surface water level for protection of human health considering food ingestion only (WAC 173-340-474).
The cleanup levels provided are based on potential for groundwater migration to surface water.

Table 3 - Water Sample Analytical Results

Sample ID	MTCA Method B	IP-14	IP-1400	JT-MW-IP-9	JT-MW-JT-11	JT-MW-JT-12	JT-MW-JT-3	JT-MW-JT-6	JT-MW-JT-7	JT-MW-JT-8	JT-MW-MW-8D	JT-MW-SRW-1	JT-5
Monitoring Well	Freshwater	IP-14	Field Dup of IP-14	IP-9	JT-11	JT-12	JT-3	JT-6	JT-17	JT-8	MW-8D	SRW-1	JT-5
Sampling Date	Screening Levels $^{\alpha}$	1/9/14	1/9/14	1/8/14	1/8/14, 1/14/14	1/8/14	1/7/14	1/7/14, 1/14/14	1/7/14, 1/14/14	1/8/14	1/7/14, 1/14/14	1/7/14, 1/14/14	3/18/14
		1		2	3	4	5	6	7	8	9	10	11
Conventionals in mg/L													
Alkalinity as Bicarbonate		152		455	380	141	135	548	562	94.5	165	35.4	
Alkalinity as Carbonate		1 U		1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	159	
Alkalinity as Hydroxide		1 U		1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	
Alkalinity, Total		152		455	380	141	135	548	562	94.5	165	195	
Chloride		8.6		9.2	18.2	38.4	16.8	26.4	17.3	2.8	8.7	12.2	
Nitrate		0.1		0.1	0.01 U	0.1		0.05 U	0.01 U	0.1	0.01 U	0.01 U	
Nitrate													
Nitrate-Nitrite as N					0.01 U			0.05 U	0.01 U		0.01 U	0.01 U	
Nitrite as N					0.01 U			0.029	0.01 U		0.01 U	0.01 U	
Sulfate		0.5		0.1 U	0.1 U	0.7	1.1	0.1 U	0.3	0.6	0.1	0.8	
Total Organic Carbon		2.2		10.5	10.6	5.17	6.61	20.4	20.4	4.77	1.8	2.52	
Total Suspended Solids													119
Dissolved Metals in µg/L													
Arsenic	0.098	**24.7**	**25.1**	**5**	**18.2**	**12**	**22.7**	**15.2**	**20**	**23.2**	**4.8**	0.2 U	
Cadmium	40.5***	0.1 U	0.1 U	0.1 U	0.2	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	
Chromium	50****	1 U	1 U	1	1 U	1 U	1	2	2	0.6	1 U	0.5 U	
Lead	15****	0.1 U	0.1 U	0.1 U	0.4	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	
Mercury	0.15	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	
Total Metals in µg/L													
Arsenic	0.098	**21.6**	**21.8**	**4.9**	**18.5**	**13.2**	**23**	**15.1**	**20.3**	**20.6**	**4.5**	**0.2**	
Cadmium	5****	0.1 U	0.1 U	0.1 U	0.3	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	
Chromium	50****	1 U	1 U	2	1	0.8	1.2	3	2	1.1	1 U	0.5 U	
Lead	15****	0.6	0.4	0.1	3.9	0.1	0.2	0.8	0.3	1.4	0.2	0.1 U	
Mercury	0.15	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	0.1 U	
TPH in mg/L													
Diesel Range Organics	500****									3600 U, C			
Residual Range Organics	500****									1400 U, C			
PCBs in µg/L													
Aroclor 1016		0.25 U	0.25 U	2.5 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	20 U	0.01 U	0.01 U	
Aroclor 1221		0.25 U	0.25 U	2.5 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	20 U	0.01 U	0.01 U	
Aroclor 1232		0.25 U	0.25 U	2.5 U	0.025 U	0.015 U	0.035 U	0.04 U	0.012 U	20 U	0.035 U	0.02 U	
Aroclor 1242		0.25 U	0.25 U	2.5 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	20 U	0.01 U	0.01 U	
Aroclor 1248		0.75 U	0.75 U	2.5 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	20 U	0.01 U	0.01 U	
Aroclor 1254		2.5 U	2.5 U	12 U	0.25 U	0.012 U	0.75 U	0.05 U	0.15 U	200 U	0.25 U	0.05 U	
Aroclor 1260		0.79	1.7	18	0.91	0.018	0.76	0.05	0.17	280	0.49	0.13	
Aroclor 1262		0.25 U	0.25 U	2.5 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	20 U	0.01 U	0.01 U	
Aroclor 1268		0.25 U	0.25 U	2.5 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	20 U	0.01 U	0.01 U	
Total PCBs	0.000064^	**0.79**	**1.7**	**18**	**0.91**	**0.018**	**0.76**	**0.05**	**0.17**	**280**	**0.49**	**0.13**	
Volatiles in µg/L													
1,1,1,2-Tetrachloroethane		0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,1,1-Trichloroethane		0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,1,2,2-Tetrachloroethane	4	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,1,2-Trichloroethane	16	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,1-Dichloroethane		0.2 U	0.2 U	0.24	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,1-Dichloroethene	3.2*	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,1-Dichloropropene		0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,2,3-Trichlorobenzene		76	84	15	0.5 U	0.5 U	0.13 T	0.5 U	0.5 U	1300	0.5 U	0.5 U	0.5 U
1,2,3-Trichloropropane		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2,4-Trichlorobenzene	1.96***	**960**	**940**	**130**	0.5 U	0.5 U	0.86	0.5 U	0.58	**9900**	0.45 T	0.5 U	0.13 JT

Table 3 - Water Sample Analytical Results

Sample ID	MTCA Method B	IP-14	IP-1400	JT-MW-IP-9	JT-MW-JT-11	JT-MW-JT-12	JT-MW-JT-3	JT-MW-JT-6	JT-MW-JT-7	JT-MW-JT-8	JT-MW-MW-8D	JT-MW-SRW-1	JT-5
Monitoring Well	Freshwater	IP-14	Field Dup of IP-14	IP-9	JT-11	JT-12	JT-3	JT-6	JT-17	JT-8	MW-8D	SRW-1	JT-5
Sampling Date	Screening Levels [a]	1/9/14	1/9/14	1/8/14	1/8/14, 1/14/14	1/8/14	1/7/14	1/7/14, 1/14/14	1/7/14, 1/14/14	1/8/14	1/7/14, 1/14/14	1/7/14, 1/14/14	3/18/14
		1		2	3	4	5	6	7	8	9	10	11
1,2,4-Trimethylbenzene		0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.12 T	0.2 U	0.2 U	0.2 U
1,2-Dibromo-3-chloropropane		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2-Dibromoethane		0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,2-Dichlorobenzene	1300	110	110	4.7	0.06 T	0.19 T	0.13 T	0.12 T	0.08 T	800	0.2 U	0.2 U	0.2 U
1,2-Dichloroethane		0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,2-Dichloropropane		0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,3,5-Trimethylbenzene		0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,3-Dichlorobenzene	960	580	590	15	0.84	1.1	0.83	1.3	0.91	220	0.2 U	0.2 U	0.2 U
1,3-Dichloropropane		0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
1,4-Dichlorobenzene	190	**670**	**680**	33	1.8	1.5	1.7	2.7	2.3	**730**	0.2 U	0.2 U	0.2 U
2,2-Dichloropropane		0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 UJ
2-Butanone		5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	2.2 T	5 U	5 U	5 U
2-Chloroethylvinylether		1 UJ	1 UJ	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
2-Chlorotoluene	4.4	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
2-Hexanone		5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
4-Chlorotoluene		0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
4-Isopropyltoluene		0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
4-Methyl-2-pentanone		5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Acetone	6000000**	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	16 U	5 U	5 U	5 U
Acrolein		5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 UJ
Acrylonitrile		1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Benzene	5****	**13**	**13**	**11**	4.8	0.42	0.97	4.4	0.63	1.5	0.2 U	0.2 U	0.2 U
Bromobenzene		0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Bromochloromethane		0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Bromodichloromethane		0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Bromoethane		0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Bromoform	140	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Bromomethane	1500	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Carbon Disulfide	22,600**	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Carbon Tetrachloride		0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
CFC-113		0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Chlorobenzene	1600**	1200	1200	370	170	42	43	300	95	150	0.4	0.12 T	0.2 U
Chloroethane		0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Chloroform	470	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Chloromethane		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UJ
cis-1,2-Dichloroethene		0.82	0.79	0.91	0.2 U	0.25	0.16 T	0.2 U	0.13 T	0.28	0.2 U	0.2 U	0.2 U
cis-1,3-Dichloropropene		0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Dibromochloromethane		0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Dibromomethane		0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Ethylbenzene	2100	0.15 T	0.2 U	0.2 U	0.1 T	0.2 U	0.2 U	0.12 T	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Hexachlorobutadiene	18	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Iodomethane		1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Isopropylbenzene		0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Methyl tert-Butyl Ether		0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Methylene Chloride	590	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Naphthalene	4938**	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
n-Butylbenzene		0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
n-Propylbenzene		0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
sec-Butylbenzene		0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Styrene		0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U

Table 3 - Water Sample Analytical Results

Sample ID	MTCA Method B	IP-14	IP-1400	JT-MW-IP-9	JT-MW-JT-11	JT-MW-JT-12	JT-MW-JT-3	JT-MW-JT-6	JT-MW-JT-7	JT-MW-JT-8	JT-MW-MW-8D	JT-MW-SRW-1	JT-5
Monitoring Well	Freshwater	IP-14	Field Dup of IP-14	IP-9	JT-11	JT-12	JT-3	JT-6	JT-17	JT-8	MW-8D	SRW-1	JT-5
Sampling Date	Screening Levels [α]	1/9/14	1/9/14	1/8/14	1/8/14, 1/14/14	1/8/14	1/7/14	1/7/14, 1/14/14	1/7/14, 1/14/14	1/8/14	1/7/14, 1/14/14	1/7/14, 1/14/14	3/18/14
		1		2	3	4	5	6	7	8	9	10	11
tert-Butylbenzene		0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Tetrachloroethene	3.3	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.29	0.2 U	0.2 U	0.2 U
Toluene	15000	0.29	0.31	0.18 T	0.2 U	0.2 U	0.11 T	0.2 U	0.2 U	0.4	0.2 U	0.2 U	0.2 U
trans-1,2-Dichloroethene	10000	0.11 T	0.2 U	0.38	0.2 U	0.13 T	0.11 T	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
trans-1,3-Dichloropropene		0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
trans-1,4-Dichloro-2-butene		1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Trichloroethene	12.7***	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.17 T	0.2 U	0.2 U	0.2 U
Trichlorofluoromethane		0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Vinyl Acetate		0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Vinyl Chloride	2.4	0.99	1.1	1.3	0.15 T	0.21	0.17 T	0.14 T	0.2 U	0.14 T	0.2 U	0.2 U	0.2 U
m, p-Xylene		0.14 T	0.18 T	0.14 T	0.4 U	0.11 T	0.4 U	0.17 T	0.16 T	0.25 T	0.4 U	0.4 U	0.4 U
O-Xylene		0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.11 T	0.13 T	0.13 T	0.2 U	0.2 U	0.2 U
Total xylenes	1000****	0.14	0.18	0.14	0.4 U	0.32 J	0.4 U	0.17	0.29 J	0.38 J	0.4 U	0.4 U	0.4 U

Table 3 - Water Sample Analytical Results

Sample ID Monitoring Well Sampling Date	MTCA Method B Freshwater Screening Levels [a]	JT-500 Field Dup of JT-5 3/18/14	JT-MW-100 MW-100 3/18/14	JT-MW-200 MW-200 3/18/14	JT-MW-8 MW-8D 3/18/14
			12	13	14
Conventionals in mg/L					
Alkalinity as Bicarbonate					
Alkalinity as Carbonate					
Alkalinity as Hydroxide					
Alkalinity, Total					
Chloride					
Nitrate					
Nitrate					
Nitrate-Nitrite as N					
Nitrite as N					
Sulfate					
Total Organic Carbon					
Total Suspended Solids			45.2	25.6	1 U
Dissolved Metals in µg/L					
Arsenic	0.098				
Cadmium	40.5***				
Chromium	50****				
Lead	15****				
Mercury	0.15				
Total Metals in µg/L					
Arsenic	0.098				
Cadmium	5****				
Chromium	50****				
Lead	15****				
Mercury	0.15				
TPH in mg/L					
Diesel Range Organics	500****				
Residual Range Organics	500****				
PCBs in µg/L					
Aroclor 1016		0.011 U	0.01 U	0.01 U	0.01 U
Aroclor 1221		0.011 U	0.01 U	0.01 U	0.01 U
Aroclor 1232		0.011 U	0.01 U	0.01 U	0.01 U
Aroclor 1242		0.011 U	0.01 U	0.01 U	0.01 U
Aroclor 1248		0.011 U	0.012 U	0.01 U	0.015 U
Aroclor 1254		0.28 U	0.4 U	0.04 U	0.15 U
Aroclor 1260		0.91	1.1	0.057	0.18
Aroclor 1262		0.011 U	0.01 U	0.01 U	0.01 U
Aroclor 1268		0.011 U	0.01 U	0.01 U	0.01 U
Total PCBs	0.000064^	**0.91**	**1.1**	**0.057**	**0.18**
Volatiles in µg/L					
1,1,1,2-Tetrachloroethane		0.2 U	0.2 U	0.2 U	0.2 U
1,1,1-Trichloroethane		0.2 U	0.2 U	0.2 U	0.2 U
1,1,2,2-Tetrachloroethane	4	0.2 U	0.2 U	0.2 U	0.2 U
1,1,2-Trichloroethane	16	0.2 U	0.2 U	0.2 U	0.2 U
1,1-Dichloroethane		0.2 U	0.2 U	0.2 U	0.2 U
1,1-Dichloroethene	3.2*	0.2 U	0.2 U	0.2 U	0.2 U
1,1-Dichloropropene		0.2 U	0.2 U	0.2 U	0.2 U
1,2,3-Trichlorobenzene		0.5 U	0.5 U	15	0.5 U
1,2,3-Trichloropropane		0.5 U	0.5 U	0.5 U	0.5 U
1,2,4-Trichlorobenzene	1.96***	0.5 UJ	0.5 U	**100 J**	0.5 UJ

Table 3 - Water Sample Analytical Results

Sample ID	MTCA Method B	JT-500	JT-MW-100	JT-MW-200	JT-MW-8
Monitoring Well	Freshwater	Field Dup of JT-5	MW-100	MW-200	MW-8D
Sampling Date	Screening Levels [a]	3/18/14	3/18/14	3/18/14	3/18/14
			12	13	14
1,2,4-Trimethylbenzene		0.2 U	0.2 U	0.2 U	0.2 U
1,2-Dibromo-3-chloropropane		0.5 U	0.5 U	0.5 U	0.5 U
1,2-Dibromoethane		0.2 U	0.2 U	0.2 U	0.2 U
1,2-Dichlorobenzene	1300	0.2 U	0.2 U	5.3	0.2 U
1,2-Dichloroethane		0.2 U	0.2 U	0.2 U	0.2 U
1,2-Dichloropropane		0.2 U	0.2 U	0.2 U	0.2 U
1,3,5-Trimethylbenzene		0.2 U	0.2 U	0.2 U	0.2 U
1,3-Dichlorobenzene	960	0.2 U	0.2 U	1.1	0.2 U
1,3-Dichloropropane		0.2 U	0.2 U	0.2 U	0.2 U
1,4-Dichlorobenzene	190	0.2 U	0.17 T	4	0.2 U
2,2-Dichloropropane		0.2 UJ	0.2 U	0.2 UJ	0.2 UJ
2-Butanone		5 U	5 U	2.6 T	5 U
2-Chloroethylvinylether		1 U	1 U	1 U	1 U
2-Chlorotoluene	4.4	0.2 U	0.2 U	0.2 U	0.2 U
2-Hexanone		5 U	5 U	5 U	5 U
4-Chlorotoluene		0.2 U	0.2 U	0.2 U	0.2 U
4-Isopropyltoluene		0.2 U	4.2	0.2 U	0.2 U
4-Methyl-2-pentanone		5 U	5 U	5 U	5 U
Acetone	6000000**	5 U	33	46	5 U
Acrolein		5 UJ	5 UJ	5 UJ	5 UJ
Acrylonitrile		1 U	1 U	1 U	1 U
Benzene	5****	0.2 U	0.84	1.5	0.2 U
Bromobenzene		0.2 U	0.2 U	0.2 U	0.2 U
Bromochloromethane		0.2 U	0.2 U	0.2 U	0.2 U
Bromodichloromethane		0.2 U	0.2 U	0.2 U	0.2 U
Bromoethane		0.2 U	0.2 U	0.2 U	0.2 U
Bromoform	140	0.2 U	0.2 U	0.2 U	0.2 U
Bromomethane	1500	1 U	1 U	1 U	1 U
Carbon Disulfide	22,600**	0.2 U	0.18 T	0.1 T	0.2 U
Carbon Tetrachloride		0.2 U	0.2 U	0.2 U	0.2 U
CFC-113		0.2 U	0.2 U	0.2 U	0.2 U
Chlorobenzene	1600**	0.2 U	16	1.4	0.28
Chloroethane		0.2 U	0.2 U	0.2 U	0.2 U
Chloroform	470	0.2 U	0.2 U	0.2 U	0.2 U
Chloromethane		0.5 UJ	0.5 UJ	0.5 UJ	0.5 UJ
cis-1,2-Dichloroethene		0.2 U	0.17 T	0.2 U	0.2 U
cis-1,3-Dichloropropene		0.2 U	0.2 U	0.2 U	0.2 U
Dibromochloromethane		0.2 U	0.2 U	0.2 U	0.2 U
Dibromomethane		0.2 U	0.2 U	0.2 U	0.2 U
Ethylbenzene	2100	0.2 U	0.2 U	0.2 U	0.2 U
Hexachlorobutadiene	18	0.5 U	0.5 U	0.5 U	0.5 U
Iodomethane		1 U	1 U	1 U	1 U
Isopropylbenzene		0.2 U	0.2 U	0.2 U	0.2 U
Methyl tert-Butyl Ether		0.5 U	0.13 T	0.5 U	0.5 U
Methylene Chloride	590	1 U	1 U	1 U	1 U
Naphthalene	4938**	0.5 U	0.5 U	0.19 T	0.5 U
n-Butylbenzene		0.2 U	0.2 U	0.2 U	0.2 U
n-Propylbenzene		0.2 U	0.2 U	0.2 U	0.2 U
sec-Butylbenzene		0.2 U	0.2 U	0.2 U	0.2 U
Styrene		0.2 U	0.2 U	0.2 U	0.2 U

Table 3 - Water Sample Analytical Results

Sample ID	MTCA Method B	JT-500	JT-MW-100	JT-MW-200	JT-MW-8
Monitoring Well	Freshwater	Field Dup of JT-5	MW-100	MW-200	MW-8D
Sampling Date	Screening Levels [a]	3/18/14	3/18/14	3/18/14	3/18/14
			12	13	14
tert-Butylbenzene		0.2 U	0.2 U	0.2 U	0.2 U
Tetrachloroethene	3.3	0.2 U	0.2 U	0.2 U	0.2 U
Toluene	15000	0.2 U	0.36	0.62	0.2 U
trans-1,2-Dichloroethene	10000	0.2 U	0.2 U	0.2 U	0.2 U
trans-1,3-Dichloropropene		0.2 U	0.2 U	0.2 U	0.2 U
trans-1,4-Dichloro-2-butene		1 U	1 U	1 U	1 U
Trichloroethene	12.7***	0.2 U	0.2 U	0.2 U	0.2 U
Trichlorofluoromethane		0.2 U	0.2 U	0.2 U	0.2 U
Vinyl Acetate		0.2 U	0.2 U	0.2 U	0.2 U
Vinyl Chloride	2.4	0.2 U	0.58	0.2 U	0.2 U
m, p-Xylene		0.4 U	0.4 U	0.15 T	0.4 U
O-Xylene		0.2 U	0.2 U	0.2 U	0.2 U
Total xylenes	1000****	0.4 U	0.4 U	0.15 T	0.4 U

Notes:
BOLD - Exceeds screening level.
U - Not detected at indicated detection limit.
a - Clean Water Act S304 Freshwater Screening Level for Consumption of Organisms groundwater migration to surface water.
* - National Toxics Rule 40 CFR 131 Freshwater Screening Level for Consumption of Organisms based on groundwater migration to surface water.
** - MTCA Method B, Non-Carcinogen, Surface Water Screening Level, standard formula value.
*** - MTCA Method B, Carcinogen, Surface Water Screening Level, standard formula value.
**** - MTCA Method A Cleanup Levels for Groundwater.
x - Screening level is lower than the method PQL; MTCA detaults the screening level up to the PQL.
T = Value is between the MDL and MRL.
C = The chromatogram indicates the presence of PCBs, not DRO or RRO.
Laboratory reported results were updated to non-detect (U) for DRO/RRO

Table 4 - Sediment Sample Analytical Results

Sample ID	SCO	CSL	JT-SS-01-S1	JT-SS-01-S2	JT-SS-02-S1	JT-SS-03-S1
Sampling Date	Screening	Screening	1/14/14	1/14/14	1/14/14	1/14/14
Depth in feet	Levels	Levels	0 to 1	1 to 2	0 to 1	0 to 1
Conventionals in %						
Total Organic Carbon			3.16	0.293	0.422	0.776
Total Solids			58.42	82.81	85.72	78.76
Metals in mg/kg						
Arsenic	14	120	11.7	4.7	7.1	17.2
Cadmium	2.1	5.4	0.9	0.1 U	0.3	0.3
Chromium	72	88	37.8	19.4	23.8	23.2
Lead	360	1300	108	2.3	17.8	24.3
Mercury	0.66	0.8	0.24 J	0.03 U	0.06	0.12
PCBs in mg/kg						
Aroclor 1016			0.0038 U	0.0038 U	0.0039 U	0.0038 U
Aroclor 1221			0.0038 U	0.0038 U	0.0039 U	0.0038 U
Aroclor 1232			0.0038 U	0.0094 U	0.0039 U	0.0038 U
Aroclor 1242			0.0038 U	0.0038 U	0.0039 U	0.0038 U
Aroclor 1248			0.064	0.0038 U	0.037	0.047 U
Aroclor 1254			0.15	0.0072	0.072	0.29
Aroclor 1260			0.069	0.0081 U	0.024	0.056
Aroclor 1262			0.0038 U	0.0038 U	0.0039 U	0.0038 U
Aroclor 1268			0.0038 U	0.0038 U	0.0039 U	0.0038 U
Total PCBs	0.11	2.5	0.283	0.0072	0.133	0.346
Volatiles in µg/kg						
1,1,1,2-Tetrachloroethane			1.6 U	1.1 U	1.4 U	1.3 U
1,1,1-Trichloroethane			1.6 U	1.1 U	1.4 U	1.3 U
1,1,2,2-Tetrachloroethane			1.6 U	1.1 U	1.4 U	1.3 U
1,1,2-Trichloroethane			1.6 U	1.1 U	1.4 U	1.3 U
1,1-Dichloroethane			1.6 U	1.1 U	1.4 U	1.3 U
1,1-Dichloroethene			1.6 U	1.1 U	1.4 U	1.3 U
1,1-Dichloropropene			1.6 U	1.1 U	1.4 U	1.3 U
1,2,3-Trichlorobenzene			7.9 U	5.3 U	6.8 U	6.3 U
1,2,3-Trichloropropane			3.1 U	2.1 U	2.7 U	2.5 U
1,2,4-Trichlorobenzene			7.9 U	5.3 U	6.8 U	6.3 U
1,2,4-Trimethylbenzene			1.6 U	1.1 U	1.4 U	1.3 U
1,2-Dibromo-3-chloropropane			7.9 U	5.3 U	6.8 U	6.3 U
1,2-Dibromoethane			1.6 U	1.1 U	1.4 U	1.3 U
1,2-Dichlorobenzene			1.6 U	1.1 U	1.4 U	1.3 U
1,2-Dichloroethane			1.6 U	1.1 U	1.4 U	1.3 U
1,2-Dichloropropane			1.6 U	1.1 U	1.4 U	1.3 U
1,3,5-Trimethylbenzene			1.6 U	1.1 U	1.4 U	1.3 U
1,3-Dichlorobenzene			1.6 U	1.1 U	1.4 U	2
1,3-Dichloropropane			1.6 U	1.1 U	1.4 U	1.3 U
1,4-Dichlorobenzene			1.6 U	1.1 U	1.4 U	1.4
2,2-Dichloropropane			1.6 U	1.1 U	1.4 U	1.3 U
2-Butanone			7.9 U	3.3 T	6.8 U	6.3 U
2-Chloroethylvinylether			7.9 U	5.3 U	6.8 U	6.3 U
2-Chlorotoluene			1.6 U	1.1 U	1.4 U	1.3 U
2-Hexanone			7.9 U	5.3 U	6.8 U	6.3 U
4-Chlorotoluene			1.6 U	1.1 U	1.4 U	1.3 U
4-Isopropyltoluene			1.6 U	1.1 U	1.4 U	1.3 U
4-Methyl-2-pentanone			7.9 U	5.3 U	6.8 U	6.3 U
Acetone			35	27	28	32
Acrolein			79 U	53 U	68 U	63 U
Acrylonitrile			7.9 U	5.3 U	6.8 U	6.3 U
Benzene			1.6 U	0.7 T	0.9 T	1.2 T
Bromobenzene			1.6 U	1.1 U	1.4 U	1.3 U
Bromochloromethane			1.6 U	1.1 U	1.4 U	1.3 U
Bromodichloromethane			1.6 U	1.1 U	1.4 U	1.3 U

Table 4 - Sediment Sample Analytical Results

Sample ID	SCO	CSL	JT-SS-01-S1	JT-SS-01-S2	JT-SS-02-S1	JT-SS-03-S1
Sampling Date	Screening	Screening	1/14/14	1/14/14	1/14/14	1/14/14
Depth in feet	Levels	Levels	0 to 1	1 to 2	0 to 1	0 to 1
Bromoethane			3.1 U	2.1 U	2.7 U	2.5 U
Bromoform			1.6 U	1.1 U	1.4 U	1.3 U
Bromomethane			1.6 UJ	1.1 UJ	1.4 UJ	1.3 UJ
Carbon Disulfide			4.5	9.9	3.6	2.3
Carbon Tetrachloride			1.6 U	1.1 U	1.4 U	1.3 U
CFC-113			3.1 U	2.1 U	2.7 U	2.5 U
Chlorobenzene			1.6 U	1.1 U	1.4 U	1.2 T
Chloroethane			1.6 U	1.1 U	1.4 U	1.3 U
Chloroform			1.6 U	1.1 U	1.4 U	1.3 U
Chloromethane			1.6 U	1.1 U	1.4 U	1.3 U
cis-1,2-Dichloroethene			1.6 U	0.6 T	1.4 U	1.3 U
cis-1,3-Dichloropropene			1.6 U	1.1 U	1.4 U	1.3 U
Dibromochloromethane			1.6 U	1.1 U	1.4 U	1.3 U
Dibromomethane			1.6 U	1.1 U	1.4 U	1.3 U
Ethylbenzene			1.6 U	1.1 U	1.4 U	1.3 U
Hexachlorobutadiene			7.9 U	5.3 U	6.8 U	6.3 U
Iodomethane			1.6 U	1.1 U	1.4 U	1.3 U
Isopropylbenzene			1.6 U	1.1 U	1.4 U	1.3 U
m, p-Xylene			1.6 U	1.1 U	1.4 U	1.3 U
Methyl tert-Butyl Ether			1.6 U	1.1 U	1.4 U	1.3 U
Methylene Chloride			3.4 U	2.8 U	3.9 U	2.5 U
Naphthalene			7.9 U	5.3 U	6.8 U	6.3 U
n-Butylbenzene			1.6 U	1.1 U	1.4 U	1.3 U
n-Propylbenzene			1.6 U	1.1 U	1.4 U	1.3 U
O-Xylene			1.6 U	1.1 U	1.4 U	1.3 U
sec-Butylbenzene			1.6 U	1.1 U	1.4 U	1.3 U
Styrene			1.6 U	1.1 U	1.4 U	1.3 U
tert-Butylbenzene			1.6 U	1.1 U	1.4 U	1.3 U
Tetrachloroethene			1.6 U	1.1 U	1.4 U	1.3 U
Toluene			1 T	0.7 T	1.4 U	0.7 T
trans-1,2-Dichloroethene			1.6 U	1.1 U	1.4 U	1.3 U
trans-1,3-Dichloropropene			1.6 U	1.1 U	1.4 U	1.3 U
trans-1,4-Dichloro-2-butene			7.9 U	5.3 U	6.8 U	6.3 U
Trichloroethene			1.6 U	1.1 U	1.4 U	1.3 U
Trichlorofluoromethane			1.6 U	1.1 U	1.4 U	1.3 U
Vinyl Acetate			7.9 U	5.3 U	6.8 U	6.3 U
Vinyl Chloride			1.6 U	1.1 U	1.4 U	1.3 U

Table 4 - Sediment Sample Analytical Results

Sample ID Sampling Date Depth in feet	SCO Screening Levels	CSL Screening Levels	JT-SS-03-S2 1/14/14 1 to 1.5	JT-SS-04-S1 1/14/14 0 to 1	JT-SS-05-S1 1/14/14 0 to 1	JT-SS-05-S2 1/14/14 1 to 2
Conventionals in %						
Total Organic Carbon			0.178	1.13	3.48	1.62
Total Solids			84.85	82.92	71.48	77.35
Metals in mg/kg						
Arsenic	14	120	12.5	71.8	23.5	13
Cadmium	2.1	5.4	0.1 U	0.7	0.8	0.6
Chromium	72	88	20.8	30.8	32.2	29.6
Lead	360	1300	4.7	68.2	126	115
Mercury	0.66	0.8	0.02 U	0.08	0.21	0.34
PCBs in mg/kg						
Aroclor 1016			0.0039 U	0.004 U	0.0039 U	0.0039 U
Aroclor 1221			0.0039 U	0.004 U	0.0039 U	0.0039 U
Aroclor 1232			0.0039 U	0.004 U	0.0039 U	0.0039 U
Aroclor 1242			0.0039 U	0.004 U	0.0039 U	0.0039 U
Aroclor 1248			0.0077 U	0.013	0.082	0.15
Aroclor 1254			0.046	0.029 JP	0.14	0.16
Aroclor 1260			0.012 U	0.016	0.07	0.095
Aroclor 1262			0.0039 U	0.004 U	0.0039 U	0.0039 U
Aroclor 1268			0.0039 U	0.004 U	0.0039 U	0.0039 U
Total PCBs	0.11	2.5	0.046	0.058 J	0.292	0.405
Volatiles in µg/kg						
1,1,1,2-Tetrachloroethane			1.1 U	1.2 U	2.2 U	1.4 U
1,1,1-Trichloroethane			1.1 U	1.2 U	2.2 U	1.4 U
1,1,2,2-Tetrachloroethane			1.1 U	1.2 U	2.2 U	1.4 U
1,1,2-Trichloroethane			1.1 U	1.2 U	2.2 U	1.4 U
1,1-Dichloroethane			1.1 U	1.2 U	2.2 U	1.4 U
1,1-Dichloroethene			1.1 U	1.2 U	2.2 U	1.4 U
1,1-Dichloropropene			1.1 U	1.2 U	2.2 U	1.4 U
1,2,3-Trichlorobenzene			5.6 U	5.9 U	11 U	6.8 U
1,2,3-Trichloropropane			2.2 U	2.4 U	4.5 U	2.7 U
1,2,4-Trichlorobenzene			5.6 U	5.9 U	11 U	6.8 U
1,2,4-Trimethylbenzene			1.1 U	1.2 U	1.4 T	1.4 U
1,2-Dibromo-3-chloropropane			5.6 U	5.9 U	11 U	6.8 U
1,2-Dibromoethane			1.1 U	1.2 U	2.2 U	1.4 U
1,2-Dichlorobenzene			1.1 U	1.2 U	2.2 U	1.4 U
1,2-Dichloroethane			1.1 U	1.2 U	2.2 U	1.4 U
1,2-Dichloropropane			1.1 U	1.2 U	2.2 U	1.4 U
1,3,5-Trimethylbenzene			1.1 U	1.2 U	2.2 U	1.4 U
1,3-Dichlorobenzene			1.1 U	1.6	1.6 T	1.4 U
1,3-Dichloropropane			1.1 U	1.2 U	2.2 U	1.4 U
1,4-Dichlorobenzene			1.1 U	0.9 T	2.2 U	1.4 U
2,2-Dichloropropane			1.1 U	1.2 U	2.2 U	1.4 U
2-Butanone			5.6 U	5.9 U	16	4 T
2-Chloroethylvinylether			5.6 U	5.9 U	11 U	6.8 U
2-Chlorotoluene			1.1 U	1.2 U	2.2 U	1.4 U
2-Hexanone			5.6 U	5.9 U	11 U	6.8 U
4-Chlorotoluene			1.1 U	1.2 U	2.2 U	1.4 U
4-Isopropyltoluene			1.1 U	1.2 U	2.2 U	0.8 T
4-Methyl-2-pentanone			5.6 U	5.9 U	11 U	6.8 U
Acetone			20	20	110	28
Acrolein			56 U	59 U	110 U	68 U
Acrylonitrile			5.6 U	5.9 U	11 U	6.8 U
Benzene			1.1 T	1.2 U	2.2 T	1.4 U
Bromobenzene			1.1 U	1.2 U	2.2 U	1.4 U
Bromochloromethane			1.1 U	1.2 U	2.2 U	1.4 U
Bromodichloromethane			1.1 U	1.2 U	2.2 U	1.4 U

Table 4 - Sediment Sample Analytical Results

Sample ID	SCO	CSL	JT-SS-03-S2	JT-SS-04-S1	JT-SS-05-S1	JT-SS-05-S2
Sampling Date	Screening	Screening	1/14/14	1/14/14	1/14/14	1/14/14
Depth in feet	Levels	Levels	1 to 1.5	0 to 1	0 to 1	1 to 2
Bromoethane			2.2 U	2.4 U	4.5 U	2.7 U
Bromoform			1.1 U	1.2 U	2.2 U	1.4 U
Bromomethane			1.1 UJ	1.2 UJ	2.2 UJ	1.4 UJ
Carbon Disulfide			3.1	7	4.2	2.3
Carbon Tetrachloride			1.1 U	1.2 U	2.2 U	1.4 U
CFC-113			2.2 U	2.4 U	4.5 U	2.7 U
Chlorobenzene			1.1 U	0.7 T	1.5 T	1.4 U
Chloroethane			1.1 U	1.2 U	2.2 U	1.4 U
Chloroform			1.1 U	1.2 U	2.2 U	1.4 U
Chloromethane			1.1 U	1.2 U	2.2 U	1.4 U
cis-1,2-Dichloroethene			0.7 T	1.2 U	2.2 U	1.4 U
cis-1,3-Dichloropropene			1.1 U	1.2 U	2.2 U	1.4 U
Dibromochloromethane			1.1 U	1.2 U	2.2 U	1.4 U
Dibromomethane			1.1 U	1.2 U	2.2 U	1.4 U
Ethylbenzene			1.1 U	1.2 U	2.2 U	1.4 U
Hexachlorobutadiene			5.6 U	5.9 U	11 U	6.8 U
Iodomethane			1.1 U	1.2 U	2.2 U	1.4 U
Isopropylbenzene			1.1 U	1.2 U	2.2 U	1.4 U
m, p-Xylene			1.1 U	1.2 U	2.2 U	1.4 U
Methyl tert-Butyl Ether			1.1 U	1.2 U	2.2 U	1.4 U
Methylene Chloride			2.8 U	3 U	4.5 U	2.7 U
Naphthalene			5.6 U	5.9 U	11 U	6.8 U
n-Butylbenzene			1.1 U	1.2 U	2.2 U	1.4 U
n-Propylbenzene			1.1 U	1.2 U	2.2 U	1.4 U
O-Xylene			1.1 U	1.2 U	2.2 U	1.4 U
sec-Butylbenzene			1.1 U	1.2 U	2.2 U	1.4 U
Styrene			1.1 U	1.2 U	2.2 U	1.4 U
tert-Butylbenzene			1.1 U	1.2 U	2.2 U	1.4 U
Tetrachloroethene			0.6 T	1.2 U	2.2 U	1.4 U
Toluene			1.1 U	1.2 U	2.8	0.8 T
trans-1,2-Dichloroethene			1.1 U	1.2 U	2.2 U	1.4 U
trans-1,3-Dichloropropene			1.1 U	1.2 U	2.2 U	1.4 U
trans-1,4-Dichloro-2-butene			5.6 U	5.9 U	11 U	6.8 U
Trichloroethene			1.1 U	1.2 U	2.2 U	1.4 U
Trichlorofluoromethane			1.1 U	1.2 U	2.2 U	1.4 U
Vinyl Acetate			5.6 U	5.9 U	11 U	6.8 U
Vinyl Chloride			1.1 U	1.2 U	2.2 U	1.4 U

U = Not detected at the reporting limit indicated.
J = Estimated value.
T = Value is between the MDL and MRL.
P = Confirmation criteria exceeded. Relative percent difference is greater than 40 percent between the two analytical results.
Boxed value exceeds Ecology sediment management standards (SMS) sediment cleanup objective (SCO) screening level.
CSL - Cleanup Screening Level

Table 5 – Potential Applicable or Relevant and Appropriate Requirements

Authority	Resource	Implementing Laws/Regulations	ARAR?	Applicability
Contaminant-Specific ARARs				
State	Soil	Washington State Model Toxics Control Act [RCW 70.105D; Chapter 173-340 WAC]	Yes	The Model Toxics Control Act (MTCA) soil cleanup levels are applicable.
State	Groundwater	Washington State Model Toxics Control Act [RCW 70.105D; Chapter 173-340 WAC]	Yes	The Model Toxics Control Act (MTCA) groundwater cleanup levels are applicable.
State	Sediment	Washington State Model Toxics Control Act [RCW 70.105D; Chapter 173-204 WAC]	Yes	The Sediment Management Standards are applicable.
Action-Specific ARARs				
Federal	Soil and Groundwater	Federal Toxic Substances Control Act [15 U.S.C. § 2601; 40 CFR 761]	Yes	The TSCA program regulates PCB remedial actions and disposal. EPA will need to grant approval of the Interim Action and waste material must be disposed of per TSCA regulations.
Federal/ State	Surface Water	Federal Water Pollution Control Act--National Pollution Discharge Elimination System [Clean Water Act; 33 USC § 1342, Section 402] and Implementing Regulations Washington State Construction Stormwater General Permit [RCW 90.48]	Yes	The NPDES program establishes requirements for point source discharges, including stormwater runoff. These requirements would be applicable for any point source discharge of stormwater during construction or following cleanup.
Federal	Surface Water	Federal Water Pollution Control Act--Water Quality Certification [Clean Water Act; 33 USC § 1341, Section 401] and Implementing Regulations	No	Section 401 of the CWA provides that applicants for a permit to conduct any activity involving potential discharges into waters or wetlands shall obtain certification from the state that discharges will comply with applicable water quality standards. No discharges are expected to waters or wetlands of the state.
State	Surface Water	Hydraulic Code [RCW 77.55; Chapter 220-110 WAC]	No	The Hydraulic Code requires that any construction activity that uses, diverts, obstructs, or changes the bed or flow of state waters must be done under the terms of a Hydraulics Project Approval permit issued by Washington State Department of Fish and Wildlife (WDFW). These activities are not expected for the proposed alternatives.
Federal	Surface Water and Wetlands	Federal Water Pollution Control Act--Discharge of Dredge and Fill Materials [Clean Water Act; 33 USC § 1344, Section 404] and Implementing Regulations	No	Section 404 of the CWA establishes a program to regulate the discharge of dredged and fill materials into the waters of the United States, including wetlands. These activities are not expected for the proposed alternatives.
Federal/ State	Solid Waste	Transportation of Hazardous Materials [49 CFR Parts 105 to 177] [Chapter 446-50 WAC]	Yes	Transportation of hazardous waste or materials is required to meet state and federal requirements. This requirement is potentially applicable to alternatives that involve the off-site transport of impacted soil.

Table 5 – Potential Applicable or Relevant and Appropriate Requirements

Authority	Resource	Implementing Laws/Regulations	ARAR?	Applicability
Federal/ State	Solid waste	Resource Conservation and Recovery Act [42 USC § 6901 et seq.], Subtitle C – Hazardous Waste Management [40 CFR Parts 260 to 279] Dangerous Waste Regulations [Chapter 173-303 WAC]	Yes	Subtitle C of the Resource Conservation and Recovery Act (RCRA) pertains to the management of hazardous waste. Off-site disposal of impacted soil meeting hazardous waste criteria may require disposal at a Subtitle C landfill. These requirements are applicable to the remediation alternatives that involve off-site disposal of impacted soil.
Federal	Solid Waste	Resource Conservation and Recovery Act [42 USC § 6901 et seq.], Subtitle D – Managing Municipal and Solid Waste [40 CFR Parts 257 and 258]	Yes	Subtitle D of RCRA establishes a framework for management of non-hazardous solid waste. These regulations establish guidelines and criteria from which states develop solid waste regulations. These requirements are applicable to the remediation alternatives that involve off-site disposal of impacted soil.
State	Solid Waste	Washington State Solid Waste Handling Standards [RCW 70.95; Chapter 173-350 WAC]	Yes	Washington State Solid Waste Handling Standards apply to facilities and activities that manage solid waste. The regulations set minimum functional performance standards for proper handling and disposal of solid waste; describe responsibilities of various entities; and stipulate requirements for solid waste handling facility location, design, construction, operation, and closure. These requirements are applicable to remediation alternatives that involve off-site disposal of impacted soil.
Federal/ State	Solid Waste	Land Disposal Restrictions [40 CFR Part 268] [Chapter 173-303-140 WAC]	Yes	Best management practices for dangerous wastes are required to meet state and federal requirements. These requirements are applicable to the remediation alternatives that involve off-site disposal of soil classified as dangerous waste.
Federal	Air	Clean Air Act [42 USC § 7401 et seq.; 40 CFR Part 50]	Yes	The federal Clean Air Act creates a national framework designed to protect ambient air quality by limiting air emissions.
State	Air	Washington Clean Air Act and Implementing Regulations [Chapter 173-400-040(8) WAC]	Yes	These regulations require the owner or operator of a source of fugitive dust to take reasonable precautions to prevent fugitive dust from becoming airborne and to maintain and operate the source to minimize emissions. These regulations are applicable to all alternatives during construction.
State	Groundwater	Minimum Standards for Construction and Maintenance of Water Wells [RCW 18.104; Chapter 173-160 WAC]	Yes	Washington State has developed minimum standards for constructing water and monitoring wells, and for the decommissioning of wells. These regulations are applicable to all alternatives prior to construction.
Federal	Endangered Species, Critical Habitats	Endangered Species Act [16 USC §§ 1531 - 1544] and Implementing Regulations	No	The Endangered Species Act (ESA) protects species of fish, wildlife, and plants that are listed as threatened or endangered with extinction. It also protects designated critical habitat for listed species. The ESA outlines procedures for federal agencies to follow when taking actions that may jeopardize listed species, including consultation with resource agencies. No threatened or endangered species or habitat areas are expected to be impacted by the remediation alternatives.

Table 5 – Potential Applicable or Relevant and Appropriate Requirements

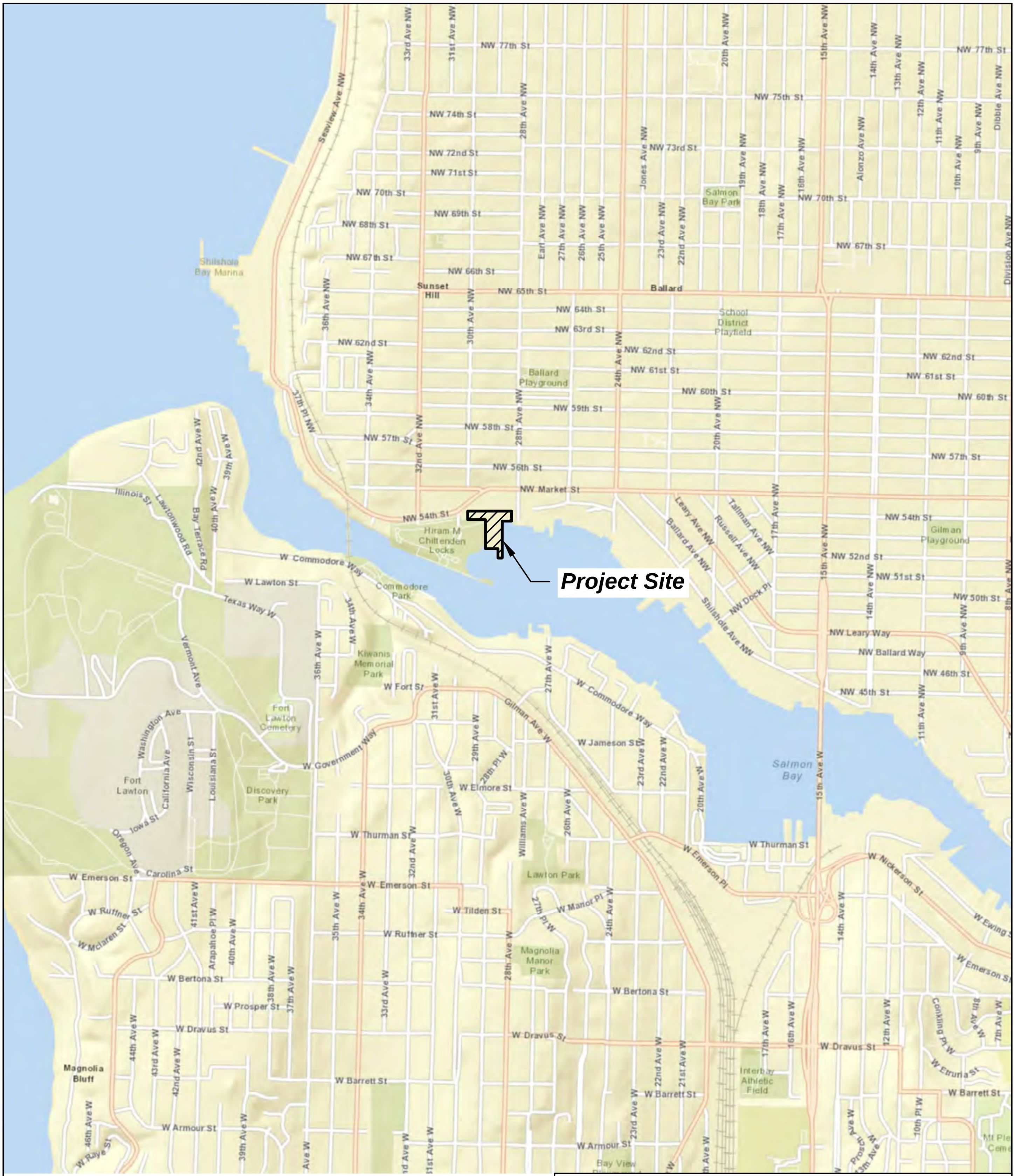
Authority	Resource	Implementing Laws/Regulations	ARAR?	Applicability
State	Remedy Construction	Washington Industrial Safety and Health Act [RCW 49.17; Chapter 296-24 WAC]	Yes	Site worker and visitor health and safety requirements established by the Washington Industrial Safety and Health Act are to be met during implementation of the remedial action.
Local	Remedy Construction	Local Ordinances	Yes	Appropriate substantive requirements are to be met for implementation of the remedial action.
Location-Specific ARARs				
State	Aquatic Lands	Aquatic Lands Management – Washington State [RCW 79.90; Chapter 332-30 WAC]	No	The Aquatic Lands Management law develops criteria for managing state-owned aquatic lands. Aquatic lands are to be managed to promote uses and protect resources as specified in the regulations. The area of concern (AOC) to which the remediation alternatives apply is not on aquatic lands.
State	Public Lands	Public Lands Management [RCW 79.02]	No	Activities on public lands are restricted, regulated, or proscribed. The remediation alternatives do not occur on public lands.
Federal/ State	Historic Areas	Archaeological and Historic Preservation Act [16 USC § 469, 470 et seq.; 36 CFR Parts 65 and 800] [RCW 24.34, 27.44, 27.48, and 27.53; Chapters 25-46 and 25-48 WAC]	No	Actions must be taken to preserve and recover significant artifacts, preserve historic and archaeological properties and resources, and minimize harm to national landmarks. There are no known historic or archaeological sites in the vicinity of the AOC.
State	Shorelines and Surface Water	Shoreline Management Act of 1971 [RCW 90.58] and Implementing Regulations	Yes	Actions are prohibited within 200 feet of shorelines of statewide significance unless permitted. Remediation alternatives occur within 200 feet of the Lake Washington Ship Canal.
State	Wetlands	Shoreline Management Act of 1971 [RCW 90.58] and Implementing Regulations	No	The construction or management of property in wetlands is required to minimize potential harm, avoid adverse effects, and preserve and enhance wetlands. The remediation alternatives do not occur within delineated wetlands.

Table 8 - Disproportionate Cost Analysis

DCA Criteria	Alternative 1: *In Situ* Solidification/Stabilization	Alternative 2: Excavation and Off-Site Disposal
Protectiveness	Solidification of hazardous substances would immobilize contaminants eliminating the direct contact risks to humans and the migration to groundwater and surface water in the treatment area. Groundwater flow patterns may be disturbed and may limit effectiveness of the zero-valent iron/granular activated carbon wall on impacts from sources outside of the treatment area. Alternative 1 is considered less protective than Alternative 2.	Removal of hazardous substances would eliminate direct contact risks to humans and the soil to groundwater pathway in the treatment area. Alternative 2 is considered more protective than Alternative 1.
Permanence	Provides no reduction in toxicity or volume of contaminants. Risk of contaminant mobility would be greatly reduced by solidification. Institutional controls may be required. Alternative 1 is considered less permanent than Alternative 2.	Provides no reduction in toxicity or volume of contaminants. Risk of contaminant mobility would be greatly reduced by removing the waste and placing it in an off-site engineered, lined, and monitored facility. Alternative 2 is considered more permanent than Alternative 1.
Cost	$1.56 million (treatment of PCB >1 mg/kg) $1.35 million (treatment of PCB >10 mg/kg)	$3.5 million (treatment of PCB >1 mg/kg) $2.9 million (treatment of PCB >10 mg/kg)
Effectiveness over the Long Term	Solidification is proven and expected to be effective over the long term. Changes in groundwater flow patterns may reduce the effectiveness of the existing treatment wall. Alternative 1 is considered less effective over the long term than Alternative 2.	Subtitle C and D landfills are proven and expected to be effective over the long term. Alternative 2 is considered more effective over the long term than Alternative 1.

Table 8 - Disproportionate Cost Analysis

DCA Criteria	**Alternative 1: *In Situ* Solidification/Stabilization**	**Alternative 2: Excavation and Off-Site Disposal**
Management of Short-Term Risks	Short-term risks are expected to be minimal. Risks can be managed by following construction health and safety plan, using property licensed contractors, etc. Alternative 1 is considered to have fewer short-term risks than Alternative 2.	Short-term risks are expected to be minimal and primarily associated with limited waste excavation and over-the-road transport to landfill. Risks will be managed by following construction health and safety plan, implementing dust suppression measures, using properly licensed material haulers, etc. Alternative 2 is considered to have greater short-term risks than Alternative 1.
Technical and Administrative Implementability	A treatability study would be required to determine the appropriate solidification mixture for the site. Alternatives 1 and 2 are considered equally implementable.	Aquifer testing will be required for dewatering analysis. Alternatives 1 and 2 are considered equally implementable.
Consideration of Public Concerns	Consideration of Public Concerns is not being evaluated as part of this document.	



Source: Base map prepared from ArcGIS Online, 2013.

N

0 2000 4000

Approximate Scale in Feet

Jacobson Terminals
Seattle, Washington

Vicinity Map

17800-43

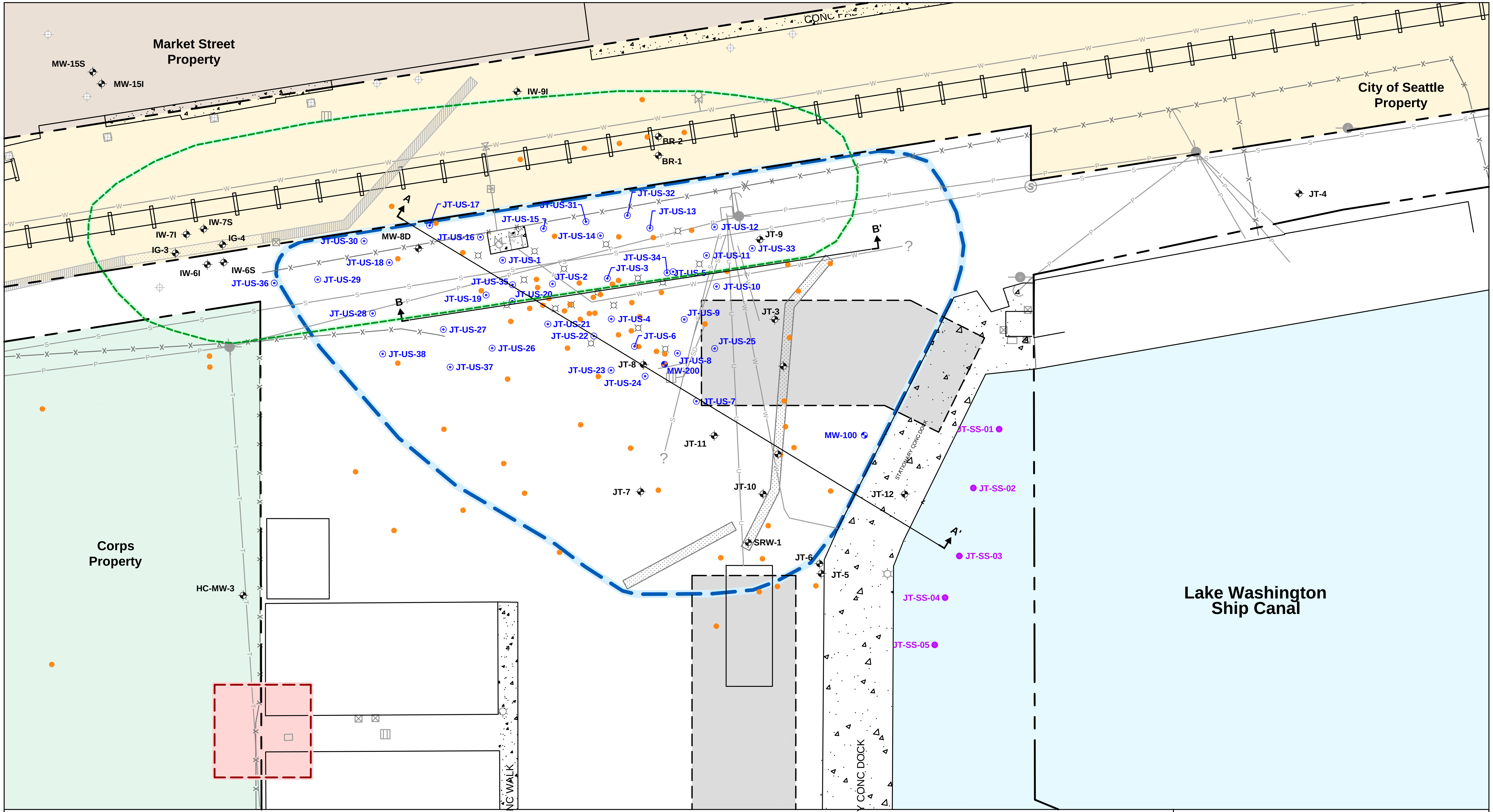
6/14

HARTCROWSER

Figure

1

EAL 06/18/14 1780043-001.dwg



Existing Monitoring Well

Former Monitoring Well, Recovery Well, or Piezometer (Abandoned)

Injection Well

● Pre-RI Soil Boring

Note: Labels removed from several borings in "IP" area for clarity. Refer to "Interim Cleanup Action Summary", Hart Crowser, July 18, 2002.

Property Boundary

Concrete Surface

Cement-Bentonite Groundwater Treatment Wall

Permeable Iron/Sand Gate

Overhead Power

Sanitary Sewer Line

Water Line

Utility Line

A A' Cross Section Location and Designation

Iron/GAC Groundwater Treatment Wall

Boat Storage Rack

Notes:

1. Base map prepared from AutoCAD file "020030-02.dwg," provided by Aspect Consulting, 10/08/13.
2. Utility locations are approximate.

JT-SS-01 ● Sediment Sampling Location and Number

JT-US-1 ⦿ Push Probe Sampling Location and Number

PCB and Chlorinated Benzene Area

Petroleum Area

Chlorinated Ethene Area

0 15 30

Scale in Feet

N

Jacobson Terminals
Seattle, Washington

Exploration Location Plan

17800-43 6/14

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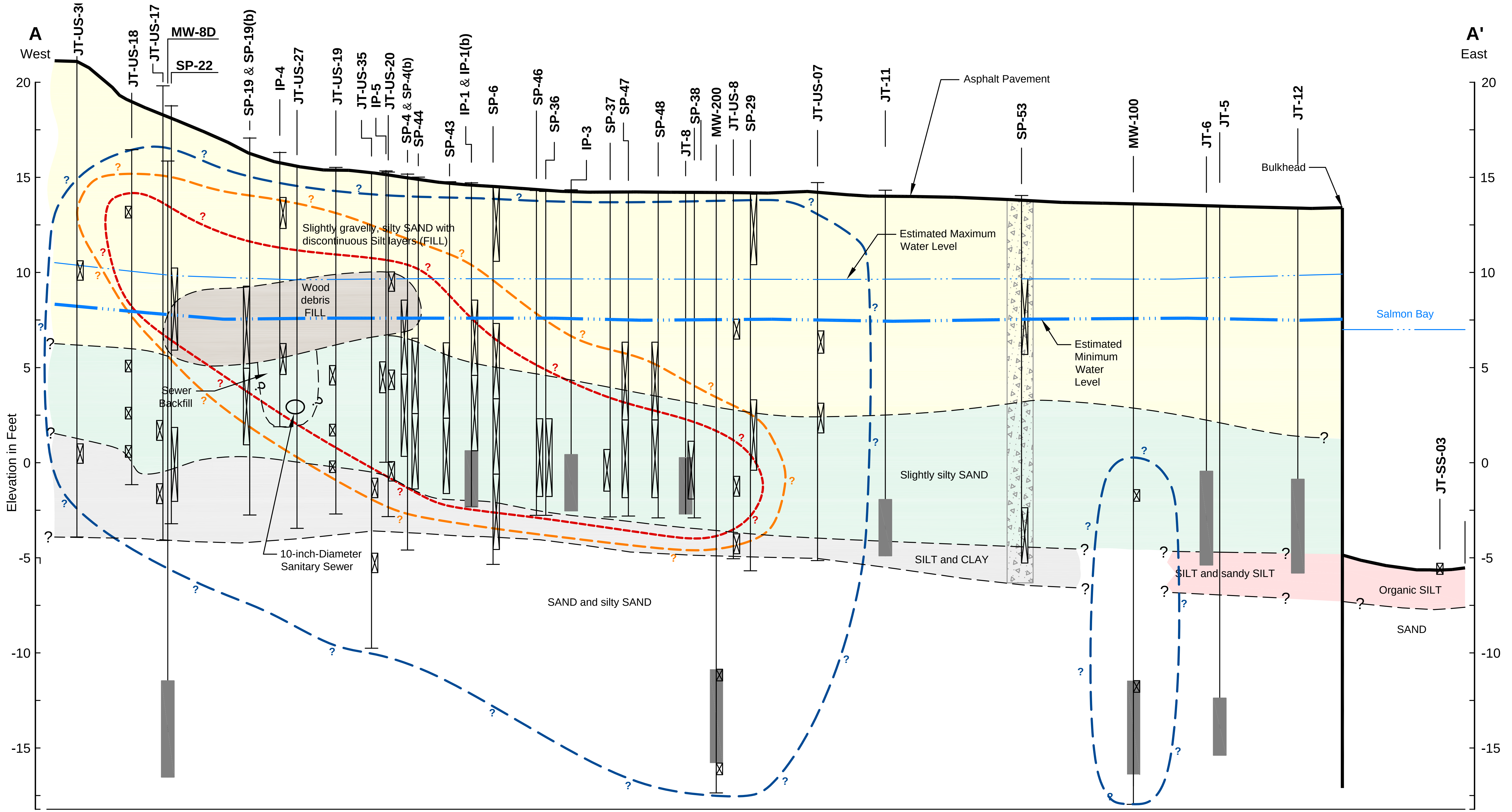
Figure

2

EAL 06/12/14 1780043-029.dwg



MW-8D Selected Exploration

Sample

Screened Interval

? Approximate Area of PCB Concentrations above Method A Industrial Cleanup (10 mg/kg)

? Approximate Area of PCB Concentrations above Method A Unrestricted Cleanup Level (1 mg/kg)

? Approximate Area of PCB Concentrations above Method B Surface Water Protection Screening Level (0.000079 mg/kg) and PQL

Iron/GAC Groundwater Treatment Wall

? — — — Geologic Contact (Approximate)

Horizontal Scale in Feet
0 15 30

0 5 10
Vertical Scale in Feet
Vertical Exaggeration x 3

Notes:
1. Contacts between soil units are based upon interpolation between borings and represent our interpretation of subsurface conditions based on currently available data.
2. Cross section developed from AutoCAD files provided by Aspect, dated 12/2005.
3. Elevation shown in City of Seattle vertical datum.

Jacobson Terminals
Seattle, Washington

Generalized Geologic Cross Section A-A'

17800-43 6/14

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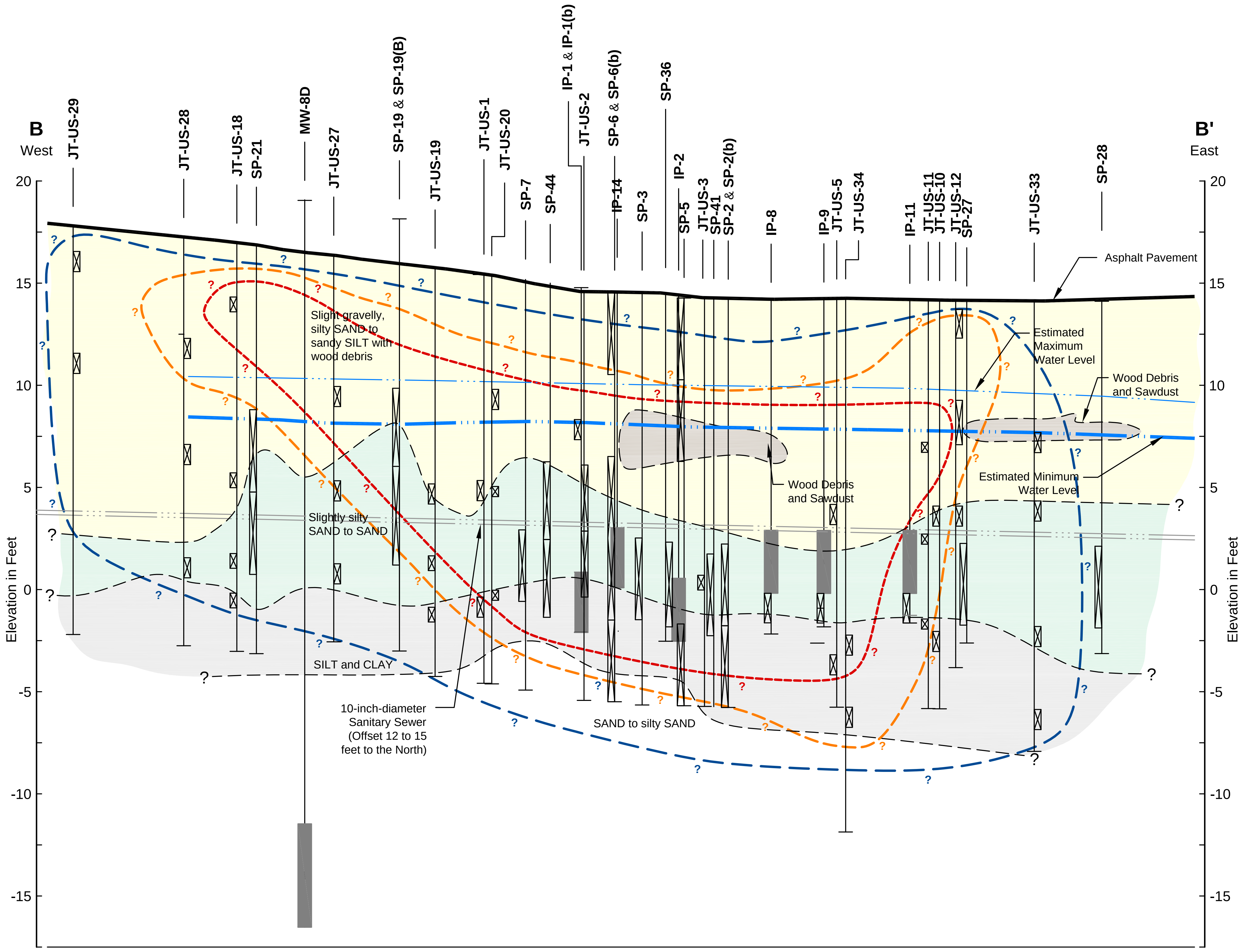
Figure
3

EAL 06/18/14 17800043-030.dwg



?— — — Geologic Contact (Approximate)

SP-3 Selected Exploration

☒ Sample

▮ Screened Interval

?🟥? Approximate Area of PCB Concentrations above Method A Industrial Cleanup (10 mg/kg)

?🟧? Approximate Area of PCB Concentrations above Method A Unrestricted Cleanup Level (1 mg/kg)

?🟦? Approximate Area of PCB Concentrations above Method B Surface Water Protection Screening Level (0.000079 mg/kg) and PQL

Horizontal Scale in Feet
0 15 30
0 5 10
Vertical Scale in Feet
Vertical Exaggeration x 3

Notes:

1. Contacts between soil units are based upon interpolation between borings and represent our interpretation of subsurface conditions based on currently available data.
2. Cross section developed from AutoCAD files provided by Aspect, dated 12/2005.
3. Elevations shown in City of Seattle vertical datum.

Jacobson Terminals
Seattle, Washington

Generalized Geologic Cross Section B-B'

17800-43 6/14

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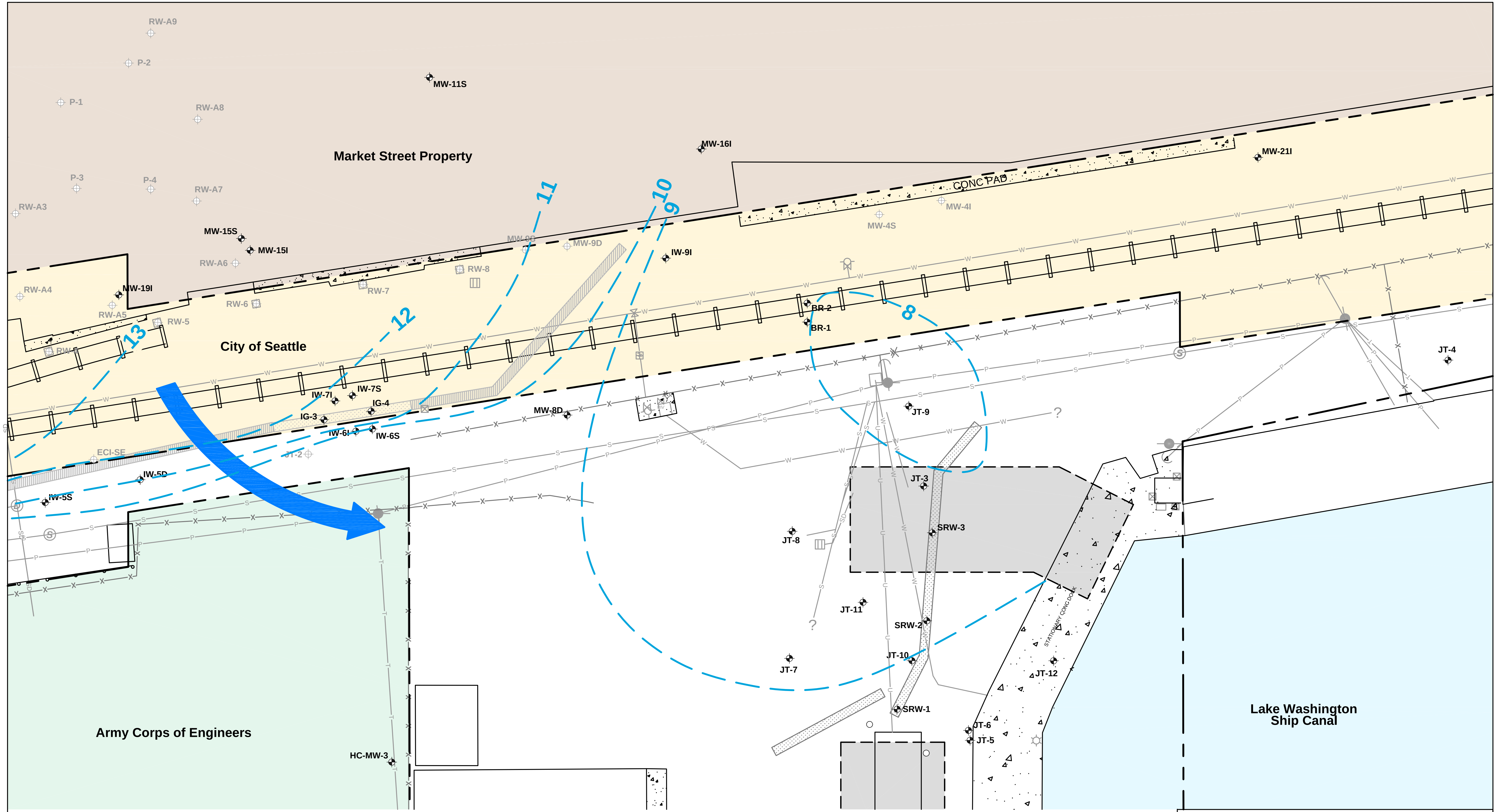
Figure
4

EAL 06/18/14 1780043-030.dwg



MW-18S Existing Monitoring Well

RW-2 Former Monitoring Well, Recovery Well, or Piezometer (Abandoned)

Property Boundary

Concrete Surface

Cement-Bentonite Ground-water Treatment Wall

Permeable Iron/Sand Gate

—P— Overhead Power

—S— Sanitary Sewer Line

—W— Water Line

—U— Utility Line

Iron/GAC Groundwater Treatment Wall

Boat Storage Rack

11 Groundwater Elevation Contour

Inferred Groundwater Gradient

Notes:

1. Base map prepared from AutoCAD file "020030-02.dwg," provided by Aspect Consulting, 10/08/13.
2. Utility locations are approximate.
3. Groundwater data from VCP Cleanup Status Report Memorandum prepared by Aspect Consulting, 12/12/05.

0 30 60
Scale in Feet

N

Jacobson Terminals
Seattle, Washington

Groundwater Elevation Contours April 2005

17800-43 6/14

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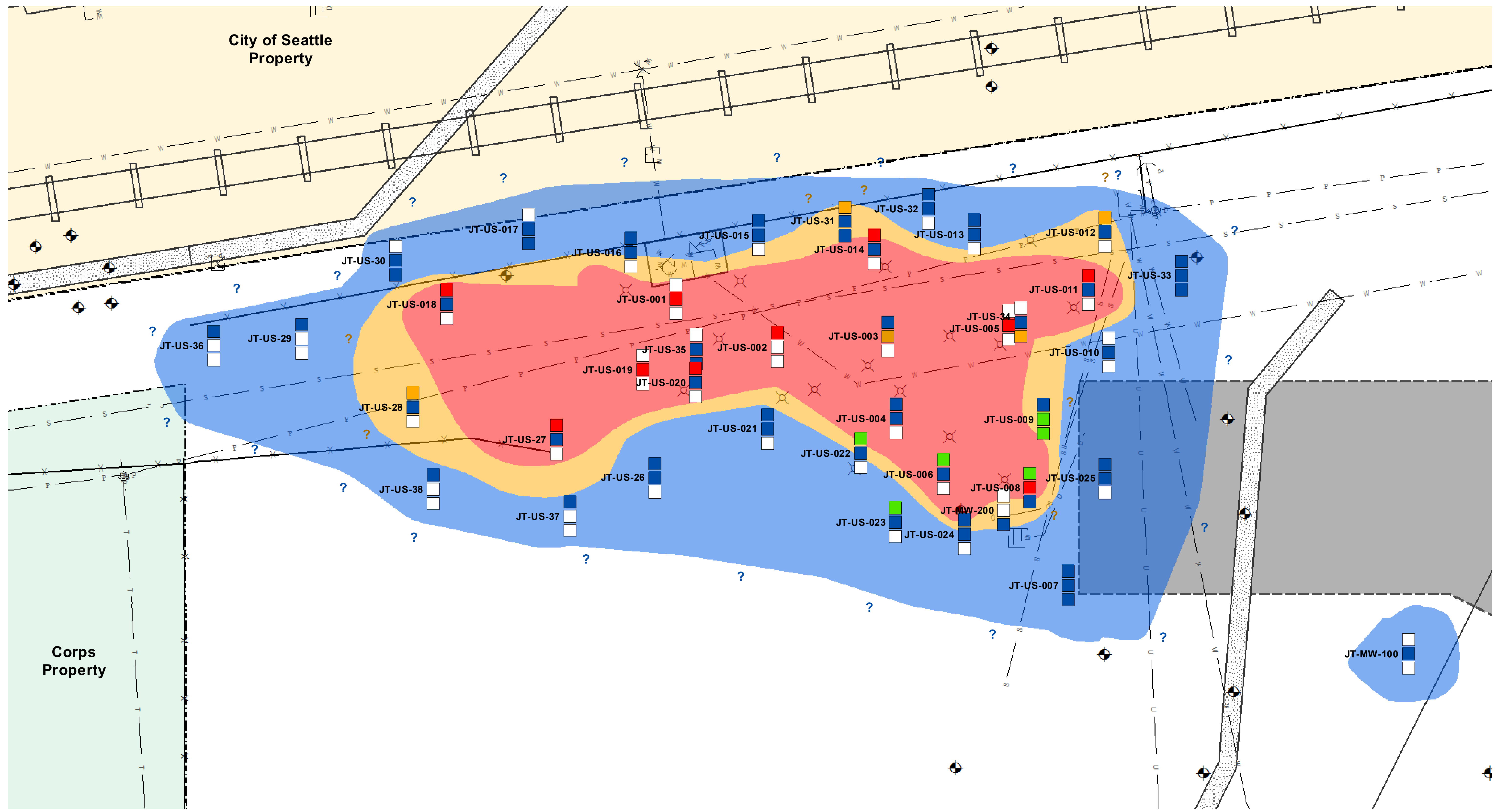
Figure
5

EAL 06/18/14 1780043-012.dwg



🟦 Above Method B Surface Water Protection Screening Level (0.0000787 mg/kg)

🟧 Above Method A (1 mg/kg)

🟥 Above Method A Industrial (10 mg/kg)

🟩 Non-detect

☐ No Data

Injection Well

Exisiting Monitoring Wells

Treatment Wall

Boat Storage Rack

Fence Line

Property Boundary

U Utility Line

W Water Line

S Sanitary Sewer Line

P Overhead Power

Exploration ID

JT-US-038

Depth Interval with Highest PCB Concentration Displayed

🟦 0 to 10 feet bgs

🟧 10 to 18 feet bgs

🟥 Below 18 feet bgs

0 15 30

Scale in Feet

N

Notes:
1. Base map prepared from AutoCAD file 020030-02.dwg by Aspect Consulting, 10/08/13.
2. Utility locations are approximate.

Jacobson Terminals
Seattle, Washington

2014 PCB Occurrences in Soil

17800-43 6/14

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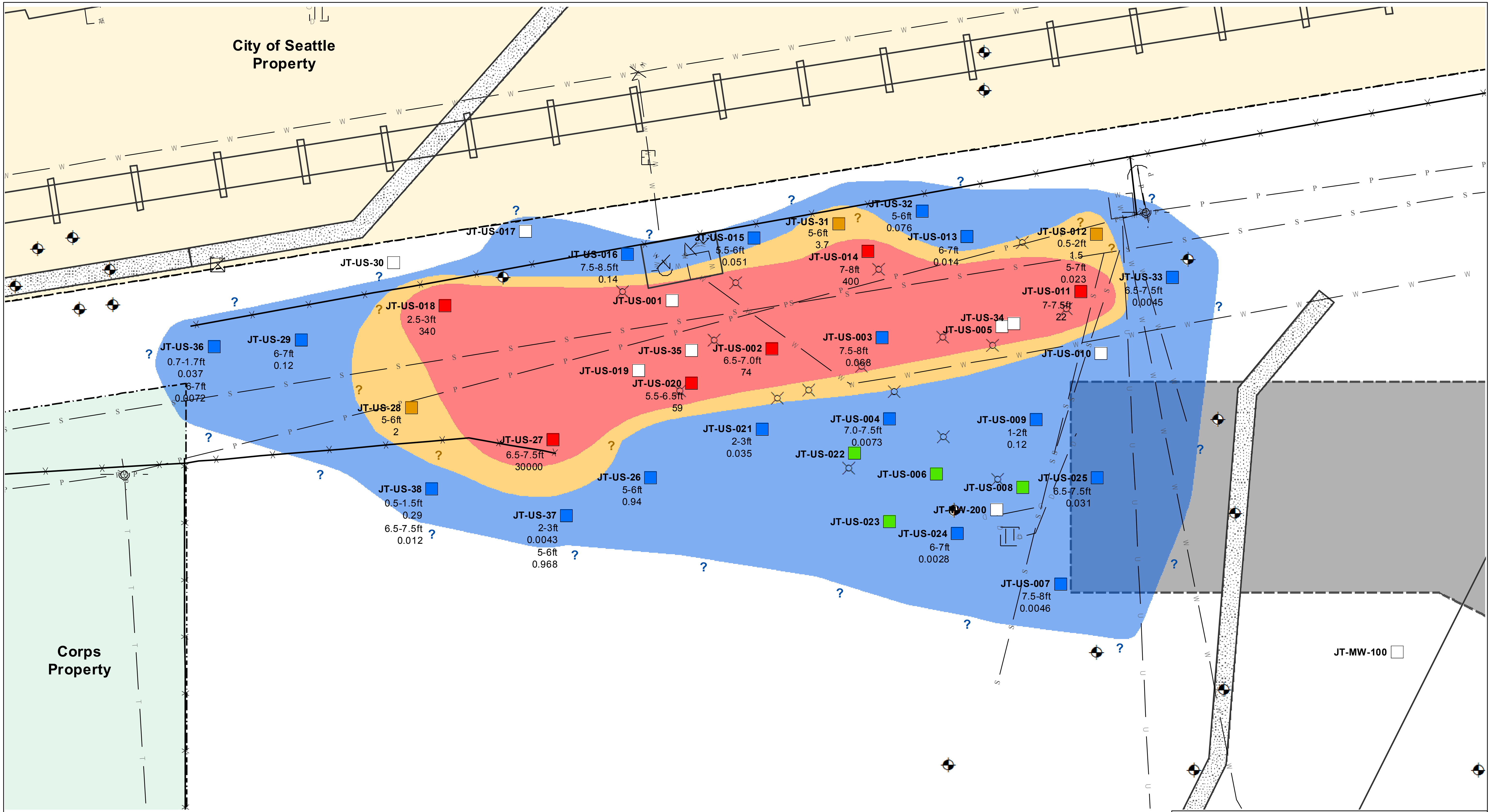
Figure
6

EAL 06/04/14 178004-AB.mxd



JT-US-35	Boring ID
20-21ft	Sample Depth
0.0036	PCB concentration in mg/kg

- 🟦 Above Method B Surface Water Protection Screening Level (0.0000787 mg/kg)
- 🟧 Above Method A (1 mg/kg)
- 🟥 Above Method A Industrial (10 mg/kg)
- 🟩 Non-detect
- ☐ No Data

- ⌧ Injection Well
- ⊕ Exisiting Monitoring Wells
- ▨ Treatment Wall
- ▨ Boat Storage Rack

- —x— Fence Line
- -·-· Property Boundary
- U — Utility Line
- W — Water Line
- S — Sanitary Sewer Line
- P — Overhead Power

Notes:
1. Highest concentration is displayed if multiple samples were collected within the 0 to 10 foot depth interval.
2. Base map prepared from AutoCAD file 020030-02.dwg by Aspect Consulting, 10/08/13.
3. Utility locations are approximate.

Jacobson Terminals
Seattle, Washington

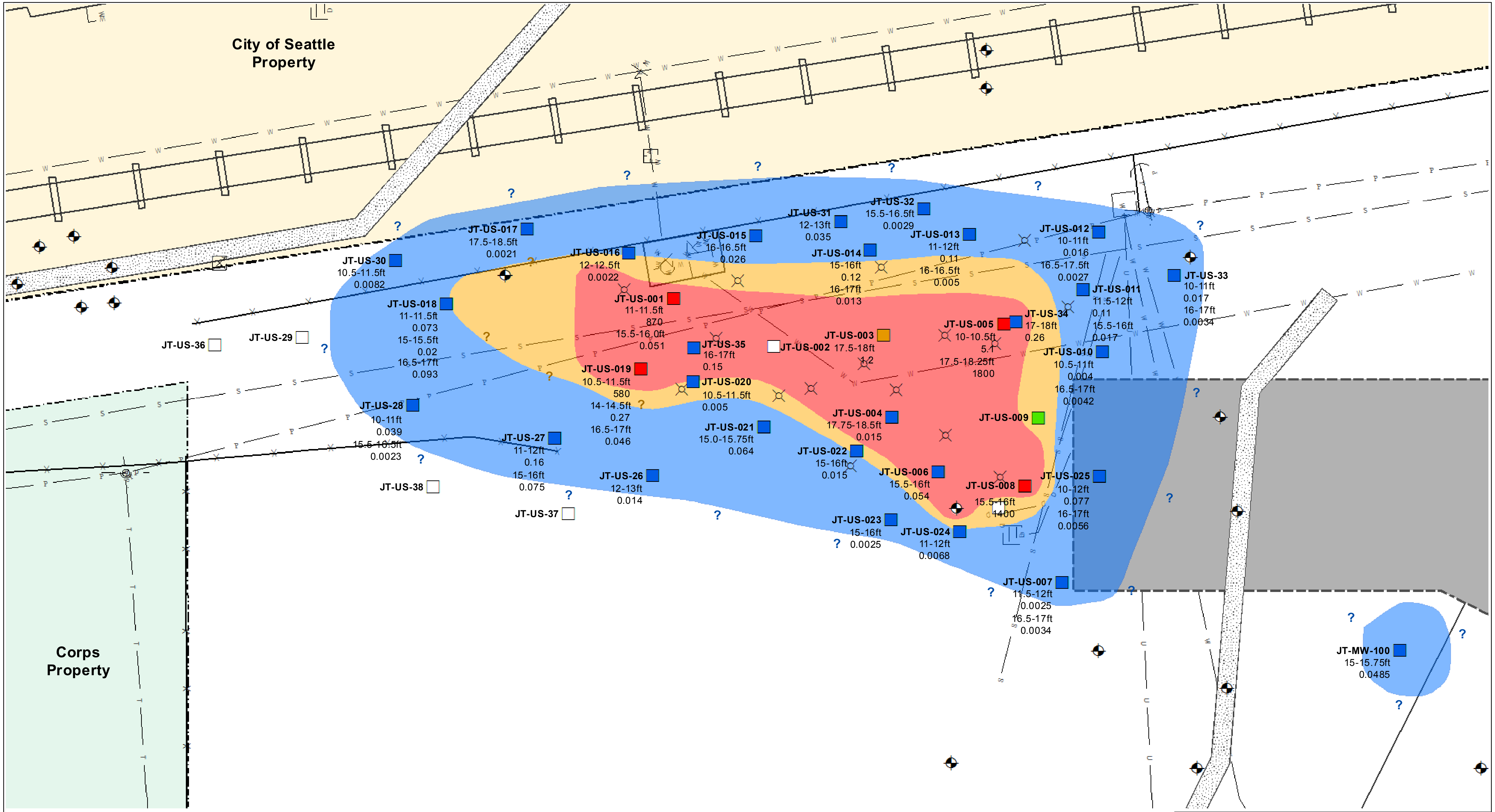
2014 PCB Concentrations in Soil to 0-10 Feet

17800-43 6/14

HARTCROWSER

Figure
6a

EAL 06/04/14 1780043-AC.mxd



EAL 06/04/14 1780043-AD.mxd

JT-US-35 Boring ID
16-17ft Sample Depth
0.15 PCB concentration in mg/kg

🟦 Above Method B Surface Water Protection Screening Level (0.0000787 mg/kg)
🟧 Above Method A (1
🟥 Above Method A Industrial (10
🟩 Non-detect
☐ No Data

Injection Well
Exisiting Monitoring Wells
▨ Treatment Wall
▨ Boat Storage Rack

Fence Line
Property Boundary
U Utility Line
W Water Line
S Sanitary Sewer Line
P Overhead Power

Notes:
1. Highest concentration is displayed if multiple samples were collected within the 0 to 10 foot depth interval.
2. Base map prepared from AutoCAD file 020030-02.dwg by Aspect Consulting, 10/08/13.
3. Utility locations are approximate.

0 15 30
Scale in Feet

N

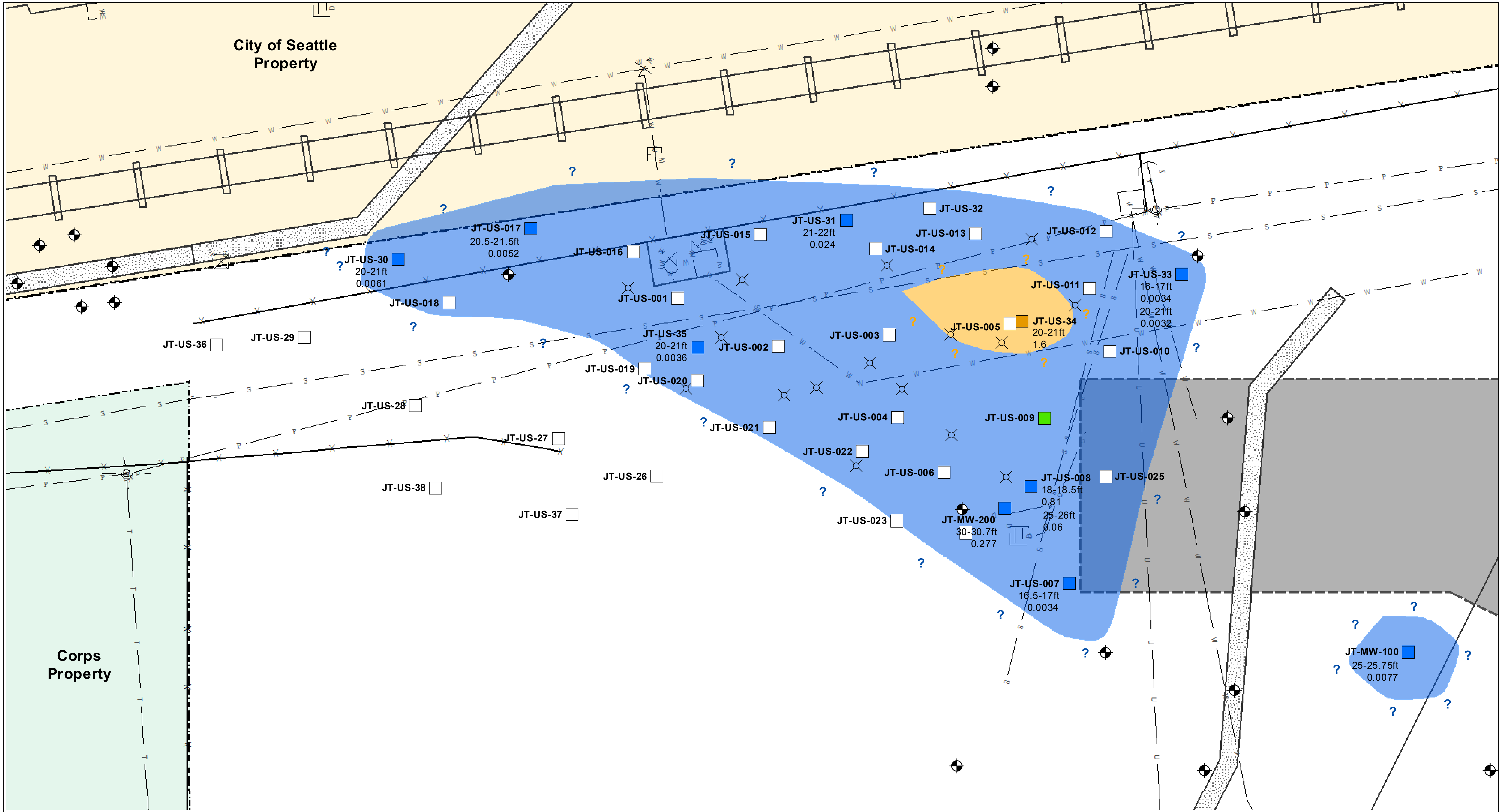
Jacobson Terminals
Seattle, Washington

2014 PCB Concentrations in Soil - 10 to 18 Feet

17800-43 6/14

HARTCROWSER

Figure
6b



JT-US-35	Boring ID
20-21ft	Sample Depth
0.0036	PCB concentration in mg/kg

🟦 Above Method B Surface Water Protection Screening Level (0.0000787 mg/kg)

🟧 Above Method A (1

🟩 Non-detect

☐ No Data

⌧ Injection Well

⊕ Exisiting Monitoring Wells

▨ Treatment Wall

▨ Boat Storage Rack

Fence Line

Property Boundary

U Utility Line

W Water Line

S Sanitary Sewer Line

P Overhead Power

Notes:

1. Highest concentration is displayed if multiple samples were collected within the 0 to 10 foot depth interval.
2. Base map prepared from AutoCAD file 020030-02.dwg by Aspect Consulting, 10/08/13.
3. Utility locations are approximate.

0 15 30

Scale in Feet

N

Jacobson Terminals
Seattle, Washington

2014 PCB Concentrations in Soil - below 18 Feet

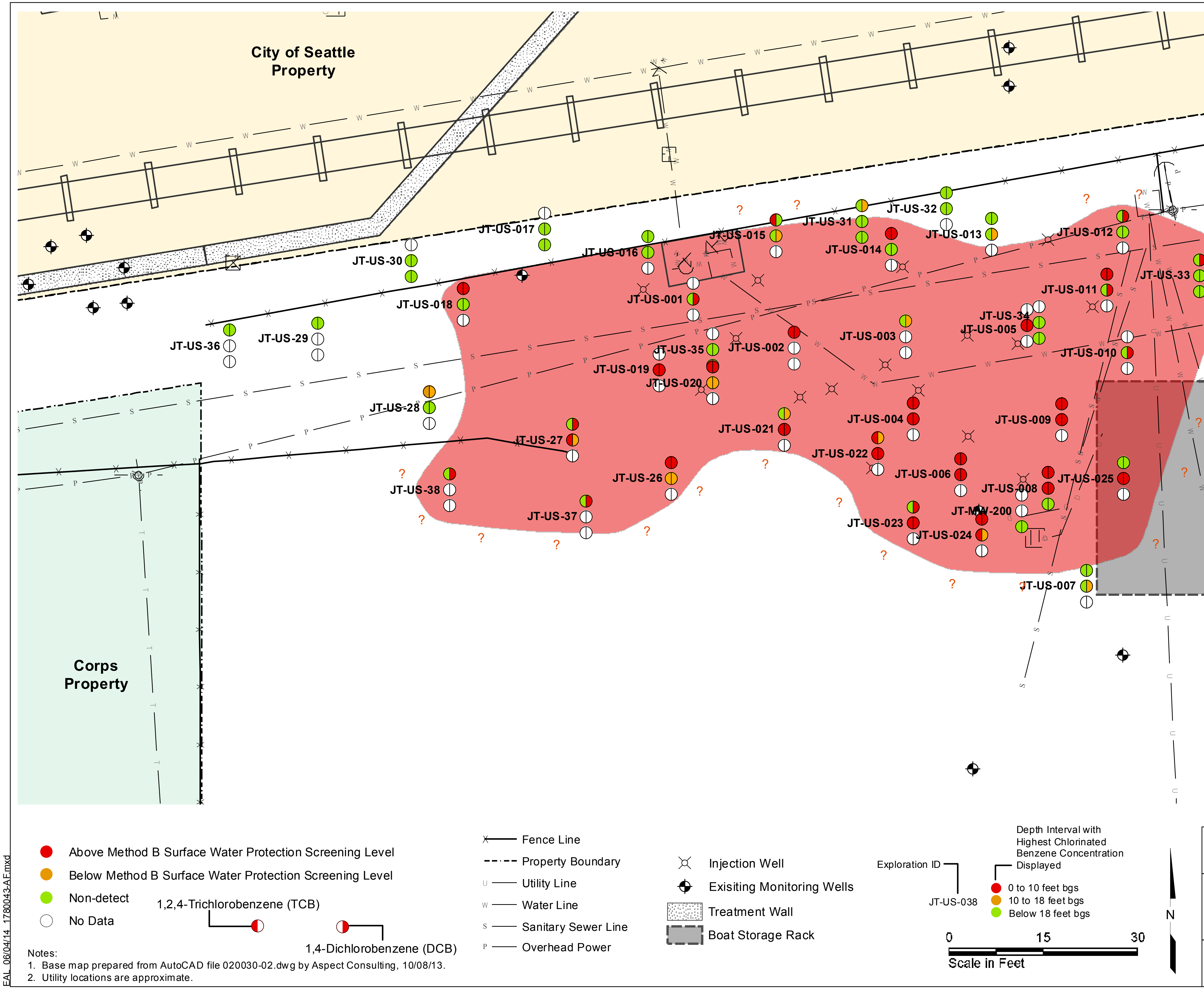
17800-43 6/14

HARTCROWSER

Figure

6c

EAL 06/04/14 1780043-AE.mxd



Notes:
1. Base map prepared from AutoCAD file 020030-02.dwg by Aspect Consulting, 10/08/13.
2. Utility locations are approximate.

Jacobson Terminals
Seattle, Washington

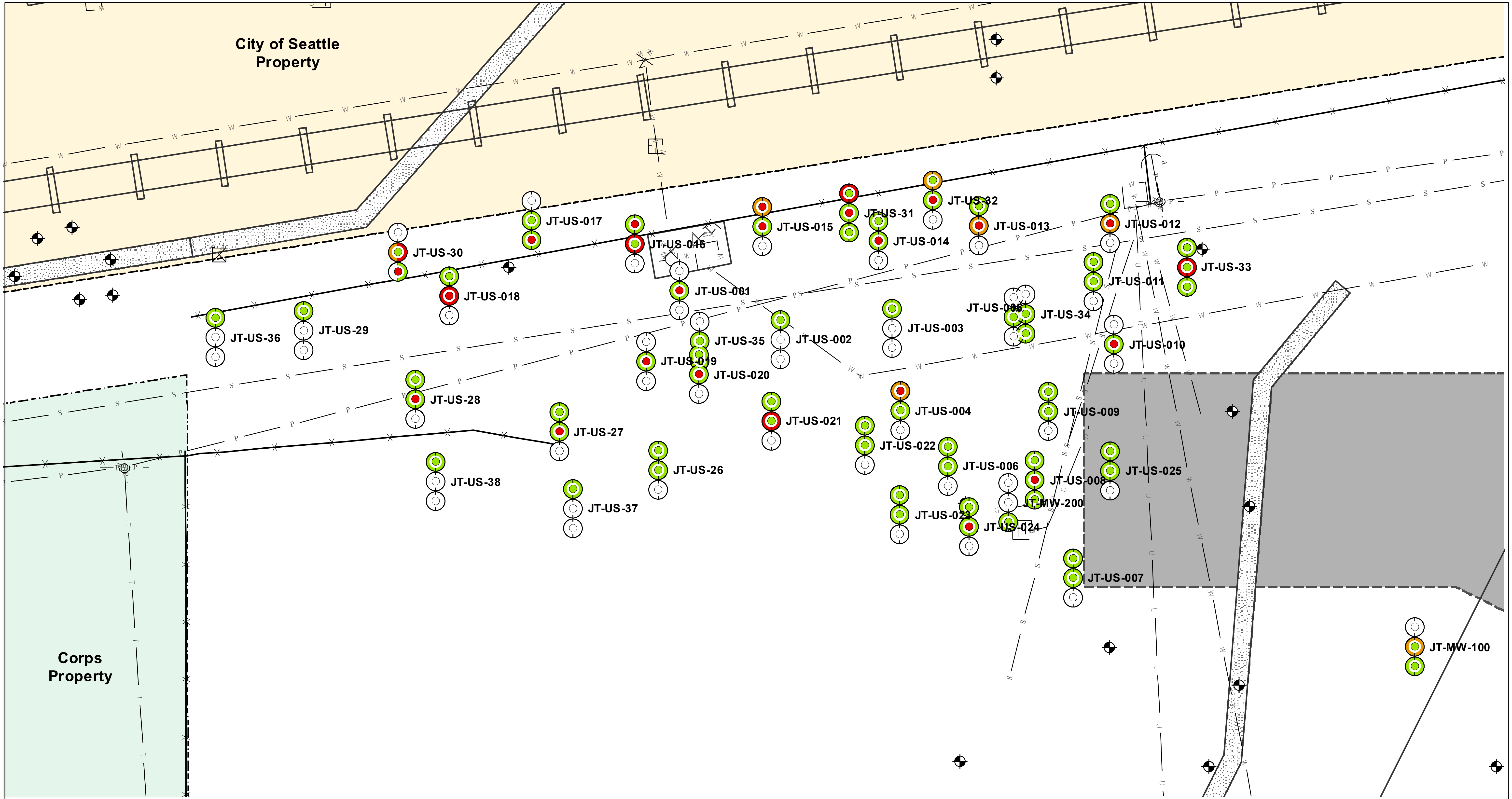
2014 Chlorinated Benzene Occurrences in Soil

17800-43 6/14

HARTCROWSER

Figure
7

EAL 06/04/14 1780043-AF.mxd



● Above Method B Surface Water Screening Level

● Below Method B Surface Water Screening Level

● Non-detect ○ No Data

Trichloroethylene (TCE)
Tetrachloroethylene (PCE)
Vinyl Chloride (VC)

Fence Line
Property Boundary
Utility Line
Water Line
Sanitary Sewer Line
Overhead Power

Exisiting Monitoring Wells
Treatment Wall
Boat Storage Rack

Exploration ID
JT-US-038
Depth Interval with Highest Chlorinated Ethene Concentration Displayed
0 to 10 feet bgs
10 to 18 feet bgs
Below 18 feet bgs

0 15 30
Scale in Feet

N

Notes:
1. Base map prepared from AutoCAD file 020030-02.dwg by Aspect Consulting, 10/08/13.
2. Utility locations are approximate.

EAL 06/04/14 1780043-AG.mxd

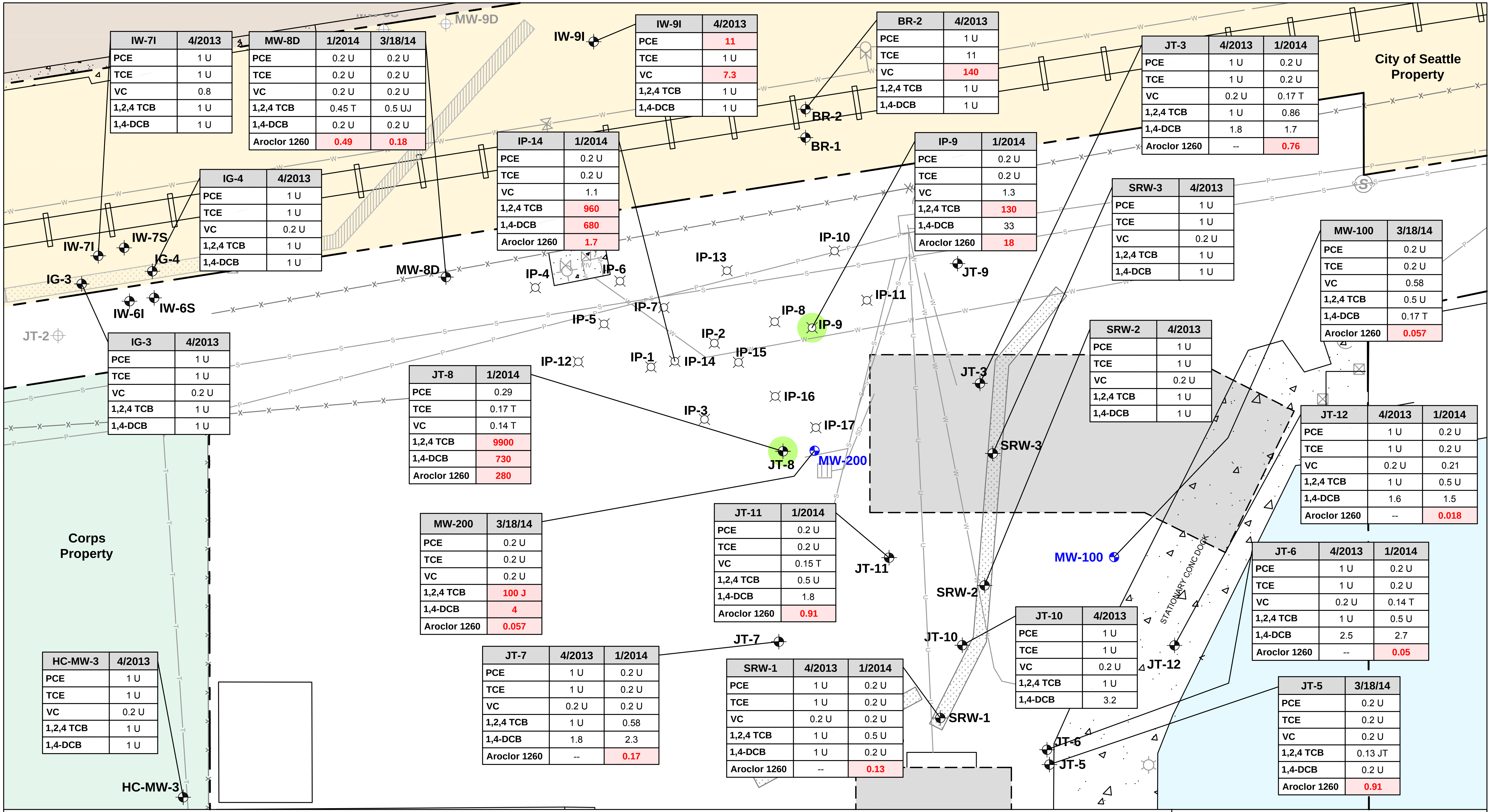
Jacobson Terminals
Seattle, Washington

2014 Chlorinated Ethene Occurrences in Soil

17800-43
6/14

HARTCROWSER

Figure
8



IW-7I	4/2013
PCE	1 U
TCE	1 U
VC	0.8
1,2,4 TCB	1 U
1,4-DCB	1 U

MW-8D	1/2014	3/18/14
PCE	0.2 U	0.2 U
TCE	0.2 U	0.2 U
VC	0.2 U	0.2 U
1,2,4 TCB	0.45 T	0.5 UJ
1,4-DCB	0.2 U	0.2 U
Aroclor 1260	**0.49**	**0.18**

IW-9I	4/2013
PCE	**11**
TCE	1 U
VC	**7.3**
1,2,4 TCB	1 U
1,4-DCB	1 U

BR-2	4/2013
PCE	1 U
TCE	11
VC	**140**
1,2,4 TCB	1 U
1,4-DCB	1 U

JT-3	4/2013	1/2014
PCE	1 U	0.2 U
TCE	1 U	0.2 U
VC	0.2 U	0.17 T
1,2,4 TCB	1 U	0.86
1,4-DCB	1.8	1.7
Aroclor 1260	--	**0.76**

IP-14	1/2014
PCE	0.2 U
TCE	0.2 U
VC	1.1
1,2,4 TCB	**960**
1,4-DCB	**680**
Aroclor 1260	**1.7**

IP-9	1/2014
PCE	0.2 U
TCE	0.2 U
VC	1.3
1,2,4 TCB	**130**
1,4-DCB	33
Aroclor 1260	**18**

IG-4	4/2013
PCE	1 U
TCE	1 U
VC	0.2 U
1,2,4 TCB	1 U
1,4-DCB	1 U

SRW-3	4/2013
PCE	1 U
TCE	1 U
VC	0.2 U
1,2,4 TCB	1 U
1,4-DCB	1 U

MW-100	3/18/14
PCE	0.2 U
TCE	0.2 U
VC	0.58
1,2,4 TCB	0.5 U
1,4-DCB	0.17 T
Aroclor 1260	**0.057**

IG-3	4/2013
PCE	1 U
TCE	1 U
VC	0.2 U
1,2,4 TCB	1 U
1,4-DCB	1 U

JT-8	1/2014
PCE	0.29
TCE	0.17 T
VC	0.14 T
1,2,4 TCB	**9900**
1,4-DCB	**730**
Aroclor 1260	**280**

SRW-2	4/2013
PCE	1 U
TCE	1 U
VC	0.2 U
1,2,4 TCB	1 U
1,4-DCB	1 U

JT-12	4/2013	1/2014
PCE	1 U	0.2 U
TCE	1 U	0.2 U
VC	0.2 U	0.21
1,2,4 TCB	1 U	0.5 U
1,4-DCB	1.6	1.5
Aroclor 1260	--	**0.018**

MW-200	3/18/14
PCE	0.2 U
TCE	0.2 U
VC	0.2 U
1,2,4 TCB	**100 J**
1,4-DCB	**4**
Aroclor 1260	**0.057**

JT-11	1/2014
PCE	0.2 U
TCE	0.2 U
VC	0.15 T
1,2,4 TCB	0.5 U
1,4-DCB	1.8
Aroclor 1260	**0.91**

JT-6	4/2013	1/2014
PCE	1 U	0.2 U
TCE	1 U	0.2 U
VC	0.2 U	0.14 T
1,2,4 TCB	1 U	0.5 U
1,4-DCB	2.5	2.7
Aroclor 1260	--	**0.05**

JT-10	4/2013
PCE	1 U
TCE	1 U
VC	0.2 U
1,2,4 TCB	1 U
1,4-DCB	3.2

HC-MW-3	4/2013
PCE	1 U
TCE	1 U
VC	0.2 U
1,2,4 TCB	1 U
1,4-DCB	1 U

JT-7	4/2013	1/2014
PCE	1 U	0.2 U
TCE	1 U	0.2 U
VC	0.2 U	0.2 U
1,2,4 TCB	1 U	0.58
1,4-DCB	1.8	2.3
Aroclor 1260	--	**0.17**

SRW-1	4/2013	1/2014
PCE	1 U	0.2 U
TCE	1 U	0.2 U
VC	0.2 U	0.2 U
1,2,4 TCB	1 U	0.5 U
1,4-DCB	1 U	0.2 U
Aroclor 1260	--	**0.13**

JT-5	3/18/14
PCE	0.2 U
TCE	0.2 U
VC	0.2 U
1,2,4 TCB	0.13 JT
1,4-DCB	0.2 U
Aroclor 1260	**0.91**

MW-100	2014 Groundwater Monitoring Well
MW-18S	Existing Monitoring Well
RW-2	Former Monitoring Well, Recovery Well, or Piezometer (Abandoned)
IP-5	Injection Well
JT-8	Product Observed in Well

Concrete Surface

Cement-Bentonite Groundwater Treatment Wall

Permeable Iron/Sand Gate

Overhead Power

Sanitary Sewer Line

Water Line

Utility Line

Property Boundary

Iron/GAC Groundwater Treatment Wall

Boat Storage Rack

Notes:
1. Base map prepared from AutoCAD file "020030-02.dwg," provided by Aspect Consulting, 10/08/13.
2. Utility locations are approximate.

	Well Name	4/2013	1/2014
Tetrachloroethylene	PCE	1 U	1 U
Trichloroethylene	TCE	1 U	1 U
Vinyl Chloride	VC	0.2 U	0.2 U
1,2,4-Trichlorobenzene	1,2,4 TCB	1 U	1 U
1,4-dichlorobenzene	1,4-DCB	3.0	3.0
	Aroclor 1260	**0.79**	**0.79**

Concentrations in μg/L

Bold, Shaded Value Exceeds Method B Freshwater Screening Level

N

0 20 40

Scale in Feet

Jacobson Terminals
Seattle, Washington

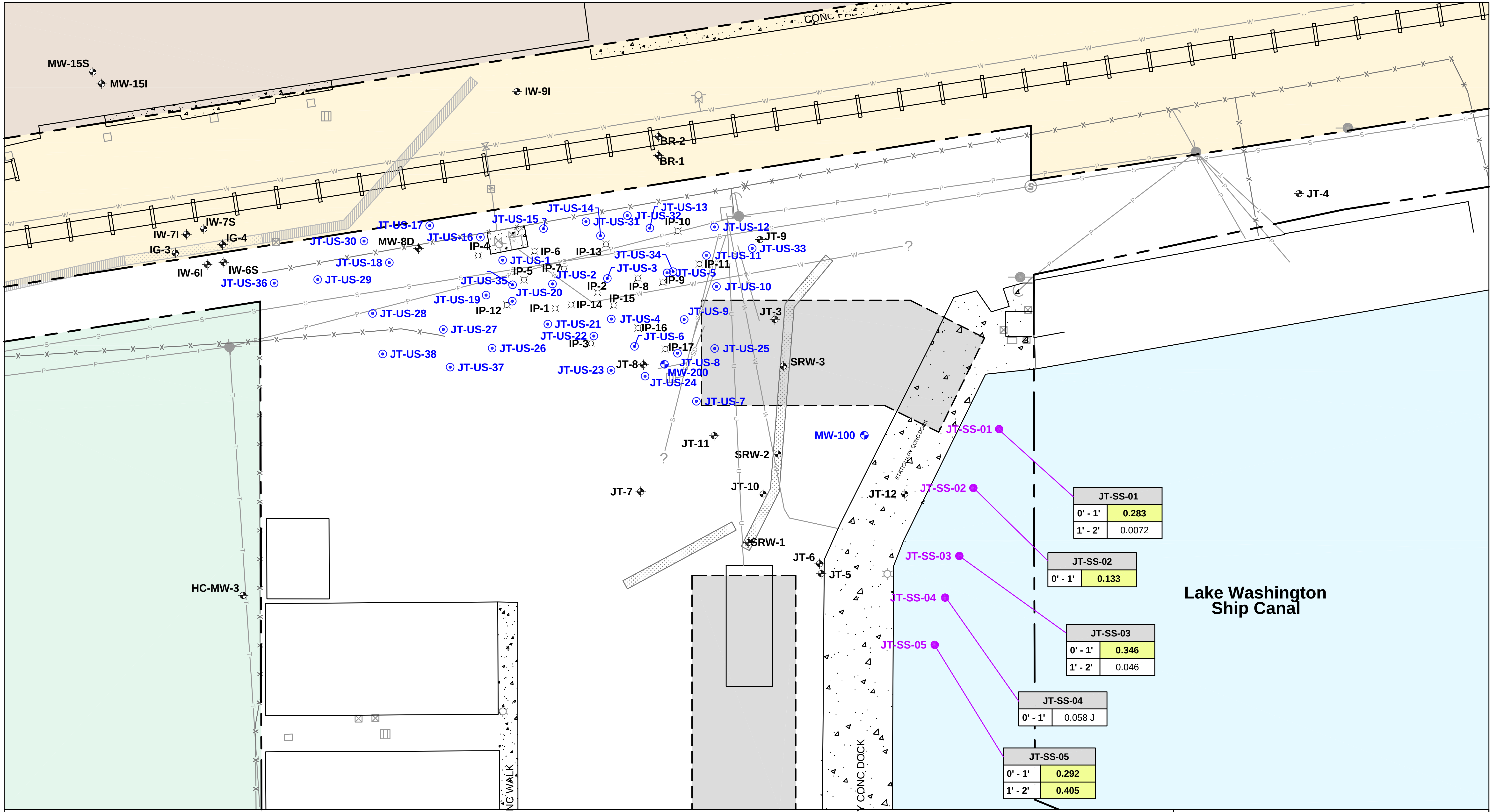
2013-2014 Groundwater COC Concentrations

17800-43 6/14

HARTCROWSER

Figure
9

EAL 06/18/14 1780043-022.dwg



JT-SS-01	
0' - 1'	**0.283**
1' - 2'	0.0072

JT-SS-02	
0' - 1'	**0.133**

JT-SS-03	
0' - 1'	**0.346**
1' - 2'	0.046

JT-SS-04	
0' - 1'	0.058 J

JT-SS-05	
0' - 1'	**0.292**
1' - 2'	**0.405**

MW-18S ⊕ Existing Monitoring Well

IP-5 ¤ Injection Well

Concrete Surface

Cement-Bentonite Groundwater Treatment Wall

Permeable Iron/Sand Gate

—P— Overhead Power

—S— Sanitary Sewer Line

—W— Water Line

—U— Utility Line

— — Property Boundary

Iron/GAC Groundwater Treatment Wall

Boat Storage Rack

Notes:

1. Base map prepared from AutoCAD file "020030-02.dwg," provided by Aspect Consulting, 10/08/13.
2. Utility locations are approximate.

Sample ID —

JT-SS-03	
0' - 1'	**0.346**
1' - 2'	0.046

Bold, yellow shaded value exceeds Sediment Cleanup Objective Screening Level

Sample Depth in Feet

Total PCB Concentration in mg/kg

JT-SS-01 ● 2014 Sediment Sampling Location and Number

JT-US-1 ⊙ 2014 Push Probe Sampling Location and Number

MW-100 ⊕ 2014 Groundwater Monitoring Well

0 30 60

Scale in Feet

N

Jacobson Terminals
Seattle, Washington

2014 PCB Occurrences in Sediment

17800-43 6/14

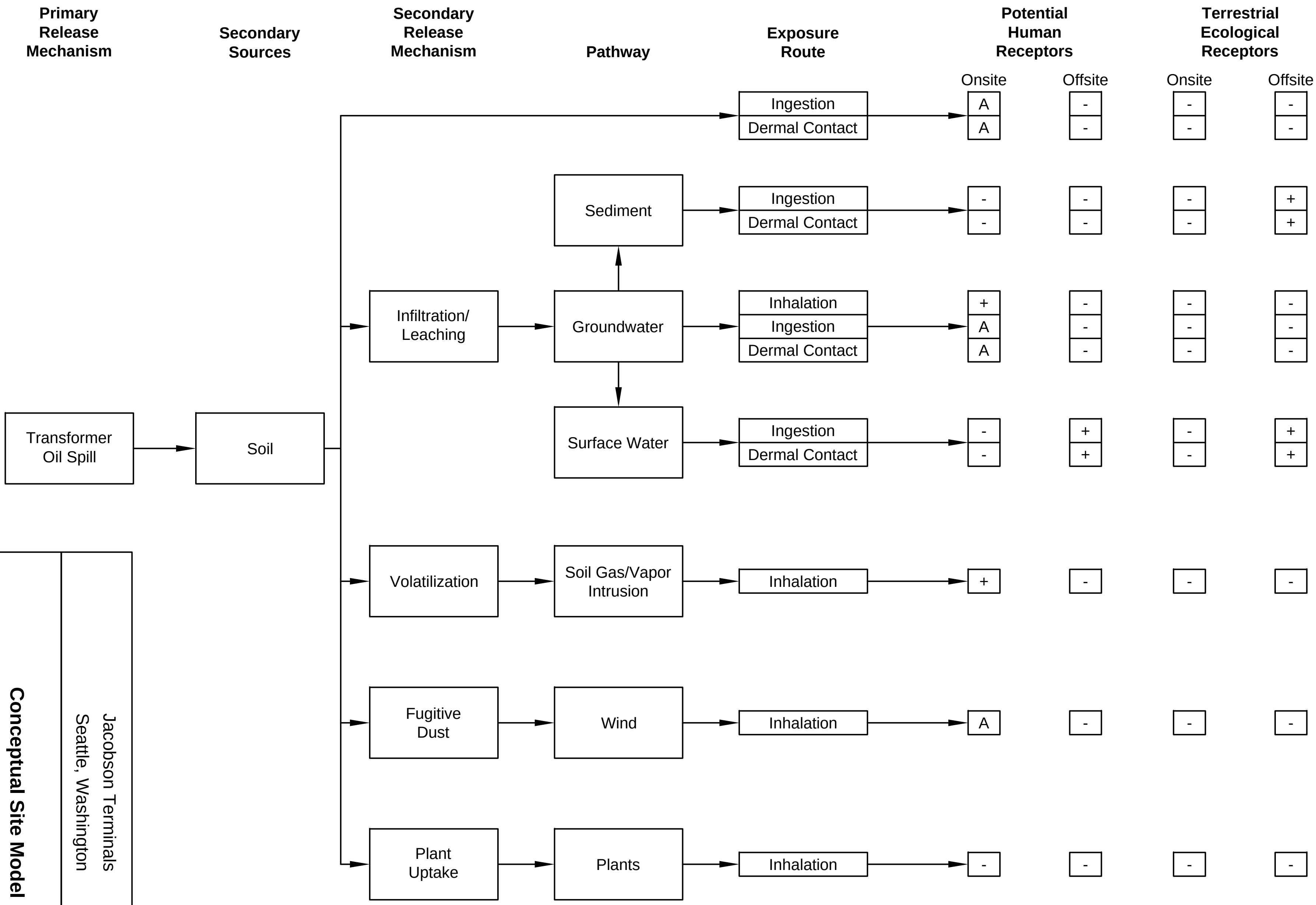
HARTCROWSER

Figure

10

EAL 06/12/14 1780043-031.dwg

EAL 06/12/14 1780043-013.dwg



\+ Potentially Complete Pathway

\- Incomplete Pathway

A Pathway Potentially Complete when digging in soil or groundwater

HARTCROWSER

17800-43

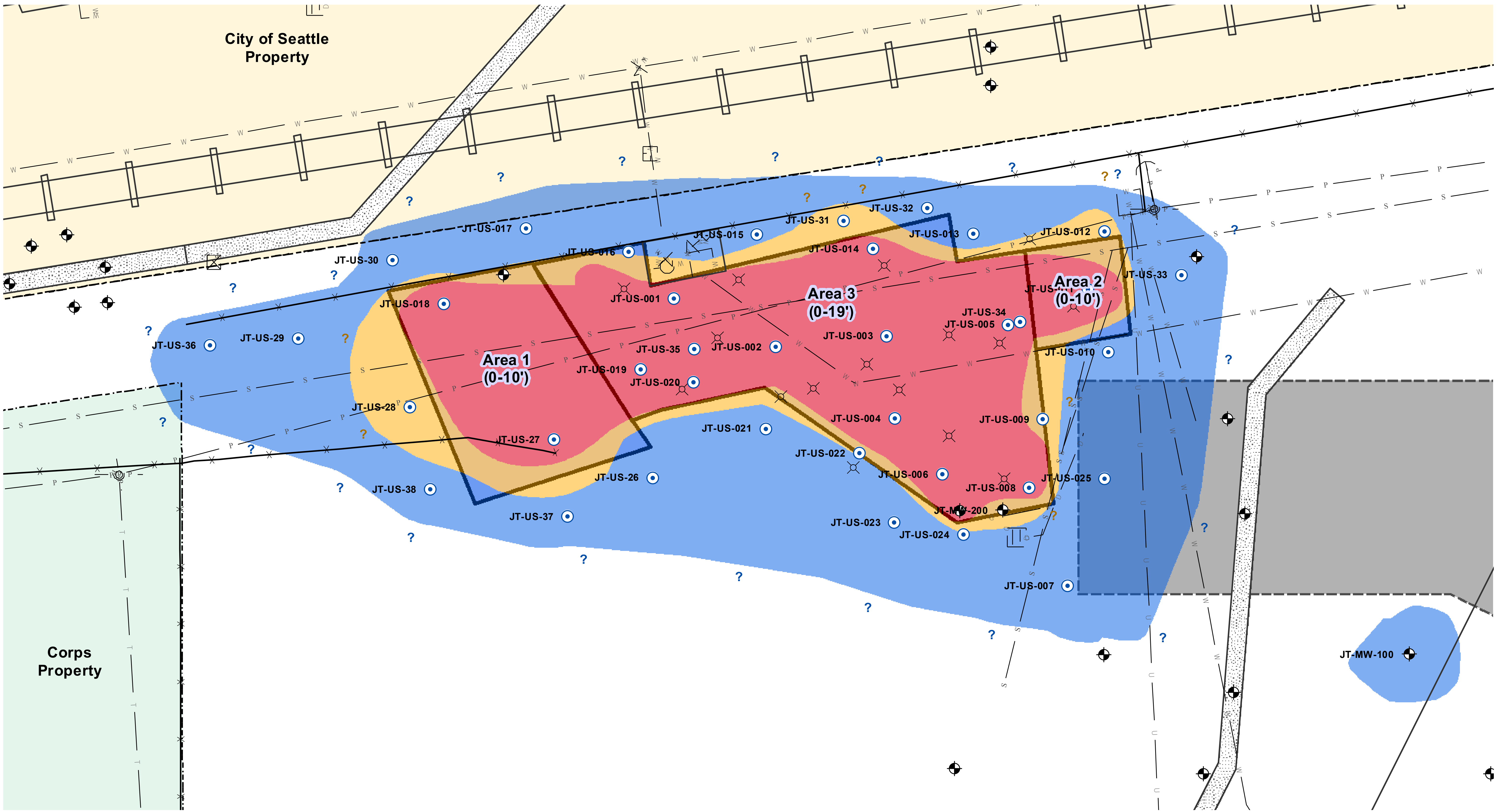
Conceptual Site Model

6/14

Jacobson Terminals
Seattle, Washington

Figure

11



🟥 Approximate Area with PCB Concentration > MTCA Method A Industrial (10 mg/kg)

🟧 Approximate Area with PCB Concentration > MTCA Method A Unrestricted (1 mg/kg)

🟦 Approximate Area with PCB Concentration > MTCA Method B Surface Water Protection (0.000076 mg/kg)

☐ Remediation Area (Depth Interval)

▨ Treatment Wall

▨ Boat Storage Rack

Fence Line

Property Boundary

Utility Line

Water Line

Sanitary Sewer Line

Overhead Power

◉ Push Probe Location and Number

Injection Well

Exisiting Monitoring Wells

N

0 15 30

Scale in Feet

Notes:
1. Base map prepared from AutoCAD file 020030-02.dwg by Aspect Consulting, 10/08/13.
2. Utility locations are approximate.

Jacobson Terminals
Seattle, Washington

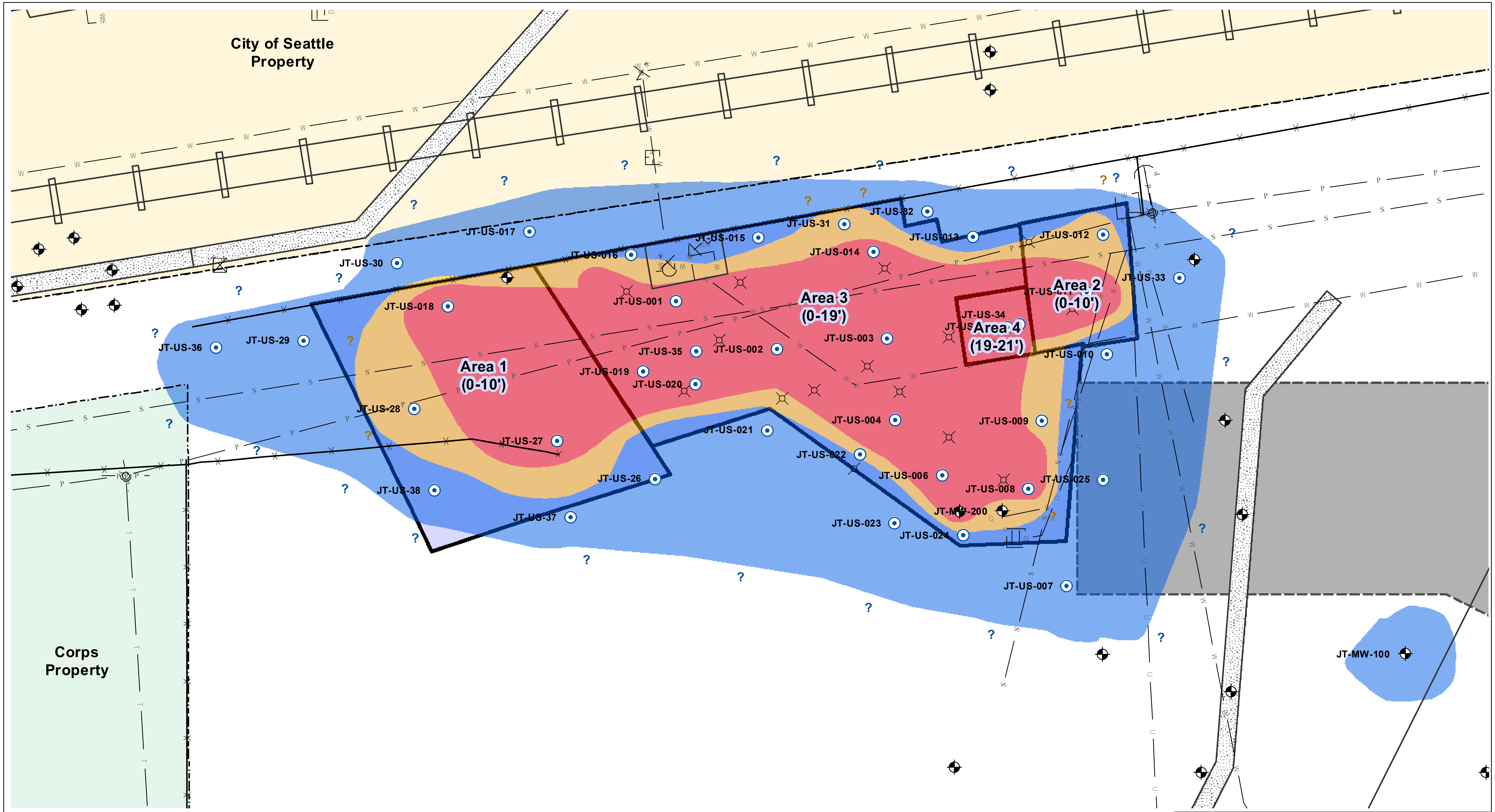
Interim Action Remediation Area
Greater than 10 mg/kg

17800-43 6/14

HARTCROWSER

Figure
12

EAL 06/04/14 178004-AH.mxd



🟥 Approximate Area with PCB Concentration > MTCA Method A Industrial (10 mg/kg)

🟧 Approximate Area with PCB Concentration > MTCA Method A Unrestricted (1 mg/kg)

🟦 Approximate Area with PCB Concentration > MTCA Method B
Surface Water Protection (0.000076 mg/kg)

☐ Remediation Area (Depth Interval)

▨ Treatment Wall

▨ Boat Storage Rack

Fence Line
Property Boundary
Utility Line
Water Line
Sanitary Sewer Line
Overhead Power

Push Probe Location and Number
Injection Well
Exisiting Monitoring Wells

0 15 30
Scale in Feet

N

Notes:
1. Base map prepared from AutoCAD file 020030-02.dwg by Aspect Consulting, 10/08/13.
2. Utility locations are approximate.

EAL 06/04/14 178004-AJ.mxd

Jacobson Terminals
Seattle, Washington

Interim Action Remediation Area
Greater than 1 mg/kg

17800-43 6/14

HARTCROWSER

Figure
13

APPENDIX A
Field Exploration Methods and Analysis with Boring and Monitoring Well Logs

APPENDIX A

Field Exploration Methods and Analysis with Boring and Monitoring Well Logs

This appendix documents the processes Hart Crowser used to determine the environmental quality of the soil, sediment, and groundwater underlying the project site. The discussion includes information on the following subjects:

- Explorations and Their Location;
- Direct Push Probes;
- Hollow-Stem Auger Borings;
- Soil Sampling Procedures;
- Soil Screening and Analysis;
- Monitoring Well Installation;
- Groundwater Sampling;
- Sediment Sampling Procedures;
- Sediment Screening and Analysis;
- Sample Handling and Laboratory Analysis; and
- Investigation-Derived Waste Storage and Disposal.

Explorations and Their Location

Subsurface explorations for this project included push-probe soil borings and hollow-stem auger borings completed as monitoring wells. Surface and subsurface sediment samples were collected from the waterway adjacent to the Jacobson Terminals property. Groundwater samples were collected from newly installed and existing monitoring wells on the site. Exploration logs in this appendix show our interpretation of the sampling and testing data. The logs indicate the depth where the physical characteristics of soils and sediment change. Note that the change may be gradual. In the field, we classified the samples taken from the explorations according to the methods presented on Figure A-1 - Key to Exploration Logs. This figure also provides a legend explaining the symbols and abbreviations used in the logs.

Figures 2 shows where the explorations were located.

Direct Push Probes

Push probes JT-US-001 through JT-US-038 were advanced to depths of 10 feet to 26 feet bgs on January 2, 3, and 6, 2014, and March 11 and 12, 2014. Holt Services, Inc., of Puyallup, Washington, completed the push-probe explorations using a limited-access 2-inch diameter Geoprobe® rig. For push probes that were advanced to 30 feet bgs, a 3-inch-diameter casing was embedded into the silt/clay layer at approximately 18 feet bgs prior to advancing the boring beyond that depth. Following placement of the casing, normal sampling continued beyond 18 feet bgs. A representative from Hart Crowser continuously observed the drilling and collected soil samples. Soil samples were collected using an acetate-lined plastic sleeve sampler pushed by the drill rig. Soil samples were generally collected in continuous 5-foot depth intervals. Samples were classified in general accordance with ASTM D 2488 and were screened for potential soil contamination. Detailed soil logs were prepared for each boring location. The soil logs are presented on Figure A-2 through A-41 at the end of this appendix.

Hollow-Stem Auger Borings

Hollow-stem auger borings JT-MW-100 and JT-MW-200 were drilled to a depth of 31.5 feet bgs on March 13, 2014. Holt Services, Inc., of Puyallup, Washington, completed the auger explorations using a truck-mounted drill rig. For JT-MW-200, a 16-inch-diameter auger was advanced to 18 feet bgs and conductor casing was embedded into the silt/clay layer. The boring was continued using an 8-inch-diameter auger to 31.5 feet bgs. JT-MW-100 was advanced using only the 8-inch-diameter auger. A representative from Hart Crowser continuously observed the drilling and collected soil samples. Soil samples were generally collected at 5-foot intervals from a clean stainless steel split-spoon sampler. Samples were classified in general accordance with ASTM D 2488 and were screened for potential soil contamination. Detailed soil logs were prepared for each boring location. The soil logs are presented on Figure A-42 and A-43 at the end of this appendix.

Soil Sampling Procedures

Soil samples were collected for chemical analysis directly from the split-spoon sampler/push probe, with a clean stainless steel spoon and/or clean disposable nitrile gloves and placed in pre-cleaned, laboratory supplied, glass sample jars and 40-ml VOA bottles. Sufficient soil was removed to overfill the glass sample jars. VOA bottles were filled with a 5-gram soil plug, based on EPA Method 5035 procedures. The jars were sealed and labeled. Filled sample jars were stored in ice-chilled cooler and submitted to the chemistry laboratory under chain of custody protocols.

Soil Screening and Analysis

Field Screening results were used as a general guideline to identify potential chemical constituents in soil samples. In addition, field screening results were used as a basis for selecting soil samples for chemical analysis.

Soil samples were continuously field screened for evidence of historical impacts using: (1) field observations, (2) sheen screening, and (3) headspace vapor screening using a MultiRAE PID. The effectiveness of field screening varies with temperature, moisture content, organic content, soil type, and age of the constituents. Visual examination consists of inspecting the soil for evidence of discoloration, staining, and/or abnormal components. Visual screening is generally more effective when impacts are related to heavy petroleum hydrocarbons, such as motor or hydraulic oil, or when hydrocarbon concentrations are high.

We conducted water sheen testing by placing a small volume of soil in a pan of water and observing the water surface for signs of sheen. Sheens were classified as follows:

No Sheen (NS)	No visible sheen on water surface.
Slight Sheen (SS)	Light colorless film, spotty to globular; spread is irregular, not rapid, areas of no sheen remain, film dissipates rapidly.
Moderate Sheen (MS)	Light to heavy film, may have some color or iridescence, globular to stringy, spread is irregular to flowing; few remaining areas of no sheen on water surface.
Heavy Sheen (HS)	Heavy colorful film with iridescence; stringy, spread is rapid; sheen flows off the sample; most of the water surface may be covered with sheen.

Headspace vapor screening is intended to indicate the presence of volatile organic vapors and involves placing a soil sample in a plastic sample bag. Air is captured in the bag and the bag is shaken to expose the soil to the air trapped in the bag. The PID probe is then inserted in the bag and the instrument measures the concentration of organic vapors in the sample headspace. The highest vapor reading for each sample is then recorded on the boring log. The PID measures concentrations in ppm (parts per million), is calibrated to isobutylene, and can typically quantify organic vapor concentrations in the range of 0 to 1,000 ppm.

All field screening observations were recorded on the boring logs, and this information was used to select which samples to submit for chemical analysis.

Monitoring Well Installation

Holt Services, Inc., installed two monitoring wells to allow for long-term groundwater level and quality monitoring. The monitoring wells were installed on March 13 and 14, 2014. The monitoring wells were installed in accordance with Washington State Department of Ecology regulations.

Two-inch-diameter Schedule 40 PVC riser pipe and 2-inch-diameter 0.020-inch machine-slotted screen were used for the well casings and screens. The well screen and casing riser were lowered down through the hollow-stem auger/casing/open hole. As the auger/casing was withdrawn, No. 10/20 silica sand was placed in the annular space from the base of the boring to approximately 2 to 3 feet above the top of the well screen. Well seals were constructed by placing bentonite chips and/or grout in the annular space on the top of the sand to within one foot of ground surface. The remaining annular space was backfilled with concrete to complete the surface seal. The wells were completed with flush-mounted monuments, and equipped with locking well caps for security. The monitoring well construction details are illustrated on the boring logs on Figures A-42 and A-43.

Well Development

Monitoring Wells IP-9, IP-14, JT-3, JT-6, JT-7, JT-8, JT-11, JT-12, MW-8D, and SRW-1 were developed on December 27 and 30, 2013. Monitoring wells JT-5, MW-100, and MW-200 were developed on March 14, 2014. All wells were developed using a stainless steel bailer and portable pump with disposable tubing. The well was developed until approximately 10 casing volumes were removed or the water cleared.

Groundwater Sampling

Groundwater samples were collected for chemical analysis on the following dates:

- JT-3, JT-6, JT-7, MW-8D, and SRW-1 on January 7, 2014;
- IP-9, JT-8, JT-11, and JT-12 on January 8, 2014;
- IP-14 on January 9, 2014;
- JT-6, JT-7, JT-11, MW-8D, and SRW-1 on January 14, 2014; and
- JT-5, JT-8, MW-100 and MW-200 on March 18, 2014.

One duplicate sample was collected for analysis of each COC; a duplicate sample was not collected for conventional analysis. The PCB sample jar for JT-5 broke during analysis, so no PCB duplicate was analyzed for PCBs during the second sampling event. PCB results from JT-500 were used for evaluation of groundwater conditions at well JT-5.

Groundwater Sampling Procedures

Upon arrival at the wellhead, field personnel recorded conditions, depth to water, depth to product (if applicable), and depth to sediment in the wells using a Solinst or equivalent interface probe. If the well was pumped dry or product was present at a thickness greater than 0.05 foot, no purging or sampling was performed from that well.

Wells were purged and sampled using a peristaltic pump and low-flow groundwater sampling techniques. Purging and sampling were conducted approximately 2 feet below the top of the water table. An In-Situ 9500 flow-through cell was used to monitor groundwater field parameters including pH, specific conductivity, ORP, dissolved oxygen, turbidity, and temperature. Groundwater samples were collected once the field parameters of pH, specific conductivity, and temperature were stabilized. The water samples were collected directly from the polyethylene tubing into the pre-cleaned containers provided by the analytical laboratory. The containers were sealed, labeled, and were stored in an ice-chilled cooler and submitted to the chemistry laboratory under chain of custody protocols.

To prevent cross-contamination of the wells, disposable polyethylene tubing was used for each groundwater sample and the interface probe was decontaminated between well locations using a non-phosphate-based cleaner and de-ionized water.

Sediment Sampling Procedures

Sediment samples were collected adjacent to the Terminals property dock using boat-mounted vibracore and pneumatic power surface grab (Van Veen) sediment sampling equipment.

Five vibracores were advanced to a depth of 5 feet below the mudline and two samples were collected for analysis from each sediment core. The samples were analyzed for volatiles (including dichlorobenzenes and 1,2,4- trichlorobenzene), PCBs, total metals, and TOC. Additional sediment was collected from each core and archived for potential PCB congener and dioxins/furans analysis. PCB congener and dioxins/furans samples were collected from areas exhibiting the most significant evidence of contamination. PCB congener and dioxins/furans sediment samples were not analyzed.

Three surface sediment samples were collected using power Van Veen sediment sampling equipment. The samples were used for analysis in the benthic survey.

Positioning Methods

A differential global positioning system (DGPS) was used aboard the sampling vessel for location positioning. Navigation systems were used to provide a target horizontal accuracy of three meters in accordance with Ecology's SAPA and PSEP protocols. The DGPS receiver was placed above the block on the sampling device deployment boom to accurately record the sampling location position. Horizontal coordinates are referenced to NAD83 State Plane North northings and eastings, and decimal minutes of latitude and longitude.

Water depths were measured directly by lead-line or sonar and converted to mudline elevations.

Vibracore Sample Collection Method

Sediment core samples were collected using a vibracore sampling device operated by Bio-Marine Enterprises. The vibracore device uses a vibration source and a piston system to drive a core tube into unconsolidated water-saturated sediments. The vibracore is a RIC 3500 unit, which weighs 400 pounds including the frame. The vibracore is rated to 250 feet water depth and 25 feet penetration. It has an impact of 3500 foot-pounds and runs at 3000 vibrations per minute. A 3.5-inch ID Lexan (polycarbonate) core tube barrel was used. A core catcher attached to the end of the barrel was used to hold the undisturbed sediment inside the barrel when withdrawn from the sediment.

During sampling, a 12-foot core tube was driven below the sediment surface with the vibracore device until the desired penetration is achieved. After sample collection, the core tube was cut into 4- to 6-foot sections and each section was labeled, sealed, and placed in a drum filled with ice.

To determine the most accurate depths for subsampling and compositing, compaction corrections were applied to the cores during logging and processing. The compaction correction is the length of sample recovery divided by the length of core penetration. Typically, sampling-induced sediment compaction will cause the recovery to be less than the total penetration. During logging and processing, the sample length was determined by dividing the actual recovery depth by the compaction correction factor. There is no way of determining the actual recovery on a foot-by-foot basis, so a uniform recovery factor was applied to the entire core.

Van Veen Sample Collection Method

A 0.1-square-meter Van Veen sampler was used to collected large-volume surface sediment samples (approximately 1 to 2 gallons from the top 10 centimeters). During sampling, the Van Veen sampler was lowered to the sediment surface and closed using a pneumatic cylinder ram.

Salinity Measurements

Salinity data was collected at each sampling location in 3-foot-depth intervals from the boat to determine whether saline or freshwater is predominant in the area at the time of the investigation. An In-Situ 9500 flow-through cell was used to monitor field parameters including pH, specific conductivity, ORP, dissolved oxygen, turbidity, and temperature. Conductivity and temperature readings were used to calculate salinity.

Sediment Screening and Analysis

Ten vibracore samples (two from each vibracore) and three power Van-Veen samples were collected adjacent to the Jacobson Terminals property dock using boat-mounted sampling device.

Each sample was photographed and visually classified in the field in accordance with ASTM D 2488. The sediment logs are presented on Figure A-44 through A-48 at the end of this appendix.

Vibracore Sediment Processing and Handling

After core recovery and compaction corrections were determined, two samples were collected from each core using a decontaminated stainless steel spoon or a disposable sampling tool, taking care to exclude material that was in contact with the core walls. The first sample was collected from the compaction-corrected top 10 cm, and an additional sample was collected from the remaining core in the area exhibiting the highest likelihood for contamination.

Sediment samples were analyzed for volatile organics, PCBs, total metals, and TOC. Additional sediment was collected from each core and archived for potential PCB congener and dioxins/furans analysis. PCB congener and dioxins/furans samples were collected from areas exhibiting the highest likelihood for contamination. The sample containers for volatile organic compounds were filled first. The remaining sediment was placed in a stainless steel bowl and mixed with a stainless steel spoon until homogenous. The homogenized sediment was then spooned into the sample jars.

Van Veen Sediment Processing and Handling

Following classification, surface sediments collected from the Van Veen sampler were transferred to a clean 5-gallon bucket and passed through a quarter-inch sieve to remove cobbles, gravel, and debris. This process was closely monitored and any macroinvertebrates that passed through the sieve were collected and placed in an ethanol preserved container. After processing the sediment through the quarter-inch sieve, the remaining sediment was then passed through a 500-micron mesh net to remove finer material while retaining the larger taxa. The remaining sediment and organisms were transferred to empty wide-mouth polyethylene jars and preserved in 95 percent ethanol.

Sample Handling and Laboratory Analysis

Soil, groundwater, and vibracore sediment samples collected were analyzed by Analytical Resources, Inc., (ARI) of Tukwila, Washington, for chemical analysis. Van Veen surface sediment samples collected were analyzed by Rhithron Associates, Inc., of Missoula, Montana.

Duplicate samples were collected and submitted to the laboratory to assess combined field and laboratory variability. The samples were assigned the same exploration label with two zeroes at the end of the number.

At the time of collection, samples were placed in an ice-chilled cooler and submitted to the laboratory using chain of custody protocols.

Investigation-Derived Waste Storage and Disposal

Soil cuttings, excess sediments, and purge water generated during exploration activities and groundwater sampling were placed in separate labeled drums and left on site, pending receipt of chemical analysis results from the analytical laboratory and determination of appropriate disposal procedures.

Key to Exploration Logs

Sample Description

Classification of soils in this report is based on visual field and laboratory observations which include density/consistency, moisture condition, grain size, and plasticity estimates and should not be construed to imply field nor laboratory testing unless presented herein. Visual-manual classification methods of ASTM D 2488 were used as an identification guide.

Soil descriptions consist of the following:
Density/consistency, moisture, color, minor constituents, MAJOR CONSTITUENT, additional remarks.

Density/Consistency

Soil density/consistency in borings is related primarily to the Standard Penetration Resistance. Soil density/consistency in test pits and probes is estimated based on visual observation and is presented parenthetically on the logs.

SAND or GRAVEL Density	Standard Penetration Resistance (N) in Blows/Foot	SILT or CLAY Consistency	Standard Penetration Resistance (N) in Blows/Foot	Approximate Shear Strength in TSF
Very loose	0 to 4	Very soft	0 to 2	<0.125
Loose	4 to 10	Soft	2 to 4	0.125 to 0.25
Medium dense	10 to 30	Medium stiff	4 to 8	0.25 to 0.5
Dense	30 to 50	Stiff	8 to 15	0.5 to 1.0
Very dense	>50	Very stiff	15 to 30	1.0 to 2.0
		Hard	>30	>2.0

Sampling Test Symbols

☒ 1.5" I.D. Split Spoon	▩ Grab (Jar)	◣ 3.0" I.D. Split Spoon
▯ Shelby Tube (Pushed)	⧄ Bag	
▥ Cuttings	▮ Core Run	

SOIL CLASSIFICATION CHART

MAJOR DIVISIONS			SYMBOLS		TYPICAL DESCRIPTIONS
			GRAPH	LETTER	
COARSE GRAINED SOILS MORE THAN 50% OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE	GRAVEL AND GRAVELLY SOILS MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE	CLEAN GRAVELS (LITTLE OR NO FINES)	●	GW	WELL-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES
			○	GP	POORLY-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES
		GRAVELS WITH FINES (APPRECIABLE AMOUNT OF FINES)	○	GM	SILTY GRAVELS, GRAVEL - SAND - SILT MIXTURES
			▨	GC	CLAYEY GRAVELS, GRAVEL - SAND - CLAY MIXTURES
	SAND AND SANDY SOILS MORE THAN 50% OF COARSE FRACTION PASSING ON NO. 4 SIEVE	CLEAN SANDS (LITTLE OR NO FINES)	⁘	SW	WELL-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
			⁘	SP	POORLY-GRADED SANDS, GRAVELLY SAND, LITTLE OR NO FINES
		SANDS WITH FINES (APPRECIABLE AMOUNT OF FINES)	⁘	SM	SILTY SANDS, SAND - SILT MIXTURES
			▨	SC	CLAYEY SANDS, SAND - CLAY MIXTURES
FINE GRAINED SOILS MORE THAN 50% OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE	SILTS AND CLAYS	LIQUID LIMIT LESS THAN 50	▥	ML	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS OR CLAYEY SILTS WITH SLIGHT PLASTICITY
			▨	CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
			☰	OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
	SILTS AND CLAYS	LIQUID LIMIT GREATER THAN 50	▥	MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SAND OR SILTY SOILS
			▨	CH	INORGANIC CLAYS OF HIGH PLASTICITY
			☰	OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS
HIGHLY ORGANIC SOILS			⫫	PT	PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS

NOTE: DUAL SYMBOLS ARE USED TO INDICATE BORDERLINE SOIL CLASSIFICATIONS

Moisture

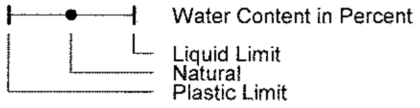
Dry	Little perceptible moisture
Damp	Some perceptible moisture, likely below optimum
Moist	Likely near optimum moisture content
Wet	Much perceptible moisture, likely above optimum

Minor Constituents

	Estimated Percentage
Trace	<5
Slightly (clayey, silty, etc.)	5 - 12
Clayey, silty, sandy, gravelly	12 - 30
Very (clayey, silty, etc.)	30 - 50

Laboratory Test Symbols

GS	Grain Size Classification
CN	Consolidation
UU	Unconsolidated Undrained Triaxial
CU	Consolidated Undrained Triaxial
CD	Consolidated Drained Triaxial
QU	Unconfined Compression
DS	Direct Shear
K	Permeability
PP	Pocket Penetrometer Approximate Compressive Strength in TSF
TV	Torvane Approximate Shear Strength in TSF
CBR	California Bearing Ratio
MD	Moisture Density Relationship
AL	Atterberg Limits

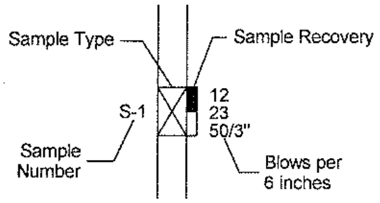


PID	Photoionization Detector Reading
CA	Chemical Analysis
DT	In Situ Density in PCF
OT	Tests by Others

Groundwater Indicators

∇	Groundwater Level on Date or (ATD) At Time of Drilling
♀	Groundwater Seepage (Test Pits)

Sample Key



HARTCROWSER

17800-43 *1/14*

Figure A-1

Push Probe Log JT-US-001

Location: Lat: 47.667668 Long: -122.394320
Approximate Ground Surface Elevation: ~14 Feet
Horizontal Datum: WGS1984
Vertical Datum: City of Seattle Datum

Drill Equipment: Direct Push
Sample Type: Acetate Liner
Hole Diameter: 2 inches
Logged By: N. Galvin Reviewed By: P. Cordell

USCS Class	Soil Descriptions	Depth in Feet	Sample	LAB TESTS
	Asphalt.	0		
ML	Damp, light gray, sandy, gravelly SILT.			
	Charred wood fragment.			
	Becomes moist, gray, very sandy SILT.		S-1	No odor, NS
	Abundant wood fragments.	5		
		∇ ATD		Slight odor, NS
ML SM	Wet, gray, very sandy SILT to very silty SAND with scattered wood fragments.	10	S-2	Slight odor, SS, CA
GW	Wet, gray GRAVEL.			
SM	Wet, gray, slightly silty SAND.	15		
ML	Wet, gray, slightly sandy SILT.		S-3	No odor, NS, CA
CL	Wet, gray CLAY.			
	Bottom of Probe at 20.0 Feet. Started 01/02/14. Completed 01/02/14.	20		
		25		

PUSH PROBE LOG-ENV 1780043-PP.GPJ HC_CORP.GDT 6/18/14

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. USCS designations are based on visual manual classification (ASTM D 2488) unless otherwise supported by laboratory testing (ASTM D 2487).
4. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
5. NS = No Sheen; SS = Slight Sheen; MS = Moderate Sheen; HS = Heavy Sheen

HARTCROWSER

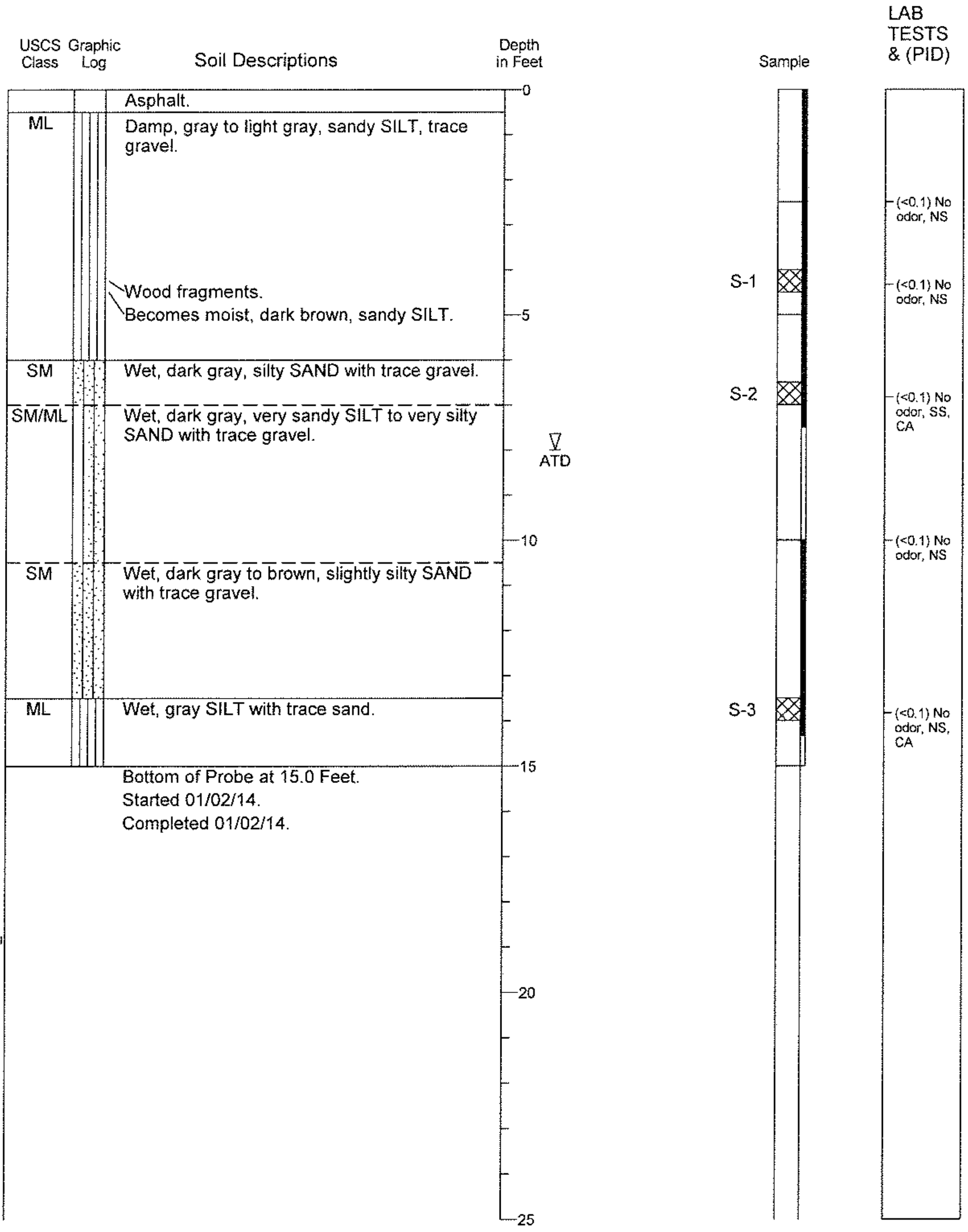
17800-43 **1/14**

Figure A-2

Push Probe Log JT-US-002

Location: Lat: 47.667648 Long: -122.394254
Approximate Ground Surface Elevation: ~13 Feet
Horizontal Datum: WGS1984
Vertical Datum: City of Seattle Datum

Drill Equipment: Direct Push
Sample Type: Acetate Liner
Hole Diameter: 2 inches
Logged By: N. Galvin Reviewed By: P. Cordell



USCS Class	Soil Descriptions	Depth in Feet	Sample	LAB TESTS & (PID)
	Asphalt.	0		
ML	Damp, gray to light gray, sandy SILT, trace gravel.			(<0.1) No odor, NS
	Wood fragments.		S-1	(<0.1) No odor, NS
	Becomes moist, dark brown, sandy SILT.	5		
SM	Wet, dark gray, silty SAND with trace gravel.		S-2	(<0.1) No odor, SS, CA
SM/ML	Wet, dark gray, very sandy SILT to very silty SAND with trace gravel.	∇ ATD		
		10		(<0.1) No odor, NS
SM	Wet, dark gray to brown, slightly silty SAND with trace gravel.			
ML	Wet, gray SILT with trace sand.		S-3	(<0.1) No odor, NS, CA
	Bottom of Probe at 15.0 Feet. Started 01/02/14. Completed 01/02/14.	15		
		20		
		25		

PUSH PROBE LOG-ENV 1780043-PP.GPJ HC_CORP.GDT 6/18/14

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. USCS designations are based on visual manual classification (ASTM D 2488) unless otherwise supported by laboratory testing (ASTM D 2487).
4. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
5. NS = No Sheen; SS = Slight Sheen; MS = Moderate Sheen; HS = Heavy Sheen

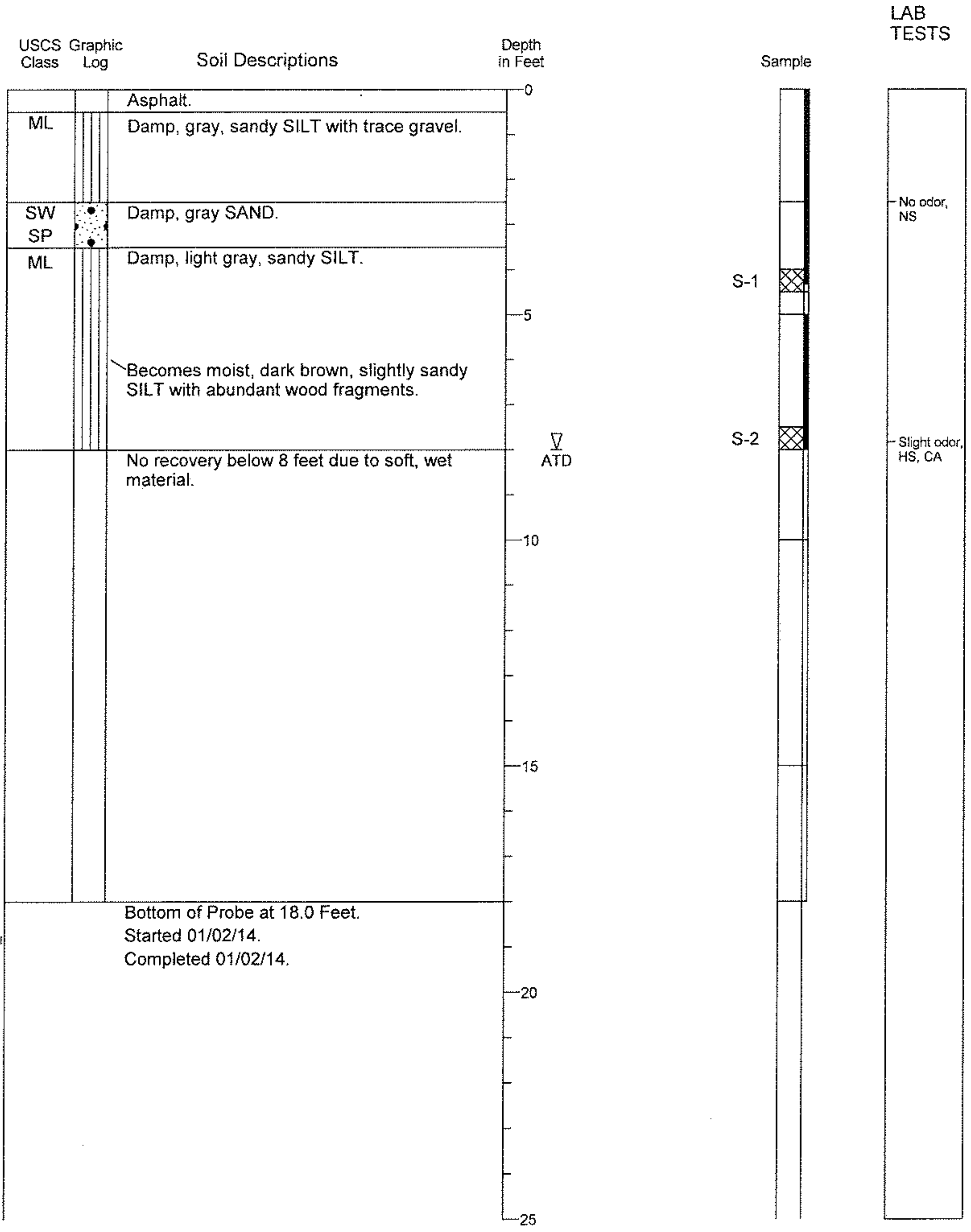
HARTCROWSER

17800-43 **1/14**

Figure A-3

Push Probe Log JT-US-003

Location: Lat: 47.667654 Long: -122.394182	Drill Equipment: Direct Push
Approximate Ground Surface Elevation: ~13 Feet	Sample Type: Acetate Liner
Horizontal Datum: WGS1984	Hole Diameter: 2 inches
Vertical Datum: City of Seattle Datum	Logged By: N. Galvin Reviewed By: P. Cordell



USCS Class	Graphic Log	Soil Descriptions	Sample	LAB TESTS
		Asphalt.		
ML		Damp, gray, sandy SILT with trace gravel.		
SW SP		Damp, gray SAND.		No odor, NS
ML		Damp, light gray, sandy SILT. Becomes moist, dark brown, slightly sandy SILT with abundant wood fragments.	S-1 S-2	Slight odor, HS, CA
		No recovery below 8 feet due to soft, wet material.		

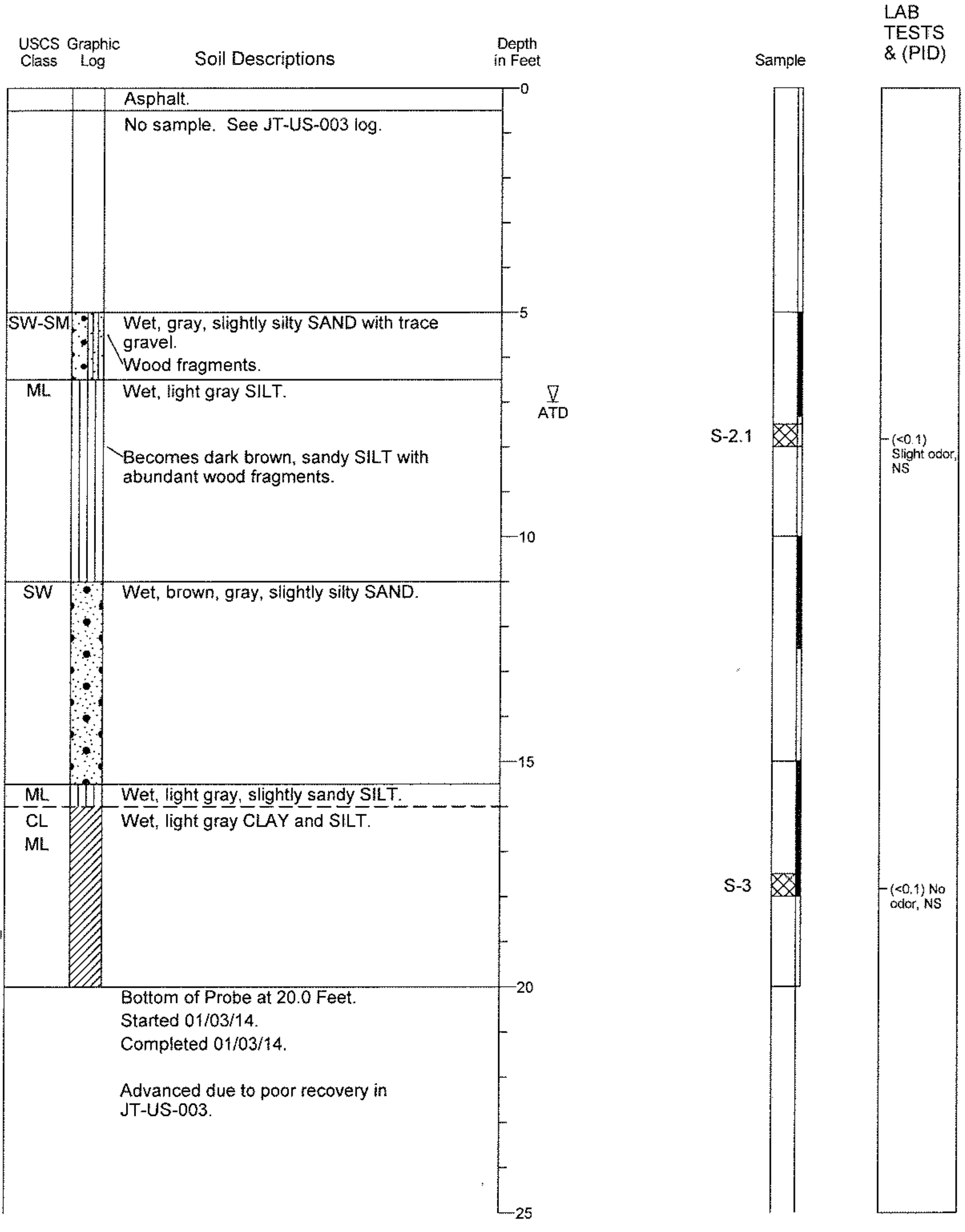
Bottom of Probe at 18.0 Feet.
Started 01/02/14.
Completed 01/02/14.

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. USCS designations are based on visual manual classification (ASTM D 2488) unless otherwise supported by laboratory testing (ASTM D 2487).
4. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
5. NS = No Sheen; SS = Slight Sheen; MS = Moderate Sheen; HS = Heavy Sheen

HARTCROWSER

Push Probe Log JT-US-003(2)

Location: Lat: 47.667654 Long: -122.394182	Drill Equipment: Direct Push
Approximate Ground Surface Elevation: ~13 Feet	Sample Type: Acetate Liner
Horizontal Datum: WGS1984	Hole Diameter: 2 inches
Vertical Datum: City of Seattle Datum	Logged By: N. Galvin Reviewed By: P. Cordell



USCS Class	Soil Descriptions	Depth in Feet	Sample	LAB TESTS & (PID)
	Asphalt.	0		
	No sample. See JT-US-003 log.			
SW-SM	Wet, gray, slightly silty SAND with trace gravel. Wood fragments.	5		
ML	Wet, light gray SILT.	▽ ATD		
	Becomes dark brown, sandy SILT with abundant wood fragments.		S-2.1	(<0.1) Slight odor, NS
SW	Wet, brown, gray, slightly silty SAND.	10		
ML	Wet, light gray, slightly sandy SILT.	15		
CL ML	Wet, light gray CLAY and SILT.		S-3	(<0.1) No odor, NS
	Bottom of Probe at 20.0 Feet. Started 01/03/14. Completed 01/03/14. Advanced due to poor recovery in JT-US-003.	20		
		25		

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. USCS designations are based on visual manual classification (ASTM D 2488) unless otherwise supported by laboratory testing (ASTM D 2487).
4. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
5. NS = No Sheen; SS = Slight Sheen; MS = Moderate Sheen; HS = Heavy Sheen

Push Probe Log JT-US-004

Location: Lat: 47.667618 Long: -122.394176
Approximate Ground Surface Elevation: ~13 Feet
Horizontal Datum: WGS1984
Vertical Datum: City of Seattle Datum

Drill Equipment: Direct Push
Sample Type: Acetate Liner
Hole Diameter: 2 inches
Logged By: N. Galvin Reviewed By: P. Cordell

USCS Class	Graphic Log	Soil Descriptions	Depth in Feet	Sample	LAB TESTS
		Asphalt.	0		
SM		Damp to moist, gray, slightly silty SAND. Wood fragment. Becomes wet.	5	S-1	No odor, NS Odor, MS
ML		Wet, dark gray to brown, slightly sandy SILT with abundant wood fragments.	▽ ATD 10	S-2	Slight odor, NS, CA
SM		Wet, brown, very silty SAND. Becomes gray to light brown, slightly silty SAND. Brown-yellow stains with sweet odor.	15	S-3	Odor, NS, CA
CL		Wet, gray to light gray CLAY.			
ML		Wet, gray to light gray, slightly sandy SILT. Rock	20	S-4	No odor, NS, CA
		Bottom of Probe at 20.0 Feet. Started 01/02/14. Completed 01/02/14.	25		

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. USCS designations are based on visual manual classification (ASTM D 2488) unless otherwise supported by laboratory testing (ASTM D 2487).
4. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
5. NS = No Sheen; SS = Slight Sheen; MS = Moderate Sheen; HS = Heavy Sheen

Push Probe Log JT-US-005

Location: Lat: 47.667660 Long: -122.394104
Approximate Ground Surface Elevation: ~13 Feet
Horizontal Datum: WGS1984
Vertical Datum: City of Seattle Datum

Drill Equipment: Direct Push
Sample Type: Acetate Liner
Hole Diameter: 2 inches
Logged By: N. Galvin Reviewed By: P. Cordell

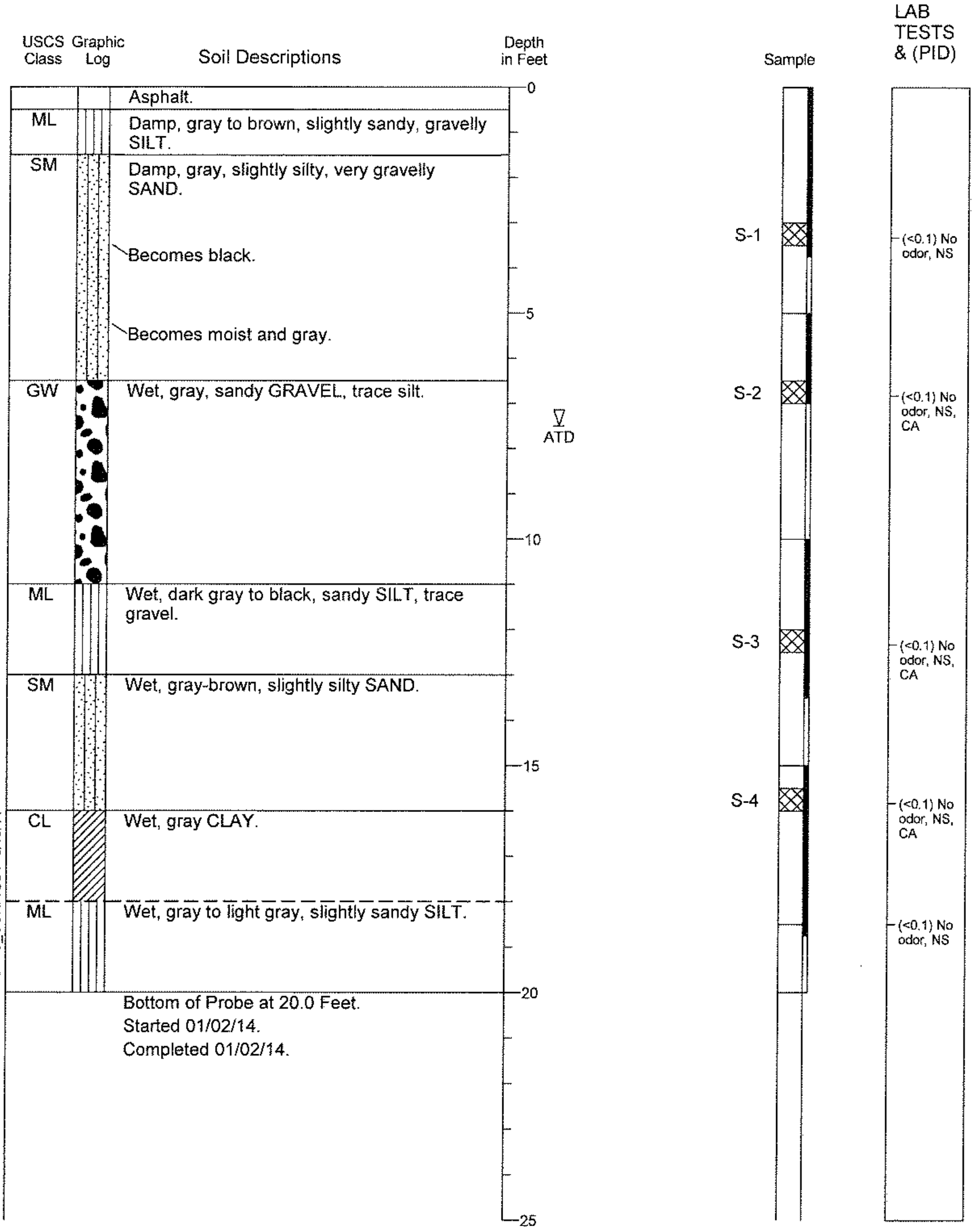
USCS Class	Graphic Log	Soil Descriptions	Depth in Feet	Sample	LAB TESTS & (PID)
		Asphalt.	0		
ML		Damp, gray, sandy SILT, trace gravel.			
SM		Damp, light gray, slightly silty SAND. (FILL)	5	S-1	(<0.1) No odor, NS
ML		Moist, brown, sandy SILT with abundant wood fragments. Becomes wet, gray, and slightly gravelly. Becomes wet, brown, gravelly, very sandy SILT with wood and brick fragments. (FILL)	▽ ATD 10	S-2	(<0.1) No odor, NS (<0.1) Odor, SS, CA
SW SP		Wet, gray, slightly silty SAND.	15		
CL		Wet, light gray CLAY.			
ML		Wet, light gray, sandy SILT.	20	S-3	(<0.1) Slight odor, NS, CA
		Bottom of Probe at 20.0 Feet. Started 01/02/14. Completed 01/02/14.	25		

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. USCS designations are based on visual manual classification (ASTM D 2488) unless otherwise supported by laboratory testing (ASTM D 2487).
4. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
5. NS = No Sheen; SS = Slight Sheen; MS = Moderate Sheen; HS = Heavy Sheen

Push Probe Log JT-US-006

Location: Lat: 47.667594 Long: -122.394145
Approximate Ground Surface Elevation: ~13 Feet
Horizontal Datum: WGS1984
Vertical Datum: City of Seattle Datum

Drill Equipment: Direct Push
Sample Type: Acetate Liner
Hole Diameter: 2 inches
Logged By: N. Galvin Reviewed By: P. Cordell



USCS Class	Soil Descriptions
	Asphalt.
ML	Damp, gray to brown, slightly sandy, gravelly SILT.
SM	Damp, gray, slightly silty, very gravelly SAND. Becomes black. Becomes moist and gray.
GW	Wet, gray, sandy GRAVEL, trace silt.
ML	Wet, dark gray to black, sandy SILT, trace gravel.
SM	Wet, gray-brown, slightly silty SAND.
CL	Wet, gray CLAY.
ML	Wet, gray to light gray, slightly sandy SILT.
	Bottom of Probe at 20.0 Feet. Started 01/02/14. Completed 01/02/14.

Sample	LAB TESTS & (PID)
S-1	(<0.1) No odor, NS
S-2	(<0.1) No odor, NS, CA
S-3	(<0.1) No odor, NS, CA
S-4	(<0.1) No odor, NS, CA
	(<0.1) No odor, NS

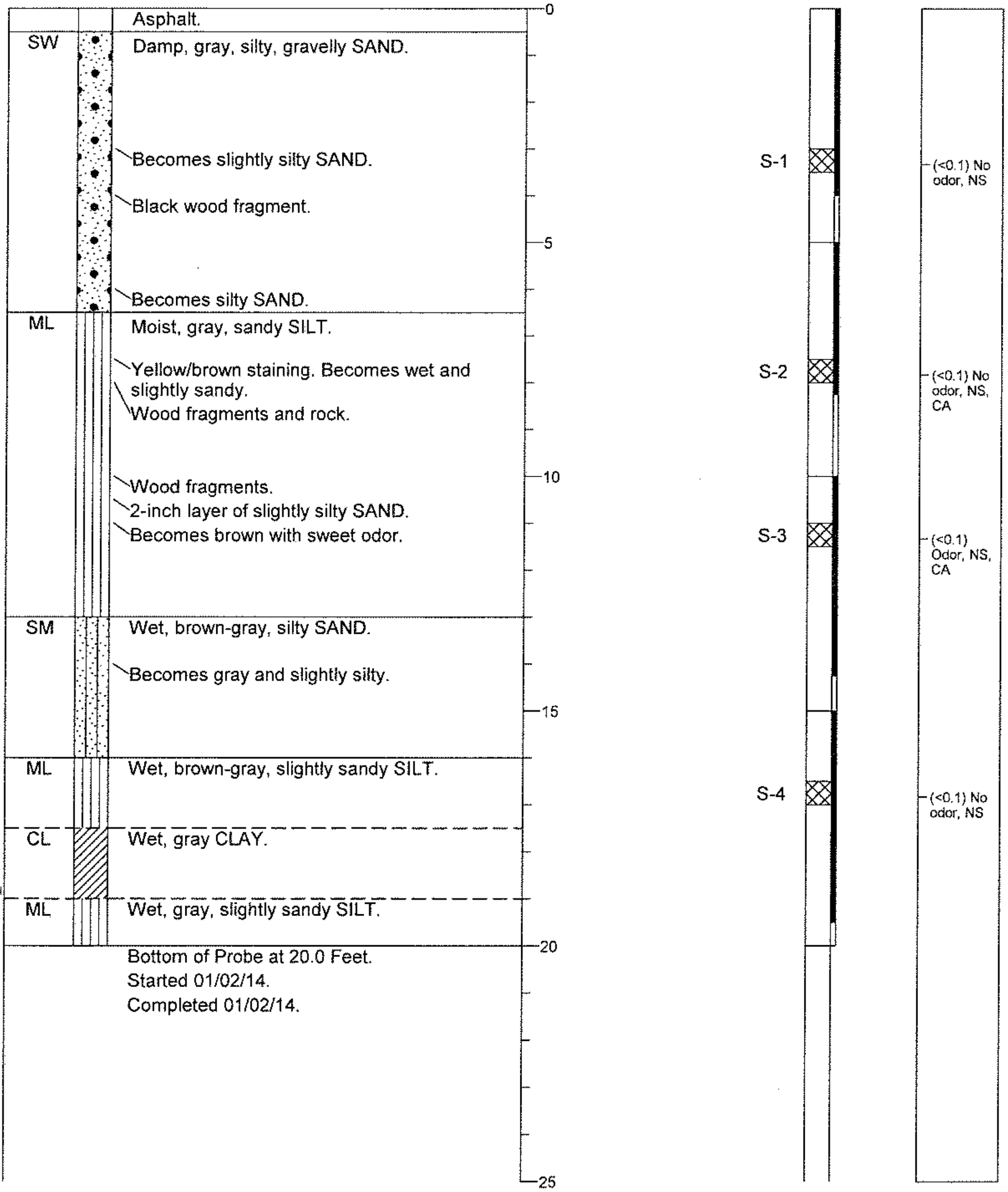
1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. USCS designations are based on visual manual classification (ASTM D 2488) unless otherwise supported by laboratory testing (ASTM D 2487).
4. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
5. NS = No Sheen; SS = Slight Sheen; MS = Moderate Sheen; HS = Heavy Sheen

HARTCROWSER

Push Probe Log JT-US-007

Location: Lat: 47.667546 Long: -122.394062
Approximate Ground Surface Elevation: ~13 Feet
Horizontal Datum: WGS1984
Vertical Datum: City of Seattle Datum

Drill Equipment: Direct Push
Sample Type: Acetate Liner
Hole Diameter: 2 inches
Logged By: N. Galvin Reviewed By: P. Cordell



USCS Class	Soil Descriptions	Depth in Feet	Sample	LAB TESTS & (PID)
	Asphalt.	0		
SW	Damp, gray, silty, gravelly SAND.			
	Becomes slightly silty SAND.		S-1	(<0.1) No odor, NS
	Black wood fragment.			
		5		
	Becomes silty SAND.			
ML	Moist, gray, sandy SILT.			
	Yellow/brown staining. Becomes wet and slightly sandy.		S-2	(<0.1) No odor, NS, CA
	Wood fragments and rock.			
	Wood fragments.	10		
	2-inch layer of slightly silty SAND.			
	Becomes brown with sweet odor.		S-3	(<0.1) Odor, NS, CA
SM	Wet, brown-gray, silty SAND.			
	Becomes gray and slightly silty.			
		15		
ML	Wet, brown-gray, slightly sandy SILT.		S-4	(<0.1) No odor, NS
CL	Wet, gray CLAY.			
ML	Wet, gray, slightly sandy SILT.			
	Bottom of Probe at 20.0 Feet. Started 01/02/14. Completed 01/02/14.	20		
		25		

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. USCS designations are based on visual manual classification (ASTM D 2488) unless otherwise supported by laboratory testing (ASTM D 2487).
4. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
5. NS = No Sheen; SS = Slight Sheen; MS = Moderate Sheen; HS = Heavy Sheen

HARTCROWSER

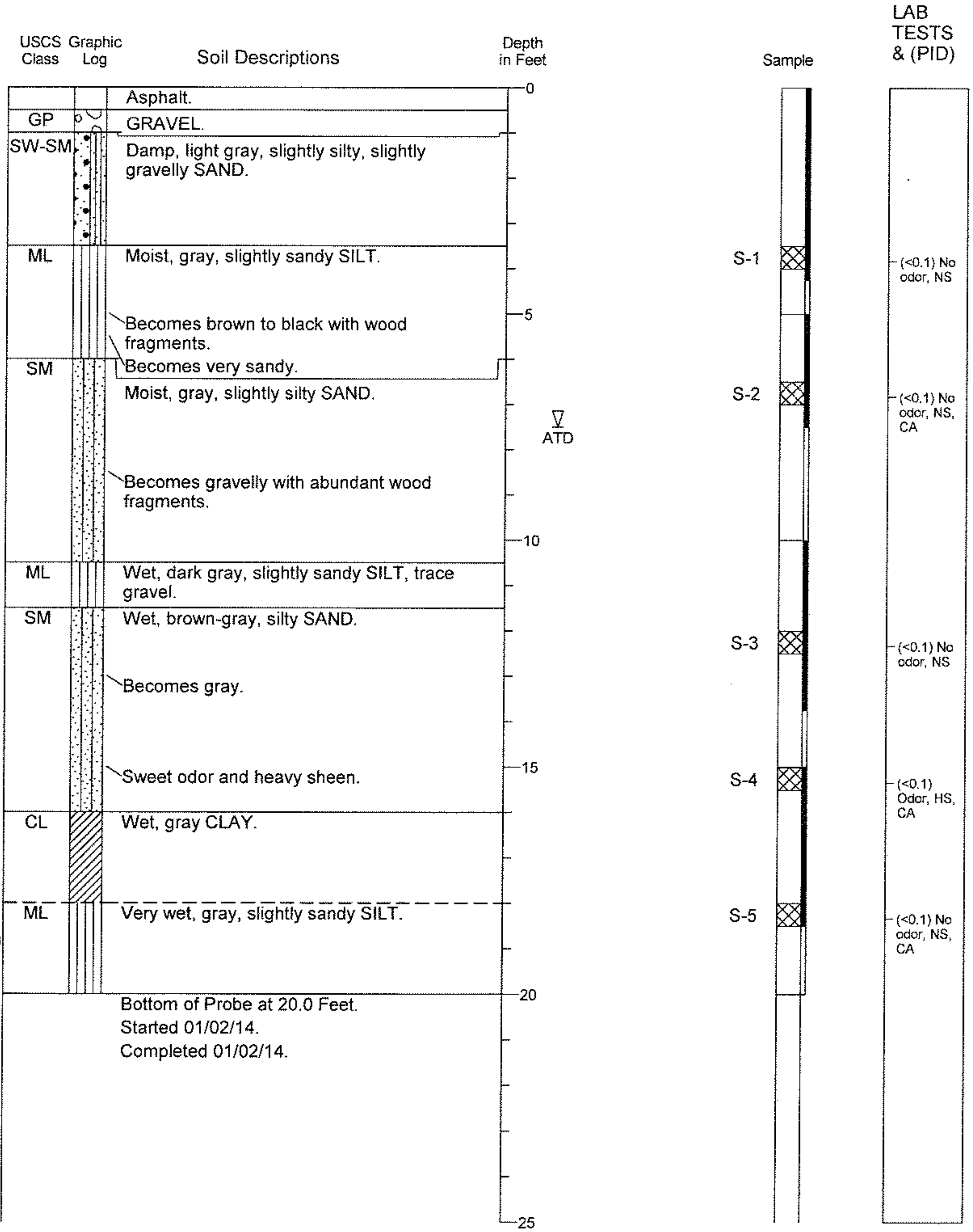
17800-43 *1/14*

Figure A-9

Push Probe Log JT-US-008

Location: Lat: 47.667589 Long: -122.394088
Approximate Ground Surface Elevation: ~13 Feet
Horizontal Datum: WGS1984
Vertical Datum: City of Seattle Datum

Drill Equipment: Direct Push
Sample Type: Acetate Liner
Hole Diameter: 2 inches
Logged By: N. Galvin Reviewed By: P. Cordell



USCS Class	Soil Descriptions	Sample	LAB TESTS & (PID)
	Asphalt.		
GP	GRAVEL.		
SW-SM	Damp, light gray, slightly silty, slightly gravelly SAND.		
ML	Moist, gray, slightly sandy SILT.	S-1	(<0.1) No odor, NS
	Becomes brown to black with wood fragments.		
	Becomes very sandy.		
SM	Moist, gray, slightly silty SAND.	S-2	(<0.1) No odor, NS, CA
	Becomes gravelly with abundant wood fragments.		
ML	Wet, dark gray, slightly sandy SILT, trace gravel.		
SM	Wet, brown-gray, silty SAND.	S-3	(<0.1) No odor, NS
	Becomes gray.		
	Sweet odor and heavy sheen.	S-4	(<0.1) Odor, HS, CA
CL	Wet, gray CLAY.		
ML	Very wet, gray, slightly sandy SILT.	S-5	(<0.1) No odor, NS, CA
	Bottom of Probe at 20.0 Feet. Started 01/02/14. Completed 01/02/14.		

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. USCS designations are based on visual manual classification (ASTM D 2488) unless otherwise supported by laboratory testing (ASTM D 2487).
4. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
5. NS = No Sheen; SS = Slight Sheen; MS = Moderate Sheen; HS = Heavy Sheen

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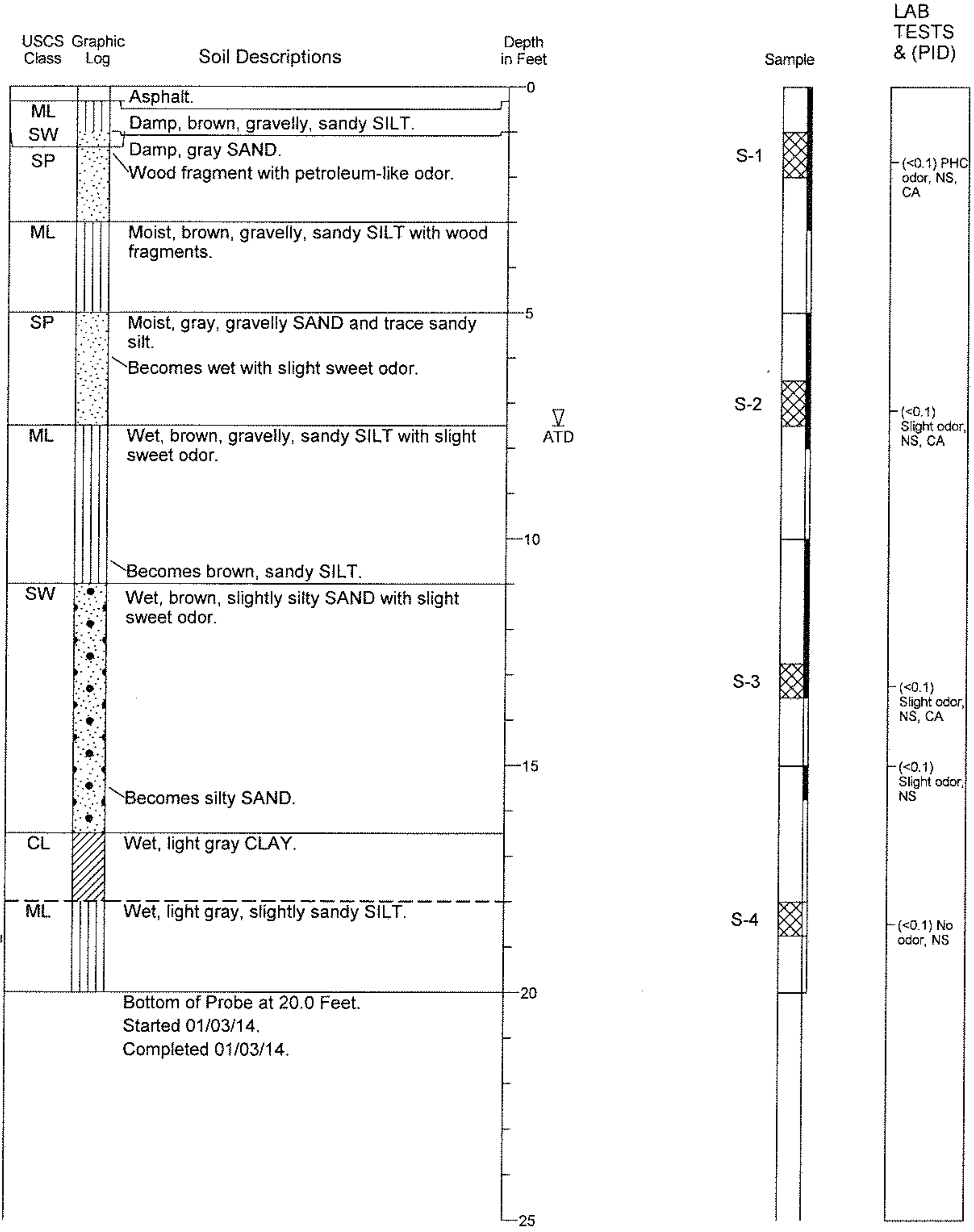
17800-43 *1/14*

Figure A-10

Push Probe Log JT-US-009

Location: Lat: 47.667619 Long: -122.394080
Approximate Ground Surface Elevation: ~13 Feet
Horizontal Datum: WGS1984
Vertical Datum: City of Seattle Datum

Drill Equipment: Direct Push
Sample Type: Acetate Liner
Hole Diameter: 2 inches
Logged By: N. Galvin Reviewed By: P. Cordell



USCS Class	Soil Descriptions	Depth in Feet	Sample	LAB TESTS & (PID)
	Asphalt.	0		
ML	Damp, brown, gravelly, sandy SILT.			
SW	Damp, gray SAND.			
SP	Wood fragment with petroleum-like odor.		S-1	(<0.1) PHC odor, NS, CA
ML	Moist, brown, gravelly, sandy SILT with wood fragments.			
SP	Moist, gray, gravelly SAND and trace sandy silt. Becomes wet with slight sweet odor.	5	S-2	(<0.1) Slight odor, NS, CA
ML	Wet, brown, gravelly, sandy SILT with slight sweet odor. Becomes brown, sandy SILT.	∇ ATD 10		
SW	Wet, brown, slightly silty SAND with slight sweet odor. Becomes silty SAND.	15	S-3	(<0.1) Slight odor, NS, CA (<0.1) Slight odor, NS
CL	Wet, light gray CLAY.			
ML	Wet, light gray, slightly sandy SILT.		S-4	(<0.1) No odor, NS
	Bottom of Probe at 20.0 Feet. Started 01/03/14. Completed 01/03/14.	20		

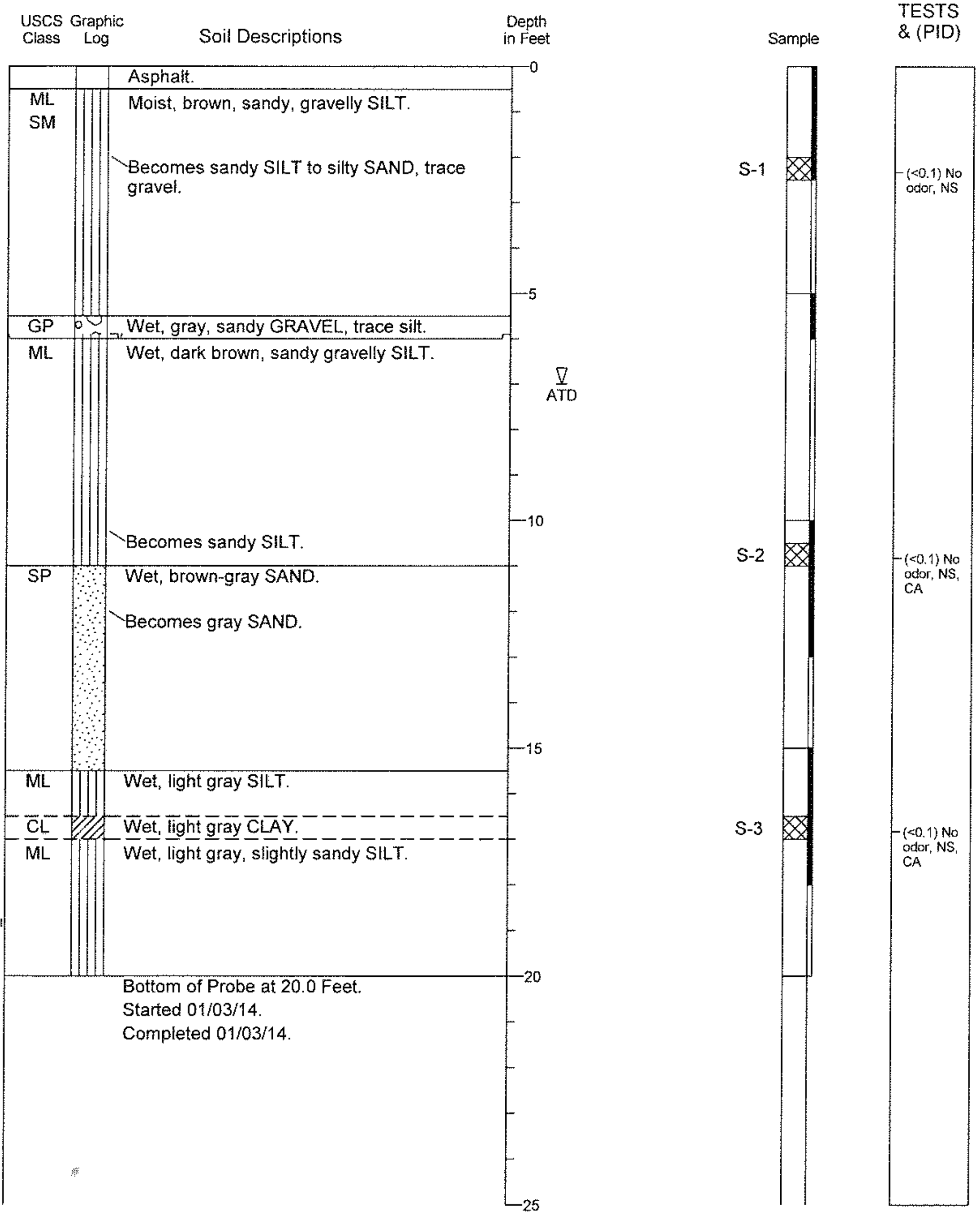
PUSH PROBE LOG-ENV 1780043-PP.GPJ HC_CORP.GDT 6/18/14

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. USCS designations are based on visual manual classification (ASTM D 2488) unless otherwise supported by laboratory testing (ASTM D 2487).
4. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
5. NS = No Sheen; SS = Slight Sheen; MS = Moderate Sheen; HS = Heavy Sheen

Push Probe Log JT-US-010

Location: Lat: 47.667649 Long: -122.394039
Approximate Ground Surface Elevation: ~13 Feet
Horizontal Datum: WGS1984
Vertical Datum: City of Seattle Datum

Drill Equipment: Direct Push
Sample Type: Acetate Liner
Hole Diameter: 2 inches
Logged By: N. Galvin   Reviewed By: P. Cordell



USCS Class	Soil Descriptions	Sample	LAB TESTS & (PID)
	Asphalt.		
ML SM	Moist, brown, sandy, gravelly SILT. Becomes sandy SILT to silty SAND, trace gravel.	S-1	(<0.1) No odor, NS
GP	Wet, gray, sandy GRAVEL, trace silt.		
ML	Wet, dark brown, sandy gravelly SILT. Becomes sandy SILT.	S-2	(<0.1) No odor, NS, CA
SP	Wet, brown-gray SAND. Becomes gray SAND.		
ML	Wet, light gray SILT.		
CL	Wet, light gray CLAY.		
ML	Wet, light gray, slightly sandy SILT.	S-3	(<0.1) No odor, NS, CA

Bottom of Probe at 20.0 Feet.
Started 01/03/14.
Completed 01/03/14.

PUSH PROBE LOG-ENV 1780043-PP.GPJ HC_CORP.GDT 6/18/14

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. USCS designations are based on visual manual classification (ASTM D 2488) unless otherwise supported by laboratory testing (ASTM D 2487).
4. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
5. NS = No Sheen; SS = Slight Sheen; MS = Moderate Sheen; HS = Heavy Sheen

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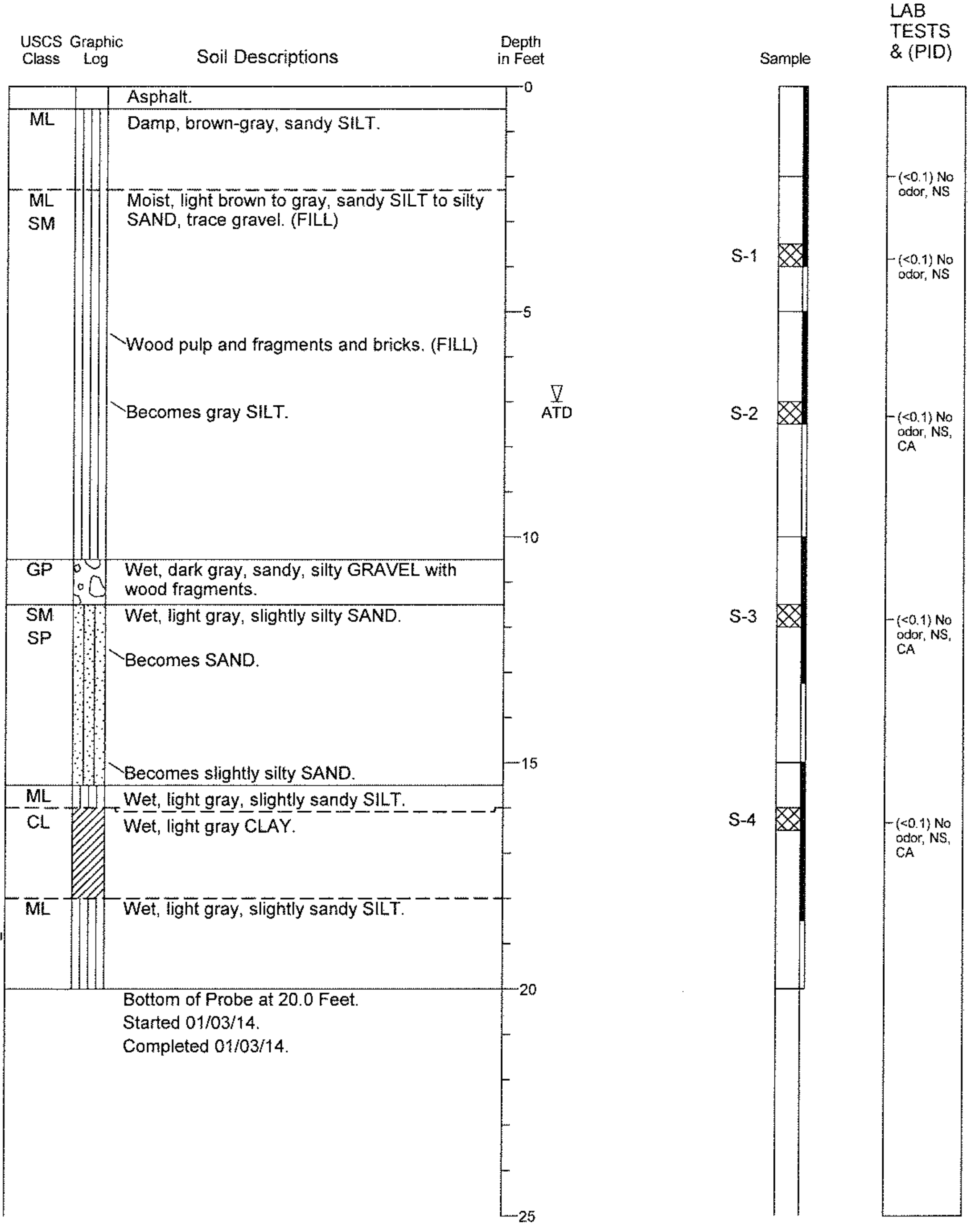
Push Probe Log JT-US-011

Location: Lat: 47.667676 Long: -122.394053
Approximate Ground Surface Elevation: ~13 Feet
Horizontal Datum: WGS1984
Vertical Datum: City of Seattle Datum

Drill Equipment: Direct Push
Sample Type: Acetate Liner
Hole Diameter: 2 inches
Logged By: N. Galvin Reviewed By: P. Cordell



USCS Class	Soil Descriptions
	Asphalt.
ML	Damp, brown-gray, sandy SILT.
ML SM	Moist, light brown to gray, sandy SILT to silty SAND, trace gravel. (FILL) Wood pulp and fragments and bricks. (FILL) Becomes gray SILT.
GP	Wet, dark gray, sandy, silty GRAVEL with wood fragments.
SM SP	Wet, light gray, slightly silty SAND. Becomes SAND. Becomes slightly silty SAND.
ML	Wet, light gray, slightly sandy SILT.
CL	Wet, light gray CLAY.
ML	Wet, light gray, slightly sandy SILT.
	Bottom of Probe at 20.0 Feet. Started 01/03/14. Completed 01/03/14.

Sample	LAB TESTS & (PID)
	(<0.1) No odor, NS
S-1	(<0.1) No odor, NS
S-2	(<0.1) No odor, NS, CA
S-3	(<0.1) No odor, NS, CA
S-4	(<0.1) No odor, NS, CA

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. USCS designations are based on visual manual classification (ASTM D 2488) unless otherwise supported by laboratory testing (ASTM D 2487).
4. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
5. NS = No Sheen; SS = Slight Sheen; MS = Moderate Sheen; HS = Heavy Sheen

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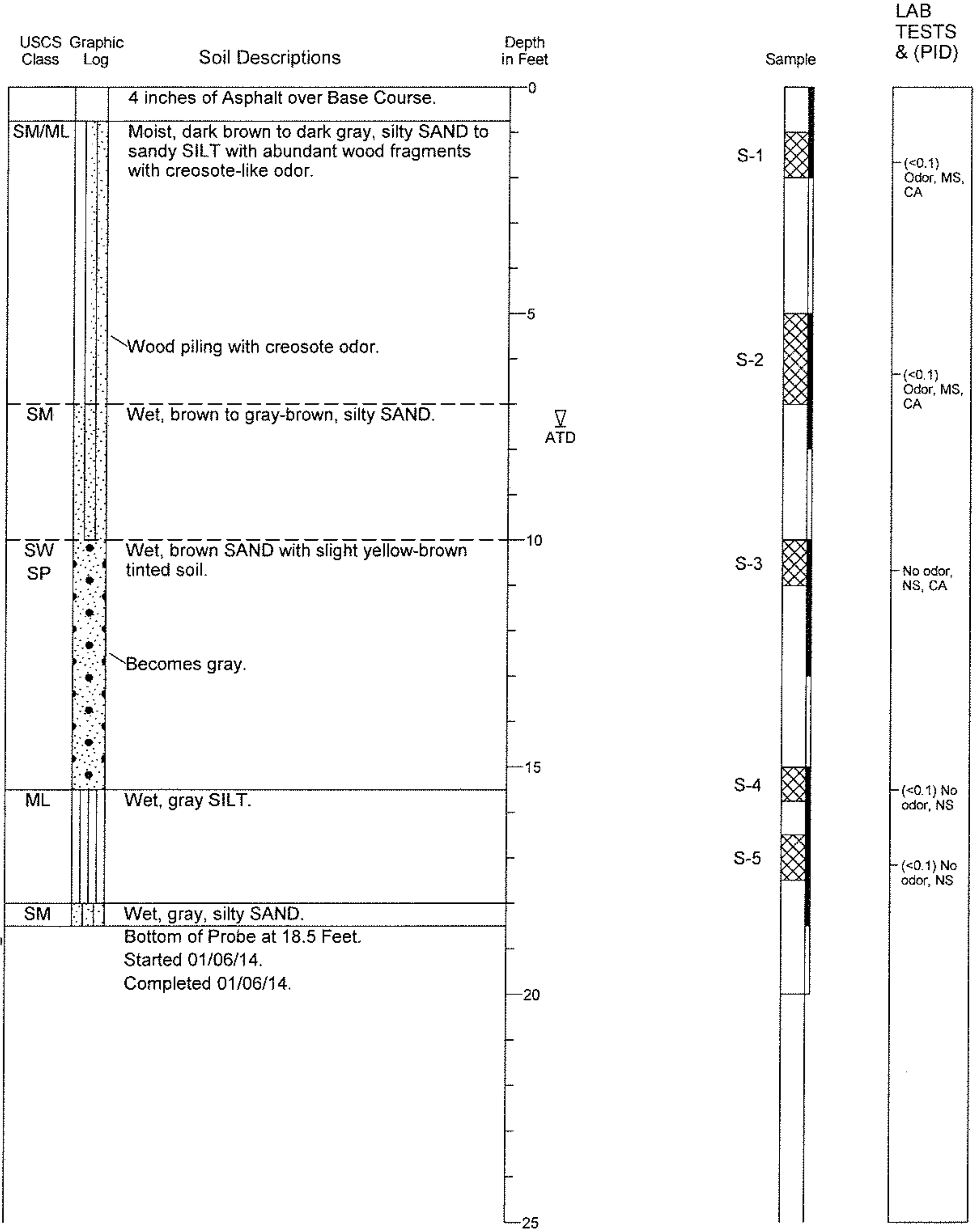
17800-43 **1/14**

Figure A-13

Push Probe Log JT-US-012

Location: Lat: 47.667701 Long: -122.394043
Approximate Ground Surface Elevation: ~13 Feet
Horizontal Datum: WGS1984
Vertical Datum: City of Seattle Datum

Drill Equipment: Direct Push
Sample Type: Acetate Liner
Hole Diameter: 2 inches
Logged By: P. Cordell Reviewed By: A. Goodwin



USCS Class	Soil Descriptions
	4 inches of Asphalt over Base Course.
SM/ML	Moist, dark brown to dark gray, silty SAND to sandy SILT with abundant wood fragments with creosote-like odor. Wood piling with creosote odor.
SM	Wet, brown to gray-brown, silty SAND.
SW SP	Wet, brown SAND with slight yellow-brown tinted soil. Becomes gray.
ML	Wet, gray SILT.
SM	Wet, gray, silty SAND.

Bottom of Probe at 18.5 Feet.
Started 01/06/14.
Completed 01/06/14.

Sample	LAB TESTS & (PID)
S-1	(<0.1) Odor, MS, CA
S-2	(<0.1) Odor, MS, CA
S-3	No odor, NS, CA
S-4	(<0.1) No odor, NS
S-5	(<0.1) No odor, NS

PUSH PROBE LOG-ENV 1780043-PP.GPJ HC_CORP.GDT 6/18/14

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. USCS designations are based on visual manual classification (ASTM D 2488) unless otherwise supported by laboratory testing (ASTM D 2487).
4. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
5. NS = No Sheen; SS = Slight Sheen; MS = Moderate Sheen; HS = Heavy Sheen

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17800-43 *1/14*

Figure A-14

Push Probe Log JT-US-013

Location: Lat: 47.667699 Long: -122.394128
Approximate Ground Surface Elevation: ~13 Feet
Horizontal Datum: WGS1984
Vertical Datum: City of Seattle Datum

Drill Equipment: Direct Push
Sample Type: Acetate Liner
Hole Diameter: 2 inches
Logged By: N. Galvin Reviewed By: P. Cordell

USCS Class	Soil Descriptions	Depth in Feet
	Asphalt.	0
ML	Damp, brown, sandy, gravelly SILT. Charred wood fragments and sand seam.	
SP-SM	Damp, brown, gravelly, very sandy SILT to very silty SAND. Wood fragments and petroleum-like odor. Black staining with petroleum-like odor.	5 ▽ ATD 10
SM	Wet, brown-gray, silty SAND. Yellow/brown staining, no odor.	
SW	Wet, gray SAND. Becomes light gray.	
SM	Wet, light gray, silty SAND.	15
ML	Wet, light gray SILT.	
CL	Wet, light gray CLAY.	
ML	Wet, light gray, slightly sandy SILT.	
	Bottom of Probe at 20.0 Feet. Started 01/03/14. Completed 01/03/14.	20 25

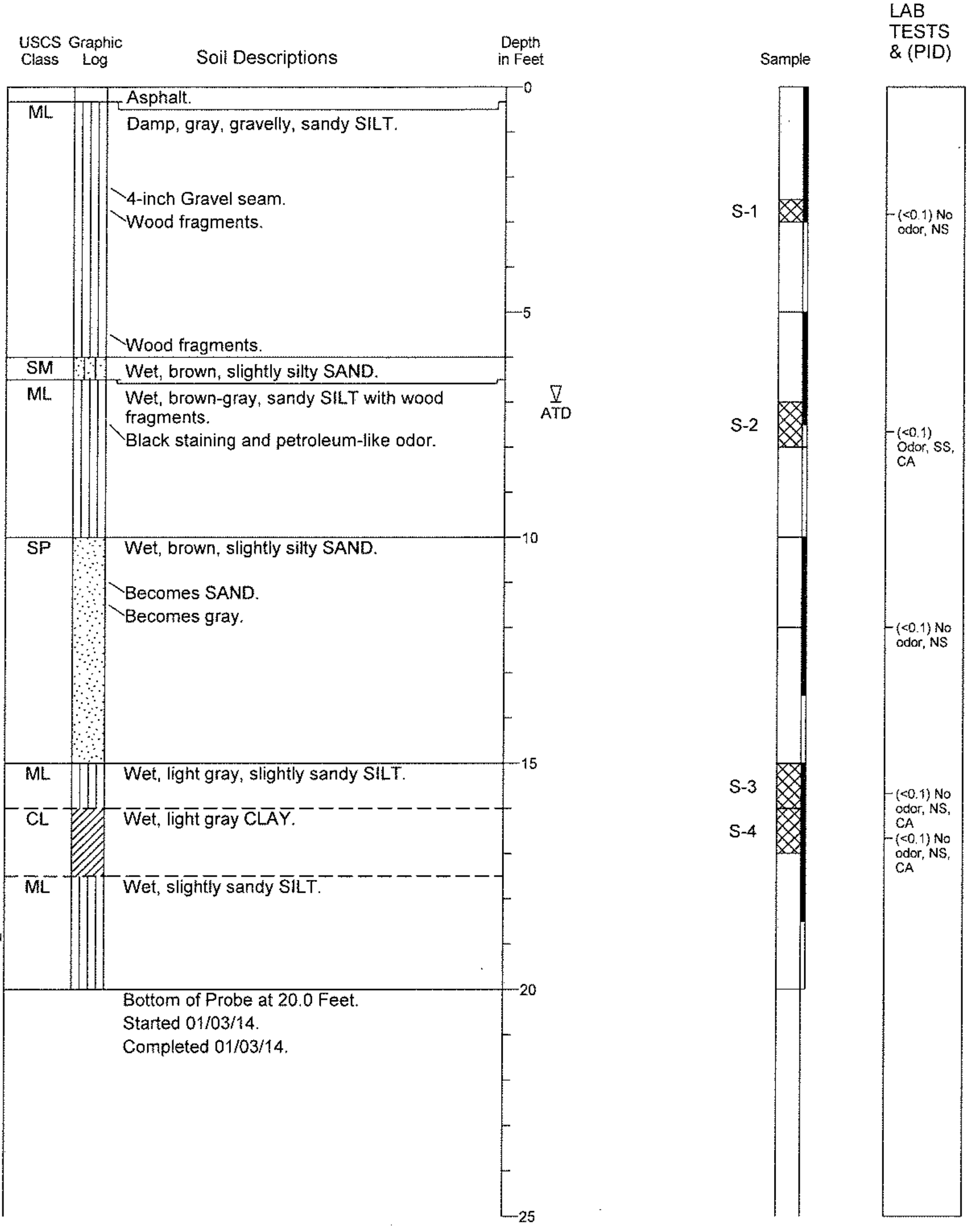
Sample	LAB TESTS & (PID)
S-1	(<0.1) No odor, NS
S-2	(<0.1) Slight odor, NS, CA
S-3	(<0.1) No odor, NS, CA
S-4	(<0.1) No odor, NS, CA

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. USCS designations are based on visual manual classification (ASTM D 2488) unless otherwise supported by laboratory testing (ASTM D 2487).
4. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
5. NS = No Sheen; SS = Slight Sheen; MS = Moderate Sheen; HS = Heavy Sheen

Push Probe Log JT-US-014

Location: Lat: 47.667692 Long: -122.394192
Approximate Ground Surface Elevation: ~13 Feet
Horizontal Datum: WGS1984
Vertical Datum: City of Seattle Datum

Drill Equipment: Direct Push
Sample Type: Acetate Liner
Hole Diameter: 2 inches
Logged By: N. Galvin Reviewed By: P. Cordell



USCS Class	Soil Descriptions	Depth in Feet	Sample	LAB TESTS & (PID)
	Asphalt.	0		
ML	Damp, gray, gravelly, sandy SILT. 4-inch Gravel seam. Wood fragments. Wood fragments.	5	S-1	(<0.1) No odor, NS
SM	Wet, brown, slightly silty SAND.			
ML	Wet, brown-gray, sandy SILT with wood fragments. Black staining and petroleum-like odor.	∇ ATD	S-2	(<0.1) Odor, SS, CA
SP	Wet, brown, slightly silty SAND. Becomes SAND. Becomes gray.	10		(<0.1) No odor, NS
ML	Wet, light gray, slightly sandy SILT.	15	S-3	(<0.1) No odor, NS, CA
CL	Wet, light gray CLAY.		S-4	(<0.1) No odor, NS, CA
ML	Wet, slightly sandy SILT.			
	Bottom of Probe at 20.0 Feet. Started 01/03/14. Completed 01/03/14.	20		
		25		

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. USCS designations are based on visual manual classification (ASTM D 2488) unless otherwise supported by laboratory testing (ASTM D 2487).
4. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
5. NS = No Sheen; SS = Slight Sheen; MS = Moderate Sheen; HS = Heavy Sheen

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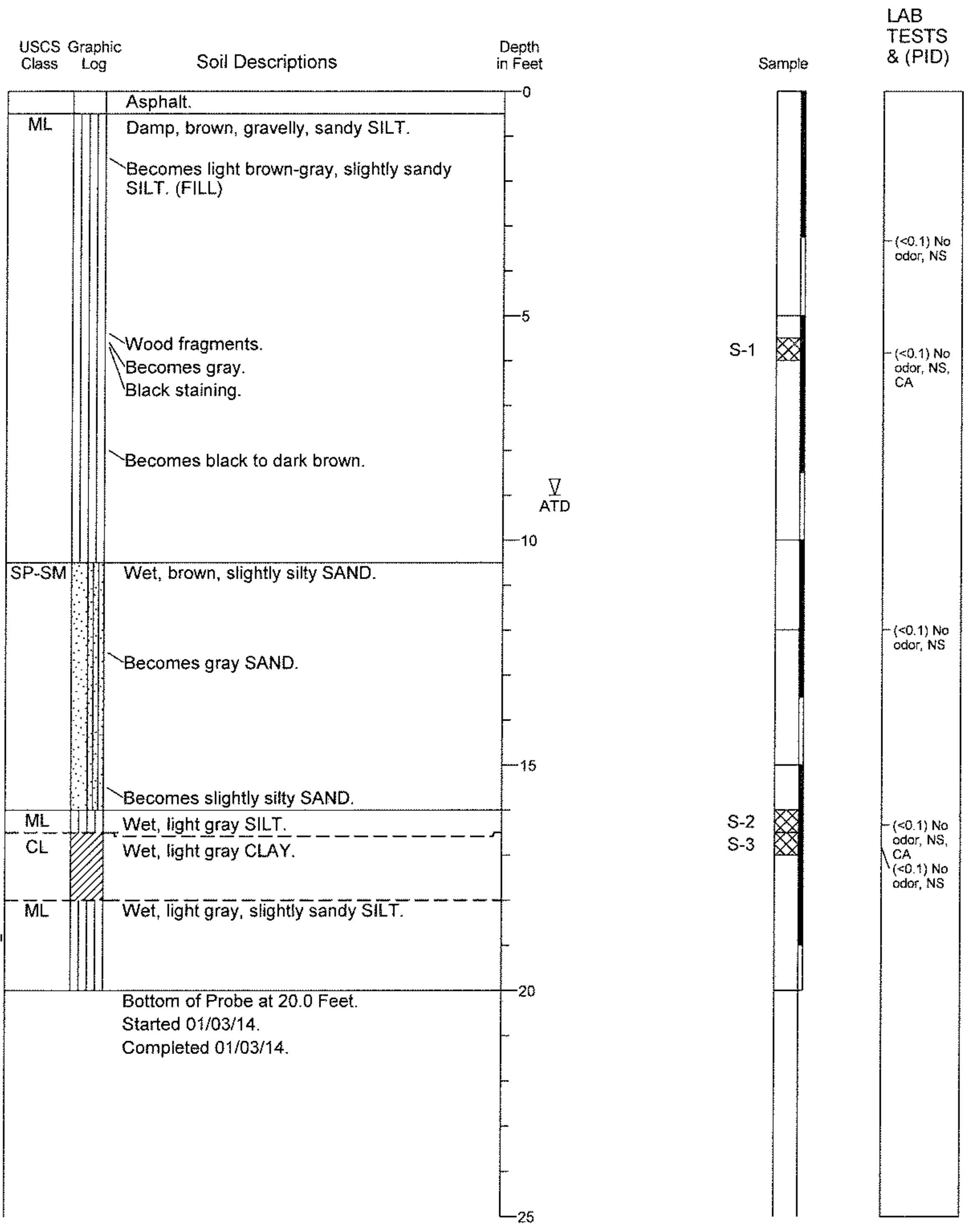
17800-43 1/14

Figure A-16

Push Probe Log JT-US-015

Location: Lat: 47.667697 Long: -122.394267
Approximate Ground Surface Elevation: ~14 Feet
Horizontal Datum: WGS1984
Vertical Datum: City of Seattle Datum

Drill Equipment: Direct Push
Sample Type: Acetate Liner
Hole Diameter: 2 inches
Logged By: N. Galvin Reviewed By: P. Cordell



USCS Class	Soil Descriptions
	Asphalt.
ML	Damp, brown, gravelly, sandy SILT. Becomes light brown-gray, slightly sandy SILT. (FILL) Wood fragments. Becomes gray. Black staining. Becomes black to dark brown.
SP-SM	Wet, brown, slightly silty SAND. Becomes gray SAND. Becomes slightly silty SAND.
ML	Wet, light gray SILT.
CL	Wet, light gray CLAY.
ML	Wet, light gray, slightly sandy SILT.
	Bottom of Probe at 20.0 Feet. Started 01/03/14. Completed 01/03/14.

LAB TESTS & (PID):

(<0.1) No odor, NS
(<0.1) No odor, NS, CA
(<0.1) No odor, NS
(<0.1) No odor, NS, CA
(<0.1) No odor, NS

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. USCS designations are based on visual manual classification (ASTM D 2488) unless otherwise supported by laboratory testing (ASTM D 2487).
4. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
5. NS = No Sheen; SS = Slight Sheen; MS = Moderate Sheen; HS = Heavy Sheen

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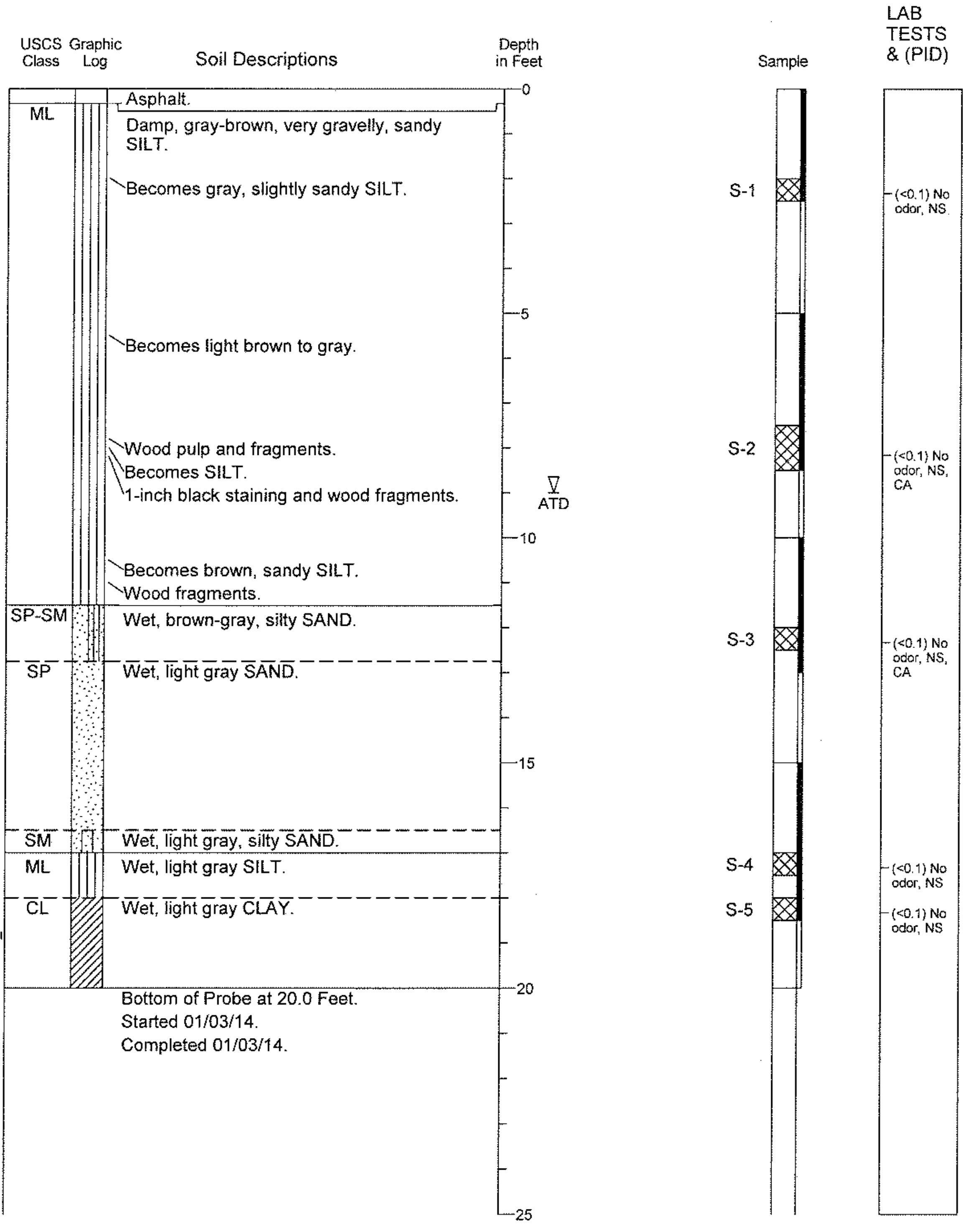
17800-43 *1/14*

Figure A-17

Push Probe Log JT-US-016

Location: Lat: 47.667688 Long: -122.394350
Approximate Ground Surface Elevation: ~15 Feet
Horizontal Datum: WGS1984
Vertical Datum: City of Seattle Datum

Drill Equipment: Direct Push
Sample Type: Acetate Liner
Hole Diameter: 2 inches
Logged By: N. Galvin Reviewed By: P. Cordell



USCS Class	Soil Descriptions
	Asphalt.
ML	Damp, gray-brown, very gravelly, sandy SILT. Becomes gray, slightly sandy SILT. Becomes light brown to gray. Wood pulp and fragments. Becomes SILT. 1-inch black staining and wood fragments. Becomes brown, sandy SILT. Wood fragments.
SP-SM	Wet, brown-gray, silty SAND.
SP	Wet, light gray SAND.
SM	Wet, light gray, silty SAND.
ML	Wet, light gray SILT.
CL	Wet, light gray CLAY.

Bottom of Probe at 20.0 Feet.
Started 01/03/14.
Completed 01/03/14.

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. USCS designations are based on visual manual classification (ASTM D 2488) unless otherwise supported by laboratory testing (ASTM D 2487).
4. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
5. NS = No Sheen; SS = Slight Sheen; MS = Moderate Sheen; HS = Heavy Sheen

HARTCROWSER

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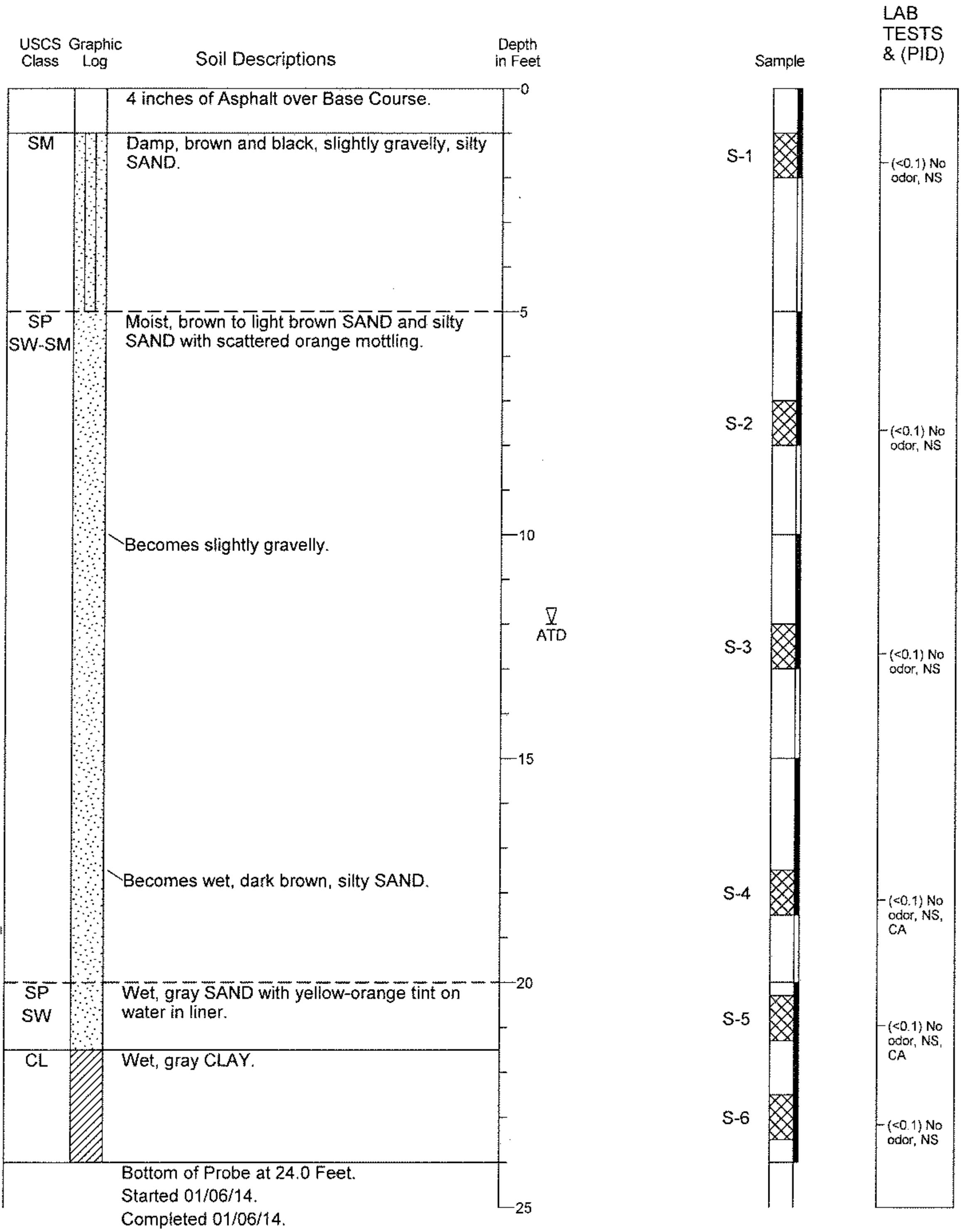
Figure A-18

Push Probe Log JT-US-017

Location: Lat: 47.667697 Long: -122.394417	Drill Equipment: Direct Push
Approximate Ground Surface Elevation: ~20 Feet	Sample Type: Acetate Liner
Horizontal Datum: WGS1984	Hole Diameter: 2 inches
Vertical Datum: City of Seattle Datum	Logged By: P. Cordell Reviewed By: A. Goodwin



USCS Class	Graphic Log	Soil Descriptions	Depth in Feet
		4 inches of Asphalt over Base Course.	0
SM		Damp, brown and black, slightly gravelly, silty SAND.	
SP SW-SM		Moist, brown to light brown SAND and silty SAND with scattered orange mottling.	5
		Becomes slightly gravelly.	10
		▽ ATD	
			15
		Becomes wet, dark brown, silty SAND.	
SP SW		Wet, gray SAND with yellow-orange tint on water in liner.	20
CL		Wet, gray CLAY.	
		Bottom of Probe at 24.0 Feet. Started 01/06/14. Completed 01/06/14.	25

Sample	LAB TESTS & (PID)
S-1	(<0.1) No odor, NS
S-2	(<0.1) No odor, NS
S-3	(<0.1) No odor, NS
S-4	(<0.1) No odor, NS, CA
S-5	(<0.1) No odor, NS, CA
S-6	(<0.1) No odor, NS

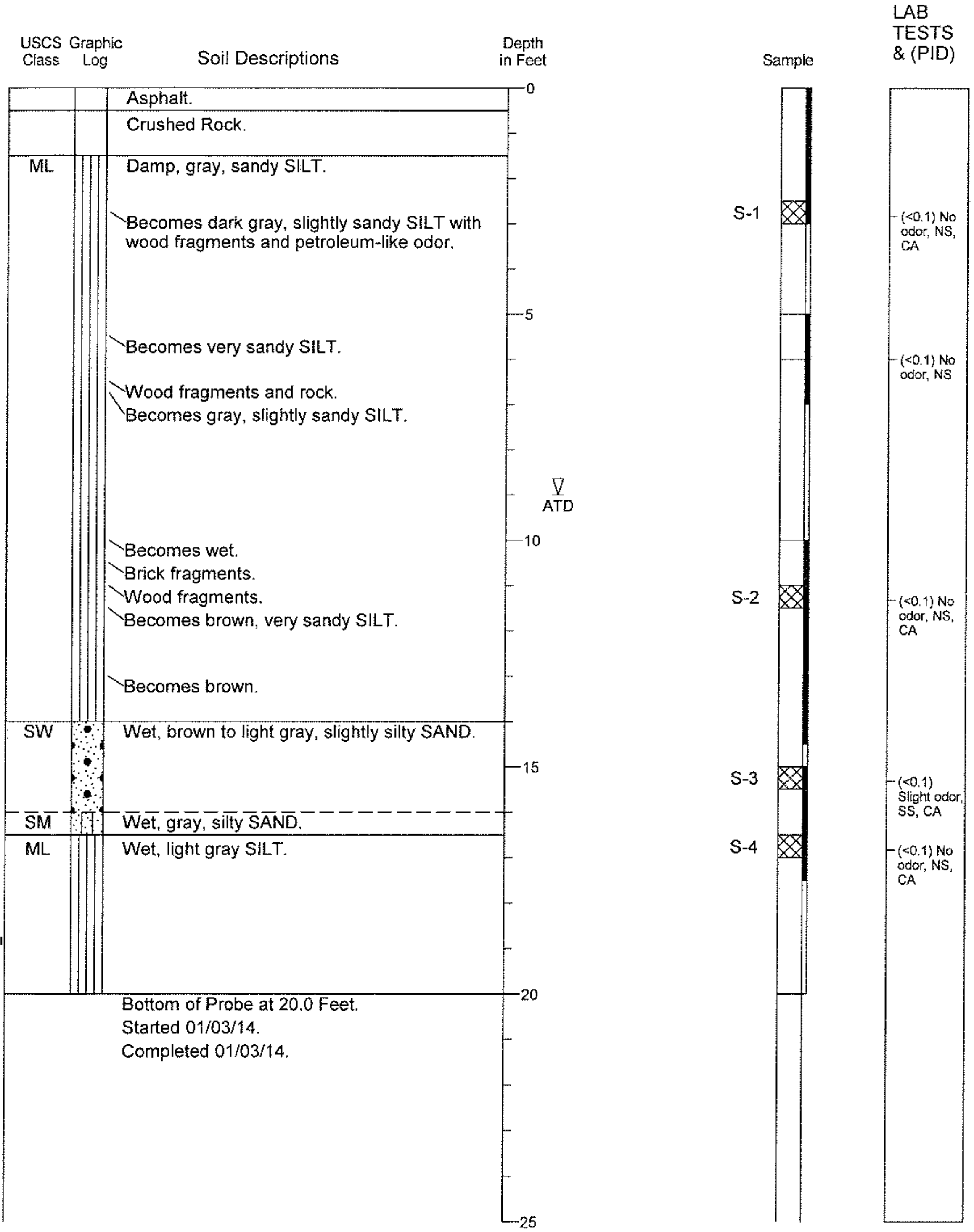
PUSH PROBE LOG-ENV 1780043-PP.GPJ HC_CORP.GDT 6/18/14

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. USCS designations are based on visual manual classification (ASTM D 2488) unless otherwise supported by laboratory testing (ASTM D 2487).
4. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
5. NS = No Sheen; SS = Slight Sheen; MS = Moderate Sheen; HS = Heavy Sheen

Push Probe Log JT-US-018

Location: Lat: 47.667664 Long: -122.394469
Approximate Ground Surface Elevation: ~17 Feet
Horizontal Datum: WGS1984
Vertical Datum: City of Seattle Datum

Drill Equipment: Direct Push
Sample Type: Acetate Liner
Hole Diameter: 2 inches
Logged By: N. Galvin Reviewed By: P. Cordell



USCS Class	Soil Descriptions
	Asphalt.
	Crushed Rock.
ML	Damp, gray, sandy SILT.
	Becomes dark gray, slightly sandy SILT with wood fragments and petroleum-like odor.
	Becomes very sandy SILT.
	Wood fragments and rock.
	Becomes gray, slightly sandy SILT.
	Becomes wet.
	Brick fragments.
	Wood fragments.
	Becomes brown, very sandy SILT.
	Becomes brown.
SW	Wet, brown to light gray, slightly silty SAND.
SM	Wet, gray, silty SAND.
ML	Wet, light gray SILT.

Bottom of Probe at 20.0 Feet.
Started 01/03/14.
Completed 01/03/14.

Sample	LAB TESTS & (PID)
S-1	(<0.1) No odor, NS, CA
	(<0.1) No odor, NS
S-2	(<0.1) No odor, NS, CA
S-3	(<0.1) Slight odor, SS, CA
S-4	(<0.1) No odor, NS, CA

PUSH PROBE LOG-ENV 1780043-PP.GPJ HC_CORP.GDT 6/18/14

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. USCS designations are based on visual manual classification (ASTM D 2488) unless otherwise supported by laboratory testing (ASTM D 2487).
4. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
5. NS = No Sheen; SS = Slight Sheen; MS = Moderate Sheen; HS = Heavy Sheen

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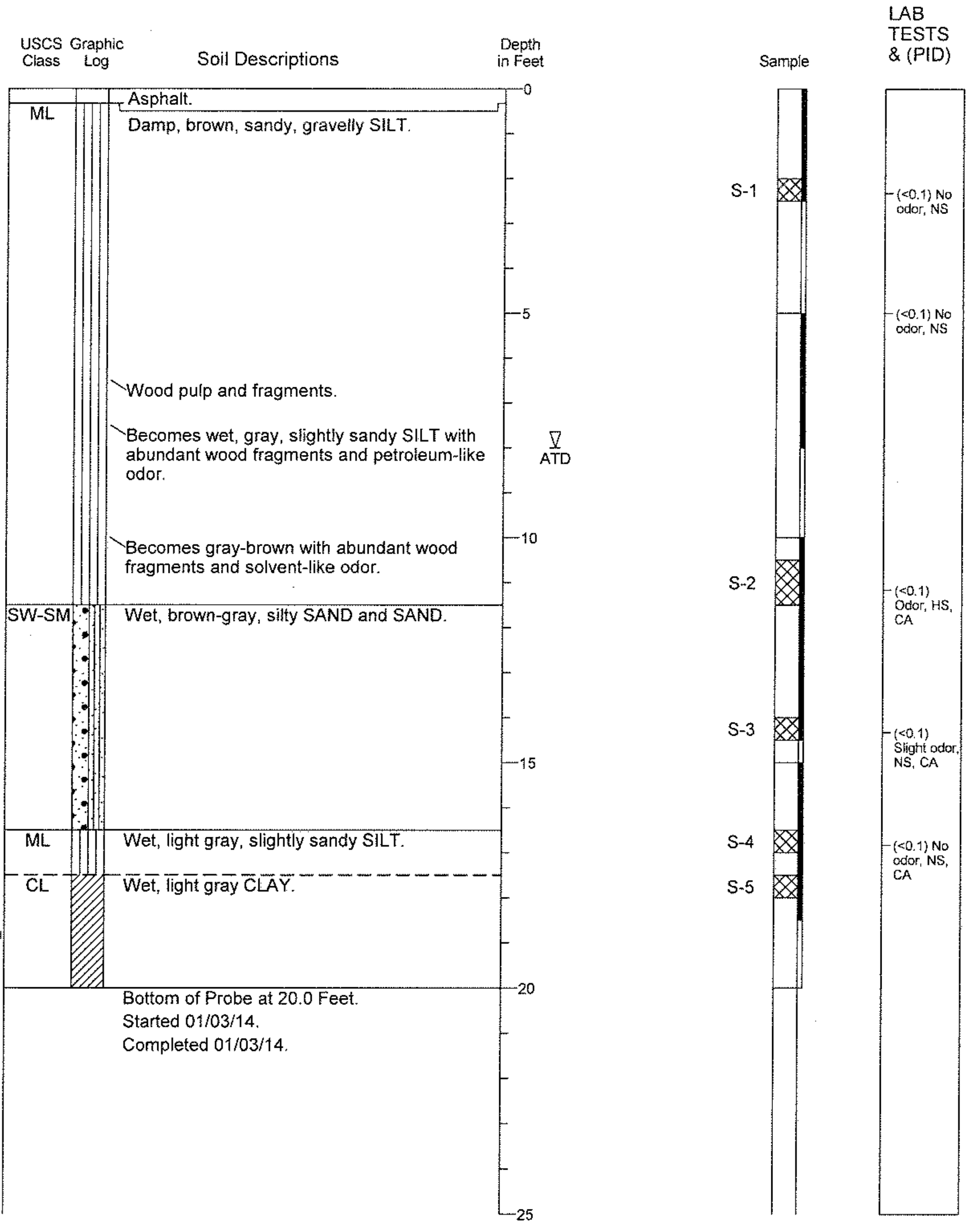
Figure A-20

Push Probe Log JT-US-019

Location: Lat: 47.667637 Long: -122.394341
Approximate Ground Surface Elevation: ~14 Feet
Horizontal Datum: WGS1984
Vertical Datum: City of Seattle Datum

Drill Equipment: Direct Push
Sample Type: Acetate Liner
Hole Diameter: 2 inches
Logged By: N. Galvin Reviewed By: P. Cordell



Asphalt.

Damp, brown, sandy, gravelly SILT.

Wood pulp and fragments.

Becomes wet, gray, slightly sandy SILT with abundant wood fragments and petroleum-like odor.

Becomes gray-brown with abundant wood fragments and solvent-like odor.

Wet, brown-gray, silty SAND and SAND.

Wet, light gray, slightly sandy SILT.

Wet, light gray CLAY.

Bottom of Probe at 20.0 Feet.
Started 01/03/14.
Completed 01/03/14.

(<0.1) No odor, NS

(<0.1) No odor, NS

(<0.1) Odor, HS, CA

(<0.1) Slight odor, NS, CA

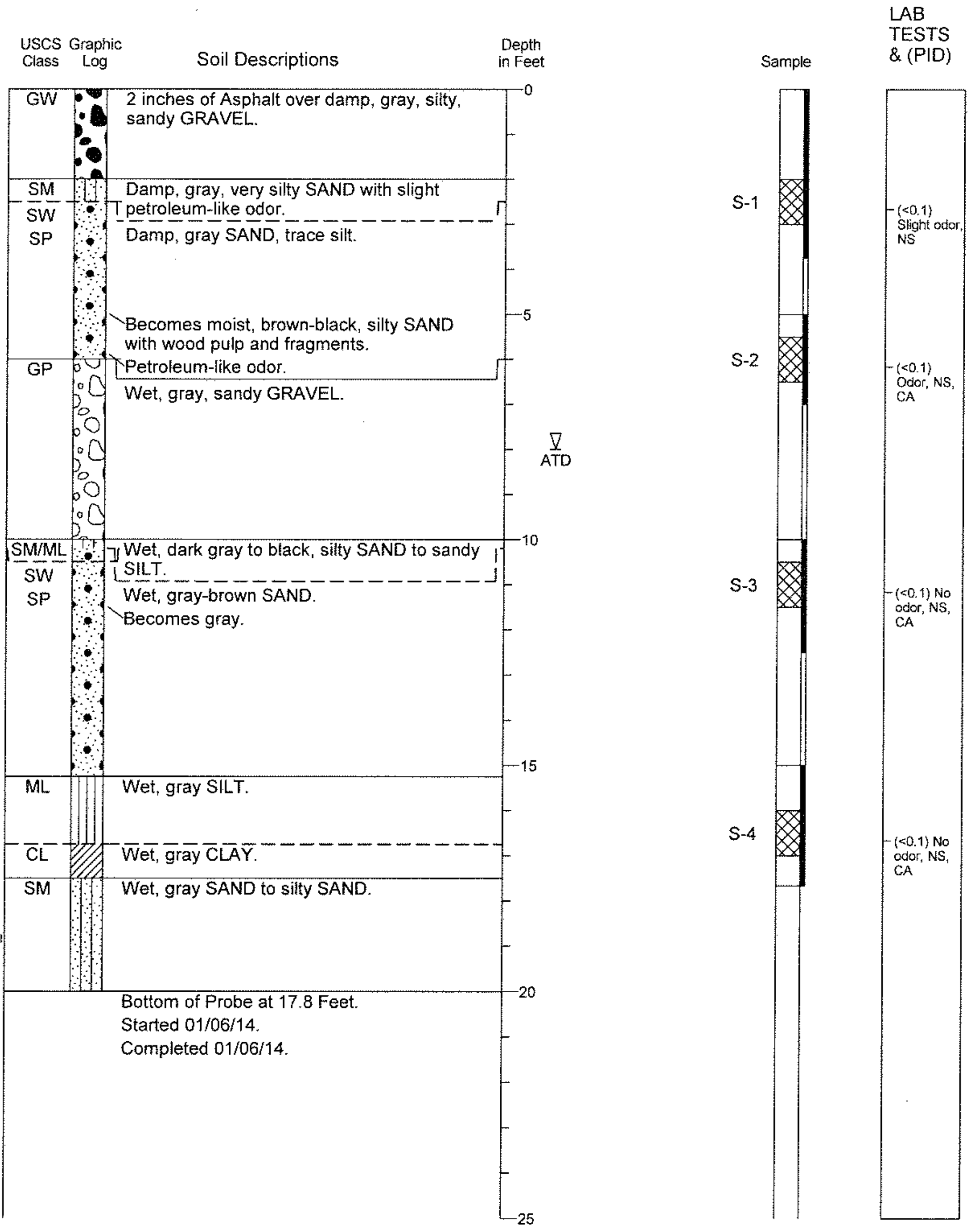
(<0.1) No odor, NS, CA

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. USCS designations are based on visual manual classification (ASTM D 2488) unless otherwise supported by laboratory testing (ASTM D 2487).
4. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
5. NS = No Sheen; SS = Slight Sheen; MS = Moderate Sheen; HS = Heavy Sheen

Push Probe Log JT-US-020

Location: Lat: 47.667632 Long: -122.394306
Approximate Ground Surface Elevation: ~13 Feet
Horizontal Datum: WGS1984
Vertical Datum: City of Seattle Datum

Drill Equipment: Direct Push
Sample Type: Acetate Liner
Hole Diameter: 2 inches
Logged By: P. Cordell Reviewed By: A. Goodwin



USCS Class	Soil Descriptions	Depth in Feet	Sample	LAB TESTS & (PID)
GW	2 inches of Asphalt over damp, gray, silty, sandy GRAVEL.	0		
SM	Damp, gray, very silty SAND with slight petroleum-like odor.		S-1	(<0.1) Slight odor, NS
SW SP	Damp, gray SAND, trace silt. Becomes moist, brown-black, silty SAND with wood pulp and fragments. Petroleum-like odor.	5	S-2	(<0.1) Odor, NS, CA
GP	Wet, gray, sandy GRAVEL.	ATD		
SM/ML	Wet, dark gray to black, silty SAND to sandy SILT.	10		
SW SP	Wet, gray-brown SAND. Becomes gray.		S-3	(<0.1) No odor, NS, CA
ML	Wet, gray SILT.	15		
CL	Wet, gray CLAY.		S-4	(<0.1) No odor, NS, CA
SM	Wet, gray SAND to silty SAND.			
	Bottom of Probe at 17.8 Feet. Started 01/06/14. Completed 01/06/14.	20		

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. USCS designations are based on visual manual classification (ASTM D 2488) unless otherwise supported by laboratory testing (ASTM D 2487).
4. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
5. NS = No Sheen; SS = Slight Sheen; MS = Moderate Sheen; HS = Heavy Sheen

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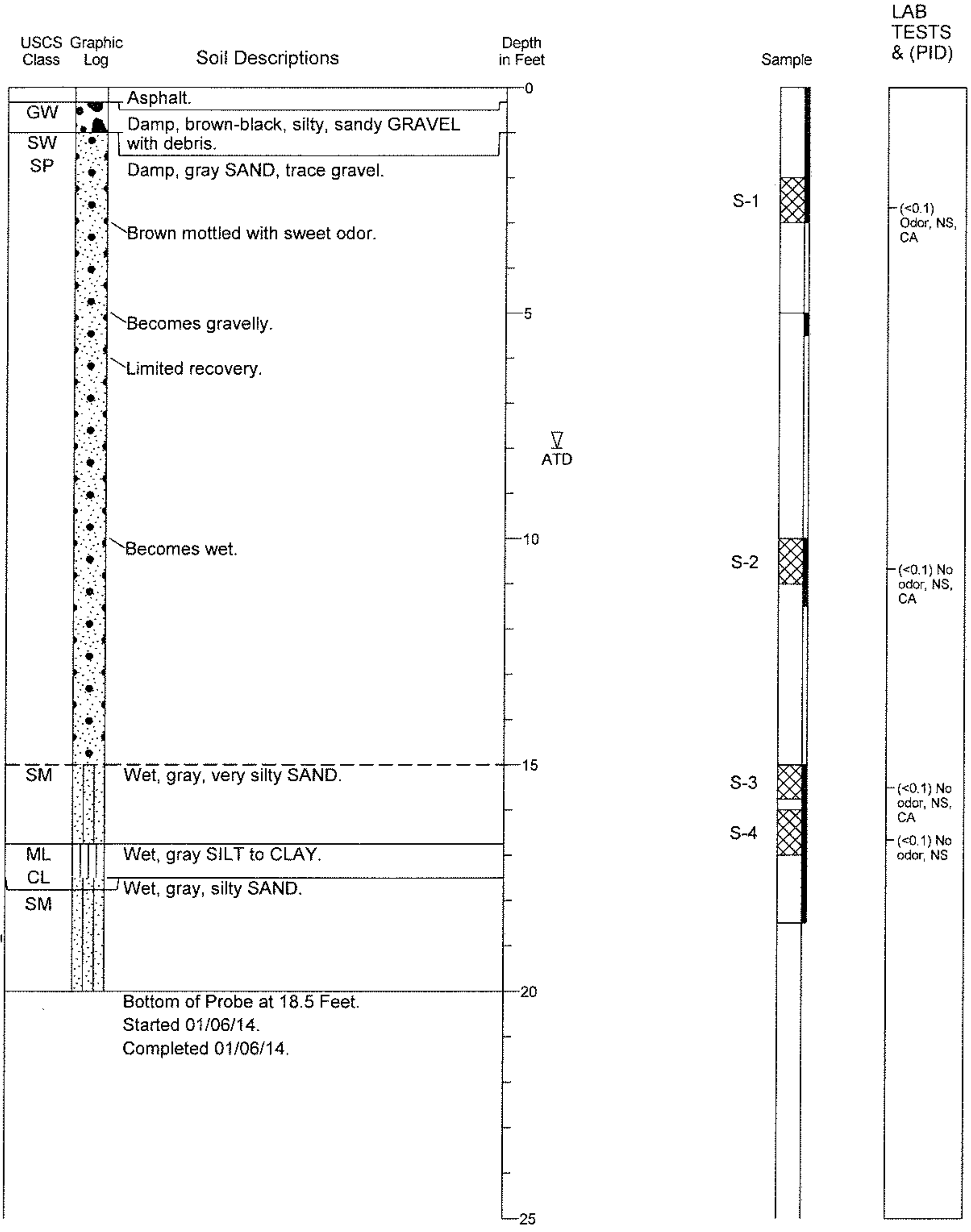
Figure A-22

Push Probe Log JT-US-021

Location: Lat: 47.667612 Long: -122.394259	Drill Equipment: Direct Push
Approximate Ground Surface Elevation: ~13 Feet	Sample Type: Acetate Liner
Horizontal Datum: WGS1984	Hole Diameter: 2 inches
Vertical Datum: City of Seattle Datum	Logged By: P. Cordell Reviewed By: A. Goodwin



Asphalt.

Damp, brown-black, silty, sandy GRAVEL with debris.

Damp, gray SAND, trace gravel.

Brown mottled with sweet odor.

Becomes gravelly.

Limited recovery.

Becomes wet.

Wet, gray, very silty SAND.

Wet, gray SILT to CLAY.

Wet, gray, silty SAND.

Bottom of Probe at 18.5 Feet.
Started 01/06/14.
Completed 01/06/14.

Sample	Lab Tests & (PID)
S-1	(<0.1) Odor, NS, CA
S-2	(<0.1) No odor, NS, CA
S-3	(<0.1) No odor, NS, CA
S-4	(<0.1) No odor, NS

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. USCS designations are based on visual manual classification (ASTM D 2488) unless otherwise supported by laboratory testing (ASTM D 2487).
4. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
5. NS = No Sheen; SS = Slight Sheen; MS = Moderate Sheen; HS = Heavy Sheen

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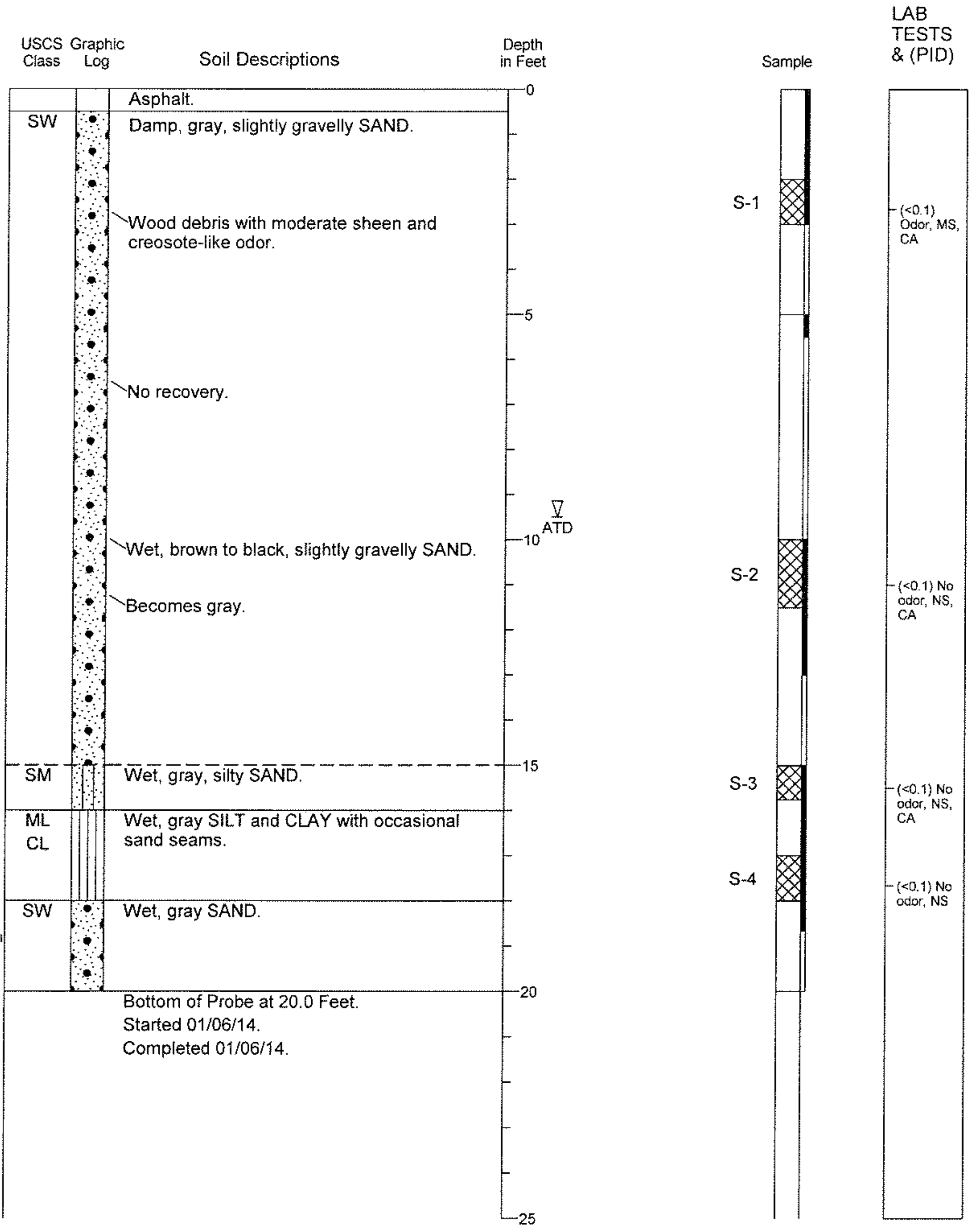
17800-43 *1/14*

Figure A-23

Push Probe Log JT-US-022

Location: Lat: 47.667602 Long: -122.394198	Drill Equipment: Direct Push
Approximate Ground Surface Elevation: ~13 Feet	Sample Type: Acetate Liner
Horizontal Datum: WGS1984	Hole Diameter: 2 inches
Vertical Datum: City of Seattle Datum	Logged By: P. Cordell Reviewed By: A. Goodwin



Asphalt.

Damp, gray, slightly gravelly SAND.

Wood debris with moderate sheen and creosote-like odor.

No recovery.

Wet, brown to black, slightly gravelly SAND.

Becomes gray.

Wet, gray, silty SAND.

Wet, gray SILT and CLAY with occasional sand seams.

Wet, gray SAND.

Bottom of Probe at 20.0 Feet.
Started 01/06/14.
Completed 01/06/14.

S-1: (<0.1) Odor, MS, CA

S-2: (<0.1) No odor, NS, CA

S-3: (<0.1) No odor, NS, CA

S-4: (<0.1) No odor, NS

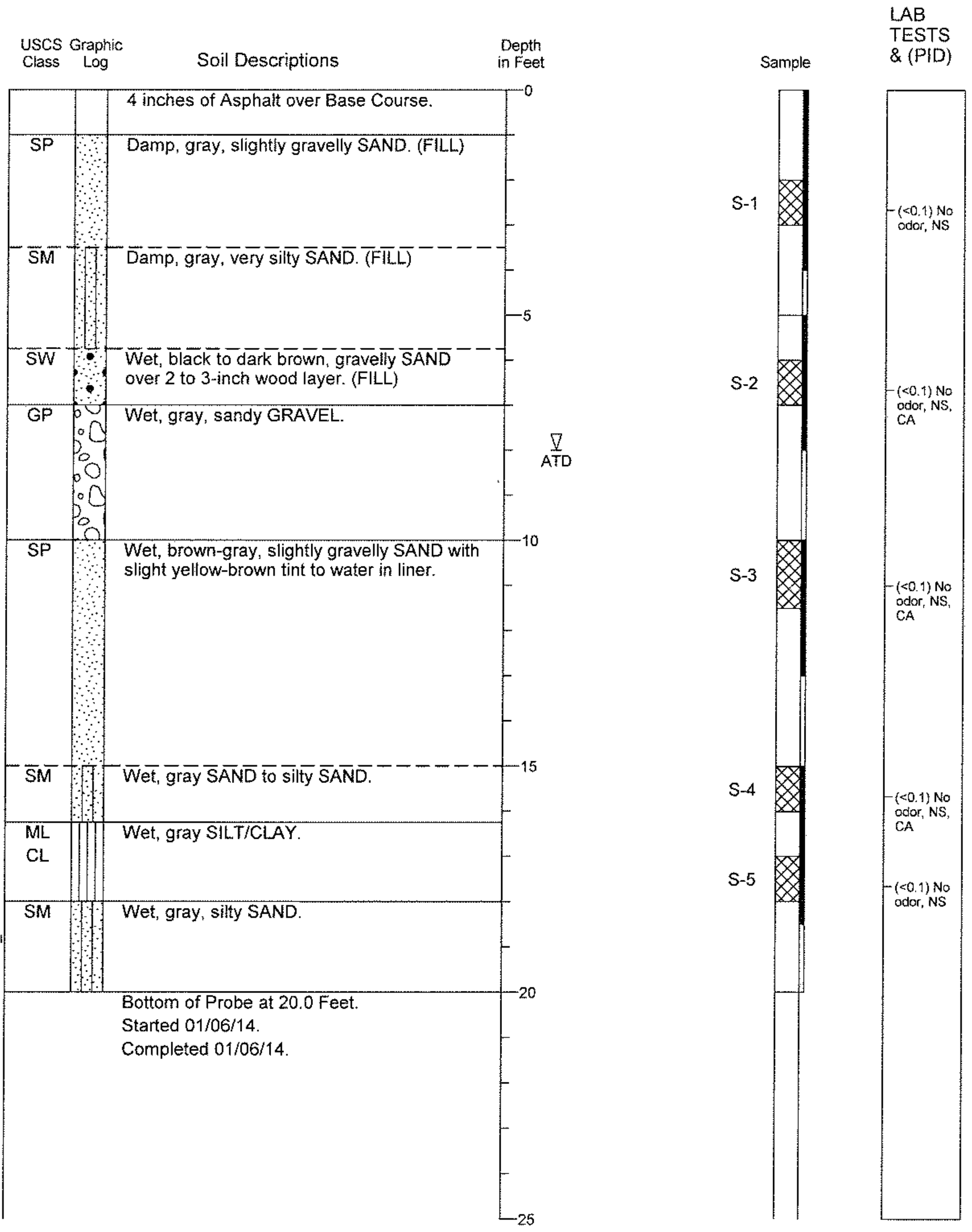
PUSH PROBE LOG-ENV 1780043-PP.GPJ HC_CORP.GDT 6/18/14

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. USCS designations are based on visual manual classification (ASTM D 2488) unless otherwise supported by laboratory testing (ASTM D 2487).
4. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
5. NS = No Sheen; SS = Slight Sheen; MS = Moderate Sheen; HS = Heavy Sheen

Push Probe Log JT-US-023

Location: Lat: 47.667572 Long: -122.394175
Approximate Ground Surface Elevation: ~13 Feet
Horizontal Datum: WGS1984
Vertical Datum: City of Seattle Datum

Drill Equipment: Direct Push
Sample Type: Acetate Liner
Hole Diameter: 2 inches
Logged By: P. Cordell Reviewed By: A. Goodwin



USCS Class	Soil Descriptions
	4 inches of Asphalt over Base Course.
SP	Damp, gray, slightly gravelly SAND. (FILL)
SM	Damp, gray, very silty SAND. (FILL)
SW	Wet, black to dark brown, gravelly SAND over 2 to 3-inch wood layer. (FILL)
GP	Wet, gray, sandy GRAVEL.
SP	Wet, brown-gray, slightly gravelly SAND with slight yellow-brown tint to water in liner.
SM	Wet, gray SAND to silty SAND.
ML CL	Wet, gray SILT/CLAY.
SM	Wet, gray, silty SAND.

Bottom of Probe at 20.0 Feet.
Started 01/06/14.
Completed 01/06/14.

Sample	LAB TESTS & (PID)
S-1	(<0.1) No odor, NS
S-2	(<0.1) No odor, NS, CA
S-3	(<0.1) No odor, NS, CA
S-4	(<0.1) No odor, NS, CA
S-5	(<0.1) No odor, NS

PUSH PROBE LOG-ENV 1780043-PP.GPJ HC_CORP.GDT 6/18/14

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. USCS designations are based on visual manual classification (ASTM D 2488) unless otherwise supported by laboratory testing (ASTM D 2487).
4. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
5. NS = No Sheen; SS = Slight Sheen; MS = Moderate Sheen; HS = Heavy Sheen

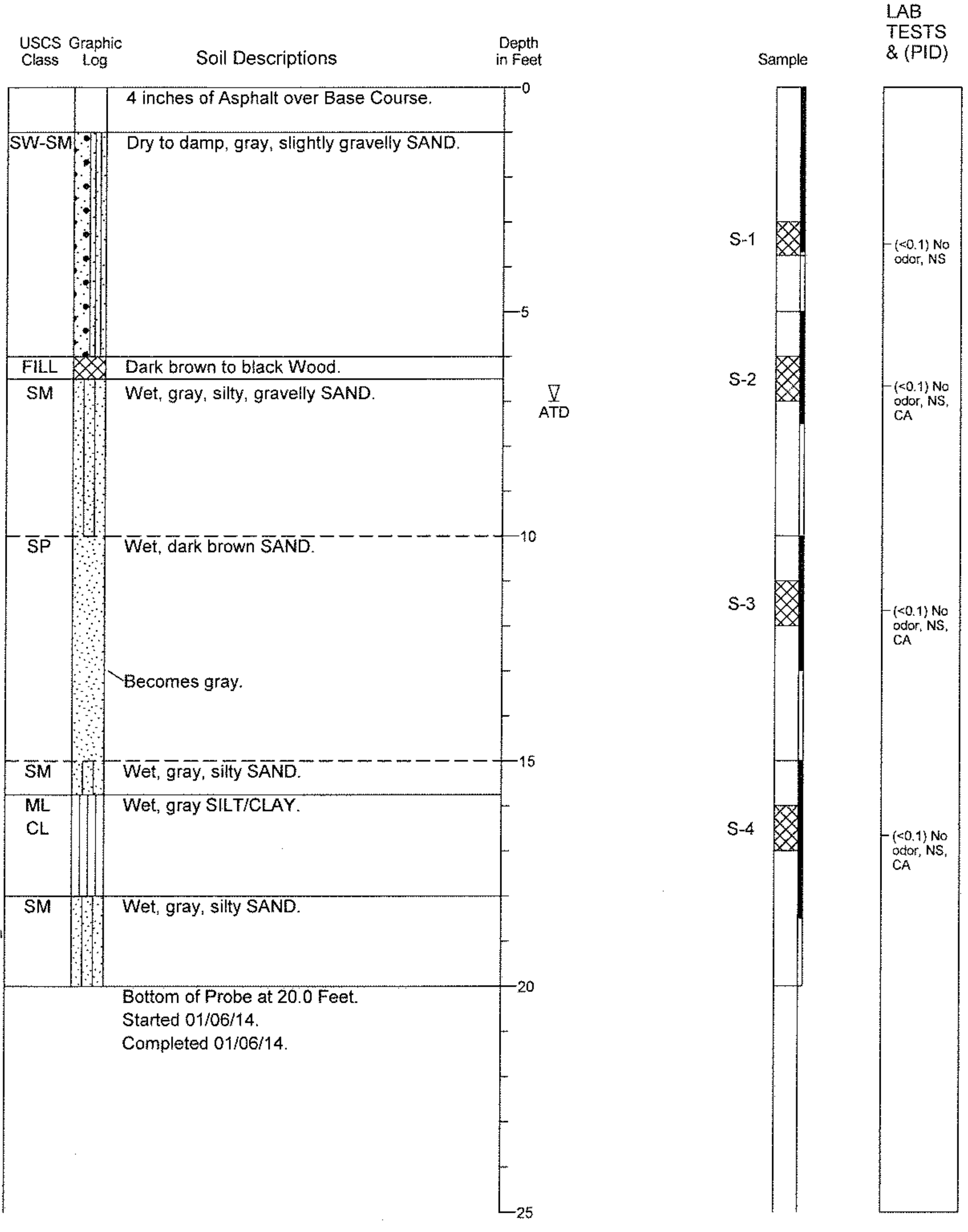
HARTCROWSER

Figure A-25

Push Probe Log JT-US-024

Location: Lat: 47.667568 Long: -122.394130
Approximate Ground Surface Elevation: ~13 Feet
Horizontal Datum: WGS1984
Vertical Datum: City of Seattle Datum

Drill Equipment: Direct Push
Sample Type: Acetate Liner
Hole Diameter: 2 inches
Logged By: P. Cordell Reviewed By: A. Goodwin



USCS Class	Soil Descriptions
	4 inches of Asphalt over Base Course.
SW-SM	Dry to damp, gray, slightly gravelly SAND.
FILL	Dark brown to black Wood.
SM	Wet, gray, silty, gravelly SAND.
SP	Wet, dark brown SAND. Becomes gray.
SM	Wet, gray, silty SAND.
ML CL	Wet, gray SILT/CLAY.
SM	Wet, gray, silty SAND.
	Bottom of Probe at 20.0 Feet. Started 01/06/14. Completed 01/06/14.

Sample	LAB TESTS & (PID)
S-1	(<0.1) No odor, NS
S-2	(<0.1) No odor, NS, CA
S-3	(<0.1) No odor, NS, CA
S-4	(<0.1) No odor, NS, CA

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. USCS designations are based on visual manual classification (ASTM D 2488) unless otherwise supported by laboratory testing (ASTM D 2487).
4. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
5. NS = No Sheen; SS = Slight Sheen; MS = Moderate Sheen; HS = Heavy Sheen

HARTCROWSER

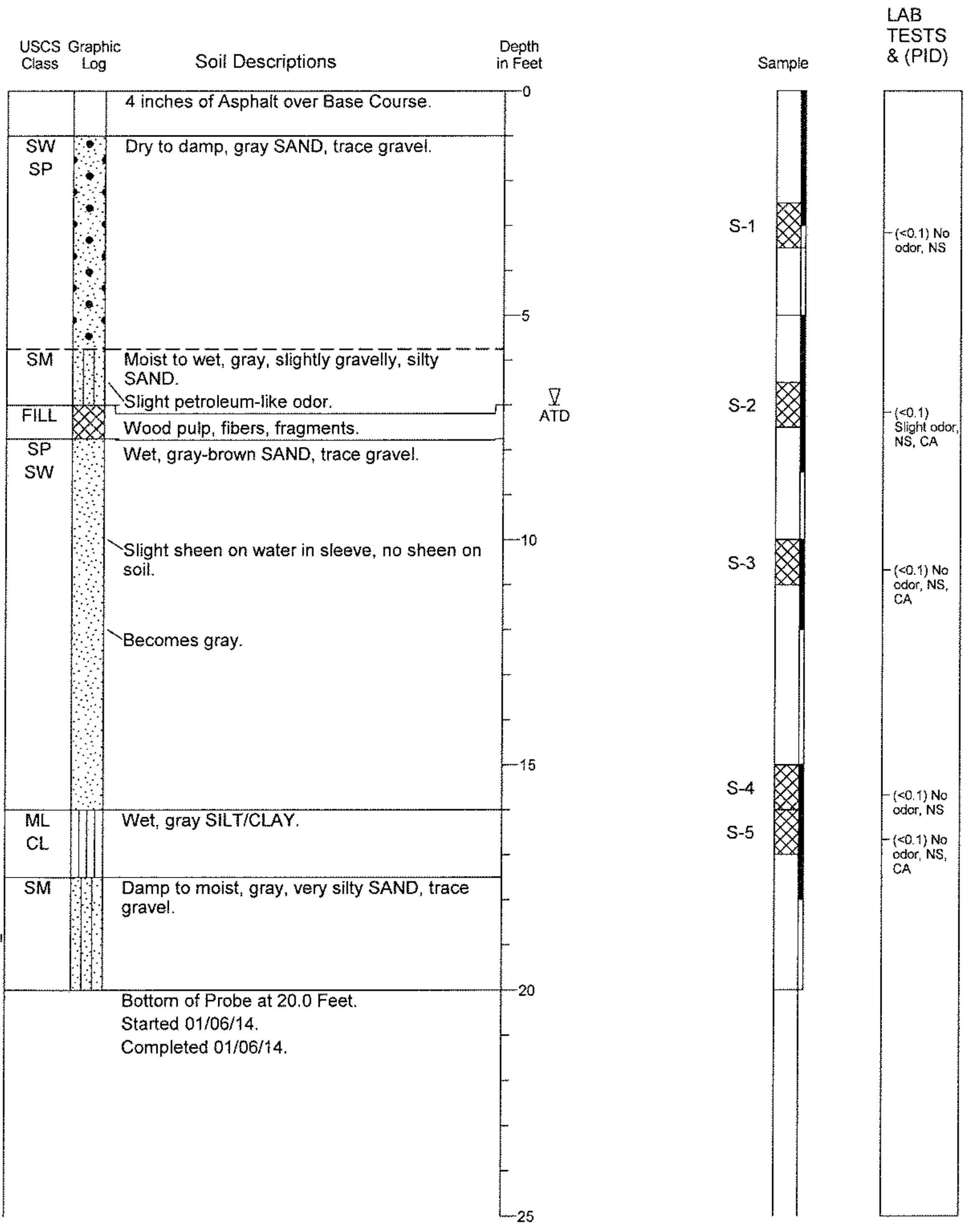
17800-43 *1/14*

Figure A-26

Push Probe Log JT-US-025

Location: Lat: 47.667594 Long: -122.394040
Approximate Ground Surface Elevation: ~13 Feet
Horizontal Datum: WGS1984
Vertical Datum: City of Seattle Datum

Drill Equipment: Direct Push
Sample Type: Acetate Liner
Hole Diameter: 2 inches
Logged By: P. Cordell Reviewed By: A. Goodwin



USCS Class	Soil Descriptions
	4 inches of Asphalt over Base Course.
SW SP	Dry to damp, gray SAND, trace gravel.
SM	Moist to wet, gray, slightly gravelly, silty SAND. Slight petroleum-like odor.
FILL	Wood pulp, fibers, fragments.
SP SW	Wet, gray-brown SAND, trace gravel. Slight sheen on water in sleeve, no sheen on soil. Becomes gray.
ML CL	Wet, gray SILT/CLAY.
SM	Damp to moist, gray, very silty SAND, trace gravel.

Bottom of Probe at 20.0 Feet.
Started 01/06/14.
Completed 01/06/14.

Sample	LAB TESTS & (PID)
S-1	(<0.1) No odor, NS
S-2	(<0.1) Slight odor, NS, CA
S-3	(<0.1) No odor, NS, CA
S-4	(<0.1) No odor, NS
S-5	(<0.1) No odor, NS, CA

PUSH PROBE LOG-ENV 17800043-PP.GPJ HC_CORP.GDT 6/18/14

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. USCS designations are based on visual manual classification (ASTM D 2488) unless otherwise supported by laboratory testing (ASTM D 2487).
4. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
5. NS = No Sheen; SS = Slight Sheen; MS = Moderate Sheen; HS = Heavy Sheen

HARTCROWSER

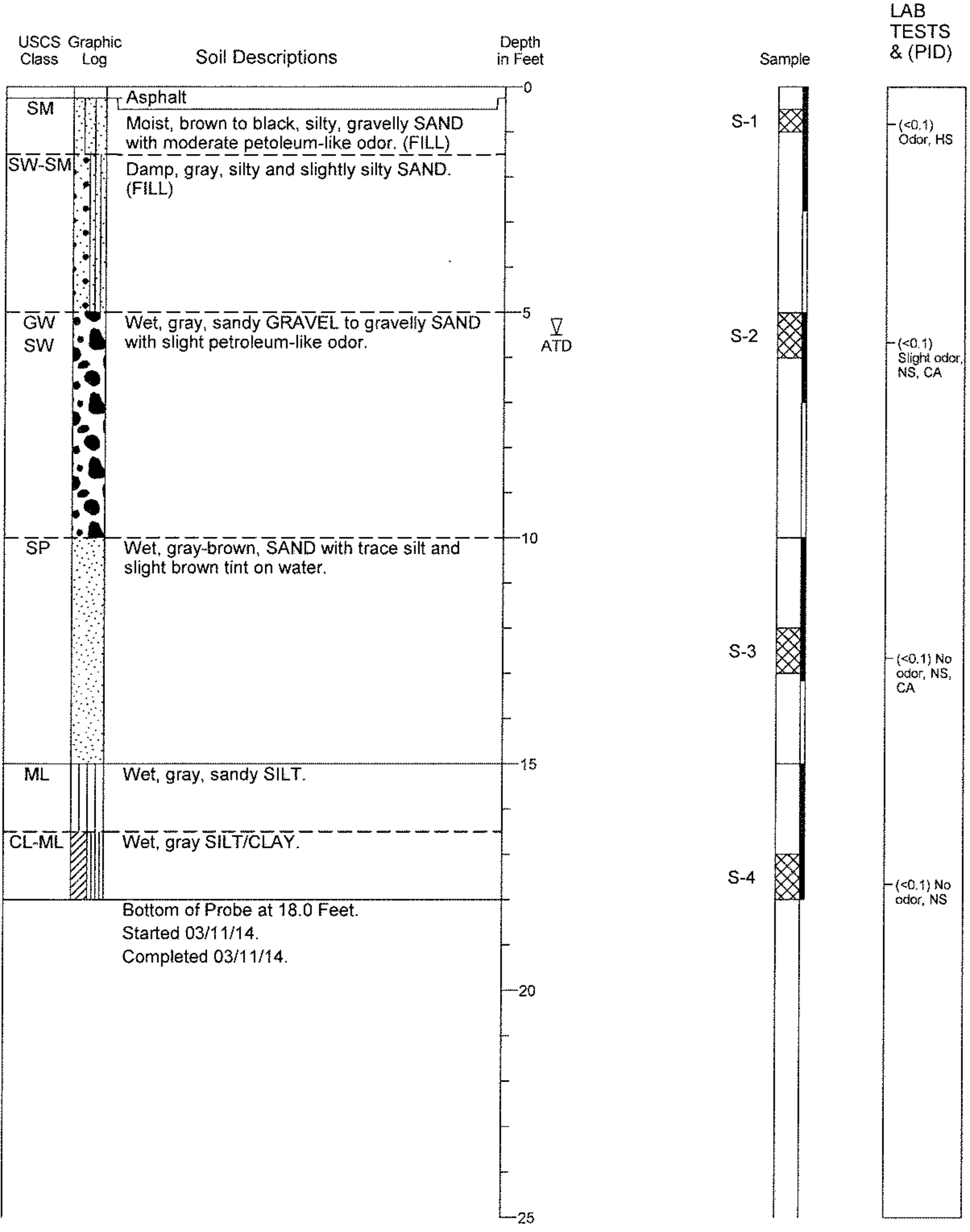
17800-43 **1/14**

Figure A-27

Push Probe Log JT-US-26

Location: Lat: 47.667590 Long: -122.394332
Approximate Ground Surface Elevation: ~13 Feet
Horizontal Datum: WGS1984
Vertical Datum: City of Seattle Datum

Drill Equipment: Direct Push
Sample Type: Acetate Liner
Hole Diameter: 2 inches
Logged By: P. Cordell Reviewed By: A. Goodwin



USCS Class	Soil Descriptions	Depth in Feet	Sample	LAB TESTS & (PID)
	Asphalt	0		
SM	Moist, brown to black, silty, gravelly SAND with moderate petoleum-like odor. (FILL)		S-1	(<0.1) Odor, HS
SW-SM	Damp, gray, silty and slightly silty SAND. (FILL)			
GW SW	Wet, gray, sandy GRAVEL to gravelly SAND with slight petroleum-like odor.	5 ∇ ATD	S-2	(<0.1) Slight odor, NS, CA
SP	Wet, gray-brown, SAND with trace silt and slight brown tint on water.	10	S-3	(<0.1) No odor, NS, CA
ML	Wet, gray, sandy SILT.	15		
CL-ML	Wet, gray SILT/CLAY.		S-4	(<0.1) No odor, NS

Bottom of Probe at 18.0 Feet.
Started 03/11/14.
Completed 03/11/14.

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. USCS designations are based on visual manual classification (ASTM D 2488) unless otherwise supported by laboratory testing (ASTM D 2487).
4. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
5. NS = No Sheen; SS = Slight Sheen; MS = Moderate Sheen; HS = Heavy Sheen

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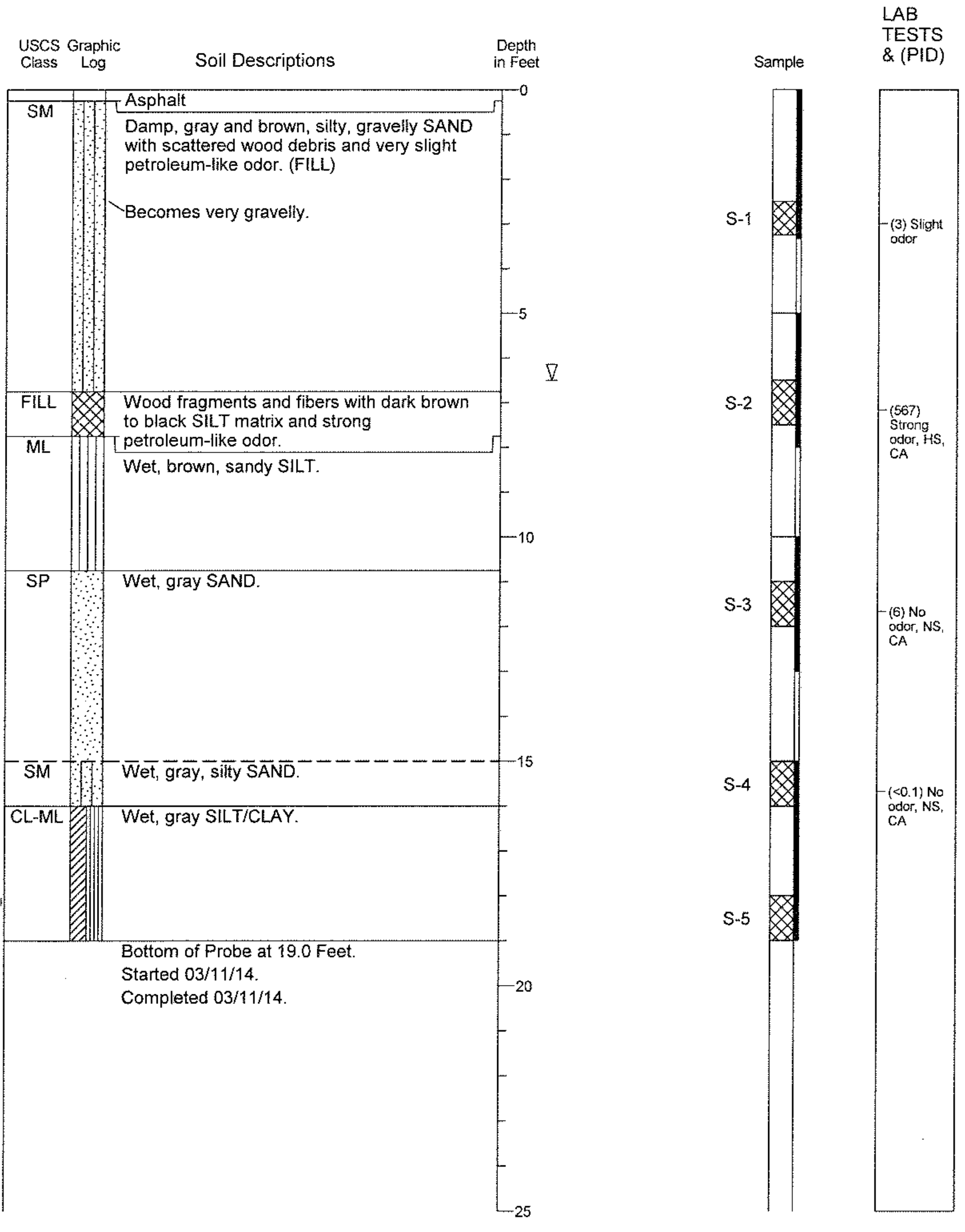
17800-43 *3/14*

Figure A-28

Push Probe Log JT-US-27

Location: Lat: 47.667606 Long: -122.394396
Approximate Ground Surface Elevation: ~14 Feet
Horizontal Datum: WGS1984
Vertical Datum: City of Seattle Datum

Drill Equipment: Direct Push
Sample Type: Acetate Liner
Hole Diameter: 2 inches
Logged By: P. Cordell Reviewed By: A. Goodwin



USCS Class	Soil Descriptions
	Asphalt
SM	Damp, gray and brown, silty, gravelly SAND with scattered wood debris and very slight petroleum-like odor. (FILL) Becomes very gravelly.
FILL	Wood fragments and fibers with dark brown to black SILT matrix and strong petroleum-like odor.
ML	Wet, brown, sandy SILT.
SP	Wet, gray SAND.
SM	Wet, gray, silty SAND.
CL-ML	Wet, gray SILT/CLAY.

Bottom of Probe at 19.0 Feet.
Started 03/11/14.
Completed 03/11/14.

Sample	LAB TESTS & (PID)
S-1	(3) Slight odor
S-2	(567) Strong odor, HS, CA
S-3	(6) No odor, NS, CA
S-4	(<0.1) No odor, NS, CA
S-5	

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. USCS designations are based on visual manual classification (ASTM D 2488) unless otherwise supported by laboratory testing (ASTM D 2487).
4. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
5. NS = No Sheen; SS = Slight Sheen; MS = Moderate Sheen; HS = Heavy Sheen

HARTCROWSER

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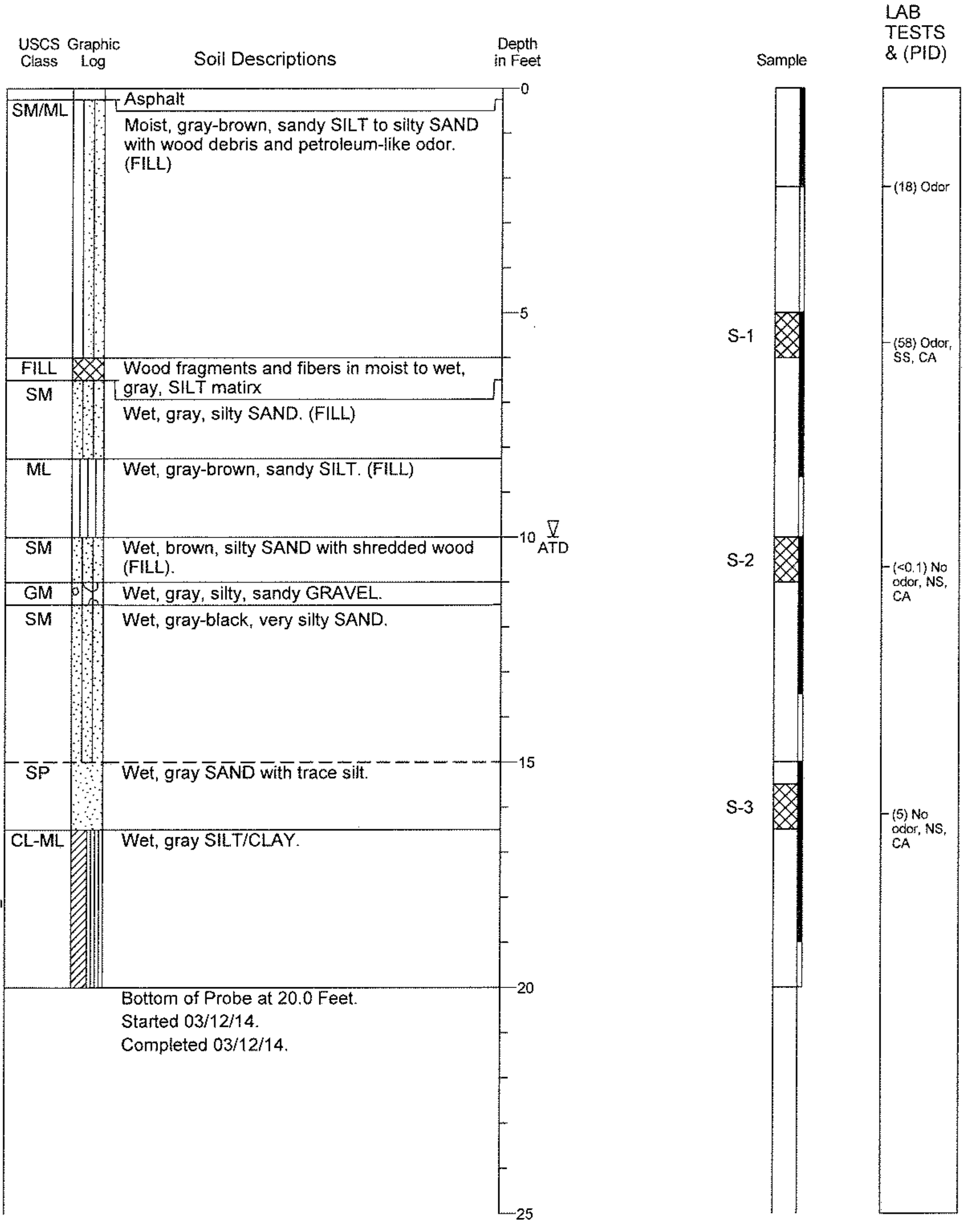
Figure A-29

Push Probe Log JT-US-28

Location: Lat: 47.667619 Long: -122.394489
Approximate Ground Surface Elevation: ~17 Feet
Horizontal Datum: WGS1984
Vertical Datum: City of Seattle Datum

Drill Equipment: Direct Push
Sample Type: Acetate Liner
Hole Diameter: 2 inches
Logged By: P. Cordell Reviewed By: A. Goodwin



USCS Class	Soil Descriptions	Depth in Feet
SM/ML	Asphalt Moist, gray-brown, sandy SILT to silty SAND with wood debris and petroleum-like odor. (FILL)	0 5
FILL	Wood fragments and fibers in moist to wet, gray, SILT matirx	
SM	Wet, gray, silty SAND. (FILL)	
ML	Wet, gray-brown, sandy SILT. (FILL)	
SM	Wet, brown, silty SAND with shredded wood (FILL).	10 ▽ ATD
GM	Wet, gray, silty, sandy GRAVEL.	
SM	Wet, gray-black, very silty SAND.	
SP	Wet, gray SAND with trace silt.	15
CL-ML	Wet, gray SILT/CLAY.	
	Bottom of Probe at 20.0 Feet. Started 03/12/14. Completed 03/12/14.	20 25

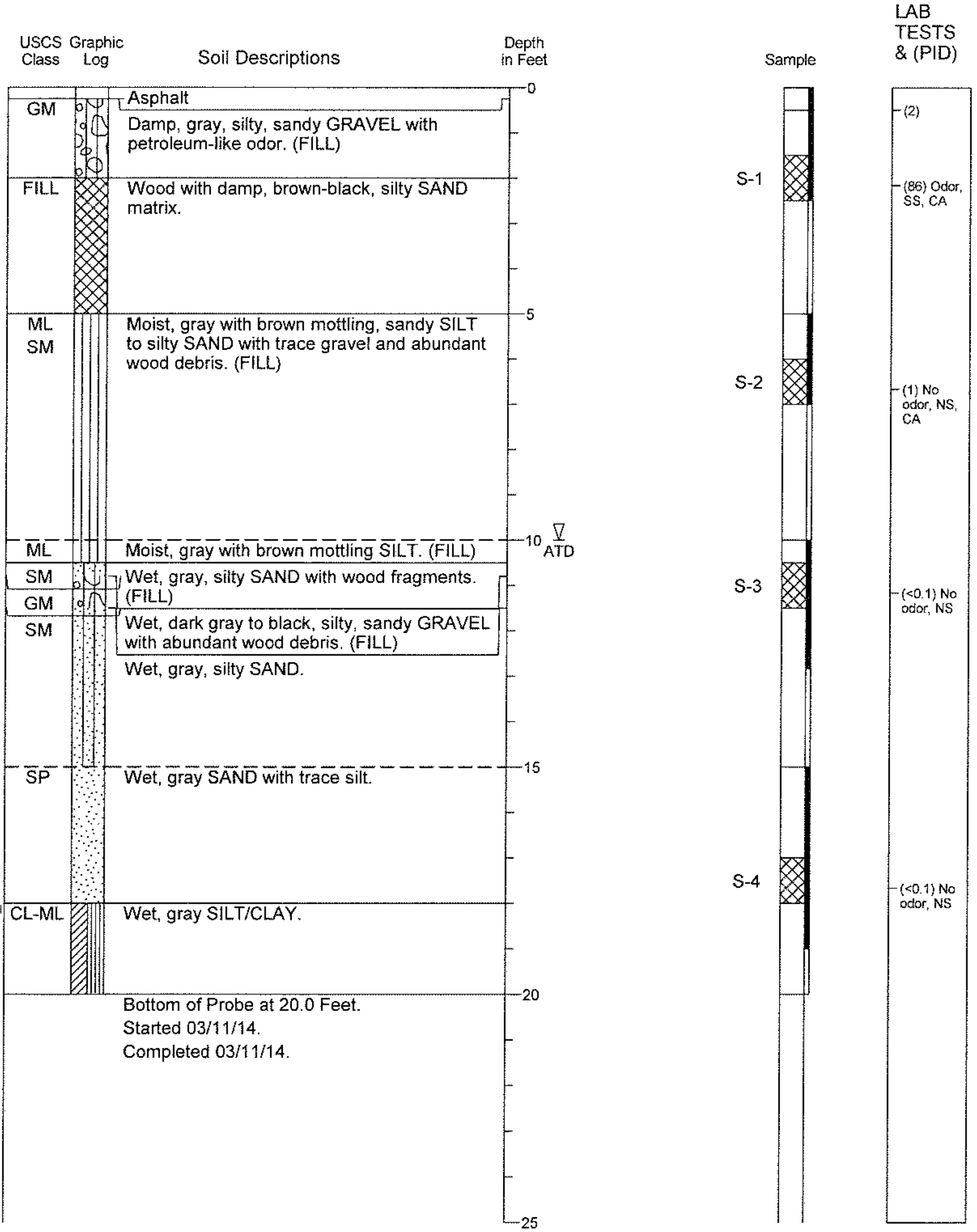
Sample	LAB TESTS & (PID)
	(18) Odor
S-1	(58) Odor, SS, CA
S-2	(<0.1) No odor, NS, CA
S-3	(5) No odor, NS, CA

PUSH PROBE LOG-ENV 17800043-PP-3-14.GPJ HC_CORP.GDT 6/18/14

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. USCS designations are based on visual manual classification (ASTM D 2488) unless otherwise supported by laboratory testing (ASTM D 2487).
4. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
5. NS = No Sheen; SS = Slight Sheen; MS = Moderate Sheen; HS = Heavy Sheen

Push Probe Log JT-US-29

Location: Lat: 47.667648 Long: -122.394562	Drill Equipment: Direct Push
Approximate Ground Surface Elevation: ~18 Feet	Sample Type: Acetate Liner
Horizontal Datum: WGS1984	Hole Diameter: 2 inches
Vertical Datum: City of Seattle Datum	Logged By: P. Cordell Reviewed By: A. Goodwin



USCS Class	Soil Descriptions	Sample	LAB TESTS & (PID)
	Asphalt		(2)
GM	Damp, gray, silty, sandy GRAVEL with petroleum-like odor. (FILL)		
FILL	Wood with damp, brown-black, silty SAND matrix.	S-1	(86) Odor, SS, CA
ML SM	Moist, gray with brown mottling, sandy SILT to silty SAND with trace gravel and abundant wood debris. (FILL)	S-2	(1) No odor, NS, CA
ML	Moist, gray with brown mottling SILT. (FILL)		
SM	Wet, gray, silty SAND with wood fragments. (FILL)	S-3	(<0.1) No odor, NS
GM	Wet, dark gray to black, silty, sandy GRAVEL with abundant wood debris. (FILL)		
SM	Wet, gray, silty SAND.		
SP	Wet, gray SAND with trace silt.	S-4	(<0.1) No odor, NS
CL-ML	Wet, gray SILT/CLAY.		

Bottom of Probe at 20.0 Feet.
Started 03/11/14.
Completed 03/11/14.

PUSH PROBE LOG-ENV 1780043-PP-3-14.GPJ HC_CORP.GDT 6/18/14

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. USCS designations are based on visual manual classification (ASTM D 2488) unless otherwise supported by laboratory testing (ASTM D 2487).
4. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
5. NS = No Sheen; SS = Slight Sheen; MS = Moderate Sheen; HS = Heavy Sheen

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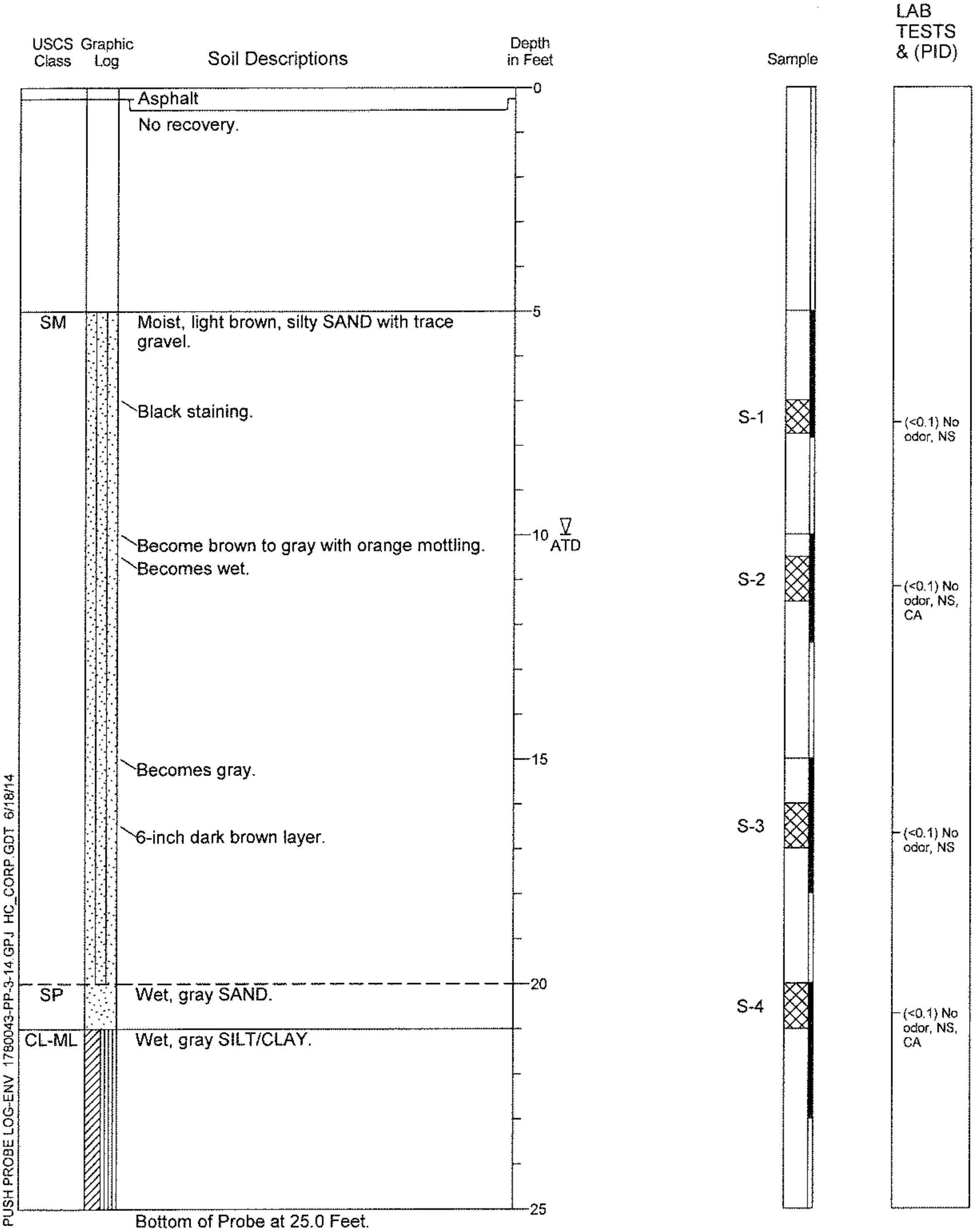
17800-43 *3/14*

Figure A-31

Push Probe Log JT-US-30

Location: Lat: 47.667682 Long: -122.394502
Approximate Ground Surface Elevation: ~20 Feet
Horizontal Datum: WGS1984
Vertical Datum: City of Seattle Datum

Drill Equipment: Direct Push
Sample Type: Acetate Liner
Hole Diameter: 2 inches
Logged By: P. Cordell Reviewed By: A. Goodwin



USCS Class	Soil Descriptions	Depth in Feet	Sample	LAB TESTS & (PID)
	Asphalt	0		
	No recovery.			
SM	Moist, light brown, silty SAND with trace gravel.	5		
	Black staining.		S-1	(<0.1) No odor, NS
	Become brown to gray with orange mottling.	10 ∇ ATD		
	Becomes wet.		S-2	(<0.1) No odor, NS, CA
	Becomes gray.	15		
	6-inch dark brown layer.		S-3	(<0.1) No odor, NS
SP	Wet, gray SAND.	20	S-4	(<0.1) No odor, NS, CA
CL-ML	Wet, gray SILT/CLAY.			
		25		

Bottom of Probe at 25.0 Feet.
Started 03/12/14.
Completed 03/12/14.

PUSH PROBE LOG-ENV 1780043-PP-3-14.GPJ HC_CORP.GDT 6/18/14

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. USCS designations are based on visual manual classification (ASTM D 2488) unless otherwise supported by laboratory testing (ASTM D 2487).
4. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
5. NS = No Sheen; SS = Slight Sheen; MS = Moderate Sheen; HS = Heavy Sheen

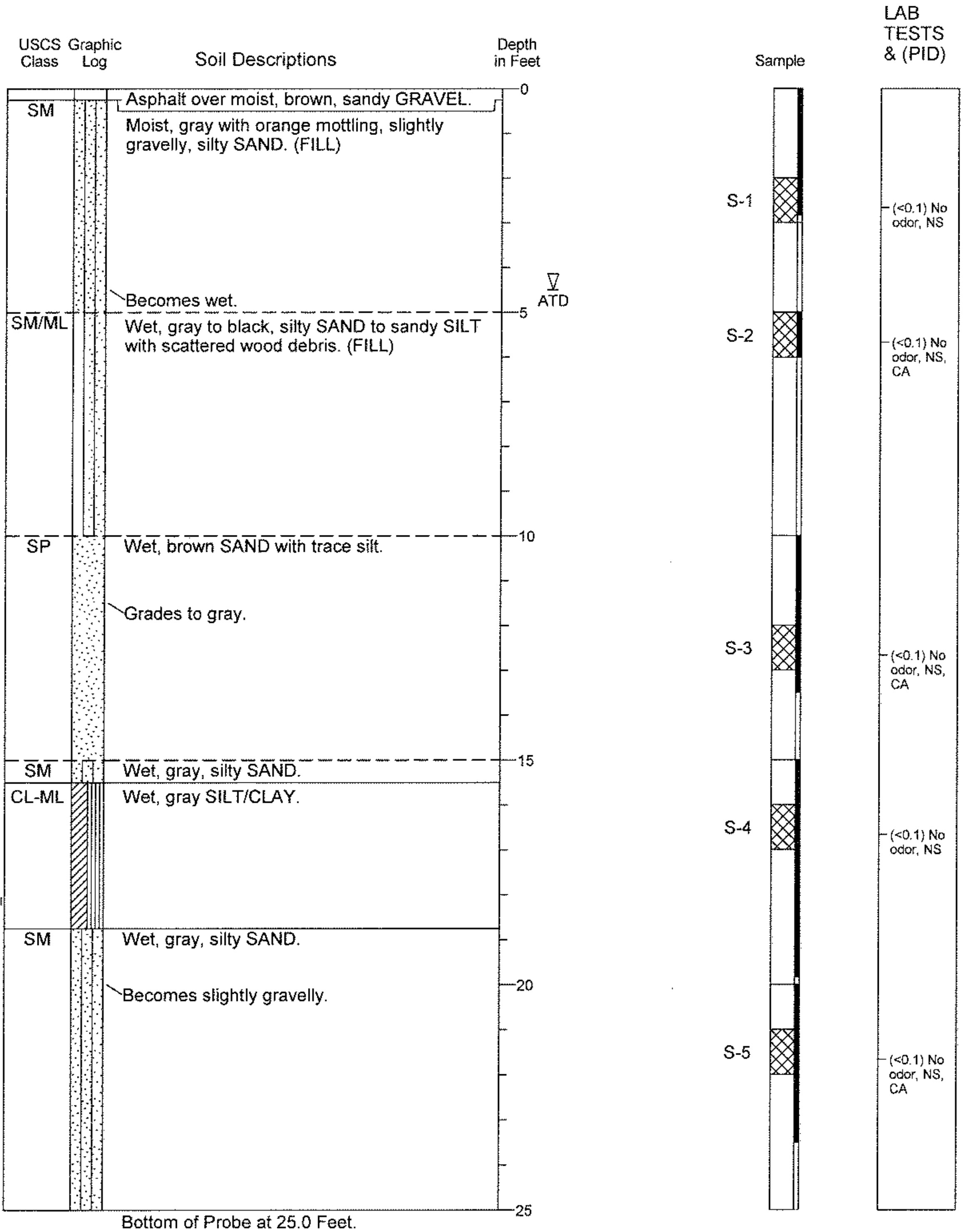
HARTCROWSER

17800-43 *3/14*
Figure A-32

Push Probe Log JT-US-31

Location: Lat: 47.667704 Long: -122.394212
Approximate Ground Surface Elevation: ~14 Feet
Horizontal Datum: WGS1984
Vertical Datum: City of Seattle Datum

Drill Equipment: Direct Push
Sample Type: Acetate Liner
Hole Diameter: 2 inches
Logged By: P. Cordell Reviewed By: A. Goodwin



Depth in Feet	USCS Class	Soil Descriptions	Sample	LAB TESTS & (PID)
0	SM	Asphalt over moist, brown, sandy GRAVEL. Moist, gray with orange mottling, slightly gravelly, silty SAND. (FILL) Becomes wet.	S-1	(<0.1) No odor, NS
5 (▽ ATD)	SM/ML	Wet, gray to black, silty SAND to sandy SILT with scattered wood debris. (FILL)	S-2	(<0.1) No odor, NS, CA
10	SP	Wet, brown SAND with trace silt. Grades to gray.	S-3	(<0.1) No odor, NS, CA
15	SM	Wet, gray, silty SAND.		
	CL-ML	Wet, gray SILT/CLAY.	S-4	(<0.1) No odor, NS
	SM	Wet, gray, silty SAND. Becomes slightly gravelly.	S-5	(<0.1) No odor, NS, CA

Bottom of Probe at 25.0 Feet.
Started 03/12/14.
Completed 03/12/14.

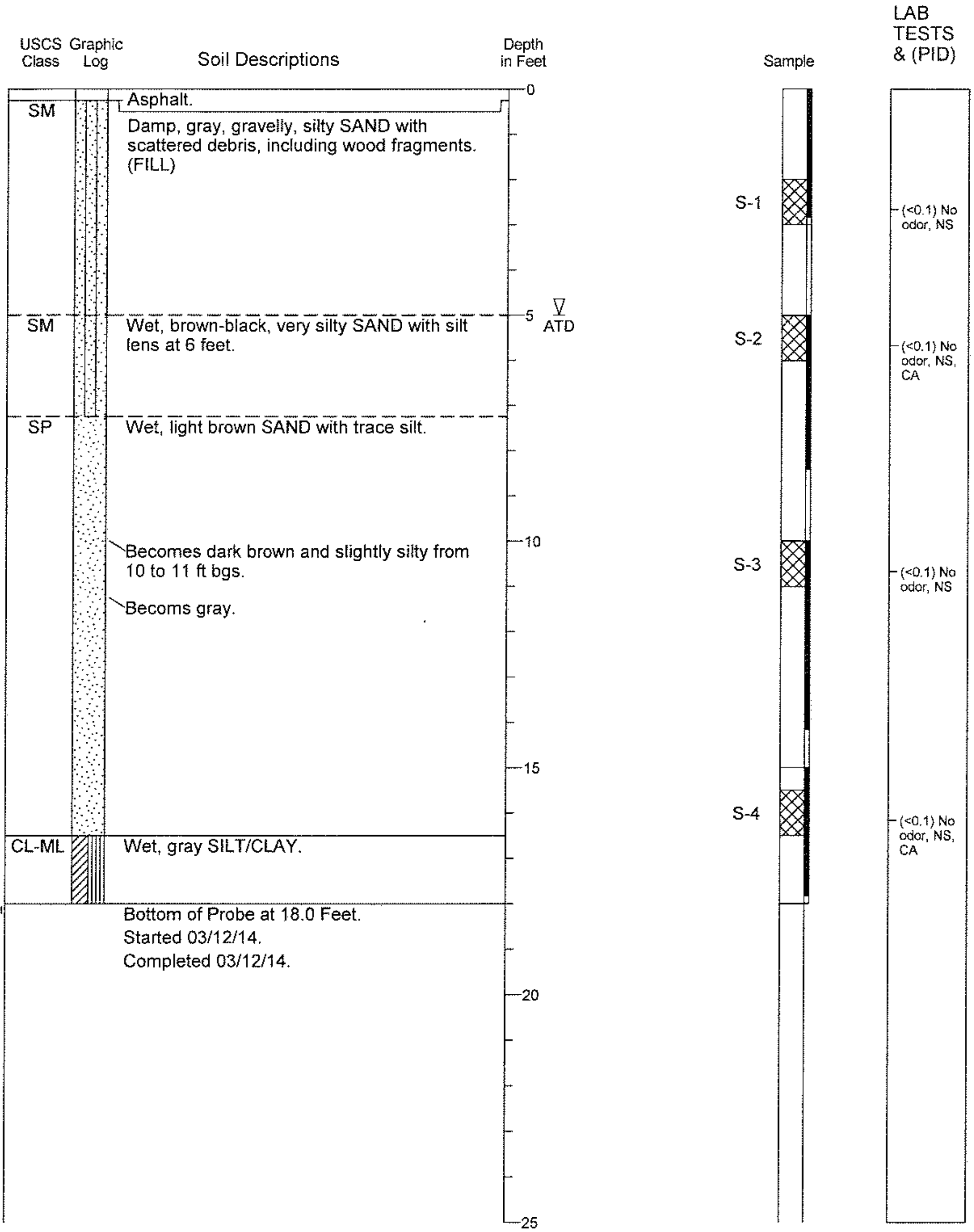
Casing advanced to 17.5 feet bgs.

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. USCS designations are based on visual manual classification (ASTM D 2488) unless otherwise supported by laboratory testing (ASTM D 2487).
4. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
5. NS = No Sheen; SS = Slight Sheen; MS = Moderate Sheen; HS = Heavy Sheen

Push Probe Log JT-US-32

Location: Lat: 47.667710 Long: -122.394158
Approximate Ground Surface Elevation: ~13 Feet
Horizontal Datum: WGS1984
Vertical Datum: City of Seattle Datum

Drill Equipment: Direct Push
Sample Type: Acetate Liner
Hole Diameter: 2 inches
Logged By: P. Cordell Reviewed By: A. Goodwin



USCS Class	Soil Descriptions	Sample	LAB TESTS & (PID)
	Asphalt.		
SM	Damp, gray, gravelly, silty SAND with scattered debris, including wood fragments. (FILL)	S-1	(<0.1) No odor, NS
SM	Wet, brown-black, very silty SAND with silt lens at 6 feet.	S-2	(<0.1) No odor, NS, CA
SP	Wet, light brown SAND with trace silt. Becomes dark brown and slightly silty from 10 to 11 ft bgs. Becoms gray.	S-3 S-4	(<0.1) No odor, NS (<0.1) No odor, NS, CA
CL-ML	Wet, gray SILT/CLAY.		

Bottom of Probe at 18.0 Feet.
Started 03/12/14.
Completed 03/12/14.

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. USCS designations are based on visual manual classification (ASTM D 2488) unless otherwise supported by laboratory testing (ASTM D 2487).
4. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
5. NS = No Sheen; SS = Slight Sheen; MS = Moderate Sheen; HS = Heavy Sheen

HARTCROWSER

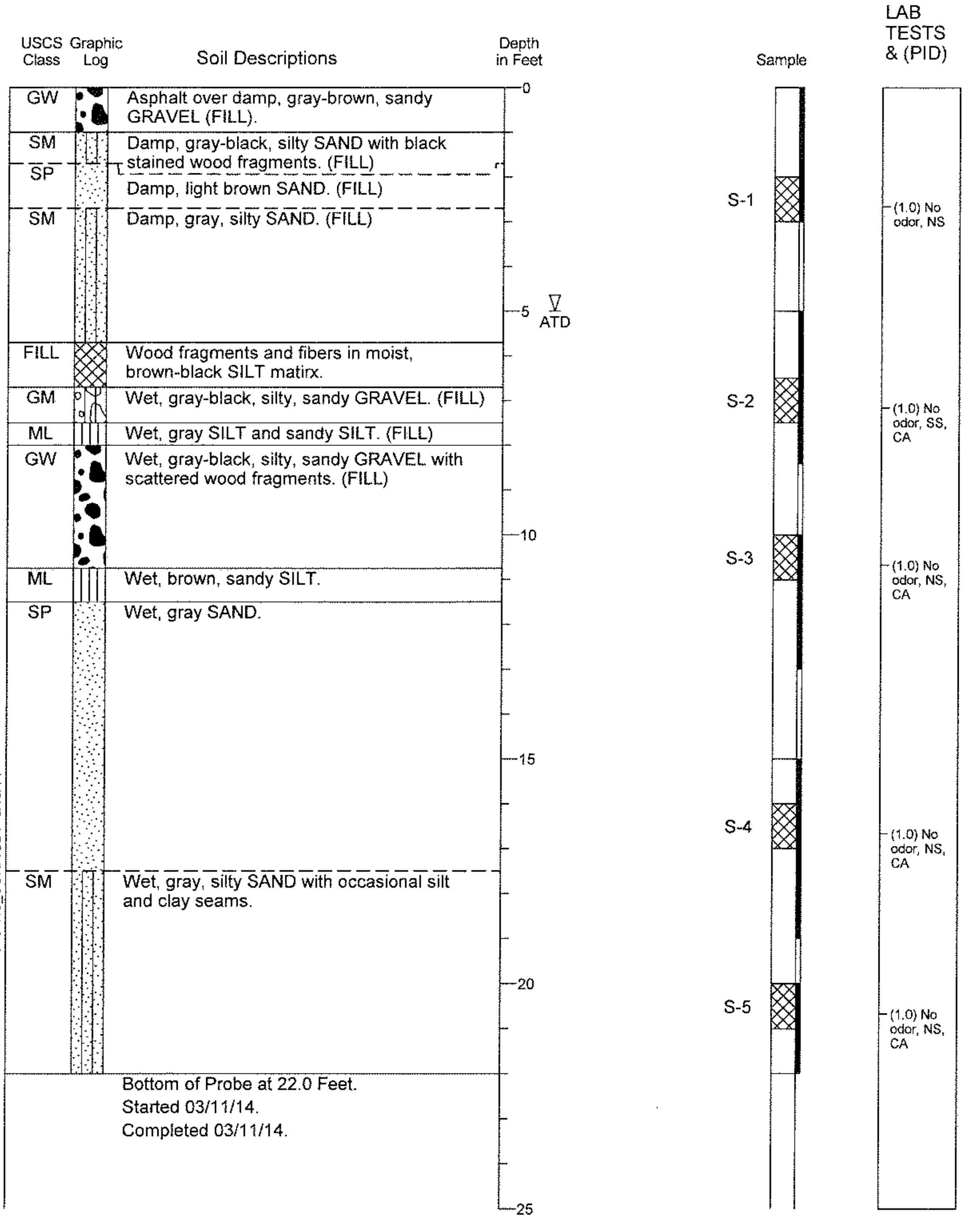
17800-43 *3/14*

Figure A-34

Push Probe Log JT-US-33

Location: Lat: 47.667683 Long: -122.393993
Approximate Ground Surface Elevation: ~13 Feet
Horizontal Datum: WGS1984
Vertical Datum: City of Seattle Datum

Drill Equipment: Direct Push
Sample Type: Acetate Liner
Hole Diameter: 2 inches
Logged By: P. Cordell Reviewed By: A. Goodwin



USCS Class	Soil Descriptions
GW	Asphalt over damp, gray-brown, sandy GRAVEL (FILL).
SM	Damp, gray-black, silty SAND with black stained wood fragments. (FILL)
SP	Damp, light brown SAND. (FILL)
SM	Damp, gray, silty SAND. (FILL)
FILL	Wood fragments and fibers in moist, brown-black SILT matirx.
GM	Wet, gray-black, silty, sandy GRAVEL. (FILL)
ML	Wet, gray SILT and sandy SILT. (FILL)
GW	Wet, gray-black, silty, sandy GRAVEL with scattered wood fragments. (FILL)
ML	Wet, brown, sandy SILT.
SP	Wet, gray SAND.
SM	Wet, gray, silty SAND with occasional silt and clay seams.

Bottom of Probe at 22.0 Feet.
Started 03/11/14.
Completed 03/11/14.

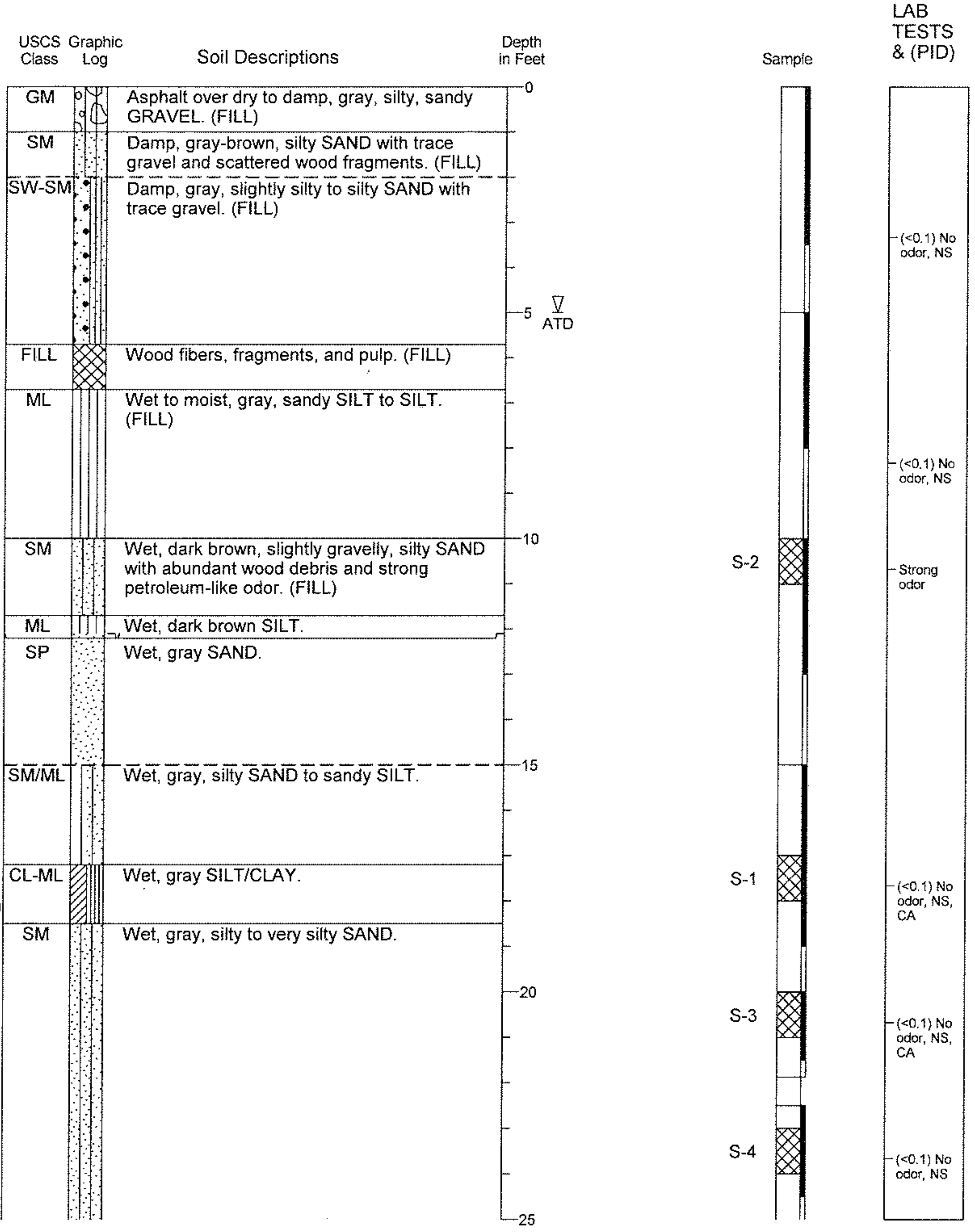
Sample	LAB TESTS & (PID)
S-1	(1.0) No odor, NS
S-2	(1.0) No odor, SS, CA
S-3	(1.0) No odor, NS, CA
S-4	(1.0) No odor, NS, CA
S-5	(1.0) No odor, NS, CA

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. USCS designations are based on visual manual classification (ASTM D 2488) unless otherwise supported by laboratory testing (ASTM D 2487).
4. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
5. NS = No Sheen; SS = Slight Sheen; MS = Moderate Sheen; HS = Heavy Sheen

Push Probe Log JT-US-34

Location: Lat: 47.667661 Long: -122.394096
Approximate Ground Surface Elevation: ~13 Feet
Horizontal Datum: WGS1984
Vertical Datum: City of Seattle Datum

Drill Equipment: Direct Push
Sample Type: Acetate Liner
Hole Diameter: 2 inches
Logged By: P. Cordell Reviewed By: A. Goodwin



USCS Class	Soil Descriptions
GM	Asphalt over dry to damp, gray, silty, sandy GRAVEL. (FILL)
SM	Damp, gray-brown, silty SAND with trace gravel and scattered wood fragments. (FILL)
SW-SM	Damp, gray, slightly silty to silty SAND with trace gravel. (FILL)
FILL	Wood fibers, fragments, and pulp. (FILL)
ML	Wet to moist, gray, sandy SILT to SILT. (FILL)
SM	Wet, dark brown, slightly gravelly, silty SAND with abundant wood debris and strong petroleum-like odor. (FILL)
ML	Wet, dark brown SILT.
SP	Wet, gray SAND.
SM/ML	Wet, gray, silty SAND to sandy SILT.
CL-ML	Wet, gray SILT/CLAY.
SM	Wet, gray, silty to very silty SAND.

Sample	LAB TESTS & (PID)
	(<0.1) No odor, NS
	(<0.1) No odor, NS
S-2	Strong odor
S-1	(<0.1) No odor, NS, CA
S-3	(<0.1) No odor, NS, CA
S-4	(<0.1) No odor, NS

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. USCS designations are based on visual manual classification (ASTM D 2488) unless otherwise supported by laboratory testing (ASTM D 2487).
4. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
5. NS = No Sheen; SS = Slight Sheen; MS = Moderate Sheen; HS = Heavy Sheen

Push Probe Log JT-US-34

Location: Lat: 47.667661 Long: -122.394096
Approximate Ground Surface Elevation: ~13 Feet
Horizontal Datum: WGS1984
Vertical Datum: City of Seattle Datum

Drill Equipment: Direct Push
Sample Type: Acetate Liner
Hole Diameter: 2 inches
Logged By: P. Cordell Reviewed By: A. Goodwin

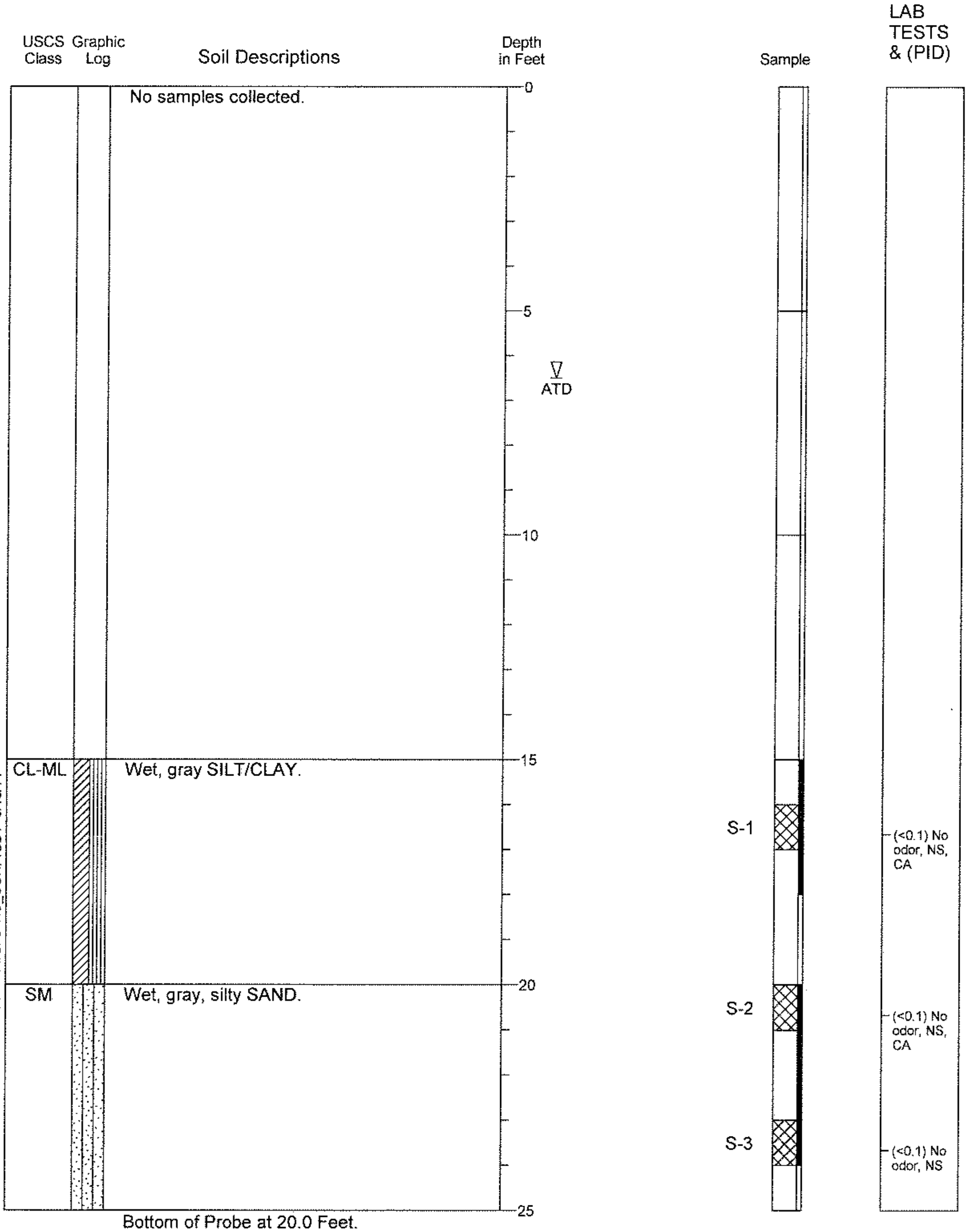
USCS Class	Graphic Log	Soil Descriptions	Depth in Feet	Sample	LAB TESTS & (PID)
SM		Wet, gray, silty to very silty SAND. (cont'd)	25		
		Bottom of Probe at 26.0 Feet. Started 03/11/14. Completed 03/11/14. Casing advanced to 17.5 feet bgs.			
			30		
			35		
			40		
			45		
			50		

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. USCS designations are based on visual manual classification (ASTM D 2488) unless otherwise supported by laboratory testing (ASTM D 2487).
4. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
5. NS = No Sheen; SS = Slight Sheen; MS = Moderate Sheen; HS = Heavy Sheen

Push Probe Log JT-US-35

Location: Lat: 47.667646 Long: -122.394306
Approximate Ground Surface Elevation: ~14 Feet
Horizontal Datum: WGS1984
Vertical Datum: City of Seattle Datum

Drill Equipment: Direct Push
Sample Type: Acetate Liner
Hole Diameter: 2 inches
Logged By: P. Cordell Reviewed By: A. Goodwin



PUSH PROBE LOG-ENV 1780043-PP-3-14.GPJ HC_CORP.GDT 6/18/14

Bottom of Probe at 20.0 Feet.
Started 03/11/14.
Completed 03/11/14.

Casing advanced to 17.5 feet bgs.

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. USCS designations are based on visual manual classification (ASTM D 2488) unless otherwise supported by laboratory testing (ASTM D 2487).
4. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
5. NS = No Sheen; SS = Slight Sheen; MS = Moderate Sheen; HS = Heavy Sheen

HARTCROWSER

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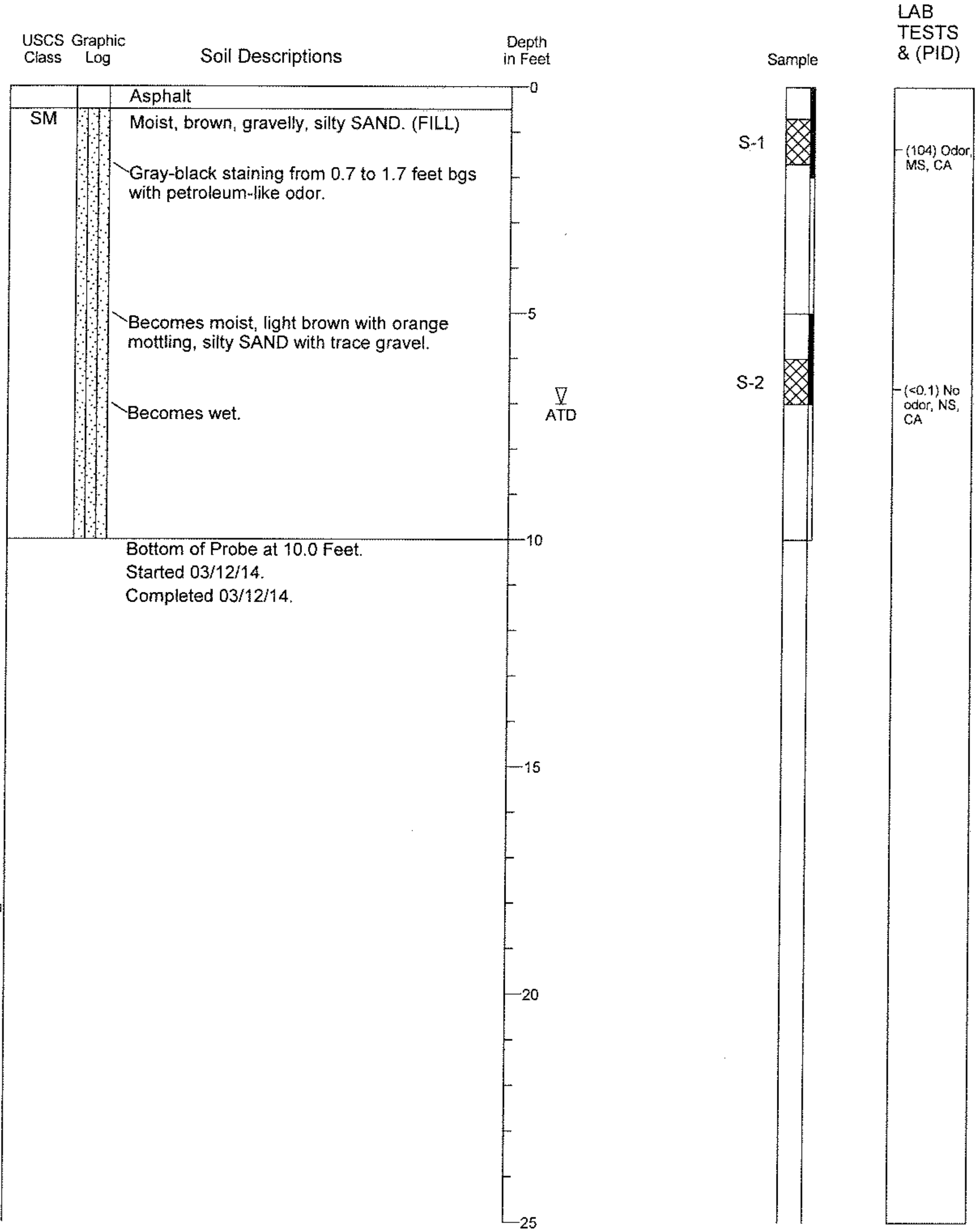
Figure A-37

Push Probe Log JT-US-36

Location: Lat: 47.667644 Long: -122.394619
Approximate Ground Surface Elevation: ~19 Feet
Horizontal Datum: WGS1984
Vertical Datum: City of Seattle Datum

Drill Equipment: Direct Push
Sample Type: Acetate Liner
Hole Diameter: 2 inches
Logged By: P. Cordell Reviewed By: A. Goodwin



SM

Asphalt

Moist, brown, gravelly, silty SAND. (FILL)

Gray-black staining from 0.7 to 1.7 feet bgs with petroleum-like odor.

Becomes moist, light brown with orange mottling, silty SAND with trace gravel.

Becomes wet.

Bottom of Probe at 10.0 Feet.
Started 03/12/14.
Completed 03/12/14.

(104) Odor, MS, CA

(<0.1) No odor, NS, CA

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. USCS designations are based on visual manual classification (ASTM D 2488) unless otherwise supported by laboratory testing (ASTM D 2487).
4. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
5. NS = No Sheen; SS = Slight Sheen; MS = Moderate Sheen; HS = Heavy Sheen

HARTCROWSER

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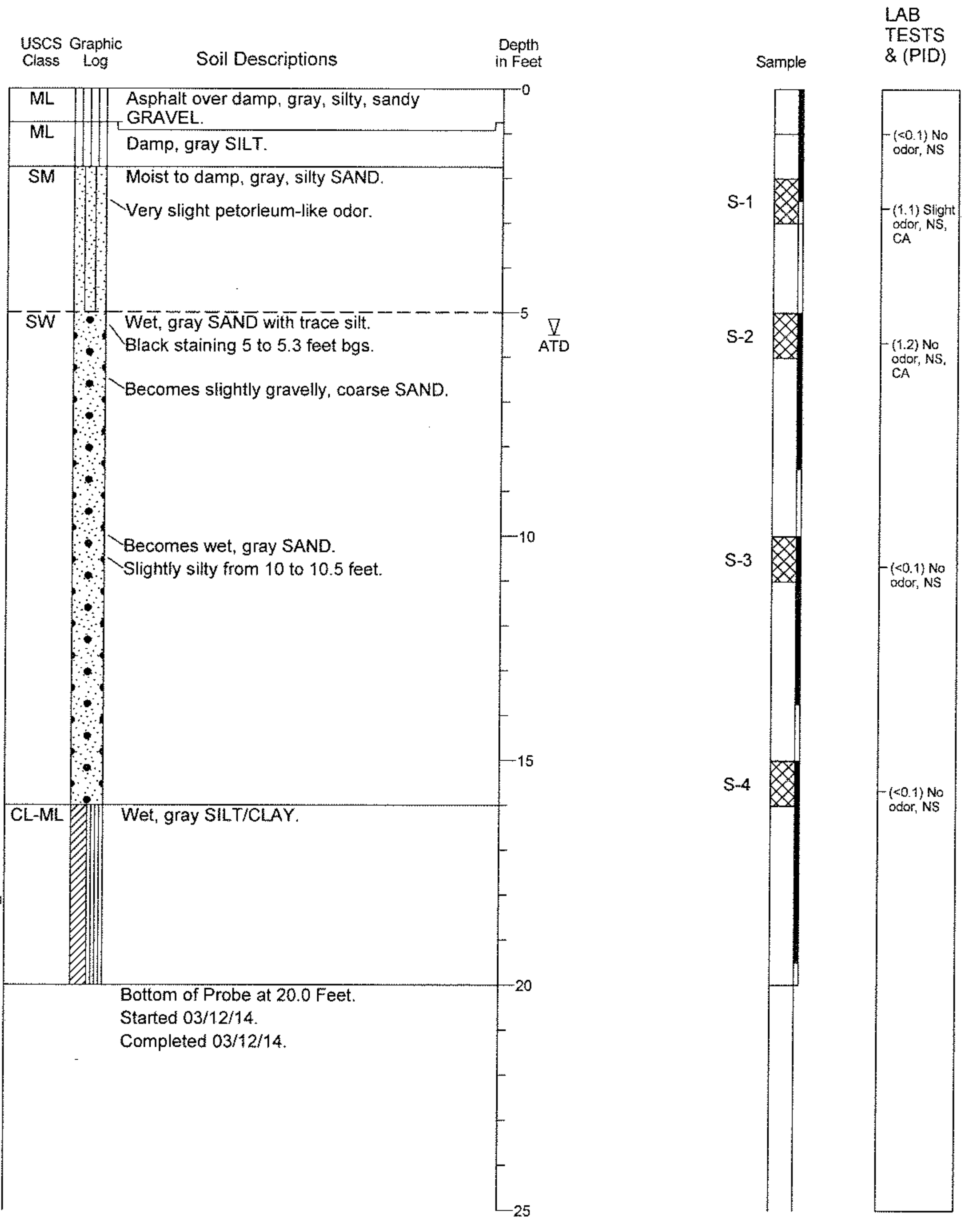
Figure A-38

Push Probe Log JT-US-37

Location: Lat: 47.667572 Long: -122.394386
Approximate Ground Surface Elevation: ~13 Feet
Horizontal Datum: WGS1984
Vertical Datum: City of Seattle Datum

Drill Equipment: Direct Push
Sample Type: Acetate Liner
Hole Diameter: 2 inches
Logged By: P. Cordell Reviewed By: A. Goodwin



Asphalt over damp, gray, silty, sandy GRAVEL.

Damp, gray SILT.

Moist to damp, gray, silty SAND.

Very slight petorleum-like odor.

Wet, gray SAND with trace silt.

Black staining 5 to 5.3 feet bgs.

Becomes slightly gravelly, coarse SAND.

Becomes wet, gray SAND.

Slightly silty from 10 to 10.5 feet.

Wet, gray SILT/CLAY.

Bottom of Probe at 20.0 Feet.
Started 03/12/14.
Completed 03/12/14.

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. USCS designations are based on visual manual classification (ASTM D 2488) unless otherwise supported by laboratory testing (ASTM D 2487).
4. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
5. NS = No Sheen; SS = Slight Sheen; MS = Moderate Sheen; HS = Heavy Sheen

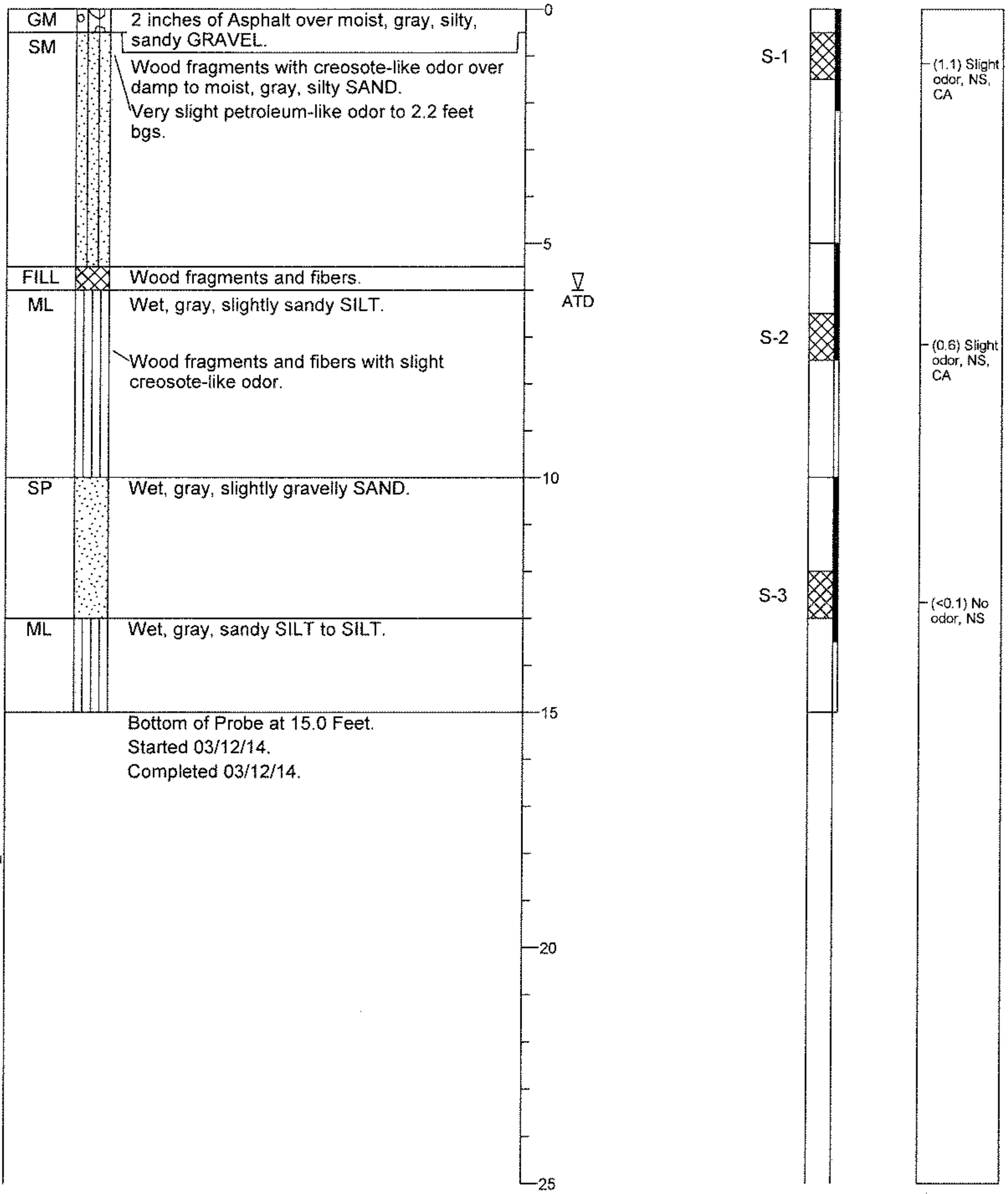
HARTCROWSER

17800-43 3/14

Figure A-39

Push Probe Log JT-US-38

Location: Lat: 47.667583 Long: -122.394475	Drill Equipment: Direct Push
Approximate Ground Surface Elevation: ~13 Feet	Sample Type: Acetate Liner
Horizontal Datum: WGS1984	Hole Diameter: 2 inches
Vertical Datum: City of Seattle Datum	Logged By: P. Cordell Reviewed By: A. Goodwin



USCS Class	Graphic Log	Soil Descriptions
GM		2 inches of Asphalt over moist, gray, silty, sandy GRAVEL.
SM		Wood fragments with creosote-like odor over damp to moist, gray, silty SAND. Very slight petroleum-like odor to 2.2 feet bgs.
FILL		Wood fragments and fibers.
ML		Wet, gray, slightly sandy SILT. Wood fragments and fibers with slight creosote-like odor.
SP		Wet, gray, slightly gravelly SAND.
ML		Wet, gray, sandy SILT to SILT.

Bottom of Probe at 15.0 Feet.
Started 03/12/14.
Completed 03/12/14.

Sample	LAB TESTS & (PID)
S-1	(1.1) Slight odor, NS, CA
S-2	(0.6) Slight odor, NS, CA
S-3	(<0.1) No odor, NS

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. USCS designations are based on visual manual classification (ASTM D 2488) unless otherwise supported by laboratory testing (ASTM D 2487).
4. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.
5. NS = No Sheen; SS = Slight Sheen; MS = Moderate Sheen; HS = Heavy Sheen

HARTCROWSER

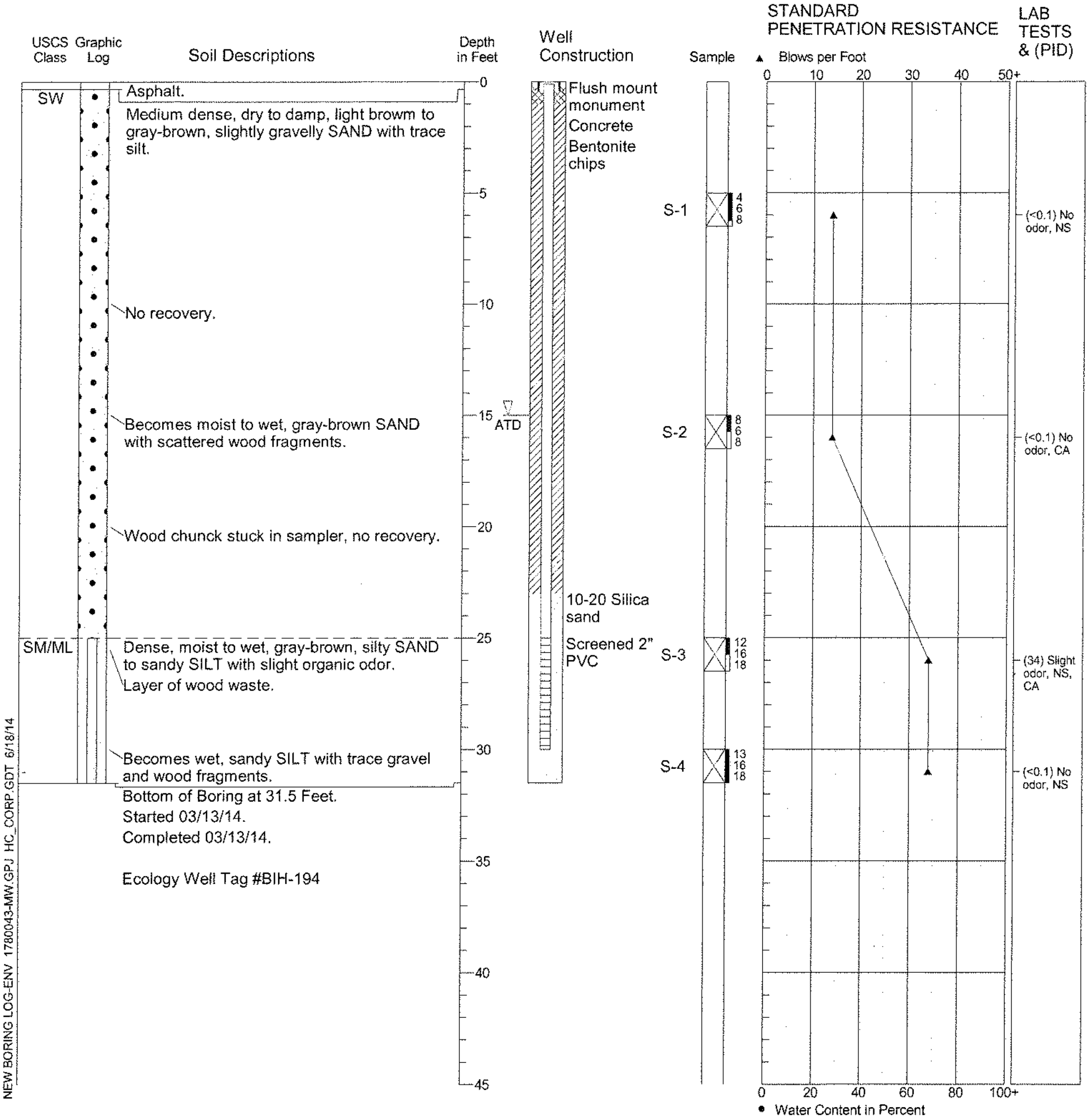
17800-43 *3/14*

Figure A-40

Boring Log JT-MW-100

Location: Lat: 47.667519 Long: -122.393841
Approximate Ground Surface Elevation: ~13 Feet
Horizontal Datum: WGS 1984
Vertical Datum: City of Seattle Datum

Drill Equipment: Hollow Stem Auger
Sample Type: SPT w/140 lb. Autohammer
Hole Diameter: ~10 inches
Logged By: S. Faubl Reviewed By: P. Cordell



Asphalt.

Medium dense, dry to damp, light browm to gray-brown, slightly gravelly SAND with trace silt.

No recovery.

Becomes moist to wet, gray-brown SAND with scattered wood fragments.

Wood chunck stuck in sampler, no recovery.

Dense, moist to wet, gray-brown, silty SAND to sandy SILT with slight organic odor.

Layer of wood waste.

Becomes wet, sandy SILT with trace gravel and wood fragments.

Bottom of Boring at 31.5 Feet.

Started 03/13/14.

Completed 03/13/14.

Ecology Well Tag #BIH-194

NEW BORING LOG-ENV 1780043-MW.GPJ HC_CORP.GDT 6/18/14

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. USCS designations are based on visual manual classification (ASTM D 2488) unless otherwise supported by laboratory testing (ASTM D 2487).
4. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.

HARTCROWSER

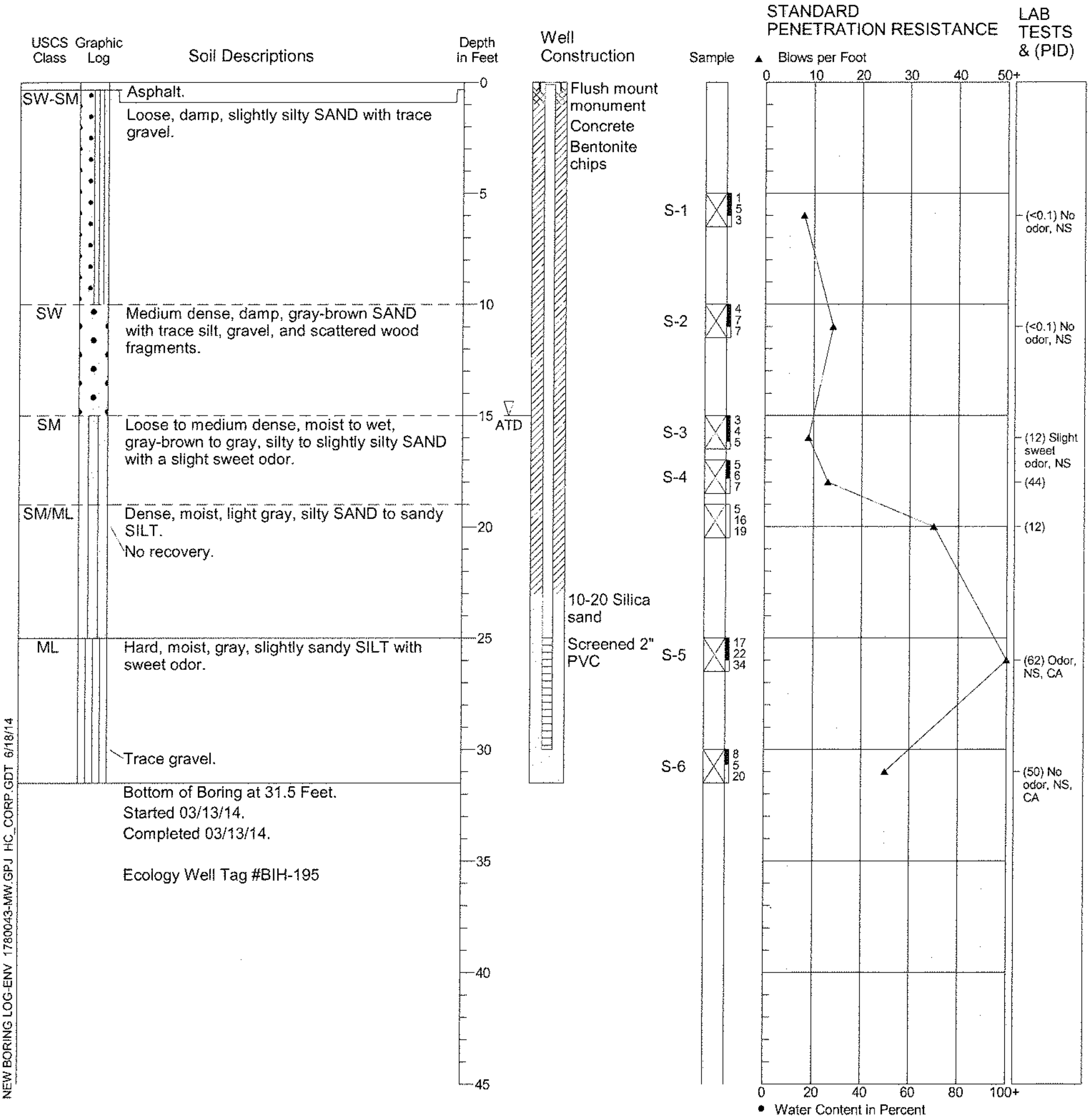
17800-43 *3/14*

Figure A-41

Boring Log JT-MW-200

Location: Lat: 47.667579 Long: -122.394105
Approximate Ground Surface Elevation: ~13 Feet
Horizontal Datum: WGS 1984
Vertical Datum: City of Seattle Datum

Drill Equipment: Hollow Stem Auger
Sample Type: SPT w/140 lb. Autohammer
Hole Diameter: ~18 inches
Logged By: S. Faubl Reviewed By: P. Cordell



USCS Class	Depth (Feet)	Soil Descriptions
SW-SM	0	Asphalt. Loose, damp, slightly silty SAND with trace gravel.
SW	10	Medium dense, damp, gray-brown SAND with trace silt, gravel, and scattered wood fragments.
SM	15	Loose to medium dense, moist to wet, gray-brown to gray, silty to slightly silty SAND with a slight sweet odor.
SM/ML	19	Dense, moist, light gray, silty SAND to sandy SILT. No recovery.
ML	25	Hard, moist, gray, slightly sandy SILT with sweet odor. Trace gravel.

Bottom of Boring at 31.5 Feet.
Started 03/13/14.
Completed 03/13/14.

Ecology Well Tag #BIH-195

Well Construction
Flush mount monument
Concrete
Bentonite chips
10-20 Silica sand
Screened 2" PVC

Sample	Blow Counts	Lab Tests & (PID)
S-1	1 5 3	(<0.1) No odor, NS
S-2	4 7 7	(<0.1) No odor, NS
S-3	3 4 5	(12) Slight sweet odor, NS
S-4	5 6 7	(44)
	5 16 19	(12)
S-5	17 22 34	(62) Odor, NS, CA
S-6	8 5 20	(50) No odor, NS, CA

NEW BORING LOG-ENV 17800043-MW.GPJ HC_CORP.GDT 6/18/14

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Soil descriptions and stratum lines are interpretive and actual changes may be gradual.
3. USCS designations are based on visual manual classification (ASTM D 2488) unless otherwise supported by laboratory testing (ASTM D 2487).
4. Groundwater level, if indicated, is at time of drilling (ATD) or for date specified. Level may vary with time.

HARTCROWSER

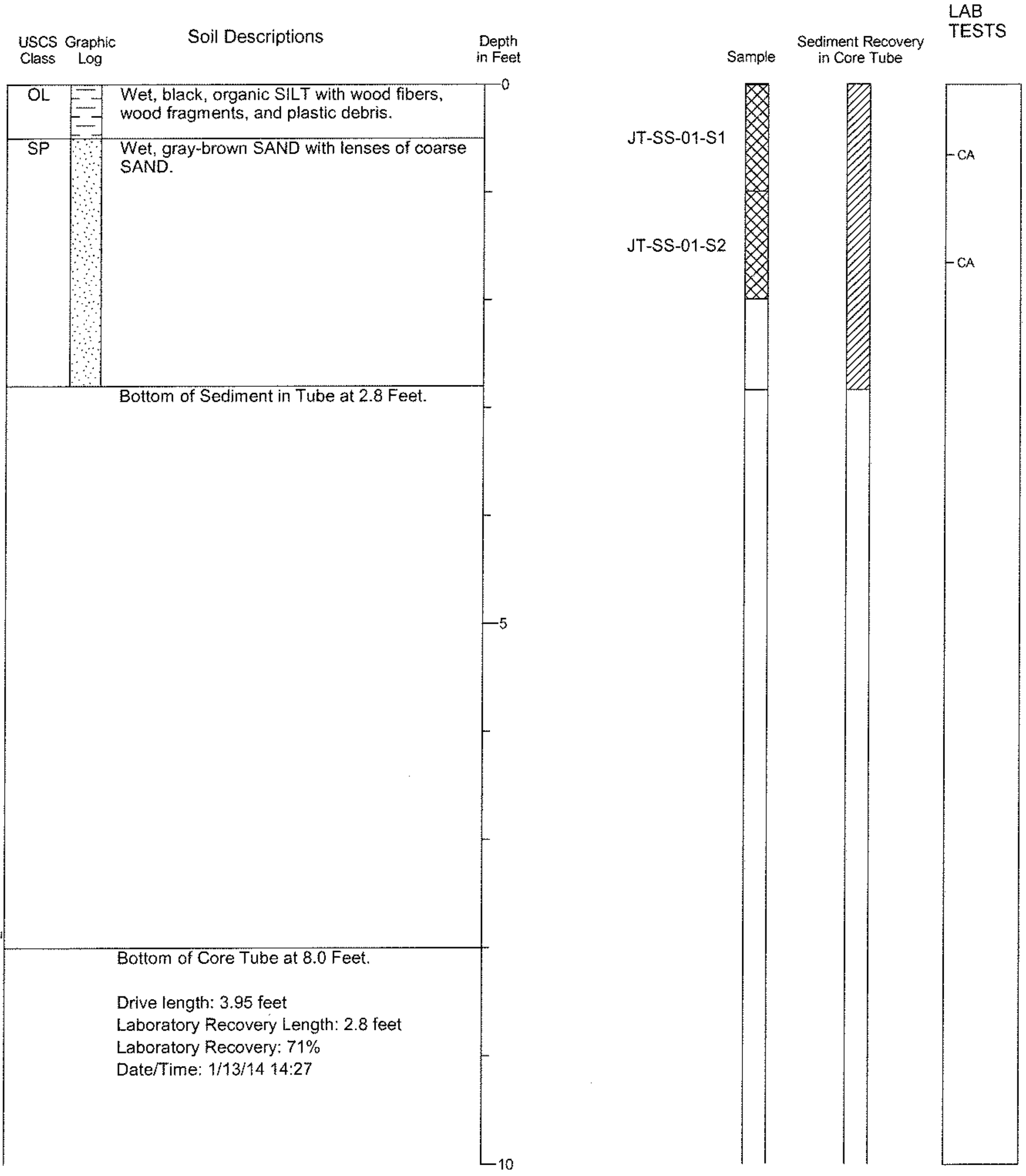
17800-43 3/14

Figure A-42

Vibracore Log HC-JT-01

Location: Lat: 47 40.0511 Long: -122 23.6180
Mudline Elevation in Feet (NAVD 88): 9.6 Feet
Water Depth in Feet: 7.15 Feet

Type of Sample: Vibracore
Core Diameter: 3.5 inches
Logged By: A. Conrad Reviewed By: P. Cordell



Wet, black, organic SILT with wood fibers, wood fragments, and plastic debris.

Wet, gray-brown SAND with lenses of coarse SAND.

Bottom of Sediment in Tube at 2.8 Feet.

Bottom of Core Tube at 8.0 Feet.

Drive length: 3.95 feet
Laboratory Recovery Length: 2.8 feet
Laboratory Recovery: 71%
Date/Time: 1/13/14 14:27

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Sediment descriptions and stratum lines are interpretive and actual changes may be gradual.
3. USCS designations are based on visual manual classification (ASTM D 2488) unless otherwise supported by laboratory testing (ASTM D 2487).
4. Outer core diameter: 4 inches; Inner core diameter: 3.5 inches.

HARTCROWSER

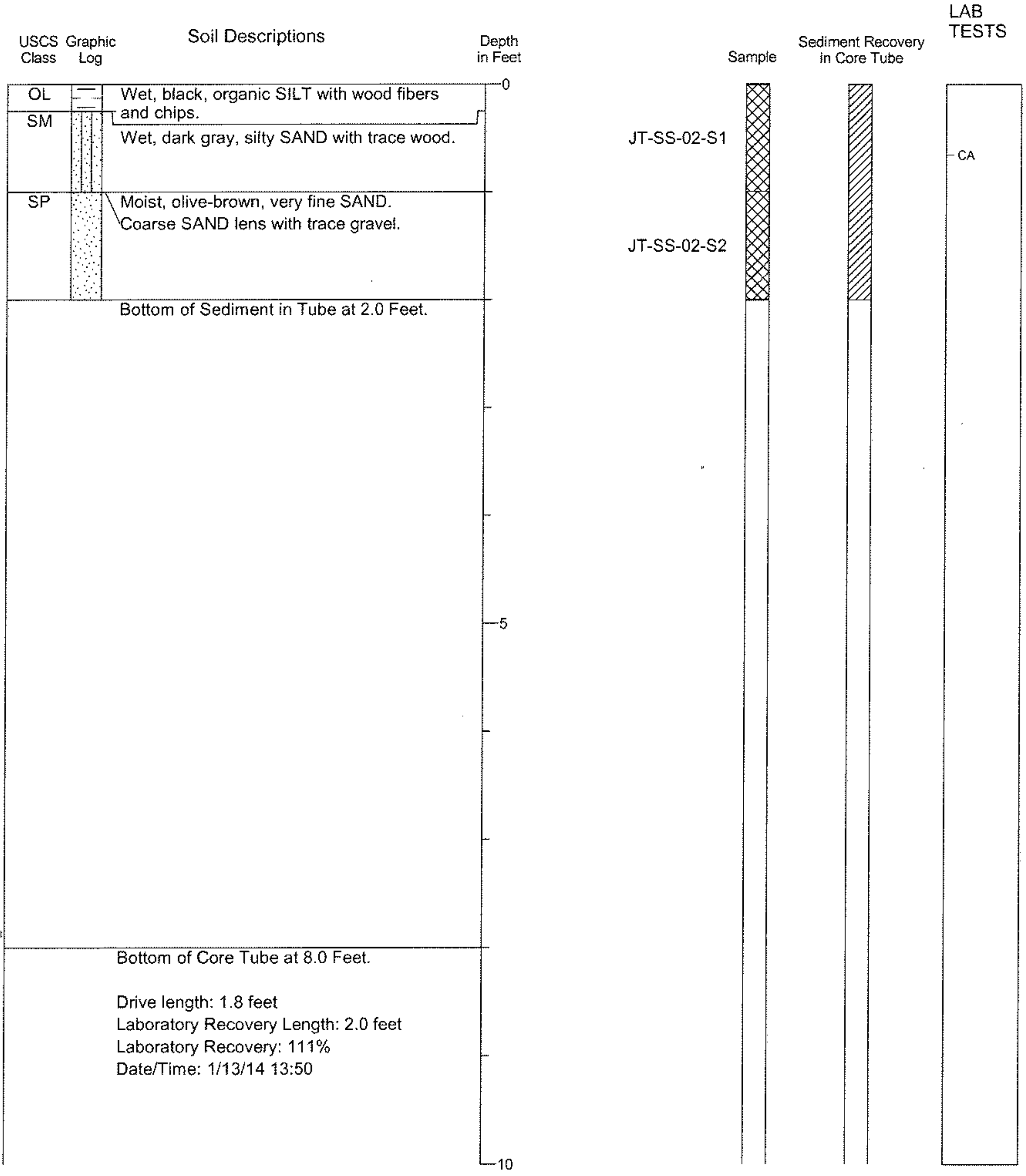
17800-43 **1/14**

Figure A-43

Vibracore Log HC-JT-02

Location: Lat: 47 40.0480 Long: -122 23.6200
Mudline Elevation in Feet (NAVD 88): 7.37 Feet
Water Depth in Feet: 9.38 Feet

Type of Sample: Vibracore
Core Diameter: 3.5 inches
Logged By: A. Conrad Reviewed By: P. Cordell



Wet, black, organic SILT with wood fibers and chips.

Wet, dark gray, silty SAND with trace wood.

Moist, olive-brown, very fine SAND.
Coarse SAND lens with trace gravel.

Bottom of Sediment in Tube at 2.0 Feet.

Bottom of Core Tube at 8.0 Feet.

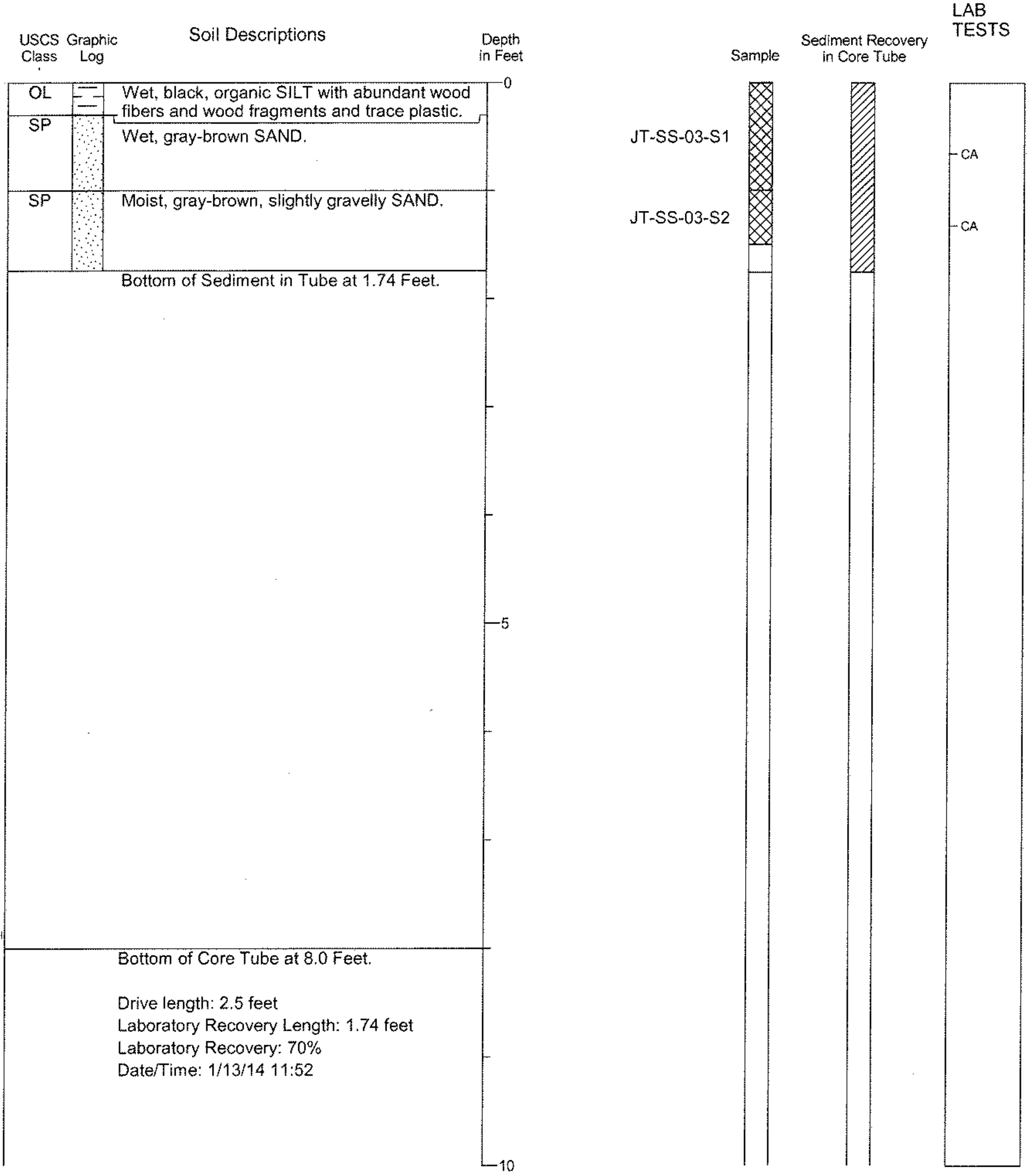
Drive length: 1.8 feet
Laboratory Recovery Length: 2.0 feet
Laboratory Recovery: 111%
Date/Time: 1/13/14 13:50

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Sediment descriptions and stratum lines are interpretive and actual changes may be gradual.
3. USCS designations are based on visual manual classification (ASTM D 2488) unless otherwise supported by laboratory testing (ASTM D 2487).
4. Outer core diameter: 4 inches; Inner core diameter: 3.5 inches.

Vibracore Log HC-JT-03

Location: Lat: 47 40.0444 Long: -122 23.6211
Mudline Elevation in Feet (NAVD 88): 4.45 Feet
Water Depth in Feet: 12.3 Feet

Type of Sample: Vibracore
Core Diameter: 3.5 inches
Logged By: A. Conrad Reviewed By: P. Cordell



Wet, black, organic SILT with abundant wood fibers and wood fragments and trace plastic.

Wet, gray-brown SAND.

Moist, gray-brown, slightly gravelly SAND.

Bottom of Sediment in Tube at 1.74 Feet.

Bottom of Core Tube at 8.0 Feet.

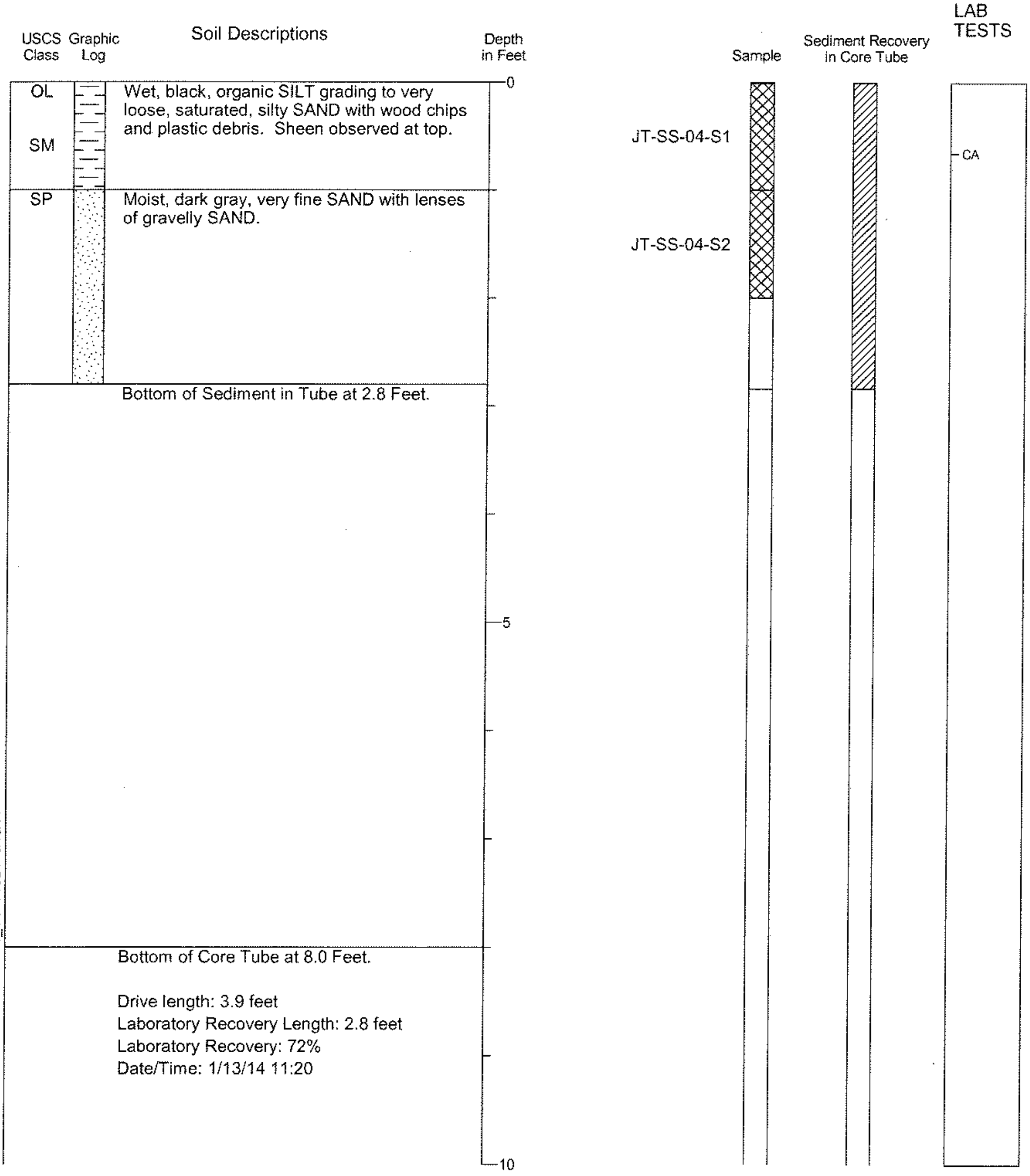
Drive length: 2.5 feet
Laboratory Recovery Length: 1.74 feet
Laboratory Recovery: 70%
Date/Time: 1/13/14 11:52

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Sediment descriptions and stratum lines are interpretive and actual changes may be gradual.
3. USCS designations are based on visual manual classification (ASTM D 2488) unless otherwise supported by laboratory testing (ASTM D 2487).
4. Outer core diameter: 4 inches; Inner core diameter: 3.5 inches.

Vibracore Log HC-JT-04

Location: Lat: 47 40.0422 Long: -122 23.6222
Mudline Elevation in Feet (NAVD 88): 2.95 Feet
Water Depth in Feet: 13.8 Feet

Type of Sample: Vibracore
Core Diameter: 3.5 inches
Logged By: A. Conrad   Reviewed By: P. Cordell



OL / SM — Wet, black, organic SILT grading to very loose, saturated, silty SAND with wood chips and plastic debris. Sheen observed at top.

SP — Moist, dark gray, very fine SAND with lenses of gravelly SAND.

Bottom of Sediment in Tube at 2.8 Feet.

Bottom of Core Tube at 8.0 Feet.

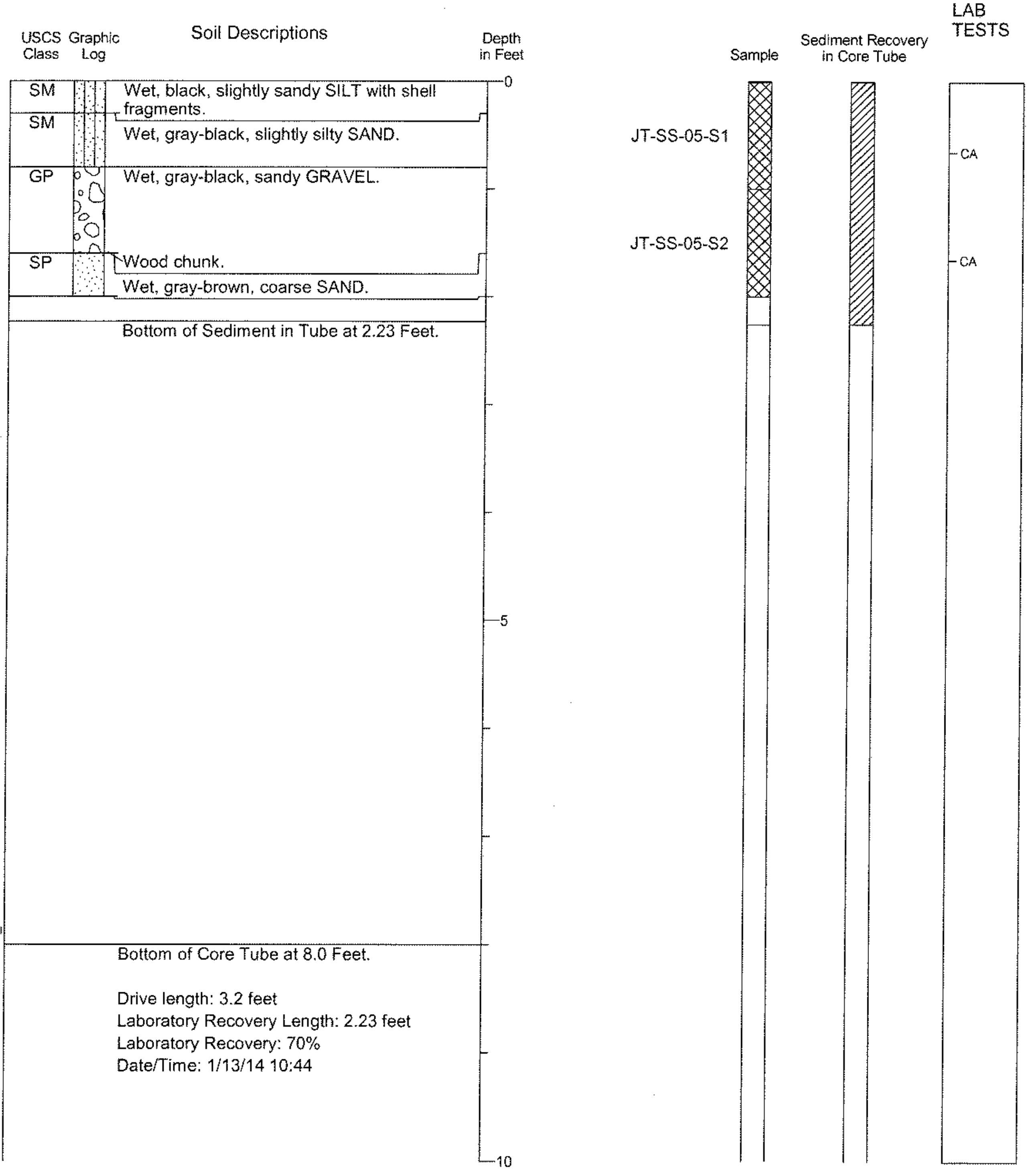
Drive length: 3.9 feet
Laboratory Recovery Length: 2.8 feet
Laboratory Recovery: 72%
Date/Time: 1/13/14 11:20

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Sediment descriptions and stratum lines are interpretive and actual changes may be gradual.
3. USCS designations are based on visual manual classification (ASTM D 2488) unless otherwise supported by laboratory testing (ASTM D 2487).
4. Outer core diameter: 4 inches; Inner core diameter: 3.5 inches.

Vibracore Log HC-JT-05

Location: Lat: 47 40.0404 Long: -122 23.6240
Mudline Elevation in Feet (NAVD 88): 1.75 Feet
Water Depth in Feet: 15 Feet

Type of Sample: Vibracore
Core Diameter: 3.5 inches
Logged By: A. Conrad Reviewed By: P. Cordell



USCS Class	Soil Descriptions
SM	Wet, black, slightly sandy SILT with shell fragments.
SM	Wet, gray-black, slightly silty SAND.
GP	Wet, gray-black, sandy GRAVEL.
SP	Wood chunk.
	Wet, gray-brown, coarse SAND.

Bottom of Sediment in Tube at 2.23 Feet.

Bottom of Core Tube at 8.0 Feet.

Drive length: 3.2 feet
Laboratory Recovery Length: 2.23 feet
Laboratory Recovery: 70%
Date/Time: 1/13/14 10:44

1. Refer to Figure A-1 for explanation of descriptions and symbols.
2. Sediment descriptions and stratum lines are interpretive and actual changes may be gradual.
3. USCS designations are based on visual manual classification (ASTM D 2488) unless otherwise supported by laboratory testing (ASTM D 2487).
4. Outer core diameter: 4 inches; Inner core diameter: 3.5 inches.

APPENDIX B
Chemical Data Quality Review

APPENDIX B
CHEMICAL DATA QUALITY REVIEW

In January and March 2014, 169 soil samples, 20 groundwater samples, 2 field duplicates, and multiple trip blanks were collected. One product sample was collected on January 10, 2014. Twelve sediment samples were collected on January 14, 2014. The samples were submitted to Analytical Resources, Inc., of Tukwila, Washington, for analysis. The laboratory reported results as ARI Job numbers XT25, XT66, XT67, XT68, XU08, XU23, XU70, XU77, XU99, YC68, YC69, YC70, YD09, and YD46.

Selected soil samples were analyzed for one or more of the following:

- Volatile organic compounds (VOCs) by EPA Method 8260C;
- Diesel and motor oil range organics by Washington State Department of Ecology (Ecology) method NWTPH-Dx with acid and silica gel cleanup;
- Total organic carbon (TOC) following Plumb, 1981;
- Polychlorinated biphenyls (PCBs) by EPA Method 8082A;
- Dioxins/furans by EPA Method 1613;
- Petroleum hydrocarbon identification by Ecology method NWTPH-HCID;
- Total metals (arsenic, cadmium, chromium, and lead) by EPA Method 200.8;
- Total mercury by EPA Method 7471A; and
- Total solids by EPA 160.3 modified.

The water samples were analyzed for one or more of the following:

- Anions (nitrate, sulfate, and chloride) by EPA Method 300.0;
- TOC by SM 5310;
- PCBs by EPA Method 8082A;
- Diesel- and motor oil-range organics by Ecology method NWTPH-Dx;
- Volatile organic compounds (VOCs) by EPA Method 8260C;
- Total metals (arsenic, cadmium, chromium, and lead) by EPA Method 200.8;
- Total mercury by EPA Method 7470A;
- Dissolved metals (arsenic, cadmium, chromium, and lead) by EPA Method 200.8;
- Dissolved mercury by EPA Method 7470A;
- Total suspended solids (TSS) by SM 2540D;
- Alkalinity by SM 2320; and
- Nitrate and nitrite by EPA Method 353.2.

The product sample was analyzed for the following:

- Diesel and motor oil range organics by Ecology method NWTPH-Dx;

The sediment samples were analyzed for one or more of the following:

- TOC by Plumb, 1981;

- PCBs by EPA Method 8082A;
- Volatile organic compounds (VOCs) by EPA Method 8260C;
- Total metals (arsenic, cadmium, chromium, and lead) by EPA Method 200.8;
- Total mercury by EPA Method 7470A; and
- Total solids by SM 2540G.

Quality assurance/quality control (QA/QC) reviews of laboratory procedures were performed on an ongoing basis by the laboratory. Hart Crowser performed the data review using laboratory quality control results summary sheets to ensure they met data quality objectives for the project. Our data review followed the format outlined in the National Functional Guidelines for Superfund Organic Methods Data Review (EPA 2008), and National Functional Guidelines for Inorganic Superfund Data Review (EPA 2010), modified to include specific criteria of the individual analytical methods. Dioxin/furan data review followed the format outlined in the National Functional Guidelines for Chlorinated Dibenzo-p-Dioxins (CDDs) and Chlorinated Dibenzofurans (CDFs) Data Review modified to include specific criteria of the analytical method. The following criteria were evaluated in the validation process:

- Sample Preservation and Holding times;
- Method blanks;
- Surrogate recoveries;
- Laboratory control sample (LCS) recoveries;
- Laboratory duplicate relative percent differences (RPDs);
- Laboratory replicate relative standard deviations (RSDs);
- Matrix spike (MS) recoveries;
- Field duplicate RPDs (where applicable);
- Standard Reference Material (SRM) recoveries;
- Internal Standard (IS) recoveries;
- Calibration criteria; and
- Reporting limits (RL).

The data were determined to be acceptable for use, as qualified. Full laboratory results are presented at the end of this Appendix. Results of the data review follows.

SAMPLE RECEIVING NOTES AND DISCREPANCIES

XT25: The Chain of Custody (CoC) did not include the total number of containers listed on pages 2 and 3, and no analyses were marked. The release date on the CoC was incorrect. The sampler did not sign off on the CoC. On January 6, 2014, a revised CoC was submitted to the laboratory with the sample analyses marked. One sample was missing from the original CoC, but was added to the revised CoC. Twelve samples were placed on hold. On January 7, 2014, acid/silica gel cleanup was added to the NWTPH-Dx analysis. On January 9, 2014, dioxin/furan analysis was added to sample JT-US-003-S2.

XT66 and XT67: The CoC did not include the total number of containers listed on page 2, and no analyses were marked. On January 7, 2014, a revised CoC was submitted to the laboratory with the sample analyses marked.

Sample JT-US-020-S3: Two 2-ounce sample jars were submitted. One 2-ounce jar was received empty. Sufficient sample volume was available for all analyses.

XT68: On January 7, 2014, a revised CoC was submitted with the following changes to the original CoC: TOC and NWTPH-Dx analyses were removed from samples JT-US-009-S3 and JT-US-013-S2; PCB, total solids, and VOC analyses were added to samples JT-US-013-S4, JT-US-014-S4, and JT-US-015-S1.

Sample JT-US-011-S4: The container lid was labelled JT-US-010-S4. The sample was logged into the LIMS with the sample ID from the container label.

XU08: The CoC did not include the total number of containers. Sixteen trip blanks were received. The laboratory submitted three trip blanks for analysis, and placed the remainder on hold.

Samples IP-14 and IP-1400: The samples were incorrectly listed on the CoC as JT-14 and JT-1400. The samples were logged in following the sample labels. Additional acid was added to the dissolved metals containers at the laboratory to properly preserve the samples.

Sample IP-14: One 1-liter amber glass jar was received broken. Sufficient sample volume remained for analysis.

Samples JT-MW-JT-6, JT-MW-SRW-1, JT-MW-JT-3, JT-MW-MW-8D, and JT-MW-JT-7: The samples were received past the holding time or with insufficient holding time available for nitrate analysis. The samples were re-collected for nitrate and reported in SDG XU70.

XU23: The water/product sample was collected in a soil jar without preservation. Sufficient volume was collected and holding times were met for unpreserved samples. The sample was split at the laboratory into two samples: JT-8-P-A was a water sample, and JT-8-P-B was the product layer.

XU70: The samples were incorrectly identified on the CoC. The sample IDs were hand-corrected on the CoC, laboratory report, and electronic data deliverable (EDD).

Sample JT-MW-MW-8D: The sample ID on the bottle was JT-MW-MW-8, while the sample ID on the CoC was HC-MW-MW-8. The sample name was hand-corrected.

XU77 and XU99: Four samples were placed on hold. Two samples (JT-SS-01-S2 and JT-SS-03-S2) were taken off hold on January 15, 2014, and logged into the LIMS as XU99.

YC68 and YC69: The original CoC did not have any analyses marked. A revised CoC was submitted to the laboratory with the sample analyses marked. On March 24, 2014, the CoC was revised again with additional analyses marked.

YC70: Some pages of the CoC did not include the sampler's signature. The COCs included in the data package did not have the laboratory "Received by" section completed. On March 13, 2014, five samples were taken off hold and analyzed for PCBs.

YD09: The original CoC did not list the total number of containers, and no analyses were marked. On March 17, 2014, a revised CoC was submitted to the laboratory with the sample analyses marked. The temperature of the cooler received at the laboratory was 7.9° C, outside the method recommended range of 2 to 6° C. The elevated temperature would not affect the stability of PCBs, and PCB sample analyses were not qualified. Results for VOC analyses were qualified as estimated (J) in samples JT-MW-100-S2, JT-MW-100-S3, JT-MW-200-S5, and JT-MW-200-S6.

LABORATORY DETECTION LIMITS

Reported detection limits and analytical results were adjusted for moisture content and any required dilution factors. Detections that fell between the Method Detection Limit (MDL) and the Reporting Limit (RL) were qualified as estimated (J) by ARI. The J qualifier was changed to T to be consistent with Washington State's Environmental Information Management database.

SOIL SAMPLES

VOCs

Analytical Methods

The samples were prepared following EPA Method 5035. The samples were analyzed by Gas Chromatograph fitted with a Mass Spectrometer (GC/MS) following EPA Method 8260C.

Sample Holding Times

The samples were prepared and analyzed within the holding time limits.

Blank Contamination

No target analytes were detected in the method blanks.

Surrogate Recovery

Surrogate recoveries were within laboratory control limits with the following exceptions:

- Sample JT-US-013-S2 RE: The recovery for d4-1,2-Dichloroethane failed high in the diluted reanalysis. The recovery was in control in the initial analysis, and no results were qualified.
- Sample JT-US-019-S3: The recovery for d4-1,2-Dichloroethane failed high. As all other surrogate recoveries were within control limits, sample results were not qualified.
- Sample JT-US-021-S3: The recovery for d4-1,2-Dichloroethane failed high. As all other surrogate recoveries were within control limits, sample results were not qualified.

- Sample JT-US-027-S3 RE: The recovery for d4-1,2-Dichloroethane failed high in the diluted reanalysis. The recovery was in control in the initial analysis, and no results were qualified.

Laboratory Control Sample Recovery

Laboratory control sample (LCS) recoveries were within laboratory control limits with the following exceptions:

- LCS/LCSD-011014: The recovery for 2-butanone in the LCS failed high, but was within control in the LCSD. The associated samples (JT-US-009-S2, JT-US-009-S3, JT-US-010-S3, JT-US-011-S2, JT-US-011-S3, JT-US-011-S4, JT-US-006-S3, JT-US-007-S2, JT-US-008-S2, and JT-US-008-S5) were non-detect for that analyte and not qualified.

- LCS/LCSD-011714: The recovery for Benzene in the LCSD failed low, but was within control in the LCS. The associated samples (JT-US-022-S2, JT-US-021-S2, JT-US-025-S2, JT-US-025-S3, JT-US-024-S4, JT-US-017-S4, JT-US-017-S5, JT-US-012-S1, JT-US-012-S2, JT-US-012-S3, JT-US-023-S3, JT-US-022-S3, JT-US-015-S2, and JT-US-024-S3) were non-detect for benzene and not qualified. Sample JT-US-024-S2 was not qualified as the LCS was in control.

- LCS/LCSD-031714: The recoveries for acetone, naphthalene, MTBE, and 1,1,2,2-tetrachloroethane failed high in the LCSD, but were within control in the LCS. The recoveries for Acrolein failed low in the LCS and the LCSD. The results for Acrolein were qualified as estimated (J) in all associated samples (JT-US-26-S2, JT-US-26-S3, JT-US-27-S2, JT-US-27-S3, JT-US-27-S4, JT-US-28-S1, JT-US-28-S2, JT-US-28-S3, JT-US-29-S1, JT-US-29-S2, JT-US-30-S2, JT-US-30-S4, JT-US-31-S2, and JT-US-31-S3). As the recoveries for acetone, naphthalene, MTBE, and 1,1,2,2-tetrachloroethane were within control in the LCS, those analytes were not qualified in the associated samples.

- LCS-032014 – The recovery for acetone failed high in the LCSD, but was in control in the LCS. The laboratory qualified detections in the associated samples with Q (JT-US-36-S2, JT-US-37-S1, JT-US-37-S2, JT-US-38-S1, JT-US-38-S2, JT-MW-100-S2, JT-MW-100-S3, JT-MW-200-S5, and JT-MW-200-S6). As the recovery for acetone was in control in the LCS, the associated samples were not qualified, and the Q qualifiers were removed.

Matrix Spike Recovery

Matrix spike (MS) recoveries were within laboratory control limits with the following exceptions:

- JT-US-025-S3 MS/MSD: The recoveries for vinyl chloride, 1,1-dichloroethene, trans-1,2-dichloroethene, chlorobenzene, bromoethane, 2,2-dichloropropane, and methylene chloride fell below the control limits in the MS and MSD. The recoveries for carbon disulfide, 1,1,1-trichloroethane, 2-hexanone, 1,1,2-trichloro-1,2,2-trifluoromethane, and acrolein fell below the control limits in the MS, but were within control limits in the MSD. The recoveries for acetone, 1,1,2,2-tetrachloroethane, MTBE, and trans-1,4-dichloro-2-butene fell below the control limits in the MSD, but were within control limits in the MS. The RPDs for trans-1,4-dichloro-2-butene and 1,1,2,2-tetrachloroethane exceeded the control limits. The associated LCS/LCSD were within control limits for the affected analytes, and associated samples were not qualified. The source sample was non-detect for those analytes except chlorobenzene. The results for vinyl chloride, 1,1-dichloroethene, trans-1,2-dichloroethene, chlorobenzene, bromoethane, 2,2-dichloropropane, and methylene chloride were qualified as estimated (J) in JT-US-025-S3.

- JT-US-008-S2 MS/MSD: The recoveries for vinyl chloride fell below the control limits in the MS and MSD. The recoveries for acetone, 1,1,2,2-tetrachloroethane, and vinyl acetate fell below the control limits in the MS, but were within control in the MSD. The recoveries for 1,1-dichloroethane and bromoethane fell below the control limits in the MSD, but were within control in the MS. The RPDs for vinyl acetate and 1,1,2,2-tetrachloroethane exceeded the control limits. The associated LCS/LCSD were within control limits for the affected analytes, and associated samples were not qualified. The source sample was non-detect for those analytes. The result for vinyl chloride was qualified as estimated (J) in JT-US-008-S2.

Internal Standard Recoveries

The internal standard (IS) recoveries were within acceptance criteria with the following exceptions:

- Sample JT-US-016-S2: The IS d4-1,4-Dichlorobenzene fell below the criteria. A low bias in the IS leads to a high bias in the associated analytes (bromobenzene, bromoform, n-butylbenzene, 1,1,2,2-tetrachloroethane, 1,2,3-trichloropropane, trans-1,4-dichloro-2-butene, d4-1,2-dichlorobenzene, sec-butylbenzene, tert-butylbenzene, 2-chlorotoluene, 4-chlorotoluene, 1,2-dibromo-3-chloropropane, 1,2-dichlorobenzene, 1,3-dichlorobenzene, 1,4-dichlorobenzene, hexachlorobutadiene, isopropylbenzene, p-isopropyltoluene, naphthalene, n-propylbenzene, 1,1,2,2-tetrachloroethane, 1,2,3-trichlorobenzene, 1,2,4-trichlorobenzene, 1,2,3-trichloropropane, 1,2,4-trimethylbenzene, and 1,3,5-trimethylbenzene). Those analytes were ND in the sample and not qualified.

- Sample JT-US-003-S2: The IS d4-1,4-Dichlorobenzene fell below the criteria. A low bias in the IS leads to a high bias in the associated analytes (bromobenzene, bromoform, n-butylbenzene, 1,1,2,2-tetrachloroethane, 1,2,3-trichloropropane, trans-1,4-dichloro-2-butene, d4-1,2-dichlorobenzene, sec-butylbenzene, tert-butylbenzene, 2-chlorotoluene, 4-chlorotoluene, 1,2-dibromo-3-chloropropane, 1,2-dichlorobenzene, 1,3-dichlorobenzene, 1,4-dichlorobenzene, hexachlorobutadiene, isopropylbenzene, p-isopropyltoluene, naphthalene, n-propylbenzene, 1,1,2,2-tetrachloroethane, 1,2,3-trichlorobenzene, 1,2,4-trichlorobenzene, 1,2,3-trichloropropane, 1,2,4-trimethylbenzene, and 1,3,5-trimethylbenzene). The analytes 1,2,4-trimethylbenzene, 1,3-dichlorobenzene, and 1,4-dichlorobenzene were detected in the sample and were qualified as estimated (J).

- Sample JT-US-010-S2: The IS d4-1,4-Dichlorobenzene fell below the criteria. A low bias in the IS leads to a high bias in the associated analytes (bromobenzene, bromoform, n-butylbenzene, 1,1,2,2-tetrachloroethane, 1,2,3-trichloropropane, trans-1,4-dichloro-2-butene, d4-1,2-dichlorobenzene, sec-butylbenzene, tert-butylbenzene, 2-chlorotoluene, 4-chlorotoluene, 1,2-dibromo-3-chloropropane, 1,2-dichlorobenzene, 1,3-dichlorobenzene, 1,4-dichlorobenzene, hexachlorobutadiene, isopropylbenzene, p-isopropyltoluene, naphthalene, n-propylbenzene, 1,1,2,2-tetrachloroethane, 1,2,3-trichlorobenzene, 1,2,4-trichlorobenzene, 1,2,3-trichloropropane, 1,2,4-trimethylbenzene, and 1,3,5-trimethylbenzene). The analyte 1,2,4-trichlorobenzene was detected in the sample and was qualified as estimated with a (J).

Calibration Criteria

The Initial Calibration Curve (ICAL) was within acceptance criteria. The Continuing Calibration Verification Checks (CCVs) were in control with the following exceptions:

- CCV 010814: The recoveries for acetone, methylene chloride, and vinyl acetate failed low. Those analytes in associated samples (JT-US-003-S2, JT-US-007-S3, and JT-US-008-S4) were qualified as estimated (J).

- CCV 011014: The recoveries for chloroethane, trichlorofluoromethane, and 1,1,1-trichloroethane failed high. Those analytes in the associated samples (JT-US-006-S3, JT-US-007-S2, JT-US-008-S2, JT-US-008-S5, JT-US-009-S2, JT-US-009-S3, JT-US-010-S3, JT-US-011-S2, JT-US-011-S3, and JT-US-011-S4) were non-detect for those analytes and not qualified.

- CCV 011414: The recoveries for Trichlorofluoromethane, 1,1,2-trichloro-1,2,2-trifluoroethane, and 1,1-dichloroethene failed high. The recovery for acetone failed low. The results for acetone in the associated samples (JT-US-015-S1, JT-US-015-S2, JT-US-009-S1, JT-US-010-S2, JT-US-013-S2, JT-US-013-S3, JT-US-013-S4, JT-US-014-S2, JT-US-014-S3, JT-US-014-S4, JT-US-018-S1 and JT-US-018-S2) were qualified as estimated (J). The recovery for 1,1-dichloroethene in sample JT-US-018-S2 was qualified as estimated (J).

- CCV 011514: The recoveries for Iodomethane, trichlorofluoromethane, 1,1,1-trichloroethane, and Dibromofluoromethane failed high. Those analytes in the associated samples (JT-US-016-S2, JT-US-016-S3, JT-US-018-S2, JT-US-018-S3, JT-US-018-S4, JT-US-019-S3, JT-US-021-S3, and JT-US-022-S1) were non-detect and not qualified.

- CCV 011614: The recoveries for acetone, bromoethane, and Iodomethane failed high. Detections for those analytes in the associated samples (JT-US-019-S2, JT-US-019-S4, JT-US-020-S2, JT-US-020-S3, JT-US-020-S4, JT-US-021-S1, JT-US-022-S1, JT-US-023-S2, and JT-US-023-S4) were qualified as estimated (J) (JT-US-019-S4 [acetone], JT-US-020-S3 [acetone], JT-US-020-S4 [acetone], JT-US-021-S1 [acetone], JT-US-022-S1 [acetone], and JT-US-023-S4 [Iodomethane]).

- CCV 011714: The recovery for Iodomethane failed high. Detections for that analyte in the associated samples (JT-US-022-S2, JT-US-021-S2, JT-US-025-S2, JT-US-025-S3, JT-US-024-S4, JT-US-015-S2, JT-US-017-S4, JT-US-017-S5, JT-US-012-S1, JT-US-012-S2, JT-US-012-S3, JT-US-023-S3, JT-US-022-S3, and JT-US-024-S3) were qualified by the laboratory with Q. The Q qualifier was changed to J in samples JT-US-021-S2 and JT-US-025-S3.

- CCV 031714: The recoveries for Bromomethane and Acrolein failed low. The recoveries for acetone and 1,1,2,2-tetrachloroethane failed high. Detections for those analytes in the associated samples were qualified with Q by the laboratory. The results Bromomethane and acrolein were qualified as estimated (J) in the associated samples (JT-US-26-S2, JT-US-26-S3, JT-US-27-S2, JT-US-27-S3, JT-US-27-S4, JT-US-28-S1, JT-US-28-S2, JT-US-28-S3, JT-US-29-S1, JT-US-29-S2, JT-US-30-S2, JT-US-30-S4, JT-US-31-S2, and JT-US-31-S3). The Q qualifier was changed to J (estimated) for detections for acetone and 1,1,2,2-tetrachloroethane in the following samples (JT-US-26-S3, JT-US-27-S3, JT-US-27-S4, JT-US-28-S1, JT-US-28-S2, JT-US-28-S3, JT-US-29-S2, JT-US-30-S2, JT-US-30-S4, JT-US-31-S2, and JT-US-31-S3).

- CCV 031914: The recovery for acetone failed high. Detections for acetone in the associated samples were qualified with Q by the laboratory. The Q qualifier was changed to J (estimated) for detections for acetone in the following samples (JT-US-32-S4, JT-US-33-S3, JT-US-33-S4, JT-US-33-S5, and JT-US-35-S2).

- CCV 032014: The recovery for acetone failed high, while the recovery for dichlorodifluoromethane failed low. Detections for those analytes in the associated samples were qualified with Q by the laboratory. The results for dichlorodifluoromethane were qualified as estimated (J) in all associated samples (JT-US-36-S2, JT-US-37-S1, JT-US-37-S2, JT-US-38-S1, JT-US-38-S2, JT-MW-100-S2, JT-MW-100-S3, JT-MW-200-S5, and JT-MW-200-S6). The Q qualifier was changed to J (estimated) for detections for acetone in the following samples (JT-US-36-S2, JT-US-37-S2, JT-US-38-S2, JT-MW-100-S2, JT-MW-100-S3, JT-MW-200-S5, and JT-MW-200-S6).

Sample Notes

- Samples JT-US-27-S4, JT-US-28-S3, JT-US-30-S4, JT-US-013-S4, JT-US-015-S2, and JT-US-014-S3: The results for vinyl chloride were qualified by the laboratory with M due to low spectral match parameters. The M qualifier was changed to J (estimated).

- Samples JT-MW-100-S2, JT-MW-100-S3, JT-MW-200-S5, and JT-MW-200-S6: The samples were received at the laboratory with an elevated temperature above 6^{o} C. All sample results were qualified as estimated (J) due to the temperature exceedance.

Diesel- and Motor Oil-Range Hydrocarbons

Analytical Methods

The samples were prepared following EPA Method 3546. The sample extracts were acid and silica gel cleaned following the NWTPH-Dx method. The samples were analyzed by a GC fitted with a Flame Ionization Detector (GC/FID) following the NWTPH-Dx method.

Sample Holding Times

The samples were prepared and analyzed within the holding time limits.

Blank Contamination

No target analytes were detected in laboratory blanks.

Surrogate Recovery

Surrogate recoveries were within laboratory control limits with the following exceptions:

- Sample JT-US-001-S2: The recovery for o-Terphenyl was not reported in the undiluted and diluted analyses. The recovery for Triacontane was within control. There were high levels of target analytes present, and sample results were not qualified.
- Sample JT-US-005-S2: The recovery for o-Terphenyl was not reported in the undiluted and diluted analyses. The recovery for Triacontane was within control. There were high levels of target analytes present, and sample results were not qualified.
- Sample JT-US-003-S2: The recovery for Triacontane was not reported in the undiluted analysis. The surrogate recoveries were in control in the diluted analysis and sample results were not qualified.

Laboratory Control Sample Recovery

The LCS recoveries were within laboratory control limits.

Matrix Spike Recovery

The MS recoveries were within laboratory control limits with the following exceptions:

- JT-US-02-S2 MS/MSD: The recoveries for diesel exceeded the control limits. There were high levels of diesel in the source sample compared to the spiking amount, and sample results were not qualified.

Calibration Criteria

The ICAL was within acceptance criteria. The CCVs were in control.

Sample Notes

The sample chromatograms were reviewed and identifications were modified as follows:

- Sample JT-US-019-S2: The sample was reported as non-detect (U) at the reported result for Diesel Range Organics (DRO), Residual Range Organics (RRO), and transformer oil, with a note that PCBs were identified (C).
- Sample JT-US-024-S2: The samples was reported as non-detect at the reported result for transformer oil. The result for motor oil was reported as RRO.
- Sample JT-US-020-S2: The sample was reported as non-detect (U) for DRO and transformer oil. The result for motor oil was reported as RRO and qualified as estimated (J), with a note that PCBs were identified (C).

- Sample JT-US-001-S2: The sample was reported as non-detect (U) at the reported result for DRO, RRO, and transformer oil, with a note that PCBs were identified (C).
- Sample JT-US-002-S2: The sample was reported as non-detect (U) at the reported result for DRO, RRO, and transformer oil, with a note that PCBs were identified (C).
- Sample JT-US-005-S2: The sample was reported as non-detect (U) at the reported result for DRO, RRO, and transformer oil, with a note that PCBs were identified (C).
- Sample JT-US-014-S2: The sample was reported as non-detect (U) at the reported result for DRO, RRO, and transformer oil, with a note that PCBs were identified (C).
- Sample JT-US-008-S4: The sample was reported as non-detect (U) at the reported result for DRO, RRO, and transformer oil, with a note that PCBs were identified (C).
- Sample JT-US-003-S2: The sample was reported as non-detect at the reported result for DRO and transformer oil. The result for motor oil was reported as RRO and qualified as estimated (J).

Petroleum Hydrocarbon Identification

Analytical Methods

The samples were prepared following EPA Method 3580A. The samples were analyzed by GC/FID following the NWTPH-HCID method.

Sample Holding Times

The samples were prepared and analyzed within the holding time limits.

Blank Contamination

No target analytes were detected in laboratory blanks.

Surrogate Recovery

Surrogate recoveries were within laboratory control limits.

Sample Notes

The sample chromatograms were reviewed and identifications were modified as follows:

- Sample JT-US-27-S2: The sample was reported as non-detect (U) at the reported result for DRO and RRO, with a note that PCBs were identified (C). Gasoline was reported as GRO, as the chromatogram indicated individual peaks, not a gasoline pattern.

PCBs

Analytical Methods

The samples were prepared following EPA Method 3546. The sample extracts were sulfur, acid, and silica gel cleaned. The samples were analyzed by a GC fitted with an Electron Capture Detector (GC/ECD) following EPA Method 8082A.

Sample Holding Times

The samples were frozen to extend holding times. The samples were prepared and analyzed within six months of sample collection.

Blank Contamination

No target analytes were detected in laboratory blanks with the following exceptions:

- MB-010914: The method blank had a detection for Aroclor 1260 above the RL. The associated samples (JT-US-016-S2, JT-US-016-S3, JT-US-018-S2, JT-US-018-S3, JT-US-018-S4, JT-US-019-S3, JT-US-019-S4, JT-US-020-S2, JT-US-020-S3, JT-US-020-S4, JT-US-021-S1, JT-US-021-S2, JT-US-021-S3, JT-US-022-S1, and JT-US-022-S2) were evaluated and qualified:
    - Samples JT-US-016-S3, JT-US-020-S3 and JT-US-018-S3 were re-extracted on January 22, 2104 due to the presence of low levels of Aroclor 1260, and both sets of results were reported by the laboratory. The results were reported from the re-extraction on January 22, 2014, without qualification.
    - Samples JT-US-021-S1, JT-US-021-S2, and JT-US-022-S1 were re-extracted, but the re-extracted results were not reported as the results did not match the original extraction. Those samples were qualified with B (blank contamination) by the laboratory. The B qualifier was removed.
    - Samples JT-US-016-S2, JT-US-018-S2, JT-US-018-S4, JT-US-019-S3, JT-US-019-S4, JT-US-020-S2, JT-US-021-S1, and JT-US-021-S3: The results for Aroclor 1260 were greater than five times the amount in the MB and not qualified.
    - Samples JT-US-020-S4 and JT-US-022-S2 were non-detect for Aroclor 1260 and not qualified.
    - Samples JT-US-021-S2 and JT-US-022-S1: The results for Aroclor 1260 were less than five times the amount in the MB and U-flagged.

Surrogate Recovery

Surrogate recoveries were within laboratory control limits with the following exceptions:

- Sample JT-US-020-S2: The surrogate recoveries were not reported for the dilution reanalysis. The recoveries were in control for the initial analysis, and sample results were not qualified.

- Sample JT-US-024-S4: The recovery for the surrogate TCMX exceeded the control limits, while the recovery for the surrogate DCBP fell within the control limits. As one surrogate recovery was within control, sample results were not qualified.

- Sample JT-US-005-S3: The surrogate recoveries were not reported for the dilution reanalysis. The recoveries were in control for the initial analysis, and sample results were not qualified.

- Sample JT-US-27-S2: The surrogate recoveries were not reported for the initial analysis, dilution reanalysis, or MS and MSD analyses. PCB screening results required a minimum 200-fold dilution due to high levels of PCBs present. Sample results were not qualified.

Laboratory Control Sample Recovery

LCS recoveries were within laboratory control limits.

Matrix Spike Recovery

MS recoveries were within laboratory control limits with the following exceptions:

- JT-US-025-S2 MS/MSD: The recovery for Aroclor 1260 in the MS fell below the control limits, but was within control in the MSD. Sample results were not qualified.

- JT-US-002-S2 MS/MSD: The recoveries for Aroclor 1016 exceeded the control limits in the MS and MSD. The recoveries for Aroclor 1260 were not reported. There were high levels of PCBs in the source sample which interfered with calculating the Aroclor 1016 recoveries. The amount of Aroclor 1260 in the source sample was greater than the spiking amount. Sample results were not qualified.

- JT-US-27-S2 MS/MSD: The recoveries for Aroclor 1016 and Aroclor 1260 were not reported. There were high levels of PCBs in the source sample which interfered with calculating the recoveries. Sample results were not qualified.

Calibration Criteria

The ICAL was within acceptance criteria. The CCVs were in control with the following exception:

- CCV 03/25/14 at 1444: The recovery for Aroclor 1248 failed high on the ZB5 column, but passed on the ZB35 column. The associated samples were reported from the passing column, and no results were qualified.

Sample Notes

- Sample JT-US-025-S3: The result for Aroclor 1248 was reported by the laboratory with Y due to interferences. The Y qualifier was changed to U.

- Samples JT-US-024-S2 and JT-US-024-S4: The results for Aroclor 1242 were reported by the laboratory with Y due to interferences. The Y qualifier was changed to U.

- Samples JT-US-003-S3, JT-MW-200-S5, JT-US-28-S2, JT-US-31-S2, JT-US-31-S5, JT-US-32-S2, JT-US-33-S3, JT-US-36-S1, JT-US-37-S2, JT-US-26-S3, JT-US-27-S2, JT-US-016-S2, JT-US-018-S1, JT-US-019-S2, JT-US-019-S4, JT-US-021-S1, JT-US-022-S1, JT-US-009-S1 diluted, JT-US-011-S2, JT-US-013-S3, JT-US-013-S3 diluted, JT-US-014-S2 diluted, JT-US-014-S3, and JT-US-014-S3 diluted: The results for Aroclor 1254 were reported by the laboratory lab with Y due to interferences. The Y qualifier was changed to U.

- Samples JT-US-26-S2, JT-US-28-S1, JT-US-29-S2, JT-US-34-S3, JT-US-38-S1, JT-US-35-S1, JT-US-015-S1, JT-US-009-S1, JT-US-011-S4, JT-US-013-S2, JT-US-011-S3, JT-US-014-S3, JT-US-011-S3 dilution, JT-US-018-S2, JT-US-018-S4, JT-US-019-S3, JT-US-020-S2, JT-US-020-S3, JT-US-02-S3 rex, JT-US-021-S2, JT-US-021-S3, JT-US-012-S1, JT-US-012-S2, and JT-US-018-S3 rex: The results for Aroclors 1248 and 1254 were reported by the laboratory with Y due to interferences. The Y qualifier was changed to U.

- Samples JT-US-023-S2, JT-US-023-S3, JT-US-024-S3, JT-US-017-S4, JT-US-017-S5, and JT-US-023-S4: The results for Aroclor 1232 were reported by the laboratory with Y due to interferences. The Y qualifier was changed to U.

- Sample JT-US-022-S3: The results for Aroclors 1254 and 1242 were reported by the laboratory with Y due to interferences. The Y qualifier was changed to U.

- Sample JT-US-29-S1: The results for Aroclors 1254 and 1260 were reported by the laboratory with Y due to interferences. The Y qualifier was changed to U.

- Samples JT-US-34-S1, JT-US-38-S2, JT-US-014-S4, JT-US-015-S2, JT-US-025-S2 and JT-US-012-S3: The results for Aroclors 1254 and 1232 were reported by the laboratory with Y due to interferences. The Y qualifier was changed to U.

Total Metals

Analytical Methods

Total arsenic, cadmium, chromium, and lead were prepared and analyzed by EPA Method 200.8. Total mercury was prepared and analyzed by EPA Method 7471A.

Sample Holding Times

The samples were prepared and analyzed within holding time limits.

Blank Contamination

No target analytes were detected in laboratory blanks.

Laboratory Control Sample Recovery

LCS recoveries were within method control limits.

Matrix Spike Recovery

MS recoveries were within method control limits.

Laboratory Duplicate Sample Analysis

The RPD between replicate measurements were within method control limits or not applicable when the sample and duplicate were less than five times the reporting limit, with the following exceptions:

- JT-US-023-S2 Dup: The RPDs for arsenic, chromium, and lead exceeded the control limits. Results for those analytes in sample JT-US-023-S2 were qualified as estimated (J).

- JT-US-009-S2 Dup: The RPD for chromium exceeded the control limits. The result for chromium in sample JT-US-009-S2 was qualified as estimated (J).

Calibration Criteria

The CCVs were in control.

Conventional Analysis

Analytical Methods

Total organic carbon (TOC) was prepared and analyzed following Plumb, 1981. Total solids were prepared and analyzed following EPA 160.3 modified.

Sample Holding Times

The samples were prepared and analyzed within holding time limits.

Blank Contamination

No target analytes were detected in laboratory blanks.

Laboratory Control Sample Recovery

LCS recoveries were within laboratory control limits.

Matrix Spike Recovery

MS recoveries were within laboratory control limits.

Standard Reference Material (SRM) Recovery

SRM recoveries were within control limits.

Laboratory Replicate Sample Analysis

The RSD between replicate measurements were within laboratory control limits.

Sample Notes

- Samples JT-US-022-S1, JT-US-28-S2, and JT-US-017-S4 were less than 50 percent total solids. The reporting limits for these samples will be elevated.

Dioxins/Furans

Analytical Methods

Dioxins/furans were prepared and analyzed by EPA Method 1613B.

Sample Holding Time

Samples were extracted and analyzed within holding time limits.

Sample Reporting Limits

Detections that fell between the Estimated Detection Limit (EDL) and the Reporting Limit (RL) were qualified as estimated (J) by ARI. The J qualifier was changed to T to be consistent with Washington State's EIM database.

Mass Calibration and Resolution

Mass spectrometer resolution was greater than 10,000 resolving power.

The laboratory uses an RTX-Dioxin 2 column rather than DB5 and DB225 columns to confirm 2,3,7,8-TCDF detects. A resolution test mixture was designed specifically for this column, consisting of 2,3,4,8-TCDF, 2,3,7,8-TCDF, and 3,4,6,7-TCDF to evaluate the minimum valley between isomers of 25 percent or less. The column met the valley resolution criteria.

Window Defining Mixture

The homolog window defining mixture was run and retention time windows were appropriately established.

Instrument Stability

The absolute RT of the first internal standard was greater than 25 minutes on the RTX-Dioxin 2 column.

The RRTs of the native and labeled CDDs/CDFs were within the method specified limits.

All native and labeled CDDs/CDFs in the CS3 standard were within their respective ion abundance ratios.

All peaks representing both native and labeled analytes in the CS3 standard had signal-to-noise ratios greater than 10:1.

The Percent Difference (%D) of the Relative Response (RR) was within ±25% of the mean RR of the initial calibration. The %D of the mean Relative Response Factor (RRF) was within ±35% of the initial calibration.

Initial Calibration

The absolute RT of the first internal standard was greater than 25 minutes.

The RRTs of the native and labeled CDDs/CDFs were within the method specified limits.

All native and labeled CDDs/CDFs were within their respective ion abundance ratios.

All peaks representing both native and labeled analytes in the CS3 standard had signal-to-noise ratios greater than 10:1.

Continuing Calibration Verification Checks

CCVs were performed at the proper frequency.

The absolute RT of the first internal standard was greater than 25 minutes.

The RRTs of the native and labeled CDDs/CDFs were within the method specified limits. Absolute RTs of the internal standards were within ± 15 seconds of the RTs obtained during the initial calibration.

All native and labeled CDDs/CDFs in the CS3 standard were within their respective ion abundance ratios.

All peaks representing both native and labeled analytes in the CS3 standard had signal-to-noise ratios greater than 10:1.

The Percent Difference (%D) of the Relative Response (RR) was within ±25% of the mean RR of the initial calibration. The %D of the mean Relative Response Factor (RRF) was within ±35% of the initial calibration.

Ongoing Precision and Recovery Sample Results

An ongoing precision and recovery (OPR) sample was used to evaluate accuracy. Sample percent recoveries were within specified control limits.

Compound Identification

The laboratory reported EMPC or “estimated maximum possible concentration” values for one or more of the target analytes. An EMPC value is reported when a peak was detected but did not meet identification criteria as required by the method; therefore, the result cannot be considered as positive identification for the analyte. To indicate that the reported result for an individual analyte is, in effect, an elevated detection limit, the EMPC values were qualified as not detected (U) at the reported values. EMPC values on Total Homologue groups were qualified as estimated (J).

Blank Contamination

MB-011514: The method blank had detections above the RL for 1,2,3,4,6,7,8-HpCDD, OCDD, and Total HpCDD. The MB had detections between the EDL and the RL for 2,3,7,8-TCDF, OCDF, and Total TCDF.

The laboratory qualified detected results in the associated samples that were less than ten times the amount in the method blank with B. The results for the analytes were evaluated and qualifiers updated thus:

- Results that were less than five times (ten times for OCDF and OCDD) the amount in the MB, had the B qualifier changed to U.
  - Sample JT-US-003-S2 [1,2,3,4,6,7,8-HpCDD and OCDD].
  - Sample JT-US-004-S2 [1,2,3,4,6,7,8-HpCDD, OCDF, and OCDD].
  - Sample JT-US-005-S2 [1,2,3,4,6,7,8-HpCDD and OCDD].

The method blank had detections for the following analytes that did not meet ion ratio criteria and were EMPC qualified:

- 1,2,3,7,8-PeCDF
- 1,2,3,4,6,7,8-HpCDF
- Total PeCDF
- Total PeCDD
- Total HxCDD
- Total HpCDF

EMPC qualified results in the method blank are considered as false positives, and no action levels were established for these analytes.

Stable Isotope Labeled Compound Recoveries

The labeled compound recoveries and ion abundance ratios were within control limits.

Internal Standard and Cleanup Standard Recoveries

Internal Standard and Cleanup Standard recoveries were acceptable.

Sample Qualifiers

Results for the following samples/analytes were qualified by the laboratory with an X due to interferences from chlorodiphenyl ethers. The X qualifiers were changed to JL (estimated).

Sample	Analyte
JT-US-003-S2	1,2,3,7,8-PeCDF
JT-US-005-S2	1,2,3,7,8-PeCDF

GROUNDWATER SAMPLES

VOCs

Analytical Methods

The samples were prepared following EPA Method 5030B. The samples were analyzed by GC/MS following EPA Method 8260C.

Sample Holding Times

The samples were prepared and analyzed within the holding time limits.

Blank Contamination

No target analytes were detected in the method blanks or trip blanks with the following exceptions:

- MB-011314: The MB had a detection for hexachlorobutadiene between the MDL and the RL. The associated samples (JT-MW-JT-6, JT-MW-SRW-1, JT-MW-JT-3, JT-MW-MW-8D, JT-MW-JT-7, JT-MW-TB, JT-MW-JT-12, JT-MW-JT-11, JT-MW-JT-8, JT-MW-IP-9, IP-14, and IP-1400) were non-detect for that analyte and not qualified.

- MB-011414: The MB had detections for hexachlorobutadiene and 1,2,4-trichlorobenzene between the MDL and the RL. The associated samples (JT-MW-JT-6, JT-MW-SRW-1, JT-MW-JT-7, JT-MW-JT-11, JT-MW-JT-8, JT-MW-IP-9, IP-14, and IP-1400) were dilution reanalyses. The analyte hexachlorobutadiene was not reported from these analyses. The analyte 1,2,4-trichlorobenzene was reported from the initial undiluted analyses for JT-MW-JT-6, JT-MW-SRW-1, JT-MW-JT-7, and JT-MW-JT-11 on January 13, 2014. The analyte 1,2,4-trichlorobenzene was reported from the January 15, 2014 dilution reanalysis for JT-MW-JT-8. The analyte 1,2,4-trichlorobenzene was reported for JT-MW-IP-9, IP-1400, and IP-14 with a B qualifier by the laboratory from the January 14, 2014 sequence. As the on-column result was greater than ten times the amount in the MB, the B qualifier was removed from those samples.

- MB-011514: The MB has detections for hexachlorobutadiene, n-butylbenzene, 1,2,4-trichlorobenzene, and 1,2,3-trichlorobenzene between the MDL and the RL. The associated sample JT-MW-JT-8, was a dilution reanalysis. The analytes hexachlorobutadiene and n-butylbenzene were reported from the undiluted analysis on January 13, 2014. The analyte 1,2,3-trichlorobenzene was reported from the dilution reanalysis on January 14, 2014. The analyte 1,2,4-trichlorobenzene was reported with a B qualifier by the laboratory on January 15, 2014. As the on-column result was greater than ten times the amount in the MB, the B qualifier was removed.

- MB-032714: The MB had detections for hexachlorobutadiene and n-butylbenzene between the MDL and the RL. The associated samples (JT-MW-100 and Trip Blanks) were non-detect for those analytes and not qualified.

- MB-032814: The MB had detections for hexachlorobutadiene and n-butylbenzene between the MDL and the RL. The associated samples (JT-MW-200, JT-MW-200 dilution, JT-MW-8, JT-5, and JT-500) were non-detect for those analytes and not qualified

- Trip blank JT-MW-TB: The TB has detections for chloromethane and acetone between the MDL and the RL. Detections for chloromethane and acetone in the associated samples that fell between the MDL and the RL were raised to the RL and U-flagged (JT-MW-JT-6 [chloromethane], JT-MW-MW-8D [chloromethane], JT-MW-JT-12 [acetone], JT-MW-JT-11 [acetone], and IP-1400 [acetone]). Non-detect results were not qualified. Detections above the RL but less than ten times the amount in the trip blank were U-flagged (JT-MW-JT-8 [acetone]).

Surrogate Recovery

Surrogate recoveries were within laboratory control limits with the following exceptions:

- Samples IP-14 and IP-1400: The recoveries for two surrogates exceeded the control limits in the undiluted analyses due to matrix interferences. The surrogate recoveries were in control in the diluted analyses, and no sample results were qualified.

- IP-14 MS/MSD: The recoveries for two surrogates exceeded the control limits in the undiluted analyses due to matrix interferences. No sample results were qualified.

- Sample JT-MW-200 dilution: The recovery for Bromofluorobenzene fell below the control limits for the diluted reanalysis, but was within control in the undiluted analysis. The sample results were not qualified.

Field Duplicate Sample Analysis

The RPD between replicate measurements was within control limits or were not applicable when the sample and duplicate were less than five times the reporting limit.

Laboratory Control Sample Recovery

LCS recoveries were within laboratory control limits with the following exceptions:

- LCS/LCSD-032714 – The recovery for Chloromethane in the LCSD failed low, but was in control in the LCS. The recoveries for Chloroethane failed high in the LCS and LCSD. The recovery for 1,2-dibromo-3-chloropropane failed low in the LCS, but was in control in the LCSD. The associated samples (JT-MW-100 and Trip Blanks) were non-detect for chloroethane and not qualified. As one batch QC sample was in control, the associated samples were not qualified for other analytes.

- LCS/LCSD-032814 – The recovery for Chloromethane in the LCSD failed low, but was in control in the LCS. The recoveries for Vinyl chloride and chloroethane failed high in the LCS, but were in control in the LCSD. The recovery for 1,2-dibromo-3-chloropropane failed low in the LCS, but was in control in the LCSD. As one batch QC sample was in control, the associated samples (JT-MW-200, JT-MW-200 dilution, JT-MW-8, JT-5, and JT-500) were not qualified for these analytes.

Matrix Spike Recovery

MS recoveries were within laboratory control limits with the following exceptions:

- IP-14 MS/MSD: The recoveries for dibromochloromethane, 1,1,2,2-tetrachloroethane, styrene, m,p-Xylene, o-Xylene, 1,1,1,2-tetrachloroethane, 1,3,5-trimethylbenzene, 1,2,4-trimethylbenzene, 1,3-dichloropropane, isopropyl benzene, n-propyl benzene, bromobenzene, 2-chlorotoluene, 4-chlorotoluene,tert-butylbenzene,sec-butylbenzene, 4-isopropyltoluene,n-butylbenzene, naphthalene, and tetrachloroethene exceeded the control limits in the MS and MSD. There were no detections for those analytes in the source sample, and no results qualified.

  There was no recovery for 2-chloroethylvinyl ether in the MS or MSD. The results for 2-chloroethylvinyl ether were qualified as estimated (J) in IP-14 and IP-1400. The recoveries for 1,2-dibromo-3-chloropropane and 1,2,3-trichloropropane exceeded the control limits in the MS, but were within control limits in the MSD. As the recoveries were in control in the LCS, LCSD, and MSD, sample results were not qualified.

  The analytes chlorobenzene, 1,4-dichlorobenzene, 1,2,4-trichlorobenzene, and 1,3-dichlorobenzene did not recover in the MS due to high levels of those analytes in the source sample compared to the spiking amount. The analyte 1,2-Dichlorobenzene did not recover in the MSD due to high levels of that analyte in the source sample compared to the spiking amount. The associated sample results were not qualified.

Internal Standard Recoveries

The IS recoveries were within acceptance criteria.

Calibration Criteria

The ICAL was within acceptance criteria. The CCVs were in control with the following exception:

- CCV 011314: The recovery for Dichlorodifluoromethane failed high. As Dichlorodifluoromethane was not a target analyte, no results were qualified.

- CCV 032714: The recoveries for Chloromethane, dichlorodifluoromethane, and acrolein failed low. The recovery for Chloroethane failed high. The results for Chloroethane in the associated samples (JT-MW-100 and Trip Blanks) were non-detect and not qualified. Dichlorodifluoromethane was not a target analyte, and sample results were not qualified. The results for Chloromethane and acrolein in the associated samples (Trip Blanks and JT-MW-100) were qualified as estimated (J).

- CCV 032814: The recoveries for Chloromethane, 2,2-dichloropropane, 1,2,4-trichlorobenzene, dichlorodifluoromethane, and acrolein failed low. The recovery for Chloroethane failed high. The results for Chloroethane in the associated samples (JT-MW-200, JT-5, JT-500, JT-MW-8, and JT-MW-200) were non-detect and not qualified. Dichlorodifluoromethane was not a target analyte, and sample results were not qualified. The results for Chloromethane, 2,2-dichloropropane, 1,2,4-

trichlorobenzene, and acrolein in the associated samples (JT-MW-200, JT-5, JT-500, JT-MW-8, and JT-MW-200) were qualified as estimated (J).

Diesel and Motor Oil Range Hydrocarbons

Analytical Methods

The sample was prepared following EPA Method 3510C. The sample was analyzed by GC/FID following NWTPH-Dx method.

Sample Holding Times

The samples were prepared and analyzed within the holding time limits.

Blank Contamination

No target analytes were detected in laboratory blanks.

Surrogate Recovery

Surrogate recoveries were within laboratory control limits.

Laboratory Control Sample Recovery

LCS recoveries were within laboratory control limits.

Calibration Criteria

The ICAL was within acceptance criteria. The CCVs were in control.

Sample Notes

The sample chromatograms were reviewed and identifications were modified as follows:

- Sample JT-8-P: The sample was reported as non-detect (U) at the reported result for Diesel Range Organics (DRO), Residual Range Organics (RRO), and transformer oil, with a note that PCBs were identified (C).

PCBs

Analytical Methods

The samples were prepared following EPA Method 3510C. The sample extracts were sulfur, acid, and silica gel cleaned. The samples were analyzed by GC/ECD following EPA Method 8082A.

Sample Holding Times

The samples were prepared and analyzed within the holding time limits.

Blank Contamination

No target analytes were detected in laboratory blanks with the following exceptions:

- MB-011314: The method blank had a detection for Aroclor 1232, which was reported as non-detect with an elevated RL. The results for Aroclor 1232 in the associated samples (JT-MW-JT-6, JT-MW-SRW-1, JT-MW-JT-3, JT-MW-MW-8D, JT-MW-JT-7, JT-MW-JT-12, JT-MW-JT-11, JT-MW-JT-8, JT-MW-IP-9, IP-14, and IP-1400) were reported with elevated RL and qualified with Y/BY. The Y/BY qualifier was changed to U.

Surrogate Recovery

Surrogate recoveries were within laboratory control limits with the following exceptions:

- Samples JT-MW-JT-8, JT-MW-IP-9, and IP-14: The samples were analyzed at dilutions, and the surrogate recoveries were not reported as they were diluted below the RL. The sample results were not qualified.

- IP-14 MS: The recovery for the surrogate TCMX was not reported, but the recovery for the surrogate DCBP fell within the control limits. As one surrogate recovery was within control, sample results were not qualified.

Laboratory Control Sample Recovery

LCS recoveries were within laboratory control limits.

Matrix Spike Recovery

MS recoveries were within laboratory control limits with the following exceptions:

- IP-14 MS/MSD: The recoveries for Aroclor 1016 and Aroclor 1260 exceeded the control limits in the MS and MSD. There were high levels of PCBs in the source sample which interfered with calculating the Aroclor 1016 recoveries. The amount of Aroclor 1260 in the source sample was greater than the spiking amount. Sample results were not qualified.

Field Duplicate Sample Analysis

The RPD between replicate measurements were within control limits with the following exception:

- Samples IP-14/IP-1400: The RPD exceeded 40 percent. The samples were both analyzed at 5-fold dilutions, but surrogate recoveries were not reported for sample IP-14, while the surrogates were reported and in control in sample IP-1400. Calculation of the surrogate recoveries for sample IP-14 indicated that the recoveries were in control. Sample results were not qualified due to field duplicate exceedances.

Internal Standard Recoveries

The IS recoveries were within acceptance criteria with the following exceptions:

Sample JT-MW-200: The IS 1-bromo-2-nitrobenzene exceeded the acceptance criteria on the ZB5 column, but passed on the ZB35 column. Sample results were reported from the ZB35 column, and not qualified.

Calibration Criteria

The ICAL was within acceptance criteria. The CCVs were in control with the following exception:

- CCV 012314 at 0715: The recovery for Aroclor 1254 failed high on the ZB5 column, but passed on the ZB35 column. The results for Aroclor 1254 in the associated samples (JT-MW-JT-8, JT-MW-IP-9, IP-14, IP-14 MS/MSD, and IP-1400) were reported from the passing column.

- CCV 032714 at 1327: The recovery for Aroclor 1248 failed high on the ZB5 column, but passed on the ZB35 column. The associated samples were non-detect for Aroclor 1248, and no results were qualified.

Sample Notes

- Sample JT-5: The sample was lost during the extraction procedure. As a field duplicate (JT-500) had been collected, results for JT-5 were reported from the JT-500 analysis.

- Samples JT-MW-200, JT-MW-JT-8, JT-MW-IP-9, JT-MW-JT-3 dilution, and JT-MW-JT-11 dilution: The results for Aroclor 1254 were reported by the laboratory lab with Y due to interferences. The Y qualifier was changed to U.

- Samples IP-14, IP-1400, JT-MW-100, JT-500, and JT-MW-8: The results for Aroclors 1248 and 1254 were reported by the laboratory with Y due to interferences. The Y qualifier was changed to U.

- Samples JT-MW-JT-6, JT-MW-SRW-1, JT-MW-JT-3, JT-MW-MW-8D, JT-MW-JT-7, JT-MW-JT-12, and JT-MW-JT-11: The results for Aroclors 1254 and 1232 were reported by the laboratory with Y due to interferences. The Y qualifier was changed to U.

Total and Dissolved Metals

Analytical Methods

Total and dissolved arsenic, cadmium, chromium, and lead were prepared and analyzed by EPA Method 200.8. Total and dissolved mercury was prepared and analyzed by EPA Method 7470A.

Sample Holding Times

The samples were prepared and analyzed within holding time limits.

Blank Contamination

No target analytes were detected in laboratory blanks.

Laboratory Control Sample Recovery

LCS recoveries were within method control limits.

Matrix Spike Recovery

MS recoveries were within method control limits.

Laboratory Duplicate Sample Analysis

The RPD between replicate measurements were within control limits or not applicable if the sample and duplicate were less than five times the reporting limit.

Field Duplicate Sample Analysis

The RPD between replicate measurements were within control limits or not applicable if the sample and duplicate were less than five times the reporting limit.

Calibration Criteria

The CCVs were in control.

Conventional Analyses

Analytical Methods

Nitrate, sulfate and chloride were determined by EPA Method 300.0. TOC was determined by SM 5310. Alkalinity was determined by SM 2320B. Nitrate and nitrite were determined by EPA Method 353.2. Total suspended solids (TSS) was determined by SM 2540D.

Sample Holding Times

The samples met holding time limits for alkalinity, nitrate, sulfate, chloride, TSS, and TOC.

Samples JT-MW-JT-6, JT-MW-SRW-1, JT-MW-JT-3, JT-MW-MW-8D, and JT-MW-JT-7. The samples did not meet holding time requirements for nitrate. The samples were recollected and resubmitted for nitrate analysis.

Blank Contamination

No target analytes were detected in laboratory blanks.

Laboratory Control Sample Recovery

LCS recoveries for TSS were within laboratory control limits.

Laboratory Duplicate Sample Analysis

The RPDs between replicate measurements were within control limits.

Matrix Spike Recovery

MS recoveries for TOC, chloride, sulfate, and nitrate were within method control limits.

Standard Reference Material Recovery

SRM recoveries for alkalinity, TOC, nitrate, sulfate, and chloride were within control limits.

Calibration Criteria

The ICAL was within acceptance criteria. The CCVs were in control.

PRODUCT SAMPLE

Diesel and Motor Oil Range Hydrocarbons

Analytical Methods

The sample was prepared following EPA Method 3580A. The sample was analyzed by GC/FID following the NWTPH-Dx method.

Sample Holding Times

The sample was prepared and analyzed within the holding time limits.

Blank Contamination

No target analytes were detected in laboratory blanks.

Surrogate Recovery

Surrogate recoveries were within laboratory control limits.

Laboratory Control Sample Recovery

LCS recoveries were within laboratory control limits.

Calibration Criteria

The ICAL was within acceptance criteria. The CCVs were in control.

Sample Notes

The sample chromatograms were reviewed and identifications were modified as follows:

- Sample JT-8-P: The sample was reported as non-detect (U) at the reported result for Diesel Range Organics (DRO), Residual Range Organics (RRO), and transformer oil, with a note that PCBs were identified (C).

SEDIMENT SAMPLES

VOCs

Analytical Methods

The samples were prepared following EPA Method 5035. The samples were analyzed by GC/MS following EPA Method 8260C.

Sample Holding Times

The samples were prepared and analyzed within the holding time limits.

Blank Contamination

No target analytes were detected in the method blanks with the following exception:

- MB-012314: The MB had a detection for methylene chloride between the MDL and the RL (1.0 ug/kg). The laboratory qualified detections for methylene chloride that were less than ten times the amount in the MB in the associated samples (JT-SS-01-S1, JT-SS-02-S1, JT-SS-03-S1, JT-SS-04-S1, JT-SS-05-S1, JT-SS-05-S2, JT-SS-01-S2, and JT-SS-03-S2) with B. The results were evaluated and qualifiers changed:
  - Sample results that were less than ten times the amount in the MB had the B qualifier changed to U (JT-SS-01-S1, JT-SS-02-S1, JT-SS-04-S1, JT-SS-01-S2, and JT-SS-03-S2).
  - Sample results that fell below the RL were raised to the RL and U-flagged (JT-SS-03-S1 and JT-SS-05-S1)
  - Sample results that were below the MDL were not qualified (JT-SS-05-S2).

Surrogate Recovery

Surrogate recoveries were within laboratory control limits.

Laboratory Control Sample Recovery

LCS recoveries were within laboratory control limits.

Internal Standard Recoveries

The IS recoveries were within acceptance criteria.

Calibration Criteria

The ICAL was within acceptance criteria. The CCVs were in control with the following exceptions:

- CCV 012314: The recovery for bromomethane failed low. The laboratory qualified detections for that analyte with a Q. All results for bromomethane in the associated samples (JT-SS-01-S1, JT-SS-

02-S1, JT-SS-03-S1, JT-SS-04-S1, JT-SS-05-S1, JT-SS-05-S2, JT-SS-01-S2, and JT-SS-03-S2) were qualified as estimated (J).

PCBs

Analytical Methods

The samples were prepared following EPA Method 3546. The sample extracts were sulfur, acid, and silica gel cleaned. The samples were analyzed by GC/ECD following EPA Method 8082A.

Sample Holding Times

The samples were prepared and analyzed within the holding time limits.

Blank Contamination

No target analytes were detected in laboratory blanks with the following exceptions:

- MB-012114: The method blank had a detection for Aroclor 1260 between the MDL and the RL. The laboratory qualified detections in the associated samples (JT-SS-01-S1, JT-SS-02-S1, JT-SS-03-S1, JT-SS-04-S1, JT-SS-05-S1, JT-SS-05-S2, JT-SS-01-S2, and JT-SS-03-S2) that were less than ten times the amount in the MB with B. The results were evaluated thus:

    - Samples JT-SS-01-S1, JT-SS-02-S1, JT-SS-03-S1, JT-SS-04-S1, JT-SS-05-S1, and JT-SS-05-S2: The results for Aroclor 1260 were greater than five times the amount in the MB and not qualified.

    - Samples JT-SS-01-S2 and JT-SS-03-S2: The results for Aroclor 1260 were less than five times the amount in the MB and the B qualifier was changed to U.

Surrogate Recovery

Surrogate recoveries were within laboratory control limits.

Laboratory Control Sample Recovery

LCS recoveries were within laboratory control limits.

Matrix Spike Recovery

MS recoveries were within laboratory control limits.

Calibration Criteria

The ICAL was within acceptance criteria. The CCVs were in control.

Sample Notes

- Samples JT-SS-03-S1, JT-SS-03-S1 dilution, and JT-SS-03-S2: The results for Aroclor 1248 were reported by the laboratory with Y due to interferences. The Y qualifier was changed to U.

- Sample JT-SS-04-S1: The result for Aroclor 1254 was qualified by the laboratory with P as the RPD between the chromatographic columns was greater than 40 percent. The P qualifier was changed to JP.

- Samples JT-SS-01-S2: The result for Aroclor 1232 was reported by the laboratory with Y due to interferences. The Y qualifier was changed to U.

Total Metals

Analytical Methods

Total arsenic, cadmium, chromium, and lead were prepared and analyzed by EPA Method 200.8. Total mercury was prepared and analyzed by EPA Method 7471A.

Sample Holding Times

The samples were prepared and analyzed within holding time limits.

Blank Contamination

No target analytes were detected in laboratory blanks.

Laboratory Control Sample Recovery

LCS recoveries were within method control limits.

Matrix Spike Recovery

MS recoveries were within method control limits with the following exception:

- JT-SS-01-S1 MS: The recovery for mercury failed high. The result for mercury in sample JT-SS-01-S1 was qualified as estimated (J).

Laboratory Duplicate Sample Analysis

The RPD between replicate measurements were within method control limits.

Calibration Criteria

The CCVs were in control.

Conventional Analyses

Analytical Methods

Total solids were prepared and analyzed following SM 2540G. TOC was prepared and analyzed following Plumb 1981.

Sample Holding Times

The samples met holding time limits.

Blank Contamination

No target analytes were detected in laboratory blanks.

Laboratory Control Sample Recovery

LCS recoveries for TOC were within control limits.

Matrix Spike Recovery

MS recoveries were within control limits.

Standard Reference Material Recovery

SRM recoveries for TOC were within control limits.

Laboratory Replicate Sample Analysis

The RSD between replicate measurements for total solids and TOC were within control limits.

Calibration Criteria

The CCVs were in control.

APPENDIX C
Benthic Survey

Summary of benthic assemblages in samples collected near the Ballard Locks, Seattle, Washington

Rhithron Associates, Inc.
February 10, 2014

Three benthic substrate samples, collected by Hart Crowser personnel from the vicinity of the Ballard Locks were delivered to Rhithron's laboratory facility in Missoula, Montana. A Van Veen sampler was used to make the collections. All samples arrived in good condition.

All organisms were sorted from substrate, and were individually examined by certified taxonomists, using 10x – 80x stereoscopic dissecting scopes (Leica S8E) and identified, using appropriate published taxonomic references and keys. Identification, counts, life stages, and information about the condition of specimens were recorded in the Rhithron database via an electronic data entry interface. Identified organisms were preserved in 80% ethanol in labeled vials, and archived at the Rhithron laboratory. Chironomids were carefully morphotyped using 10x – 80x stereoscopic dissecting microscopes (Leica S8E) and representative specimens were slide mounted and examined at 200x – 1000x magnification using an Olympus BX 51 compound microscope. Slide mounted organisms were archived at the Rhithron laboratory. Quality assurance procedures for sorting efficiency and taxonomic precision were carried out for a single randomly-selected sample. Sorting efficiency was measured at 96%, and taxonomic precision was 100%.

Benthic assemblages were generally depauperate, and consisted of tolerant taxa. None of the animals collected at any site could be identified as marine or intertidal. In general, the fauna at these sites were characteristic of hypoxic freshwater environments.

Site JT-SS-AI-01

A total of 48 invertebrates were present in the sample collected here. This site supported freshwater gastropods, amphipods, and aquatic mites. Several specimens of tubificid oligochaetes were also present. Five insect taxa were collected, including odonates and chironomids. Chironomid taxa collected at the site included *Xenochironomus xenolabis*, a hemoglobin-bearing taxon associated with freshwater sponges. Two glossiphoniid leeches were collected.

Site JT-SS-AI-03

The sample collected at this site contained a total of 13 invertebrates, including 2 specimens of the glossiphoniid leech. Sphaeriid clams were the most abundant taxon in the sample: these were freshwater forms. The site also supported freshwater scuds, mites, and the hemoglobin-bearing midge *Procladius* sp.

Site JT-SS-AI-05

Eight invertebrates were collected here: the non-insect fauna included a free-living nematode, a copepod, an ostracod, and an aquatic mite. Two insect taxa were present. These were the midge *Procladius* sp., and larvae of a ceratopogonid fly.

APPENDIX D
Cost Summary Backup

Table D1 - Remediation Alternative 1a Cost Estimate

Continuous Trenching Solidification of Soil with PCBs >10 mg/kg

Capital Costs Estimating Worksheet

COST COMPONENT	UNIT	QUANTITY	UNIT COST	TOTAL COST
Site Preparation and Restoration				
Monitoring Well Abandonment	EA	10	$3,000	$30,000
Sanitary Sewer Demolition and Temporay Re-route	LF	1,400	$18	$25,200
Overhead Power Re-route	LS	-	$125,000	$0
Monitoring Well Replacement	EA	3	$4,000	$12,000
Sanitary Sewer Replacement	LF	1,400	$60	$84,000
Pavement Replacement	SF	3,300	$2	$6,600
			Subtotal:	$157,800
Continuous Trenching Excavation/Solidification				
Mobilization Demobilization	LS	1	$160,000	$160,000
Decontamination Facilities	LS	1	$90,000	$90,000
Portland Cement (delivered)	Ton	461	$330	$152,213
Other Additives (delivered)	Ton	31	$1,000	$30,750
Excavate/solidify	CY	2,460	$125	$307,500
			Subtotal:	$740,463
Waste Disposal				
Non-Hazardous Water	Gal.	18,000	$1.25	$22,500
Hazardous Liquid	Drum	-	$3,000	$0
Non-Hazardous Solids	Ton	1	$75	$75
Hazardous Solids	Ton	-	$200	$0
			Subtotal:	$22,575
			Total Direct Capital Costs:	$920,838
Indirect Capital Costs				
Project Management	% of Direct Costs	8%		$73,667
Construction Management	% of Direct Costs	10%		$92,084
Contingency	% of Direct Costs	30%		$276,251
			Total Indirect Capital Costs:	$442,002
Total Capital Costs				**$1,362,840**

Table D2 - Remediation Alternative 1b Cost Estimate

Continuous Trenching Solidification of Soil with PCBs >1 mg/kg

Capital Costs Estimating Worksheet

COST COMPONENT	UNIT	QUANTITY	UNIT COST	TOTAL COST
Site Preparation and Restoration				
Monitoring Well Abandonment	EA	10	$3,000	$30,000
Sanitary Sewer Demolition and Temporay Re-route	LF	1,400	$18	$25,200
Overhead Power Re-route	LS	-	$125,000	$0
Monitoring Well Replacement	EA	3	$4,000	$12,000
Sanitary Sewer Replacement	LF	1,400	$60	$84,000
Pavement Replacement	SF	4,500	$2	$9,000
			Subtotal:	$160,200
Continuous Trenching Excavation/Solidification				
Mobilization Demobilization	LS	1	$160,000	$160,000
Decontamination Facilities	LS	1	$90,000	$90,000
Portland Cement (delivered)	Ton	630	$330	$207,900
Other Additives (delivered)	Ton	42	$1,000	$42,000
Excavate/solidify	CY	3,360	$125	$420,000
			Subtotal:	$919,900
Waste Disposal				
Non-Hazardous Water	Gal.	18,000	$1.25	$22,500
Hazardous Liquid	Drum	-	$3,000	$0
Non-Hazardous Solids	Ton	1	$75	$75
Hazardous Solids	Ton	-	$200	$0
			Subtotal:	$22,575
			Total Direct Capital Costs:	$1,102,675
Indirect Capital Costs				
Project Management	% of Direct Costs	8%		$88,214
Construction Management	% of Direct Costs	10%		$110,268
Contingency	% of Direct Costs	30%		$330,803
			Total Indirect Capital Costs:	$529,284
Total Capital Costs				**$1,631,959**

Table D3 - Remediation Alternative 1c Cost Estimate

Continuous Trenching Removal of Soil with PCBs > 0.0000787 mg/kg

Capital Costs Estimating Worksheet

COST COMPONENT	UNIT	QUANTITY	UNIT COST	TOTAL COST
Site Preparation and Restoration				
Monitoring Well Abandonment	EA	10	$3,000	$30,000
Sanitary Sewer Demolition and Temporay Re-route	LF	1,400	$18	$25,200
Overhead Power Re-route	LS	-	$125,000	$0
Monitoring Well Replacement	EA	3	$4,000	$12,000
Sanitary Sewer Replacement	LF	1,400	$60	$84,000
Pavement Replacement	SF	13,000	$2	$26,000
			Subtotal:	$177,200
Continuous Trenching Excavation/Solidification				
Mobilization Demobilization	LS	1	$160,000	$160,000
Decontamination Facilities	LS	1	$90,000	$90,000
Portland Cement (delivered)	Ton	3,263	$330	$1,076,625
Other Additives (delivered)	Ton	218	$1,000	$217,500
Excavate/solidify	CY	17,400	$125	$2,175,000
			Subtotal:	$3,719,125
Waste Disposal				
Non-Hazardous Water	Gal.	18,000	$1.25	$22,500
Hazardous Liquid	Drum	-	$3,000	$0
Non-Hazardous Solids	Ton	1	$75	$75
Hazardous Solids	Ton	-	$200	$0
			Subtotal:	$22,575
			Total Direct Capital Costs:	$3,918,900
Indirect Capital Costs				
Project Management	% of Direct Costs	8%		$313,512
Construction Management	% of Direct Costs	10%		$391,890
Contingency	% of Direct Costs	30%		$1,175,670
			Total Indirect Capital Costs:	$1,881,072
Total Capital Costs				**$5,799,972**

Table D4 - Remediation Alternative 2a Cost Estimate

Continuous Trenching Removal of Soil with PCBs >10 mg/kg

Capital Costs Estimating Worksheet

COST COMPONENT	UNIT	QUANTITY	UNIT COST	TOTAL COST
Site Preparation and Restoration				
Monitoring Well Abandonment	EA	10	$3,000	$30,000
Sanitary Sewer Demolition and Temporay Re-route	LF	1,400	$18	$25,200
Overhead Power Re-route	LS	1	$125,000	$125,000
Monitoring Well Replacement	EA	3	$4,000	$12,000
Sanitary Sewer Replacement	LF	1,400	$60	$84,000
Pavement Replacement	SF	3,300	$2	$6,600
			Subtotal:	$282,800
Dewatering System				
Extraction Wells	EA	1	$20,000	$20,000
Media and Carbon Filters	LS	1	$30,000	$30,000
Discharge to POTW	LS	1	$25,000	$25,000
Monitoring	per Sample	40	$1,000	$40,000
Sewer Discharge Charges	Day	30	$180	$5,400
			Subtotal:	$120,400
Continuous Trenching Excavation & Backfill				
Mobilization Demobilization	LS	1	$160,000	$160,000
Decontamination Facilities	LS	1	$90,000	$90,000
Backfill (load, haul, place, compact)	CY	2,050	$50	$102,500
Excavation and Backfill	CY	2,460	$125	$307,500
			Subtotal:	$660,000
Waste Disposal				
Non-Hazardous Water	Gal.	-	$1.25	$0
Hazardous Liquid	Drum	-	$3,000	$0
Hazardous Solids - Incineration	Ton	369	$700	$258,300
Hazardous Solids - Subtitle C	Ton	3,321	$200	$664,200
			Subtotal:	$922,500
			Total Direct Capital Costs:	$1,985,700
Indirect Capital Costs				
Project Management	% of Direct Costs	8%		$158,856
Construction Management	% of Direct Costs	10%		$198,570
Contingency	% of Direct Costs	30%		$595,710
			Total Indirect Capital Costs:	$953,136
Total Capital Costs				**$2,938,836**

Table D5 - Remediation Alternative 2b Cost Estimate

Continuous Trenching Removal of Soil with PCBs >1 mg/kg

Capital Costs Estimating Worksheet

COST COMPONENT	UNIT	QUANTITY	UNIT COST	TOTAL COST
Site Preparation and Restoration				
Monitoring Well Abandonment	EA	10	$3,000	$30,000
Sanitary Sewer Demolition and Temporay Re-route	LF	1,400	$18	$25,200
Overhead Power Re-route	LS	1	$125,000	$125,000
Monitoring Well Replacement	EA	3	$4,000	$12,000
Sanitary Sewer Replacement	LF	1,400	$60	$84,000
Pavement Replacement	SF	4,500	$2	$9,000
			Subtotal:	$285,200
Dewatering System				
Extraction Wells	EA	1	$20,000	$20,000
Media and Carbon Filters	LS	1	$30,000	$30,000
Discharge to POTW	LS	1	$25,000	$25,000
Monitoring	per Sample	40	$1,000	$40,000
Sewer Discharge Charges	Day	30	$180	$5,400
			Subtotal:	$120,400
Continuous Trenching Excavation & Backfill				
Mobilization Demobilization	LS	1	$160,000	$160,000
Decontamination Facilities	LS	1	$90,000	$90,000
Backfill (load, haul, place, compact)	CY	2,800	$50	$140,000
Excavation and Backfill	CY	3,360	$125	$420,000
			Subtotal:	$810,000
Waste Disposal				
Non-Hazardous Water	Gal.	-	$1.25	$0
Hazardous Liquid	Drum	-	$3,000	$0
Non-Hazardous Solids	Ton	504	$700	$352,800
Hazardous Solids	Ton	4,536	$200	$907,200
			Subtotal:	$1,260,000
			Total Direct Capital Costs:	$2,475,600
Indirect Capital Costs				
Project Management	% of Direct Costs	8%		$198,048
Construction Management	% of Direct Costs	10%		$247,560
Contingency	% of Direct Costs	30%		$742,680
			Total Indirect Capital Costs:	$1,188,288
Total Capital Costs				**$3,663,888**

Table D6 - Remediation Alternative 2c Cost Estimate

Continuous Trenching Removal of Soil with PCBs > 0.0000787 mg/kg

Capital Costs Estimating Worksheet

COST COMPONENT	UNIT	QUANTITY	UNIT COST	TOTAL COST
Site Preparation and Restoration				
Monitoring Well Abandonment	EA	10	$3,000	$30,000
Sanitary Sewer Demolition and Temporay Re-route	LF	1,400	$18	$25,200
Overhead Power Re-route	LS	1	$125,000	$125,000
Monitoring Well Replacement	EA	3	$4,000	$12,000
Sanitary Sewer Replacement	LF	1,400	$60	$84,000
Pavement Replacement	SF	13,000	$2	$26,000
			Subtotal:	$302,200
Dewatering System				
Extraction Wells	EA	1	$20,000	$20,000
Media and Carbon Filters	LS	1	$30,000	$30,000
Discharge to POTW	LS	1	$25,000	$25,000
Monitoring	per Sample	40	$1,000	$40,000
Sewer Discharge Charges	Day	30	$180	$5,400
			Subtotal:	$120,400
Continuous Trenching Excavation & Backfill				
Mobilization Demobilization	LS	1	$160,000	$160,000
Decontamination Facilities	LS	1	$90,000	$90,000
Backfill (load, haul, place, compact)	CY	14,500	$50	$725,000
Excavation and Backfill	CY	17,400	$125	$2,175,000
			Subtotal:	$3,150,000
Waste Disposal				
Non-Hazardous Water	Gal.	-	$1.25	$0
Hazardous Liquid	Drum	-	$3,000	$0
Hazardous Solids - Incineration	Ton	522	$700	$365,400
Hazardous Solids - Subtitle C	Ton	4,176	$200	$835,200
Non-Hazardous Solids - Subtitle D	Ton	21,402	$75	$1,605,150
			Subtotal:	$2,805,750
			Total Direct Capital Costs:	$6,378,350
Indirect Capital Costs				
Project Management	% of Direct Costs	8%		$510,268
Construction Management	% of Direct Costs	10%		$637,835
Contingency	% of Direct Costs	30%		$1,913,505
			Total Indirect Capital Costs:	$3,061,608
Total Capital Costs				**$9,439,958**

APPENDIX E
Data Gaps Report