Environmental Investigation and Cleanup Documentation American Boiler Works/Bayside Marine Site Everett, Washington

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Prepared for

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LIST OF ABBREVIATIONS AND ACRONYMS

ABW	American Boiler Works
Ag	Silver
ARAR	Applicable or Relevant and Appropriate Requirement
As	Arsenic
BGS	Below Ground Surface
CAO	Cleanup Action Objective
CAP	Cleanup Action Plan
CCP	Contamination Cleanup Plan
Cd	Cadmium
CLARC	Cleanup Levels and Calculations
CMP	Compliance Monitoring Plan
cPAHs	Carcinogenic Polycyclic Aromatic Hydrocarbons
Cr	Chromium
Cu	Copper
DGI	Data Gaps Investigation
DO	Dissolved Oxygen
Ecology	Washington State Department of Ecology
ESA	Environmental Site Assessment
FeAs	Iron-arsenic
FS	Feasibility Study
Ft^2	Square Feet
Hg	Mercury
HIS	Indicator Hazardous Substances
mg/kg	Milligrams per Kilogram
mg/L	Milligrams per Liter
MLLW	Mean Lower Low Water
MS/MSD	Matrix Spike/Matrix Spike Duplicate
MTCA	Model Toxics Control Act
NFA	No Further Action
Pb	Lead
PCBs	Polychlorinated Biphenyls
RCW	Revised Code of Washington
RPDs	Relative Percent Differences
SMA	Shoreline Management Act
TEF	Toxicity Equivalency Factors
TEQ	Toxicity Equivalency Quotient
TPH	Total Petroleum Hydrocarbons
TSCA	Toxics Substance Control Act
USTs	Underground Storage Tanks
VCP	Voluntary Cleanup Program
WAC	Washington Administrative Code
Yd^3	Cubic Yards
Zn	Zinc

1.0 INTRODUCTION

This report summarizes the environmental investigation and cleanup activities completed for the American Boiler Works (i.e., ABW Technologies, Inc.; ABW)/Bayside Marine Site [Site or ABW/Bayside Marine Voluntary Cleanup Program (VCP) Site] located within the Port of Everett (Port) Waterfront Place Central Redevelopment (formerly known as the North Marina Redevelopment) project boundary in Everett, Washington as shown on Figure 1. The VCP reference number for the Site is NW2842. This Site was previously part of a broader VCP site known as the North Marina Redevelopment VCP site (North Marina Site also referred to in this document as the North Marina Area). For the purpose of this document, the North Marina Redevelopment/Waterfront Place Central Redevelopment project area, will be referred to as the Redevelopment Area.

On November 14, 2007, the North Marina VCP Site (VCP reference number NW1249) was removed from the VCP list and split into six separate sites under the Puget Sound Initiative (PSI). At the request of the Washington State Department of Ecology (Ecology), three of these sites were to be addressed as VCP sites, including the ABW/Bayside Marine VCP site, and three of the sites were to be addressed under Ecology's formal program. The ABW/Bayside Marine VCP site was previously enrolled in the VCP under reference number NW1876. The Site was removed from the VCP on September 28, 2009 because cleanup activities at the Site were suspended while some of the other Port's PSI cleanup sites along the Everett Waterfront were being addressed in order of priority. The Site was accepted back into the VCP by Ecology on March 24, 2014. The location of this Site relative to the other Redevelopment Area sites is shown on Figure 2. The other two sites addressed through the VCP program, the Phase I VCP Site and the 14th Street Bulkhead VCP Site, have since received no further action (NFA) determinations from Ecology. Cleanup has been completed for the West End Site and is nearly complete at the Everett Shipyard and Ameron/Hulbert Sites – each of these cleanups are now under consent decrees in the formal cleanup program.

Investigation of the former North Marina VCP Site was initiated by the Port in 2001 with a Phase I Environmental Site Assessment (ESA). Evaluation of soil and groundwater conditions at the North Marina VCP Site was conducted in stages between approximately 2003 and 2006. Cleanup actions were completed at the North Marina VCP Site between 2006 and 2008 in accordance with the cleanup action plan (CAP) developed for the former North Marina VCP Site (Landau Associates 2006a). Ecology reviewed the CAP and issued an opinion letter dated November 22, 2006 stating that the proposed cleanup action would likely be sufficient to meet the substantive requirements under the Model Toxics Control Act (MTCA; Ecology 2006). It should be noted that a Contamination Contingency Plan (CCP) was developed for the Redevelopment Area (Landau Associates 2008a). Any unanticipated soil or

groundwater contamination encountered at the ABW/Bayside Marine VCP Site during future redevelopment activities will be managed using the approach and procedures outlined in the CCP consistent with other sites in the Redevelopment Area.

The cleanup activities summarized in this document were completed to address the requirements of the Model Toxics Control Act [MTCA; Washington Administrative Code (WAC) 173-340] under the Ecology VCP. It is the intent of the Port that the Site cleanup meets MTCA requirements for cleanup to unrestricted site use standards.

This document structure is based on the Phase I VCP Area Cleanup Action Report (Landau Associates 2008b), which should be referenced to ensure that the sites are being addressed in a consistent manner. Other previous documents were used as a basis for the Site information and should be reviewed for a more thorough description of Site historical uses and recognized environmental conditions. These previous Site documents are identified in Section 2.1 below.

1.1 SITE DESCRIPTION

The Site is located on the eastern portion of the Redevelopment Area and is approximately 3 acres in size. The Site is generally bounded by 13th Street/Port Gardner Way followed by the North Marina Ameron/Hulbert Site to the north, West Marine View Drive to the east, 14th Street followed by the Everett Shipyard Site to the south, and the Phase I VCP Site to the west. The eastern portion of the ABW/Bayside Marine VCP Site consists of the former ABW Plant I leasehold. The western portion of the Site consists of a portion of the former Everett Bayside Marine (Bayside Marine) Leasehold. The Port owns the property within the Site. Current and historical Site features are shown on Figure 3 and described in the following sections.

1.2 SITE DEVELOPMENT HISTORY

The Redevelopment Area has been used for a variety of commercial, industrial, and marine-related activities since the late 1800s. From about 1890 until about 1950, timber-product operations dominated waterfront industrial activities. Over that period, the shoreline of Port Gardner Bay was near the current location of West Marine View Drive, with shingle and lumber mills either along the shoreline or located on wharfs to the west of the shoreline. The Redevelopment Area was filled to its current configuration between about 1947 and 1955, using predominantly dredge fill from the Snohomish River to create the Site's uplands from the tidelands to the west of the original shoreline.

After the additional uplands were created, businesses transitioned from primarily the wood products industry to a broader range of industries and commercial enterprises, with a large percentage of

marine services operations. Although turnover in businesses has occurred over the intervening years, the area is still dominated by businesses with a marine services orientation.

1.3 HISTORICAL SITE USE

There have been a variety of leaseholds by the Port to various tenants around the Redevelopment Area. The tenants utilized the leaseholds for a variety of business ventures, primarily related to marine repair and other marine support services. Former leaseholds within the Site include ABW and Bayside Marine. The following subsections provide a description of the former operations associated with these leaseholds, including a description of identified environmental concerns associated with tenant activities. The former leasehold boundaries and associated Site features are labeled on Figure 3.

1.3.1 AMERICAN BOILER WORKS PLANT I

The ABW Plant I leasehold was located at the southwest corner of the intersection of West Marine View Drive and 13th Street at 1332 West Marine View Drive. The leasehold was developed with a main manufacturing building, which occupied the majority of the western two thirds of the leasehold, and the associated work area, which was predominantly paved. Based on a review of aerial photographs, the eastern portion of the manufacturing building was constructed between 1965 and 1969. The western portion of the manufacturing building was constructed between 1974 and 1976. The facility was historically used for metal manufacturing and machining operations. Milling machines that used cutting oil were commonly used within the building. A smaller office building was located near the southeast corner of the leasehold and appears to have been present since approximately 1953. General environmental concerns for this leasehold include potential petroleum hydrocarbon contamination related to the machinery operated inside of the building. No known underground storage tanks (USTs) were documented in association with the ABW facility. The manufacturing building was vacated and demolished in 2005 leaving the footings and original concrete pad in place and the office building was demolished in 2009.

1.3.2 BAYSIDE MARINE BOATYARD

The Bayside Marine former leasehold was located west of the ABW Plant 1 leasehold at 1001 14th Street. Bayside Marine leased the property from 1992 to 2007. The leasehold was previously leased by others for marine-related business ventures similar to Bayside Marine. The leasehold included a gravel boatyard, a dry stack building that was used for covered storage of boats, and a combination maintenance shop and office building. The dry stack building was constructed between 1961 and 1965 and the office/shop building was built between 1970 and 1971; both were demolished in early 2008. The

buildings were located on the western portion of the leasehold, which was included in the Phase I VCP Site and is not part of the ABW/Bayside Marine VCP Site.

Two former USTs (one 500-gallon UST and one 2,000-gallon UST) were located immediately south of the dry stack building. Ecology files indicate that the USTs stored gasoline and were removed from the Site in January 1991. Following removal of the USTs, eight soil samples were collected from the base and sidewalls of the excavation. Samples were analyzed for petroleum hydrocarbons using modified method 8015 and for gasoline and benzene, toluene, ethylbenzene, and xylenes (BTEX) using method 8020. Records indicate that soil in the USTs excavation area exceeded cleanup levels for petroleum hydrocarbons and xylenes, and that free product was observed on water entering the UST excavation (Kaldveer Associates 1991). Impacted soil was excavated from the former USTs cavity later in 1991 and water was pumped from the excavation at that time. Analytical results for soil and water samples collected following the excavation indicate that total petroleum hydrocarbons (TPH) and BTEX were not detected in the soil and water samples collected following excavation." Records indicate that the excavated soil was placed in a berm, aerated, rechecked, and placed on the north portion of the Port property (A-1 Pump Service 1991). The locations of the soil samples are shown on Figure 8. Correspondence from Ecology regarding the soil disposition or determination that no further action was required at the site was not identified in the Ecology files (Landau Associates 2001).

A gravel-surfaced area occupied the eastern portion of the former Bayside Marine leasehold. This area was previously used for boat maintenance and storage. It was operational until Bayside Marine vacated the leasehold in 2007. A boat wash was located in the southwestern portion of the Site, south of the Bayside boat maintenance area. The facility was constructed in the late 1990s and was associated with the Port's haul-out and travel lift operation. The boat wash area was paved and wastewater from the boat wash facility was routed to the sanitary sewer. The boat wash facility was removed concurrent with the final cleanup action at the Site in March 2015. Prior to construction of the boat wash, this area was part of the Bayside Marine work area.

1.4 CURRENT SITE USE

The Site consists of an empty open lot and was vacated by the Port's various tenants in the spring of 2014. The eastern two-thirds of the Site (former ABW leasehold) are mostly paved with some areas of gravel (e.g., where previous cleanup occurred). Remnants of rail lines are present in this portion of the Site. Electrical pedestals for boat storage tenants are situated approximately north to south near the center and along the west boundary of this portion of the Site. Two stormwater catch basins drain a majority of the former ABW leasehold. Where the stormwater does not drain to the catch basins, it is infiltrated into the Site through permeable surfaces.

The western one-third of the Site (eastern portion of former Bayside Marine leasehold) is covered with gravel and is used for commercial fisherman's gear storage. The boat wash was located to the south of the storage area until March 2015. A paved road (Westminster Way) runs approximately north to south through the western portion of the Site. The road was installed between 2009 and 2010, following cleanup at the Site (Section 6.0). The ground surface in the northwestern portion of the Site slopes downward to the east from the access road. The Site is located within a planned development known as Waterfront Place Central. A conceptual site plan for the planned developed shows commercial mixed-use structures within the boundaries of the subject property (Appendix A).

2.0 SITE CHARACTERIZATION

This section presents Site characterization activities that were conducted to delineate the nature and extent of contamination. Included is a description of investigation activities (Section 2.1), and the physical and hydrogeologic setting (Section 2.2).

2.1 ENVIRONMENTAL INVESTIGATIONS

Several environmental investigations have been conducted to determine the nature and extent of contamination within the North Marina Area, including the Site. These investigations include:

- A Phase I ESA conducted in 2001 (Landau Associates 2001)
- A Phase II ESA conducted in late 2003 and early 2004 (Landau Associates 2004a)
- A Data Gaps Investigation (DGI) conducted in late 2004 and early 2005 to fill data gaps in environmental characterization that remained following the completion of the previous investigations (Landau Associates 2005)
- A Supplemental DGI (Landau Associates 2006b) conducted in late 2005 to provide a similar level of environmental characterization in the Craftsman District as that accomplished for other portions of the North Marina Area, and to further delineate isolated areas of shallow soil contamination, including portions of the Site.
- A limited soil investigation conducted in 2006 to characterize soil conditions beneath the former ABW manufacturing building (Pinnacle GeoSciences 2006a)
- Additional characterization soil sampling (not previously reported) conducted by Landau Associates in 2006 and 2007 to characterize soil encountered during Site cleanup.
- Additional soil and groundwater quality characterization (not previously reported) conducted by Landau Associates in 2014 to characterize soil conditions in the area of the boat wash facility and to characterize groundwater conditions in the southwestern portion of the Site where oil-range petroleum hydrocarbons were detected in groundwater during a previous investigation.
- Additional soil and groundwater quality characterization (not previously reported) conducted by HWA Geosciences, Inc. (HWA) in 2014 and by Landau Associates in 2014 and 2015 to characterize fill quality beneath the former ABW building and to further evaluate groundwater quality across the Site.

The former Redevelopment Area was subdivided into investigation areas A through L based on areas of similar operations or areas that could be connected for environmental investigation purposes. The ABW/Bayside Marine VCP Site includes the eastern portion of Investigation Area B and Investigation Area L; the western portion of Investigation Area B was included in the Phase I VCP Site. Sampling location identifications were assigned prefixes that match the investigation area in which they are located. For example, sample location L-GC-5 was collected from Investigation Area L. Similarly, identifications of cleanup action areas have a prefix that matches the investigation area in which they are located. For example, Cleanup Action Area B-1 is located in Investigation Area B.

During previous investigations, including the Phase II ESA, the DGI, and the Supplemental DGI, 52 soil samples and 7 groundwater samples were collected throughout the Redevelopment Area. All investigations were conducted under sampling and analysis plans. Sampling and analysis plans prepared subsequent to completion of the Phase II ESA were reviewed by Ecology under its VCP, including the Data Gaps Investigation work plan (Landau Associates 2004b).

All analytical results from these investigations were determined acceptable without qualification based on data quality evaluations completed for each data set, which consisted of reviewing data for holding times, method blank results, surrogate spike recovery results, matrix spike/matrix spike duplicate (MS/MSD) recoveries and relative percent differences (RPDs), laboratory duplicate samples, and reporting limits.

A summary of these investigations, as related to the ABW/Bayside Marine VCP Site, are presented in the following subsections. A detailed description of sampling methods employed during these investigations is presented in Appendix B and should be reviewed to obtain a more complete understanding of sampling methods. It should be noted that most of the groundwater samples collected from the Site for metals analysis represent dissolved concentrations; total metals sample data were collected for other portions of the Redevelopment Area and were determined not to be representative of groundwater quality. Exploration logs are provided in Appendix C.

2.1.1 PHASE II ESA

The Phase II ESA was conducted in early 2003 and 2004 to provide initial characterization of the environmental conditions across the Redevelopment Area. The intent of the investigation was to evaluate locations where hazardous substances may have been released based on the understanding of present and historic potential sources of contamination. Sample locations and testing parameters were selected to determine whether soil or groundwater contamination had resulted from potential sources and activities identified as "high risk issues" in the Phase I ESA (Landau Associates 2001). A total of 30 soil and 45 groundwater samples were collected and tested during the Phase II ESA. Of these samples, three soil samples and two groundwater samples (from the same location) were obtained from within the ABW/Bayside Marine VCP Site boundary.

Soil samples were collected using direct-push drilling techniques. Groundwater samples were collected from direct-push borings and newly constructed monitoring wells using low-flow groundwater sampling techniques. Depending on the location of the sample, with respect to current and former Site uses and features, samples were selectively analyzed for the following parameters:

- **Soil samples**: Metals [arsenic (As), cadmium (Cd), chromium (Cr), copper (Cu), lead (Pb), mercury (Hg), silver (Ag), and zinc (Zn)]; carcinogenic polycyclic aromatic hydrocarbons (cPAHs).

- **Groundwater Samples**: TPH; dissolved metals (As, Cd, Cr, Cu, Pb, Hg, Ag, Zn); and/or cPAHs.

A summary of the soil and groundwater analytical testing related to the samples collected within the ABW/Bayside Marine VCP Site boundary during the Phase II ESA is presented in Tables 1 and 2.

Based on the results of the Phase II ESA, several constituents of concern were identified for the Redevelopment Area, including cPAHs and selected metals that were detected in soil and/or groundwater (As, Cu, Pb, and Zn). The constituents of concern identified during the Phase II ESA served as the basis for establishing the testing protocol used during subsequent Redevelopment Area investigations. The results of this investigation are presented in conjunction with the other investigation results in Section 4.0.

2.1.2 DATA GAPS INVESTIGATION

The DGI scope of work was developed to fill the data gaps in Redevelopment Area characterization data that remained following the Phase II ESA. The DGI scope was subdivided into two broad elements: 1) general characterization to provide sufficient data to delineate the extent of contamination throughout Redevelopment Area that were not evaluated during the Phase II ESA and did not have identified environmental concerns, and 2) focused investigation to better delineate contamination in affected areas identified during the Phase II ESA. Boring locations were labeled with the investigation area designation first, followed by "GC" or "FA" to designate the boring as a general characterization or focus area location, respectively, followed by a unique sequential number (e.g., B-FA-3).

Soil samples and groundwater samples were collected from within the ABW/Bayside Marine VCP Site boundary during the DGI. The soil samples were collected using direct-push drilling techniques. Groundwater samples were collected from direct-push borings and monitoring wells using low-flow groundwater sampling techniques.

A summary of the soil and groundwater analytical testing related to the samples collected within the ABW/Bayside Marine VCP Site boundary during the DGI is presented in Tables 1 and 2. The following subsections present summaries of the general characterization and focused investigation activities conducted during the DGI. The results of the DGI are presented in conjunction with the other investigation results in Section 4.0.

2.1.2.1 General Characterization

Area-wide (i.e., general characterization) sampling methods were used to characterize soil quality in areas with no specific environmental concern within the Redevelopment Area, including the ABW/Bayside Marine VCP Site, by obtaining samples that were distributed across the Redevelopment Area on about a 100 to 150 foot (ft) spacing, and testing the samples for constituents of concern identified

at the Redevelopment Area during the Phase II ESA. Six general characterization sample locations were tested within the ABW/Bayside Marine VCP Site boundary (B-GC-1 and L-GC-1 through L-GC-5). At each general characterization sample location, the total depth of the borings ranged from 4 and 12 ft below ground surface (BGS) and the top 3 ft of recovered soil below the pavement and base course section were separated into three sample intervals (0 to 0.5, 1 to 2, and 2 to 3 ft). Three step-out sample locations were tested within the Site boundary (L-GC-4b, L-GC-5b, and L-GC-5c).

The uppermost sample interval from each general characterization location was tested for constituents of concern detected above the cleanup levels during the Phase II ESA, including selected metals (arsenic, copper, lead, and zinc); cPAHs; and TPH. The vertical extent of soil contamination was evaluated at each location by testing the deeper samples if the uppermost sample exceeded the cleanup levels. Samples collected from the step-out borings were analyzed for constituents of concern detected above the cleanup levels in the primary boring. A summary of the analytical testing related to the soil samples collected within the Site boundary during the DGI is presented in Table 1.

2.1.2.2 Focused Investigation

Focused investigation methods were used in areas identified as historical operational work areas where contamination was considered likely. These areas were identified based on knowledge of current and past Site uses, a review of historical aerial photographs, and the results of the Phase II sampling. The following focused investigation areas and associated sample locations are located within the ABW/Bayside Marine VCP Site boundary:

- **ABW Plant I Leasehold:** Soil and groundwater samples were collected at boring locations L-FA-1, L-FA-2, and L-FA-2b to evaluate potential environmental releases associated with industrial activities conducted on the property.
- **Bayside Marine Leasehold:** Soil samples were collected at boring locations B-FA-1 through B-FA-4, B-FA-9, and B-FA-12 and a groundwater sample was collected from B-FA-12 to evaluate potential environmental releases associated with boat maintenance activities and the former USTs.

A summary of the analytical testing related to the soil and groundwater samples collected within the Site boundary during the DGI is presented in Tables 1 and 2.

2.1.3 ADDITIONAL CHARACTERIZATION AND DELINEATION 2006 AND 2007

A supplemental DGI was conducted within the Redevelopment Area in 2006 to better delineate the extent of contamination identified during the DGI. No samples were collected from within the ABW/Bayside Marine VCP Site boundary during the supplemental DGI. Following completion of the Supplemental DGI, additional soil samples were collected in the vicinity of boring location B-FA-9 (B-FA-9.1E, -9.1W, -9.2W); L-GC-4 (L-GC-4.1E); and L-GC-5 (L-GC-5.1SW, -5.2SW) to further delineate

the limits of metals soil contamination in these areas. The samples were collected in the same manner as during the DGI. Two additional characterization samples were collected during excavations completed as part of Site cleanup in 2006 and 2007 (L2-AC-1 and B1-AC-1).

The results of these samples have not previously been reported, but are reported in Section 4.0 in conjunction with other investigations results.

2.1.4 PINNACLE GEOSCIENCES ABW SOIL INVESTIGATION

Pinnacle GeoSciences was retained by ABW Technologies, Inc., to conduct a soil investigation within the former ABW facility footprint. Pinnacle visited the ABW facility during operations and concluded there were four locations within the building where cutting oil was used for the milling machines (Pinnacle 2006a). No other potential environmental concerns were identified within the former building footprint. A soil investigation was completed at these locations following demolition of the building in 2005. The soil investigation consisted of excavation of nine test pits (TP-1 to TP-9) to depths ranging from 6 to 9 ft BGS and collection of soil samples. Selected soil samples were submitted to the laboratory for analysis for TPH-diesel range (TPH-D) and TPH-oil range (TPH-O), as indicated in Table 1. The results of the soil investigation are presented in conjunction with the other investigation results in Section 4.0.

2.1.5 ADDITIONAL CHARACTERIZATION AND DELINEATION - BOAT WASH AREA

Additional soil and groundwater samples were collected from the southwestern portion of the Site in March 2014 to characterize soil conditions in the area of the boat wash and to characterize groundwater conditions in the southwestern portion of the Site where TPH-O was detected in groundwater at concentrations greater than the screening levels during a previous investigation. The samples were collected in the same manner as during the DGI. Two focused area direct push borings (B-FA-20 and B-FA-21) were advanced in the central portion of the boat wash. Five step-out borings (B-FA-20.1N, B-FA-20.1S, B-FA-21.1N, B-FA-21.1S, and B-FA-21.1W) were completed to the north, south, and west of the boat wash to further delineate the limits of soil contamination in this area. Soil samples were collected at each of the boring locations to evaluate potential environmental releases associated with boat maintenance activities. Soil samples from the step-out borings were archived by the analytical laboratory pending the results from the primary borings.

To evaluate groundwater conditions in the southwestern portion of the Site, one groundwater monitoring well (P-27) was installed west of the boat wash and south of the former Bayside Marine dry stack building in the area where TPH-O was detected in groundwater at concentrations greater than the screening levels during a previous investigation.

The results of these samples have not previously been reported, but are reported in Section 4.0 in conjunction with results from other investigations.

2.1.6 ADDITIONAL SOIL CHARACTERIZATION AND GROUNDWATER MONITORING

Additional soil and groundwater samples were collected from the Site by HWA between July 2014 and September 2014 to characterize fill conditions beneath the former ABW building, to evaluate groundwater conditions downgradient of cleanup area B-1, and to further evaluate groundwater conditions across the Site. The samples were collected in the same manner as during previous investigations.

One direct push boring (HWA-B1) was advanced in the northern portion of the former ABW building and three groundwater monitoring wells (HWA-MW1, HWA-MW2, and HWA-MW3) were installed using direct-push drilling techniques. Groundwater samples were collected by HWA from the new monitoring wells and from existing monitoring wells P-26 and P-27 in July 2014 and September 2014. Samples were also collected by HWA from monitoring wells P-26 and HWA-MW1 in August of 2014 to confirm the results of the July 2014 sampling event. Landau Associates completed groundwater monitoring events at the Site in December 2014 and March 2015.

The analytical results for these samples have not previously been reported, but are reported in Section 4.0 in conjunction with results from other investigations. A data report prepared by HWA is also included as Appendix D to this report.

2.2 PHYSICAL AND HYDROGEOLOGIC SETTING

The ground surface of the entire North Marina area is generally flat ranging from about 13 ft to 18 ft above mean lower low water (MLLW). Site geologic conditions encountered within the depth range of environmental explorations consisted primarily of a pavement section or a granular fill trafficking layer overlying hydraulic fill. Hydraulic fill is typically a loose to medium dense, poorly graded fine to medium sand with silt or silty fine to medium sand. Native marine sediment consisting of soft to loose silt to silty sand directly underlies the hydraulic fill. Across the Redevelopment Area, the hydraulic fill thickens from east to west, and is about 15 ft thick near West Marine View Drive and about 70 ft thick at the west of the Redevelopment Area adjacent to the Snohomish River. Glacial soil, consisting of dense soil of variable composition, underlies the marine sediment and slopes steeply downward from east to west, resulting in a thickening layer of marine sediment to the west.

The uppermost hydrostratigraphic unit at the Site consists of the fill unit that overlies the finer-grained marine sediment unit. The marine sediment unit forms the uppermost aquitard throughout the

Site. A cross section of the Redevelopment Area, including the ABW/Bayside Marine VCP Site, is shown on Figure 4.

Depth to water was measured in monitoring wells at the ABW/Bayside Marine VCP site and ranged from about 3.3 to 4.4 ft BGS. Figures 5 and 6 present groundwater elevation contour maps for the Site during the December 2014 and March 2015sampling events. Groundwater elevation contour maps for the Site during the July 2014 and September 2014 sampling events are included in Appendix D. As is shown, groundwater generally flows to the west/southwest across the Site to its point of discharge at the shoreline near the southwestern corner of the Site.

3.0 CLEANUP STANDARDS

Cleanup standards were developed to evaluate the nature and extent of contamination and to develop the Site cleanup action. Cleanup standards for the constituents of concern in Site soil have been developed in accordance with the MTCA regulations. Cleanup standards consist of: 1) cleanup levels that are adequately protective of human health and the environment, and 2) the point of compliance at which the cleanup levels must be met.

As allowed under WAC 173-340-703, proposed indicator hazardous substances (IHS) were also developed to separate those constituents at the Site that contribute the greatest threat to human health and the environment from those that contribute little or no threat. The IHS are described in Section 4.3.

3.1 CLEANUP LEVELS

Cleanup levels for Site soil protective of human health and the environment were developed in accordance with MTCA requirements and are presented in Table 3. Also, cleanup levels for groundwater protective of marine surface water were developed in accordance with MTCA requirements and are presented in Table 4. Exposure pathways and receptors based on current and likely future Site uses were identified as part of cleanup level development.

3.2 CURRENT AND LIKELY FUTURE LAND USE

The Site is currently zoned Waterfront Commercial – Planned Development Overlay and a conceptual site plan for Waterfront Place Central shows commercial mixed-use structures within the Site boundary. Residential and commercial use in the form of apartments, retail space, or office space may be constructed within the Site, so cleanup standards were developed based on unrestricted use.

3.3 EXPOSURE PATHWAYS

Potential exposure pathways were identified for human and environmental impacts based on the planned land use. The potential exposure pathways are presented by medium below.

3.3.1 SOIL

The potential exposure pathways for Site soil are:

- Human contact (dermal, incidental ingestion, or inhalation) with constituents in Site soil
- Leaching to groundwater and subsequent exposure of humans or aquatic organisms to affected groundwater at the point of discharge to marine surface water
- Uptake of constituents in Site soil by terrestrial plants

- Contact by terrestrial wildlife (dermal, incidental ingestion, or inhalation) with constituents in the soil.

Sites that contain less than 1.5 acres of contiguous undeveloped area are excluded from having to conduct a terrestrial ecological evaluation in accordance with WAC 173-340-7491(1)(c)(i). Following redevelopment, the Site will be almost entirely covered with buildings and pavement, and with landscaping confined to small areas around buildings, along roadways, and within parking areas. Most Site landscaping will be contained in planters or otherwise isolated from the underlying existing soil surface. As a result, the Site meets the exclusion for a terrestrial ecological evaluation. Ecology's Terrestrial Ecological Exclusion form is included as Appendix E.

3.3.2 GROUNDWATER

Groundwater at the Site, whether or not potentially affected by any identified residual contamination, is not currently used for drinking water and has an extremely low probability that it will be used as a future source of drinking water due to its proximity to marine surface water and the availability of a municipal water supply. As observed during investigation and cleanup activities, groundwater levels at the Site fluctuate with changing tides, indicating that the groundwater and surface water are connected hydraulically. If groundwater were pumped for drinking water use, saltwater intrusion would likely occur due to the proximity of the Site to marine surface water. It should also be noted that the City of Everett requires that all residences and businesses within the city limits connect to city water, so the potential for shallow Site groundwater to be used as a potable supply is extremely low.

Based on these considerations, groundwater is considered nonpotable under the provisions of WAC 173-340-720(2)(d), and the potential exposure pathways for Site groundwater are assumed to include:

- Human ingestion of marine organisms affected by releases of Site groundwater to adjacent marine surface water
- Acute or chronic effects to aquatic organisms resulting from exposure to constituents in groundwater discharging to adjacent marine surface water.

Groundwater cleanup criteria developed based on the exposure pathways identified in this subsection must be adequately protective of aquatic organisms and of humans that ingest these marine organisms.

3.4 SOIL CLEANUP LEVELS

Proposed soil cleanup levels for unrestricted land use were developed in accordance with WAC 173-340-740 using the exposure pathways identified above, based on the mixed residential and

commercial uses that will be present on the Site following redevelopment. Under MTCA, Method B soil cleanup levels must be as stringent as:

- Concentrations established under applicable state and federal laws
- Concentrations protective of direct human contact with soil
- Concentrations protective of groundwater.

These criteria were considered during development of proposed soil cleanup levels.

Except for the toxics substance control act (TSCA), which establishes cleanup levels for polychlorinated biphenyls (PCBs), there are no soil cleanup levels established under applicable state or federal laws, other than MTCA cleanup levels. Standard MTCA Method B soil cleanup levels protective of direct human contact were determined in accordance with WAC 173-340-740(3) using Ecology's on-line Cleanup Levels and Risk Calculations (CLARC) database (https://fortress.wa.gov/ecy/clarc/CLARCHome.aspx). These cleanup levels are shown in Table 3. The cleanup level for benzo(a)pyrene was used for the sum of cPAHs, using toxicity equivalency factors (TEFs) to calculate a toxicity equivalency quotient (TEQ) for total cPAHs in accordance with WAC 173-340-708(8)(e).

Soil cleanup levels protective of groundwater were determined using the fixed parameter three-phase partitioning model in accordance with WAC 173-340-747(4). Because groundwater is not a current or likely future source of drinking water, and because it discharges to marine surface water, groundwater cleanup levels were developed based on marine surface water cleanup levels protective of human health and aquatic organisms in accordance with WAC 173-340-730. The three-phase model provides a conservative estimate of the concentration of a contaminant in soil that is protective of groundwater. Soil cleanup levels protective of groundwater as marine surface water are shown in Table 3.

For constituents present in soil at concentrations greater than the calculated soil cleanup levels protective of groundwater as marine surface water, an empirical demonstration that concentrations present in soil are not causing groundwater cleanup levels (based on marine surface water criteria) to be exceeded may be made. The Site meets the requirements for an empirical demonstration listed in WAC 173-340-747(9)(b) for metals in soil. The empirical demonstration requires that:

- Measured groundwater concentrations in proposed point of compliance wells are less than the groundwater cleanup levels.
- Any hazardous substances in soil have been present for many years, allowing sufficient time for migration to the shallow groundwater.
- Future Site use following redevelopment will reduce the potential for leaching from soil to groundwater due to an increase of low-permeability cover resulting from additional buildings and paved areas.

3.5 GROUNDWATER CLEANUP LEVELS

Because human ingestion of constituents in groundwater is not a potential exposure pathway, as described in Section 3.3.2, groundwater cleanup levels based on potable use were not developed for Site groundwater. Instead, cleanup levels protective of marine surface water were developed because Site groundwater discharges directly to the North Marina, which in turn discharges to the lower reaches of the Snohomish River that are subject to saltwater intrusion. MTCA Method B groundwater cleanup levels protective of marine surface water were developed in accordance with WAC 173-340-730(3) for the detected constituents in groundwater. Groundwater cleanup levels for those constituents positively detected in groundwater are shown in Table 4.

3.6 POINT OF COMPLIANCE

Under MTCA, the point of compliance is the point or location on a site where the cleanup levels must be attained. The point of compliance where proposed soil cleanup levels will be attained is throughout the Site in accordance with WAC 173-340-740(6)(b). Because groundwater cleanup levels are based on protection of marine surface water and not protection of groundwater as drinking water, a conditional point of compliance was established at the point of discharge to marine surface water, which is consistent with WAC 173-340-720(8)(d)(i).

4.0 ENVIRONMENTAL CONDITIONS

Environmental conditions were evaluated, and cleanup areas were designated, based on comparison of the analytical results for Site soil and groundwater to the cleanup levels discussed in Section 3.0. The following sections present a discussion of the environmental conditions with respect to soil and groundwater quality at the Site prior to implementation of the cleanup action and identify IHS for soil and groundwater based on the results of characterization samples at the Site.

4.1 SOIL QUALITY

Soil sample locations and cleanup level exceedances are presented on Figures 7 and 8, and Tables 5 through 8 present all laboratory analytical data for the soil characterization samples. Figures 7 and 8 identify the locations where soil concentrations for one or more constituent exceed the cleanup levels, illustrating the aerial distribution of Site soil contamination.

As shown on Figures 7 and 8, six cleanup action areas were identified based on the distribution of soil contamination. Cleanup action areas were defined based on the distribution of cleanup level exceedances, with consideration given to the nature of contamination, its potential distribution based on known or suspected sources, and Site features that provide boundaries to the extent of contamination. Gasoline-range petroleum hydrocarbons (TPH-G) were not detected in soil at concentrations greater than the cleanup levels in the area of the former USTs south of the Bayside Marine dry stack building (Figure 8; B-FA-12 and B-GC-1 and soil data presented in Section 1.3.2), so the former UST area was not identified as a cleanup action area.

The following sections describe the nature and distribution of contamination within each designated contamination area. The identified IHS for each cleanup action area described below are presented in Table 9.

4.1.1 CLEANUP ACTION AREAS B-1 AND B-1A

Cleanup Action Area B-1 corresponds to an affected area encountered during soil characterization in the eastern portion of the former Bayside Marine leasehold. This area was formerly an active boatyard used for repair and maintenance of boats. The affected area is a gravel lot that is located to the east of the former Bayside Marine dry stack storage building. Arsenic was detected at concentrations greater than the cleanup level in surface soil (0 to 0.5 ft BGS) at six locations in this area and cPAHs were detected in surface soil at concentrations greater than the cleanup level two locations in this area. The samples taken at the depth interval of 1 to 2 ft BGS did not exceed soil cleanup levels. Based on these results, Cleanup Action Area B-1 is identified as shallow soil in the area shown on Figure 7.

TPH-D was detected in surface soil at a concentration greater than the cleanup level at one location in Area B-1a (B-FA-4) in the southwestern portion of Cleanup Area B-1. The detected concentration of TPH-D in the sample collected from 1 to 2 ft BGS at this location was well below the cleanup level. TPH-D contamination is limited to shallow soil in the southwest portion of Cleanup Area B-1. Shallow soil in this area was designated Cleanup Action Area B-1a because it is within Cleanup Action Area B-1. Shallow soil contamination in Areas B-1 and B-1a was likely the result of boat maintenance activities at the former boatyard. Arsenic contamination was likely the result of boat hull sandblasting or similar activities, with arsenic potentially present in the sandblast grit or in hull paint for older vessels. The presence of cPAHs and TPH-D was likely associated with the maintenance of marine engines and other vessel mechanical elements.

4.1.2 CLEANUP ACTION AREA B-1B

Cleanup Action Area B-1b corresponds to an affected area delineated during soil characterization in the area of the boat wash (eastern portion of the former Bayside Marine leasehold) in 2014. Shallow soil in this area was designated Cleanup Action Area B-1b because, based on historical aerial photographs, this area was formerly part of the Bayside Marine active boatyard described above and identified as Cleanup Action Area B-1. This area was not previously investigated due to the presence of the boat wash facility.

Arsenic was detected at concentrations greater than the cleanup level in surface soil (0.8 to 1.8 ft BGS) and in shallow subsurface soil (1.8 to 2.8 ft BGS) at one location (B-FA-20). The sample taken at 2.8 to 3.8 ft BGS at this location did not exceed the soil cleanup level for arsenic. Samples taken from locations to the south (B-FA-20.1S) and west (B-FA-21) of this location also did not exceed the soil cleanup level for arsenic. Soil samples from this area were also tested for cPAHs and TPH-D; these compounds were not detected at concentrations greater than the cleanup level. Based on these results, Cleanup Action Area B-1b is identified as shallow soil in the area shown on Figure 7.

Shallow soil contamination in Area B-1b is likely the result of boat maintenance activities at the former boatyard. Arsenic contamination was likely the result of boat hull sandblasting or similar activities, with arsenic potentially present in the sandblast grit or in hull paint for older vessels.

4.1.3 CLEANUP ACTION AREA L-1

Cleanup Action Area L-1 corresponds to a paved area in the northeast corner of the former ABW leasehold where arsenic was detected at a concentration greater than the cleanup level during Site characterization. Analytical results for samples taken in this area show a soil cleanup level exceedance of arsenic in the surface samples only. Cleanup Action Area L-1 is identified as shallow soil in the northeast

portion of the Site, as shown on Figure 7. The source of arsenic in surface soil in this area is not known. The analytical results for contamination soil in area L-1 are consistent with slag-derived sandblast grit in conjunction with marine paints containing elevated levels of metals.

4.1.4 CLEANUP ACTION AREA L-2 & L-3

Cleanup Action Areas L-2 and L-3 are located in the north portion of the Site, near the northwest corner of the former ABW leasehold and north of the former ABW building. This area is bounded to the north by 13th Street and to the south by a paved area (sample locations L-FA-2 and L-FA-2b) and the former ABW building. In the eastern portion of this area (identified on Figure 7 as Area L-2), sample location L-GC-4 exhibited concentrations of arsenic greater than the cleanup level in the 0- to 0.5-ft depth interval and below the cleanup level at a depth of 0.7 to 1.2 ft BGS. Contamination in Area L-2 was limited to the surface soil. In the western portion of this area (identified on Figure 7 as Area L-3), sample location L-GC-4b exhibited concentrations of arsenic greater than the cleanup level in the 1.7- to 2.2-ft depth interval. Contamination in this area was limited to the upper 3 ft of soil. The source of arsenic in surface soil in this area is not known, but the arsenic may be related to former boat maintenance activities at the adjacent Bayside Marine boatyard.

4.1.5 CLEANUP ACTION AREA ABW-P1

Cleanup Action Area ABW-P1 corresponds to an area of TPH-impacted soil located within the footprint of the former ABW building, as shown on Figure 8. TPH-O was detected at concentrations greater than the cleanup level in soil samples collected from two of the nine test pits completed within the footprint of the former ABW building. The TPH-O contamination extended to a maximum depth of 4 ft BGS. The impacted soil was likely the result of cutting oil used by ABW in milling machines within the building.

4.2 GROUNDWATER QUALITY

Groundwater sample locations and cleanup level exceedances for samples collected between 2003 and 2005 are presented on Figure 9 and Table 10 presents all laboratory analytical data for the groundwater characterization samples from this time period. Groundwater sample locations and cleanup level exceedances for samples collected in 2014 and 2015 are presented on Figure 10 and in Table 11. The following sections present a discussion of groundwater quality at the Site.

4.2.1 2003 TO 2005 GROUNDWATER MONITORING

As shown on Figure 9 and in Table 10, seven groundwater samples were collected from six locations across the Site for analysis between 2003 and 2005. Monitoring well P-8 was installed at the location of direct-push boring B-1, so two groundwater samples were collected from this location. Analytical results for groundwater indicates that VOCs (including BTEX); cPAHs; TPH-g, and TPH-D were not detected at concentrations greater than the laboratory reporting limits in groundwater samples collected from the Site.

Dissolved arsenic was detected at one location (L-FA-1) and dissolved zinc was detected at one location (L-FA-2) at concentrations greater than the cleanup levels. These samples were collected from direct-push borings. To determine if the results for groundwater samples collected from direct-push borings were an artifact of the sampling process (fine-grained particulates that passed through the filter media, poor filter performance, or both), monitoring well P-26 was installed in the immediate vicinity of direct-push borings L-FA-1 and L-FA-2. Dissolved arsenic and zinc were detected in the groundwater sample from P-26 at concentrations greater than the laboratory reporting limits, but well below the groundwater cleanup levels. The data suggest that exceedances in the grab samples from L-FA-1 and L-FA-2 were likely due to the sampling process and not representative of groundwater quality at the Site.

TPH-O was detected at a concentration of 0.92 milligrams per liter (mg/L) in one groundwater sample collected from the southwestern portion of the Site (direct-push boring B-4), south of the former Bayside Marine dry stack storage building. The detected concentration is greater than the cleanup level of 0.5 mg/L. The source of petroleum hydrocarbons in groundwater at this location is not known, but the detection is suspected to be a false positive. Two USTs were previously located to the south of the Bayside Marine dry stack storage building, in the vicinity of B-4. Because the tanks reportedly contained gasoline and TPH-O was not identified in soil in the former UST area (B-GC-1), the USTs are not considered a potential source of TPH-O to groundwater. Dissolved oil-range petroleum hydrocarbons are not typically found in groundwater, particularly if there are no obvious indications of oil presence such as free phase product or heavy oil staining in soil, which were not present in the B-4 boring. The lack of visual evidence of oil contamination at B-4 suggests that the exceedance may be related to particulates in the groundwater sample, which as previously discussed, is a common issue with groundwater samples collected from soil borings.

4.2.2 2014 TO 2015 GROUNDWATER MONITORING

To further evaluate groundwater quality in the area of direct-push boring B-4, and to determine if results for groundwater samples collected from B-4 were an artifact of the sampling process, monitoring

well P-27 was installed in the immediate vicinity of direct-push boring B-4 in March of 2014. In July of 2014, three additional monitoring wells (HWA-MW1, HWA-MW2, and HWA-MW3 were installed at the Site by HWA to further evaluate groundwater quality at the Site. Samples were collected from the three new wells and existing wells P-26 and P-27 in July, September, and December of 2014, and in March of 2015. Groundwater samples were also collected from monitoring wells P-26 and HWA-MW1 in August of 2014 to confirm the results for arsenic from the July 2014 sampling event. Samples were analyzed for dissolved metals, TPH-D, TPH-O, nitrate, and sulfate. For the December 2014 and March 2015 sampling events, all samples were also analyzed for methane to evaluate reduction and oxidation conditions, and samples from monitoring well P-27 were analyzed for TPH-G due to the former presence of gasoline USTs in this area (See Section 1.3.2).

Groundwater sample locations and cleanup level exceedances for monitoring completed between 2014 and 2015 are presented on Figure 10 and Table 11 presents all laboratory analytical data for the groundwater characterization samples from this time period. As indicated in Table 11, TPH-O and TPH-D were not detected in the groundwater sample from P-27 at concentrations greater than the laboratory reporting limits, supporting the conclusion that the previous exceedance of the TPH-O cleanup level in the groundwater sample collected from boring B-4 was an artifact of the sampling process.

Arsenic is the only constituent detected in groundwater samples collected from the Site between 2014 and 2015 at concentrations greater than the preliminary cleanup level. Detected concentrations of arsenic exceeded the cleanup level during one or more sampling events in samples collected from three of the five existing monitoring wells (P-26, HWA-MW1, and HWA-MW2).

4.2.3 ARSENIC IN GROUNDWATER

With the exception of arsenic, contaminants of concern have not been identified in groundwater at concentrations greater than the cleanup levels. Arsenic is the only constituent that has been detected at concentrations greater than the cleanup level during multiple rounds of sampling. Site groundwater data indicate that arsenic is present in Site groundwater as the result of natural reducing conditions and not as the result of a Site release. Groundwater data indicate that conditions are naturally reduced at the Site (Table 11). Conditions that are a least iron-reducing will release arsenic due to reduction (solubilization) of iron-arsenic (FeAs) complexes. Site data indicate that Site conditions are not only iron-reducing, but also indicate sulfate reduction (i.e., conditions are more strongly reducing than required for solubilization of FeAs). Evidence of naturally reduced conditions is as follows:

- Dissolved oxygen (DO) is low based on field monitoring.
- Detected concentrations of nitrate are low (0.1 mg/L to 0.61 mg/L), indicating nitrate-reducing conditions.

- Ferrous iron (reduced iron) is detected at all locations indicating iron reducing conditions, which are required for solubilization of naturally occurring FeAs complexes.
- Detected concentrations of sulfate are low (0.2 mg/L to 9.1 mg/L), indicating sulfate-reducing conditions, which is a more highly reduced condition that iron-reducing conditions. Sulfate is typically present in groundwater at concentrations ranging from 20 mg/L to 60 mg/L in aerobic or non-sulfate reducing inland aquifers and at higher concentrations at near-shoreline sites due to tidal influence and mixing of seawater with groundwater. Seawater contains almost 3,000 mg/L sulfate.
- Methane is detected at all locations indicating that conditions are also methanogenic (methane producing), which is also indicative of highly reducing conditions.

Site groundwater does not pose a threat to human health and the environment. Because groundwater at the Site is not used as drinking water, the pathway of concern is a release to marine surface water. Arsenic has not been detected at concentrations greater than the cleanup level in any of the five groundwater samples collected from the downgradient monitoring well P-27 between March of 2014 and March of 2015, indicating that there is no complete pathway to surface water.

4.3 INDICATOR HAZARDOUS SUBSTANCES

As allowed under WAC 173-340-703, IHS were identified to separate those constituents at the Site that contribute the greatest threat to human health from those that contribute little or no threat. IHS were selected by applying the factors identified in WAC 173-340-703(2) and by comparing detected constituent concentrations in soil and groundwater to applicable soil and groundwater quality criteria developed in Tables 3 and 4. Results from the Phase II ESA, DGI, and additional delineation and characterization investigations were used to identify Site soil and groundwater IHS.

Tables 9 and 12 summarize the analytical testing and cleanup level exceedances for Site soil and groundwater, respectively. The tables include the analytical parameters that were tested, the number of detections, and the number of samples that exceeded the Site cleanup levels. The tables also summarize the constituent frequency of detection, minimum and maximum reporting limits and detected concentrations, and rationale for either including or excluding the constituents as IHS. The bases for identifying IHS are described in the following sections, and the identified IHS and their associated cleanup levels are included in Tables 9 and 12.

4.3.1 SOIL

As shown in Tables 5 through 9, all but six of the constituents analyzed for in soil were either not detected or the detected concentrations were below the identified cleanup levels. The constituents that did not exceed the cleanup levels do not pose an unacceptable threat to human health or the environment, and, as a result, were not identified as IHS. The remaining six constituents were detected in at least one soil

sample at a concentration exceeding the cleanup level. These constituents are arsenic, lead, cPAHs, TPH-G, TPH-D, and TPH-O:

- **Arsenic** was tested for in 53 characterization soil samples collected across the Site, including one duplicate sample. Of these 53 samples, 85 percent exhibited concentrations of arsenic above the laboratory reporting limit, and 12 of the samples exceeded the soil cleanup level for arsenic. Due to the broader geographic distribution of arsenic exceedances in soil, arsenic is identified as an IHS throughout the Site.
- **Lead** was tested for in 47 characterization soil samples. Lead was detected in each of the samples analyzed at concentrations greater than the laboratory reporting limit. The detected concentration of lead in one soil sample exceeded the preliminary cleanup level for lead and was co-located with an exceedance for arsenic. Lead was not identified as an IHS for the Site.
- **cPAHs** were tested for in 28 soil samples collected from across the Site. Of these 28 samples, 36 percent exhibited concentrations above the laboratory report limit and 2 samples exceeded the preliminary cleanup level for cPAHs. The exceedances were limited to the former Bayside Marine area. As a result, cPAHs are identified as an IHS for Area B-1 only.
- **TPH-D** was tested for in 38 samples collected across the Site (including samples tested for TPH using the HCID method). Of these 38 samples, 32 percent exhibited concentrations of TPH-D above the laboratory reporting limit, and 1 sample exceeded the soil cleanup level for TPH-D. The exceedance was limited to the former Bayside Marine area. As a result, TPH-D is identified as an IHS for Area B-1a only.
- **TPH-O** was tested for in 38 samples collected across the Site (including samples tested for TPH using the HCID method). Of these 38 samples, 47 percent exhibited concentrations of TPH-O above the laboratory reporting limit, and 3 samples exceeded the soil cleanup level for TPH-O. The three samples that exceeded were located in one area beneath the former ABW manufacturing building. As a result, TPH-O is identified as an IHS for Area ABW-P1 only.
- **TPH-G** was tested for in 21 samples collected across the Site (including samples tested for TPH using the HCID method). Of these 21 samples, 10 percent exhibited concentrations of TPH-G above the laboratory reporting limit, and one sample exceeded the soil cleanup level for TPH-G. The laboratory noted that the positive gasoline result for the sample with the exceedance did not match an identifiable gasoline pattern. The exceedance was co-located with an exceedance for TPH-D. TPH-G is not identified as an IHS for the Site.

4.3.2 GROUNDWATER

As shown in Tables 10 through 12, three tested constituents (dissolved arsenic, dissolved zinc and TPH-O were each detected in one or more groundwater samples at concentrations greater than the groundwater cleanup levels. The exceedances for zinc and TPH-O were in samples collected from direct-push borings. Zinc was not detected at concentrations greater than the groundwater cleanup level in a monitoring well installed in the immediate vicinity of the direct-push boring where zinc was detected at a concentration greater than the cleanup level. TPH-O was not detected at a concentration greater than the cleanup level (or the laboratory reporting limit) in a monitoring well installed in the immediate vicinity of the direct-push boring where TPH-O was detected at a concentration greater than the cleanup level.

Constituents present at concentrations below the cleanup level do not pose an unacceptable threat to human health or the environment. Therefore, zinc and TPH-O were not identified as IHS for groundwater at the Site.

Dissolved arsenic is the only constituent that is present in Site groundwater at concentrations greater than the cleanup level and has been detected during multiple rounds of sampling. Dissolved arsenic is likely present due to naturally reduced conditions at the Site and not as the result of a Site release, as discussed further in Section 4.2.3; therefore, arsenic is not identified as an IHS for groundwater at the Site.

Based on Site groundwater sampling results and soil contaminant characteristics as explained below, groundwater at the Site is not affected by soil IHS (cPAHs, TPH-D, and TPH-O).

cPAHs were identified as a Site soil IHS, and exceeded the cPAH TEQ cleanup level in one (B-1) of the seven soil cleanup action areas. cPAHs were not detected above the laboratory reporting limit in the one groundwater sample collected from the Site (within Cleanup Action Area B-1) that was tested for cPAHs. Across the North Marina Area, a total of 23 groundwater samples were analyzed for cPAHs prior to implementation of the CAP. cPAHs were detected in nine of these samples and two of the detected concentrations exceeded the proposed groundwater cleanup level. Eight of the samples with detectable concentrations, which include the cPAH exceedances, are associated with groundwater samples from the Phase II ESA (Landau Associates 2004) believed to have soil particulates entrained in the samples during collection. Groundwater samples collected at the same eight locations at a later date were centrifuged by the lab to settle particulates prior to cPAH analysis; only one of the centrifuged groundwater samples contained detectable concentrations of cPAHs and the detected concentration was below the proposed cPAH groundwater cleanup level. These results indicate the detected concentrations in the earlier non-centrifuged groundwater samples are likely due to constituents adsorbed to soil particulates entrained in the groundwater sample. Because of the large number of groundwater samples analyzed for cPAHs and the lack of cleanup level exceedances, excluding false positives, groundwater at the Site is not affected by cPAHs (Landau Associates 2006a).Diesel-range petroleum hydrocarbons were identified as a Site soil IHS, and exceeded the cleanup level in one (B-1a) of the seven Site soil cleanup action areas. Diesel-range petroleum hydrocarbons were not detected at concentrations above the cleanup levels in any of the 21 groundwater samples collected from the Site that were tested for diesel-range petroleum hydrocarbons. As a result, groundwater at the Site is not affected by TPH-D.

Oil-range petroleum hydrocarbons were identified as a Site soil IHS, and exceeded the cleanup level in one (ABW-P1) of the seven Site soil cleanup action areas. Because of its high soil partitioning properties and low solubility, oil-range petroleum hydrocarbons are typically not detected in groundwater at concentrations greater than the groundwater cleanup level unless a source of free-phase TPH-O is

present at or near the groundwater table. No free-phase TPH-O was present at or near the groundwater table in area ABW-P1; the soil contamination in ABW-P1 was related to soil that was stained with TPH-O and did not contain free-phase TPH-O. Oil-range petroleum hydrocarbons were detected above the cleanup level in one (B-4) of the 21 groundwater samples collected from the Site that were tested for oil-range petroleum hydrocarbons. Sample B-4 was collected from a location in the southwestern portion of the Site, and not in the vicinity of Cleanup Action Area ABW-P1. Field screening evidence of petroleum hydrocarbon contamination was not observed during drilling, installation, or sampling of boring B-4. In addition, and as discussed above, TPH-O was not detected at a concentration greater than the cleanup level (or the laboratory reporting limit) in the samples from monitoring well P-27, which was installed in the immediate vicinity of direct-push boring B-4. As a result, the exceedance in the sample collected from B-4 is not representative of Site groundwater quality and groundwater at the Site is not affected by TPH-O

5.0 DEVELOPMENT OF CLEANUP ACTION

Development of a cleanup action for a site is a multi-step process. First, cleanup action objectives (CAO) must be established for the site. Next, cleanup action technologies are evaluated to determine those technologies that are capable of achieving the various CAOs. The cleanup technologies must then be assembled into alternatives that achieve all CAOs, and the alternatives need to be compared against criteria established under MTCA to select the most practicable cleanup action for the site.

This alternative development, evaluation, and selection process is typically accomplished by conducting a feasibility study [FS; WAC 173-340-350(8)]. The FS develops alternatives that achieve the CAOs, compares the alternatives against criteria established under MTCA (WAC 173-340-360), and selects the alternative that is permanent to the maximum extent practicable. However, based on the need to integrate Site cleanup with redevelopment, the cleanup was focused on those actions that were compatible with redevelopment plans. Therefore, rather than conducting a FS, the alternatives considered for Site cleanup are described below, and the selected cleanup action is compared against MTCA requirements, to demonstrate compliance with the regulations.

The following sections establish the CAOs (Section 5.1); identify applicable or relevant and appropriate requirements (ARARs; Section 5.2); present the response actions, cleanup technologies, and alternatives considered for site cleanup (Sections 5.3 and 5.4); and identify the selected alternative in comparison to MTCA requirements (Section 5.5).

5.1 CLEANUP ACTION OBJECTIVES

The IHS established for the Site indicates that soil was the only confirmed affected media and, as a result, soil was the only media that required the development of CAOs. Additionally, because Site groundwater was generally not affected, developing a CAO for protection of groundwater was not necessary. As a result, the CAO for the Site was established as:

- Prevent human contact (dermal, incidental ingestion, or inhalation) with Site soil containing IHS (arsenic, petroleum hydrocarbons in the diesel and oil ranges, and cPAHs) above the cleanup levels discussed in Section 3.0.

5.2 APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS

In accordance with MTCA, all cleanup actions conducted under MTCA shall comply with applicable state and federal laws [WAC 173-340-710(1)]. MTCA defines applicable state and federal laws to include legally applicable requirements and those requirements that are relevant and appropriate. Collectively, these requirements are referred to as ARARs. This section provides a brief overview of ARARs identified for the site cleanup. The primary ARAR was the MTCA cleanup regulation (Chapter

173-340 WAC), especially with respect to the development of cleanup levels and procedures for development and implementation of a cleanup under MTCA. The primary ARARs that were applicable to the cleanup action include the following:

- Washington Water Pollution Control Act and the following implementing regulation: Water Quality Standards for Surface Waters (WAC 173-201A). These regulations establish water quality standards for surface waters of the State of Washington consistent with public health and the propagation and protection of fish, shellfish, and wildlife. These standards were used to develop groundwater cleanup levels for the Site, as discussed in Section 3.0.
- Washington Hazardous Waste Management Act [Chapter 70.105 Revised Code of Washington (RCW)] and the following implementing regulation: Dangerous Waste Regulations (WAC 173-303). These regulations establish a comprehensive statewide framework for the planning, regulation, control, and management of dangerous waste. The regulation designates those solid wastes that are dangerous or extremely hazardous to the public health and environment. The management of excavated contaminated soil from the Site was conducted in accordance with these regulations to the extent that any dangerous wastes are discovered or generated during the cleanup action.
- Washington Solid Waste Management Act (Chapter 70.95 RCW) and the following implementing regulations: Solid Waste Handling Standards (WAC 173-350) and Criteria for Municipal Solid Waste Landfills (WAC173-351). These regulations establish a comprehensive statewide program for solid waste management, including proper handling and disposal. The management of excavated contaminated soil from the Site was conducted in accordance with these regulations to the extent that the soil can be managed as inert or solid waste instead of dangerous waste.
- Shoreline Management Act (SMA; Chapter 90.58 RCW). Establishes permitting and other requirements for substantial development occurring within waters of the U.S. or within 200 ft of a shoreline, and requires that the activities in coastal zones be consistent with local regulations. MTCA exempts cleanup projects being conducted under an enforceable order or consent decree from the requirement of obtaining the shoreline permit; however, the cleanup must be conducted in accordance with the substantive requirements of the regulation. Site cleanup was addressed in the shoreline permit for Site redevelopment, so additional action relative to the SMA was not required.
- Hazardous Waste Operations (WAC 296-843). Establishes safety requirements for workers providing investigation and cleanup operations at sites containing hazardous materials. These requirements are applicable to onsite cleanup activities and were addressed in site health and safety plans prepared specifically for these activities.

5.3 EVALUATION OF RESPONSE ACTIONS AND CLEANUP TECHNOLOGIES

Soil response actions and cleanup technologies were screened for possible use in developing alternatives for Site cleanup. Each alternative must address the CAO presented in Section 5.1. Applicable response actions and cleanup technologies evaluated for potential use as part of the cleanup action are described below.

Two response actions were considered for cleanup of contaminated Site soil: 1) removal and 2) containment. The cleanup technology considered for removal of contaminated soil was excavation with offsite disposal. Soil would either be disposed of at a solid waste landfill or at an inert waste landfill, depending on the nature of contamination and the chemical concentrations. No constituent concentrations exceeded levels that required the soil to be managed as a dangerous waste. The Snohomish Health District, in consultation with Ecology, has established criteria for disposal of affected Site soil at the former Rinker Materials (currently CEMEX) Everett inert waste landfill. Soil was not characterized as inert waste for disposal purposes if it exhibited any of the following characteristics on a bulk testing basis:

- Both arsenic and lead exceed their respective cleanup levels.
- Arsenic exceeds 65 milligrams per kilogram (mg/kg), or 100 mg/kg with acceptable leachability test results.
- TPH exceeds 200 mg/kg.

The cleanup technology considered for containment was consolidation of contaminated soil and onsite containment in one or more areas that could be integrated with the Site redevelopment configuration (i.e., large parking lots or beneath Port-owned buildings). For planning purposes, it was assumed that any contaminated soil that was relocated for onsite containment would be placed a minimum of 1.5 ft above elevation 13.2 ft, MLLW, which is the maximum tide elevation for Everett over the past 20 years.

Capping would consist of asphalt or concrete pavement and/or buildings. Containment through capping would also include institutional controls, such as restrictive covenants (e.g., deed restrictions), and cap maintenance.

Containment in-place (without consolidation) was not considered practicable because it would be difficult to ensure the long-term integrity of numerous contaminated soil areas that are not aligned with the post-redevelopment Site configuration. Additionally, a significant percentage of the contaminated soil may require excavation to accommodate utilities, foundations, and other Site improvements, so containing in-place would incur the costs for excavation, stockpiling, replacement, and compaction of contaminated soil during redevelopment.

5.4 SCREENING OF CLEANUP TECHNOLOGIES

Cleanup technologies were screened against site-specific conditions and other considerations to determine which technologies could be practicably implemented at the Site and properly function as part of the cleanup action.

Two cleanup technologies: 1) excavation and offsite disposal, and 2) consolidation and onsite containment, were identified as potential cleanup actions for soil. Excavation and offsite disposal would be easily implemented and would integrate well with planned Site development activities. Conversely, consolidation and onsite containment would pose significant challenges and do not appear to be practicable, largely due to the cleanup constraints discussed in Section 5.2 and discussed further below.

Approximately 2,200 cubic yards (yd^3) of contaminated soil were estimated to be present within the Site. The combined constraints of not containing contaminated soil within the potential residential portion of the redevelopment, the aforementioned minimum elevation for confined soil, and the limited ability to raise Site grades, essentially prevented the consolidation and onsite containment of large volumes of contaminated soil.

5.5 SELECTED ALTERNATIVE

Based on the above considerations, consolidation and onsite containment were not considered viable alternatives and excavation/offsite disposal was selected as the technology that was applied for cleanup of Site-contaminated soil.

6.0 CLEANUP ACTION DESIGN AND IMPLEMENTATION

The cleanup action was designed based on the results of the Site characterization discussed in Section 4.0. A total of seven cleanup action areas (B-1, B-1a, B-1b, L-1, L-2, L-3, and ABW-P1) were identified based on Site characterization activities, and were addressed as part of the planned cleanup action for the Site. With the exception of cleanup action area B-1b, cleanup was completed between 2005 and 2007. Cleanup Action Area B-1b was identified based on the results of a March 2014 investigation. Cleanup in this area was completed in March of 2015, concurrent with removal of the boat wash facility. Plans as specifications were prepared for the cleanup actions to define the planned excavation limits, the management and disposal of excavated contaminated soil, requirements for stormwater management during cleanup, and worker health and safety (Landau Associates 2006d). The excavation plans for cleanup action areas B-1, B-1a, L-1, L-2, and L-3 (Drawing CS1.2), and for cleanup action area B-1b (Drawing D1.3) are presented in Appendix F.

Cleanup action was conducted consistent with methods, procedures, and standards identified in the CAP previously developed for the Redevelopment Area (Landau Associates 2006a) and reviewed by Ecology (Ecology 2006), and detailed in the construction plans and specifications (Landau Associates 2006d and PND and Landau Associates 2014). Contaminated soil was disposed of offsite at either an inert waste or solid waste landfill, depending on waste characteristics, as described in Section 5.3 and detailed on the excavation plans (Appendix F).

Note that cleanup in Area ABW-P1 was conducted under the direction of Pinnacle GeoSciences as consultant to ABW while cleanup in Areas B-1, B-1a, B-1b, L-1, L-2, and L-3 was conducted under the observation of Landau Associates as consultant to the Port. A brief description of compliance monitoring procedures, the cleanup actions conducted in these areas, and compliance monitoring results are presented in this section.

6.1 COMPLIANCE MONITORING PROCEDURES

Following excavation and prior to backfilling, confirmation soil samples were collected at the base and along the excavation sidewalls within each cleanup action area. Compliance monitoring sampling for Cleanup Action Areas B-1, B-1a, B1-b, L-1, L-2, and L-3 was conducted in conformance with the compliance monitoring plan, which was submitted for Ecology review in 2006 (CMP; Landau Associates 2006c).

Confirmation soil samples were analyzed for the IHS that exceeded the cleanup levels in each cleanup action area. Soil removal and compliance monitoring was conducted iteratively until residual soil concentrations in all cleanup action areas achieved the soil cleanup levels for all IHS, except as described

below. The following sections describe how compliance monitoring samples were located and collected, and present the compliance monitoring results.

6.1.1 SAMPLE LOCATIONS

To collect data representative of the soil remaining at the base of the excavation in each cleanup action area, the base of each excavation was divided into approximately equal-sized grids and one sample was collected from the center of each grid and submitted for laboratory analysis. By dividing the base of the excavations into grids, a sufficient number of samples were collected to support the calculation of an upper confidence interval for the mean contaminant concentrations remaining at the base of the excavation. In smaller cleanup action areas, the base of the excavation was divided into fewer grids, with a maximum grid size of about 500 square feet (ft^2), consistent with the CMP.

Confirmation soil samples from the base of each excavation were collected from the upper 6 inches of soil. If field observations of the soil at the base of an excavation indicated evidence of potential contamination either through visual observation (e.g., soil discoloration, presence of debris, or sheen) or through the use of appropriate instrumentation (e.g., photoionization detector), the confirmation sample within a particular grid was moved from the center of the grid to the area of potential contamination.

At each excavation, one sidewall sample was collected for every 50 linear ft of sidewall with a minimum of one sample per sidewall. However, if the 50-ft spacing results in more than 10 sidewall samples in one excavation, the linear spacing was increased to 75 ft. In all cases, sidewall samples were collected from the depth interval identified as contaminated for that excavation. If field observations of the soil along an excavation sidewall indicated evidence of contamination either through visual observation (e.g., soil discoloration, presence of debris, or sheen) or through the use of appropriate instrumentation (e.g., photoionization detector), an additional confirmation sidewall sample was collected within the area of potential contamination if the potentially contaminated soil was not excavated prior to compliance monitoring.

A consistent sample labeling protocol was used for most compliance monitoring samples. Samples were labeled with the cleanup area, followed by a "B" or an "S" to identify bottom and sidewall samples, followed by a sequential number. For example, Sample B1-B1 was the first bottom sample collected within Cleanup Action Area B-1. If a compliance monitoring sample exceeded the cleanup levels and the area was re-excavated, the subsequent compliance monitoring sample was given the same label with a lower case letter appended to the end of the label (e.g., B1-B1a); sequential appended letters, starting with "a", were used for locations where multiple iterations of excavation and compliance monitoring were conducted. This labeling convention was used for all cleanup action areas, except area

ABW-P1. For Area ABW-P1, compliance monitoring soil samples were labeled EX (for excavation), followed by the sequential sample number, and the sample depth. For example, sample EX-3-1.5 was the third sample collected from the excavation and was collected from a depth of 1.5 ft BGS.

Compliance monitoring soil sample locations and the final lateral limits of excavation for each of the cleanup action areas are shown on Figures 11 and 12.

6.1.2 SAMPLE COLLECTION

Compliance monitoring samples representative of the soil remaining at the base of the excavation were collected from the base and sidewalls of the excavation. A shallow hole was hand dug at each base sample location using decontaminated hand implements, including stainless-steel spoons and steel shovels, picks, and similar equipment. The sidewall surface of the hand-dug hole was scraped to expose a fresh surface for sample collection. In general, the upper 6 inches of the sample location sidewall was sampled using a decontaminated stainless-steel spoon, placed in a decontaminated stainless-steel bowl, homogenized, and transferred to the appropriate sample container. Material greater than about ¼ inch was removed from the sample volume.

Confirmation samples collected from the excavation sidewalls were collected from a depth interval extending the full thickness of the contaminated soil zone. For excavations in unpaved areas, the sample was collected from the ground surface to the base of the excavation. For excavations in paved areas, the sample was collected from the base of the pavement/subgrade section to the base of the excavation. The surface of the sidewall was scraped using a decontaminated hand implement to expose a fresh surface for sample collection. In general, equal amounts of soil from the full thickness of the sidewall were collected using a decontaminated stainless-steel spoon, placed in a decontaminated stainless-steel bowl, homogenized, and transferred to the appropriate sample container.

6.2 CLEANUP ACTION IMPLEMENTATION

Cleanup action implementation included the excavation and offsite disposal of affected soil identified during previous Site investigation activities, and the collection and analysis of compliance monitoring samples to verify that cleanup levels were achieved. Cleanup activities were conducted in conformance with the plans and specifications (Reid Middleton 2005, Landau Associates 2006d, 2015) previously discussed.

Multiple excavation events were conducted in cleanup action areas where soil compliance monitoring samples exceeded the cleanup levels. The analytical results for compliance monitoring soil samples, including samples with constituent concentrations exceeding cleanup levels representing soil that was removed during additional excavation, are summarized in Table 13.

The following sections describe cleanup activities, including the nature of contamination, the extent of excavation, the disposal location and volume of contaminated soil, and the results of compliance monitoring.

6.2.1 CLEANUP ACTION AREA B-1

Cleanup Action Area B-1 was excavated to remove soil containing cPAHs and arsenic above the soil cleanup levels. The excavated soil was disposed of at the Rinker Materials inert waste facility in Everett, Washington. The depth of the excavation ranged from about 1 to 2.5 ft BGS, depending on the thickness of the contaminated soil layer and its initial depth below the ground surface. The excavation area was generally bound by paved areas to the north, south, and west, and by a paved area and the former ABW building to the east. A total of 2,597 tons of contaminated soil was excavated and disposed from this area.

Ten bottom and 12 sidewall compliance monitoring soil samples were collected from the initial Area B-1 excavation and tested for metals, including arsenic. Selected samples were also tested for TPH and/or cPAHs. The locations of Area B-1 compliance monitoring samples are shown on Figure 11 and compliance monitoring data are presented in Table 13. Five of the initial compliance monitoring samples exceeded soil cleanup levels after the initial excavation (B1-B2, B1-B3, B1-S6, B1-S7, and B1-S8). Arsenic and copper exceeded soil cleanup levels in sample B1-B2 and arsenic exceeded the soil cleanup level in sample B1-B3. In these areas, an additional 1 ft of soil was excavated and compliance monitoring samples B1-B2a and B1-B3a were collected. There were no soil cleanup level exceedances in these samples.

cPAHs exceeded the soil cleanup level in sidewall sample B1-S8. Additional excavation and sidewall scraping was conducted in this area following the initial excavation and compliance monitoring sample B1-S8a was collected. There were no soil cleanup level exceedances in this sample.

Sidewall samples B1-S6 and B1-S7 are located on the south side of Area B-1. These sidewall samples had slight exceedances of the cleanup level for arsenic (34 mg/kg and 28 mg/kg, respectively). No additional excavation occurred here at the time of the original excavation because the boat wash facility for the North Marina was obstructing further excavation. The boat wash facility was removed and additional soil was removed from this area as part of cleanup in Area B-1b (see Section 6.2.3).

6.2.2 CLEANUP ACTION AREA B-1A

Cleanup Action Area B-1a consists of a localized area of petroleum hydrocarbon-impacted soil in the southwestern portion of Cleanup Action Area B-1. Soil excavated from this area was disposed of at the Waste Management solid waste landfill in Arlington, Oregon and at the Rinker Materials inert waste

facility in Everett, Washington. The depth of the excavation was approximately 1 ft BGS. A total of 27 tons of inert waste and 449 tons of solid waste were excavated and disposed from this area.

Three sidewall compliance monitoring soil samples were collected from the Cleanup Action Area B-1a excavation and tested for TPH-D and TPH-O, and two bottom samples were collected from this area (B1-B7 and B1-B9). The locations of Cleanup Action Area B-1a compliance monitoring samples are shown on Figure 11 and compliance monitoring data are presented in Table 13. None of the B-1a compliance monitoring samples exceeded soil cleanup levels.

6.2.3 CLEANUP ACTION AREA B-1B

Cleanup Action area B-1b was excavated to remove arsenic soil contamination, including residual contamination on the south side of Area B-1, concurrent with removal of the boat wash facility. Soil excavated from this area was disposed of at the Roosevelt Regional Landfill in Roosevelt, Washington. The depth of the excavation was approximately 3 ft BGS. A total of 1,095 tons of solid waste were excavated and disposed from this area. The western half of the north sidewall was extended approximately 4 ft north of the planned excavation boundary and the southern end of the east sidewall was extended approximately 1 ft east of the planned boundary due to the presence of apparent sandblast grit.

Ten sidewall (B1b-S1 through B1b-S10) 15 bottom compliance monitoring soil samples (B-1b-B1 through B1b-B15) were collected from the Cleanup Action Area B-1b excavation and tested for arsenic. Sandblast grit was encountered along the north and east sidewalls of the excavation; therefore, compliance monitoring samples from the areas where the sandblast grit was encountered and removed (B1b-S4, -S7, and –S8) were also analyzed for antimony and lead. The locations of Cleanup Action Area B-1b compliance monitoring samples are shown on Figure 12 and compliance monitoring data are presented in Table 13. Arsenic was detected in one sidewall sample (B1b-S5) at a concentration greater the cleanup level. An additional 1 ft of soil was removed from the sidewall at this location and an additional confirmation sample was collected (B1b-S5a). Arsenic, antimony, and lead were not detected in the final confirmation samples at concentrations exceeding soil cleanup levels.

6.2.4 CLEANUP ACTION AREA L-1

Area L-1 corresponds to shallow arsenic soil contamination encountered during soil characterization. The approximate upper 1.5 ft of soil was excavated across the affected area and disposed of at the Rinker Materials inert waste facility in Everett, Washington. A total of 455 tons of soil was removed and disposed from this area.

Four bottom and six sidewall compliance monitoring soil samples were initially collected from the Area L-1 excavation. Following the initial excavation, two sidewall samples (L1-S1 and L1-S4) and one base sample (L1-B4) had soil arsenic concentrations greater than the cleanup level. In the area of L1-B4, an additional 1-ft depth excavation was conducted. Once the additional soil was excavated, a second base sample (L1-B4a) was collected that did not exceed the soil cleanup level. At the L1-S1 sidewall sample location, the excavation was continued northeast. A second sidewall sample was collected (L1-S1a) and the detected concentration of arsenic was below the soil cleanup level. To the north, the boundary for the area was defined by characterization sample L-GC-5c.

Initial excavation sidewall sample L1-S4 also had an exceedance of the cleanup level for arsenic; therefore, the excavation was continued to the northwest of this sample. Sidewall samples L1-S4a and L1-S5 were collected as the excavation progressed to the west and also had exceedances for arsenic. The excavation was expanded to the northwest to the location of compliance monitoring sample L1-S6 and west to the concrete footing of the former ABW building. Detected concentrations of arsenic in compliance monitoring sample L1-S6 and the base sample associated with this additional excavation, L1-B5, were less than the cleanup level and no additional excavation was required. The locations of Area L-1 compliance monitoring samples are shown on Figure 11 and compliance monitoring data are presented in Table 13.

6.2.5 CLEANUP ACTION AREA L-2

Area L-2 corresponds to shallow arsenic soil contamination encountered during soil characterization. The approximate upper 1 ft of soil was excavated across the affected area and disposed of at the Rinker Materials inert waste facility in Everett, Washington. A total of 30 tons of contaminated soil were excavated and disposed from this area.

In Area L-2, one bottom and one sidewall compliance monitoring soil sample were collected from the initial excavation. Sidewall sample L2-S1 exceeded the soil cleanup level for arsenic. The excavation was expanded to the east of Area L-2 and sidewall sample L2-S2 was collected. This sample also exceeded the soil cleanup level for arsenic. The excavation was expanded east to the location of characterization sample L-GC-4.1E. Compliance monitoring samples were not collected from the south sidewall of the L-2 excavation because soil was excavated to the concrete footing of the former ABW building. Compliance monitoring samples were also not collected from the west sidewall of the L-2 excavation because it was continuous with the L-3 excavation. The locations of Areas L-2 compliance monitoring samples are shown on Figure 11 and compliance monitoring data are presented in Table 13.

6.2.6 CLEANUP ACTION AREA L-3

Area L-3 corresponds to shallow arsenic soil contamination encountered during soil characterization. The approximate upper 2.5 ft of soil was excavated across the affected area and disposed of at the Waste Management solid waste landfill in Arlington, Oregon. A total of 60 tons of soil was removed and disposed from Area L-3.

Following the excavation, one bottom and two sidewall compliance monitoring samples were collected. None of the three samples had soil cleanup level exceedances. Compliance monitoring samples were not collected from the east or west sidewalls of the L-3 excavation because the excavation was continuous with Areas L-2 and B-1. The locations of Area L-3 compliance monitoring samples are shown on Figure 11 and compliance monitoring data are presented in Table 13.

6.2.7 CLEANUP ACTION AREA ABW-P1 (FORMER ABW BUILDING FOOTPRINT)

Area ABW-P1 consists of an area of TPH-impacted soil identified during characterization soil sampling conducted by Pinnacle Geosciences on behalf of ABW following demolition of the ABW building. The impacted soil was excavated and disposed offsite in March of 2006 under the direction of Pinnacle Geosciences. The depth of the excavation ranged from 3 to 5 ft BGS. Compliance monitoring samples were collected to verify that all contaminated soil was removed. A total of 234 tons of petroleum-contaminated soil were excavated and transported to Waste Management's railhead in Seattle, and then to Waste Management's Columbia Ridge landfill. The locations of the compliance monitoring samples are shown on Figure 11 and the compliance monitoring data are presented in Table 13. Detected concentrations of petroleum hydrocarbons were below cleanup levels. Additional details regarding the excavation can be found in the ABW *Plant I Remedial Excavation Report* by Pinnacle GeoSciences 2006 (Pinnacle Geosciences 2006b).

7.0 CONCLUSIONS

Cleanup actions were implemented at the Site between 2005 and 2015 to remove shallow soil contamination associated with historical Site operations. Cleanup activities were conducted in conformance with the cleanup plan approved by Ecology. Compliance monitoring soil samples collected in each of the seven cleanup action areas indicate that the contaminant concentrations in soil remaining at the Site are below Site cleanup levels. Although arsenic is present in groundwater at concentrations greater than the Site cleanup levels, the detected concentrations are attributed to naturally reducing conditions at the Site and are not the result of a Site release. The cleanup levels for the Site were based on unrestricted land uses and, as a result, long-term compliance monitoring is not required. A restrictive covenant will be placed on the Site to prevent use of groundwater.

Based on the results of soil compliance monitoring data and the evidence that elevated arsenic concentrations in groundwater are the result of reducing conditions rather than Site releases, the Site achieves MTCA cleanup levels and no further action is required.

8.0 LIMITATIONS

This document has been prepared for the exclusive use of the Port of Everett for cleanup of the ABW/Bayside Marine VCP Site. No other party is entitled to rely on the information, conclusions, and recommendations included in this document without the express written consent of the Port of Everett. Further, the reuse of information, conclusions, and recommendations provided herein for extensions of the project or for any other project, without review and authorization by Port of Everett, shall be at the user's sole risk. The Port warrants that within the limitations of scope, schedule, and budget, our services have been provided in a manner consistent with that level of care and skill ordinarily exercised by members of the profession currently practicing in the same locality under similar conditions as this project. We make no other warranty, either express or implied.

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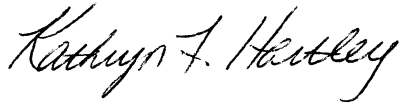

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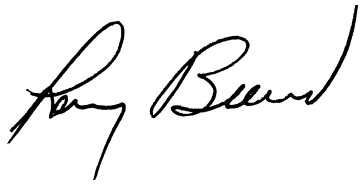

Lawrence D. Beard, P.E.
Principal

LDB/KFH/tam

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Data Source: Esri 2012

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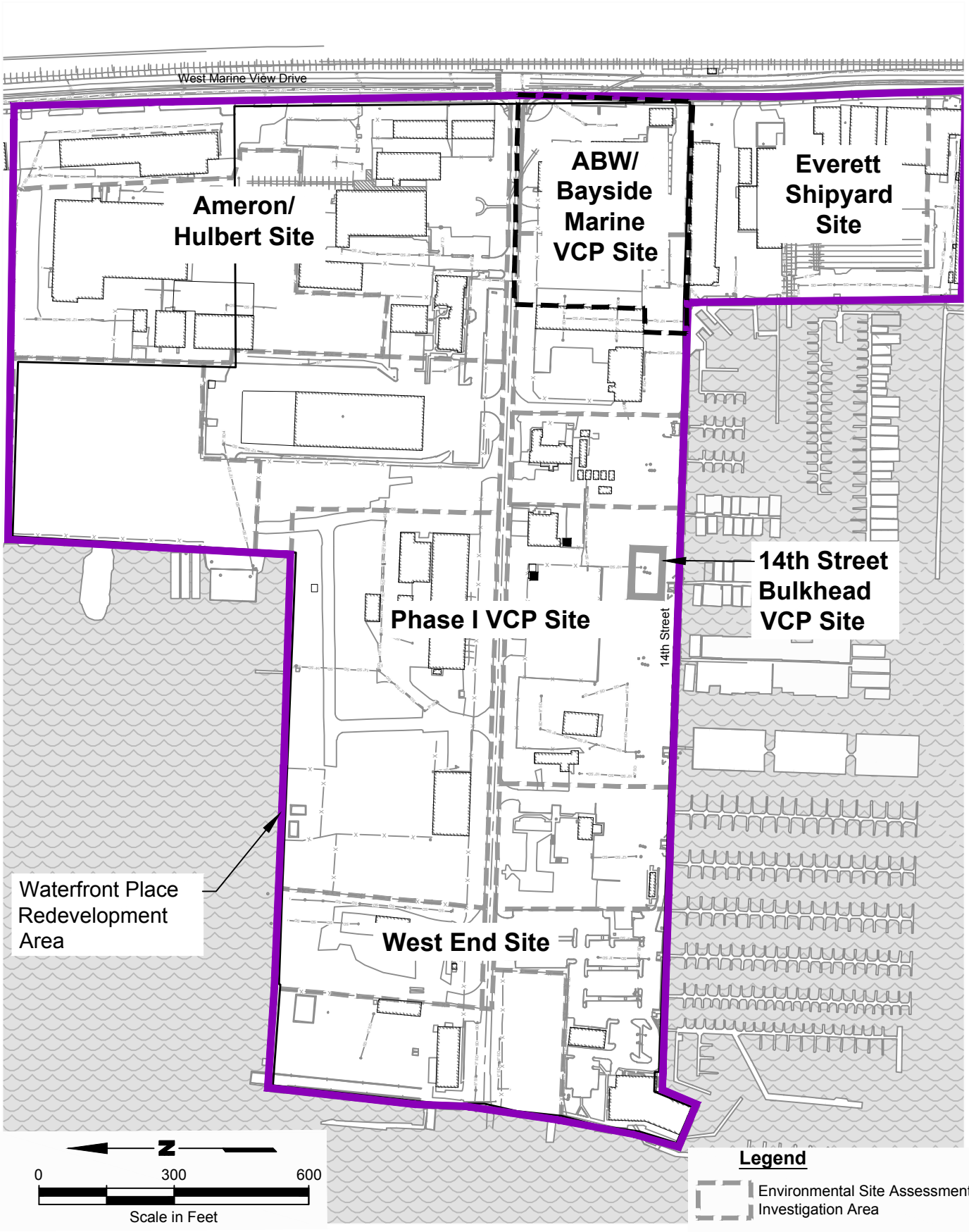
North Marina ABW/Bayside Marine VCP Site Port of Everett, Washington	**Vicinity Map**	Figure 1



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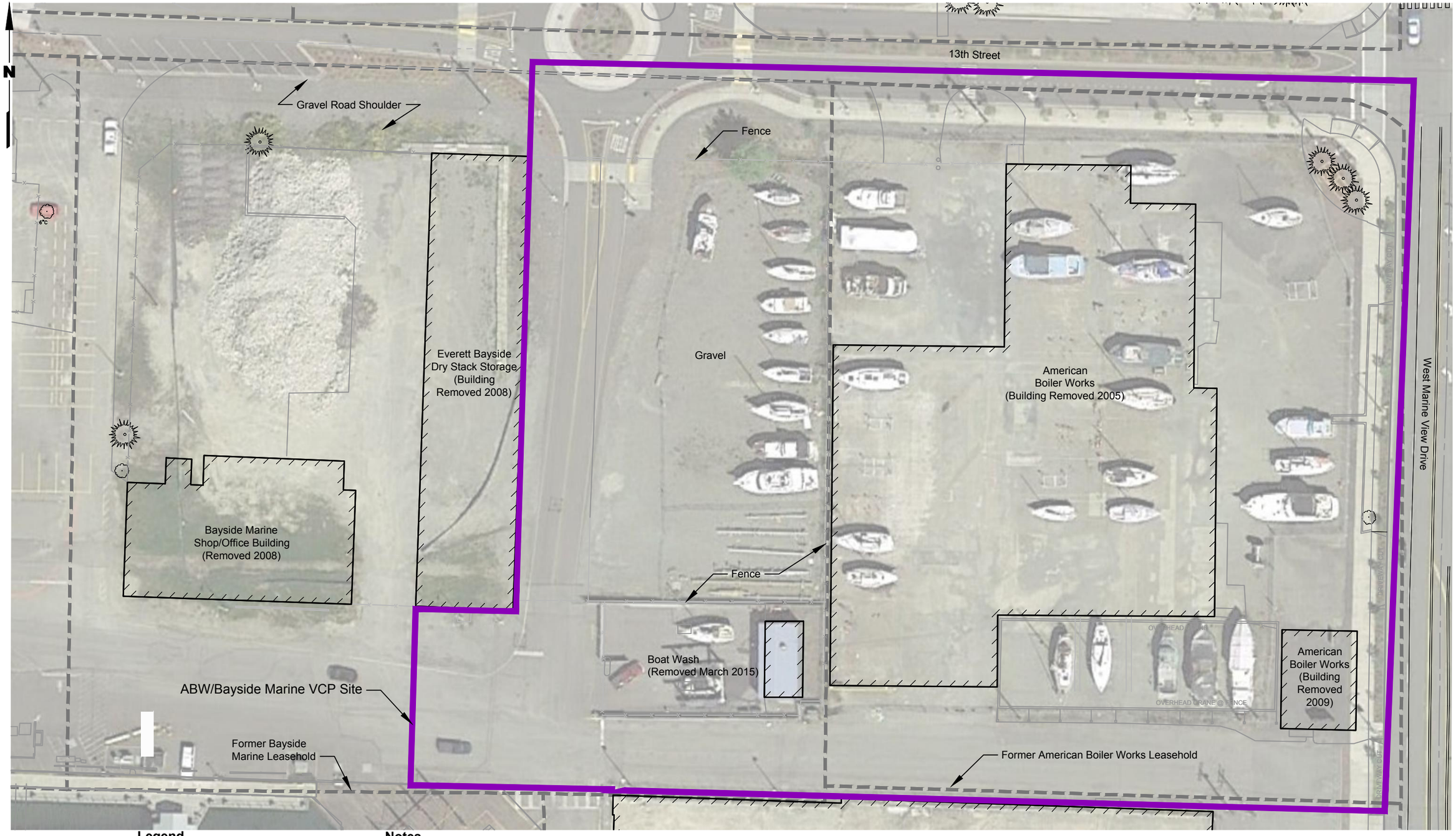
North Marina
ABW/Bayside Marine VCP Site
Port of Everett, Washington

Location Plan

Figure
2



Legend

Former Lease Boundary

Notes

1. Aerial Photography does not line up with survey information.
2. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.

0 80 160

Scale in Feet

Source: © 2013 Google Earth

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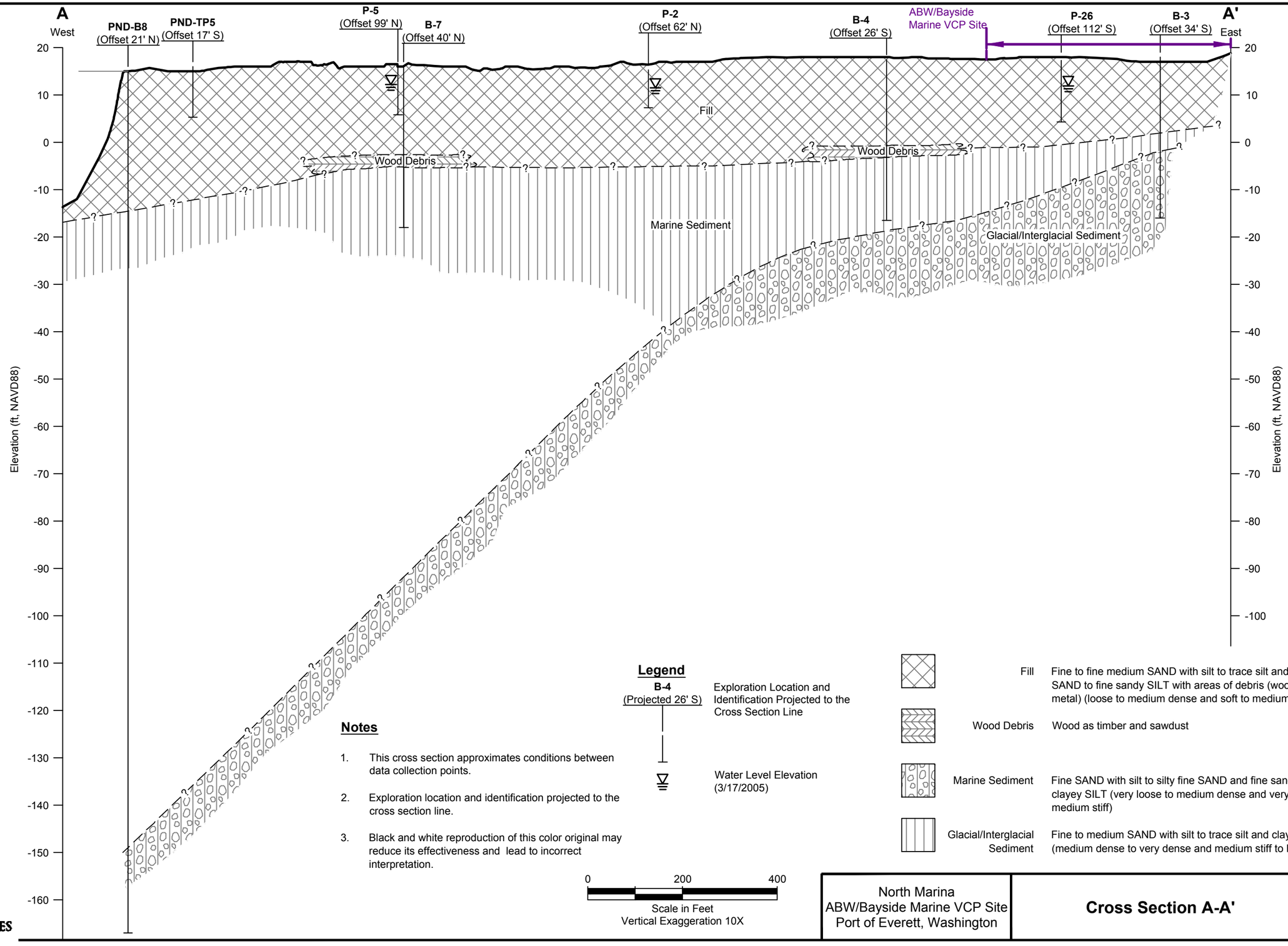
North Marina
ABW/Bayside Marine VCP Site
Port of Everett, Washington

Current and Historical Site Features

Figure 3

Port of Everett/North Marina/Cleanup Action Plan | G:\Projects\147\037\030\035\CleanupReport\F03SitePlan.dwg (A) "Figure 3" 4/20/2015



Notes

1. This cross section approximates conditions between data collection points.
2. Exploration location and identification projected to the cross section line.
3. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.

Legend

B-4
(Projected 26' S)
Exploration Location and Identification Projected to the Cross Section Line

Water Level Elevation (3/17/2005)

Fill	Fine to fine medium SAND with silt to trace silt and silty fine SAND to fine sandy SILT with areas of debris (wood, concrete, metal) (loose to medium dense and soft to medium stiff)
Wood Debris	Wood as timber and sawdust
Marine Sediment	Fine SAND with silt to silty fine SAND and fine sandy SILT to clayey SILT (very loose to medium dense and very soft to medium stiff)
Glacial/Interglacial Sediment	Fine to medium SAND with silt to trace silt and clayey SILT (medium dense to very dense and medium stiff to hard)

0 200 400
Scale in Feet
Vertical Exaggeration 10X

North Marina
ABW/Bayside Marine VCP Site
Port of Everett, Washington

Cross Section A-A'

Figure
4

| G:\Projects\1470\037\030\035\CleanupReport\F04CrossSection.dwg (A) "Figure 4" 4/20/2015

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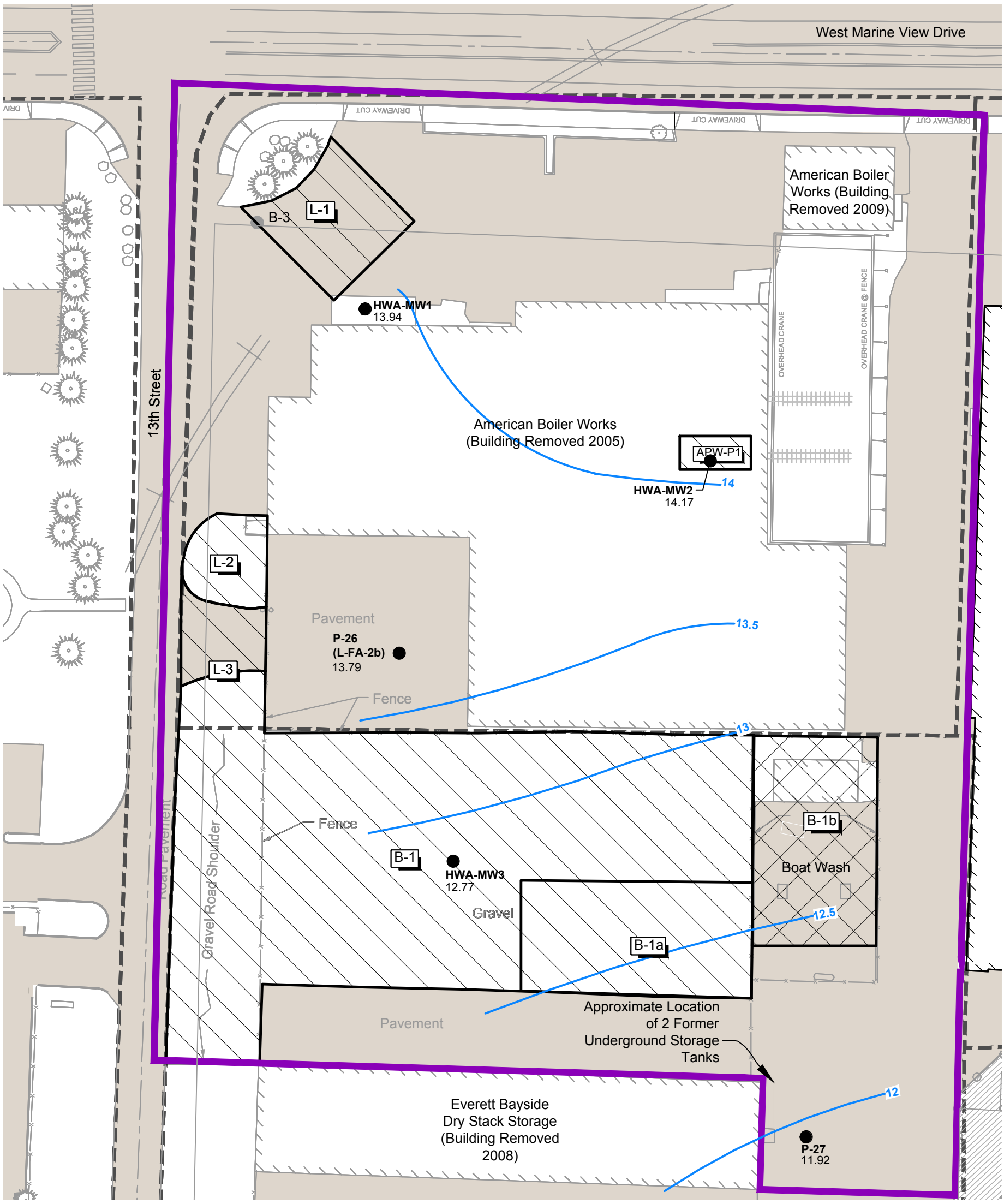

Legend

- Monitoring Well Location
- B-1 — Soil Cleanup Action Area - Cleanup Complete
- B-1b — Soil Cleanup Action Area - Cleanup Planned
- Existing Paved Areas
- North Marina - ABW Bayside Marine VCP Site
- Vegetation

Notes:

1. Northings and eastings are in US state Plane1983, Washington North 4601, NAD 83 (CONUS)
2. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.

N

0 50 100

Scale in Feet

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North Marina
ABW/Bayside Marine VCP Site
Port of Everett, Washington

December 2014 Groundwater Elevation Contour Map

Figure 5

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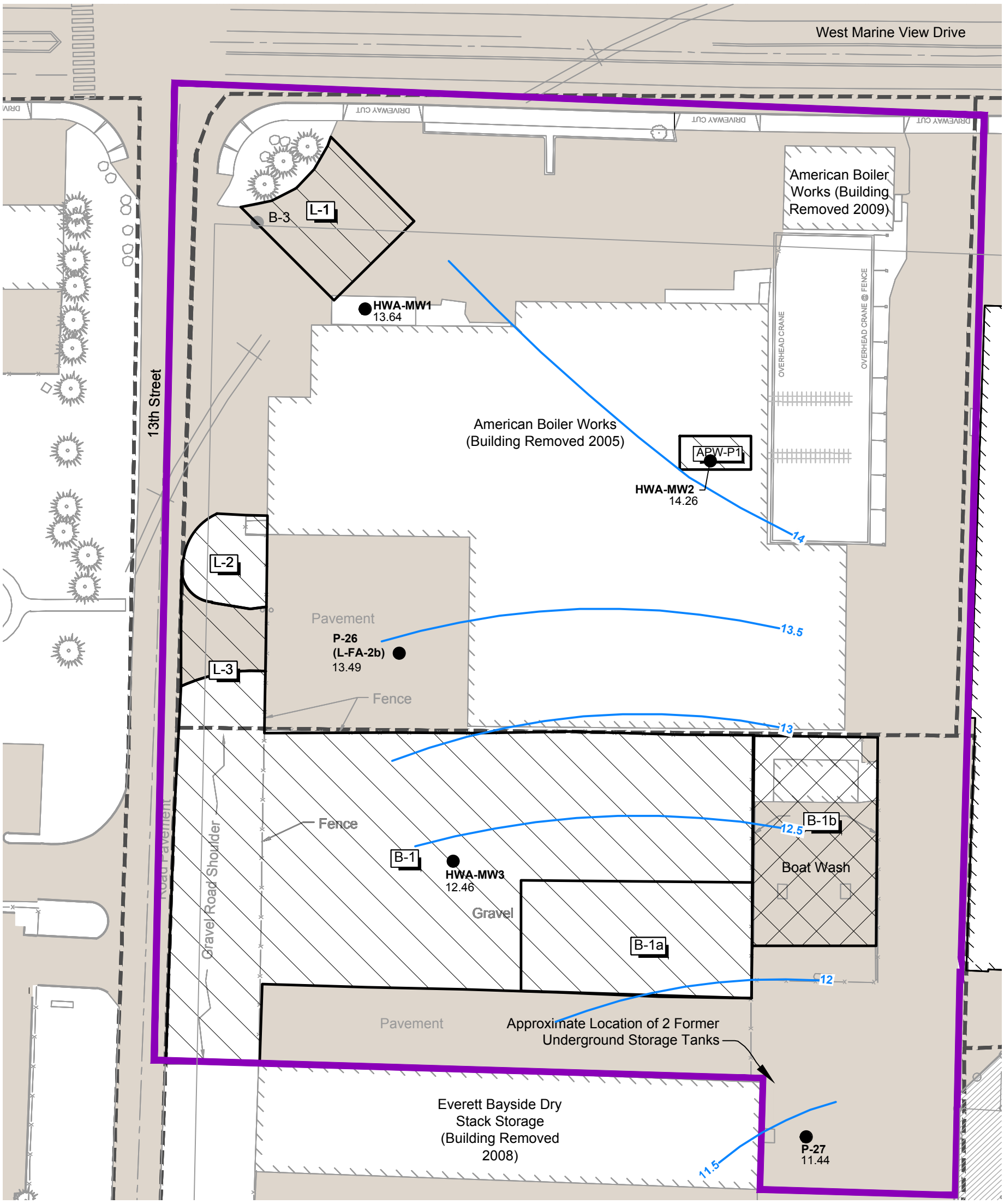

Legend

- Monitoring Well Location
- B-1 — Soil Cleanup Action Area - Cleanup Complete
- B-1b — Soil Cleanup Action Area - Cleanup Planned
- Existing Paved Areas
- North Marina - ABW Bayside Marine VCP Site
- Vegetation

Notes:

1. Northings and eastings are in US state Plane1983, Washington North 4601, NAD 83 (CONUS)
2. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.

N

0 50 100

Scale in Feet

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North Marina
ABW/Bayside Marine VCP Site
Port of Everett, Washington

March 2015 Groundwater Elevation Contour Map

Figure 6

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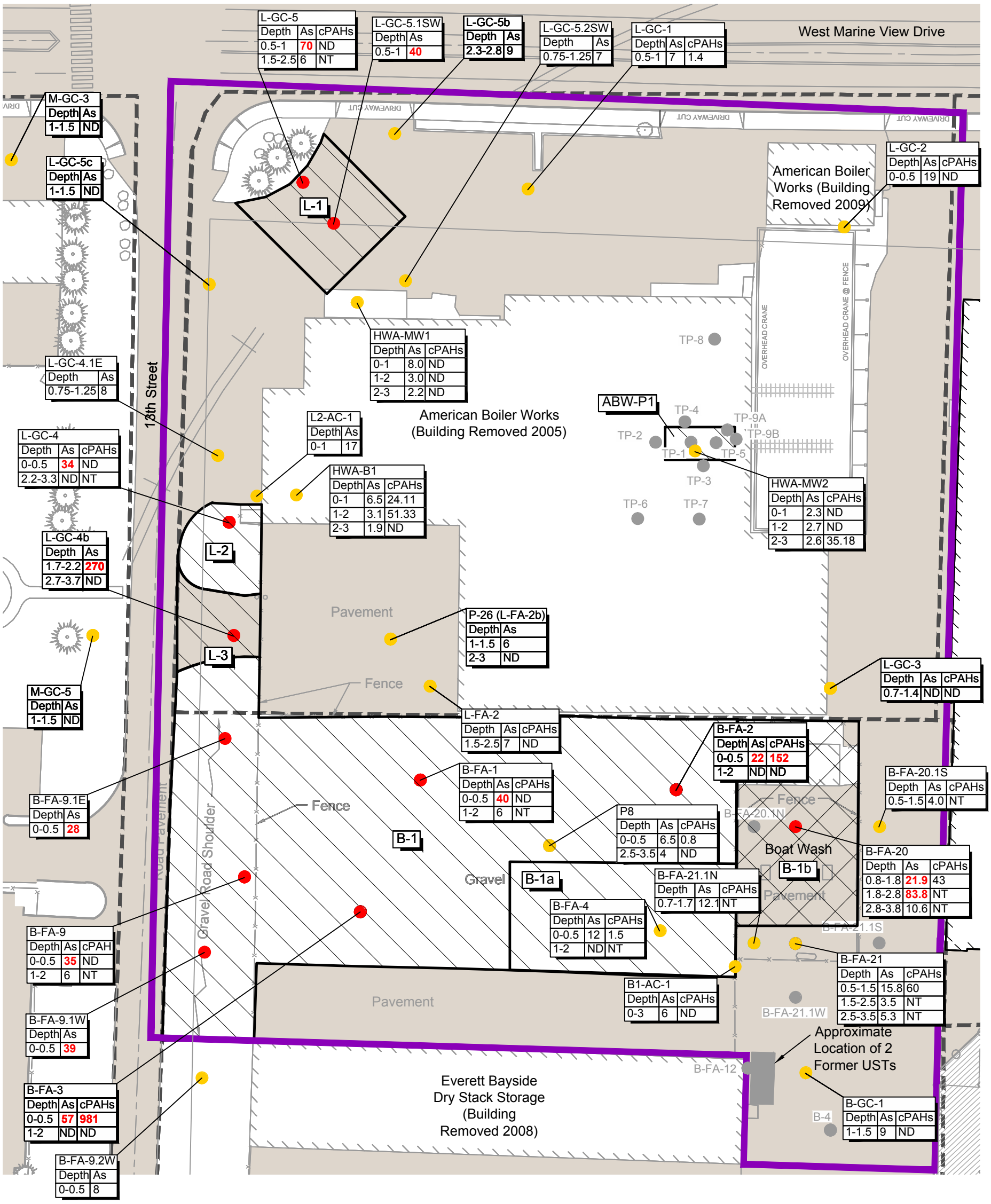

Legend

- Soil Sample Location with Cleanup Level Exceedance
- Soil Sample with No Cleanup Level Exceedance
- Soil Sample Not Tested for Arsenic or cPAHs
- B-1 — Soil Cleanup Action Area - Cleanup Complete
- B-1b — Soil Cleanup Action Area - Cleanup Planned
- Existing Paved Areas
- North Marina - ABW Bayside Marine VCP Site
- Vegetation

N

0 50 100

Scale in Feet

Abbreviations

ND	Not Detected
NT	Not Tested
As	Arsenic
cPAHs	Carcinogenic Polycyclic Aromatic Hydrocarbons
USTs	Underground Storage Tanks
mg/kg	milligrams per kilogram
µg/kg	micrograms per kilogram

Notes:

1. All arsenic results are reported in mg/kg.
2. All cPAH results are reported in µg/kg.
3. All values in red exceed the cleanup level.
4. Northings and Eastings are in US state Plane1983, Washington North 4601, NAD 83 (CONUS).
5. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.

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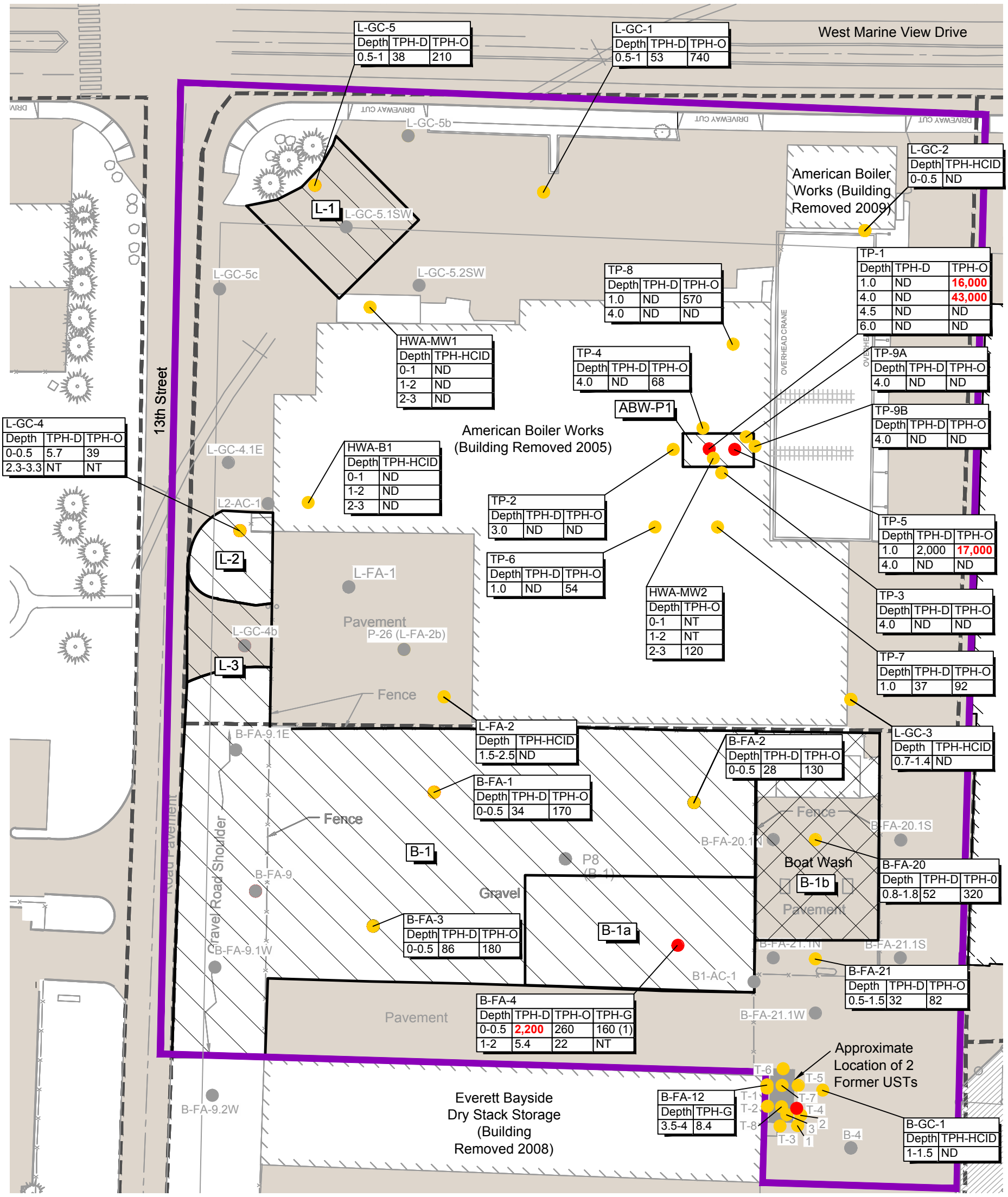
North Marina
ABW/Bayside Marine VCP Site
Port of Everett, Washington

Soil Characterization Results Arsenic and cPAHs

Figure 7

| G:\Projects\147\037\030\035\CleanupReport\F08TPHCharacterization.dwg (A) "Figure 8" 4/20/2015



Legend

- Soil Sample Location with Cleanup Level Exceedance
- Soil Sample with No Cleanup Level Exceedance
- Soil Sample Not Tested for TPH
- B-1 — Soil Cleanup Action Area - Cleanup Complete
- B-1b — Soil Cleanup Action Area - Cleanup Planned
- Existing Paved Areas
- North Marina - ABW Bayside Marine VCP Site
- Vegetation

Abbreviations

ND	Not Detected
TPH-G	Total Petroleum Hydrocarbons Gasoline-range
TPH-D	Diesel-range TPH
TPH-O	Motor Oil-range TPH
TPH-HCID	Hydrocarbon Identification Method
USTs	Underground Storage Tanks
mg/kg	milligrams per kilogram

Notes:

1. As indicated by the laboratory, the positive gasoline result does not match an identifiable gasoline pattern.
2. All TPH results are reported in mg/kg.
3. All values in red exceed the cleanup level.
4. Northings and Eastings are in US state Plane1983, Washington North 4601, NAD 83 (CONUS).
5. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.

N

0 50 100

Scale in Feet

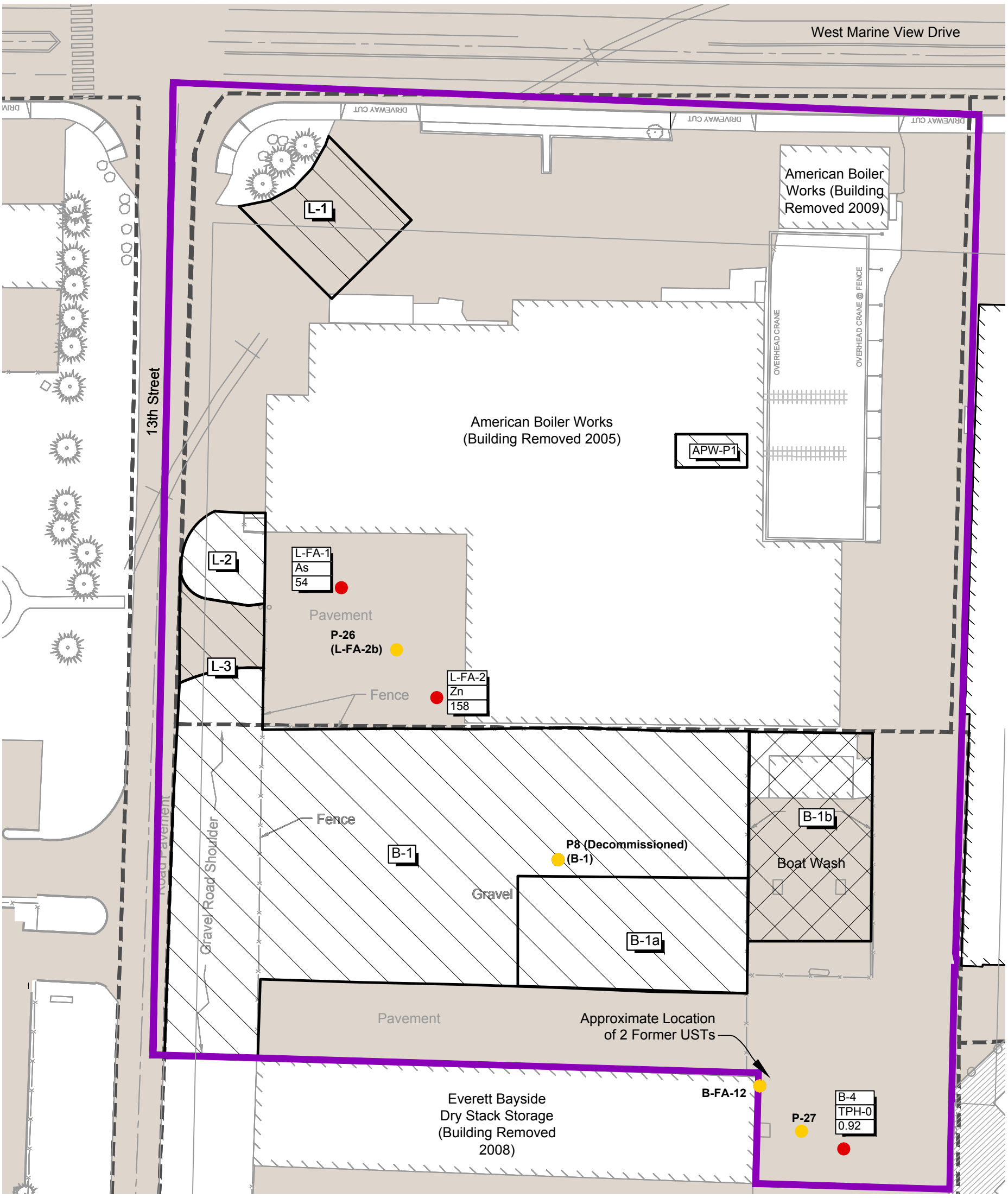
LANDAU ASSOCIATES

North Marina
ABW/Bayside Marine VCP Site
Port of Everett, Washington

Soil Characterization Results TPH

Figure 8

| G:\Projects\147\037\030\035\CleanupReport\F09GW Characterization.dwg (A) "Figure 9" 4/20/2015



Legend

- Groundwater Sample Location with Cleanup Level Exceedance
- Groundwater Sample with No Cleanup Level Exceedance
- B-1 — Soil Cleanup Action Area - Cleanup Complete
- B-1b — Soil Cleanup Action Area - Cleanup Planned
- Existing Paved Areas
- North Marina - ABW Bayside Marine VCP Site
- Vegetation

Abbreviations

As	Arsenic
Zn	Zinc
TPH-O	Motor Oil-range TPH
USTs	Underground Storage Tanks

Notes:

1. Northings and eastings are in US state Plane1983, Washington North 4601, NAD 83 (CONUS)
2. All results are in micrograms per liter (µg/L).
3. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.

N

0 50 100

Scale in Feet

LANDAU ASSOCIATES

North Marina
ABW/Bayside Marine VCP Site
Port of Everett, Washington

Groundwater Characterization Results (2003-2005)

Figure 9

| G:\Projects\147\037\030\035\CleanupReport\F010GW Characterization.dwg (A) "Figure 10" 4/20/2015

West Marine View Drive

13th Street

L-1

L-2

L-3

American Boiler Works (Building Removed 2009)

American Boiler Works (Building Removed 2005)

OVERHEAD CRANE

OVERHEAD CRANE @ FENCE

DRIVEWAY CUT

DRIVEWAY CUT

DRIVEWAY CUT

HWA-MW1

	7/24/14	8/18/14	9/3/14	12/3/14	3/10/15
As	64	77	91	65.1	51.5

APW-P1

HWA-MW2

	7/24/14	9/3/14	12/3/14	3/10/15
As	2.7	8.2	9.6	8.1

Pavement

P-26

	7/24/14	8/18/14	9/3/14	12/3/14	3/10/15
As	15	9.8	6.3	18.6	12.8

Fence

Fence

Road Pavement

Gravel Road Shoulder

B-1

Gravel

HWA-MW3

	7/24/14	9/3/14	12/3/14	3/10/15
As	2.1	ND	2.4	3.2

B-1a

B-1b

Boat Wash

Pavement

Approximate Location of 2 Former USTs

Everett Bayside Marine Drystack Storage Building (Removed 2008)

P-27

	3/13/14	7/24/14	9/3/14	12/3/14	3/10/15
As	ND	ND	ND	3	1.7

Legend

- Groundwater Sample Location with Cleanup Level Exceedance
- Groundwater Sample with No Cleanup Level Exceedance
- B-1 — Soil Cleanup Action Area - Cleanup Complete
- B-1b — Soil Cleanup Action Area - Cleanup Planned
- Existing Paved Areas
- North Marina - ABW Bayside Marine VCP Site
- Vegetation

Abbreviations

As	Arsenic
ND	Not Detected
USTs	Underground Storage Tanks

Notes:

1. Northings and eastings are in US state Plane1983, Washington North 4601, NAD 83 (CONUS)
2. All results are reported in micrograms per liter (µg/L).
3. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.

N

0 50 100

Scale in Feet

LANDAU ASSOCIATES

North Marina
ABW/Bayside Marine VCP Site
Port of Everett, Washington

Groundwater Characterization Results (2014-2015)

Figure 10

| G:\Projects\147\037\030\035\CleanupReport\F11Compliance.dwg (A) "Figure 11" 4/20/2015

West Marine View Drive

CURB CUT

DRIVEWAY CUT

American Boiler Works (Building Removed 2009)

OVERHEAD CRANE

OVERHEAD CRANE @ FENCE

13th Street

L-1

L1-S1a

L1-S1

L1-B2

L1-S2

L1-B4

L1-B4a

L1-B1

L1-B5

L1-S4

L1-B3

L1-S3

L-GC-5C

L1-S4a

L1-S6

L1-S5

Excavated To Concrete Footing
(No Sidewall Samples)

ABW-P1

EX-7-1.5

EX-2-1.5

EX-8-4.0

EX-1-3.0

EX-6-5.0

EX-4-4.5

EX-5-1.5

EX-9-1.5

EX-3-1.5

EX-10-4.0

EX-11-1.5

American Boiler Works
(Building Removed 2005)

L-GC-4.1E

Excavated To Concrete Footing
(No Sidewall Samples)

L2-S2

L2-S3

L2-S1

L2-B1

L-2

L3-B1

L3-S2

L3-S1

Pavement

L-3

Fence

B1-B2a

B1-B2

B1-S3

B1-S4

B1-S5

B1-S6

B1-S2

B1-B4

B1-B6

B1-B8

B1-B10

Fence

Gravel Road Shoulder

B-1

Boat Wash

Pavement

B1-B3a

B1-B3

Gravel

B1a-S1

B1-B7

B-1a

B1-B9

B1-S7

B1-S1

B1-B1

B1-S10

B1-S9

B1a-S2

B1-S8a

B1-S8

B1a-S3

B1-S11

Pavement

B1-S12

Everett Bayside
Dry Stack
Storage (Building
Removed 2008)

Legend

- Vegetation
- Environmental Site Assessment Investigation Area Limits
- B-1 Soil Cleanup Action Area
- Existing Paved Areas

Compliance Monitoring Legend:

- Sidewall Sample Below Cleanup Level
- Sidewall Sample Failed Compliance - Soil Removed
- Bottom Sample Below Cleanup Level
- Bottom Sample Failed Compliance - Soil Removed

Notes:

1. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.

N

0 50 100

Scale in Feet

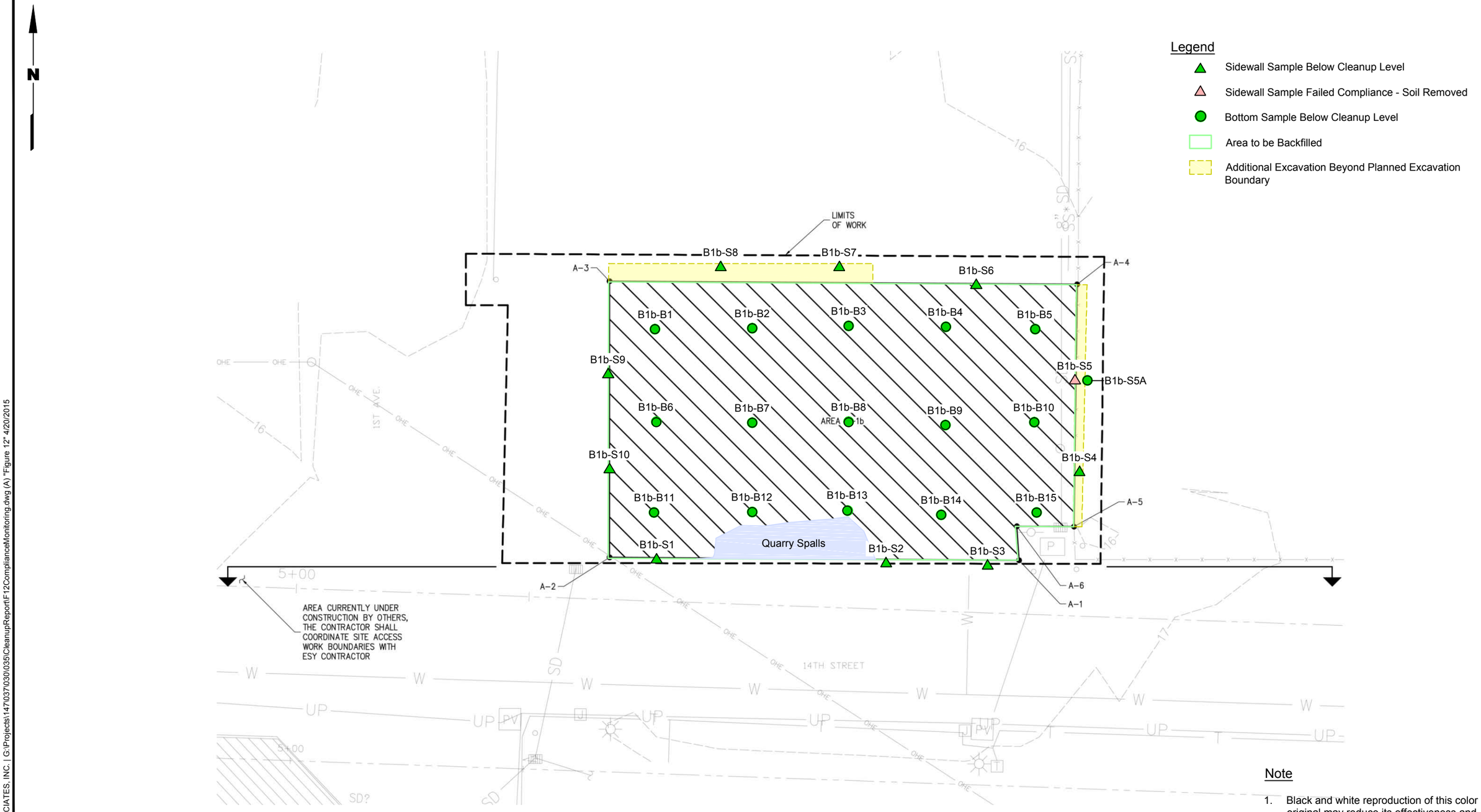
E. GRONEWALD 2013

LANDAU ASSOCIATES

North Marina
ABW/Bayside Marine VCP Site
Port of Everett, Washington

Compliance Monitoring Results
B-1, L-1, L-2, L-3, and ABW-P1

Figure
11



Note

1. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.

Source: Port of Everett

0 20 40
Scale in Feet

LANDAU ASSOCIATES

North Marina ABW/Bayside Marine VCP Site Port of Everett, Washington	**Compliance Monitoring Results B-1b**	Figure 12

TABLE 1
SUMMARY OF SOIL CHARACTERIZATION SAMPLES
ABW/BAYSIDE MARINE VCP SITE
PORT OF EVERETT, WASHINGTON

	Sample Name	Rationale	Depth Range (BGS)	Date Collected	Metals	TBT	cPAHs	PCBs	TPH-Gx	TPH-Dx	TPH-HCID	BTEX	SVOCs	VOCs
Phase II (2003-2004)	NMP2-P-8	General Marine Industry Use	0-0.5	2/11/2004	X		X							
	NMP2-P-8		2.5-3.5	2/11/2004	X		X							
	B-4		2.5-3.5	2/11/2004	X									
Data Gaps Investigation and Supplemental Data Gaps Investigation (2004-2005)	B-FA-1	Boat Maintenance Activities	0-0.5	1/14/2005	X		X			X	X			
	B-FA-1		1-2	1/14/2005	X									
	B-FA-2		0-0.5	1/14/2005	X		X			X	X			
	B-FA-2		1-2	1/14/2005	X		X							
	B-FA-3		0-0.5	1/14/2005	X		X			X	X			
	B-FA-3		1-2	1/14/2005	X		X							
	B-FA-4		0-0.5	1/14/2005	X	X	X		X	X	X	X		
	B-FA-4		1-2	1/14/2005	X					X				
	B-FA-9		0-0.5	1/19/2005	X		X							
	B-FA-9		1-2	1/19/2005	X									
	B-FA-9.1E		0-0.5	3/1/2006	X									
	B-FA-9.1W		0-0.5	3/1/2006	X									
	B-FA-9.2W		0-0.5	3/1/2006	X									
	B-FA-12		3.5-4	1/27/2005					X			X		
	B-GC-1	General Characterization	1-1.5	1/14/2005	X		X				X			
	L-GC-1		0.5-1	1/19/2005	X		X			X	X			
	L-GC-2		0-0.5	1/19/2005	X		X				X			
	L-GC-3		0.7-1.4	1/19/2005	X		X				X			
	L-GC-4		0-0.5	1/19/2005	X		X			X	X			
	L-GC-4		2.3-3.3	1/19/2005	X									
	L-GC-4.1E		0.75-1.25	3/1/2006	X									
	L-GC-4b		1.7-2.2	3/3/2005	X									
	L-GC-4b		2.7-3.7	3/3/2005	X									
	L-GC-5		0.5-1	1/19/2005	X		X			X	X			
	L-GC-5		1.5-2.5	1/19/2005	X									
	L-GC-5.1SW		0.5-1.0	3/1/2006	X									
	L-GC-5.2SW		0.75-1.25	3/1/2006	X									
	L-GC-5b		2.3-2.8	3/3/2005	X									
	L-GC-5c		1-1.5	3/3/2005	X									
	L-FA-2	Sump Investigation	1.5-2.5	1/19/2005	X		X	X			X		X	X
	L-FA-2b		1-1.5	3/3/2005	X									
	L-FA-2b		2-3	3/3/2005	X									
Limited Soil Investigation (2006)	TP-1-1.0	ABW Manufacturing Activities	1.0	1/9/2006						X				
	TP-1-4.0		4.0	1/9/2006						X				
	TP-1-4.5		4.5	1/9/2006						X				
	TP-1-6.0		6.0	1/9/2006						X				
	TP-2-3.0		3.0	1/9/2006						X				
	TP-3-4.0		4.0	1/9/2006						X				
	TP-4-4.0		4.0	1/9/2006						X				
	TP-5-1.0		1.0	1/9/2006						X				
	TP-5-4.0		4.0	1/9/2006						X				
	TP-6-1.0		1.0	1/9/2006						X				
	TP-7-1.0		1.0	1/9/2006						X				
	TP-8-1.0		1.0	1/9/2006						X				
	TP-8-4.0		4.0	1/9/2006						X				
	TP-9-4.0A		4.0	1/9/2006						X				
	TP-9-4.0B		4.0	1/9/2006						X				

TABLE 1
SUMMARY OF SOIL CHARACTERIZATION SAMPLES
ABW/BAYSIDE MARINE VCP SITE
PORT OF EVERETT, WASHINGTON

	Sample Name	Rationale	Depth Range (BGS)	Date Collected	Metals	TBT	cPAHs	PCBs	TPH-Gx	TPH-Dx	TPH-HCID	BTEX	SVOCs	VOCs
Additional Characterization	B1-AC-1	Additional Characterization	0-3	11/16/2007	X		X							
	L2-AC-1		0-1	8/24/2006	X									
	B-FA-20		0.8-1.8	3/5/2014	X		X			X				
	B-FA-20		1.8-2.8	3/5/2014	X									
	B-FA-20		2.8-3.8	3/5/2014	X									
	B-FA20.1S		0.5-1.5	3/5/2014	X									
	B-FA-21		0.5-1.5	3/5/2014	X		X			X				
	B-FA-21		1.5-2.5	3/5/2014	X									
	B-FA-21		2.5-3.5	3/5/2014	X									
	B-FA-21.1N		0.7-1.7	3/5/2014	X									
Additional Characterization	HWA-MW1	Additional Characterization	0-1	7/23/2014	X		X				X			
	HWA-MW1		1-2	7/23/2014	X		X				X			
	HWA-MW1		2-3	7/23/2014	X		X				X			
	HWA-MW2		0-1	7/23/2014	X		X				X			
	HWA-MW2		1-2	7/23/2014	X		X				X			
	HWA-MW2		2-3	7/23/2014	X		X			X	X			
	HWA-B1		0-1	7/23/2014	X		X				X			
	HWA-B1		1-2	7/23/2014	X		X				X			
	HWA-B1		2-3	7/23/2014	X		X				X			

ABW = American Boiler Works
BGS = Below Ground Surface
TBT = Tributyl Tin
cPAHs = Carcinogenic Polycyclic Aromatic Hydrocarbons
PCBs = Polychlorinated Biphenyls
TPH-Gx = Gasoline-range Total Petroleum Hydrocarbons
TPH-Dx = Diesel-range TPH
TPH-HCID = TPH Hydrocarbon Identification
BTEX = Benzene, Toluene, Ethylbenzene, and Xylenes
SVOCs = Semivolatile Organic Compounds
VOCs = Volatile Organic Compounds

TABLE 2
SUMMARY OF GROUNDWATER CHARACTERIZATION SAMPLES
ABW/BAYSIDE MARINE VCP SITE
PORT OF EVERETT, WASHINGTON

Sample ID	Date Collected	Total Metals	Dissolved Metals	cPAHs	TPH-HCID	TPH-Dx	TPH-Gx	BTEX	VOCs	Nitrate	Sulfate	Methane
B-1	12/23/2003					X	X					
B-4	2/11/2004		X			X	X	X				
P-8 (a)	2/18/2004		X	X			X					
P-26	3/4/2005	X	X									
	7/24/2014		X			X						
	8/18/2014		X (b)							X	X	
	9/3/2014		X			X				X	X	
	12/3/2014		X			X				X	X	X
	3/10/2015		X			X				X	X	X
L-FA-1	1/19/2005		X		X				X			
L-FA-2	1/19/2005		X		X				X			
B-FA-12	1/18/2005						X	X				
P-27	3/13/2014		X			X						
	7/24/2014		X			**X**						
	9/3/2014		X			X				X	X	
	12/3/2014		X			X				X	X	X
	3/10/2015		X			X	X			X	X	X
HWA-MW1	7/24/2014		X			X						
	8/18/2014		X (b)							X	X	
	9/3/2014		X			X				X	X	
	12/3/2014		X			X				X	X	X
	3/10/2015		X			X				X	X	X
HWA-MW2	7/24/2014		X			X						
	9/3/2014		X			X				X	X	
	12/3/2014		X			X				X	X	X
	3/10/2015		X			X				X	X	X
HWA-MW3	7/24/2014		X			X						
	9/3/2014		X			X				X	X	
	12/3/2014		X			X				X	X	X
	3/10/2015		X			X				X	X	X

Metals = arsenic, cadmium, copper, chromium, lead, mercury, zinc
cPAHs = Carcinogenic Polycyclic Aromatic Hydrocarbons
TPH-Gx = Gaoline-range Total Petroleum Hydrocarbons
TPH-Dx = Diesel-range TPH
TPH-HCID = TPH Hydrocarbon Identification
BTEX = Benzene, Toluene, Ethylbenzene, and Xylenes
VOCs = Volatile Organic Compounds

(a) P-8 also analyzed for chromium
(b) Arsenic only.

TABLE 3
SOIL CLEANUP LEVELS FOR DETECTED CONSTITUENTS
ABW/BAYSIDE MARINE VCP SITE
PORT OF EVERETT, WASHINGTON

Analyte	MTCA Method B Direct Contact (a)	MTCA Protection of Groundwater as Marine Surface Water (b)	Background (c)	Practical Quantitation Limit (d)	Preliminary Cleanup Level (e)
TOTAL PETROLEUM HYDROCARBONS (mg/kg)					
Gasoline range	30/100 (f,g)	--	--	5.00	30/100 (g)
Diesel range	2,000 (f)	--	--	10.00	2,000
Oil range	2,000 (f)	--	--	10.00	2,000
METALS (mg/kg)					
Arsenic	20 (h)	20 (h)	7	5.00	20
Cadmium	80 (i)	1.2	1	0.20	80 (j)
Chromium III	120,000 (i)	1,000,000 (k)	48	0.50	120,000 (j)
Copper	3,200 (i)	1.4	36	0.20	3,200 (j)
Lead	250 (l)	1,600	24	2.00	250 (l)
Mercury	24 (i)	0.1	0.07	0.05	24 (j)
Zinc	24,000 (i)	100	85	0.60	24,000 (j)
cPAHs (mg/kg)					
Benzo(a)anthracene	TEQ (m)	0.72	--	0.02	(m)
Chrysene	TEQ (m)	0.80	--	0.02	(m)
Benzo(b)fluoranthene	TEQ (m)	2.5	--	0.02	(m)
Benzo(k)fluoranthene	TEQ (m)	2.5	--	0.02	(m)
Benzo(a)pyrene	0.14 (n)	1.9	--	0.02	0.14
Indeno(1,2,3-cd)pyrene	TEQ (m)	6.9	--	0.02	(m)
Dibenz(a,h)anthracene	TEQ (m)	3.6	--	0.02	(m)
cPAH TEQ	0.14	--		--	0.14
VOCs (mg/kg)					
Xylenes (total)	16,000 (i)	15,000		1.0	15,000
Carbon Disulfide	8,000 (i)	--		1.0	8,000
Methyl ethyl ketone	48,000 (i)	--		1.0	48,000
TRIBUTYL TIN (mg/kg)					
Tributyl Tin Ion	24 0.00	7.4	--	0.04	7.4

-- = Soil criteria not established.
Shaded value = selected as proposed cleanup level.
TEQ = Toxicity Equivalency Quotient. TEQ is based on individual Toxicity Equivalency Factors (TEFs) of benzo(a)anthracene; chrysene; benzo(b)fluoranthene; benzo(k)fluoranthene; benzo(a)pyrene; indeno(1,2,3-cd)pyrene; and dibenz(a,h)anthracene.
mg/kg = milligrams per kilogram
MTCA = Model Toxics Control Act
cPAHs = Carcinogenic Polycylic Aromatic Hydrocarbons
CLARC = Cleanup Levels and Calculations
Ecology = Washington State Department of Ecology
WAC = Washington Administrative Code

(a) MTCA Method B standard formula values based on direct contact (Ecology's CLARC) unless otherwise noted.
(b) MTCA Method B values based on protection of marine surface water using MTCA equation 747-1 (November 2007), unless otherwise noted.
(c) From Ecology 1994 Puget Sound Region
(d) Practical quantitation limits (PQLs) based on analytical method reporting limits.
(e) Cleanup level based on lowest soil criteria corrected for PQL and background, as indicated by shading, unless otherwise indicated.
(f) MTCA Method A soil cleanup levels for unrestricted land uses (November 2007). MTCA Method B criteria do not exist for this constituent.
(g) MTCA Method A cleanup level is 30 mg/kg when benzene is present and 100 mg/kg when benzene is not present.
(h) MTCA Method A soil cleanup level based on direct contact using equation 740-2 and protection of drinking water using the procedures in WAC 173-340-747(4); adjusted for natural background.
(i) MTCA Method B soil standard formula value based on criteria as a non-carcinogen.
(j) Cleanup level is the Method B direct human contact cleanup level. Empirical evidence, based on groundwater analytical results, indicate that current concentrations of cadmium, chromium, copper, mercury, and zinc in soil are protective of groundwater and, therefore, need only be compared to cleanup levels protective of direct human contact.
(k) Calculated cleanup level is greater than 100% of constituent
(l) MTCA Method A soil cleanup level based on preventing unacceptable blood lead levels.
(m) In addition to this proposed cleanup level for individual PAHs, a TEQ will be computed for each sample containing carcinogenic PAHs above reporting limits and compared to the benzo(a)pyrene cleanup level in accordance with WAC 173-340-708(8)(d).
(n) MTCA Method B soil standard formula value based on criteria as a carcinogen.
(o) Direct contact for tributyl tin oxide.

TABLE 4
GROUNDWATER CLEANUP LEVELS FOR DETECTED CONSTITUENTS
ABW/BAYSIDE MARINE VCP SITE
PORT OF EVERETT, WASHINGTON

Analyte	Federal Standards (a)			State Standards			Practical Quantitation Limit (d)	Cleanup Level (e)
	Acute	Chronic	Human Health (Consumption of organisms only)	Acute (b)	Chronic (b)	MTCA Method B Surface Water Equation for Human Health (c)		
TOTAL PETROLEUM HYDROCARBONS (mg/L)								
Gasoline-range	--	--	--	--	--	--	0.1	0.8 (f)
Diesel-range	--	--	--	--	--	--	0.1	0.5 (f)
Oil-range	--	--	--	--	--	--	0.25	0.5 (f)
METALS (µg/L)								
Arsenic	69	36	0.14	69 (g)	36 (g)	5 (f)	0.2	5 (f)
Chromium (III)	--	--	--	--	-- (g)	240,000 (f)	1	240,000
Copper	2.4	2.4	--	4.8 (g)	3.1 (g)	2,900 (h)	1	2.4
Zinc	90	81	26,000	90 (g)	81 (g)	17,000 (h)	1	81

Shaded value = Basis for proposed cleanup level.
--' = Water quality standard or other criteria not established.
µg/L = micrograms per liter
mg/L = milligrams per kilogram
MTCA = Model Toxics Control Act
CFR = Code of Federal Regulations
CLARC = Cleanup Levels and Calculations
WAC = Washington Administrative Code

(a) All federal standards are from 40 CFR 131.36 (November 9, 1999) or the Clean Water Act Section 304. Values shown are the lowest standard. x1 = Clean Water Act standard. x2 = 40 CFR standard
(b) Washington State acute and chronic standards from WAC 173-201A-040 (Online Source 3/16/2006: https://fortress.wa.gov/ecy/clarc/CLARCHome.aspx).
(c) MTCA Method B standard formula values (Online Source 3/16/2006: https://fortress.wa.gov/ecy/clarc/CLARCHome.aspx), except as noted otherwise.
(d) Practical quantitation limits (PQLs) based on analytical method reporting limits.
(e) Cleanup level based on lowest water quality standard or PQL or background, indicated by shading, except as noted otherwise.
(f) Cleanup level based on MTCA Method A groundwater cleanup level in accordance with WAC 173-340-730(a)(b)(iii)(c).
(g) Indicated criteria are for dissolved fraction.
(h) MTCA Method B surface water standard formula value based on criteria as a non-carcinogen.

TABLE 5
ANALYTICAL RESULTS FOR METALS IN SOIL
ABW/BAYSIDE MARINE VCP SITE
PORT OF EVERETT, WASHINGTON

			TOTAL METALS (mg/kg) SW6000-7000 Series, EPA200.8							
Location	Depth (ft)	Date Collected	Arsenic	Cadmium	Chromium	Copper	Lead	Mercury	Silver	Zinc
			Preliminary Cleanup Level (a):							
			20	80 (b)	$1.2x10^5$	3200 (b)	250	24 (b)		24000 (b)
B-4	2.5-3.5	2/11/2004					**9**			
P-8	(0-0.5)	2/11/2004	**6.5**	0.2 U	**30.0**	**53.4**	26	**0.07**	0.3 U	**79.6** J
P-8	(2.5-3.5)	2/11/2004	**4**	0.2 U	**23.0**	**11.7**	**4**	0.05 U	0.3 U	**29.8**
B-FA-1	(0-0.5)	1/14/2005	**40**	0.5 U		**343**	**205**	**0.52**		**533**
B-FA-1	(1-2)	1/14/2005	**6**	0.2 U		**27**	**114**	**0.06**		**122**
B-FA-2	(0-0.5)	1/14/2005	**22**	**0.5**		**1,000**	**192**	**1.18**		**292**
B-FA-2	(1-2)	1/14/2005	6 U	0.2 U		**16.5**	**3**	0.05 U		**34.1**
B-FA-3	(0-0.5)	1/14/2005	**57**	**1.4**		**1,600**	**237**	**1.78**		**606**
B-FA-3	(1-2)	1/14/2005	5 U	0.2 U		**13.9**	**3**	0.05 U		**33.9**
B-FA-4	(0-0.5)	1/14/2005	**12**	**0.2**		**135**	**127**	**0.20**		**508**
B-FA-4	(1-2)	1/14/2005	5 U	0.2 U		**15.5**	**4**	0.05 U		**43.8**
B-FA-9	(0-0.5)	1/19/2005	**35**	**0.3**		**84.7**	**61**	0.05 U		**212**
B-FA-9	(1-2)	1/19/2005	**6**	0.2 U		**17.0**	**9**	0.05 UJ		**44.1**
B-FA-9.1E	(0-0.5)	3/1/2006	**28**							
B-FA-9.1W	(0-0.5)	3/1/2006	**39**							
B-FA9.2W	(0-0.5)	3/1/2006	**8**							
B-GC-1	(1-1.5)	1/14/2005	**9**	0.2 U		**14.5**	**25**	0.05 U		**37.3**
B1-AC-1	(0-3)	11/16/2007	**6**							
L-FA-2	(1.5-2.5)	1/19/2005	**7**	0.2 U		**16.2**	**4**	0.05 UJ		**41.1**
L-FA-2b	(1-1.5)	3/3/2005	**6**	**0.3**		**45.9**	**76**	**0.08** J		**391**
L-FA-2b	(2-3)	3/3/2005	6 U	**0.3**		**24.4**	**30**	**0.13** J		**219**
L-GC-1	(0.5-1)	1/19/2005	**7**	0.2 U		**31.7**	**31**	**0.11**		**97.4**
L-GC-2	(0-0.5)	1/19/2005	**19**	**0.2**		**71.9**	**48**	**0.07**		**170**
L-GC-3	(0.7-1.4)	1/19/2005	5 U	0.2 U		**20.8**	**6**	**0.04**		**40.7**
L-GC-4	(0-0.5)	1/19/2005	**34**	**0.4**		**90.5**	**66**	**0.18**		**315**
L-GC-4	(2.3-3.3)	1/19/2005	6 U	0.2 U		**22.7**	**4**	0.05 U		**41.6**
L-GC-4.1E	(0.75-1.25)	3/1/2006	**8**							
L-GC-4b	(1.7-2.2)	3/3/2005	**270**	**2**		**838**	**330**	**0.21**		**3130**
L-GC-4b	(2.7-3.7)	3/3/2005	5 U	0.2 U		**14.1**	**4**	0.04 U		**38.4**
L-GC-5	(0.5-1)	1/19/2005	**70**	**0.6**		**201**	**190**	0.05 U		**728**
L-GC-5	(1.5-2.5)	1/19/2005	**6**	0.2 U		**21.2**	**7**	**0.04**		**42.0**
L-GC-5.1SW	(0.5-1.0)	3/1/2006	**40**							
L-GC-5.2SW	(0.75-1.25)	3/1/2006	**7**							
L-GC-5b	(2.3-2.8)	3/3/2005	**9**	0.2 U		**16.9**	**13**	0.05 U		**42.5**
L-GC-5c	(1-1.5)	3/3/2005	5 U	0.2 U		**14.1**	**6**	0.05 U		**28.7**
L2-AC-1	(0-1)	8/24/2006	**17**	0.2 U	**33.2**	**21.4**	**19**	0.04 U		**74.4**
B-FA-20	(0.8-1.8)	3/5/2014	**21.9**	**0.2**		**407**	**28.0**	**0.15**		**121**
B-FA-20	(1.8-2.8)	3/5/2014	**83.8**	**0.8**		**1030**	**251**	**0.67**		**500**
B-FA-20	(2.8-3.8)	3/5/2014	**10.6**	**0.5**		**475**	**52.6**	**0.17**		**203**
B-FA-20.1S	(0.5-1.5)	3/5/2014	**4.0**	**0.2**		**20.5**	**8.0**	**0.05**		**46**
B-FA-20.1-Dup	(0.5-1.5)	3/5/2014	**3.9**	**0.2**		**21.3**	**7.5**	**0.06**		**48**
B-FA-21	(0.5-1.5)	3/5/2014	**15.8**	**0.1**		**61.0**	**31.6** J	**0.14** J		**135** J
B-FA-21.1N	(0.7-1.7)	3/5/2014	**12.1**	**0.1**		**33.2**	**8.3**	**0.06**		**67**
B-FA-21	(1.5-2.5)	3/5/2014	**3.5**	**0.2**		**19.6**	**3.0**	0.02 U		**47**
B-FA-21	(2.5-3.5)	3/5/2014	**5.3**	**0.3**		**17.9**	**2.6**	0.02 U		**39**
HWA-MW1	(0-1)	7/23/2014	**8**	0.5 U	**24**	**75**	**88**	**0.045**		**410**
HWA-MW1	(1-2)	7/23/2014	**3**	0.5 U	**21**	**25**	**10**	**0.04**		**51**
HWA-MW1	(2-3)	7/23/2014	**2.2**	0.5 U	**20**	**8.6**	**2.2**	**0.027**		**24**
HWA-MW2	(0-1)	7/23/2014	**2.3**	0.5 U	**24**	**14**	**7.3**	**0.049**		**29**
HWA-MW2	(1-2)	7/23/2014	**2.7**	0.5 U	**25**	**16**	**14**	**0.025**		**47**
HWA-MW2	(2-3)	7/23/2014	**2.6**	0.5 U	**21**	**38**	**28**	**0.084**		**70**
HWA-B1	(0-1)	7/23/2014	**6.5**	0.5 U	**30**	**36**	**22**	**0.049**		**130**
HWA-B1	(1-2)	7/23/2014	**3.1**	0.5 U	**34**	**16**	**24**	**0.04**		**55**
HWA-B1	(2-3)	7/23/2014	**1.9**	0.5 U	**29**	**14**	**2.7**	**0.029**		**32**

Box indicates exceedance of cleanup screening level.
Bold indicates detected value.
U = Indicates the compound was undetected at the reported concentration.
UJ = The analyte was not detected in the sample; the reported sample detection limit is an estimate.
J = Data validation flag indicating the analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
mg/kg = milligrams per kilogram
ft = feet

(a) See Table 3, Soil Cleanup Levels for Detected Constituents, for explanation of preliminary cleanup level.
(b) Few to no groundwater detects above cleanup screening level. Method B screening level for direct contact used as cleanup level

TABLE 6
ANALYTICAL RESULTS FOR cPAHs IN SOIL
ABW/BAYSIDE MARINE VCP SITE
PORT OF EVERETT, WASHINGTON

cPAHs (µg/kg)
SW8270C-SIM/SW8270DSIM

Location	Depth (ft)	Date Collected	Benzo[a] anthracene	Chrysene	Benzo[b] fluoranthene	Benzo[k] fluoranthene	Total Benzofluoranthenes	Benzo[a] pyrene	Indeno[1,2,3-cd] pyrene	Dibenz[a,h] anthracene	cPAH TEQ (b)
			Cleanup Screening Level (a):								**140**
P-8	(0-0.5)	2/11/2004	**7.2** J	**9.9**	7.6 U	7.6 U		7.6 U	7.6 U	7.6 U	**0.8**
P-8	(2.5-3.5)	2/11/2004	7.2 U	7.2 U	7.2 U	7.2 U		7.2 U	7.2 U	7.2 U	ND
B-FA-1	(0-0.5)	1/14/2005	74 U	74 U	74 U	74 U		74 U	74 U	74 U	ND
B-FA-2	(0-0.5)	1/14/2005	**87**	**170**	**160**	**160**		**110**	72 U	72 U	**152**
B-FA-2	(1-2)	1/14/2005	65 U	65 U	65 U	65 U		65 U	65 U	65 U	ND
B-FA-3	(0-0.5)	1/14/2005	**550**	**760**	**740**	**740**		**680**	**420**	**120**	**981**
B-FA-3	(1-2)	1/14/2005	66 U	66 U	66 U	66 U		66 U	66 U	66 U	ND
B-FA-4	(0-0.5)	1/14/2005	99 U	**150**	99 U	99 U		99 U	99 U	99 U	**1.5**
B-FA-9	(0-0.5)	1/19/2005	66 U	66 U	66 U	66 U		66 U	66 U	66 U	ND
B-GC-1	(1-1.5)	1/14/2005	70 U	70 U	70 U	70 U		70 U	70 U	70 U	ND
B1-AC-1	(0-3)	11/16/2007	63 U	63 U	63 U	63 U		63 U	63 U	63 U	ND
L-FA-2	1.5-2.5	1/19/2005	64 U	64 U	64 U	64 U		64 U	64 U	64 U	ND
L-GC-1	(0.5-1)	1/19/2005	61 U	**140**	61 U	61 U		61 U	61 U	61 U	**1.4**
L-GC-2	(0-0.5)	1/19/2005	66 U	66 U	66 U	66 U		66 U	66 U	66 U	ND
L-GC-3	(0.7-1.4)	1/19/2005	60 U	60 U	60 U	60 U		60 U	60 U	60 U	ND
L-GC-4	(0-0.5)	1/19/2005	60 U	60 U	60 U	60 U		60 U	60 U	60 U	ND
L-GC-5	(0.5-1)	1/19/2005	66 U	66 U	66 U	66 U		66 U	66 U	66 U	ND
B-FA-20	(0.8-1.8)	3/5/2014	**24**	**47**			**69**	**31**	**18**	**7.0**	**43**
B-FA-21	(0.5-1.5)	3/5/2014	**47**	**72**			**84**	**43**	**23**	5.0 U	**60**
HWA-MW1	(0-1)	7/23/2014	20 U	20 U	20 U	20 U		20 U	20 U	20 U	ND
HWA-MW1	(1-2)	7/23/2014	20 U	20 U	20 U	20 U		20 U	20 U	20 U	ND
HWA-MW1	(2-3)	7/23/2014	20 U	20 U	20 U	20 U		20 U	20 U	20 U	ND
HWA-MW2	(0-1)	7/23/2014	20 U	20 U	20 U	20 U		20 U	20 U	20 U	ND
HWA-MW2	(1-2)	7/23/2014	20 U	20 U	20 U	20 U		20 U	20 U	20 U	ND
HWA-MW2	(2-3)	7/23/2014	**24**	**38**	**34**	20 U		**29**	20 U	20 U	**35.18**
HWA-B1	(0-1)	7/23/2014	20 U	**31**	**28**	20 U		**21**	20 U	20 U	**24.11**
HWA-B1	(1-2)	7/23/2014	**29**	**53**	**45**	20 U		**41**	**24**	20 U	**51.33**
HWA-B1	(2-3)	7/23/2014	20 U	20 U	20 U	20 U		20 U	20 U	20 U	ND

Box indicates exceedance of cleanup screening level.
Bold indicates detected value.
ND = Not Detected.
U = Indicates the compound was undetected at the reported concentration.
J = Data validation flag indicating the analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
µg/kg = micrograms per liter
ft = feet
TEQ = Toxicity Equivalency Quotient
TEF = Toxicity Equivalency Factor
cPAH = Carcinogenic Polycyclic Aromatic Hydrocarbon
SIM = Selected Ion Monitoring

(a) See Table 3, Soil Cleanup Levels for Detected Constituents, for explanation of preliminary cleanup level.
(b) The TEQ for each sample was calculated based on the following TEFs: Benzo[a]anthracene (0.1); Chrysene (0.01); Benzo[b]fluoranthene (0.1); Benzo[k]fluoranthene (0.1); Benzo[a]pyrene (1); Indeno[1,2,3-cd]pyrene (0.1); and Dibenz[a,h]anthracene (0.4)

TABLE 7
ANALYTICAL RESULTS FOR PETROLEUM HYDROCARBONS AND BTEX IN SOIL
ABW/BAYSIDE MARINE VCP SITE
PORT OF EVERETT, WASHINGTON

			PETROLEUM HYDROCARBONS						BTEX (µg/kg)					
			NWTPH-HCID (mg/kg)			NWTPH-Dx (mg/kg)		NWTPH-G (mg/kg)						
Location	Depth (ft)	Date Collected	Gasoline	Diesel	Motor Oil	Diesel	Motor Oil	Gasoline	Benzene	Toluene	Ethyl-benzene	m,p-Xylene	o-Xylene
			Preliminary Cleanup Level (a):										
			---	**---**	**---**	**2000**	**2000**	**100 (b)**				**1.50E+08**	**1.50E+08**
B-FA-1	(0-0.5)	1/14/2005	22 U	**>55**	**>110**	**34**	**170**						
B-FA-2	(0-0.5)	1/14/2005	22 U	**>54**	**>110**	**28**	**130**						
B-FA-3	(0-0.5)	1/14/2005	23 U	**>58**	**>120**	**86**	**180**						
B-FA-4	(0-0.5)	1/14/2005	**>22**	**>55**	**>110**	**2,200**	**260**	**160** (c)	17 U	33 U	33 U	67 U	33 U
B-FA-4	(1-2)	1/14/2005				**5.4** J	**22** J						
B-FA-12	(3.5-4.0)	1/27/2005						**8.4**	10 U	21 U	21 U	**44**	21 U
B-GC-1	(1-1.5)	1/14/2005	21 U	53 U	100 U								
L-FA-2	(1.5-2.5)	1/19/2005	26 U	65 U	130 U				0.6 U	0.6 U	0.6 U	0.6 U	0.6 U
L-GC-1	(0.5-1)	1/19/2005	22 U	**>55**	**>110**	**53** J	**740** J						
L-GC-2	(0-0.5)	1/19/2005	24 U	59 U	120 U								
L-GC-3	(0.7-1.4)	1/19/2005	22 U	54 U	110 U								
L-GC-4	(0-0.5)	1/19/2005	22 U	54 U	**>110**	**5.7** J	**39** J						
L-GC-5	(0.5-1)	1/19/2005	21 U	**>53**	**>110**	**38** J	**210** J						
TP-1-1.0	1.0	1/9/2006				250 U	**16,000**						
TP-1-4.0	4.0	1/9/2006				1,000 U	**43,000**						
TP-1-4.5	4.5	1/9/2006				25 U	50 U						
TP-1-6.0	6.0	1/9/2006				25 U	50 U						
TP-2-3.0	3.0	1/9/2006				25 U	50 U						
TP-3-4.0	4.0	1/9/2006				25 U	50 U						
TP-4-4.0	4.0	1/9/2006				25 U	**68**						
TP-5-1.0	1.0	1/9/2006				**2,000**	**17,000**						
TP-5-4.0	4.0	1/9/2006				25 U	50 U						
TP-6-1.0	1.0	1/9/2006				25 U	**54**						
TP-7-1.0	1.0	1/9/2006				**37**	**92**						
TP-8-1.0	1.0	1/9/2006				25 U	**570**						
TP-8-4.0	4.0	1/9/2006				25 U	50 U						
TP-9-4.0A	4.0	1/9/2006				25 U	50 U						
TP-9-4.0B	4.0	1/9/2006				25 U	50 U						
B-FA-20	(0.8-1.8)	3/5/2014				**52**	**320**						
B-FA-21	(0.5-1.5)	3/5/2014				**32**	**82**						
HWA-MW1	(0-1)	7/23/2014	20 U	50 U	100 U								
HWA-MW1	(1-2)	7/23/2014	20 U	50 U	100 U								
HWA-MW1	(2-3)	7/23/2014	20 U	50 U	100 U								
HWA-MW2	(0-1)	7/23/2014	20 U	50 U	100 U								
HWA-MW2	(1-2)	7/23/2014	20 U	50 U	100 U								
HWA-MW2	(2-3)	7/23/2014	20 U	50 U	**>100**	25 U	**120**						
HWA-B1	(0-1)	7/23/2014	20 U	50 U	100 U								
HWA-B1	(1-2)	7/23/2014	20 U	50 U	100 U								
HWA-B1	(2-3)	7/23/2014	20 U	50 U	100 U								

Box indicates exceedance of cleanup screening level.
Bold indicates detected value.
U = Indicates the compound was undetected at the reported concentration.
UJ = The analyte was not detected in the sample; the reported sample detection limit is an estimate.
J = Data validation flag indicating the analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.

mg/kg = milligrams per kilogram
µg/kg = micrograms per kilogram
ft = feet
BTEX = Benzene, Toluene, Ethylbenze, Xylenes
TPH-G = Gasoline-range Total Petroleum Hydrocarbons
TPH-Dx = Diesel-range TPH
TPH-HCID = TPH Hydrocarbon Identification

(a) See Table 3, Soil Cleanup Levels for for Detected Constituents, for explanation of preliminary cleanup level.
(b) Cleanup screening level 30 mg/kg at locations with benzene present and 100 mg/kg at locations where benzene is not present.
(c) As indicated by the laboratory, the positive gasoline result for this sample does not match an identifiable gasoline pattern.

TABLE 8
ANALYTICAL RESULTS FOR PCBs, TBT, VOCs, AND SVOCs IN SOIL
ABW/BAYSIDE MARINE VCP SITE
PORT OF EVERETT, WASHINGTON

	Preliminary Cleanup Level (a)	B-FA-4 (0-0.5) HP39L 1/14/2005	L-FA-2 (1.5-2.5) HQ00E/HT11A 1/19/2005
PCBs (µg/kg)			
Method SW8082			
Aroclor-1016			33 U
Aroclor-1242			33 U
Aroclor-1248			33 U
Aroclor-1254			33 U
Aroclor-1260			33 U
Aroclor-1221			33 U
Aroclor-1232			33 U
Total PCBs			ND
TRIBUTYL TIN (µg/kg)			
TBT Ion by SIM			
Tributyl Tin Chloride		**41**	
Dibutyl Tin Dichloride		**46**	
Butyl Tin Trichloride		**14**	
TBT as Tin ion	7,400	**37**	
VOLATILE ORGANIC COMPOUNDS (µg/kg)			
Method 8260B			
Chloromethane			0.6 U
Bromomethane			0.6 U
Vinyl chloride			0.6 U
Chloroethane			0.6 U
Methylene chloride			1.2 U
Acetone			17 U
Carbon disulfide	8,000,000		**2.2**
1,1-Dichloroethene			0.6 U
1,1-Dichloroethane			0.6 U
trans-1,2-Dichloroethene			0.6 U
cis-1,2-Dichloroethene			0.6 U
Chloroform			0.6 U
1,2-Dichloroethane			0.6 U
Methyl ethyl ketone	48,000,000		**5.0**
1,1,1-Trichloroethane			0.6 U
Carbon tetrachloride			0.6 U
Vinyl acetate			3.0 U
Bromodichloromethane			0.6 U
1,2-Dichloropropane			0.6 U
cis-1,3-Dichloropropene			0.6 U
Trichloroethene			0.6 U
Dibromochloromethane			0.6 U
1,1,2-Trichloroethane			0.6 U
Benzene			0.6 U
trans-1,3-Dichloropropene			0.6 U
2-Chloroethylvinylether			3.0 U
Bromoform			0.6 U
4-Methyl-2-Pentanone (MIBK)			3.0 UJ
2-Hexanone			3.0 UJ
Tetrachloroethene			0.6 U
1,1,2,2-Tetrachloroethane			0.6 U
Toluene			0.6 U
Chlorobenzene			0.6 U
Ethylbenzene			0.6 U
Styrene			0.6 U
Trichlorofluoromethane			0.6 U
1,1,2-Trichloro-1,2,2-trifluoroethane			1.2 U
m,p-Xylene			0.6 U
o-Xylene			0.6 U
1,2-Dichlorobenzene			0.6 U
1,3-Dichlorobenzene			0.6 U
1,4-Dichlorobenzene			0.6 U
Acrolein			30 U

TABLE 8
ANALYTICAL RESULTS FOR PCBs, TBT, VOCs, AND SVOCs IN SOIL
ABW/BAYSIDE MARINE VCP SITE
PORT OF EVERETT, WASHINGTON

	Preliminary Cleanup Level (a)	B-FA-4 (0-0.5) HP39L 1/14/2005	L-FA-2 (1.5-2.5) HQ00E/HT11A 1/19/2005
Methyl Iodide			0.6 U
Bromoethane			1.2 U
Acrylonitrile			3.0 U
1,1-Dichloropropene			0.6 U
Dibromomethane			0.6 U
1,1,1,2-Tetrachloroethane			0.6 U
1,2-Dibromo-3-chloropropane			3.0 U
1,2,3-Trichloropropane			1.2 U
trans-1,4-Dichloro-2-butene			3.0 U
1,3,5-Trimethylbenzene			0.6 U
1,2,4-Trimethylbenzene			0.6 U
Hexachlorobutadiene			3.0 U
Ethylene Dibromide			0.6 U
Bromochloromethane			0.6 U
2,2-Dichloropropane			0.6 U
1,3-Dichloropropane			0.6 U
Isopropylbenzene			0.6 U
n-Propylbenzene			0.6 U
Bromobenzene			0.6 U
2-Chlorotoluene			0.6 U
4-Chlorotoluene			0.6 U
tert-Butylbenzene			0.6 U
sec-Butylbenzene			0.6 U
4-Isopropyltoluene			0.6 U
n-Butylbenzene			0.6 U
1,2,4-Trichlorobenzene			3.0 U
Naphthalene			3.0 U
1,2,3-Trichlorobenzene			3.0 U
SEMIVOLATILE ORGANIC COMPOUNDS (µg/kg)			
Method 8270C			
Phenol			64 U
Bis-(2-Chloroethyl) Ether			64 U
2-Chlorophenol			64 U
1,3-Dichlorobenzene			64 U
1,4-Dichlorobenzene			64 U
Benzyl Alcohol			320 U
1,2-Dichlorobenzene			64 U
2-Methylphenol			64 U
2,2'-Oxybis(1-Chloropropane)			64 U
4-Methylphenol			64 U
N-Nitroso-Di-N-Propylamine			320 U
Hexachloroethane			64 U
Nitrobenzene			64 U
Isophorone			64 U
2-Nitrophenol			320 U
2,4-Dimethylphenol			64 U
Benzoic Acid			640 U
bis(2-Chloroethoxy) Methane			64 U
2,4-Dinitrophenol			320 U
1,2,4-Trichlorobenzene			64 U
Naphthalene			64 U
4-Chloroaniline			320 U
Hexachlorobutadiene			64 U
4-Chloro-3-methylphenol			320 U
2-Methylnaphthalene			64 U
Hexachlorocyclopentadiene			320 U
2,4,6-Trichlorophenol			320 U
2,4,5-Trichlorophenol			320 U

TABLE 8
ANALYTICAL RESULTS FOR PCBs, TBT, VOCs, AND SVOCs IN SOIL
ABW/BAYSIDE MARINE VCP SITE
PORT OF EVERETT, WASHINGTON

	Preliminary Cleanup Level (a)	B-FA-4 (0-0.5) HP39L 1/14/2005	L-FA-2 (1.5-2.5) HQ00E/HT11A 1/19/2005
2-Chloronaphthalene			64 U
2-Nitroaniline			320 U
Dimethylphthalate			64 U
Acenaphthylene			64 U
3-Nitroaniline			320 U
Acenaphthene			64 U
2,4-Dichlorophenol			640 U
4-Nitrophenol			320 U
Dibenzofuran			64 U
2,6-Dinitrotoluene			320 U
2,4-Dinitrotoluene			320 U
Diethylphthalate			64 U
4-Chlorophenyl-phenylether			64 U
Fluorene			64 U
4-Nitroaniline			320 U
4,6-Dinitro-2-Methylphenol			640 U
N-Nitrosodiphenylamine			64 U
4-Bromophenyl-phenylether			64 U
Hexachlorobenzene			64 U
Pentachlorophenol			320 U
Phenanthrene			64 U
Carbazole			64 U
Anthracene			64 U
Di-n-Butylphthalate			64 U
Fluoranthene			64 U
Pyrene			64 U
Butylbenzylphthalate			64 U
3,3'-Dichlorobenzidine			320 U
Benzo(a)anthracene			64 U
bis(2-Ethylhexyl)phthalate			64 U
Chrysene			64 U
Di-n-Octyl phthalate			64 U
Benzo(b)fluoranthene			64 U
Benzo(k)fluoranthene			64 U
Benzo(a)pyrene			64 U
Indeno(1,2,3-cd)pyrene			64 U
Dibenz(a,h)anthracene			64 U
Benzo(g,h,i)perylene			64 U

Bold indicates detected value.
U = Indicates the compound was undetected at the reported concentration.
UJ = The analyte was not detected in the sample; the reported sample detection limit is an estimate.
PCBs = Polychlorinated Biphenyls
TBT = Tributyl Tin
VOCs = Volatile Organic Compounds
SVOCs = Semivolatile Organic Compounds
ABW = American Boiler Works
VCP = Voluntary Cleanup Program
SIM = Selected Ion Monitoring
ug/kg = micrograms per kilogram
ND = Not Detected

(a) See Table 3, Soil Cleanup Levels for Detected Constituents, for explanation of preliminary cleanup level.

TABLE 9
SOIL INDICATOR HAZARDOUS SUBSTANCE EVALUATION
ABW / BAYSIDE MARINE VCP SITE
PORT OF EVERETT, WASHINGTON

Analyte (a)	Number of Soil Samples Analyzed	Number of Samples with Detected Concentrations	Frequency of Detection (%)	Number of Soil Samples with Concentrations Exceeding Cleanup Levels	Units	Cleanup Level	Min Reporting Limit	Max Reporting Limit	Min Detection	Max Detection	Chemical Selected As an IHS?	Affected Area	Rationale Inclusion or Exclusion as IHS
cPAHs													
Method 8270-SIM													
cPAH TEQ	28	10	36	2	µg/kg	140	---	---	0.8	981	Yes	B-1	Analyte exceeded the cleanup level
Metals													
Method 6000-7000 Series													
Arsenic	53	45	85	10	mg/kg	20	1	6	1.9	270	Yes	B-1, B-1b, L-1, L-2, L-3	Analyte exceeded the cleanup level
Cadmium	46	19	41	0	mg/kg	80	0.2	0.5	0.2	1.4	No		Analyte did not exceed the cleanup level
Chromium	12	12	100	0	mg/kg	120,000	---	---	20	34	No		Analyte did not exceed the cleanup level
Copper	46	46	100	0	mg/kg	3,200	---	---	8.6	1,600	No		Analyte did not exceed the cleanup level
Lead	47	47	100	1	mg/kg	250	--	--	2.2	330	No		The only soil sample that exceeded the lead cleanup level also exceeded the arsenic cleanup level. Cleanup of arsenic will result in cleanup of lead.
Mercury	46	30	65	0	mg/kg	24	0.02	0.05	0.025	1.78	No		Analyte did not exceed the cleanup level
Zinc	46	46	100	0	mg/kg	24,000	---	---	24	3,130	No		Analyte did not exceed the cleanup level
Tributyl Tin (TBT)													
TBT Ion by SIM													
TBT Tin Ion	1	1	100	0	µg/kg	7,400	--	--	37	37	No		Analyte did not exceed the cleanup level
Petroleum Hydrocarbons Method NWTPH-Dx, NWTPH-Gx, and/or NWTPH-HCID													
Gasoline range	21	2	10	1	mg/kg	100	21	26	8.4	160	No		The only soil sample that exceeded the gasoline cleanup level also exceeded the diesel cleanup level and the laboratory indicated that the sample did not match an identifiable gasoline pattern. Cleanup of TPH-D will result in cleanup of TPH-G.
Diesel range	38	12	32	1	mg/kg	2,000	25	1000	5.4	2,200	Yes	B-1a	Analyte exceeded the cleanup level
Motor oil range	38	18	47	3	mg/kg	2,000	50	50	22	43,000	Yes	ABW-P1	Analyte exceeded the cleanup level
Volatile Organic Compounds (VOCs)													
Method 8021 or 8260													
Xylenes (m, p)	3	1	33	0	µg/kg	150,000,000	0.6	67	44	44	No		Analyte did not exceed the cleanup level
Carbon disulfide	1	1	100	0	µg/kg	8,000,000	--	--	2.2	2.2	No		Analyte did not exceed the cleanup level
Methyl ethyl ketone	1	1	100	0	µg/kg	48,000,000	--	--	5.0	5.0	No		Analyte did not exceed the cleanup level

TPH-G Gasoline-range Total Petroleum Hydrocarbons
TPH-D = Diesel-range TPH
IHS = Indicator Hazardous Substance
cPAH = Carcinogenic Polycyclic Aromatic Hydrocarbon
TEQ = Toxicity Equivalency Quotient
SIM = Selected Ion Monitoring
ug/kg = micrograms per kilogram
mg/kg = milligrams per kilogram

(a) Only positively detected chemicals are presented in this table

TABLE 10
GROUNDWATER ANALYTICAL DATA (2003-2005)
NORTH MARINA ABW/BAYSIDE MARINE VCP SITE
PORT OF EVERETT, WASHINGTON

Sample ID Laboratory ID Date Collected	Preliminary Cleanup Level (a)	B-1 GE48K 12/23/2003	B-4 GI07A 2/11/2004	NMP2-P-8 GI71I 2/18/2004	B-FA-12 HP77D 1/18/2005	L-FA-1 HP99B 1/19/2005	L-FA-2 HP99A 1/19/2005	P-26 HV19A/B 3/4/2005
DISSOLVED METALS (µg/L)								
Method SW6000-7000								
Arsenic	5			1 U		**54**	**1.2**	**0.5**
Cadmium				2 U		0.2 U	0.2 U	0.2 U
Chromium	240,000			5 U				
Copper	2.4			2 U		0.5 U	**0.7**	0.5 U
Lead			1 U	1 U		1 U	1 U	1 U
Mercury				0.1 U		0.1 U	0.1 U	0.1 U
Silver				3 U				
Zinc	81			6 U		**6**	**158**	**13**
TOTAL METALS (µg/L)								
Method SW6000-7000/200.8								
Arsenic	5							**0.6**
Cadmium								0.2 U
Chromium								
Copper	2.4							**1.6**
Lead								1 U
Mercury								0.1 U
Zinc	81							**15**
TOTAL PETROLEUM HYDROCARBONS (mg/L)								
Method NWTPH-HCID								
Gasoline	0.8					0.25 U	0.25 U	
Diesel	0.5					0.63 U	0.63 U	
Motor Oil	0.5					0.63 U	0.63 U	
NWTPH-Dx (mg/L)								
Diesel-Range	0.5	0.25 U	0.25 U					
Motor Oil-Range	0.5	0.5 U	**0.92**					
NWTPH-Gx (mg/kg)								
Gasoline-Range	0.8	0.25 U	0.25 U	0.25 U	0.25 U			
BTEX (µg/L)								
Method 8260B								
Benzene			1.0 U		1.0 U	1.0 U	1.0 U	
Toluene			1.2 U		1.0 U	1.0 U	1.0 U	
Ethylbenzene			1.0 U		1.0 U	1.0 U	1.0 U	
m,p-Xylene			1.0 U		1.0 U	1.0 U	1.0 U	
o-Xylene			1.0 U		1.0 U	1.0 U	1.0 U	
VOLATILE ORGANIC COMPOUNDS (µg/L)								
Method 8260B								
Chloromethane						1.0 U	1.0 U	
Bromomethane						1.0 U	1.0 U	
Vinyl chloride						1.0 U	1.0 U	
Chloroethane						1.0 U	1.0 U	
Methylene chloride						2.0 U	2.0 U	
Acetone						5.0 U	5.0 U	
Carbon disulfide						1.0 U	1.0 U	
1,1-Dichloroethene						1.0 U	1.0 U	
1,1-Dichloroethane						1.0 U	1.0 U	
trans-1,2-Dichloroethene						1.0 U	1.0 U	
cis-1,2-Dichloroethene						1.0 U	1.0 U	
Chloroform						1.0 U	1.0 U	
1,2-Dichloroethane						1.0 U	1.0 U	
Methyl ethyl ketone						5.0 U	5.0 U	
1,1,1-Trichloroethane						1.0 U	1.0 U	
Carbon tetrachloride						1.0 U	1.0 U	
Vinyl acetate						5.0 U	5.0 U	
Bromodichloromethane						1.0 U	1.0 U	
1,2-Dichloropropane						1.0 U	1.0 U	
cis-1,3-Dichloropropene						1.0 U	1.0 U	

TABLE 10
GROUNDWATER ANALYTICAL DATA (2003-2005)
NORTH MARINA ABW/BAYSIDE MARINE VCP SITE
PORT OF EVERETT, WASHINGTON

Sample ID Laboratory ID Date Collected	Preliminary Cleanup Level (a)	B-1 GE48K 12/23/2003	B-4 GI07A 2/11/2004	NMP2-P-8 GI71I 2/18/2004	B-FA-12 HP77D 1/18/2005	L-FA-1 HP99B 1/19/2005	L-FA-2 HP99A 1/19/2005	P-26 HV19A/B 3/4/2005
Trichloroethene						1.0 U	1.0 U	
Dibromochloromethane						1.0 U	1.0 U	
1,1,2-Trichloroethane						1.0 U	1.0 U	
Benzene						1.0 U	1.0 U	
trans-1,3-Dichloropropene						1.0 U	1.0 U	
2-Chloroethylvinylether						5.0 U	5.0 U	
Bromoform						1.0 U	1.0 U	
4-Methyl-2-Pentanone (MIBK)						5.0 U	5.0 U	
2-Hexanone						5.0 U	5.0 U	
Tetrachloroethene						1.0 U	1.0 U	
1,1,2,2-Tetrachloroethane						1.0 U	1.0 U	
Toluene						1.0 U	1.0 U	
Chlorobenzene						1.0 U	1.0 U	
Ethylbenzene						1.0 U	1.0 U	
Styrene						1.0 U	1.0 U	
Trichlorofluoromethane						1.0 U	1.0 U	
1,1,2-Trichloro-1,2,2-trifluoroethane						2.0 U	2.0 U	
m,p-Xylene						1.0 U	1.0 U	
o-Xylene						1.0 U	1.0 U	
1,2-Dichlorobenzene						1.0 U	1.0 U	
1,3-Dichlorobenzene						1.0 U	1.0 U	
1,4-Dichlorobenzene						1.0 U	1.0 U	
Acrolein						50 U	50 U	
Methyl Iodide						1.0 U	1.0 U	
Bromoethane						2.0 U	2.0 U	
Acrylonitrile						5.0 U	5.0 U	
1,1-Dichloropropene						1.0 U	1.0 U	
Dibromomethane						1.0 U	1.0 U	
1,1,1,2-Tetrachloroethane						1.0 U	1.0 U	
1,2-Dibromo-3-chloropropane						5.0 U	5.0 U	
1,2,3-Trichloropropane						2.0 U	2.0 U	
trans-1,4-Dichloro-2-butene						5.0 U	5.0 U	
1,3,5-Trimethylbenzene						1.0 U	1.0 U	
1,2,4-Trimethylbenzene						1.0 U	1.0 U	
Hexachlorobutadiene						5.0 U	5.0 U	
Ethylene Dibromide						1.0 U	1.0 U	
Bromochloromethane						1.0 U	1.0 U	
2,2-Dichloropropane						1.0 U	1.0 U	
1,3-Dichloropropane						1.0 U	1.0 U	
Isopropylbenzene						1.0 U	1.0 U	
n-Propylbenzene						1.0 U	1.0 U	
Bromobenzene						1.0 U	1.0 U	
2-Chlorotoluene						1.0 U	1.0 U	
4-Chlorotoluene						1.0 U	1.0 U	
tert-Butylbenzene						1.0 U	1.0 U	
sec-Butylbenzene						1.0 U	1.0 U	
4-Isopropyltoluene						1.0 U	1.0 U	
n-Butylbenzene						1.0 U	1.0 U	
1,2,4-Trichlorobenzene						5.0 U	5.0 U	
Naphthalene						5.0 U	5.0 U	
1,2,3-Trichlorobenzene						5.0 U	5.0 U	
cPAHs (µg/L)								
Method 8270C-SIM								
Benzo(a)anthracene				0.010 UJ				
Chrysene				0.010 UJ				
Benzo(b)fluoranthene				0.010 UJ				
Benzo(k)fluoranthene				0.010 UJ				
Benzo(a)pyrene				0.010 UJ				
Indeno(1,2,3-cd)pyrene				0.010 UJ				
Dibenzo(a,h)anthracene				0.010 UJ				
cPAH TEQ				ND				

ND = Not Detected
TPH-Gx = Gasoline-range Total Petroleum Hydrocarbons
TPH-Dx = Diesel-range TPH
TPH-HCID = TPH Hydrocarbon Identification
cPAHs = Carcinogenic Polycyclic Aromatic Hydrocarbons
TEQ = Toxicity Equivalency Quotient
SIM = Select Ion Monitoring
BTEX = Benzene, Toluene, Ethylbenzene, and Xylenes

U = Indicates the compound was undetected
UJ = The analyte was not detected in the sample; the reported sample detection limit is an estimate.

TABLE 11
GROUNDWATER ANALYTICAL DATA (2014-2015)
NORTH MARINA ABW/BAYSIDE MARINE VCP SITE
PORT OF EVERETT, WASHINGTON

Sample ID Laboratory ID Date Collected	Preliminary Cleanup Level (a)	P-26 7/24/2014	P-26 8/18/2014	P-26 9/3/2014	P-26 ZN28F 12/3/2014	P-26 ZZ75C 3/10/2015	P-27 YC90A 3/13/2014	Dup of P-27 DUP-1 YC90B 3/13/2014	P-27 7/24/2014	P-27 9/3/201	P-27 ZN28A 12/3/2014	Dup of P-27 DUP1 ZN28B 12/3/2014	P-27 AC91A/ZZ75G 3/26/2015	Dup of P-27 DUP-2 ZZ75F 3/10/2015	HWA-MW1 7/24/2014	HWA-MW1 8/18/2014	HWA-MW1 9/3/2014	HWA-MW1 ZN28D 12/3/2014
DISSOLVED METALS (µg/L)																		
Method SW6000-7000																		
Arsenic	5	**15**	**9.8**	**6.3**	**18.6**	**12.8**	0.5 U	**0.6**	1 U	1 U	**3.0**		**1.7**		**64**	**77**	**91**	**65.1**
Cadmium		1 U		1 U	0.1 U	0.1 U	0.1 U	0.1 U	1 U	1 U	0.1 U		0.1 U		1 U		1 U	0.1 U
Chromium	240,000	2 U		2 U	**2**	**1.0**			2 U	2 U	1 U		0.5 U		**2.1**		**2.2**	**3**
Copper	2.4	2 U		2 U	**0.5**	0.5 U	0.5 U	**0.6**	2 U	2 U	**0.8**		**0.5**		2 U		2 U	**0.7**
Lead		1 U		1 U	0.1 U	0.1 U	0.1 U	0.1 U	1 U	1 U	0.1 U		0.1 U		1 U		1 U	0.1 U
Mercury		0.2 U		0.2 U	0.1 U	0.1 U	0.1 U	0.1 U	0.2 U	0.2 U	0.1 U		0.1 U		0.2 U		0.2 U	0.1 U
Silver																		
Zinc	81	2.5 U		**5.7**	4 U	4 U	4 U	**5**	2.5 U	**8.2**	**5**		4 U		2.5 U		**7.6**	**8**
NWTPH-Dx (mg/L)																		
Diesel-Range	0.5	**0.14**		**0.18**	0.10 U	0.10 U	0.13 U	0.11 U	0.13 U	0.13 U	0.10 U		0.10 U		**0.15**		**0.13**	0.10 U
Motor Oil-Range	0.5	0.25 U		0.25 U	0.20 U	0.20 U	0.27 U	0.23 U	0.25 U	0.25 U	0.20 U		0.20 U		0.25 U		0.25 U	0.20 U
NWTPH-Gx (mg/kg)																		
Gasoline-Range	0.8										0.25 U	0.25 U	0.25 U	0.25 U				
DISSOLVED GASES (µg/L)																		
RSK-175																		
Methane					**8980**	**15100**					**503**	**536**	**5780**					**15000**
CONVENTIONALS (mg/L)																		
Method EPA300.0																		
Nitrate			**0.18**	**0.19**	0.1 U	**0.1**				0.15 U	0.1 U		0.1 U			0.15 U	**0.27**	**0.1**
Sulfate			0.26 U	**0.37**	0.1 U	**0.2**				**0.58**	**9.1**		**4.1**			0.26 U	0.26 U	**0.5**
Field Parameters																		
pH		6.42	7.01	7.14	6.71	6.04	6.39	6.33	7.05	7.21	7.3		6.37		6.59	6.87	6.8	6.74
Conductance (µS/cm)		1112	989	968	4.59	404	856	856	3430	481	460		421		1259	1204	968	736
Temperature (°C)		18.3	17.6	20.7	13.07	11.94	11.79	11.79	18.5	20.2	10.9		11.54		20.6	17.9	22.7	11.93
Dissolved Oxygen (mg/l)		3	0.33	0.39	0.49	4.41	1.92	1.92	0.23	0.63	0.95		1.19		0.27	0.54	0.39	0.51
ORP (mV)			95	120	-92.2	-82	-84.7	-84.7		39	-42.6		-28			50	49	-114.6
Ferrous Iron (mg/L)			1.2	1	1.2	1.8				0.4	1.5		1.4			1.6	1.5	1.6
Turbidity (NTU)					87.87	12.3	2.57	2.57			0.27		1.66					1.72

TABLE 11
GROUNDWATER ANALYTICAL DATA (2014-2015)
NORTH MARINA ABW/BAYSIDE MARINE VCP SITE
PORT OF EVERETT, WASHINGTON

Sample ID	Dup of HWA-MW1 DUP2	HWA-MW1	Dup of HWA-MW1 DUP-1	HWA-MW2	HWA-MW2	HWA-MW2	HWA-MW2	HWA-MW3	HWA-MW3	HWA-MW3	HWA-MW3
Laboratory ID	ZN28E	ZZ75B	ZZ75A			ZN28G	ZZ75D			ZN28C	ZZ75E
Date Collected	12/3/2014	3/10/2015	3/10/2015	7/24/2014	9/3/2014	12/3/2014	3/10/2015	7/24/2014	9/3/2014	12/3/2014	3/10/2015
DISSOLVED METALS (µg/L)											
Method SW6000-7000											
Arsenic	**66.3**	**51.5**	**52.5**	**2.7**	**8.2**	**9.6**	**8.1**	**2.1**	1 U	**2.4**	**3.2**
Cadmium	0.1 U	0.1 U	0.1 U	1 U	1 U	0.1 U	0.1 U	1 U	1 U	0.1 U	0.1 U
Chromium	**2**	**1.8**	**1.8**	**2.1**	**2.8**	**2**	**1.4**	2 U	2 U	**1**	**1.1**
Copper	**0.7**	**0.8**	**0.7**	2 U	2 U	**0.6**	0.5 U	2 U	2 U	**0.6**	**0.5**
Lead	**0.2**	0.1 U	0.1 U	1 U	1 U	0.1 U	0.1 U	1 U	1 U	0.1 U	0.1 U
Mercury	0.1 U	0.1 U	0.1 U	0.2 U	0.2 U	0.1 U	0.1 U	0.2 U	0.2 U	0.1 U	0.1 U
Silver											
Zinc	**8**	**4**	4 U	2.5 U	**13**	**4**	4 U	2.5 U	**10**	**6**	4 U
NWTPH-Dx (mg/L)											
Diesel-Range	0.10 U	0.10 U	0.10 U	**0.22**	**0.14**	0.10 U	0.10 U	0.13 U	0.13 U	0.10 U	0.10 U
Motor Oil-Range	0.20 U	0.20 U	0.20 U	0.25 U	0.25 U	0.20 U	0.20 U	0.25 U	0.25 U	0.20 U	0.20 U
NWTPH-Gx (mg/kg)											
Gasoline-Range											
DISSOLVED GASES (µg/L)											
RSK-175											
Methane	**14000**	**17700**	**16900**			**13300**	**25200**			**3480**	**9550**
CONVENTIONALS (mg/L)											
Method EPA300.0											
Nitrate	**0.1**	0.1 U	0.1 U		0.61	0.1 U	0.1 U		0.17	0.1 U	0.1 U
Sulfate	**0.4**	**0.2**	**0.3**		0.26 U	0.1 U	**0.8**		0.26 U	**0.1**	**0.5**
Field Parameters											
pH	6.75	6.19		6.42	6.38	6.15	6.22	6.71	7.13	6.82	6.78
Conductance (µS/cm)	736	663		1400	847	389	326	1031	938	406	334
Temperature (°C)	11.94	11.95		17.7	20.5	13.23	11.46	15.4	17	11.87	11.09
Dissolved Oxygen (mg/l)	0.52	5.05		0.21	0.66	0.36	2.37	0.26	0.41	0.54	1.54
ORP (mV)	-114.6	-105			75	-13.8	-70		143	-63.5	-80
Ferrous Iron (mg/L)	1.6	1.4			0.6	5	1.8		1.7	1.8	1.4
Turbidity (NTU)	2.05	8.82				104.2	62.1			26.7	70.9

Box indicates exceedance of cleanup level.
Bold indicates detected value.
ND = Not Detected
µg/L = micrograms per liter
mg/L = milligrams per liter
mg/kg = milligrams per kilogram

U = Indicates the compound was undetected
UJ = The analyte was not detected in the sample; the reported sample detection limit is an estimate.

(a) See Table 3, Soil Cleanup Levels for Detected Constituents, for explanation of preliminary cleanup level.

TABLE 12
GROUNDWATER INDICATOR HAZARDOUS SUBSTANCE EVALUATION
ABW/BAYSIDE MARINE VCP SITE
PORT OF EVERETT, WASHINGTON

Analyte (a)	Number of Water Samples Analyzed	Number of Samples with Detected Concentrations	Frequency of Detection (%)	Number of Water Samples with Concentrations Exceeding Cleanup Levels	Units	Cleanup Level	Min Reporting Limit	Max Reporting Limit	Min Detection	Max Detection	Chemical Selected As an IHS?	Affected Area	Rationale Inclusion or Exclusion as IHS
Metals													
Method 6000-7000 Series													
Arsenic (Dissolved)	27	22	81	14	µg/L	5	0.5	1	0.5	91	No		Analyte exceeded cleanup level but is attributed to naturally reduced conditions and is not the result of a Site release.
Chromium III (Dissolved)	21	12	57	0	µg/L	240,000	2	5	1	2.8	No		Analyte did not exceed cleanup level
Copper (Dissolved)	25	9	36	0	µg/L	2.4	0.5	2	0.7	0.8	No		Analyte did not exceed cleanup level
Zinc (Dissolved)	25	13	52	1	µg/L	81	4	6	6	158	No		Analyte exceeded cleanup level in sample from one direct push boring, but not in sample collected from well installed in immediate vicinity or other Site monitoring wells.
Petroleum Hydrocarbons Method NWTPH-Dx and/or NWTPH-HCID													
Diesel Range	25	6	24	0	mg/L	0.5	0.1	0.63	0.13	0.22	No		Analyte did not exceed cleanup level
Motor oil range	25	1	4	1	mg/L	0.5	0.23	0.63	0.92	0.92	No		Analyte exceeded cleanup level in sample from one direct push boring, but not in sample collected from well installed in immediate vicinity or other Site monitoring wells.

mg/L = milligrams per liter
ug/L = micrograms per liter
HIS = Indicator Hazardous Substance
TPH-Dx = Diesel-range Total Petroleum Hydrocarbons
TPH-HCID = TPH Hydrocarbon Identification

(a) Only positively detected chemicals are presented on this table

TABLE 13
COMPLIANCE MONITORING SAMPLE RESULTS
ABW/BAYSIDE MARINE VCP SITE
PORT OF EVERETT, WASHINGTON

	Site	B1-AC-1	B1-B1	B1-B2	B1-B2a	B1-B3	B1-B3a	B1-B4	B1-B5	B1-B6	B1-B7	B1-B8	B1-B9	B1-B10	B1-S1	B1-S2	B1-S3	B1-S4
		3	1-1.5	1-1.5	1.5-2	1-1.5	2.5-3	1-1.5	1-1.5	1-1.5	1-1.5	1-1.5	1-1.5	1-1.5	0.5-1	0.5-1	0-1	0-1
	Cleanup	LY74Q	JU68E	JU68F	JV94A	LY74A	MB63A	LY74B	LY74C	LY74D	LY74E	LY74F	LY74G	LY74H	JU68A	JU68B	LY74I	LY74J
	Levels (a)	11/16/2007	8/28/2006	8/28/2006	9/11/2006	11/16/2007	12/10/2007	11/16/2007	11/16/2007	11/16/2007	11/16/2007	11/16/2007	11/16/2007	11/16/2007	8/28/2006	8/28/2006	11/16/2007	11/16/2007
NWTPH-Dx (mg/kg)																		
Diesel-Range Hydrocarbons	2000 (b)		U							520 J	5.4 UJ		5.3 UJ					
Motor Oil-Range Hydrocarbons	2000 (b)		U							280 J	11 UJ		11 UJ					
TOTAL METALS (mg/kg)																		
SW 6000/7000 series																		
Antimony	32																	
Arsenic	20 (b)	6	5 U	27	5	21 J	6 U	6	6	7	6	5	6	6	6	6	5 U	8
Cadmium	80		0.2 U	0.2 U	0.2										0.2 U	0.2 U		
Chromium	--		25.1	31.2	24.9										27.8 J	24.1		
Copper	2,960		15.3	59.4	12.5										36.4	39.2		
Lead	250 (b)		5	34	4										40 J	31		
Mercury	24		0.05 U	0.10	0.04										0.05 U	0.04 U		
Zinc	24,000		38.5	116	31.7										76.1	91.9		
cPAHs (µg/kg)																		
SW8270D																		
Benzo(a)anthracene	--	63 U	69 U	69 U		63 U	65 U	65 U	63 U	66 U	63 U	63 U	66 U	64 U	67 U	68 U	64 U	65 U
Chrysene	--	63 U	69 U	69 U		63 U	65 U	65 U	63 U	66 U	63 U	63 U	66 U	64 U	67 U	68 U	64 U	65 U
Benzo(b)fluoranthene	--	63 U	69 U	69 U		63 U	65 U	65 U	63 U	66 U	63 U	63 U	66 U	64 U	67 U	68 U	64 U	65 U
Benzo(k)fluoranthene	--	63 U	69 U	69 U		63 U	65 U	65 U	63 U	66 U	63 U	63 U	66 U	64 U	67 U	68 U	64 U	65 U
Benzo(a)pyrene	--	63 U	69 U	69 U		63 U	65 U	65 U	63 U	66 U	63 U	63 U	66 U	64 U	67 U	68 U	64 U	65 U
Indeno(1,2,3-cd)pyrene	--	63 U	69 U	69 U		63 U	65 U	65 U	63 U	66 U	63 U	63 U	66 U	64 U	67 U	68 U	64 U	65 U
Dibenz(a,h)anthracene	--	63 U	69 U	69 U		63 U	65 U	65 U	63 U	66 U	63 U	63 U	66 U	64 U	67 U	68 U	64 U	65 U
TEQ	140 (c)	ND	ND	ND		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

TABLE 13
COMPLIANCE MONITORING SAMPLE RESULTS
ABW/BAYSIDE MARINE VCP SITE
PORT OF EVERETT, WASHINGTON

	Site	B1-S5	B1-S6	B1-S7	B1-S8	B1-S8a	B1-S9	B1-S10	B1-S11	B1-S12	B1A-S1	B1A-S2	B1A-S3	B1b - B1	B1b - B2	B1b - B3	B1b - B4	B1b - B5
		0-1	0-1	0-1	0-1	0.25-1	0-1	0-1	0-1	0-1	0.25-1	0.25-1	0.25-1	3-3.5 ft	3-3.5 ft	3-3.5 ft	3-3.5 ft	3-3.5 ft
	Cleanup	LY74K	LY74L	LY74M	LY74N	ME13A	LY74O	LY74P	JU68D	JU68C	0711019-01	0711019-02	0711019-03	EV15030161-09	EV15030161-06	EV15030161-01	EV15030157-06	EV15030157-01 E
	Levels (a)	11/16/2007	11/16/2007	11/16/2007	11/16/2007	1/2/2008	11/16/2007	11/16/2007	8/28/2006	8/28/2006	11/6/2007	11/6/2007	11/6/2007	3/27/2015	3/27/2015	3/27/2015	3/26/2015	3/26/2015
NWTPH-Dx (mg/kg)																		
Diesel-Range Hydrocarbons	2000 (b)				5.4 UJ		18 J				25 U	25 U	25 U					
Motor Oil-Range Hydrocarbons	2000 (b)				11 UJ		80 J				50 U	50 U	50 U					
TOTAL METALS (mg/kg)																		
SW 6000/7000 series																		
Antimony	32																	
Arsenic	20 (b)	7	34	28	7		6	8	5 U	6				2.5	2.2	2.2	17	2.7
Cadmium	80								0.2 U	0.2 U								
Chromium	--								21.9	23.9								
Copper	2,960								34.7	41.0								
Lead	250 (b)								11	18								
Mercury	24								0.04 U	0.08								
Zinc	24,000								51.7	107								
cPAHs (µg/kg)																		
SW8270D																		
Benzo(a)anthracene	--	64 U	66 U	62 U	150	66 U	63 U	66 U	68 U	69 U								
Chrysene	--	64 U	66 U	62 U	180	66 U	63 U	66 U	68 U	69 U								
Benzo(b)fluoranthene	--	64 U	70	62 U	140	66 U	63 U	66 U	68 U	69 U								
Benzo(k)fluoranthene	--	64 U	66 U	62 U	140	66 U	63 U	66 U	68 U	69 U								
Benzo(a)pyrene	--	64 U	66 U	62 U	190	66 U	63 U	66 U	68 U	69 U								
Indeno(1,2,3-cd)pyrene	--	64 U	66 U	62 U	90	66 U	63 U	66 U	68 U	69 U								
Dibenz(a,h)anthracene	--	64 U	66 U	62 U	63 U	66 U	63 U	66 U	68 U	69 U								
TEQ	140 (c)	ND	ND	ND	244	ND	ND	ND	ND	ND								

TABLE 13
COMPLIANCE MONITORING SAMPLE RESULTS
ABW/BAYSIDE MARINE VCP SITE
PORT OF EVERETT, WASHINGTON

			Dup of B1b - B6																
		B1b - B6	B1b - DUP2	B1b - B9	B1b - B10	B1b - B13	B1b - B14	B1b - B15	B1b - S1	B1b - S2	B1b - S3	B1b - S4	B1b - S5	B1b-S5a	B1b - S6	B1b - S7	B1b - S8	B1b - S9	B1b - S10
	Site	3-3.5 ft	3-3.5 ft	3-3.5 ft	3-3.5 ft	3-3.5 ft	3-3.5 ft	3-3.5 ft	0-3 ft	0-3 ft	0-3 ft	0-3 ft	0-3 ft	0-3 ft	0-3 ft	0-3 ft	0-3 ft	0-3 ft	0-3 ft
	Cleanup	EV15030161-08	EV15030161-15	EV15030157-05	EV15030157-02	EV15030161-03	EV15030157-04	EV15030157-03	EV15030161-11	EV15030161-10	EV15030157-09	EV15030161-18	EV15030157-07	EV15040017-01	EV15030157-08	EV15030161-17	EV15030161-16	EV15030161-13	EV15030161-12
	Levels (a)	3/27/2015	3/27/2015	3/26/2015	3/26/2015	3/27/2015	3/26/2015	3/26/2015	3/27/2015	3/27/2015	3/26/2015	3/27/2015	3/26/2015	4/3/2015	3/26/2015	3/27/2015	3/27/2015	3/27/2015	3/27/2015
NWTPH-Dx (mg/kg)																			
Diesel-Range Hydrocarbons	2000 (b)																		
Motor Oil-Range Hydrocarbons	2000 (b)																		
TOTAL METALS (mg/kg)																			
SW 6000/7000 series																			
Antimony	32											0.50 U				0.50 U	0.50 U		
Arsenic	20 (b)	4.3 J	6.6 J	1.8	2.1	10	5.7	5.2	2.4	10	4.2	2.4	26	5.5	2.2	2.0	3.7	4.0	4.2
Cadmium	80																		
Chromium	--																		
Copper	2,960																		
Lead	250 (b)											4.0				2.1	3.2		
Mercury	24																		
Zinc	24,000																		
cPAHs (µg/kg)																			
SW8270D																			
Benzo(a)anthracene	--																		
Chrysene	--																		
Benzo(b)fluoranthene	--																		
Benzo(k)fluoranthene	--																		
Benzo(a)pyrene	--																		
Indeno(1,2,3-cd)pyrene	--																		
Dibenz(a,h)anthracene	--																		
TEQ	140 (c)																		

TABLE 13
COMPLIANCE MONITORING SAMPLE RESULTS
ABW/BAYSIDE MARINE VCP SITE
PORT OF EVERETT, WASHINGTON

		L1-B2	L1-B3	L1-B4	L1-B4a	L1-B5	L1-S1	L1-S1a	L1-S2	L1-S3	L1-S4	L1-S4a	L1-S5	L1-S6	L2-AC-1	L2-B1	L2-S1	L2-S2	L2-S3	L3-B1	L3-S1	L3-S2
	Site	1.5-2	1.5-2	1.5-2	0-0.5	1.5-2	1.5	1.5	1.5	1.5	1.5	1.5	1.5	0.25-1.5	0-1	1-1.5	0.25-1	0.25-1	0.25-1	2.5-3	1.5-2.5	1.5-2.5
	Cleanup	JR94F	JR94G	JR94H	JU33D	JV94C	JR94A	LL78A	JR94B	JR94C	JR94D	JT96H	JV94B	JW09A	JU32A	JU68K	JU68J	JW09B	JW09C	JU68I	JU68G	JU68H
	Levels (a)	8/3/2006	8/3/2006	8/3/2006	8/24/2006	9/12/2006	8/3/2006	8/16/2007	8/3/2006	8/3/2006	8/3/2006	8/22/2006	9/12/2006	9/12/2006	8/24/2006	8/28/2006	8/28/2006	9/12/2006	9/12/2006	8/28/2006	8/28/2006	8/28/2006
NWTPH-Dx (mg/kg)																						
Diesel-Range Hydrocarbons	2000 (b)																					
Motor Oil-Range Hydrocarbons	2000 (b)																					
TOTAL METALS (mg/kg)																						
SW 6000/7000 series																						
Antimony	32																					
Arsenic	20 (b)	8	8	30	5 U	6 U	23	7	20	10	24	50	35	5 U	17	5 U	72	100	6	5 U	5 U	5 U
Cadmium	80	0.2 U	0.2 U	0.5 U	0.2 U	0.2 U	0.2 U		0.5 U	0.2 U	0.2 U	0.5 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	1.6	0.2 U	0.2 U	0.2 U	0.2 U
Chromium	--	23.3	33.9	51	53.1	28.1	35.4		54	43.2	34.8	37	37.7	28.1	39.4	33.2	60.3	150	32.1	23.4	33.1	33.0
Copper	2,960	19.8	40.3	203	35.5	20.2	74		74.6	45.8	70	116	77.5	19.2	47.2	21.4	96.3	332	39.4	12.3	15.2	27.3
Lead	250 (b)	7	36	67	7	8	44		68	94	50	54	89	7	60	19	101	192	44	2 U	4	28
Mercury	24	0.04 U	0.06	0.09	0.04	0.05 U	0.05		0.04	0.06	0.04	0.05 U	0.05	0.04 U	0.05	0.04 U	0.06	0.04 U	1.00	0.05 U	0.04 U	0.13
Zinc	24,000	48.9	111	449	46.0	55.8	232		356	163	177	380	227	50.4	166	74.4	178	2030	65.0	29.2	31.4	121
cPAHs (µg/kg)																						
SW8270D																						
Benzo(a)anthracene	--																					
Chrysene	--																					
Benzo(b)fluoranthene	--																					
Benzo(k)fluoranthene	--																					
Benzo(a)pyrene	--																					
Indeno(1,2,3-cd)pyrene	--																					
Dibenz(a,h)anthracene	--																					
TEQ	140 (c)																					

TABLE 13
COMPLIANCE MONITORING SAMPLE RESULTS
ABW/BAYSIDE MARINE VCP SITE
PORT OF EVERETT, WASHINGTON

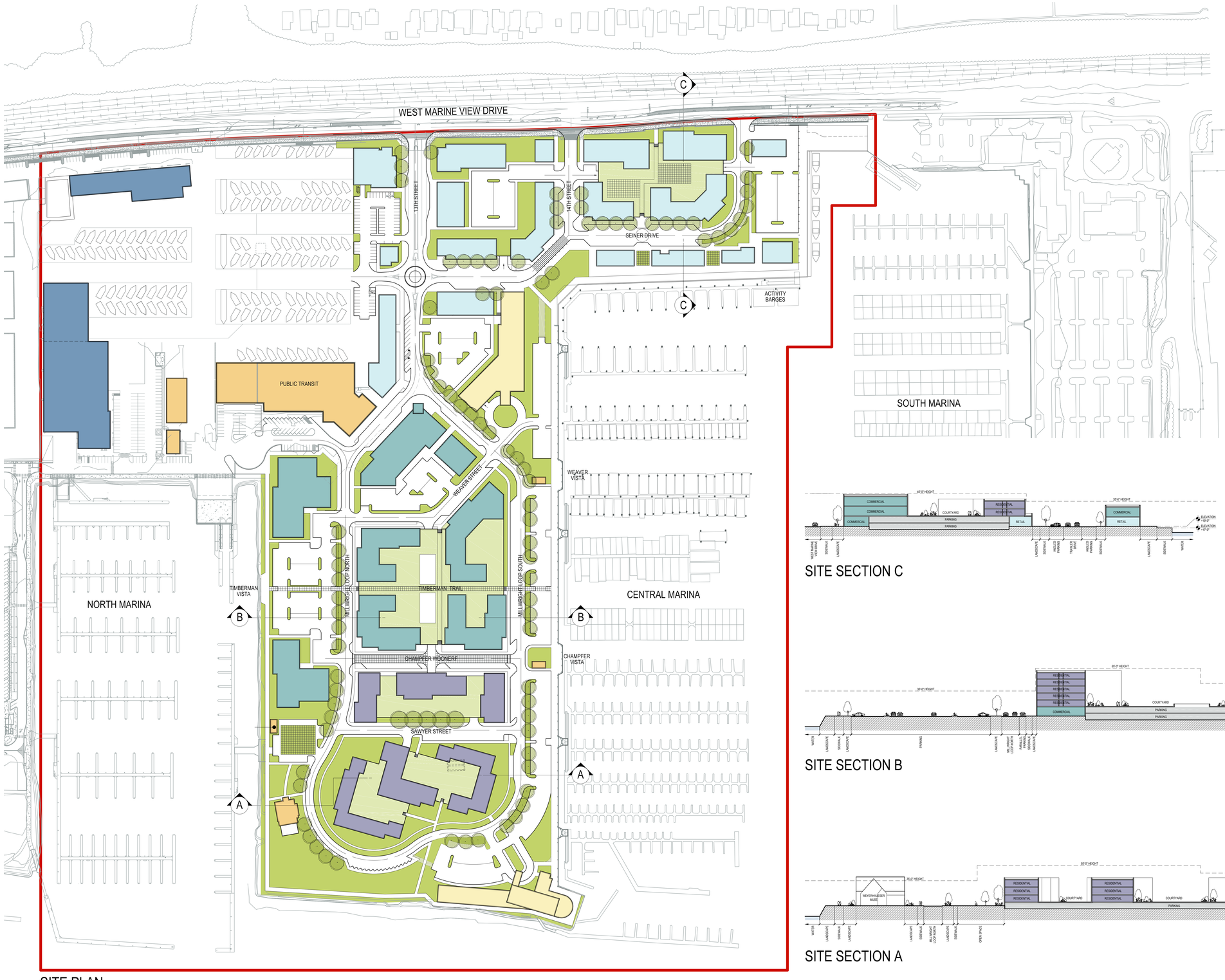
		BASE	EAST	WEST	BASE	SOUTH	BASE	EAST	EAST	NORTH	WEST	WEST
		EX-1-3.0	EX-2-1.5	EX-3-1.5	EX-4-4.5	EX-5-1.5	EX-6-5.0	EX-7-1.5	EX-8-4.0	EX-9-1.5	EX-10-4.0	EX-11-1.0
	Site	3 ft	1.5 ft	1.5 ft	4.5 ft	1.5 ft	5.0 ft	1.5 ft	4.0 ft	1.5 ft	4.0 ft	1.0 ft
	Cleanup	0603052-01	0603052-02	0603052-03	0603052-04	0603052-05	0603052-06	0603052-07	0603052-08	0603052-09	0603052-10	0603052-11
	Levels (a)	3/10/2006	3/10/2006	3/10/2006	3/10/2006	3/10/2006	3/10/2006	3/10/2006	3/10/2006	3/10/2006	3/10/2006	3/10/2006
NWTPH-Dx (mg/kg)												
Diesel-Range Hydrocarbons	2000 (b)	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U	25 U
Motor Oil-Range Hydrocarbons	2000 (b)	**88**	**59**	**68**	50 U	50 U	50 U	**210**	50 U	50 U	50 U	50 U
TOTAL METALS (mg/kg)												
SW 6000/7000 series												
Antimony	32											
Arsenic	20 (b)											
Cadmium	80											
Chromium	--											
Copper	2,960											
Lead	250 (b)											
Mercury	24											
Zinc	24,000											
cPAHs (µg/kg)												
SW8270D												
Benzo(a)anthracene	--											
Chrysene	--											
Benzo(b)fluoranthene	--											
Benzo(k)fluoranthene	--											
Benzo(a)pyrene	--											
Indeno(1,2,3-cd)pyrene	--											
Dibenz(a,h)anthracene	--											
TEQ	140 (c)											

U = The analyte was not detected in the sample at the given reporting limit.
UJ = The analyte was not detected in the sample; the given reporting limit is an estimate.
J = The analyte was detected in the sample; the given concentration is an estimate.
Boxed cells indicate an exceedance of site cleanup levels.
Shaded cells indicate soil was removed by subsequent excavation
ND = Not Detected
mg/kg = milligrams per kilogram
µg/kg = micrograms per kilogram
TPH-Dx = Diesel-range Total Petroleum Hydrocarbons
cPAHs = Carcinogenic Polycyclic Aromatic Hydrocarbons
TEQ = Toxicity Equivalency Quotient

(a) Cleanup level as proposed in the Final Cleanup Action Plan, North Marina Redevelopment Site (Landau Associates 2006)
(b) MTCA Method A soil cleanup levels for unrestricted land uses.
(c) MTCA Method B soil cleanup level based on direct contact for unrestricted land use.

APPENDIX A

Conceptual Site Development Plan for Waterfront Place Central



SITE PLAN

N SCALE: 1" = 100'

SITE SECTION C

SITE SECTION B

SITE SECTION A

PUBLIC USE
HOSPITALITY
MARINE SERVICES
RESIDENTIAL MIXED-USE
EMPLOYMENT MIXED-USE
COMMERCIAL MIXED-USE
PARKING WITH PLAZA ABOVE

Phase II - Implementation Planning

1.1 CONCEPTUAL SITE PLAN

SEPT14

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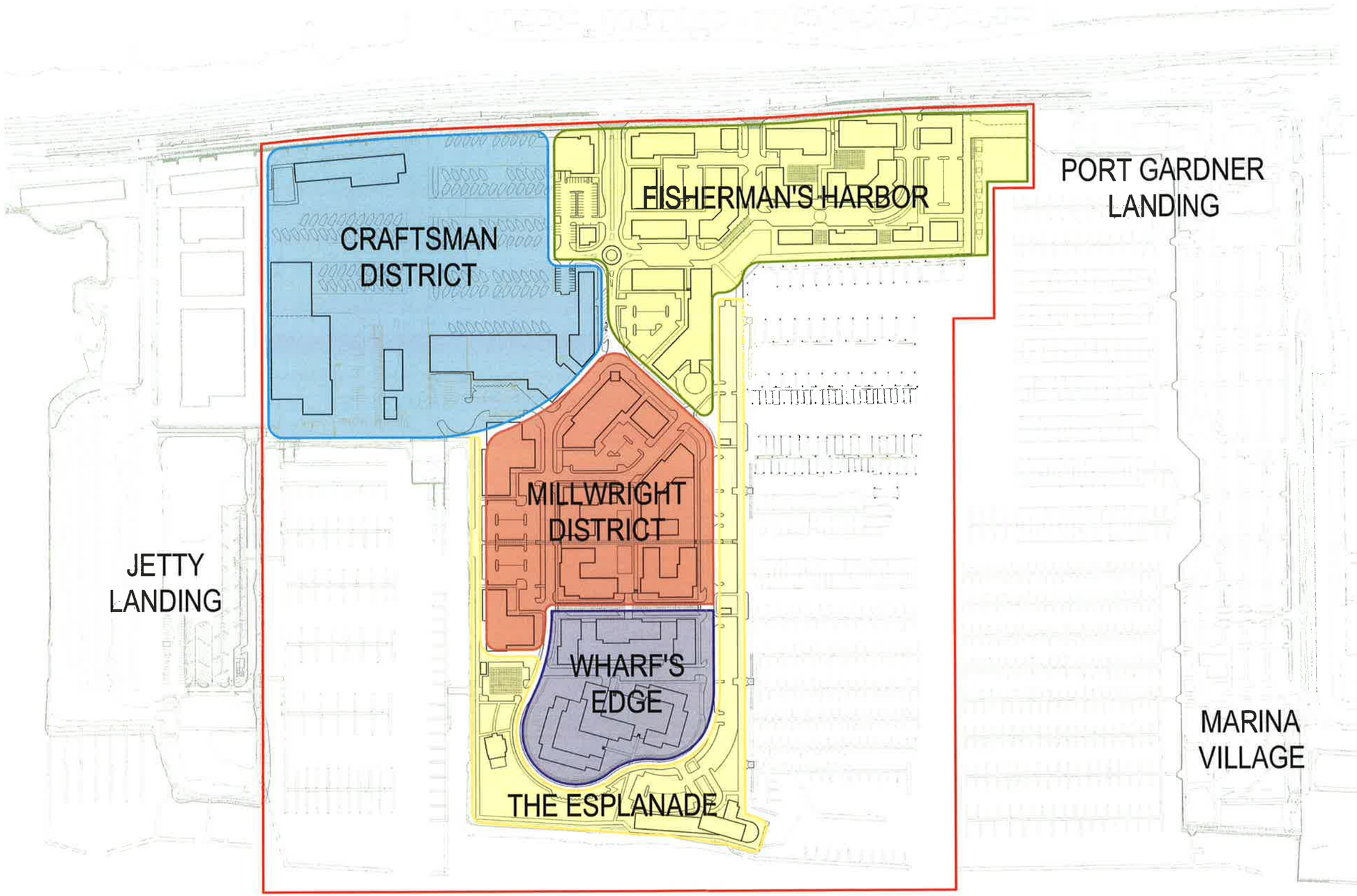
WATERFRONT PLACE @ PORT OF EVERETT



Phase II - Implementation Planning

2.0 NEIGHBORHOODS AND DISTRICTS

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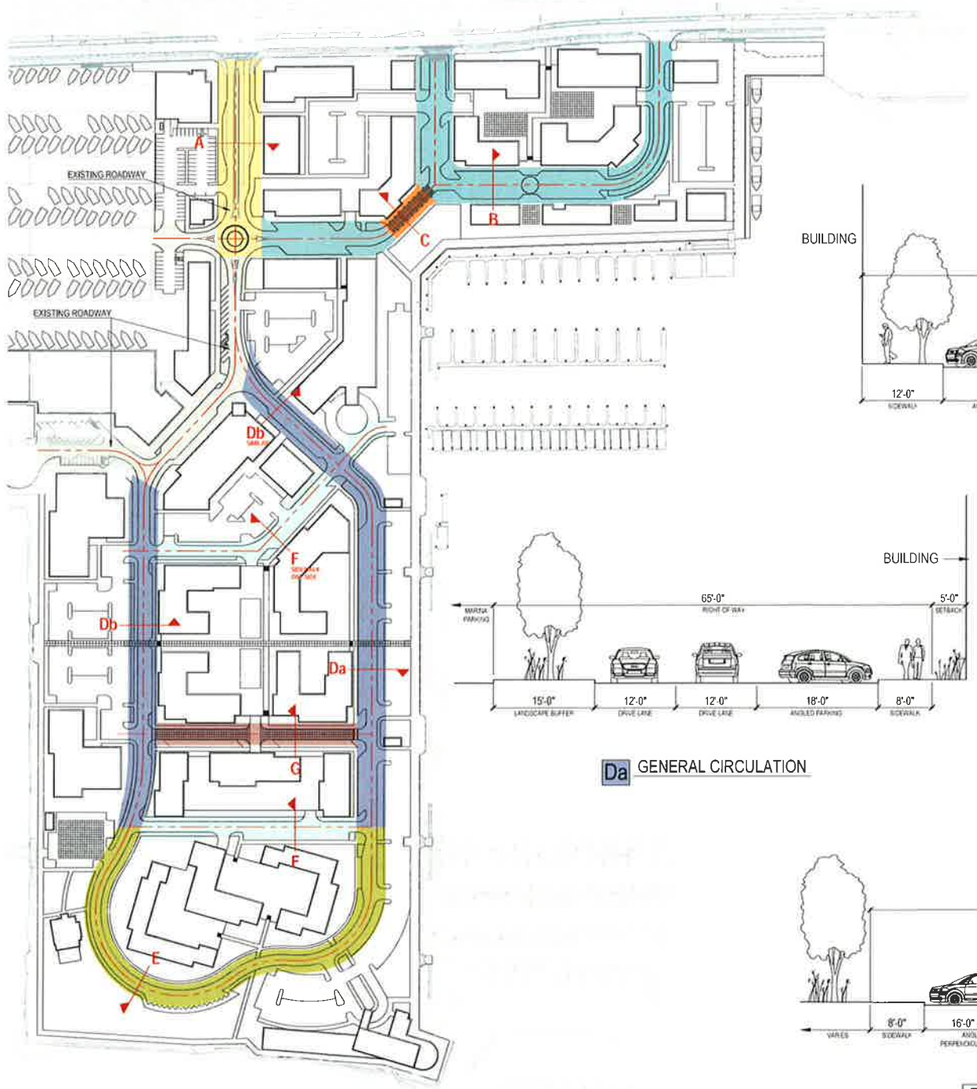
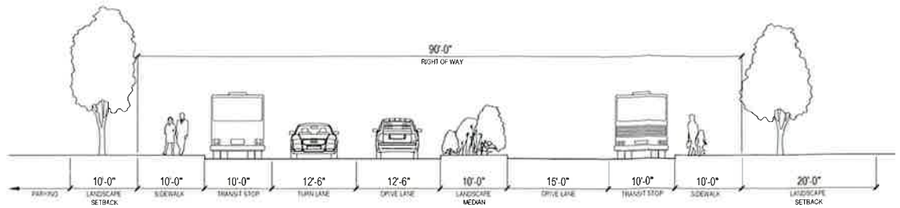
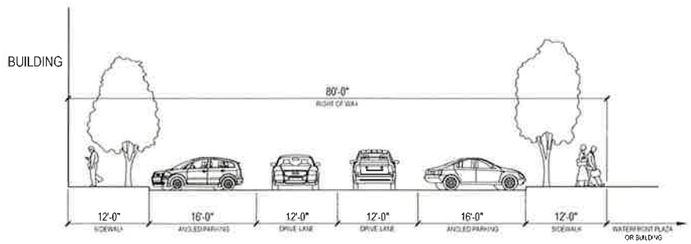
WATERFRONT PLACE @ PORT OF EVERETT

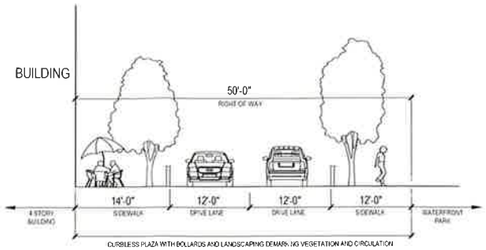




A ENTRY BOULEVARD (EXISTING)

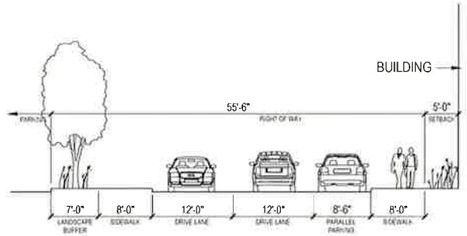


B PEDESTRIAN STREET

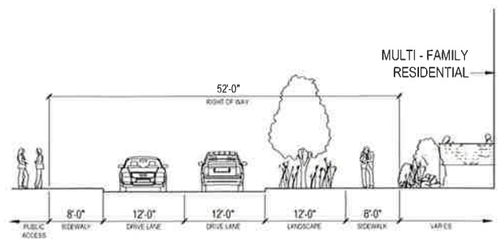


C PLAZA STREET

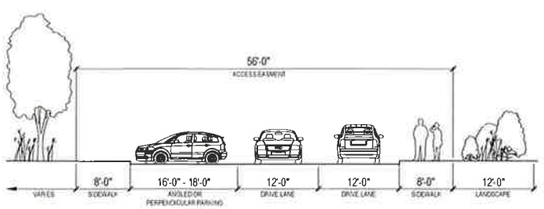
Da GENERAL CIRCULATION



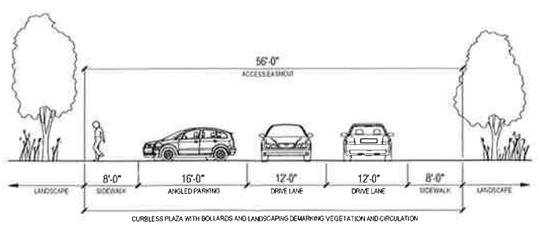
Db GENERAL CIRCULATION



E GENERAL CIRCULATION @PUBLIC ACCESS



F INTERIOR CROSS STREETS



G WOONERF

Phase II - Implementation Planning

2.1 RIGHT OF WAY IMPROVEMENTS

30MAY14
REV 11/01/2014

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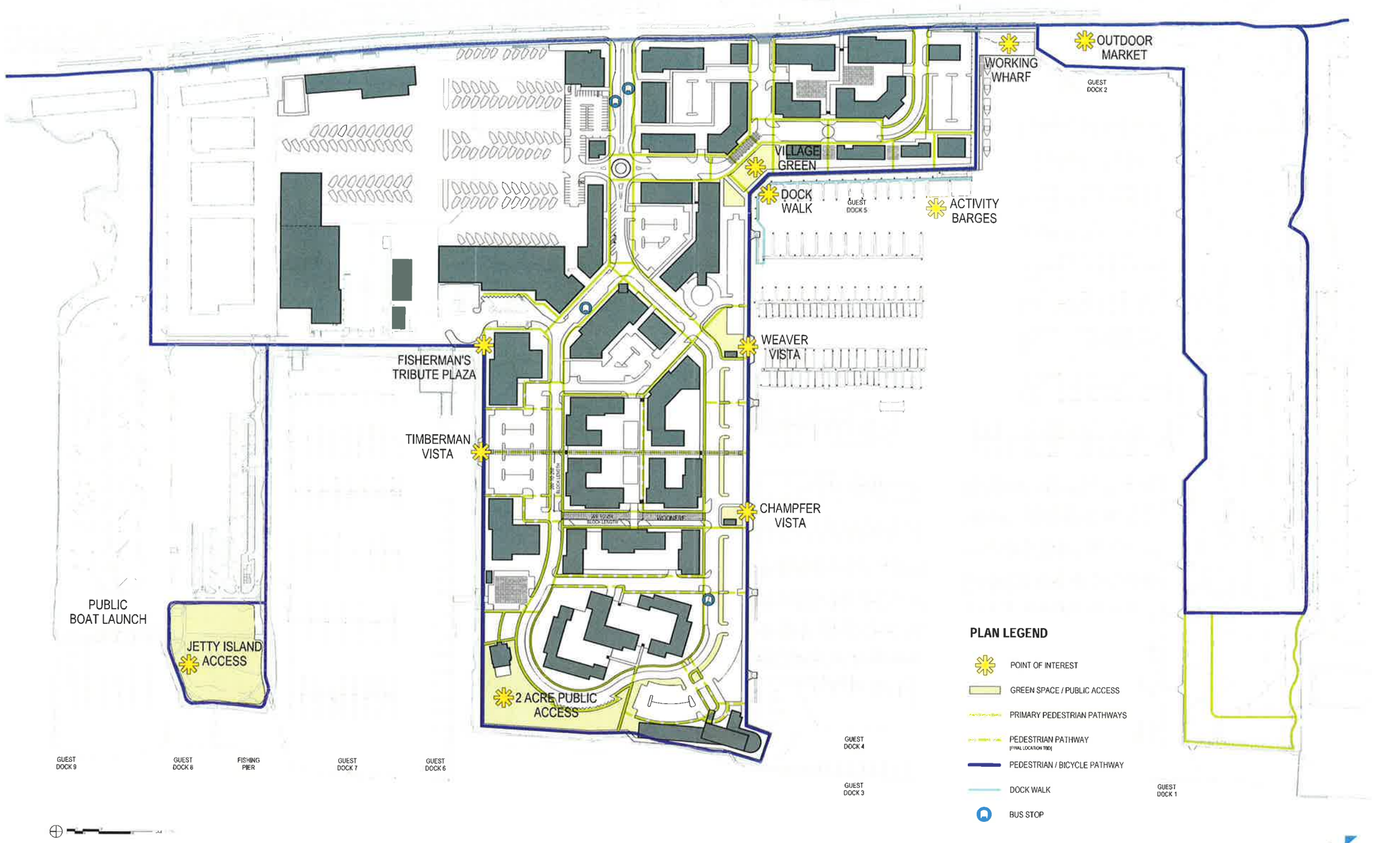
WATERFRONT PLACE @ PORT OF EVERETT



PLAN LEGEND

- POINT OF INTEREST
- GREEN SPACE / PUBLIC ACCESS
- PRIMARY PEDESTRIAN PATHWAYS
- PEDESTRIAN PATHWAY (FINAL LOCATION TBD)
- PEDESTRIAN / BICYCLE PATHWAY
- DOCK WALK
- BUS STOP

Phase II - Implementation Planning

2.2a PATHWAYS AND PUBLIC ACCESS

30MAY14
REV 11AUG14

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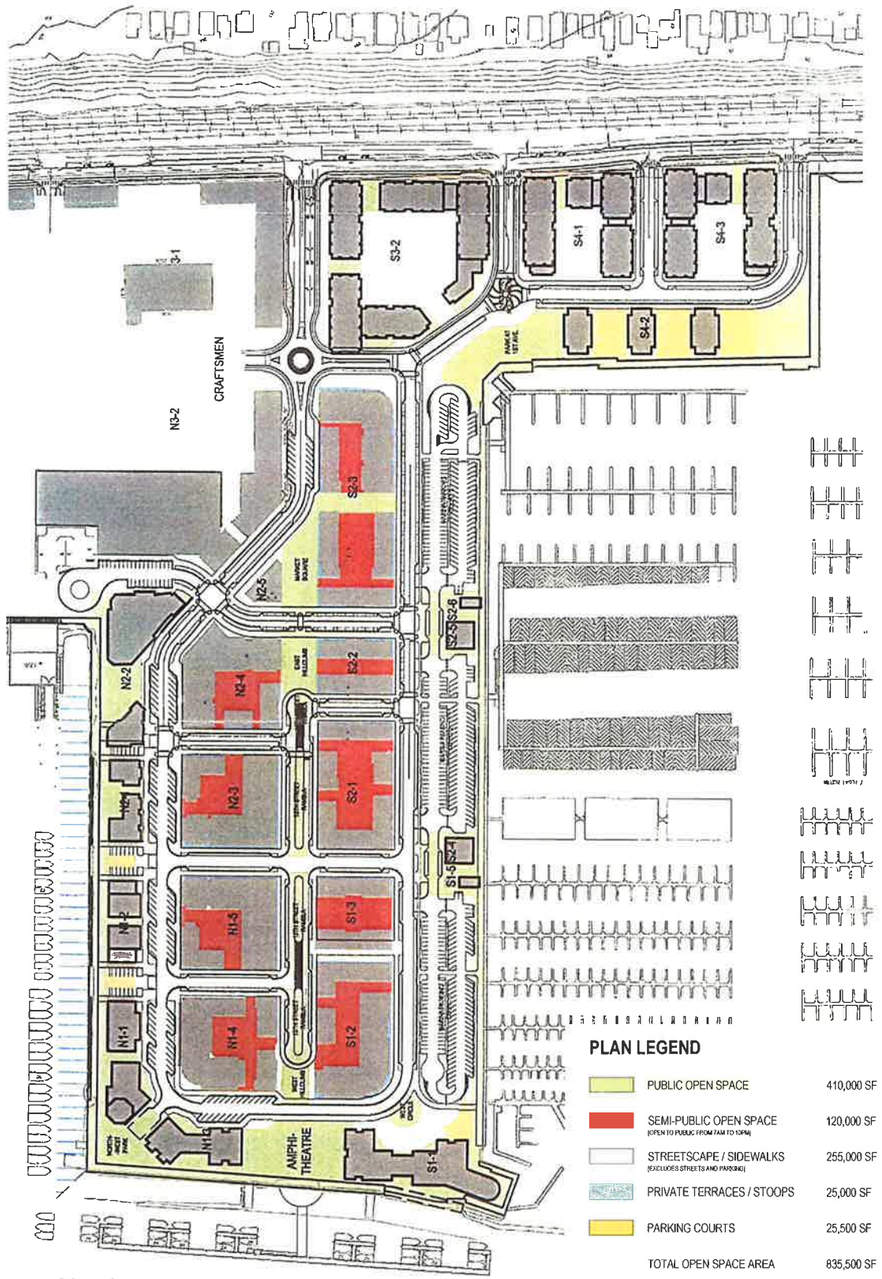
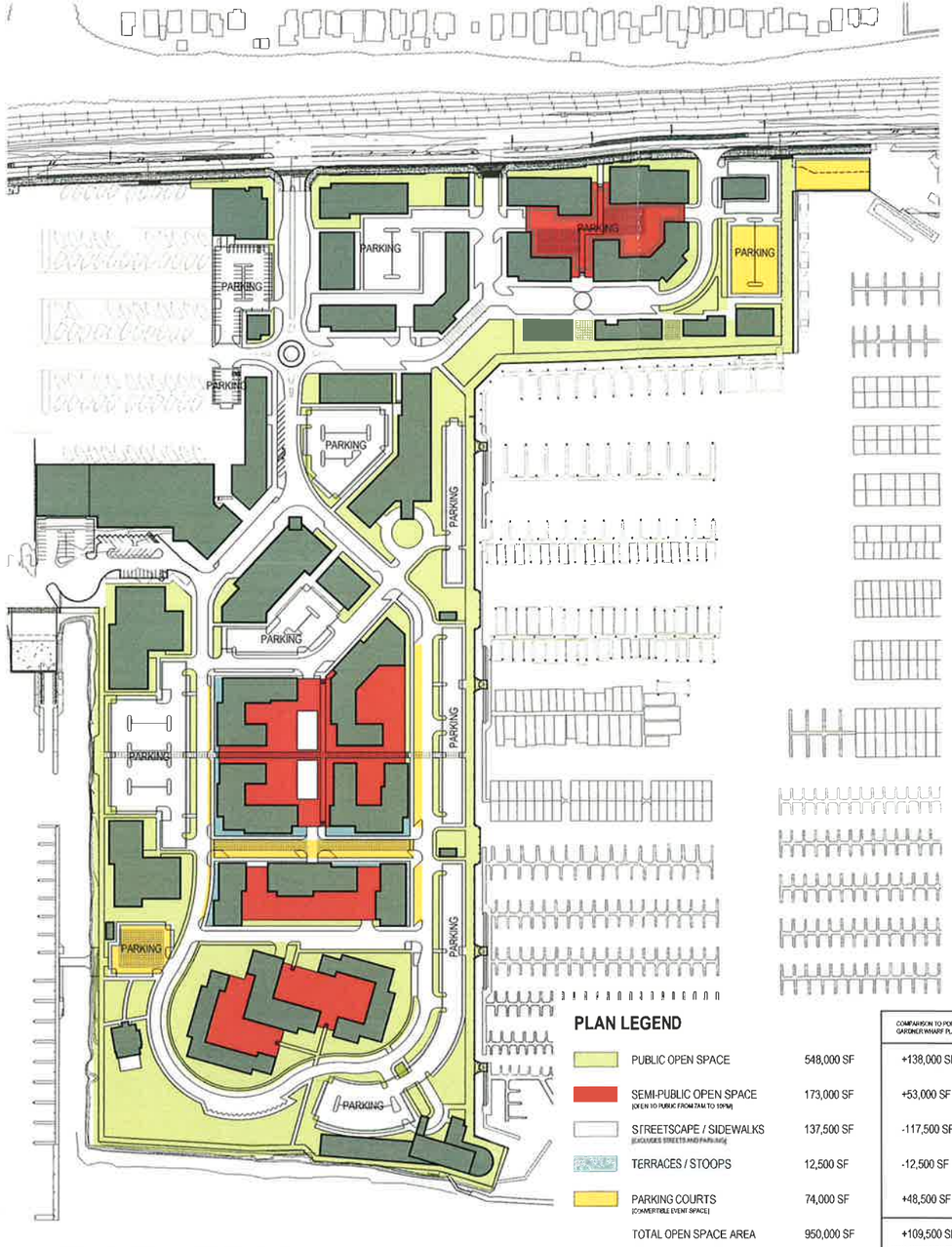
WATERFRONT PLACE
@ PORT OF EVERETT



PLAN LEGEND

PUBLIC OPEN SPACE		410,000 SF
SEMI-PUBLIC OPEN SPACE (OPEN TO PUBLIC FROM 7AM TO 10PM)		120,000 SF
STREETSCAPE / SIDEWALKS (EXCLUDES STREETS AND PARKING)		255,000 SF
PRIVATE TERRACES / STOOPS		25,000 SF
PARKING COURTS		25,500 SF
TOTAL OPEN SPACE AREA		835,500 SF

PORT GARDNER WHARF
OPEN SPACE DIAGRAM



PLAN LEGEND

			COMPARISON TO PORT GARDNER WHARF PLAN
PUBLIC OPEN SPACE	548,000 SF		+138,000 SF
SEMI-PUBLIC OPEN SPACE (OPEN TO PUBLIC FROM 7AM TO 10PM)	173,000 SF		+53,000 SF
STREETSCAPE / SIDEWALKS (EXCLUDES STREETS AND PARKING)	137,500 SF		-117,500 SF
TERRACES / STOOPS	12,500 SF		-12,500 SF
PARKING COURTS (CONVERTIBLE EVENT SPACE)	74,000 SF		+48,500 SF
TOTAL OPEN SPACE AREA	950,000 SF		+109,500 SF TOTAL ADDED OPEN SPACE

WATERFRONT PLACE CENTRAL
OPEN SPACE DIAGRAM

Phase II - Implementation Planning

2.2c OPEN SPACE DIAGRAM | STRUCTURED PARKING OPTION 2

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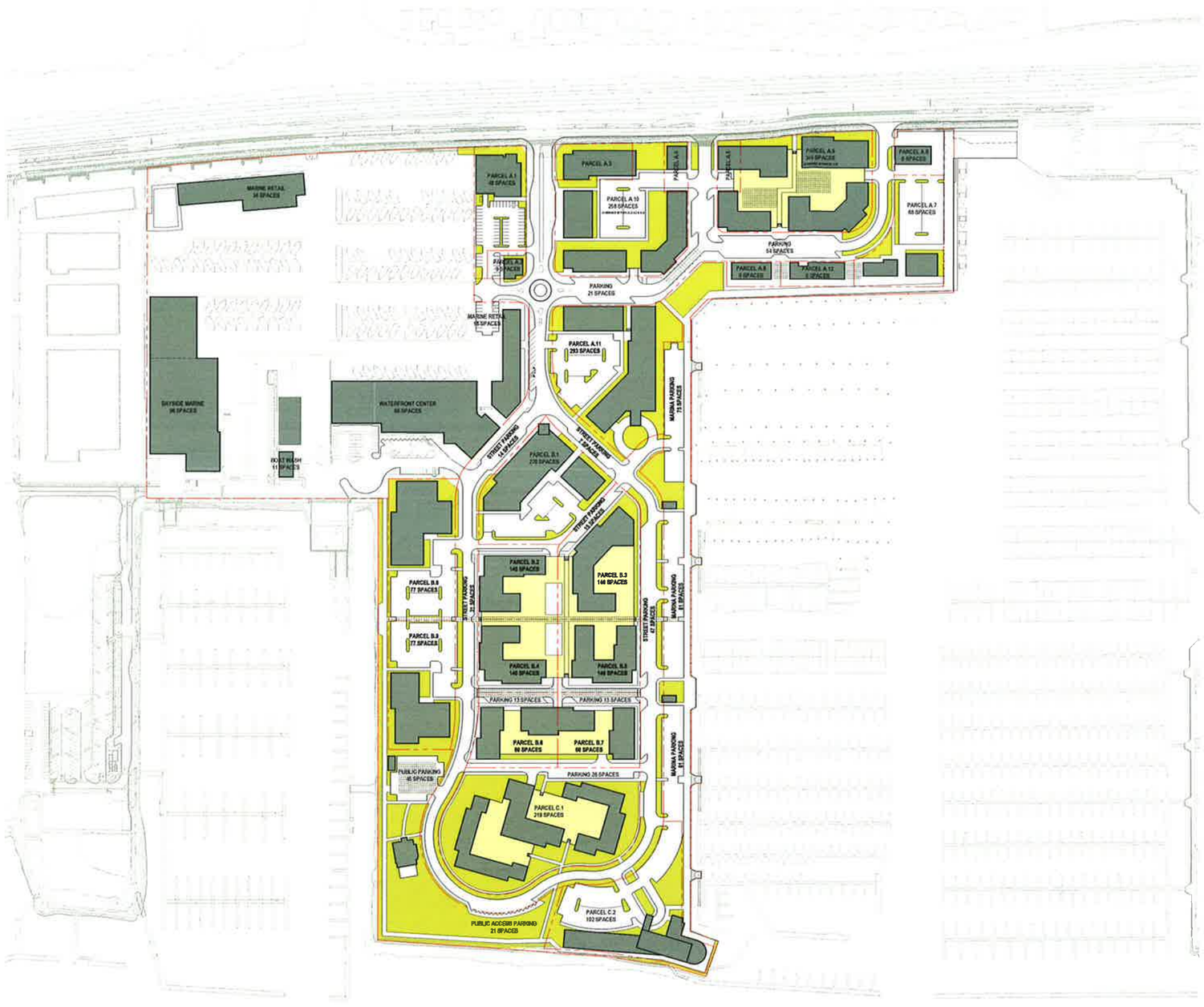
WATERFRONT PLACE
@ PORT OF EVERETT



PARKING SUMMARY

PARCEL	USE TYPE	SIZE	PARKING SHOWN
A.1	15,000 SF RETAIL	1 ACRES	48
A.2	3,000 SF RETAIL	.19 ACRES	9
A.3 + A.4 + A.10	10,500 SF RETAIL 61,000 SF COMMERCIAL 114 UNITS MULTI-FAMILY	2.98 ACRES	258
A.5 + A.9	10,500 SF RETAIL 74,500 SF COMMERCIAL 90 UNITS MULTI-FAMILY	2.98 ACRES	345
A.6	5,000 SF WEB LOCKER	.40 ACRES	0
A.7	4,000 SF RETAIL 8,000 SF RESTURANT	1.65 ACRES	68
A.8	5,000 SF RETAIL	.23 ACRES	0
A.11	10,000 SF RETAIL 20,000 SF COMMERCIAL 120 ROOM HOTEL + MEETING ROOMS	2.5 ACRES	293
A.12	4,300 SF RETAIL 4,300 SF OFFICE	.32 ACRES	0
STREET PARKING			75
SUBTOTAL			1096
B.1	114,000 SF COMMERCIAL		270
B.2	75 UNITS MULTI - FAMILY + 8,200 SF COMMERCIAL		140
B.3	51 UNITS MULTI - FAMILY + 15,000 SF COMMERCIAL		140
B.4	75 UNITS MULTI - FAMILY + 8,200 SF COMMERCIAL		140
B.5	44 UNITS MULTI - FAMILY + 11,000 SF COMMERCIAL		140
B.6	53 UNITS MULTI - FAMILY + 8,200 SF COMMERCIAL		60
B.7	38 UNITS MULTI - FAMILY + 8,200 SF COMMERCIAL		60
B.8	55,900 SF COMMERCIAL	1.42 ACRES	77
B.9	40,000 SF COMMERCIAL	1.46 ACRES	77
WATERFRONT CENTER	6,500 RESTAURANT 18,000 RETAIL 8,000 OFFICE 6,000 CLASSROOM 5,000 MEETING ROOM 14,000 SERVICE SHOPS		60
BAYSIDE MARINE	56,000 SF DRYSTACK 19,000 SF MARINE SALES/SERVICES		96
BOAT WASH	4,000 SF OFFICE + MAINTENANCE		11
MARINE RETAIL	24,900 SF SALES + SERVICE		34
MARINE RETAIL	15,000 SF SALES + SERVICE		18
MARINA PARKING	520 SLIPS		217
STREET PARKING			151
SUBTOTAL			1691
C.1	120 UNITS MULTI - FAMILY	3.61 ACRES	219
C.2	60 ROOM HOTEL + 4,000 SF RESTAURANT	2.10 ACRES	102
PUBLIC PARKING	2.23 ACRE PARK		66
SUBTOTAL			387
COMBINED TOTAL PARKING			3174

Phase II - Implementation Planning

2.3c PARKING STRATEGY | STRUCTURED PARKING OPTION 2

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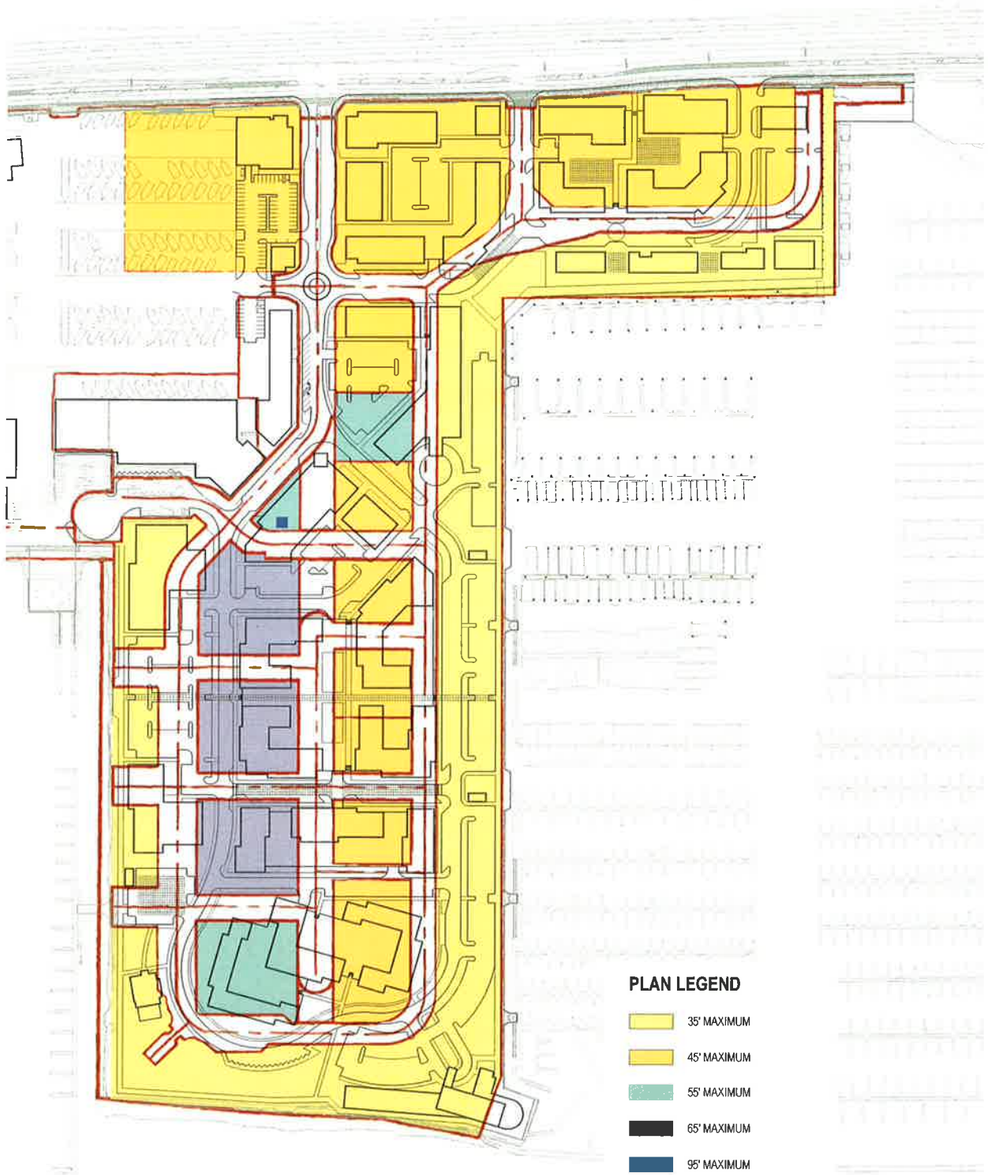
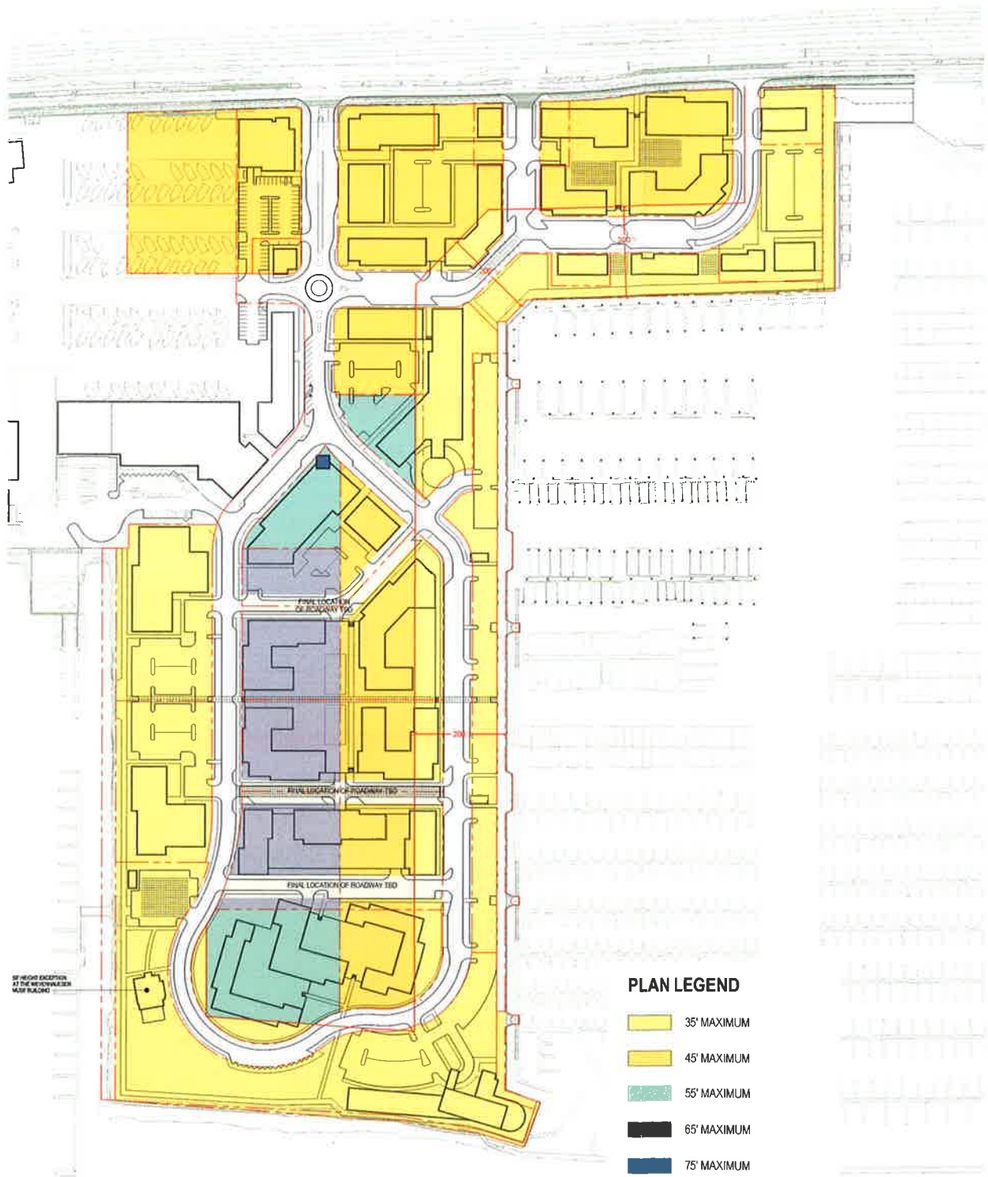
WATERFRONT PLACE @ PORT OF EVERETT



EXISTING HEIGHT ZONE MAP



NOTE: BASE ELEVATION AS SPECIFIED IN DEVELOPMENT AGREEMENT

PROPOSED HEIGHT ZONE MAP

SITE AREA SUMMARY

PARCEL	USE TYPE	SITE AREA	
A.1	COMMERCIAL / MIXED-USE	1 ACRES	
A.2	COMMERCIAL / MIXED-USE	.19 ACRES	
A.3	COMMERCIAL / MIXED-USE	.64 ACRES	
A.4	COMMERCIAL / MIXED-USE	.26 ACRES	
A.5	COMMERCIAL / MIXED-USE	.60 ACRES	
A.6	COMMERCIAL / MIXED-USE	.40 ACRES	
A.7	COMMERCIAL / MIXED-USE	1.65 ACRES	
A.8	COMMERCIAL / MIXED-USE	.23 ACRES	
A.9	COMMERCIAL / MIXED-USE	1.97 ACRES	
A.10	COMMERCIAL / MIXED-USE	2.09 ACRES	
A.11	HOSPITALITY / MIXED-USE	2.44 ACRES	
A.12	COMMERCIAL / MIXED-USE	.32 ACRES	
SUBTOTAL		11.79 ACRES	
B.1	EMPLOYMENT / MIXED-USE	1.92 ACRES	
B.2	EMPLOYMENT / MIXED-USE	1.02 ACRES	
B.3	EMPLOYMENT / MIXED-USE	1.57 ACRES	
B.4	EMPLOYMENT / MIXED-USE	1.01 ACRES	
B.5	EMPLOYMENT / MIXED-USE	1.05 ACRES	
B.6	RESIDENTIAL / MIXED-USE	1.10 ACRES	
B.7	RESIDENTIAL / MIXED-USE	1.08 ACRES	
B.8	EMPLOYMENT / MIXED-USE	1.64 ACRES	
B.9	EMPLOYMENT / MIXED-USE	1.46 ACRES	
SUBTOTAL		11.85 ACRES	
C.1	RESIDENTIAL / MIXED-USE	3.61 ACRES	
C.2	HOSPITALITY / MIXED-USE	2.10 ACRES	
SUBTOTAL		5.71 ACRES	
	CRAFTSMAN DISTRICT	20.25 ACRES	882,100 SF
	PUBLIC ACCESS	5.38 ACRES	217,800 SF
	PUBLIC PARKING	1.80 ACRES	78,400 SF
	RIGHT - OF - WAY	9.08 ACRES	395,600 SF
SUBTOTAL		36.51 ACRES	1,586,500 SF
TOTAL SITE AREA		**65.86 ACRES**	

DRAWING LEGEND

- DEVELOPMENT PARCEL
- PUBLIC ACCESS
- ROW / PUBLIC PARKING
- CRAFTSMAN DISTRICT
- PDO BOUNDARY (APPROXIMATE)
- PARCEL LINES

Phase II - Implementation Planning

2.5 DEVELOPMENT PARCEL DIAGRAM

30MAY14
REV 27JUN14

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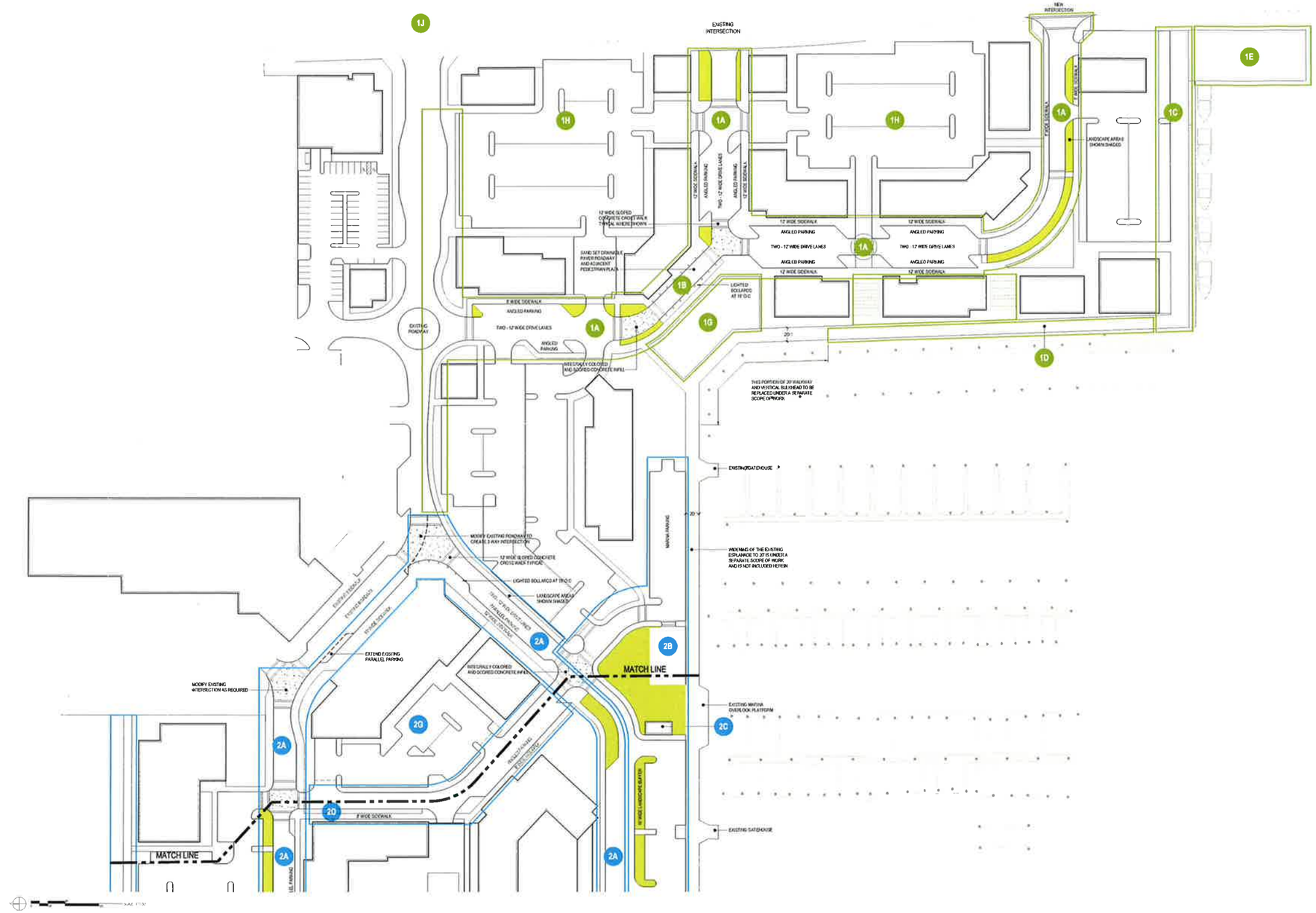
WATERFRONT PLACE @ PORT OF EVERETT

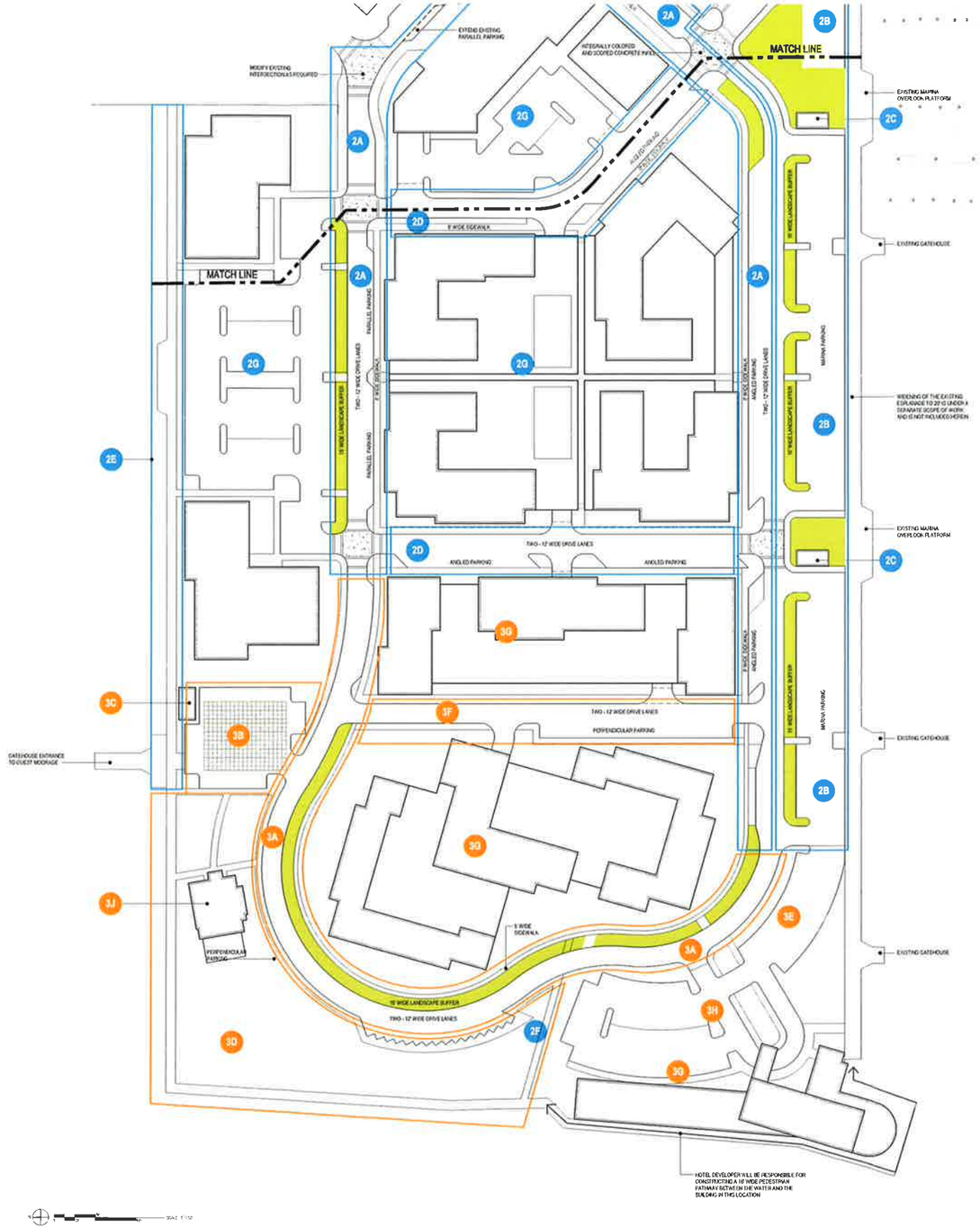


Phase II - Implementation Planning

3.0 SCOPING DIAGRAM A

30MAY14 RMC ARCHITECTS PLLC | LELAND CONSULTING GROUP

WATERFRONT PLACE @ PORT OF EVERETT



INFRASTRUCTURE SUMMARY

ZONE 1	COST CATEGORIES				
	UPLANDS	MARINA	MITIGATION	PUBLIC ACCESS	NOTES
1A ROADWAY, SIDEWALK, PARKING AND UTILITIES	●				INCLUDES STREET LIGHTING, TREES, SITE FURNISHINGS, ETC.
1B PLAZA STREET	●				SIDEWALK AND STREET FINISHED WITH CONCRETE PAVERS - BOLLARDS USED TO DEFINE DRIVE LANES AND PEDESTRIAN ZONES
1C RECONSTRUCT OVER WATER WHARF AND BULKHEAD NEAR W. MARINEVIEW DR.			●		BUDGET PROVIDED BY PORT
1D RECONSTRUCT BULKHEAD AND ADD 20' WIDE PEDESTRIAN ESPLANADE	●		●	●	BUDGET PROVIDED BY PORT AND COST SHARED BETWEEN UPLANDS, MITIGATION AND PUBLIC ACCESS
1E REPLACE EXISTING OVER WATER WHARF AND EXPAND WORK AREA		●			BUDGET PROVIDED BY PORT (11,200 SF x $250/SF)
1F NOT USED					
1G GREEN SPACE				●	
1H FILL DIRT			●		AS REQUIRED TO ACCOMMODATE SEA LEVEL RISE STRATEGY (SEE CIVIL)
1J TRAFFIC SIGNAL	●				INFRASTRUCTURE ALREADY INSTALLED
ZONE 2					
2A ROADWAY, SIDEWALK, PARKING AND UTILITIES	●				INCLUDES STREET LIGHTING, TREES, SITE FURNISHINGS, ETC.
2B MARINA PARKING AND ACCESS PLUS ESPLANADE IMPROVEMENTS		●		●	PARKING SERVING MARINA PLUS HALF OF ACCESS ROAD PLUS WIDENING OF ESPLANADE TO 20'
2C TOILET ROOMS, SHOWERS AND LAUNDRY FACILITIES SERVING THE MARINA		●			TWO 1,500 SF BUILDINGS
2D INTERIOR CROSS STREETS	●				
2E 16' WIDE CONCRETE WALKING TRAIL AND LANDSCAPING				●	35' WIDE PUBLIC ACCESS ZONE TO BE FULLY LANDSCAPED
2F SEWER PUMP STATION	●				
2G FILL DIRT			●		AS REQUIRED TO ACCOMMODATE SEA LEVEL RISE STRATEGY (SEE CIVIL)
ZONE 3					
3A ROADWAY, SIDEWALK, PARKING AND UTILITIES	●			●	INCLUDES STREET LIGHTING, TREES, SITE FURNISHINGS, ETC. DIVIDED 50/50 BETWEEN UPLANDS AND PUBLIC ACCESS
3B PUBLIC PARKING				●	
3C TOILET ROOMS, SHOWERS AND LAUNDRY		●			INCORPORATED INTO RENOVATED WEYERHOUSER BUILDING [SEE 3J BELOW]
3D PUBLIC ACCESS / GREEN SPACE				●	PASSIVE OPEN SPACE WITH TRAIL NETWORK AND LIMITED AMOUNT OF OUTDOOR STRUCTURES
3E REMOVE EXISTING FUEL TANKS AND INSTALL NEW FUEL TANKS	●	●			
3F INTERIOR CROSS STREET	●				
3G FILL DIRT			●		AS REQUIRED TO ACCOMMODATE SEA LEVEL RISE STRATEGY (SEE CIVIL)
3H DEMOLITION OF EXISTING STRUCTURES	●				
3J RELOCATE EXISTING WEYERHAUSER BUILDING				●	

Phase II - Implementation Planning

3.1 SCOPING DIAGRAM B

30MAY14 RMC ARCHITECTS PLLC | LELAND CONSULTING GROUP

WATERFRONT PLACE @ PORT OF EVERETT

APPENDIX B

Investigation Sampling Methods

APPENDIX B
INVESTIGATION SAMPLING METHODS

This document describes the soil and groundwater sampling methods used for obtaining environmental characterization data for the American Boiler Works (i.e., ABW Technologies, Inc.; ABW)/Bayside Marine Site [Site or ABW/Bayside Marine Voluntary Cleanup Program (VCP) Site]. The sampling methods were used during the following investigations:

- The Phase II Environmental Site Assessment (ESA) conducted in late 2003 and early 2004 (Landau Associates 2004a)
- The Data Gaps Investigation (DGI) conducted in late 2004 and early 2005 (Landau Associates 2005)
- The Supplemental DGI conducted in late 2005 (Landau Associates 2006)
- An additional soil investigation conducted in 2006 following the Supplemental DGI (not previously reported).

The investigations were conducted under, or consistent with, sampling and analysis plans reviewed by Ecology under its VCP, except for the Phase II ESA work plan (Landau Associates 2004b), which was conducted prior to the Port's entry into the VCP. The remainder of this document summarizes soil sampling methods, groundwater sampling methods, and equipment decontamination methods employed during these investigations. The work plans for the various investigations should be reviewed for a more detailed description of investigation sampling methods.

SOIL SAMPLING METHODS

Soil samples were obtained from borings installed using a truck-mounted direct-push drilling rig. Soil recovered from the borings was described using the Unified Soil Classification System (USCS) and was field screened for potential contamination. Field screening was accomplished by examining the soil for discoloration, anthropogenic materials (e.g., sand blast grit), and sheen or non-aqueous phase liquid (NAPL). A photo-ionization detector (PID) reading was obtained if field observations indicated the presence of petroleum hydrocarbons and was recorded for each 1-ft interval. If obvious signs of contamination were observed, a discrete sample was collected from the area with the greatest level of observed contamination. For the purposes of these investigations, "significant contamination" was defined as the presence of:

- Free-phase petroleum product
- Soil or groundwater with moderate to heavy visible product film
- Soil with moderate to heavy sheen produced during sheen test. The sheen test will consist of the addition of deionized water to a portion of the soil sample that will not be submitted for chemical analysis, and agitation of the soil/water mixture. If a moderate to

heavy sheen is visible on the surface of the water, then the soil will be considered to have significant levels of petroleum-related contamination.

- Soil with visible staining
- Soil with a strong petroleum odor
- Soil with PID readings of volatile organic compounds (VOCs) at or above 20 parts per million.

Field observations, including soil type classification and field screening results were recorded on a log of exploration field form. Following the completion of soil classification and field screening, samples were collected for analytical testing or for laboratory archive. The soil core was divided into the planned sample intervals (e.g., 0 to 0.5 ft, 1 to 2 ft, and 2 to 3 ft BGS) and the sample intervals were individually homogenized using decontaminated stainless-steel bowls and spoons. The homogenized sample volumes were placed into the appropriate laboratory supplied sample containers. Between samples, all down-hole drilling and sampling equipment was decontaminated, as specified below in the Equipment Decontamination Methods section.

The U.S. Environmental Protection Agency (EPA) 5035A soil sampling procedures were used to collect soil samples planned for VOCs; gasoline-range petroleum hydrocarbons (TPH-G); and benzene, toluene, ethylbenzene, and xylenes (BTEX) analyses. The EPA 5035A soil sampling method is intended to reduce volatilization and biodegradation of samples. The EPA 5035A procedure for soil sample collection is as follows:

- Collect soil "cores" using coring devices (i.e., EnCore® sampler, EasyDraw Syringe®, or a Terra Core ™ sampling device). Each "core" will consist of approximately 5 grams of soil. Collect three discrete "cores" from each sampling location. One EasyDraw Syringe® or Terra Core ™ device will be used to collect the three discrete "cores"; however, if the EnCore® samplers are used, three sampling devices are required.

- Remove excess soil from coring device. If EasyDraw Syringe® or Terra Core ™ sampling device are used for sample collection, place the "cored" soil directly into unpreserved 40 ml vials with a stirbar. If the EnCore® sampler is used, close the sampler for transport to the laboratory.

- Collect one 2-oz soil jar of representative soil for moisture content and laboratory screening purposes. Fill the jar to minimize headspace.

- Samples will be placed in shipping cooler at 4^0C. Samples will be transported to laboratory within 24 hours of sample collection, and will be stored at the laboratory at -7^0C.

GROUNDWATER SAMPLING METHODS

Groundwater samples were collected from direct push soil borings and monitoring wells during the above referenced environmental investigations. Groundwater samples from direct push borings were collected using a temporary well screed advanced through the drill rods and were located within the upper two ft of the water table. Water was purged and sampled through the temporary well screen or monitoring well screen using new polyethylene tubing and a peristaltic pump. Low-flow sampling techniques were employed to minimize turbidity and the potential disturbance of volatile organic compounds in groundwater. The following field parameters were measured during purging and sample collection:

- pH
- Conductivity
- Temperature

The purging was continued until the parameters stabilized and turbidity dissipated. Immediately following purging, the groundwater samples were collected into the appropriate laboratory supplied sample containers. Samples collected for dissolved metals were field filtered using an inline 0.45 µm disposable field filter. Between samples, all down-hole drilling and sampling equipment was decontaminated, as specified below in the Equipment Decontamination Methods section.

EQUIPMENT DECONTAMINATION METHODS

The decontamination procedures described below were used by field personnel to decontaminate sampling, drilling, and related field equipment.

Sampling Equipment

All sampling equipment used (e.g., stainless-steel bowls, stainless-steel spoons, hand augers, direct-push core samplers, etc.) was cleaned using a three-step process, as follows:

1. Scrub surfaces of equipment that contact the sample using brushes using an Alconox solution
2. Rinse and scrub equipment with clean tap water
3. Rinse equipment a final time with deionized water to remove tap water impurities.

Decontamination of the reusable sampling devices was completed between collection of each sample. Sampling equipment that exhibited a visible sheen will be decontaminated using a hexane rinse (or other appropriate solvent) prior to the tap water rinse.

Heavy Equipment

Heavy equipment (e.g., the drilling rigs and drilling equipment that is used downhole, or that contacts material and equipment going downhole) was cleansed by a hot water, high pressure wash before each use and at completion of the project. Potable tap water was used as the cleansing agent.

REFERENCES

Landau Associates. 2006. *Ecology Review Draft Report, Supplemental Data Gaps Investigation, North Marina Redevelopment Site, Everett, Washington*. February 28.

Landau Associates. 2005. Ecology Review Draft, Data Gaps Investigation, North Marina Redevelopment Site, Everett, Washington. Prepared for the Port of Everett. May 13.

Landau Associates. 2004a. *Phase II Environmental Site Assessment Report, North Marina Area, Port of Everett, Everett, Washington.* April 13.

Landau Associates. 2004b. *Work Plan, Phase II Sediment Quality Investigation, North Marina Area Property, Port of Everett, Washington*. Prepared for the Port of Everett. June 30.

APPENDIX C

Exploration Logs

B-1

SAMPLE DATA					SOIL PROFILE			GROUNDWATER
Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm) or moisture content (W)	Graphic Symbol	USCS Symbol	Drilling Method: Geoprobe™ Ground Elevation (ft): No Reference Drilled By: Cascade Drilling Inc.	Water Level
0						GP	Gray, sandy, fine to coarse angular GRAVEL (medium dense, moist) (gravel roadbase)	
2		f3		0		SP-SM	Green-gray, fine to medium SAND with trace silt (loose, moist to wet) (no odor) (hydraulic fill)	
4							-shell fragments	▽ ATD
6		f3		0				
8	NMP2-B-1 -GW @1105							
10								
12								
14								

Boring Completed 12/23/03
Total Depth of Boring = 8.0 ft.

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

147020.14 5/13/05 \\EDMDATA\GINT\GINT6\PROJECTS\147020.090.GPJ SOIL BORING LOG

LANDAU ASSOCIATES

Port of Everett, Data Gaps Investigation
Everett, Washington

Log of Boring B-1

Figure
A-26

B-2

SAMPLE DATA				SOIL PROFILE			GROUNDWATER
Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm) or moisture content (W)	Graphic Symbol	USCS Symbol	Drilling Method: Geoprobe™ Ground Elevation (ft): No Reference Drilled By: Cascade Drilling Inc.	Water Level
0						GP	Gray, sandy, fine to coarse angular GRAVEL (medium dense, moist) (gravel roadbase)	
2		f3		0		SP-SM	Tan, fine to medium SAND with trace silt (loose, moist to wet) (no odor) (hydraulic fill)	
4								▽ ATD
6		f3		0			-shell fragments and becomes dark gray at 6.75 feet	
8	NMP2-B-2 -GW @1250							
10								
12								
14								

Boring Completed 12/23/03
Total Depth of Boring = 8.5 ft.

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

147020.14 5/13/05 \\EDMDATA\GINT\GINT6\PROJECTS\147020.090.GPJ SOIL BORING LOG

LANDAU ASSOCIATES

Port of Everett, Data Gaps Investigation
Everett, Washington

Log of Boring B-2

Figure A-27

B-3

SAMPLE DATA				SOIL PROFILE			GROUNDWATER
Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm) or moisture content (W)	Graphic Symbol	USCS Symbol	Drilling Method: Geoprobe™ Ground Elevation (ft): No Reference Drilled By: Cascade Drilling Inc.	Water Level
0						AC	Asphalt	
				0		GP	Gray, sandy, fine to coarse angular GRAVEL (medium dense, moist) (gravel roadbase)	
2				0		SP/ SM	Dark gray, fine to medium SAND with silt (loose, moist to wet) (slight hydrocarbon odor) (hydraulic fill)	
4								▽ ATD
6		f3		0			-shell fragments	
8	NMP2-B-3 -GW @1150							
10								
12								
14								

Boring Completed 12/23/03
Total Depth of Boring = 9.0 ft.

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

147020.14 5/13/05 \\EDMDATA\GINT\GINT6\PROJECTS\147020.090.GPJ SOIL BORING LOG

LANDAU ASSOCIATES

Port of Everett, Data Gaps Investigation
Everett, Washington

Log of Boring B-3

Figure A-28

B-4

SAMPLE DATA					SOIL PROFILE			GROUNDWATER
Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm) or moisture content (W)	Graphic Symbol	USCS Symbol	Drilling Method: GeoprobeTM Ground Elevation (ft): No Reference Drilled By: Cascade Drilling Inc.	Water Level
0						AC	Asphalt	
						GP	Brown, sandy, fine to coarse gravel, (medium dense, moist) (gravel roadbase)	
2		f3		0				
	NMP2-B-4 -CS @1255					SP	Gray to black, coarse SAND with shells (loose, moist) (no odor) (fill)	
						WD	Wood debris; wood chips	
4						SP-SM	Dark green-gray, fine to medium SAND with silt and shell fragments (loose, moist to wet) (no odor) (hydraulic fill)	▽ ATD
				0				
6		f3						
	NMP2-B-4 -GW @1300							
8								
10								
12								
14								

Boring Completed 02/11/04
Total Depth of Boring = 8.0 ft.

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

147020.14 5/13/05 \\EDMDATA\GINT\GINT6\PROJECTS\147020.090.GPJ SOIL BORING LOG

LANDAU ASSOCIATES

Port of Everett, Data Gaps Investigation
Everett, Washington

Log of Boring B-4

Figure A-29

B-FA-1

SAMPLE DATA				SOIL PROFILE			GROUNDWATER
Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm) or moisture content (W)	Graphic Symbol	USCS Symbol	Drilling Method: Geoprobe™ Ground Elevation (ft): Drilled By: Cascade Drilling Inc.	
0	B-FA-1 0-0.5			0		GP/ SW	Brown, crushed gravelly, fine to medium SAND with silt (dense, damp to moist)(no odor, no sheen)(roadbase)	Groundwater not encountered.
	B-FA-1 1-2	e3				SM	Grey with brown mottles, silty, fine to medium SAND (dense, moist)(no odor, no sheen)(hydraulic fill)	
2	B-FA-1 2-3			0			Silt content decreases to a fine to medium SAND with silt	
4								

Boring Completed 01/14/05
Total Depth of Boring = 4.0 ft.

6
8
10
12

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

147020. 5/13/05 \\EDMDATA\GINT\GINT6\PROJECTS\147020.090.GPJ SOIL BORING LOG

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Port of Everett, Data Gaps Investigation
Everett, Washington

Log of Boring B-FA-1

Figure
A-30

B-FA-2

SAMPLE DATA				SOIL PROFILE			GROUNDWATER
Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm) or moisture content (W)	Graphic Symbol	USCS Symbol	Drilling Method: Geoprobe™ Ground Elevation (ft): Drilled By: Cascade Drilling Inc.	Water Level
0	B-FA-2 0-0.5			0		GP/ SW	Brown, medium to coarse SAND and crushed GRAVEL with silt (dense, moist)(no odor, no sheen)(roadbase)	
	B-FA-2 1-2	e3				SM	Orange brown, silty, fine to medium SAND (dense, moist)(no odor, no sheen)(fill) Silt content decreases to a fine to medium SAND with silt at 1.5' Density decreases to loose at 1.5'	
2	B-FA-2 2-3			0				▽ ATD
4								

Boring Completed 01/14/05
Total Depth of Boring = 4.0 ft.

6
8
10
12

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

147020. 5/13/05 \\EDMDATA\GINT\GINT6\PROJECTS\147020.090.GPJ SOIL BORING LOG

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Everett, Washington

Log of Boring B-FA-2

Figure
A-31

B-FA-3

SAMPLE DATA				SOIL PROFILE			GROUNDWATER
Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm) or moisture content (W)	Graphic Symbol	USCS Symbol	Drilling Method: Geoprobe™ Ground Elevation (ft): Drilled By: Cascade Drilling Inc.	
0	B-FA-3 0-0.5			0		SW	Brown, crushed gravelly, fine to coarse SAND (dense, moist)(no odor, no sheen)(roadbase)	Groundwater not encountered.
	B-FA-3 1-2	e3				SM	Tan, fine to medium SAND with trace silt (loose, damp to moist)(no odor, no sheen)(hydraulic fill)	
2	B-FA-3 2-3			0				
						SM	Silt content increases from trace amounts to SAND with silt at 3.3' Shell fragments present at 3.3'	
4								

Boring Completed 01/14/05
Total Depth of Boring = 4.0 ft.

6
8
10
12

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

147020. 5/13/05 \\EDMDATA\GINTGINT6\PROJECTS\147020.090.GPJ SOIL BORING LOG

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Everett, Washington

Log of Boring B-FA-3

Figure
A-32

B-FA-4

SAMPLE DATA				SOIL PROFILE			GROUNDWATER
Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm) or moisture content (W)	Graphic Symbol	USCS Symbol	Drilling Method: Geoprobe™ Ground Elevation (ft): Drilled By: Cascade Drilling Inc.	
0	B-FA-4 0-0.5			0		SP	Grey, gravelly, SAND with silt (medium dense, moist)(slight petroleum odor, no sheen)(fill)	Groundwater not encountered.
	B-FA-4 1-2	e3				SM	Grey, fine to medium SAND with trace silt (loose to medium dense, moist)(no odor, no sheen)(hydraulic fill)	
2	B-FA-4 2-3			0				
4								

Boring Completed 01/14/05
Total Depth of Boring = 4.0 ft.

6
8
10
12

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

147020. 5/13/05 \\EDMDATA\GINT\GINT6\PROJECTS\147020.090.GPJ SOIL BORING LOG

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Everett, Washington

Log of Boring B-FA-4

Figure
A-33

B-FA-5

SAMPLE DATA				SOIL PROFILE			GROUNDWATER
Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm) or moisture content (W)	Graphic Symbol	USCS Symbol	Drilling Method: Geoprobe™ Ground Elevation (ft): Drilled By: Cascade Drilling Inc.
0						AC	Asphalt
						GP/ SP	Brown, medium to coarse SAND and crushed GRAVEL (medium dense, moist)(no odor, no sheen)(roadbase)
	B-FA-5 0.9-1.4			0		SM	Tan, fine to medium SAND with silt (medium dense, moist)(no odor, no sheen)(hydraulic fill)
2		e3					
	B-FA-5 1.9-2.9			0			
	B-FA-5 2.9-3.9			0			Silt increases to a silty, fine to medium SAND at 3.5'
4							

Groundwater not encountered.

Boring Completed 01/14/05
Total Depth of Boring = 4.0 ft.

6
8
10
12

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

147020. 5/13/05 \\EDMDATA\GINT\GINT6\PROJECTS\147020.090.GPJ SOIL BORING LOG

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Everett, Washington

Log of Boring B-FA-5

Figure
A-34

B-FA-6

SAMPLE DATA				SOIL PROFILE			GROUNDWATER
Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm) or moisture content (W)	Graphic Symbol	USCS Symbol	Drilling Method: Geoprobe™ Ground Elevation (ft): Drilled By: Cascade Drilling Inc.	
0	B-FA-6 0-0.5	e3		0		GP/ SW	Brown, medium to coarse SAND and crushed GRAVEL (dense, moist)(no odor, no sheen)(roadbase)	Groundwater not encountered.
						SM	Tan, fine to medium SAND with silt (loose, moist)(no odor, no sheen)(hydraulic fill)	
2	B-FA-6 1-2							
	B-FA-6 2-3			0			- Becomes gray at 3.5' with shell fragment	
4								

Boring Completed 01/14/05
Total Depth of Boring = 4.0 ft.

6
8
10
12

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

147020. 5/13/05 \\EDMDATA\GINT\GINT6\PROJECTS\147020.090.GPJ SOIL BORING LOG

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Everett, Washington

Log of Boring B-FA-6

Figure
A-35

B-FA-7

SAMPLE DATA				SOIL PROFILE			GROUNDWATER
Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm) or moisture content (W)	Graphic Symbol	USCS Symbol	Drilling Method: Geoprobe™ Ground Elevation (ft): Drilled By: Cascade Drilling Inc.	
0	B-FA-7 0-0.5	e3		0		GP/ SW	Brown, medium to course SAND and crushed GRAVEL (loose, moist)(no odor, no sheen)(roadbase)	Groundwater not encountered.
						SM	Tan, fine to medium SAND with silt (loose, moist)(no odor, no sheen)(hydraulic fill)	
2	B-FA-7 1-2							
	B-FA-7 2-3			0				
4								

Boring Completed 01/14/05
Total Depth of Boring = 4.0 ft.

6
8
10
12

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

147020. 5/13/05 \\EDMDATA\GINT\GINT6\PROJECTS\147020.090.GPJ SOIL BORING LOG

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Everett, Washington

Log of Boring B-FA-7

Figure
A-36

B-FA-8

SAMPLE DATA				SOIL PROFILE			GROUNDWATER
Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm) or moisture content (W)	Graphic Symbol	USCS Symbol	Drilling Method: Geoprobe™ Ground Elevation (ft): Drilled By: Cascade Drilling Inc.	
0	B-FA-8 0-0.5	e3		0		GP/ SW	Brown, medium to coarse SAND and crushed GRAVEL (dense, moist)(no odor, no sheen)(roadbase)	Groundwater not encountered.
	B-FA-8 1-2					SM	Tan to grey, fine to course SAND with abundant shell fragments and with silt (loose, moist)(no odor, no sheen)(hydraulic fill)	
2	B-FA-8 2-3			0				
4								

Boring Completed 01/14/05
Total Depth of Boring = 4.0 ft.

6
8
10
12

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

147020. 5/13/05 \\EDMDATA\GINT\GINT6\PROJECTS\147020.090.GPJ SOIL BORING LOG

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Everett, Washington

Log of Boring B-FA-8

Figure
A-37

B-FA-9

SAMPLE DATA				SOIL PROFILE			GROUNDWATER
Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm) or moisture content (W)	Graphic Symbol	USCS Symbol	Drilling Method: Geoprobe™ Ground Elevation (ft): Drilled By: Cascade Drilling Inc.	Water Level
0	B-FA-9 0-0.5			0		GP/ SW	Brown, fine to coarse SAND and GRAVEL (medium dense, moist)(no odor, no sheen)(roadbase)	
	B-FA-9 1-2	e3		0		SM	Tan, fine to medium SAND with silt and shell fragments (medium dense, moist)(no odor, no sheen)(hydraulic fill)	
2	B-FA-9 2-3			0				▽ ATD
4								

Boring Completed 01/19/05
Total Depth of Boring = 4.0 ft.

6
8
10
12

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

147020. 5/13/05 \\EDMDATA\GINT\GINT6\PROJECTS\147020.090.GPJ SOIL BORING LOG

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Everett, Washington

Log of Boring B-FA-9

Figure
A-38

B-FA-10

SAMPLE DATA					SOIL PROFILE			GROUNDWATER
Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm) or moisture content (W)	Graphic Symbol	USCS Symbol	Drilling Method: Geoprobe™ Ground Elevation (ft): Drilled By: Cascade Drilling Inc.	
0	B-FA-10 0-0.5			0		ML	Grey and brown, fine sandy, SILT with grass roots (loose, moist)(no odor, no sheen)(topsoil)	Groundwater not encountered.
						SM	Brown, fine to medium SAND with silt (loose, moist)(no odor, no sheen)(fill)	
	B-FA-10 1-2			0				
2		e3						
	B-FA-10 2-3			0				
4								

Boring Completed 01/19/05
Total Depth of Boring = 4.0 ft.

6
8
10
12

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

147020. 5/13/05 \\EDMDATA\GINT\GINT6\PROJECTS\147020.090.GPJ SOIL BORING LOG

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Everett, Washington

Log of Boring B-FA-10

Figure
A-39

B-FA-11

SAMPLE DATA				SOIL PROFILE			GROUNDWATER
Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm) or moisture content (W)	Graphic Symbol	USCS Symbol	Drilling Method: Geoprobe™ Ground Elevation (ft): Drilled By: Cascade Drilling Inc.	Water Level
0	B-FA-11 0-0.5			0		SM	Tan, fine to medium SAND with trace silt (loose, moist)(no odor, no sheen)(landscaping fill)	
	B-FA-11 1-2	b3						
2	B-FA-11 2-3			0				▽ ATD
4								

Boring Completed 01/14/05
Total Depth of Boring = 4.0 ft.

6
8
10
12

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

147020. 5/13/05 \\EDMDATA\GINT\GINT6\PROJECTS\147020.090.GPJ SOIL BORING LOG

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Everett, Washington

Log of Boring B-FA-11

Figure
A-40

B-FA-12

SAMPLE DATA				SOIL PROFILE			GROUNDWATER
Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm) or moisture content (W)	Graphic Symbol	USCS Symbol	Drilling Method: Geoprobe™ Ground Elevation (ft): Drilled By: Cascade Drilling Inc.	Water Level
0						AC	Asphalt	
						SP	Brown, fine SAND with gravel (medium dense, moist)(no odor, no sheen)(roadbase) Pink, fine sand from 0.5' - 0.7'	
2		e3				SM	Grey, fine to medium SAND with shell fragments (medium dense, moist)(no odor, no sheen)(hydraulic fill)	
4	B-FA-12 3.7-4.0			0				▽ ATD
6		e3						
8								
10								
12								

Boring Completed 01/18/05
Total Depth of Boring = 8.0 ft.

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

147020. 5/13/05 \\EDMDATA\GINT\GINT6\PROJECTS\147020.090.GPJ SOIL BORING LOG

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Everett, Washington

Log of Boring B-FA-12

Figure A-41

B-GC-1

SAMPLE DATA				SOIL PROFILE			GROUNDWATER
Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm) or moisture content (W)	Graphic Symbol	USCS Symbol	Drilling Method: Geoprobe™ Ground Elevation (ft): Drilled By: Cascade Drilling Inc.	
0						AC	Asphalt	Groundwater not encountered.
						GP/ SW SP	Tan, fine to coarse SAND and crushed GRAVEL (dense, moist)(no odor, no sheen)(roadbase)	
	B-GC-1 1-1.5	e3		0			Tan, medium SAND (loose to medium dense, moist)(no odor, no sheen)(hydraulic fill)	
2	B-GC-1 2-3							
	B-GC-1 3-4			0				
4								

Boring Completed 01/14/05
Total Depth of Boring = 4.0 ft.

6
8
10
12

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

147020. 5/13/05 \\EDMDATA\GINT\GINT6\PROJECTS\147020.090.GPJ SOIL BORING LOG

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Everett, Washington

Log of Boring B-GC-1

Figure
A-42

B-GC-2

SAMPLE DATA					SOIL PROFILE			GROUNDWATER
Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm) or moisture content (W)	Graphic Symbol	USCS Symbol	Drilling Method: Geoprobe™ Ground Elevation (ft): Drilled By: Cascade Drilling Inc.	Water Level
0				W = 5		AC	Asphalt	
						GP/SW	Gray, fine to coarse SAND and crushed GRAVEL with silt (loose, moist) (unidentifiable odor, no sheen)(road base)	
	B-GC-2 (0-0.5)	e3				SW	Gray, gravelly, fine to coarse SAND, with silt (loose, moist) (no odor, no sheen) (fill)	
2								
	B-GC-2 (1-2)			0				
	B-GC-2 (2-3)			0				▽ ATD
4								
6						WD	Brick debris at 5.9'	
							Wood debris	
						SM	Gray, silty, fine SAND with medium sand and trace coarse sand and shell fragments (loose, wet)(no odor, no sheen)(hydraulic fill)	
8								
10								
12								

Boring Completed 09/10/04
Total Depth of Boring = 8.0 ft.

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

147020.60 5/13/05 \\EDMDATA\GINT\GINT6\PROJECTS\147020.090.GPJ SOIL BORING LOG

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Everett, Washington

Log of Boring B-GC-2

Figure A-43

NMP2-B-1

SAMPLE DATA				SOIL PROFILE			GROUNDWATER
Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm)	Graphic Symbol	USCS Symbol	Drilling Method: Geoprobe™ Ground Elevation (ft): No Reference Drilled By: Cascade Drilling Inc.	Water Level
0						GP	Gray, sandy, fine to coarse angular GRAVEL (medium dense, moist) (gravel roadbase)	
				0		SP-SM	Green-gray, fine to medium SAND with trace silt (loose, moist to wet) (no odor) (hydraulic fill)	
2		f3						
4							-shell fragments	▽ ATD
6		f3		0				
8	NMP2-B-1 -GW @1105							

Boring Completed 12/23/03
Total Depth of Boring = 8.0 ft.

10
12
14

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

652002.014 3/26/04 \\EDMDATA\GINT\GINT6\PROJECTS\652002.GPJ SOIL BORING LOG

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North Marina Area
Everett, Washington

Log of Boring NMP2-B-1

Figure
B-14

NMP2-B-2

SAMPLE DATA				SOIL PROFILE			GROUNDWATER
Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm)	Graphic Symbol	USCS Symbol	Drilling Method: Geoprobe™ Ground Elevation (ft): No Reference Drilled By: Cascade Drilling Inc.	Water Level
0						GP	Gray, sandy, fine to coarse angular GRAVEL (medium dense, moist) (gravel roadbase)	
2		f3		0		SP-SM	Tan, fine to medium SAND with trace silt (loose, moist to wet) (no odor) (hydraulic fill)	▽ ATD
4								
6		f3		0			-shell fragments and becomes dark gray at 6.75 feet	
8	NMP2-B-2 -GW @1250							

Boring Completed 12/23/03
Total Depth of Boring = 8.5 ft.

10
12
14

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

652002.014 3/26/04 \\EDMDATA\GINT\GINT6\PROJECTS\652002.GPJ SOIL BORING LOG

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North Marina Area
Everett, Washington

Log of Boring NMP2-B-2

Figure
B-15

NMP2-B-3

SAMPLE DATA				SOIL PROFILE			GROUNDWATER
Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm)	Graphic Symbol	USCS Symbol	Drilling Method: Geoprobe™ Ground Elevation (ft): No Reference Drilled By: Cascade Drilling Inc.	Water Level
0						AC	Asphalt	
				0		GP	Gray, sandy, fine to coarse angular GRAVEL (medium dense, moist) (gravel roadbase)	
2				0		SP/ SM	Dark gray, fine to medium SAND with silt (loose, moist to wet) (slight hydrocarbon odor) (hydraulic fill)	
4								▽ ATD
6		f3		0			-shell fragments	
8	NMP2-B-3 -GW @1150							
10								
12								
14								

Boring Completed 12/23/03
Total Depth of Boring = 9.0 ft.

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

652002.014 3/26/04 \\EDMDATA\GINT\GINT6\PROJECTS\652002.GPJ SOIL BORING LOG

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Log of Boring NMP2-B-3

Figure
B-16

NMP2-B-4

SAMPLE DATA | **SOIL PROFILE** | **GROUNDWATER**

Drilling Method: GeoprobeTM
Ground Elevation (ft): No Reference
Drilled By: Cascade Drilling Inc.

Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm)	Graphic Symbol	USCS Symbol	Soil Profile	Water Level
0						AC	Asphalt	
						GP	Brown, sandy, fine to coarse gravel, (medium dense, moist) (gravel roadbase)	
2		f3		0		SP	Gray to black, coarse SAND with shells (loose, moist) (no odor) (fill)	
	NMP2-B-4 -CS @1255					WD	Wood debris; wood chips	
4						SP-SM	Dark green-gray, fine to medium SAND with silt and shell fragments (loose, moist to wet) (no odor) (hydraulic fill)	ATD
				0				
6		f3						
	NMP2-B-4 -GW @1300							
8								

Boring Completed 02/11/04
Total Depth of Boring = 8.0 ft.

10
12
14

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

652002.014 3/26/04 \\EDMDATA\GINT\GINT6\PROJECTS\652002.GPJ SOIL BORING LOG

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North Marina Area
Everett, Washington

Log of Boring NMP2-B-4

Figure
B-17

L-FA-2

SAMPLE DATA					SOIL PROFILE			GROUNDWATER
Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm) or moisture content (W)	Graphic Symbol	USCS Symbol	Drilling Method: Geoprobe™ Ground Elevation (ft): Drilled By: Cascade Drilling Inc.	Water Level
0		e3					Void space below storm grate	
							Surface water	
2	L-FA-2 1.8-2.8					ML	Dark brown, fine sandy, SILT with organics (loose, wet)(no odor, no sheen)(parking lot sediment runoff)	
		e3				SP	Black, gravelly, SAND (loose, wet)(unidentifiable odor, no sheen)(asphalt remnant)	▽ ATD
4	L-FA-2 3.3-4.3			0		SM	Grey, silty, fine SAND with shell fragments (medium dense, wet)(no odor, no sheen)(hydrualic fill)	
	L-FA-2 4.3-5.3			0		ML	Grey, fine sandy, SILT with wood fragments (medium dense, wet)(no odor, no sheen)(hydraulic fill)	
6	L-FA-2 5.3-6.3	e3		0		SM	Grey, silty, medium SAND with shell fragments (medium dense, very moist)(no odor, no sheen)(hydraulic fill)	
8								
10								
12								

Boring Completed 01/19/05
Total Depth of Boring = 8.0 ft.

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

147020. 5/13/05 \\EDMDATA\GINT\GINT6\PROJECTS\147020.090.GPJ SOIL BORING LOG

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Everett, Washington

Log of Boring L-FA-2

Figure
A-205

L-GC-1

SAMPLE DATA				SOIL PROFILE			GROUNDWATER
Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm) or moisture content (W)	Graphic Symbol	USCS Symbol	Drilling Method: Geoprobe™ Ground Elevation (ft): Drilled By: Cascade Drilling Inc.	
0						AC	Asphalt	Groundwater not encountered.
						GP	Grey to brown, crushed GRAVEL with medium to coarse sand (dense, damp)(no odor, no sheen)(roadbase)	
	L-GC-1 0.5-1			0		SP	Dark brown, fine to medium SAND with gravel and silt (medium dense, damp)(no odor, no sheen)(fill)	
2	L-GC-1 1.5-2.5	e3		0			Becomes greenish grey	
	L-GC-1 2.5-3.5			0		SM	Dark grey, fine to medium SAND with silt (loose, moist)(no odor, no sheen)(hydraulic fill)	
4								

Boring Completed 01/19/05
Total Depth of Boring = 4.0 ft.

6
8
10
12

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

147020. 5/13/05 \\EDMDATA\GINT\GINT6\PROJECTS\147020.090.GPJ SOIL BORING LOG

LANDAU ASSOCIATES

Port of Everett, Data Gaps Investigation
Everett, Washington

Log of Boring L-GC-1

Figure
A-206

L-GC-2

SAMPLE DATA				SOIL PROFILE			GROUNDWATER
Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm) or moisture content (W)	Graphic Symbol	USCS Symbol	Drilling Method: Geoprobe™ Ground Elevation (ft): Drilled By: Cascade Drilling Inc.	
0	L-GC-2 0-0.5	e3		0		ML SM	Brown with orange brown mottles, fine to medium sandy SILT (loose, moist)(no odor, no sheen)(fill)	Groundwater not encountered.
	L-GC-2 1-2			0			Brown, fine to medium SAND with silt (loose, moist)(no odor, no sheen)(hydraulic fill) - Black and orange mottles 1.2'	
2	L-GC-2 2-3			0			- Shell fragments at 2.2'	
4								

Boring Completed 01/19/05
Total Depth of Boring = 4.0 ft.

6
8
10
12

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

147020. 5/13/05 \\EDMDATA\GINT\GINT6\PROJECTS\147020.090.GPJ SOIL BORING LOG

LANDAU ASSOCIATES

Port of Everett, Data Gaps Investigation Everett, Washington	Log of Boring L-GC-2	Figure A-207

L-GC-3

SAMPLE DATA				SOIL PROFILE			GROUNDWATER
Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm) or moisture content (W)	Graphic Symbol	USCS Symbol	Drilling Method: Geoprobe™ Ground Elevation (ft): Drilled By: Cascade Drilling Inc.	Water Level
0						AC	Asphalt	
						SP	Brown, gravelly, fine to medium SAND with silt (dense, moist)(no odor, no sheen)(roadbase) Gravel decreases to trace amounts at 0.7'	
	L-GC-3 0.7-1.4			0				
2	L-GC-3 1.7-2.7	e3		0		SM	Grey, silty, fine SAND (loose, wet)(no odor, no sheen)(hydraulic fill)	
	L-GC-3 2.7-3.7			0				
4								▽ ATD
6		e3						
8								
10								
12								

Boring Completed 01/19/05
Total Depth of Boring = 8.0 ft.

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

147020. 5/13/05 \\EDMDATA\GINT\GINT6\PROJECTS\147020.090.GPJ SOIL BORING LOG

LANDAU ASSOCIATES

Port of Everett, Data Gaps Investigation
Everett, Washington

Log of Boring L-GC-3

Figure
A-208

L-GC-4

SAMPLE DATA					SOIL PROFILE			GROUNDWATER
Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm) or moisture content (W)	Graphic Symbol	USCS Symbol	Drilling Method: Geoprobe™ Ground Elevation (ft): Drilled By: Cascade Drilling Inc.	Water Level
0	L-GC-4 0-0.5	e3		0		GP	Brown, sandy, GRAVEL (dense, moist)(no odor, no sheen)(roadbase)	
2	L-GC-4 2.3-3.3			0		SM	Brown, fine to medium SAND with silt (loose, moist)(no odor, no sheen)(hydraulic fill)	
4	L-GC-4 3.3-4.3	e3		0				▽ ATD
6							Silt content increases to a silty, fine to medium SAND at 6.5'	
8								
10								
12								

Boring Completed 01/19/05
Total Depth of Boring = 8.0 ft.

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

147020. 5/13/05 \\EDMDATA\GINT\GINT6\PROJECTS\147020.090.GPJ SOIL BORING LOG

LANDAU ASSOCIATES

Port of Everett, Data Gaps Investigation
Everett, Washington

Log of Boring L-GC-4

Figure
A-209

L-GC-4b

SAMPLE DATA					SOIL PROFILE			GROUNDWATER
Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm) or moisture content (W)	Graphic Symbol	USCS Symbol	Drilling Method: Geoprobe™ Ground Elevation (ft): Drilled By: ESN	Water Level
0						AC	Asphalt	
						GP/ SW	Brown, fine to course SAND and GRAVEL (dense, moist)(no odor, no sheen)(roadbase)	
	L-GC-4b 1.7-2.2							
2		e3		0		SM	Dark brown, fine to medium SAND with silt and gravel (medium dense, moist)(no odor, no sheen)(hydraulic fill) Gravel absent past 2.2'	
	L-GC-4b 2.7-3.7							
4	L-GC-4b 3.7-4.7			0				
							Becomes wet at 5.1'	▽ ATD
	L-GC-4b 4.7-6.7							
6		e3					Grey, fine sandy, SILT, (medium dense, west) (no odor, no sheen)	
	L-GC-4b 6.7-8			0				
8								
10								
12								

Boring Completed 03/03/05
Total Depth of Boring = 8.0 ft.

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

147020. 5/13/05 \\EDMDATA\GINT\GINT6\PROJECTS\147020.090.GPJ SOIL BORING LOG

LANDAU ASSOCIATES

Port of Everett, Data Gaps Investigation
Everett, Washington

Log of Boring L-GC-4b

Figure
A-210

L-GC-5

SAMPLE DATA				SOIL PROFILE			GROUNDWATER
Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm) or moisture content (W)	Graphic Symbol	USCS Symbol	Drilling Method: Geoprobe™ Ground Elevation (ft): Drilled By: Cascade Drilling Inc.	
0						AC	Asphalt	Groundwater not encountered.
	L-GC-5 0.5-1			0		GP/ SP SM	Brown to grey, fine to medium SAND and GRAVEL (dense, damp)(no odor, no sheen)(roadbase)	
2	L-GC-5 1.5-2.5	e3					Brown, fine to coarse SAND with silt and trace gravel (medium dense, damp)(no odor, no sheen)(fill)	
	L-GC-5 2.5-3.5			0		SM	Grey, fine to medium SAND with trace silt (loose, moist)(no odor, no sheen)(hydraulic fill)	
4						ML	Brown, fine sandy, SILT (soft, moist)(no odor, no sheen)(hydraulic fill)	

Boring Completed 01/19/05
Total Depth of Boring = 4.0 ft.

6
8
10
12

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

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Port of Everett, Data Gaps Investigation
Everett, Washington

Log of Boring L-GC-5

Figure A-211

L-GC-5b

SAMPLE DATA				SOIL PROFILE			GROUNDWATER
Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm) or moisture content (W)	Graphic Symbol	USCS Symbol	Drilling Method: Geoprobe™ Ground Elevation (ft): Drilled By: ESN	Water Level
0						AC	Asphalt	
						GP/ SW	Brown, fine to course SAND and crushed GRAVEL (dense, damp)(no odor, no sheen)(roadbase)	
2		e3						
	L-GC-5b 2.3-2.8			0		SP	Brown to greenish grey, gine to medium SAND with gravel (dense, moist)(no odor, no sheen)(fill)	
	L-GC-5b 3.3-4.3					SM	Grey, fine to medium SAND with silt (medium dense, moist)(no odor, no sheen)(hydraulic fill)	▽ ATD
4								
	L-GC-5b 4.3-5.3			0			Becomes wet at 4.5'	
6		e3						
	L-GC-5b 5.3-8			0				
8								
10								
12								

Boring Completed 03/03/05
Total Depth of Boring = 8.0 ft.

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

147020. 5/13/05 \\EDMDATA\GINT\GINT6\PROJECTS\147020.090.GPJ SOIL BORING LOG

LANDAU ASSOCIATES

Port of Everett, Data Gaps Investigation Everett, Washington	Log of Boring L-GC-5b	Figure A-212

L-GC-5c

SAMPLE DATA				SOIL PROFILE			GROUNDWATER
Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm) or moisture content (W)	Graphic Symbol	USCS Symbol	Drilling Method: Geoprobe™ Ground Elevation (ft): Drilled By: ESN	Water Level
0						AC	Asphalt	
						GP/ SW	Dark brown, fine to course SAND and GRAVEL (medium dense, damp)(no odor, no sheen)(roadbase)	
	L-GC-5c 1-1.5			0		SM	Grey, fine to medium SAND with silt and trace gravel (medium dense, moist)(no odor, no sheen)(hydraulic fill)	
2		e3					Wood debris at 1.2' (1" thick)	
	L-GC-5c 2-3							
	L-GC-5c 3-4							
4								
	L-GC-5c 4-6			0			Becomes wet at 5.2'	▽ ATD
6		e3						
	L-GC-5c 6-7.7					SP	Dark grey, medium to course SAND with trace silt (loose, wet)(no odor, no sheen)(hydraulic fill)	
8								
10								
12								

Boring Completed 03/03/05
Total Depth of Boring = 8.0 ft.

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

147020. 5/13/05 \\EDMDATA\GINT\GINT6\PROJECTS\147020.090.GPJ SOIL BORING LOG

LANDAU ASSOCIATES

Port of Everett, Data Gaps Investigation
Everett, Washington

Log of Boring L-GC-5c

Figure
A-213

B-FA-20

SAMPLE DATA				SOIL PROFILE			GROUNDWATER
Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm)	Graphic Symbol	USCS Symbol	Water Level

Drilling Method: Direct Push
Ground Elevation (ft): not surveyed
Drilled By: Cascade

Depth (ft)	Sample Number & Interval	PID (ppm)	USCS Symbol	
0			AC	Asphalt surface and roadbase (no odor, no sheen) (loose, dry) **(ASPHALT)**
	B-FA-20 (0.8-1.8)		GP-GM	Brown, sandy GRAVEL with silt (no odor, no sheen) (loose, dry)
			SP	**(FILL)**
2	B-FA-20 (1.8-2.8)	PID=0.0	SP-SM	Dark brown, fine to medium SAND with gravel (no odor, no sheen) (loose, dry)
	B-FA-20 (2.8-3.8)			Gray, fine to medium SAND with silt (no odor, no sheen) (loose, damp)
4				▽ ATD
			SM	Gray, very silty, fine SAND (no odor, no sheen) (loose, wet)
6		PID=0.0		
8				

Boring Completed 03/05/14
Total Depth of Boring = 8.0 ft.

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

0147037.010.011 3/31/14 N:\PROJECTS\147037.010.011.GPJ SOIL BORING LOG

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American Boiler Works/Bayside Marine Site
Everett, Washington

Log of Boring B-FA-20

Figure 1

B-FA-20.1N

SAMPLE DATA				SOIL PROFILE			GROUNDWATER
Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm)	Graphic Symbol	USCS Symbol	Water Level

Drilling Method: Direct Push
Ground Elevation (ft): not surveyed
Drilled By: Cascade

Depth (ft)	Sample Number & Interval	PID (ppm)	USCS Symbol	
0			AC	Asphalt surface and roadbase (no odor, no sheen) (loose, dry) **(ASPHALT)**
			SM	Brown, fine to medium SAND with gravel (no odor, no sheen) (loose, damp) **(FILL)**
	B-FA-20.1N (1.8-2.8)			
2	B-FA-20.1N (0.8-1.8)	PID=0.0		(loose, wet) ▽ ATD
	B-FA-20.1N (2.8-3.8)		SM	Gray, silty, fine SAND (no odor, no sheen) (loose, wet)
4				
6		PID=0.0		
8				

Boring Completed 03/05/14
Total Depth of Boring = 8.0 ft.

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

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American Boiler Works/Bayside Marine Site
Everett, Washington

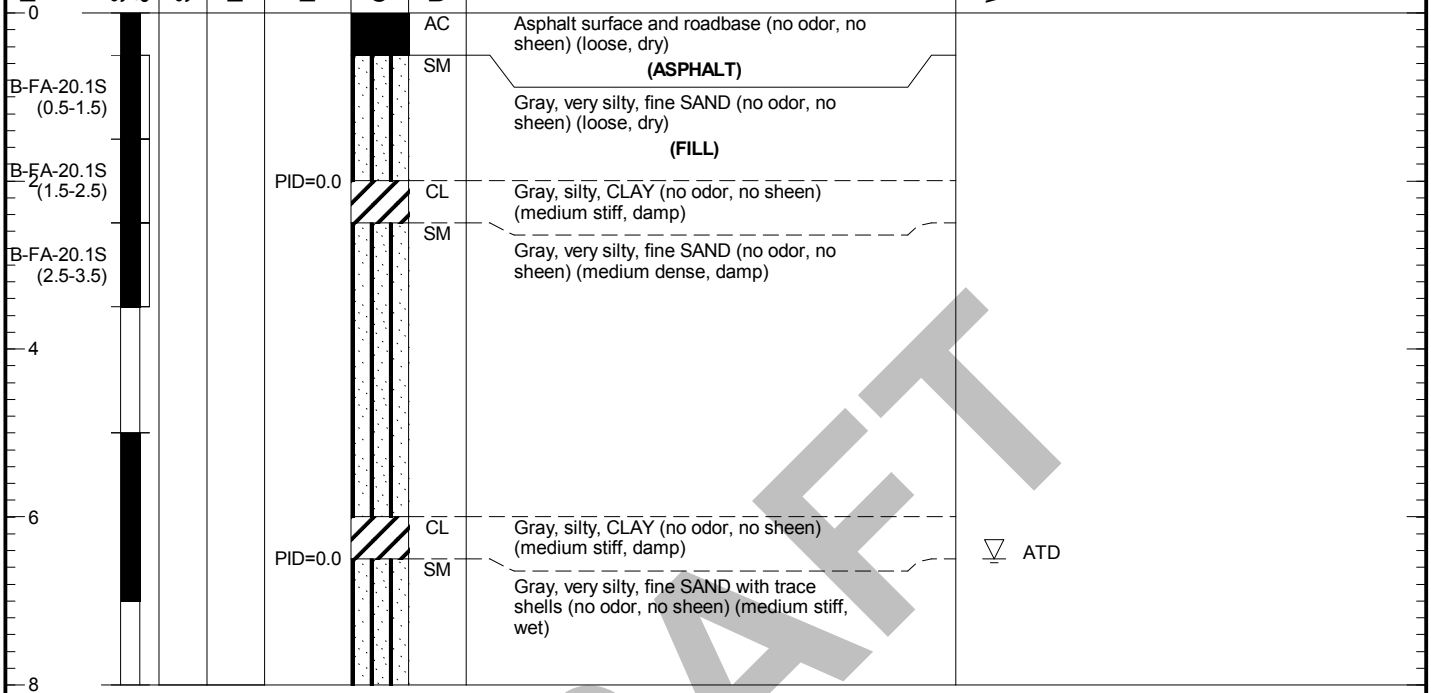
Log of Boring B-FA-20.1N

Figure 2

B-FA-20.1S

SAMPLE DATA				SOIL PROFILE			GROUNDWATER
Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm)	Graphic Symbol	USCS Symbol	Water Level

Drilling Method: Direct Push
Ground Elevation (ft): not surveyed
Drilled By: Cascade



Boring Completed 03/05/14
Total Depth of Boring = 8.0 ft.

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

0147037.010.011 3/31/14 N:\PROJECTS\147037.010.011.GPJ SOIL BORING LOG

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American Boiler Works/Bayside Marine Site
Everett, Washington

Log of Boring B-FA-20.1S

Figure 3

B-FA-21

SAMPLE DATA				SOIL PROFILE			GROUNDWATER
Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm)	Graphic Symbol	USCS Symbol	Water Level

Drilling Method: Direct Push
Ground Elevation (ft): not surveyed
Drilled By: Cascade

Depth (ft)	Sample Number & Interval	PID (ppm)	USCS Symbol	
0			AC	Asphalt surface and roadbase (no odor, no sheen) (loose, dry)
				(ASPHALT)
	B-FA-21 (0.5-1.5)		GP-GM	Brown, sandy GRAVEL with silt (no odor, no sheen) (loose, dry)
				(FILL)
2	B-FA-21 (1.5-2.5)	PID=0.0	SP-SM	Gray, fine to medium SAND with silt (no odor, no sheen) (loose, dry)
	B-FA-21 (2.5-3.5)			
4				ATD
			SM	Gray, silty, fine SAND with trace shells (no odor, no sheen) (loose, wet)
6		PID=0.0		
8				

Boring Completed 03/05/14
Total Depth of Boring = 8.0 ft.

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

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Everett, Washington

Log of Boring B-FA-21

Figure 4

B-FA-21.1N

SAMPLE DATA				SOIL PROFILE			GROUNDWATER
Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm)	Graphic Symbol	USCS Symbol	Water Level
0						AC	Asphalt surface and roadbase (no odor, no sheen) (loose, dry) **(ASPHALT)**
						SP	Brown, fine to medium SAND (no odor, no sheen) (loose, dry) **(FILL)**
2	B-FA-21.1N (0.7-1.7)						
	B-FA-21.1N (1.7-2.7)			PID=0.0			
	B-FA-21.1N (2.7-3.7)						
4							
6				PID=0.0		SM	Gray, silty, fine SAND with trace shells (no odor, no sheen) (loose, wet)
							▽ ATD
8							

Drilling Method: Direct Push

Ground Elevation (ft): not surveyed

Drilled By: Cascade

Boring Completed 03/05/14
Total Depth of Boring = 8.0 ft.

10
12
14
16

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

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American Boiler Works/Bayside Marine Site
Everett, Washington

Log of Boring B-FA-21.1N

Figure 5

B-FA-21.1S

SAMPLE DATA | **SOIL PROFILE** | **GROUNDWATER**

Drilling Method: Direct Push
Ground Elevation (ft): not surveyed
Drilled By: Cascade

Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm)	Graphic Symbol	USCS Symbol	Soil Description	Water Level
0						AC	Asphalt surface and roadbase (no odor, no sheen) (loose, dry)	
						SP-SM	**(ASPHALT)**	
	B-FA-21.1S (0.5-1.5)						Brown, fine to coarse SAND with silt (no odor, no sheen) (loose, dry)	
						SM	**(FILL)**	
2	B-FA-21.1S (1.5-2.5)			PID=0.0			Gray, silty, fine SAND (no odor, no sheen) (loose, dry)	
	B-FA-21.1S (2.5-3.5)							
4								
						SM	Gray, silty, fine SAND (no odor, no sheen) (loose, wet)	ATD
6				PID=0.0				
8								

Boring Completed 03/05/14
Total Depth of Boring = 8.0 ft.

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

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American Boiler Works/Bayside Marine Site
Everett, Washington

Log of Boring B-FA-21.1S

Figure 6

B-FA-21.1W

SAMPLE DATA				SOIL PROFILE			GROUNDWATER
Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm)	Graphic Symbol	USCS Symbol	Water Level

Drilling Method: Direct Push
Ground Elevation (ft): not surveyed
Drilled By: Cascade

Depth (ft)	Sample Number & Interval	PID (ppm)	USCS Symbol	
0			AC	Asphalt surface and roadbase (no odor, no sheen) (loose, dry)
			SP-SM	**(ASPHALT)** Gray, gravelly fine to medium SAND (no odor, no sheen) (loose, dry) **(FILL)**
2	B-FA-21.1W (0.5-1.5)	PID=0.0	SP	Gray, fine to medium SAND (no odor, no sheen) (loose, dry)
	B-FA-21.1W (1.5-2.5)			
4	B-FA-21.1W (2.5-3.5)			
				ATD
6			SM	Gray, very silty, fine SAND with shells (sulfur odor, no sheen) (loose, wet)
		PID=0.0		
8				
10				
12				
14				
16				

Boring Completed 03/05/14
Total Depth of Boring = 10.0 ft.

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

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American Boiler Works/Bayside Marine Site
Everett, Washington

Log of Boring B-FA-21.1W

Figure 7

P-27

SAMPLE DATA | **SOIL PROFILE** | **GROUNDWATER**

Drilling Method: Direct Push
Ground Elevation (ft): not surveyed
Drilled By: Cascade

Depth (ft) | Sample Number & Interval | Sampler Type | Blows/Foot | PID (ppm) | Graphic Symbol | USCS Symbol | Water Level | Monitoring Well Detail

Depth (ft)	USCS Symbol	Description
0	AC	Asphalt surface and roadbase (no odor, no sheen) (loose, dry)
	SP	**(ASPHALT)** Gray, fine to medium SAND with gravel (no odor, no sheen) (loose, dry)
2	SP-SM	**(FILL)** Gray, fine to medium SAND with silt (no odor, no sheen) (loose, dry)
4	SM	Gray, silty, fine SAND (no odor, no sheen) (loose, damp)
	SM	Gray, silty, fine SAND (sulfur odor, no sheen) (loose, wet)
6	SP-SM	Gray, fine to medium SAND with silt (sulfur odor, no sheen) (loose, wet)
8		
10	WD	Brown wood chips (no odor, no sheen) (loose, wet)
12		
14		
16		

ATD ▽

Monitoring Well Detail:
- Bentonite chips
- 1-inch diameter, Schedule 40, PVC well casing
- 20/40 Colorado sand pack
- 1-inch diameter, Schedule 40, PVC screen (0.010-inch slot size)
- Threaded end cap
- Slough

Boring Completed 03/05/14
Total Depth of Boring = 15.0 ft.

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

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American Boiler Works/Bayside Marine Site
Everett, Washington

Log of Monitoring Well P-27

Figure 8

RELATIVE DENSITY OR CONSISTENCY VERSUS SPT N-VALUE

COHESIONLESS SOILS			COHESIVE SOILS		
Density	N (blows/ft)	Approximate Relative Density(%)	Consistency	N (blows/ft)	Approximate Undrained Shear Strength (psf)
Very Loose	0 to 4	0 - 15	Very Soft	0 to 2	<250
Loose	4 to 10	15 - 35	Soft	2 to 4	250 - 500
Medium Dense	10 to 30	35 - 65	Medium Stiff	4 to 8	500 - 1000
Dense	30 to 50	65 - 85	Stiff	8 to 15	1000 - 2000
Very Dense	over 50	85 - 100	Very Stiff	15 to 30	2000 - 4000
			Hard	over 30	>4000

USCS SOIL CLASSIFICATION SYSTEM

MAJOR DIVISIONS			GROUP DESCRIPTIONS	
Coarse Grained Soils	Gravel and Gravelly Soils	Clean Gravel (little or no fines)	GW	Well-graded GRAVEL
			GP	Poorly-graded GRAVEL
	More than 50% of Coarse Fraction Retained on No. 4 Sieve	Gravel with Fines (appreciable amount of fines)	GM	Silty GRAVEL
			GC	Clayey GRAVEL
More than 50% Retained on No. 200 Sieve Size	Sand and Sandy Soils	Clean Sand (little or no fines)	SW	Well-graded SAND
			SP	Poorly-graded SAND
	50% or More of Coarse Fraction Passing No. 4 Sieve	Sand with Fines (appreciable amount of fines)	SM	Silty SAND
			SC	Clayey SAND
Fine Grained Soils	Silt and Clay	Liquid Limit Less than 50%	ML	SILT
			CL	Lean CLAY
			OL	Organic SILT/Organic CLAY
50% or More Passing No. 200 Sieve Size	Silt and Clay	Liquid Limit 50% or More	MH	Elastic SILT
			CH	Fat CLAY
			OH	Organic SILT/Organic CLAY
Highly Organic Soils			PT	PEAT

TEST SYMBOLS

%F	Percent Fines	
AL	Atterberg Limits:	PL = Plastic Limit LL = Liquid Limit
CBR	California Bearing Ratio	
CN	Consolidation	
DD	Dry Density (pcf)	
DS	Direct Shear	
GS	Grain Size Distribution	
K	Permeability	
MD	Moisture/Density Relationship (Proctor)	
MR	Resilient Modulus	
PID	Photoionization Device Reading	
PP	Pocket Penetrometer Approx. Compressive Strength (tsf)	
SG	Specific Gravity	
TC	Triaxial Compression	
TV	Torvane Approx. Shear Strength (tsf)	
UC	Unconfined Compression	

SAMPLE TYPE SYMBOLS

- 2.0" OD Split Spoon (SPT) (140 lb. hammer with 30 in. drop)
- Shelby Tube
- 3-1/4" OD Split Spoon with Brass Rings
- Small Bag Sample
- Large Bag (Bulk) Sample
- Core Run
- Non-standard Penetration Test (3.0" OD split spoon)

GROUNDWATER SYMBOLS

- Groundwater Level (measured at time of drilling)
- Groundwater Level (measured in well or open hole after water level stabilized)

COMPONENT DEFINITIONS

COMPONENT	SIZE RANGE
Boulders	Larger than 12 in
Cobbles	3 in to 12 in
Gravel	3 in to No 4 (4.5mm)
Coarse gravel	3 in to 3/4 in
Fine gravel	3/4 in to No 4 (4.5mm)
Sand	No. 4 (4.5 mm) to No. 200 (0.074 mm)
Coarse sand	No. 4 (4.5 mm) to No. 10 (2.0 mm)
Medium sand	No. 10 (2.0 mm) to No. 40 (0.42 mm)
Fine sand	No. 40 (0.42 mm) to No. 200 (0.074 mm)
Silt and Clay	Smaller than No. 200 (0.074mm)

COMPONENT PROPORTIONS

PROPORTION RANGE	DESCRIPTIVE TERMS
< 5%	Clean
5 - 12%	Slightly (Clayey, Silty, Sandy)
12 - 30%	Clayey, Silty, Sandy, Gravelly
30 - 50%	Very (Clayey, Silty, Sandy, Gravelly)
Components are arranged in order of increasing quantities.	

NOTES: Soil classifications presented on exploration logs are based on visual and laboratory observation. Soil descriptions are presented in the following general order:

Density/consistency, color, modifier (if any) GROUP NAME, additions to group name (if any), moisture content. Proportion, gradation, and angularity of constituents, additional comments. (GEOLOGIC INTERPRETATION)

Please refer to the discussion in the report text as well as the exploration logs for a more complete description of subsurface conditions.

MOISTURE CONTENT

DRY	Absence of moisture, dusty, dry to the touch.
MOIST	Damp but no visible water.
WET	Visible free water, usually soil is below water table.

HWA GEOSCIENCES INC.

Port of Everett
Bayside Marine Site
Everett, WA

LEGEND OF TERMS AND SYMBOLS USED ON EXPLORATION LOGS

PROJECT NO.: 2013-066 FIGURE: A-1

DRILLING COMPANY: ESN Northwest
DRILLING METHOD: Direct-push
SAMPLING METHOD: 1.5"x60" Macrocore sampler with HDPE liner
LOCATION:

SURFACE ELEVATION: ± feet
CASING ELEVATION ± feet

DATE STARTED: 7/23/2014
DATE COMPLETED: 7/23/2014
LOGGED BY: V. Atkins

DEPTH (feet)	SYMBOL	USCS SOIL CLASS	DESCRIPTION
0			Asphalt
		GW	Fine GRAVEL
			Light brown, gravelly SAND. Trace oxidation. (FILL)
5		SM	Brown, slightly silty SAND.
		SM	Gray, silty gravelly SAND. Moist to wet.
10			Boring completed to 3 feet below ground surface. No ground water seepage was observed during the exploration. Boring backfilled with hydrated bentonite chips and surface restored.
15			

SAMPLE TYPE
SAMPLE NUMBER
PEN. RESISTANCE (blows/6 inches)
PID (ppm)
GROUNDWATER

▲ Blows per foot

0 10 20 30 40 50

DEPTH (feet)

0 5 10 15

0 20 40 60 80 100

Water Content (%)

Plastic Limit — Liquid Limit

Natural Water Content

NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated and therefore may not necessarily be indicative of other times and/or locations.

HWA GEOSCIENCES INC.

Bayside Marine Site
Everett, WA

BORING:
CB-1

PAGE: 1 of 1

PROJECT NO.: 2013-066

FIGURE: A-2

BORINGE 2013-066.GPJ 9/10/14

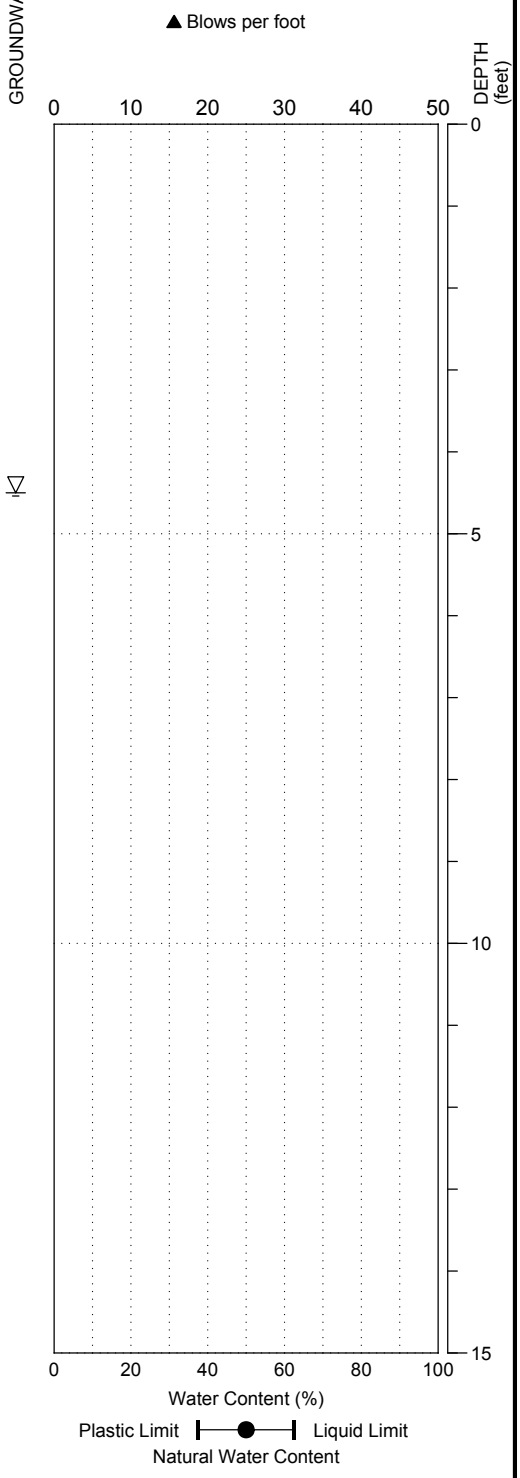
DRILLING COMPANY: ESN Northwest
DRILLING METHOD: Direct-push
SAMPLING METHOD: 1.5"x60" Macrocore sampler with HDPE liner
LOCATION:

SURFACE ELEVATION: ± feet
CASING ELEVATION ± feet

DATE STARTED: 7/23/2014
DATE COMPLETED: 7/23/2014
LOGGED BY: V. Atkins

DEPTH (feet)	SYMBOL	USCS SOIL CLASS	DESCRIPTION
0			Asphalt
		GP	Fine GRAVEL
		SM	Brown, slightly gravelly silty SAND. Trace oxidation. (FILL)
		SM	Brown, slightly gravelly slightly silty SAND.
		SM	Gray, silty gravelly SAND. Wet.
5			Boring completed to 5 feet below ground surface. Ground water seepage was observed at 4.5 feet depth. Boring backfilled with hydrated bentonite chips and surface restored.

SAMPLE TYPE
SAMPLE NUMBER
PEN. RESISTANCE (blows/6 inches)
PID (ppm)
GROUNDWATER



NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated and therefore may not necessarily be indicative of other times and/or locations.

HWA GEOSCIENCES INC.

Bayside Marine Site
Everett, WA

BORING:
CB-2

PAGE: 1 of 1

PROJECT NO.: 2013-066 FIGURE: A-3

BORINGE 2013-066.GPJ 9/10/14

DRILLING COMPANY: ESN Northwest
DRILLING METHOD: Direct-push
SAMPLING METHOD: 1.5"x60" Macrocore sampler with HDPE liner
LOCATION:

SURFACE ELEVATION: ± feet
CASING ELEVATION ± feet

DATE STARTED: 7/23/2014
DATE COMPLETED: 7/23/2014
LOGGED BY: V. Atkins

DEPTH (feet)	SYMBOL	USCS SOIL CLASS	DESCRIPTION
0			Asphalt
		GP	Fine GRAVEL
		SM	Medium dense, gray, silty SAND. Trace oxidation. Trace Wood debris. Moist to wet.
5			

SAMPLE TYPE
SAMPLE NUMBER
PEN. RESISTANCE (blows/6 inches)
PID (ppm)
GROUNDWATER

▲ Blows per foot

0 10 20 30 40 50

DEPTH (feet)

0
5
10
15

Boring completed to 5 feet below ground surface.
No ground water seepage was observed during the exploration.
Boring backfilled with hydrated bentonite chips and surface restored.

0 20 40 60 80 100
Water Content (%)
Plastic Limit — Liquid Limit
Natural Water Content

NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated and therefore may not necessarily be indicative of other times and/or locations.

HWA GEOSCIENCES INC.

Bayside Marine Site
Everett, WA

BORING:
CB-3

PAGE: 1 of 1

PROJECT NO.: 2013-066 FIGURE: A-4

DRILLING COMPANY: ESN Northwest
DRILLING METHOD: Direct-push
SAMPLING METHOD: 1.5"x60" Macrocore sampler with HDPE liner
LOCATION:

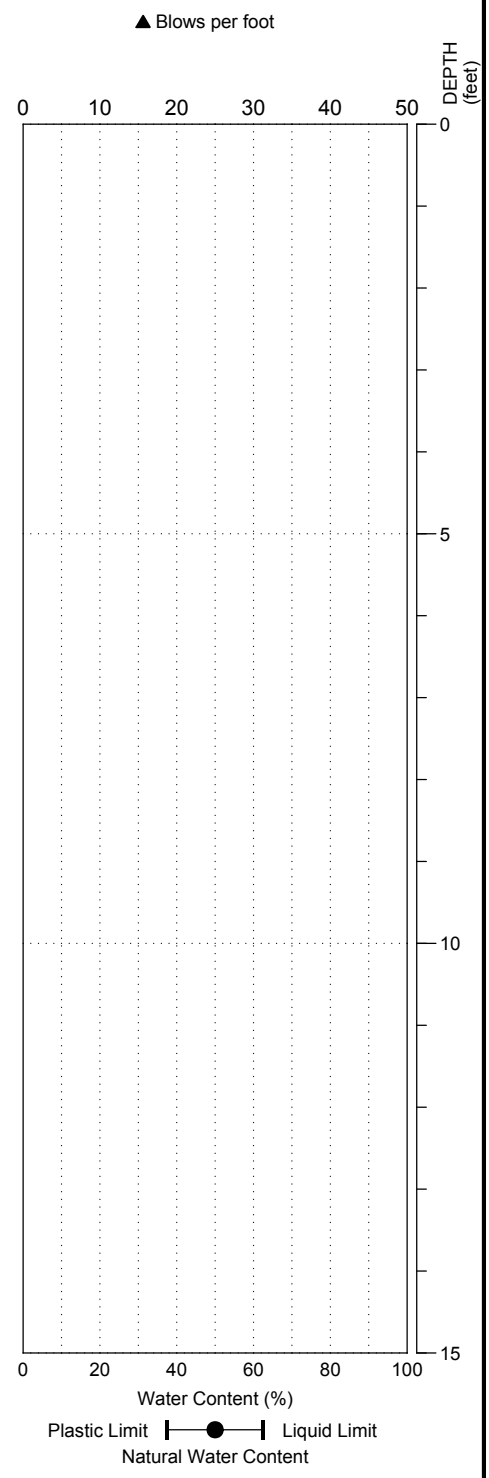
SURFACE ELEVATION: ± feet
CASING ELEVATION ± feet

DATE STARTED: 7/23/2014
DATE COMPLETED: 7/23/2014
LOGGED BY: V. Atkins

DEPTH (feet)	SYMBOL	USCS SOIL CLASS	DESCRIPTION
0			Asphalt
		GP	Gray, silty GRAVEL. Concrete debris.
		SM	Dark gray, silty SAND. Wood debris. Trace oxidation. Slight creosote odor, decreasing below 2' depth. Moist to wet.
			Increasing silt to sandy silt.
5		SM	Loose to medium dense, brown, silty SAND with trace gravel. Wet.

Boring completed to 5 feet below ground surface.
No ground water seepage was observed during the exploration.
Boring backfilled with hydrated bentonite chips and surface restored.

SAMPLE TYPE
SAMPLE NUMBER
PEN. RESISTANCE (blows/6 inches)
PID (ppm)
GROUNDWATER



NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated and therefore may not necessarily be indicative of other times and/or locations.

HWA GEOSCIENCES INC.

Bayside Marine Site
Everett, WA

BORING:
CB-4

PAGE: 1 of 1

PROJECT NO.: 2013-066 FIGURE: A-5

DRILLING COMPANY: ESN Northwest
DRILLING METHOD: Direct-push
SAMPLING METHOD: 1.5"x60" Macrocore sampler with HDPE liner
LOCATION:

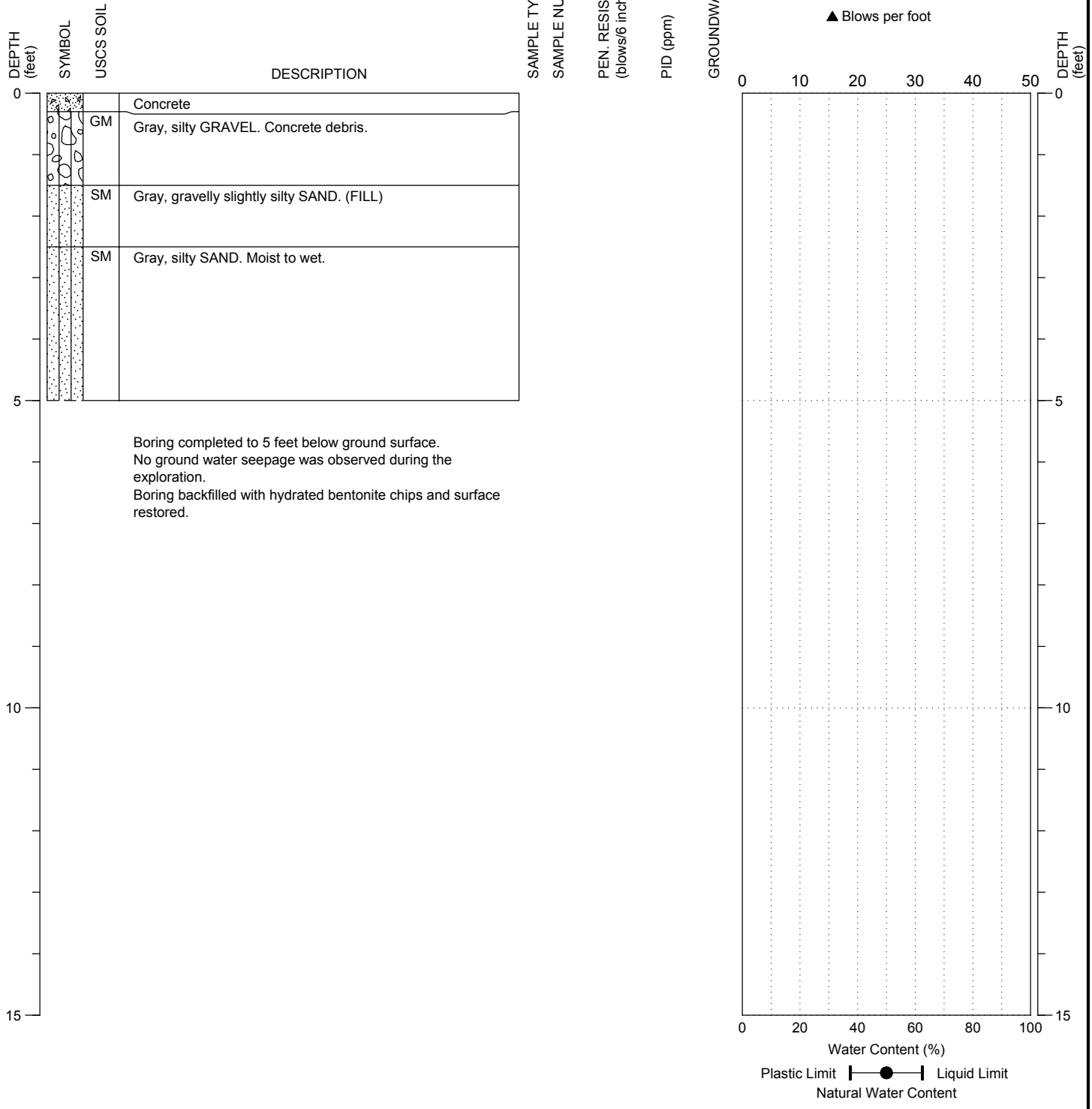
SURFACE ELEVATION: ± feet
CASING ELEVATION ± feet

DATE STARTED: 7/23/2014
DATE COMPLETED: 7/23/2014
LOGGED BY: V. Atkins

DEPTH (feet)	SYMBOL	USCS SOIL CLASS	DESCRIPTION
0			Concrete
		GM	Gray, silty GRAVEL. Concrete debris.
		SM	Gray, gravelly slightly silty SAND. (FILL)
5		SM	Gray, silty SAND. Moist to wet.

SAMPLE TYPE
SAMPLE NUMBER
PEN. RESISTANCE (blows/6 inches)
PID (ppm)
GROUNDWATER

Boring completed to 5 feet below ground surface.
No ground water seepage was observed during the exploration.
Boring backfilled with hydrated bentonite chips and surface restored.



NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated and therefore may not necessarily be indicative of other times and/or locations.

HWA GEOSCIENCES INC.

Bayside Marine Site
Everett, WA

BORING:
CB-5

PAGE: 1 of 1

PROJECT NO.: 2013-066 FIGURE: A-6

DRILLING COMPANY: ESN Northwest
DRILLING METHOD: Direct-push
SAMPLING METHOD: 1.5"x60" Macrocore sampler with HDPE liner
LOCATION:

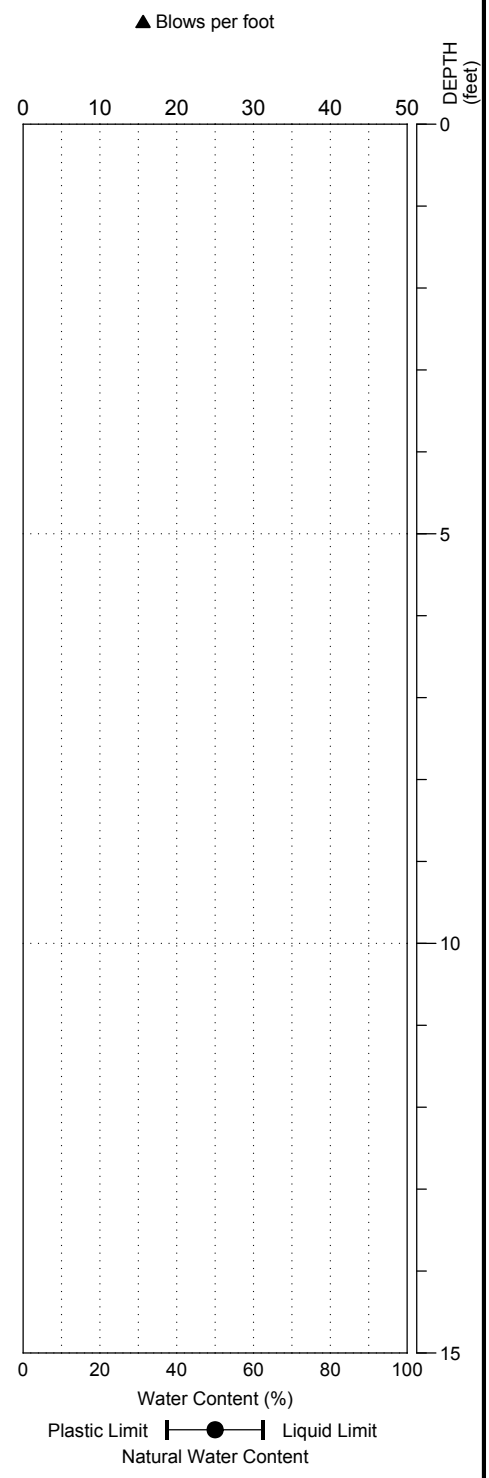
SURFACE ELEVATION: ± feet
CASING ELEVATION ± feet

DATE STARTED: 7/23/2014
DATE COMPLETED: 7/23/2014
LOGGED BY: V. Atkins

DEPTH (feet)	SYMBOL	USCS SOIL CLASS	DESCRIPTION
0			Asphalt
		SM	Brown, silty slightly gravelly SAND. Trace wood debris.
		SM	Dark gray, silty SAND to sandy SILT. Trace wood.
5		SM	Gray-brown, silty SAND. Trace gravel. Wet.

Boring completed to 5 feet below ground surface.
No ground water seepage was observed during the exploration.
Boring backfilled with hydrated bentonite chips and surface restored.

SAMPLE TYPE
SAMPLE NUMBER
PEN. RESISTANCE (blows/6 inches)
PID (ppm)
GROUNDWATER



NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated and therefore may not necessarily be indicative of other times and/or locations.

HWA GEOSCIENCES INC.

Bayside Marine Site
Everett, WA

BORING:
CB-6

PAGE: 1 of 1

PROJECT NO.: 2013-066 FIGURE: A-7

DRILLING COMPANY: ESN Northwest
DRILLING METHOD: Direct-push
SAMPLING METHOD: 1.5"x60" Macrocore sampler with HDPE liner
LOCATION:

SURFACE ELEVATION: ± feet
CASING ELEVATION ± feet

DATE STARTED: 7/23/2014
DATE COMPLETED: 7/23/2014
LOGGED BY: V. Atkins

DEPTH (feet)	SYMBOL	USCS SOIL CLASS	DESCRIPTION
0			Asphalt
		GP	Brown, sandy GRAVEL. Trace silt. Trace oxidation. (FILL)
		SM	Gray, silty SAND. Wood debris.
		SM	Becoming dark gray, wet.
5			
10			
15			

Boring completed to 5 feet below ground surface.
No ground water seepage was observed during the exploration.
Boring backfilled with hydrated bentonite chips and surface restored.

SAMPLE TYPE
SAMPLE NUMBER
PEN. RESISTANCE (blows/6 inches)
PID (ppm)
GROUNDWATER

▲ Blows per foot

0 10 20 30 40 50

0 20 40 60 80 100

Water Content (%)

Plastic Limit ⊢●⊣ Liquid Limit
Natural Water Content

NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated and therefore may not necessarily be indicative of other times and/or locations.

HWA GEOSCIENCES INC.

Bayside Marine Site
Everett, WA

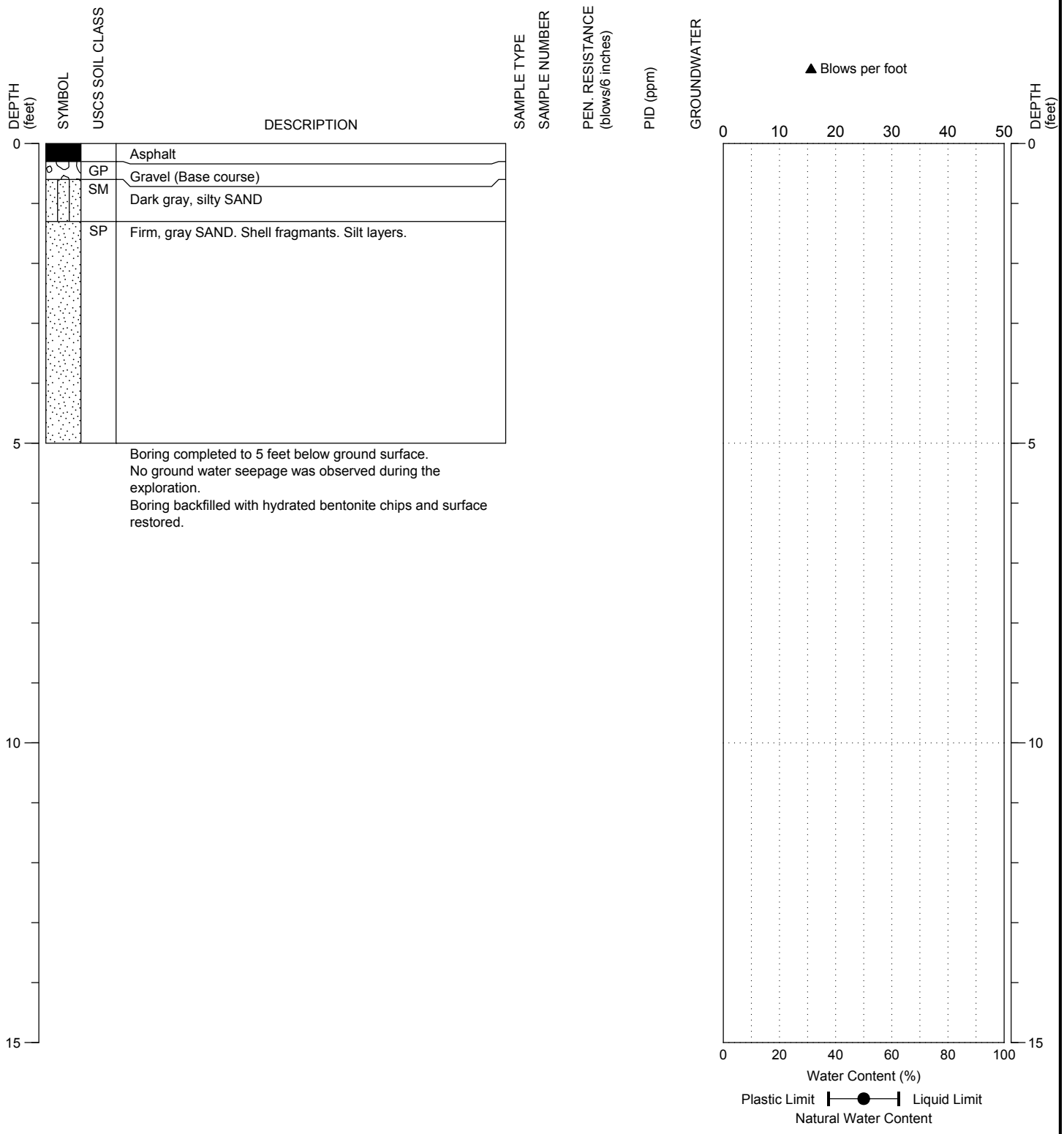
BORING:
CB-7

PROJECT NO.: 2013-066 FIGURE: A-8

DRILLING COMPANY: ESN Northwest
DRILLING METHOD: Direct-push
SAMPLING METHOD: 1.5"x60" Macrocore sampler with HDPE liner
LOCATION:

SURFACE ELEVATION: ± feet
CASING ELEVATION ± feet

DATE STARTED: 7/23/2014
DATE COMPLETED: 7/23/2014
LOGGED BY: V. Atkins



NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated and therefore may not necessarily be indicative of other times and/or locations.

HWA GEOSCIENCES INC.

Bayside Marine Site
Everett, WA

BORING:
HWA-B1

PAGE: 1 of 1

PROJECT NO.: 2013-066 FIGURE: A-9

DRILLING COMPANY: ESN Northwest
DRILLING METHOD: Direct-push
SAMPLING METHOD: 1.5"x60" Macrocore sampler with HDPE liner
LOCATION:

SURFACE ELEVATION: ± feet
CASING ELEVATION ± feet

DATE STARTED: 7/23/2014
DATE COMPLETED: 7/23/2014
LOGGED BY: V. Atkins

DEPTH (feet)	SYMBOL	USCS SOIL CLASS	DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	PEN. RESISTANCE (blows/6 inches)	OTHER TESTS	PID (ppm)	WELL COMPLETION SCHEMATIC	NOTES	DEPTH (feet)
0			Asphalt								0
		GP	Gravel (Base course)							Concrete & monument	
		SM	Dark brown, silty SAND. Trace wood debris.							Bentonite	
		SP	Gray, slightly silty fine SAND. Trace shell fragments.								
			Becomes wet at 4' depth.								
5											5
		ML	Stiff, dark gray SILT. Wet.							Prepacked well screen	
10											10
15											15

Boring completed to 13 feet below ground surface.
Ground water seepage was observed at 4' during the exploration.
Boring backfilled with hydrated bentonite chips and surface restored.

NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated and therefore may not necessarily be indicative of other times and/or locations.

HWA GEOSCIENCES INC.

Bayside Marine Site
Everett, WA

MONITORING WELL:
HWA-MW1

PROJECT NO.: 2013-066 FIGURE: A-10

DRILLING COMPANY: ESN Northwest
DRILLING METHOD: Direct-push
SAMPLING METHOD: 1.5"x60" Macrocore sampler with HDPE liner
LOCATION:

SURFACE ELEVATION: ± feet
CASING ELEVATION ± feet

DATE STARTED: 7/23/2014
DATE COMPLETED: 7/23/2014
LOGGED BY: V. Atkins

DEPTH (feet)	SYMBOL	USCS SOIL CLASS	DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	PEN. RESISTANCE (blows/6 inches)	OTHER TESTS	PID (ppm)	WELL COMPLETION SCHEMATIC	NOTES	DEPTH (feet)
0			Asphalt							Concrete & monument	0
			Medium dense, brown to gray, silty slightly gravelly SAND.								
		SM	Gray, silty SAND							Bentonite	
		SP	Gray, slightly silty fine SAND. Trace brick debris.								
5		ML SM	Stiff, gray to dark gray sandy SILT. Wood fragment layers. Wet.								5
										Prepacked well screen	
10											10
15											15

Boring completed to 13 feet below ground surface.
No ground water seepage was observed during the exploration.
Boring backfilled with hydrated bentonite chips and surface restored.

NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated and therefore may not necessarily be indicative of other times and/or locations.

HWA GEOSCIENCES INC.

Bayside Marine Site
Everett, WA

MONITORING WELL:
HWA-MW2

PROJECT NO.: 2013-066 FIGURE: A-11

DRILLING COMPANY: ESN Northwest
DRILLING METHOD: Direct-push
SAMPLING METHOD: 1.5"x60" Macrocore sampler with HDPE liner
LOCATION:

SURFACE ELEVATION: ± feet
CASING ELEVATION ± feet

DATE STARTED: 7/23/2014
DATE COMPLETED: 7/23/2014
LOGGED BY: V. Atkins

DEPTH (feet)	SYMBOL	USCS SOIL CLASS	DESCRIPTION
0		GM	Light brown, silty GRAVEL. (FILL)
			Stiff, dark gray, sandy SILT.
		SM	Gray, slightly silty SAND. Sand fine to medium. Trace oxidation.
5		ML	Soft, dark gray to brown SILT. Wet.
		SM	Gray to dark gray, slightly silty SAND. Wood debris layers. Some shell fragmants. Wet.
10			
15			

SAMPLE TYPE | SAMPLE NUMBER | PEN. RESISTANCE (blows/6 inches) | OTHER TESTS | PID (ppm)

WELL COMPLETION SCHEMATIC

NOTES

Concrete & monument

Bentonite

Prepacked well screen

DEPTH (feet)

Boring completed to 13 feet below ground surface.
Ground water seepage was observed at 4' during the exploration.
Boring backfilled with hydrated bentonite chips and surface restored.

NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated and therefore may not necessarily be indicative of other times and/or locations.

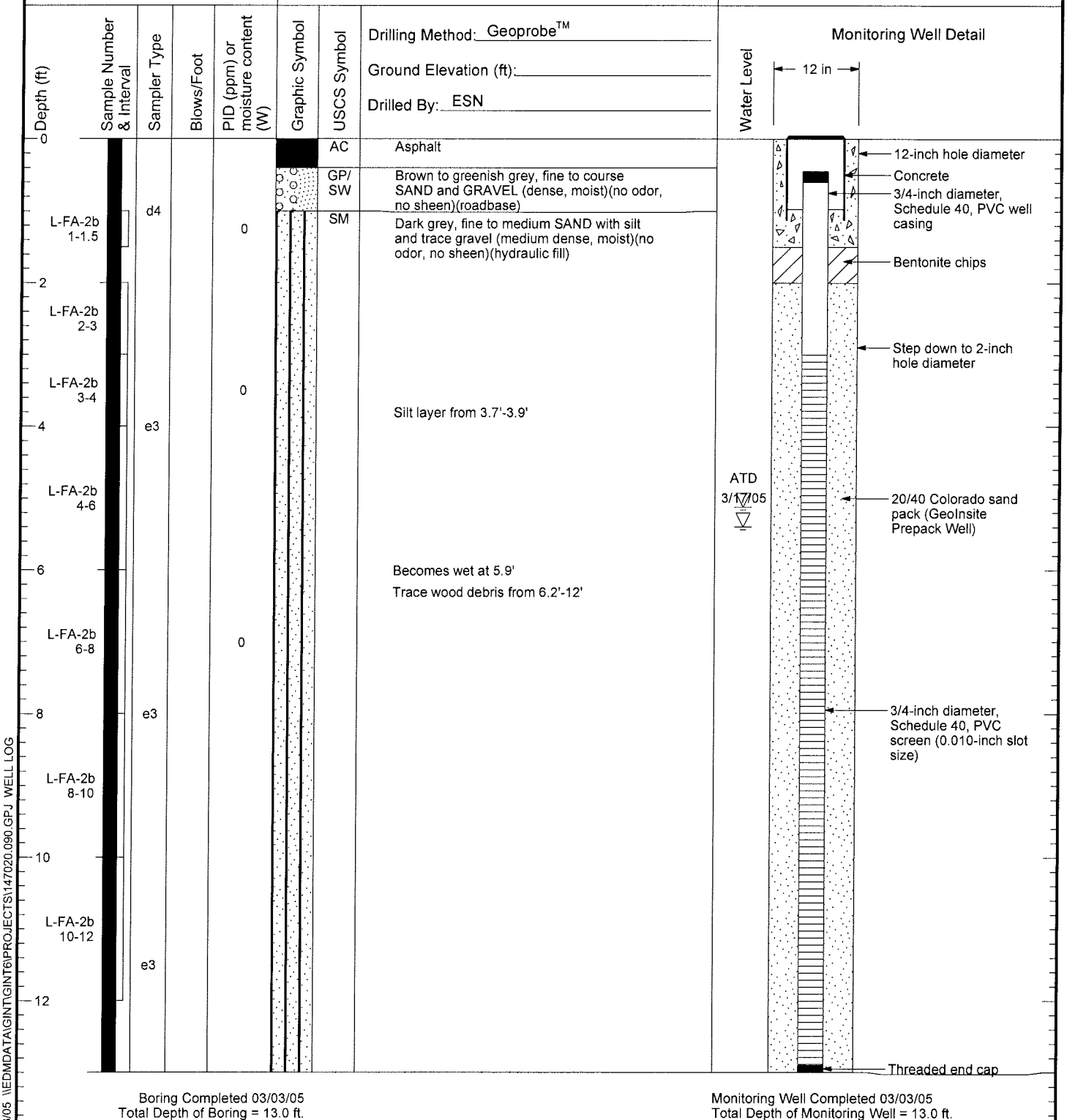
HWA GEOSCIENCES INC.

Bayside Marine Site
Everett, WA

MONITORING WELL:
HWA-MW3

PROJECT NO.: 2013-066 FIGURE: A-12

P-26 (L-FA-2b)



Boring Completed 03/03/05
Total Depth of Boring = 13.0 ft.

Monitoring Well Completed 03/03/05
Total Depth of Monitoring Well = 13.0 ft.

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

147020. 5/13/05 \\EDMDATA\GINT\GINT6\PROJECTS\147020.090.GPJ WELL LOG

LANDAU ASSOCIATES

Port of Everett, Data Gaps Investigation
Everett, Washington

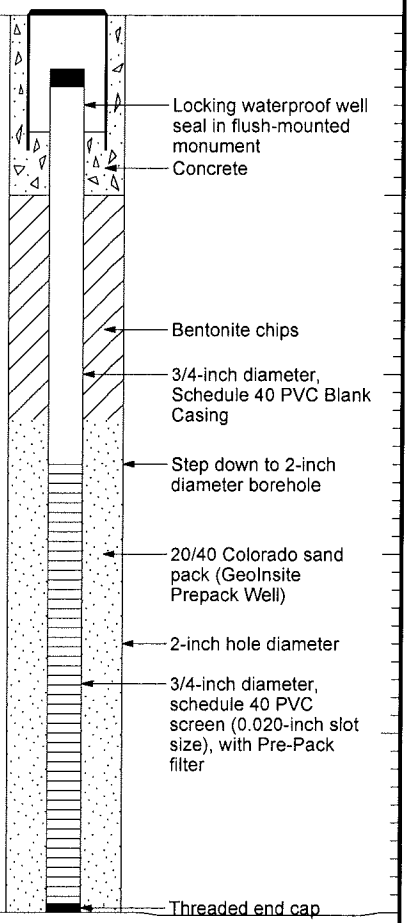
Log of Monitoring Well P-26 (L-FA-2b)

Figure A-26

P-8

SAMPLE DATA				SOIL PROFILE			GROUNDWATER
Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	PID (ppm) or moisture content (W)	Graphic Symbol	USCS Symbol	Drilling Method: GeoprobeTM Ground Elevation (ft): No Reference Drilled By: Cascade Drilling Inc.	Water Level
0	NMP2-PZ-8 SS @1325					AC	Asphalt	
						SP	Dark brown to green gray, fine to medium SAND, with fine gravel (loose, slightly moist) (no odor) (hydraulic fill)	
2	NMP2-PZ-8 -CS 3' @1335							ATD
4		f3		0				
						SP	Green-gray, fine to coarse SAND, abundant sea shells (loose, wet) (no odor) (hydraulic fill)	
6	NMP2-PZ-8 -CS 6' @1340							
8		f3		0		SP	Tan, coarse SAND with gravel (loose, wet) (no odor) (hydraulic fill)	
10								
12								
14								

Detail



Boring Completed 02/11/04
Total Depth of Boring = 10.0 ft.

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

147020.14 5/13/05 \\EDMDATA\GINT\GINT6\PROJECTS\147020.090.GPJ WELL LOG

LANDAU ASSOCIATES

Port of Everett, Data Gaps Investigation
Everett, Washington

Log of P-8

Figure
A-8

APPENDIX D

HWA Geosciences Data Report

SOIL AND GROUND WATER SAMPLING
AMERICAN BOILER WORKS
/ BAYSIDE MARINE SITE
EVERETT, WASHINGTON
HWA Project No. 2013 066

Prepared for

Port of Everett

October 13, 2014

HWA GeoSciences Inc.
• Geotechnical Engineering
• Hydrogeology
• Geoenvironmental Services
• Inspection & Testing

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SOIL AND GROUND WATER SAMPLING
AMERICAN BOILER WORKS
/ BAYSIDE MARINE SITE
EVERETT, WASHINGTON

1.0 INTRODUCTION

This report presents the results of the HWA GeoSciences Inc. (HWA) soil and ground water sampling at the American Boiler Works (ABW) / Bayview Marine (BM) Voluntary Cleanup Program (VCP) site in Everett, Washington (Site).

1.1 SITE LOCATION AND DESCRIPTION

The Site is located adjacent west of West Marine View Drive between Port Gardner Way and 14th Street (Figure 1).

1.2 AUTHORIZATION / SCOPE OF WORK

HWA's work for this project was authorized by the Port of Everett on June 11, 2014. HWA's scope of work for this project is summarized below:

- Coordinate with the Port for site access
- Prepare site Health and Safety Plan/Sampling and Analysis Plan (HSP/SAP).
- Locate underground utilities
- Drill and sample soil borings and monitoring wells using direct-push drilling equipment.
- Collect soil and ground water samples for analysis
- Conduct a quality control review of laboratory reports
- Prepare ground water contour maps
- Submit analytical data to the Washington Department of Ecology Environmental Information Management (EIM) database.
- Prepare this report

1.3 OBJECTIVES

We understand that soil remediation and soil and ground water characterization associated with hazardous materials releases have been completed at the Site, but that additional characterization has been requested by the Washington Department of Ecology. The purpose of this investigation is to 1) evaluate shallow soil conditions beneath the footprint of the former ABW building, and 2) to further evaluate ground water quality at the Site.

1.4 PREVIOUS SITE ASSESSMENT RESULTS

The Site has undergone several investigations and remedial actions. The Site was formerly part of the larger North Marina Site (VCP reference number NW1249). The North Marina Site was removed from the VCP and split into multiple sites under the Puget Sound Initiative. The Site was accepted back into the VCP in March, 2014 and is assigned VCP Number NW2842.

The ABW Plant I formerly was developed with a main manufacturing building, which occupied the majority of the eastern part of the Site. The building was built in the 1960s, and expanded in the 1970s. Although no USTs were known at the site, the milling and manufacturing at the site used significant quantities of cutting oil. The building was demolished in 2009.

The BM site (western part of the Site) formerly included a gravel boatyard, a dry stack building that was used for covered storage of boats, a boatwash area, and a combination maintenance shop and office building. The dry stack building was constructed between 1961 and 1965 and the office/shop building was built between 1970 and 1971; both were demolished in early 2008. Two USTs were removed from the site in 1991, and soils exceeding state cleanup levels in effect at that time were left in place. Soil remediation took place in 1991, and the site was reportedly cleaned up to the applicable standards.

Several Phase II ESAs and supplemental investigations took place between 2001 and 2014 to further characterize the Site. Soils and ground water exceeding MTCA cleanup levels were identified at several locations. Contaminants of concern included petroleum hydrocarbons and metals (Landau, 2014). The Port conducted a cleanup in 2006 in areas B-1, L-1, L-2, and L-3 (Figure 2). Some inaccessible impacted soil remained beneath the boatwash building and pad.

The Site is currently leased for storage.

2.0 SAMPLE LOCATIONS AND METHODS

HWA conducted the exploration program in July through September 2014. The program consisted of advancing 11 direct-push soil probe borings, three of which were completed as ground water monitoring wells, soil and ground water sampling, and sampling two existing monitoring wells. Table 1 summarizes the sampling locations, depths and analytes. Figure 2 shows the boring and well locations. Appendix A contains the Sampling and Analysis Plan which describes the site investigation methodologies. Appendix B contains the boring logs.

Seven shallow borings (HWA-CB1, 2, 3, 4, 5, 6, and 7) were advanced to depths of five feet beneath the former ABW building, to evaluate the quality of fill material beneath the building. Field screening did not indicate any impacts, and no laboratory analyses were completed.

One other boring, HWA-B1 was advanced to a depth of five feet near a former soil cleanup area where sidewall samples were not previously collected because the excavation was completed to the building foundation which extended deeper than the excavation.

Three borings were completed to depths of 13 feet, and completed as ground water monitoring wells (HWA-MW-1 ,2, and 3), to ascertain general ground water quality across the site.

Table 1
Sampling Locations, Depths and Analytes

Boring ID	Exploration depth (ft bgs)	WSP coordinates, NAD83 Washington North		Soil sampling intervals*	Analytes	Complete as well
Soil						
HWA-MW-1	5	367805.11	1302310.22	0-1 1-2 2-3	NWTPH-HCID w/ follow up MTCA Metals+Cu,Zn, cPAHs	Yes
HWA-MW-2	5	367640.21	1302237.77	0-1 1-2 2-3	NWTPH-HCID w/ follow up MTCA Metals+Cu,Zn, cPAHs	Yes
HWA-MW-3	5	367762.94	1302046.73	0-1 1-2 2-3	Archive**	Yes
HWA-B-1	5	NA	NA	0-1 1-2 2-3	NWTPH-HCID w/ follow up MTCA Metals+Cu,Zn, cPAHs	No
HWA-CB1,2,3,4,5,6,7 (contingent borings)	5	NA	NA	0-1 1-2 2-3	Archive**	No
Ground Water						
HWA-MW-1	13	367805.11	1302310.22		NWTPH-Dx, MTCA Metals+Cu,Zn (dissolved)	
HWA-MW-2	13	367640.21	1302237.77		NWTPH-Dx, MTCA Metals+Cu,Zn (dissolved)	
HWA-MW-3	13	367762.94	1302046.73		NWTPH-Dx, MTCA Metals+Cu,Zn (dissolved)	
P-26		367770.27	1302162.29		NWTPH-Dx, MTCA Metals+Cu,Zn (dissolved)	Existing well
P-27		367575.86	1301932.29		NWTPH-Dx, MTCA Metals+Cu,Zn (dissolved)	Existing well

***** Sampling intervals are measured from below bottom of concrete slab and base-course fill

****** Laboratory analysis contingent on field screening

2.1 SOIL SAMPLE COLLECTION

Under subcontract to the Port of Everett, ESN Northwest of Lacey, Washington, (ESN), a Washington licensed drilling contractor, advanced 11 soil borings on July 23, 2014, at the locations shown on Figure 2.

ESN employed a mobile direct-push sampling device (e.g., Geoprobe) to collect soil and ground water samples. The device consists of a hydraulic drive assembly mounted on a pickup truck. Steel pipe (2 inch diameter) was driven into the ground using a hydraulic impact driver. Soil samples were then retrieved through the stainless-steel sampler with a high-density polyethylene (HDPE) liner.

HWA field staff collected continuous depth soil samples. Soil samples were placed in labeled laboratory-provided sample containers using nitrile gloves and clean stainless steel spoons. Samples were placed in a cooler with "blue ice" for transport to the laboratory under chain-of-custody protocol.

HWA collected soil samples from each soil boring at the intervals listed in Table 1. All samples were field screened using a photo ionization detector (PID). Soil boring logs are included in Appendix B.

2.2 GROUND WATER MONITORING WELLS

Under subcontract to the Port of Everett, ESN completed three shallow monitoring wells using direct-push drilling equipment. Wells were constructed of one-inch PVC casing and manufactured pre-packed screens. Wells were completed to depths of 13 feet below ground surface. The wells were later surveyed for location and elevation by Metron and Associates, Inc.

2.3 GROUND WATER SAMPLE COLLECTION

HWA collected ground water samples from new and existing monitoring wells using low-flow sampling methodology. The wells were purged using a peristaltic pump at a low pumping rate to minimize aquifer drawdown and to ensure sampled water represents aquifer conditions. New pump tubing was used at each location. Samples were collected after pH, conductivity, temperature, and dissolved oxygen field readings from periodic monitoring had stabilized. Dissolved metals samples were filtered through a disposable 0.45-micron glass fiber filter at the time of sample collection. Samples were pumped directly into the appropriate containers, as provided by the laboratory. Samples were placed in a cooler with blue ice for transport to the laboratory under chain-of-custody protocol.

2.4 FIELD SCREENING INSTRUMENTS

HWA conducted field screening of soil from the borings for the presence of volatile organic vapors using a Mini-Rae PGM 75 photoionization detector (PID). Visual

indications of contamination and odor were also noted. Although the PID is not capable of quantifying or identifying specific organic compounds, this instrument is capable of measuring relative concentrations of a variety of organic vapors with ionization potentials less than the energy of the ultraviolet source (in this case, 10.6 eV). The PID is useful for providing qualitative information with respect to the presence and relative concentration of organic vapors. PID readings are shown on the boring logs in Appendix B.

The PID was calibrated with 100 parts per million isobutylene standard at the beginning of the day. For field screening, 50 to 100 grams of soil from a discrete depth were placed in a plastic bag, sealed, and permitted to sit at least 10 minutes prior to analyzing the vapor in the sample bag. The bag was then perforated by the PID sample tip to obtain the reading. Samples were screened with the PID when sufficient sample volume was available. Exact depths of field PID sample screening and concentration values were recorded on the boring logs.

2.5 DECONTAMINATION METHODS

To prevent potential cross-contamination of samples, ESN cleaned drilling rods between each boring. All sampling equipment was decontaminated prior to use with detergent solution, potable water, and deionized water.

2.6 INVESTIGATION DERIVED WASTE

The soil cuttings and decontamination water from the field investigation were placed in sealed drums at the site pending analytical results. Disposable personal protective equipment (e.g., nitrile gloves) was discarded off-site as ordinary solid waste.

3.0 SAMPLE ANALYSES

CCI Analytical Laboratories of Everett, Washington, analyzed the samples for the following analytes:

Soil

- Hydrocarbon Identification by Washington State Method NWTPH-HCID
- Gasoline Range Hydrocarbons and aromatic hydrocarbons (BETX) – Washington State Method NWTPH-G/BETX (contingent on HCID results)
- Diesel and Oil-Range Hydrocarbons – Washington State Method NWTPH-Dx (contingent on HCID results)
- Carcinogenic Polynuclear Aromatic Hydrocarbons (cPAHs) – EPA Method # 8270 SIM
- MTCA Metals (Arsenic, Cadmium, Chromium, Lead, and Mercury) plus copper and zinc by EPA Method #6010/#7471A

Ground water

- Diesel and Oil-Range Hydrocarbons – Washington State Method NWTPH-Dx
- Dissolved MTCA Metals (Arsenic, Cadmium, Chromium, Lead, and Mercury) plus copper and zinc by EPA Method #6010/#7471A,
- Nitrate, sulfate

HWA also analyzed ground water samples for ferrous iron using HACH field test method IR-18C.

Appendix C contains the complete laboratory analytical packages, including chain-of custody forms.

3.1 QUALITY CONTROL REVIEW

HWA reviewed quality control results of the analytical data. Surrogate recoveries, laboratory blanks, laboratory control samples, method blanks, laboratory duplicates, matrix spikes, and matrix spike duplicates were all within control limits with no exceptions.

The analyses of the soil and water samples collected on July 23, 24, August 18, and September 3, 2014 were determined to be acceptable for their intended use.

4.0 RESULTS

4.1 SUBSURFACE CONDITIONS

HWA's borings encountered sandy fill in the upper two to five feet, overlying sand and silty sand with shell fragments to 13 feet that may be marine sediment or hydraulic fill. One boring (HWA-MW-1) encountered stiff native silt at six feet depth.

Ground water was encountered at depths ranging from three to 4.5 feet. Table 2 summarizes ground water depths and elevations. Figures 3 and 4 show measured ground water elevations and interpreted ground water gradients for July 24 and September 3, 2014. Ground water flow at the site is generally to the west, with gradients ranging from 0.005 to 0.008 ft/ft.

TABLE 2
GROUND WATER ELEVATIONS

	P26	P27	HWA-MW1	HWA-MW2	HWA-MW3
Depth to water, ft bgs					
7/24/2014	4.07	4.08	3.72	4.05	3.95
8/18/2014	4.01		3.78		
9/3/2014	4.16	4.18	3.73	4.41	4.04
Casing elevation, Tidal Datum MLLW					
	17.22	15.24	17.45	17.5	16.2
Ground water elevation, Tidal Datum MLLW					
7/24/2014	13.15	11.16	13.73	13.45	12.25
8/18/2014	13.21		13.67		
9/3/2014	13.06	11.06	13.72	13.09	12.16

4.2 ANALYTICAL RESULTS

Soil analytical results are summarized in Table 3. Ground water analytical results are summarized in Table 4.

TABLE 3
SOIL ANALYTICAL DATA
(all results in milligrams per kilogram (mg/kg) except as noted)

	Boring ID	HWA-MW1			HWA-MW2			HWA-B1			MTCA-A	MTCA-B
	Exploration depth (ft bgs)	13			13			5				
	Soil sampling intervals*	0-1	1-2	2-3	0-1	1-2	2-3	0-1	1-2	2-3		
TPH	HCID Gas	<20	<20	<20	<20	<20	<20	<20	<20	<20		
	HCID Diesel	<50	<50	<50	<50	<50	<50	<50	<50	<50		
	HCID Oil	<100	<100	<100	<100	<100	**>100**	<100	<100	<100		
	TPH-Dx Diesel						<25				2,000	
	TPH-Dx Oil						**120**				2,000	
cPAHs	Benzo[A]Anthracene (ug/kg)	<20	<20	<20	<20	<20	**24**	<20	**29**	<20		
	Chrysene (ug/kg)	<20	<20	<20	<20	<20	**38**	**31**	**53**	<20		
	Benzo[B]Fluoranthene (ug/kg)	<20	<20	<20	<20	<20	**34**	**28**	**45**	<20		
	Benzo[K]Fluoranthene (ug/kg)	<20	<20	<20	<20	<20	<20	<20	<20	<20		
	Benzo[A]Pyrene (ug/kg)	<20	<20	<20	<20	<20	**29**	**21**	**41**	<20		
	Indeno[1,2,3-Cd]Pyrene (ug/kg)	<20	<20	<20	<20	<20	<20	<20	**24**	<20		
	Dibenzo[A,H]Anthracene (ug/kg)	<20	<20	<20	<20	<20	<20	<20	<20	<20		
	Toxicity Equivalency Factor (ug/kg)	<20	<20	<20	<20	<20	**35.18**	**24.11**	**51.33**		100	
Metals	Mercury	**0.045**	**0.040**	**0.027**	**0.049**	**0.025**	**0.084**	**0.049**	**0.04**	**0.029**		
	Arsenic	**8**	**3.0**	**2.2**	**2.3**	**2.7**	**2.6**	**6.5**	**3.1**	**1.9**	20	
	Cadmium	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	2.00	2.00
	Chromium	**24**	**21**	**20**	**24**	**25**	**21**	**30**	**34**	**29**	*	
	Copper	**75**	**25**	**8.6**	**14**	**16**	**38**	**36**	**16**	**14**		3,200
	Lead	**88**	**10**	**2.2**	**7.3**	**14**	**28**	**22**	**24**	**2.7**	250	
	Zinc	**410**	**51**	**24**	**29**	**47**	**70**	**130**	**55**	**32**		24,000

Notes:

MTCA A / B – Ecology MTCA Method A / B soil cleanup levels, Chapter 173-340 WAC, shown for reference only. These cleanup levels may not apply at this site, and are provided as a screening level indication of the environmental quality of the site only.

< - not detected at listed reporting limit

Bold – Analyte Detected

* - The Method A soil cleanup levels for Chromium are 19 mg/kg for Cr VI and 2000 mg/kg for Cr III. Analyses are for total chromium. Geochemical conditions on site would not likely cause oxidation to hexavalent chromium having a cleanup level of 19 mg/kg

TABLE 4
GROUND WATER ANALYTICAL DATA
(all results in micrograms per liter (µg/l) except as noted)

Sample ID	P-26			P-27		HWA-MW1			HWA-MW2		HWA-MW3		MTCA-A	MTCA-B
Date	7/24/2014	8/18/2014	9/3/2014	7/24/2014	9/3/2014	7/24/2014	8/18/2014	9/3/2014	7/24/2014	9/3/2014	7/24/2014	9/3/2014		
Depth to water, ft bgs	**4.07**	**4.01**	**4.16**	**4.08**	**4.18**	**3.72**	**3.78**	**3.73**	**4.05**	**4.41**	**3.95**	**4.04**		
Field Parameters														
pH	6.42	7.01	7.14	7.05	7.21	6.59	6.87	6.8	6.42	6.38	6.71	7.13		
Conductance (µm/cm)	1112	989	968	3430	481	1259	1204	968	1400	847	1031	938		
Temperature (°C)	18.3	17.6	20.7	18.5	20.2	20.6	17.9	22.7	17.7	20.5	15.4	17.0		
Dissolved Oxygen (mg/l)	3	0.33	0.39	0.23	0.63	0.27	0.54	0.39	0.21	0.66	0.26	0.41		
ORP (mV)		95	120		39		50	49		75		143.0		
Ferrous Iron (mg/L)		1.2	1.0		0.4		1.6	1.5		0.6		1.70		
Petroleum Hydrocarbons														
TPH-Diesel	**140**		**180**	<130	<130	**150**		**130**	**220**	**140**	<130	<130	500	
TPH-Oil	<250		<250	<250	<250	<250		<250	<250	<250	<250	<250	500	
Metals (dissolved)														
Mercury	<0.20		<0.20	<0.20	<0.20	<0.20		<0.20	<0.20	<0.20	<0.20	<0.20		
Arsenic	**15**	**9.8**	**6.3**	<1.0	<1.0	**64**	**77**	**91**	**2.7**	**8.2**	**2.1**	<1.0	5	
Cadmium	<1.0		<1.0	<1.0	<1.0	<1.0		<1.0	<1.0	<1.0	<1.0	<1.0	5	
Chromium	<2.0		<2.0	<2.0	<2.0	**2.1**		**2.2**	**2.1**	**2.8**	<2.0	<2.0	50	
Copper	<2.0		<2.0	<2.0	<2.0	<2.0		<2.0	<2.0	<2.0	<2.0	<2.0		320
Lead	<1.0		<1.0	<1.0	<1.0	<1.0		<1.0	<1.0	<1.0	<1.0	<1.0	15	
Zinc	<2.5		**5.7**	<2.5	**8.2**	<2.5		**7.6**	<2.5	**13**	<2.5	10		NA
Conventionals														
Nitrate (mg/L)		**0.18**	**0.19**		<0.15		<0.15	**0.27**		**0.61**		**0.17**		
Sulfate (mg/L)		<0.26	**0.37**		**0.58**		<0.26	<0.26		<0.26		<0.26		

Notes:
MTCA A / B – Ecology MTCA Method A / B ground water cleanup levels, Chapter 173-340 WAC, shown for reference only. These cleanup levels may not apply at this site, and are provided as a screening level indication of the environmental quality of the site only.
< - not detected at listed reporting limit
Blank – Not Analyzed
Bold – detected
Bold / highlighted – Analyte exceeds cleanup level

5.0 DISCUSSION

5.1 SOIL

Seven shallow borings (HWA-CB1, 2, 3, 4, 5, 6, and 7) were advanced to depths of five feet beneath the former building, to evaluate shallow soil. Field screening did not indicate any impacts, and no laboratory analyses were completed.

One other boring, HWA-B1, was advanced to a depth of five feet near a former soil cleanup area where sidewall samples were not previously collected due to the building foundation.

Three shallow (zero to three feet below paving subgrade) soil samples from boring HWA-B1 did not contain any analyzed constituents above MTCA cleanup levels, indicating no shallow soil impacts in this area, and limited extent of remaining impacts at the eastern sidewall of the former soil cleanup area.

Shallow (zero to three feet below paving subgrade) soil samples from borings HWA-MW1 and HWA-MW2 also did not contain any analyzed constituents above MTCA cleanup levels, indicating no shallow soil impacts in these areas.

5.2 GROUND WATER

Two to three rounds of ground water sampling at wells P-26, P-27, HWA-MW1, HWA-MW2, and HWA-MW3, indicated no petroleum hydrocarbons exceeding MTCA cleanup levels. Of the seven dissolved metals analyzed, only arsenic exceeded MTCA cleanup levels, in P-26, HWA-MW1, and HWA-MW2, all located on the east half of the Site (ABW area). Dissolved arsenic concentrations were highest in HWA-MW1, with concentrations from 64 to 91 µg/L.

Evaluation of redox parameters such as nitrate, sulfate, ferrous iron, and field parameters including dissolved oxygen and oxidation/reduction potential indicates generally reducing conditions.

5.3 CLEANUP LEVELS

Laboratory analytical data were compared to the MTCA Method A and/or Method B cleanup levels, as a screening level evaluation of the environmental quality of the subject property. Method A values are intended to be protective of all exposure pathways, but are only provided for a limited list of contaminants. The Method B soil values shown are for the "soil direct contact (ingestion)" pathway. Method B soil values for the "protection of ground water" pathway require default values and/or site specific risk calculations, and are not provided herein.

MTCA Method A levels are intended to provide conservative values, typically for voluntary or routine cleanups. MTCA states that the Method A values "*should not*

automatically be used to define cleanup levels that must be met for financial, real estate, insurance coverage or placement, or similar transactions or purposes. Exceedances of the values in this table do not necessarily mean the soil/water must be restored to these levels at a site".

MTCA Method B cleanup levels are the universal cleanup levels that typically employ risk-based cleanup levels, and likewise do not necessarily trigger any cleanup action. Cleanup levels for a particular site are determined after evaluating appropriate exposure pathway endpoints (e.g., drinking water, nonpotable ground water, surface water, soil, wildlife, etc.) based on site use, contaminant distribution, etc. The actual clean up *standard* is then based on the calculated cleanup levels, measured at the point of compliance.

6.0 REFERENCES

Landau, 2014, *Ecology Review Draft Report Environmental Investigation and Cleanup Activities American Boiler Works/Bayside Marine Site Everett, Washington,* April 25, 2014.

Washington State Department of Ecology, *Model Toxics Control Act Cleanup Regulation, Chapter 173-340 WAC*, Publication No. 94-06, February 12, 2001.

7.0 LIMITATIONS

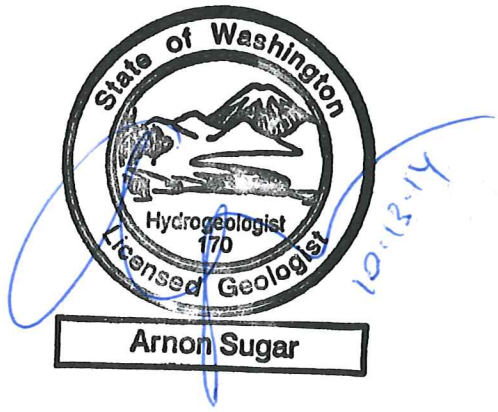
The conclusions expressed by HWA are based solely on material referenced in this report. Observations were made under the conditions stated. Within the limitations of scope, schedule and budget, HWA attempted to execute these services in accordance with generally accepted professional principles and practices in the area at the time the report was prepared. No warranty, expressed or implied, is made. Experience has shown that subsurface soil and ground water conditions can vary significantly over small distances. It is always possible that contamination may exist in areas that were not sampled. HWA's findings and conclusions must not be considered as scientific or engineering certainties, but rather as our professional opinion concerning the significance of the limited data gathered and interpreted during the course of the assessment.

This study and report have been prepared on behalf of the Port of Everett, for the specific application to the subject property. We are not responsible for the impacts of any changes in environmental standards, practices, or regulations subsequent to performance of services. We do not warrant the accuracy of information supplied by others, nor the use of segregated portions of this report.

We appreciate the opportunity to provide professional services on this project. Please feel free to call us if you have any questions or need more information.

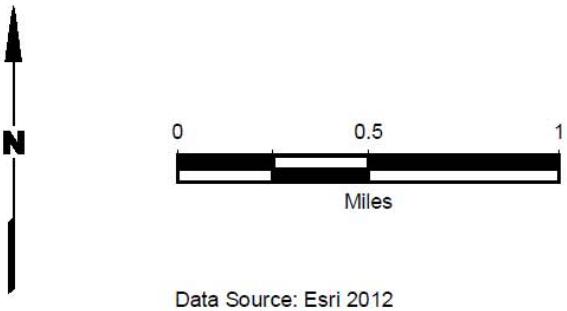
Sincerely,

HWA GEOSCIENCES INC.



Kim Stilson
Geologist

Arnie Sugar, LG, LHG
President



Data Source: Esri 2012

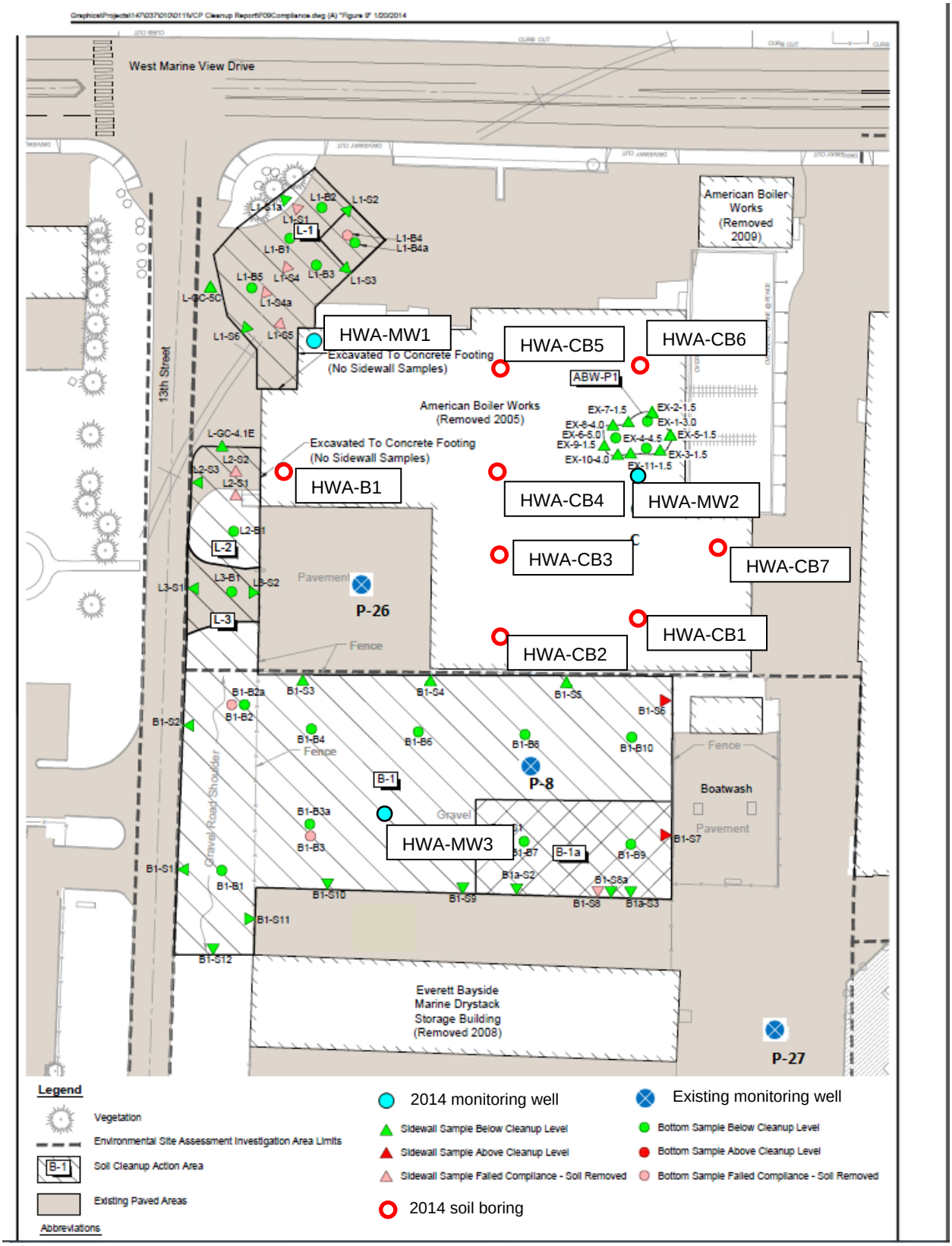
HWA GeoSciences Inc.

SITE VICINITY

BAYSIDE MARINE VCP SITE
PORT OF EVERETT
EVERETT, WASHINGTON

FIGURE NO.
1

PROJECT NO.
2013-066



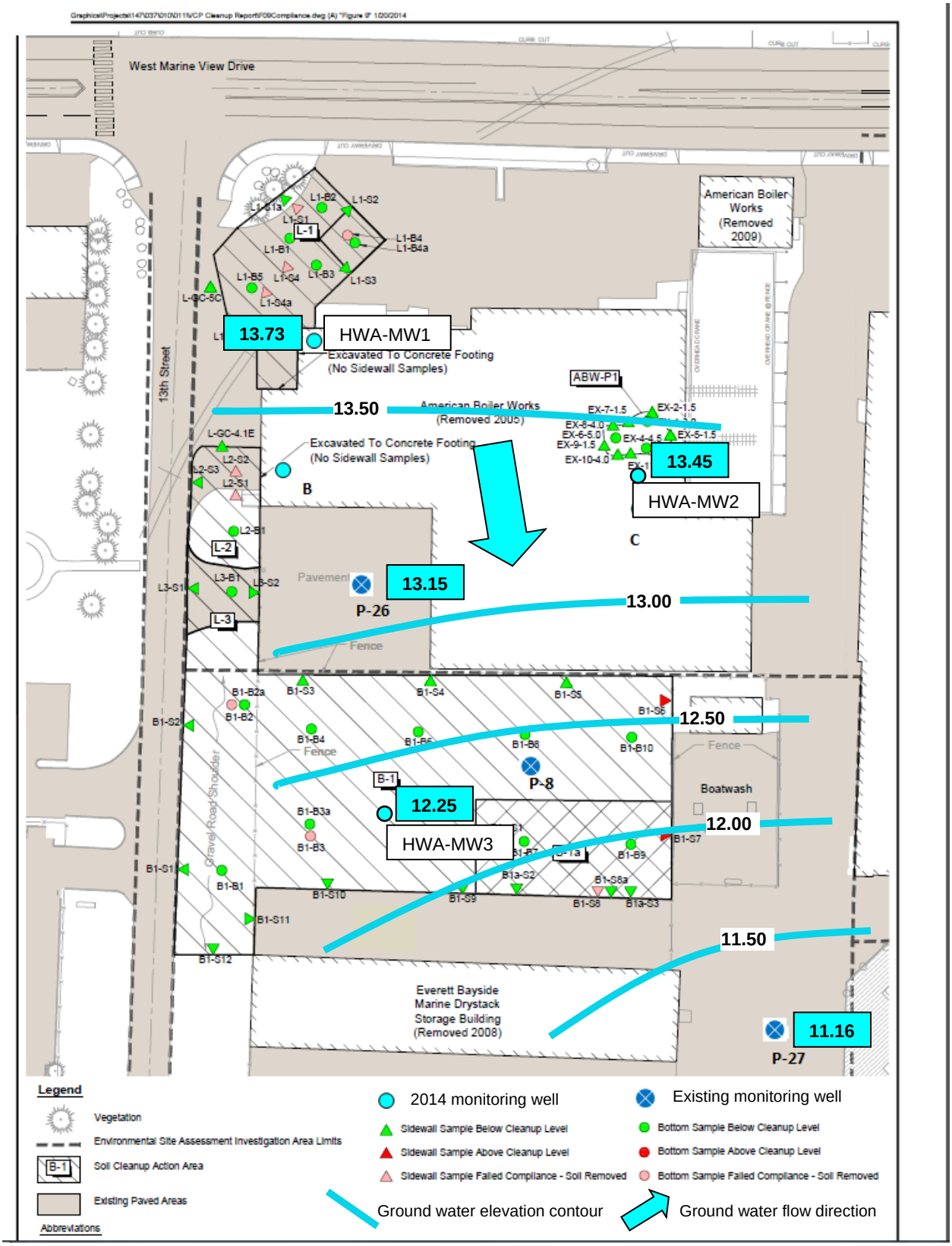
SOIL AND GROUND WATER SAMPLING LOCTIONS

BAYSIDE MARINE VCP SITE
PORT OF EVERETT
EVERETT, WASHINGTON

FIGURE NO. 2

PROJECT NO. 2013-066

HWA GEOSCIENCES INC.



0 50 100

Scale in Feet

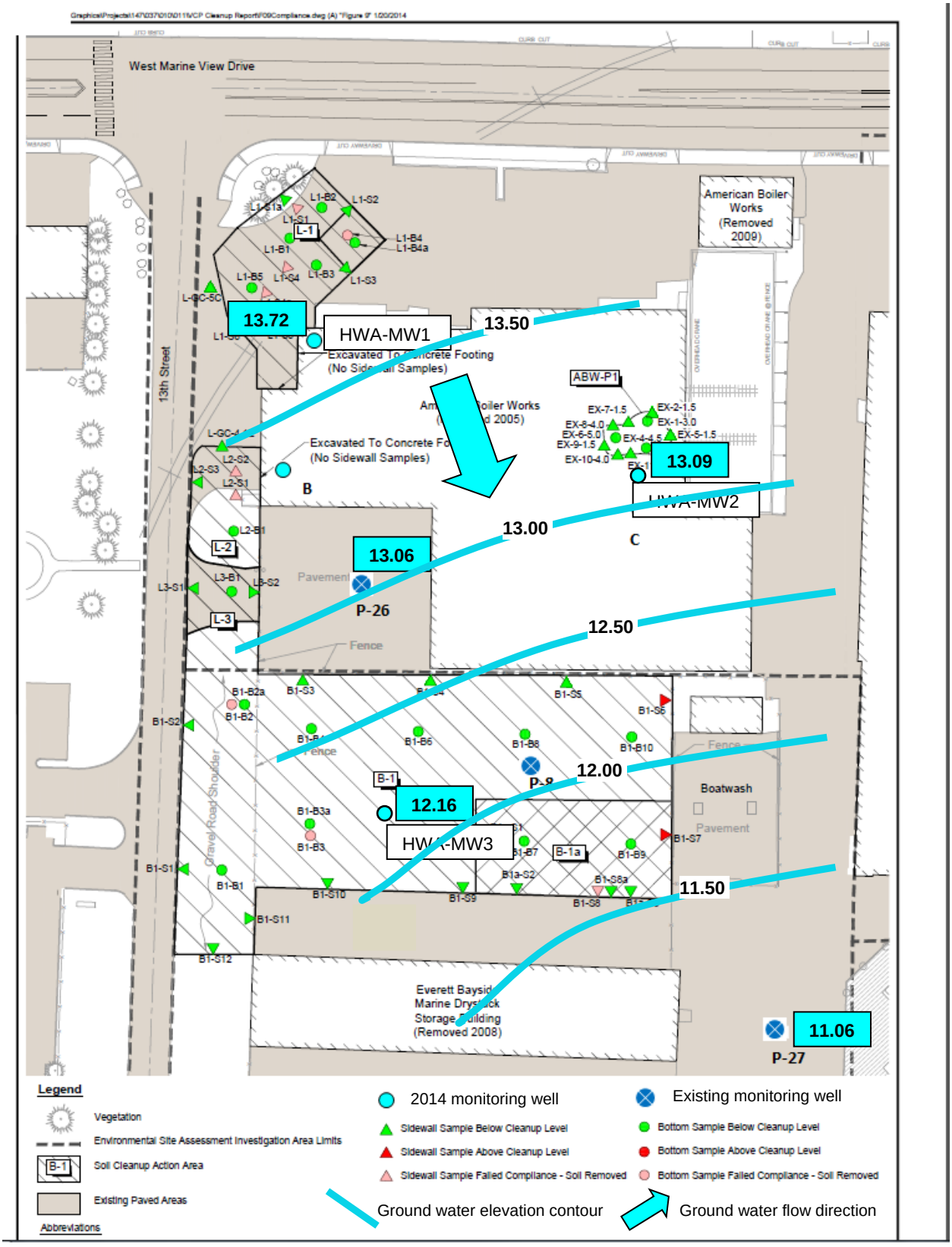
GROUND WATER ELEVATIONS 7/24/14

BAYSIDE MARINE VCP SITE
PORT OF EVERETT
EVERETT, WASHINGTON

FIGURE NO.
3

PROJECT NO.
2013-066

HWA GEOSCIENCES INC.



GROUND WATER ELEVATIONS 9/3/14

BAYSIDE MARINE VCP SITE
PORT OF EVERETT
EVERETT, WASHINGTON

FIGURE NO.
4

PROJECT NO.
2013-066

HWA GEOSCIENCES INC.

APPENDIX A

SAMPLING AND ANALYSIS PLAN

AMERICAN BOILER WORKS/BAYSIDE MARINE SITE
WEST MARINE VIEW DRIVE AND 13TH STREET
EVERETT, WASHINGTON
SAMPLING AND ANALYSIS PLAN

Project No. 2013-066

July 18, 2014

Prepared For

Port of Everett

HWA GEOSCIENCES INC.

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SOIL & GROUND WATER SAMPLING
AMERICAN BOILER WORKS/BAYSIDE MARINE SITE
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EVERETT, WASHINGTON
SAMPLING AND ANALYSIS PLAN

1.0 INTRODUCTION

This Sampling and Analysis plan provides the scope and rationale for HWA GeoSciences Inc. (HWA's) field sampling efforts associated with a site investigation conducted for the Port of Everett at the American Boiler Works (ABW)/Bayview Marine (BM) Voluntary Cleanup Program (VCP) site in Everett, Washington (Site).

HWA prepared this plan in accordance with our understanding of the project, and Chapter 173-340-820 WAC in the Washington State Model Toxics Control Act (MTCA) Cleanup Regulations, and specific information requested by the Washington State Department of Ecology (Ecology). The body of this plan outlines our field sampling and laboratory analytical methods.

1.1 PURPOSE AND OBJECTIVES

We understand that soil remediation and soil and ground water characterization associated with hazardous materials releases have been completed at the Site, but that additional characterization has been requested by the Washington Department of Ecology. The purpose of this investigation is to 1) confirm the absence of any known contamination on the site exceeding current cleanup levels, and 2) to monitor ground water level and quality via permanent monitoring wells as requested by Ecology, in order to characterize areas adjacent to existing cleanup extents.

Sampling locations, depths and analytes are summarized in Table 1.

Table 1
Sampling Locations, Depths and Analytes

Boring ID	Exploration depth (ft bgs)	Soil sampling intervals*	Analytes	Complete as well
Soil				
A**	5	0-1	NWTPH-HCID***, MTCA Metals+Cu,Zn, cPAHs	Yes
		1-2	NWTPH-HCID, MTCA Metals, cPAHs	
		2-3	NWTPH-HCID, MTCA Metals+Cu,Zn, cPAHs	
B	5	0-1	NWTPH-HCID, MTCA Metals+Cu,Zn, cPAHs	No
		1-2	NWTPH-HCID, MTCA Metals+Cu,Zn, cPAHs	
		2-3	NWTPH-HCID, MTCA Metals+Cu,Zn, cPAHs	
C	5	0-1	NWTPH-HCID, MTCA Metals+Cu,Zn, cPAHs	Yes
		1-2	NWTPH-HCID, MTCA Metals+Cu,Zn, cPAHs	
		2-3	NWTPH-HCID, MTCA Metals+Cu,Zn, cPAHs	
D****	5	0-1	Archive	Yes
		1-2	Archive	
		2-3	Archive	
Contingent borings (7)	5	0-1	Archive	No
		1-2	Archive	
		2-3	Archive	
Ground Water***				
A	15		NWTPH-Dx, MTCA Metals+Cu,Zn (dissolved)	
C	15		NWTPH-Dx, MTCA Metals+Cu,Zn (dissolved)	
D	15		NWTPH-Dx, MTCA Metals+Cu,Zn (dissolved)	
P-26			NWTPH-Dx, MTCA Metals+Cu,Zn (dissolved)	Existing well
P-27			NWTPH-Dx, MTCA Metals+Cu,Zn (dissolved)	Existing well

* Sampling intervals are measured from below bottom of concrete slab and base-course fill
** Final Boring ID's will be determined with Port of Everett input
*** Additional analyses contingent on initial results
**** Laboratory analysis contingent on field screening
***** Two initial rounds, more if needed

1.2 PROJECT ORGANIZATION

Personnel involved with this project and roles are listed below:

- Arnie Sugar, HWA project manager (425) 774-0106, cell (206) 794-3130
- Rick Bagan, Laboratory project manager, ALS Laboratories (425) 356-2600
- Anisa Harnden, ESN Northwest, Geoprobe subcontractor, (360) 459 4670
- Elise Gronewald, Port of Everett project engineer, (425) 388-0630, cell (425) 922-8032

1.3 PROJECT SCHEDULE

A proposed project schedule is shown below:

Week	0	1	2	3	4	5	6	7
Schedule subs	xxxxxxxx	.	.	.	.	.	.	
Underground utilities	.	xxxx	.	.	.	.	.	.
Drilling	.	.	xx	.	.	.	.	
Lab analysis	.	.	.	xxxxxxxxxxxxxx	.	.	.	.
Preliminary Reporting		.	.	.	xxxxxxxxxxxxxxxx		.	.

The subsequent ground water sampling round will take place in September, with the final technical memorandum prepared within three weeks of laboratory analytical report receipt.

1.4 SITE LOCATION

The Site is located adjacent west of West Marine View Drive between Port Gardner Way and 14th Street (Figure 1).

1.5 BACKGROUND

The Site has undergone several investigations and remedial actions. The Site was formerly part of the larger North Marina Site (VCP reference number NW1249), but was removed from the VCP and split into multiple sites under the Puget Sound Initiative (PSI). The Site was accepted back into the VCP in March, 2014 and is assigned VCP Number NW2842.

The ABW Plant I formerly was developed with a main manufacturing building, which occupied the majority of the western two thirds of the site. The building was built in the 1960s, and expanded in the 1970s. Although no USTs were known at the site, the milling and manufacturing at the site used significant quantities of cutting oil. The building was demolished in 2009.

The BM site formerly included a gravel boatyard, a dry stack building that was used for covered storage of boats, and a combination maintenance shop and office building. The dry stack building was constructed between 1961 and 1965 and the office/shop building was built between 1970 and 1971; both were demolished in early 2008. Two USTs were removed from the site in 1991, and

soils exceeding state cleanup levels in effect at that time were left in place. Soil remediation took place in 1991, and the site was reportedly cleaned up to the applicable standards.

Several Phase II ESAs and supplemental investigations took place between 2001 and 2014 to further characterize the site. Soils and ground water exceeding MTCA cleanup levels were identified at several locations. Contaminants of concern included petroleum hydrocarbons and metals.

The site is currently leased for storage.

2.0 SAMPLING

The scope of work for the environmental assessment is summarized below:

1) Review available data
2) Prepare this Sampling & Analysis Plan (SAP), and health and safety plan
3) Locate underground utilities
4) Advance and sample soil borings, install monitoring wells.
5) Collect soil and ground water samples at selected locations and depths
6) Submit samples for laboratory analysis
7) Prepare assessment report and recommendations

Planned site sampling is described in the following sections

2.1 SOIL BORINGS

All borings and wells will be drilled and installed according to Ecology Minimum Standards for Construction and Maintenance of Wells (Chapter 173-160 WAC).

2.1.1 Underground Utilities/Site Access

HWA will attempt to locate underground utilities by calling the Utilities Underground Location Center before drilling. HWA will also subcontract a private locating service (APS, Inc.) to attempt to locate and mark underground utilities at proposed boring locations. PVC and concrete utilities can not be located.

2.1.2 Soil Boring And Sample Designation

Soil borings will be designated as per Table 1. Soil samples will be designated with the boring number followed by the sample depth. For example, HWA-B2-10 would indicate the soil sample collected at 10 feet below ground surface (bgs) at soil boring HWA-B2. The depth designation is for the top of the sample, and the sample interval shall be denoted in the field logs.

Ground water samples will be numbered using the well designation (ex. P-27-W).

2.2.3 Direct-push Soil Boring and Sampling

HWA will employ a subcontracted mobile direct-push sampling device (e.g., Geoprobe) to collect soil samples. Under subcontract to the Port of Everett, ESN Northwest (ESN) will drill soil borings at the approximate locations shown in Figure1. The device consists of a hydraulic/ pneumatic drive assembly mounted on a pickup truck. Steel pipe (1.25-2 inch diameter) is driven into the ground using a pneumatic impact driver (air hammer), then withdrawn. Soil cores within a glycol modified polyethylene terephthalate (PETG) inner sleeve can then be retrieved from the sampler and removed for logging and sampling.

Soil cuttings and all investigation-derived waste will be disposed of off site. Three characterization soil borings and seven contingent soil borings will be completed at the site. The characterization samples are shown on Figure 1. Contingent soil boring locations will be determined in the field with consultation with Port of Everett personnel. We anticipate completing all probe locations in one day. Maximum probe depth will be 5 feet, depending on soil recovery. We will collect continuous soil core samples, and submit soil samples to a laboratory for analysis.

All field work will be supervised by an HWA geologist or engineer. HWA field staff will collect continuous soil samples. At each sampling interval, HWA will log the soil samples and obtain and record pertinent information including soil sample depths, stratigraphy, ground water occurrence, and any visual or olfactory observations regarding the presence of contamination. HWA will log the sample for lithology and field screen the samples for organic vapors by headspace analysis using a photoionization detector (PID). For each boring, samples with the highest level of organic vapors and/or most discernible visual/olfactory contamination will be shipped to the laboratory for chemical analysis. In the absence of field screening indications, the sample immediately above ground water will be submitted for analysis.

HWA will deliver samples to the laboratory within 24 hours of sampling and will employ full chain-of-custody procedures to allow tracking and handling of the samples.

2.2.4 Ground Water Monitoring Wells

The Port of Everett will retain a Washington-licensed drilling contractor to complete three shallow monitoring wells at locations surrounding the former UST excavation using direct-push ('GeoProbe') drilling equipment.

Wells will be constructed of one-inch PVC casing and manufactured pre-packed screens. Wells will be completed to an estimated depth of 15 feet below ground surface, based on site observations and ground water elevation. The wells will be developed and wellhead elevations will be surveyed using an optical transit and stadia.

HWA will collect two rounds of ground water samples from the three new monitoring wells and existing monitoring wells P-26 and P-27 (Figure 1). Ground water samples will be collected utilizing low-flow methodology. Samples will be collected with a peristaltic pump via dedicated disposable HDPE tubing. Field parameters (pH, specific conductivity, temperature, and dissolved oxygen) will be measured at intervals through a flow-through cell. Upon stabilization of

parameters, samples will be collected. Samples for dissolved metals will be field-filtered through 0.45 μm filters. The samples will be collected in precleaned laboratory-provided sample containers and placed in a cooler filled with 'blue ice' and submitted for analysis to a Washington Department of Ecology-accredited analytical laboratory.

HWA will measure ground water depths, calculate ground water elevations, and prepare ground water gradient maps for each sampling round.

2.2.5 Borehole Abandonment

After all soil borings reach their maximum depth and are sampled, the holes will be grouted to the ground surface using hydrated granular or powdered bentonite. The drillers will also use concrete or asphalt to patch any boreholes installed through paved surfaces.

2.2.6 Decontamination Procedures

To prevent potential cross-contamination of samples, HWA will maintain appropriate decontamination procedures. Between sampling intervals in each boring, we will wash all sampling devices in a detergent solution, rinse with tap water and then rinse again with deionized water. Drillers will steam clean all probe rods, and other downhole tooling between boring locations.

2.3 FIELD SCREENING

HWA will screen soil samples by photoionization detector (PID) headspace analysis. Although the PID is not capable of quantifying or identifying specific organic compounds, this instrument is capable of measuring relative concentrations of a variety of organic vapors. The geologist/ engineer collecting samples will place approximately two ounces of soil in a resealable (i.e. ziplock) plastic bag with ample air headspace. After a minimum of five minutes at ambient temperature, the sampler will agitate the sample for ten seconds, insert the PID probe through a small opening in the plastic bag, and record the highest reading within ten seconds.

2.4 SOIL ANALYSIS

HWA will submit the soil and ground water samples to a Washington Department of Ecology-accredited analytical laboratory for analyses for one or more of the following analytes (based on preliminary data) by using the following test methods:

- Hydrocarbon Identification by Washington State Method NWTPH-HCID
- Gasoline Range Hydrocarbons and aromatic Hydrocarbons (BETX) – Washington State Method NWTPH-G/BETX (contingent on HCID results)
- Diesel and Oil-Range Hydrocarbons – Washington State Method NWTPH-Dx (contingent on HCID results)
- Carcinogenic Polynuclear aromatic hydrocarbons (cPAHs) – EPA Method # 8270 SIM
- MTCA Metals (Arsenic, Cadmium, Chromium, Lead, and Mercury) by EPA Method #6010/#7471A

HWA will submit the samples for standard turnaround time analysis (5 days). Follow-up analyses, based on initial analytical results may result in a total turnaround time of up to two weeks.

The sample bottle requirements are as follows:

Bottle Type	Method	Holding Time
VOAs – see below	NWTPH-G BTEX	see below
8 oz. Glass	NWTPH-Dx cPAHs EPA # 8270SIM Metals #6000/7000 series	14 days

After collection, the samples will be labeled, placed in a cooler with ice, and shipped to ALS Laboratories (ALS) for analysis.

2.4.1 Method 5035A for Collection of BTEX/VOC Soil Samples

Bottle Type	Method	Holding Time
(1) tared VOA (non-preserved)* (1) 4 oz. glass jar (moisture)	NWTPH-G / 5035A	14 days

* - if sample containers can not be delivered to lab within 48 hours,
** - if sample containers can not be delivered to lab within 48 hours

<u>VOAs are pre-weighed (tared) at the lab</u>
- Do not add any labels, tape, etc.
- Keep the same cap with each VOA

<u>Collect Core Sample</u>
- Geoprobe liner - slice open acetate liner, core immediately after opening

<u>Soil types:</u>
- Cohesive granular - use core
- Cemented (e.g. till) - break up with stainless steel spoon, place in VOA & cap as soon as possible
- Non cohesive (won't stay in core) - place in VOA & cap as soon as possible

<u>Extrude core into VOA</u>
- Wipe threads with clean tissue or dry wipe
- Cap VOA

- Label - ball point pen (e.g., write in the rain) only, no markers

Note in field notebook:
- Soil type, moisture
- Any bias e.g., gravels, organics (avoid both in core sample)
- Weather (temp, humidity, wind)
- Coring method used
- Preservation and storage method used

2.5 GROUND WATER SAMPLING

Ground water samples will be collected from the wells. Ground water samples will be retrieved using a peristaltic pump. New pump tubing will be used at each location.

Wells will be purged before sample collection to obtain groundwater samples that are representative of the formation water. Wells points will be purged and sampled using low-flow purging methods. Sampling staff will measure groundwater levels to the nearest 0.01-foot using a decontaminated electronic well probe prior to collection of samples. Prior to collection of groundwater samples, the wells will be purged by pumping a small volume of water to ensure sampled water represents aquifer conditions. The volume pumped will be determined in the field based on stabilization of field parameters: specific conductance, dissolved oxygen, and pH. Wells will be purged by very slowly lowering semi-rigid polyethylene tubing to a depth corresponding to roughly the midpoint of the screen, securing the tubing to prevent vertical movement, connecting it to a peristaltic pump, and then pumping at a rate not to exceed 0.5 liters/minute (0.13 gallons/minute). At a minimum, two pump and tubing volumes will be purged (1/2" I.D. tubing = 0.010 gallon/lineal foot, 0.17" I.D. tubing = 0.001 gallon/lineal foot = 5 ml/lineal foot). Samples will be collected once the parameter values have stabilized over the course of three sets of measurements as follows:

specific conductance	10 μS/cm
dissolved oxygen	2 mg/L
pH	0.1

If a well can be pumped dry prior to reaching the desired purge volume, it will be allowed to recover prior to sampling, using the minimum time between purging and sampling that would allow collection of sufficient sample volume. Samples will be pumped directly into the appropriate containers, as provided by the laboratory. A Field Data Sampling Sheet (provided in Appendix A) will be filled out for each sample. New tubing will be used at each location.

Dissolved metals samples will be filtered through a disposable 0.45-micron filter at the time of sample collection. The filters will attach directly to the discharge tube of the sampling pump. The filter must be changed between wells, or more frequently if clogging occurs. Samples that have been field-filtered must be noted on the Chain-of-Custody forms in the comments section.

2.5.1 Ground Water Analysis

We will submit ground water samples to the analytical laboratory for the following analyses:

- Diesel and Oil-Range Hydrocarbons – Washington State Method NWTPH-Dx
- Dissolved MTCA Metals (Arsenic, Cadmium, Chromium, Lead, and Mercury) by EPA Method #6010/#7471A

The sample bottle requirements are as follows:

Bottle Type	Analytes	PRESERVATIVE
1 liter amber glass	NWTPH-Dx	none
500 ml poly	Dissolved metals (filtered)	HNO_3 to pH<2

After collection, the samples will be labeled, chilled in a cooler to 4^{o}C, and shipped to ALS for analysis. Samples will be submitted for standard laboratory turnaround time (5-10 days).

2.6 QUALITY ASSURANCE/QUALITY CONTROL

Samples will be collected and analyzed with sufficient quality assurance/quality control (QA/QC) to ensure representative and reliable results. The overall QA objective for this investigation is to ensure that all laboratory and field data on which decisions are based are technically sound, statistically valid, and properly documented. There are two parts to the QA/QC program for this project: field and laboratory.

Field QA/QC includes proper documentation of field activities and sampling/handling procedures, as described in Section 2.5. Field QA/QC samples will consist of the following:

SOIL
- None

GROUND WATER
- 1 field duplicate for ground water, if sample volume is sufficient

Field Duplicates are used to confirm analytical results from a given sample point. Duplicate samples are collected in the field using a matching set of laboratory-supplied bottles and sampling from the selected well, as requested. Each duplicate should be sampled by alternating between the regular and the duplicate sample bottles, proceeding in the designated sampling order (VOCs first). The location where the duplicate is collected must be identified on the field sampling data sheet. All duplicates shall be blind-labeled (i.e., the well designation is not listed on the sample bottle or Chain-of-Custody form). Once a duplicate is collected, it is handled and shipped in the same manner as the rest of the samples. Duplicate results will be reported in the laboratory results as separate samples, using the designation DUP-(#).

Split samples are collected when a location is sampled with a third party. Split samples are not anticipated for this investigation.

Trip blanks are used to detect contamination that may be introduced in bottle preparation, in transit to or from the sampling site, or in the field. Trip blanks are samples of volatile-organic-free, laboratory-quality water (Type II reagent grade) that are prepared at the laboratory. They remain with the sample bottles while in transit to the site, during sampling, and during the return trip to the laboratory. Trip blank sample bottles are not opened at any time during this process. Trip blanks are to be reported in the laboratory results as separate samples, using the designation TB-(#). Each sample cooler that includes bottles for VOC analysis must include a trip blank, whether it was requested or not.

Field blanks are used to detect contamination that may be introduced in the field. Field blanks are not anticipated for this investigation.

Equipment blanks are used to detect residue from decontaminated equipment. Equipment blanks are not anticipated for this investigation.

Laboratory QA/QC analyses provide information about accuracy, precision, and detection limits.

Method-specific QA/QC samples may include the following, depending on the analysis:

- Method blanks
- Duplicates
- Instrument calibration verification standards
- Laboratory control samples
- Surrogate spiked samples
- Performance evaluation QC check samples

2.6.1 Data Evaluation

Data evaluation will include checking holding times, method blank results, surrogate recovery results, field and laboratory duplicate results, completeness, detection limits, laboratory control sample results, and Chain-of-Custody forms.

2.7 FIELD DOCUMENTATION AND CHAIN-OF-CUSTODY

The following sections describe the recording system for documenting all site field activities, and the sample chain-of-custody program.

2.7.1 Field Log Book

An accurate chronological recording of all field activities is vital to the documentation of any environmental investigation. To accomplish this, field team members will maintain field log books providing a daily record of significant events, observations, deviations from the sampling plan and measurements collected during the field activities.

2.7.2 Sample Identification

Following sample collection, field personnel will affix labels to each sample container. Samplers will use waterproof ink, plastic bags, or clear tape to ensure labels remain legible even when wet. Samplers will record the following information on the labels:

- Project name and number
- Sample identification number
- Date and time of collection
- Required test methods
- Name of sample collector

2.7.3 Chain-Of-Custody Record

The objective of the chain-of-custody program is to allow the tracking of possession and handling of individual samples from the time of field collection through laboratory analysis. Once a sample is collected, it becomes part of the chain-of-custody process. A sample is "in custody" when (1) it is in someone's possession, (2) it is within visual proximity of that person, (3) it is in that person's

possession, but locked up and sealed (e.g., during transport), or (4) it is in a designated secure sample storage area. Sampling staff will complete a chain-of-custody record which will accompany each batch of samples. The record will contain the following information:

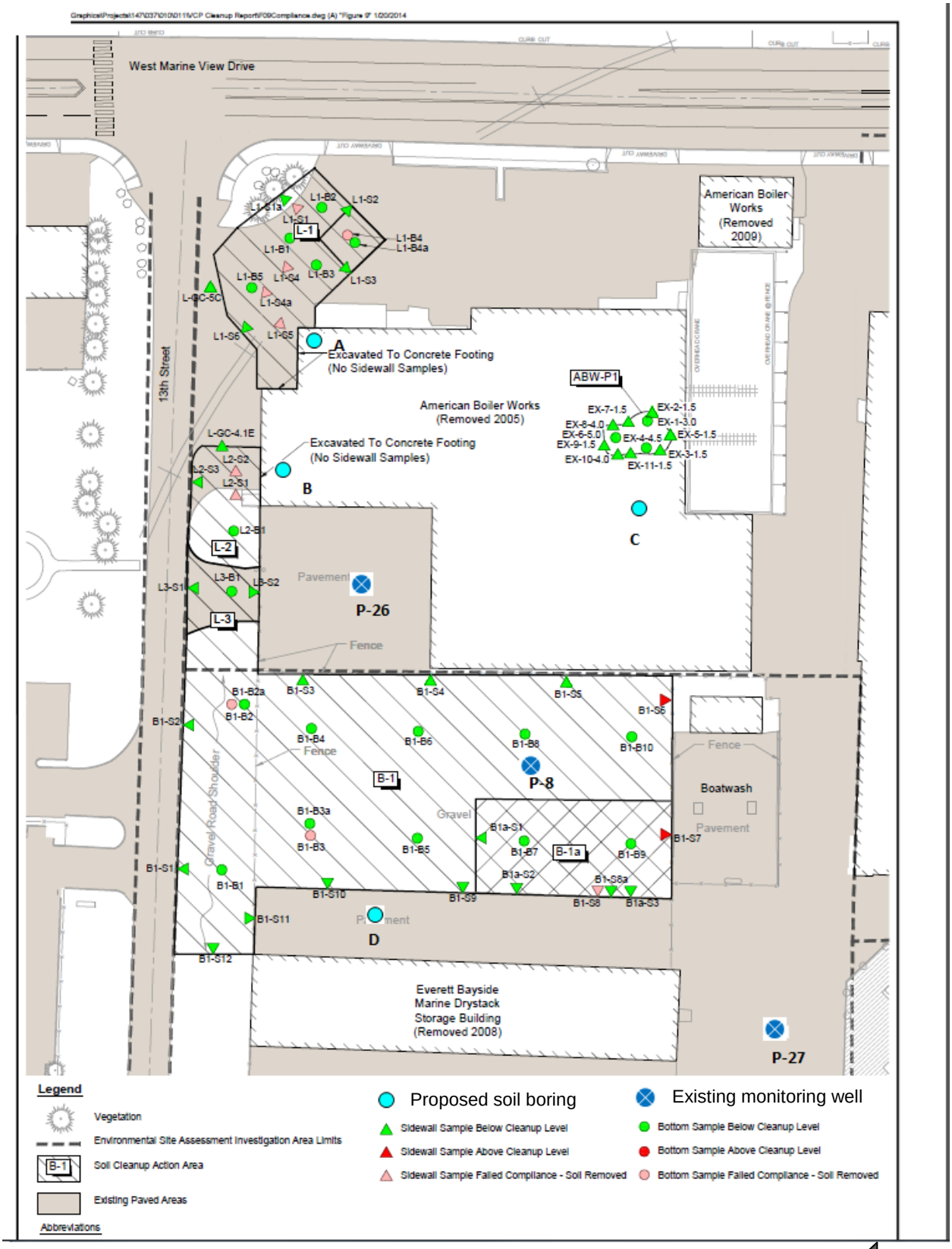
- Project name and number
- Names of sampling team members
- Requested testing program
- Required turnaround time
- Sample number
- Date and time collected
- Sample type
- Number of containers
- Special Instructions
- Signatures of persons involved in the chain of possession

When sample custody is transferred to another individual, the samples must be relinquished by the present custodian and received by the new custodian. This will be recorded at the bottom of the chain-of-custody report where the persons involved will sign, date and note the time of transfer.

Sampling team members will keep sample coolers in locked vehicles while not in active use or visual range. If couriers are used to transport samples, chain of custody seals will be affixed to sample coolers.

3.0 HEALTH AND SAFETY

HWA personnel conducting this field program are required to follow the health and safety protocol presented in the HWA site specific Health and Safety Plan. Subcontractors and other authorized visitors to the site are responsible for their own health and safety. The Health and Safety Plan will be made available to subcontractors and other site visitors who request it. Health and Safety precautions will be communicated to subcontractors by HWA personnel in site safety briefings at the beginning of each field day. To acknowledge review and comprehension of this plan, HWA personnel must sign the appropriate section included in the back of the document.



SOIL AND GROUND WATER SAMPLING LOCTIONS

BAYSIDE MARINE VCP SITE
PORT OF EVERETT
EVERETT, WASHINGTON

FIGURE NO. 1

PROJECT NO. 2013-066

HWA GEOSCIENCES INC.

APPENDIX A to SAP

CHAIN OF CUSTODY FORM
FIELD SAMPLING DATA SHEET

HWA GEOSCIENCES INC.
19730 64th Ave. W., Suite 200, Lynnwood, WA 98036 (425)774-0106
4500 Kruse Way, Suite 300, Lake Oswego, OR 97035 (503)675-2424

Chain of Custody and Laboratory Analysis Request

DATE: _____

PAGE: _____ of _____

PROJECT NAME: _____ #: _____

SITE CODE: _____

SAMPLERS NAME: _____ PHONE: _____

SAMPLERS SIGNATURE: _____

HWA CONTACT: _____ PHONE: _____

HWA SAMPLE ID	DATE	TIME	MATRIX	LAB ID	# OF BOTTLE	ANALYSIS REQUESTED	REMARKS

PRINT NAME	SIGNATURE	COMPANY	DATE	TIME	REMARKS
Relinquished by:					
Received by:					
Relinquished by:					
Received by:					

DISTRIBUTION: WHITE - Return to HWA; YELLOW - Retain by Lab; PINK - Retain by Sampler

HWA GEOSCIENCES INC.
19730 64th Avenue West, Suite 200 Lynnwood, WA 98036
Tel: 425-774-0106 / Fax: 425-774-2714 / E-Mail: hwa@hongwest.com

FIELD SAMPLING DATA SHEET

Project Name: _____ Well Number: _____
Project Number: _____ Sample Number: _____
Project Location: _____ Weather: _____
Client/Contact: _____ Date: _____

WELL MONITORING:

Time	Well Depth	Depth to Water	Measuring Point (TOC?)	Measuring Point Elevation	Water Level Elevation	Gallons in Well (Pore Volume)

(2" case = 0.163 gal/ft)
(4" case = 0.653 gal/ft)

WELL PURGING:

Time	Method	Gallons	Pore Volumes	pH	Conductivity	Temperature		

WELL SAMPLING:

Time	Sampling Method	Sample Analysis	Container Number	Container Volume	Container Type	Field Filtered (Y/N)	Preservative	Iced (Y/N)

COMMENTS/NOTES:

(Include equipment used: Bailers, Filters, Well Probe, pH/Conductivity Meter, etc.)

Total # of Bottles: _____ Sampler: _____ Signature: _____

APPENDIX B

BORING LOGS

RELATIVE DENSITY OR CONSISTENCY VERSUS SPT N-VALUE

COHESIONLESS SOILS			COHESIVE SOILS		
Density	N (blows/ft)	Approximate Relative Density(%)	Consistency	N (blows/ft)	Approximate Undrained Shear Strength (psf)
Very Loose	0 to 4	0 - 15	Very Soft	0 to 2	<250
Loose	4 to 10	15 - 35	Soft	2 to 4	250 - 500
Medium Dense	10 to 30	35 - 65	Medium Stiff	4 to 8	500 - 1000
Dense	30 to 50	65 - 85	Stiff	8 to 15	1000 - 2000
Very Dense	over 50	85 - 100	Very Stiff	15 to 30	2000 - 4000
			Hard	over 30	>4000

USCS SOIL CLASSIFICATION SYSTEM

MAJOR DIVISIONS			GROUP DESCRIPTIONS	
Coarse Grained Soils	Gravel and Gravelly Soils	Clean Gravel (little or no fines)	GW	Well-graded GRAVEL
			GP	Poorly-graded GRAVEL
	More than 50% of Coarse Fraction Retained on No. 4 Sieve	Gravel with Fines (appreciable amount of fines)	GM	Silty GRAVEL
			GC	Clayey GRAVEL
More than 50% Retained on No. 200 Sieve Size	Sand and Sandy Soils	Clean Sand (little or no fines)	SW	Well-graded SAND
			SP	Poorly-graded SAND
	50% or More of Coarse Fraction Passing No. 4 Sieve	Sand with Fines (appreciable amount of fines)	SM	Silty SAND
			SC	Clayey SAND
Fine Grained Soils	Silt and Clay	Liquid Limit Less than 50%	ML	SILT
			CL	Lean CLAY
			OL	Organic SILT/Organic CLAY
50% or More Passing No. 200 Sieve Size	Silt and Clay	Liquid Limit 50% or More	MH	Elastic SILT
			CH	Fat CLAY
			OH	Organic SILT/Organic CLAY
Highly Organic Soils			PT	PEAT

TEST SYMBOLS

%F	Percent Fines	
AL	Atterberg Limits:	PL = Plastic Limit LL = Liquid Limit
CBR	California Bearing Ratio	
CN	Consolidation	
DD	Dry Density (pcf)	
DS	Direct Shear	
GS	Grain Size Distribution	
K	Permeability	
MD	Moisture/Density Relationship (Proctor)	
MR	Resilient Modulus	
PID	Photoionization Device Reading	
PP	Pocket Penetrometer Approx. Compressive Strength (tsf)	
SG	Specific Gravity	
TC	Triaxial Compression	
TV	Torvane Approx. Shear Strength (tsf)	
UC	Unconfined Compression	

SAMPLE TYPE SYMBOLS

- 2.0" OD Split Spoon (SPT) (140 lb. hammer with 30 in. drop)
- Shelby Tube
- 3-1/4" OD Split Spoon with Brass Rings
- Small Bag Sample
- Large Bag (Bulk) Sample
- Core Run
- Non-standard Penetration Test (3.0" OD split spoon)

GROUNDWATER SYMBOLS

- Groundwater Level (measured at time of drilling)
- Groundwater Level (measured in well or open hole after water level stabilized)

COMPONENT DEFINITIONS

COMPONENT	SIZE RANGE
Boulders	Larger than 12 in
Cobbles	3 in to 12 in
Gravel	3 in to No 4 (4.5mm)
Coarse gravel	3 in to 3/4 in
Fine gravel	3/4 in to No 4 (4.5mm)
Sand	No. 4 (4.5 mm) to No. 200 (0.074 mm)
Coarse sand	No. 4 (4.5 mm) to No. 10 (2.0 mm)
Medium sand	No. 10 (2.0 mm) to No. 40 (0.42 mm)
Fine sand	No. 40 (0.42 mm) to No. 200 (0.074 mm)
Silt and Clay	Smaller than No. 200 (0.074mm)

COMPONENT PROPORTIONS

PROPORTION RANGE	DESCRIPTIVE TERMS
< 5%	Clean
5 - 12%	Slightly (Clayey, Silty, Sandy)
12 - 30%	Clayey, Silty, Sandy, Gravelly
30 - 50%	Very (Clayey, Silty, Sandy, Gravelly)
Components are arranged in order of increasing quantities.	

NOTES: Soil classifications presented on exploration logs are based on visual and laboratory observation. Soil descriptions are presented in the following general order:

Density/consistency, color, modifier (if any) GROUP NAME, additions to group name (if any), moisture content. Proportion, gradation, and angularity of constituents, additional comments. (GEOLOGIC INTERPRETATION)

Please refer to the discussion in the report text as well as the exploration logs for a more complete description of subsurface conditions.

MOISTURE CONTENT

DRY	Absence of moisture, dusty, dry to the touch.
MOIST	Damp but no visible water.
WET	Visible free water, usually soil is below water table.

HWA GEOSCIENCES INC.

Port of Everett
Bayside Marine Site
Everett, WA

LEGEND OF TERMS AND SYMBOLS USED ON EXPLORATION LOGS

PROJECT NO.: 2013-066 FIGURE: A-1

DRILLING COMPANY: ESN Northwest
DRILLING METHOD: Direct-push
SAMPLING METHOD: 1.5"x60" Macrocore sampler with HDPE liner
LOCATION:

SURFACE ELEVATION: ± feet
CASING ELEVATION ± feet

DATE STARTED: 7/23/2014
DATE COMPLETED: 7/23/2014
LOGGED BY: V. Atkins

DEPTH (feet)	SYMBOL	USCS SOIL CLASS	DESCRIPTION
0			Asphalt
		GW	Fine GRAVEL
			Light brown, gravelly SAND. Trace oxidation. (FILL)
5		SM	Brown, slightly silty SAND.
		SM	Gray, silty gravelly SAND. Moist to wet.
10			Boring completed to 3 feet below ground surface. No ground water seepage was observed during the exploration. Boring backfilled with hydrated bentonite chips and surface restored.
15			

SAMPLE TYPE
SAMPLE NUMBER
PEN. RESISTANCE (blows/6 inches)
PID (ppm)
GROUNDWATER

▲ Blows per foot

0 10 20 30 40 50

DEPTH (feet)

0 5 10 15

0 20 40 60 80 100

Water Content (%)

Plastic Limit — Liquid Limit

Natural Water Content

NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated and therefore may not necessarily be indicative of other times and/or locations.

HWA GEOSCIENCES INC.

Bayside Marine Site
Everett, WA

BORING:
CB-1

PAGE: 1 of 1

PROJECT NO.: 2013-066

FIGURE: A-2

BORINGE 2013-066.GPJ 9/10/14

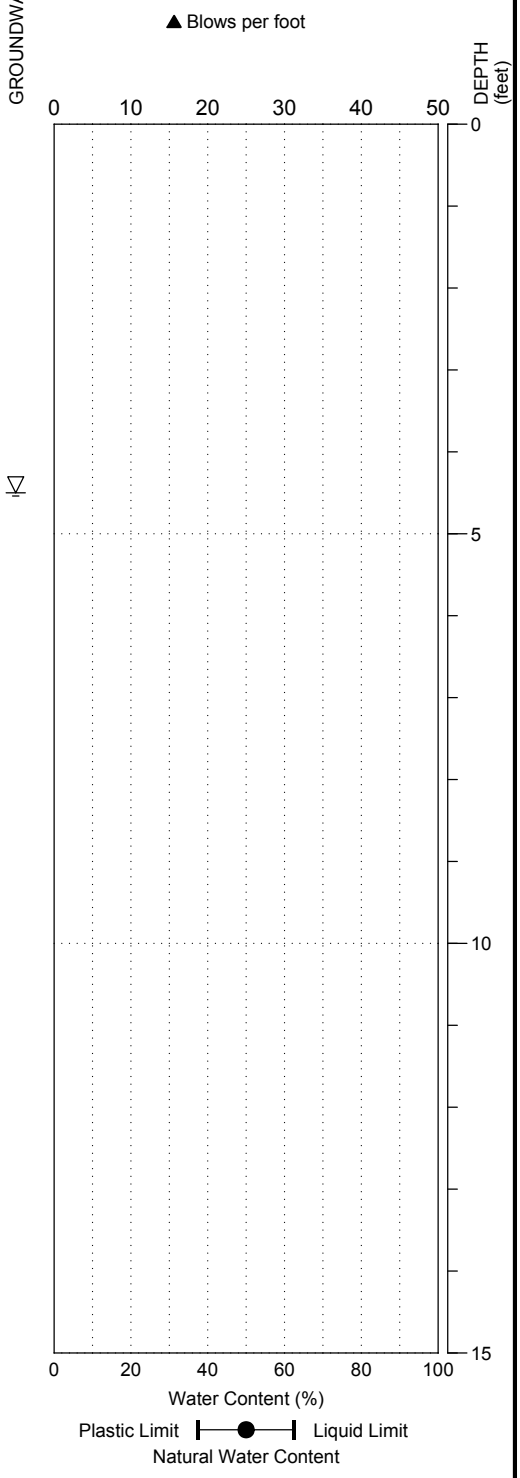
DRILLING COMPANY: ESN Northwest
DRILLING METHOD: Direct-push
SAMPLING METHOD: 1.5"x60" Macrocore sampler with HDPE liner
LOCATION:

SURFACE ELEVATION: ± feet
CASING ELEVATION ± feet

DATE STARTED: 7/23/2014
DATE COMPLETED: 7/23/2014
LOGGED BY: V. Atkins

DEPTH (feet)	SYMBOL	USCS SOIL CLASS	DESCRIPTION
0			Asphalt
		GP	Fine GRAVEL
		SM	Brown, slightly gravelly silty SAND. Trace oxidation. (FILL)
		SM	Brown, slightly gravelly slightly silty SAND.
		SM	Gray, silty gravelly SAND. Wet.
5			Boring completed to 5 feet below ground surface. Ground water seepage was observed at 4.5 feet depth. Boring backfilled with hydrated bentonite chips and surface restored.

SAMPLE TYPE
SAMPLE NUMBER
PEN. RESISTANCE (blows/6 inches)
PID (ppm)
GROUNDWATER



NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated and therefore may not necessarily be indicative of other times and/or locations.

HWA GEOSCIENCES INC.

Bayside Marine Site
Everett, WA

BORING:
CB-2

PAGE: 1 of 1

PROJECT NO.: 2013-066 FIGURE: A-3

BORINGE 2013-066.GPJ 9/10/14

DRILLING COMPANY: ESN Northwest
DRILLING METHOD: Direct-push
SAMPLING METHOD: 1.5"x60" Macrocore sampler with HDPE liner
LOCATION:

SURFACE ELEVATION: ± feet
CASING ELEVATION ± feet

DATE STARTED: 7/23/2014
DATE COMPLETED: 7/23/2014
LOGGED BY: V. Atkins

DEPTH (feet)	SYMBOL	USCS SOIL CLASS	DESCRIPTION
0			Asphalt
		GP	Fine GRAVEL
		SM	Medium dense, gray, silty SAND. Trace oxidation. Trace Wood debris. Moist to wet.
5			

SAMPLE TYPE
SAMPLE NUMBER
PEN. RESISTANCE (blows/6 inches)
PID (ppm)
GROUNDWATER

▲ Blows per foot

0 10 20 30 40 50

DEPTH (feet)

0
5
10
15

Boring completed to 5 feet below ground surface.
No ground water seepage was observed during the exploration.
Boring backfilled with hydrated bentonite chips and surface restored.

0 20 40 60 80 100
Water Content (%)
Plastic Limit — Liquid Limit
Natural Water Content

NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated and therefore may not necessarily be indicative of other times and/or locations.

HWA GEOSCIENCES INC.

Bayside Marine Site
Everett, WA

BORING:
CB-3

PAGE: 1 of 1

PROJECT NO.: 2013-066 FIGURE: A-4

DRILLING COMPANY: ESN Northwest
DRILLING METHOD: Direct-push
SAMPLING METHOD: 1.5"x60" Macrocore sampler with HDPE liner
LOCATION:

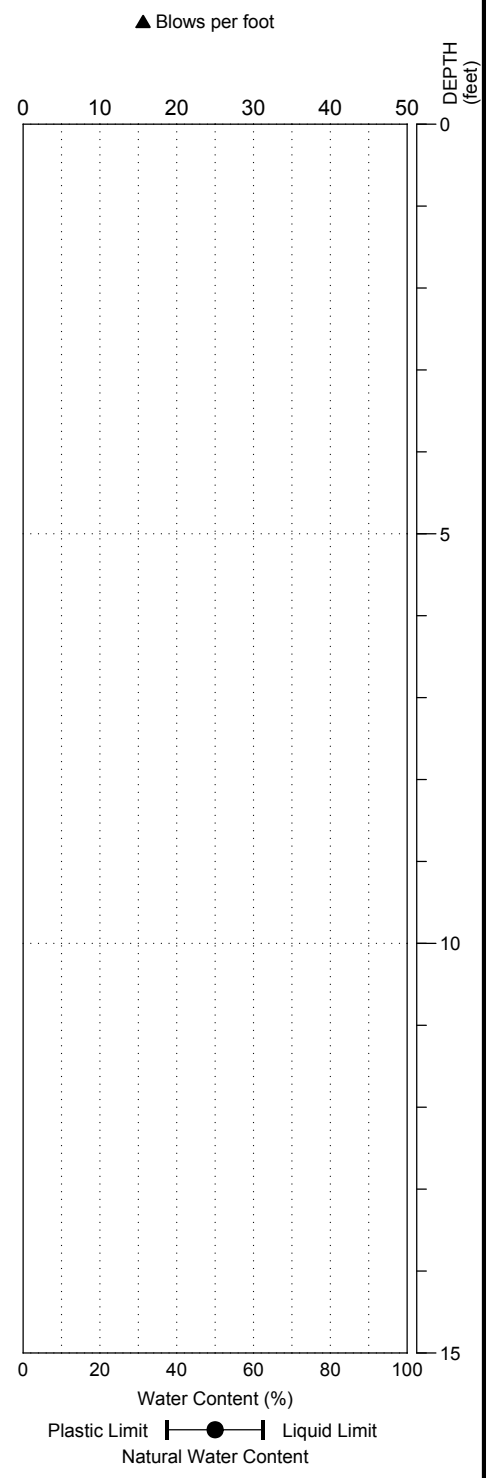
SURFACE ELEVATION: ± feet
CASING ELEVATION ± feet

DATE STARTED: 7/23/2014
DATE COMPLETED: 7/23/2014
LOGGED BY: V. Atkins

DEPTH (feet)	SYMBOL	USCS SOIL CLASS	DESCRIPTION
0			Asphalt
		GP	Gray, silty GRAVEL. Concrete debris.
		SM	Dark gray, silty SAND. Wood debris. Trace oxidation. Slight creosote odor, decreasing below 2' depth. Moist to wet.
			Increasing silt to sandy silt.
5		SM	Loose to medium dense, brown, silty SAND with trace gravel. Wet.

Boring completed to 5 feet below ground surface.
No ground water seepage was observed during the exploration.
Boring backfilled with hydrated bentonite chips and surface restored.

SAMPLE TYPE
SAMPLE NUMBER
PEN. RESISTANCE (blows/6 inches)
PID (ppm)
GROUNDWATER



NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated and therefore may not necessarily be indicative of other times and/or locations.

HWA GEOSCIENCES INC.

Bayside Marine Site
Everett, WA

BORING:
CB-4

PAGE: 1 of 1

PROJECT NO.: 2013-066 FIGURE: A-5

DRILLING COMPANY: ESN Northwest
DRILLING METHOD: Direct-push
SAMPLING METHOD: 1.5"x60" Macrocore sampler with HDPE liner
LOCATION:

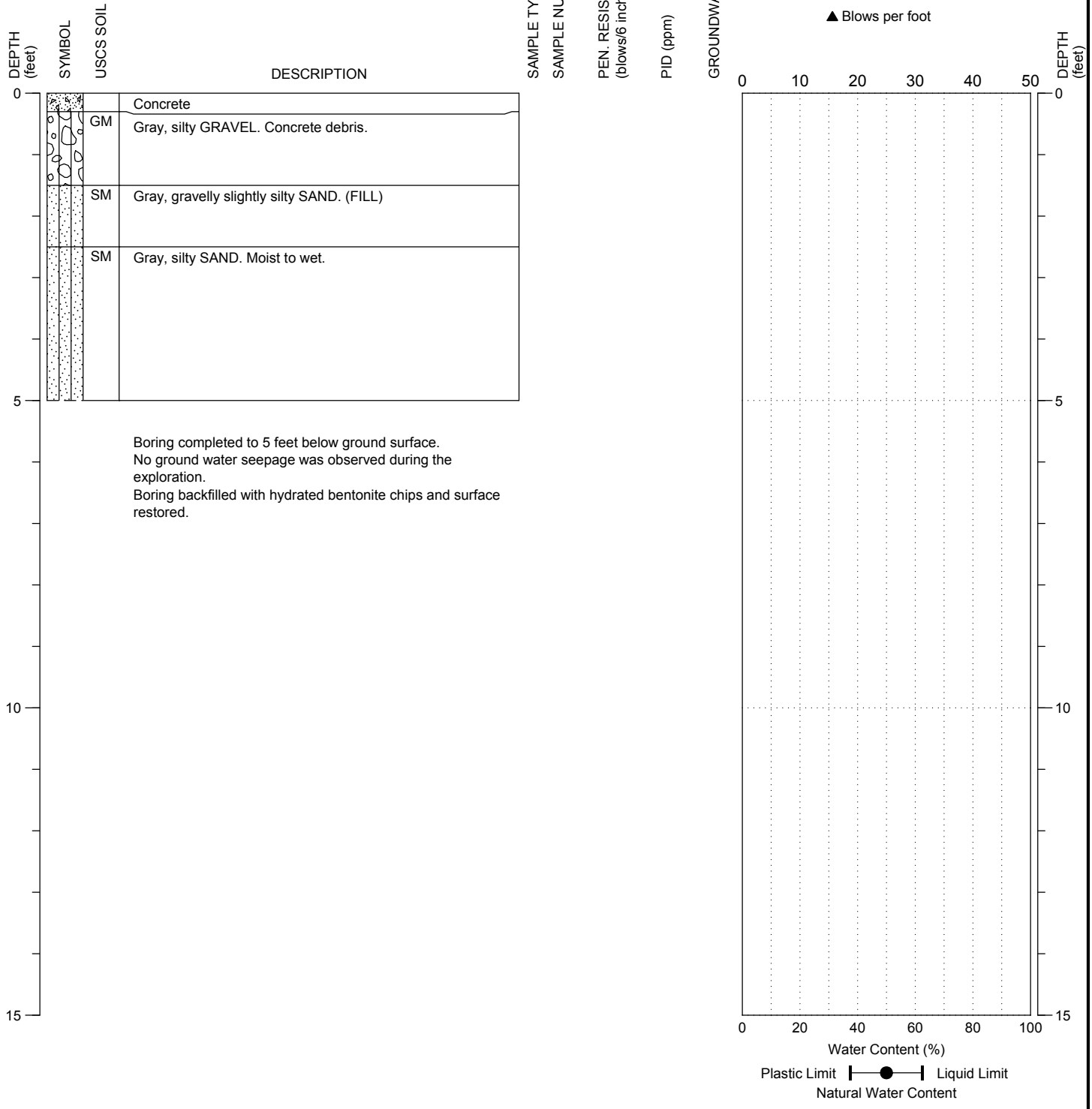
SURFACE ELEVATION: ± feet
CASING ELEVATION ± feet

DATE STARTED: 7/23/2014
DATE COMPLETED: 7/23/2014
LOGGED BY: V. Atkins

DEPTH (feet)	SYMBOL	USCS SOIL CLASS	DESCRIPTION
0			Concrete
		GM	Gray, silty GRAVEL. Concrete debris.
		SM	Gray, gravelly slightly silty SAND. (FILL)
5		SM	Gray, silty SAND. Moist to wet.

SAMPLE TYPE
SAMPLE NUMBER
PEN. RESISTANCE (blows/6 inches)
PID (ppm)
GROUNDWATER

Boring completed to 5 feet below ground surface.
No ground water seepage was observed during the exploration.
Boring backfilled with hydrated bentonite chips and surface restored.



NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated and therefore may not necessarily be indicative of other times and/or locations.

HWA GEOSCIENCES INC.

Bayside Marine Site
Everett, WA

BORING:
CB-5

PAGE: 1 of 1

PROJECT NO.: 2013-066 FIGURE: A-6

DRILLING COMPANY: ESN Northwest
DRILLING METHOD: Direct-push
SAMPLING METHOD: 1.5"x60" Macrocore sampler with HDPE liner
LOCATION:

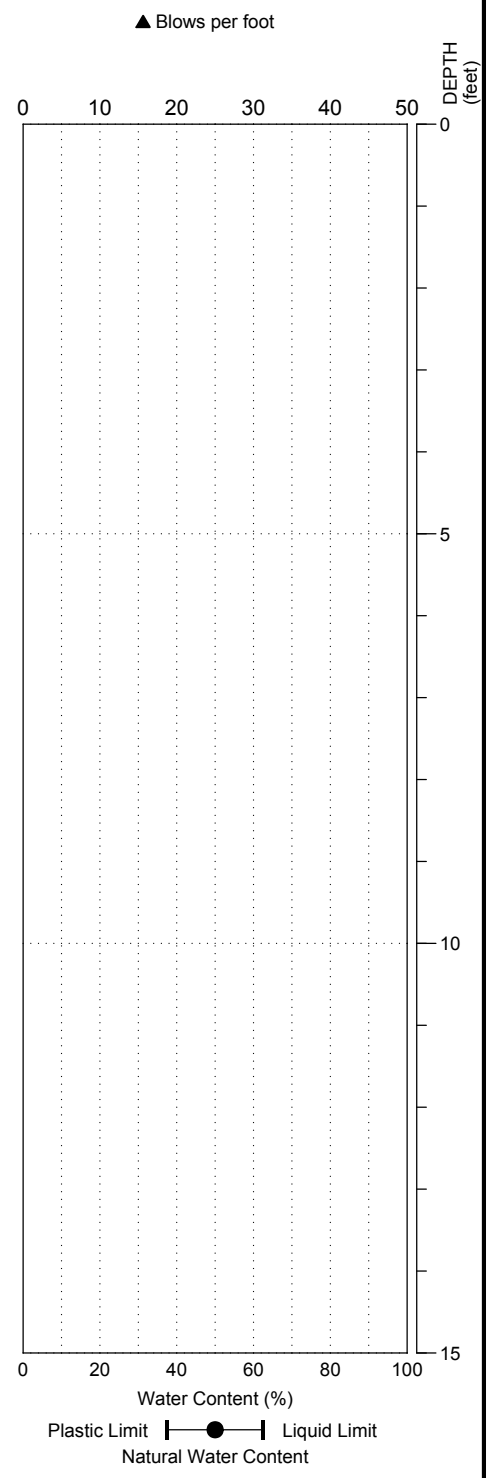
SURFACE ELEVATION: ± feet
CASING ELEVATION ± feet

DATE STARTED: 7/23/2014
DATE COMPLETED: 7/23/2014
LOGGED BY: V. Atkins

DEPTH (feet)	SYMBOL	USCS SOIL CLASS	DESCRIPTION
0			Asphalt
		SM	Brown, silty slightly gravelly SAND. Trace wood debris.
		SM	Dark gray, silty SAND to sandy SILT. Trace wood.
5		SM	Gray-brown, silty SAND. Trace gravel. Wet.

Boring completed to 5 feet below ground surface.
No ground water seepage was observed during the exploration.
Boring backfilled with hydrated bentonite chips and surface restored.

SAMPLE TYPE
SAMPLE NUMBER
PEN. RESISTANCE (blows/6 inches)
PID (ppm)
GROUNDWATER



NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated and therefore may not necessarily be indicative of other times and/or locations.

HWA GEOSCIENCES INC.

Bayside Marine Site
Everett, WA

BORING:
CB-6

PAGE: 1 of 1

PROJECT NO.: 2013-066 FIGURE: A-7

DRILLING COMPANY: ESN Northwest
DRILLING METHOD: Direct-push
SAMPLING METHOD: 1.5"x60" Macrocore sampler with HDPE liner
LOCATION:

SURFACE ELEVATION: ± feet
CASING ELEVATION ± feet

DATE STARTED: 7/23/2014
DATE COMPLETED: 7/23/2014
LOGGED BY: V. Atkins

DEPTH (feet)	SYMBOL	USCS SOIL CLASS	DESCRIPTION
0			Asphalt
		GP	Brown, sandy GRAVEL. Trace silt. Trace oxidation. (FILL)
		SM	Gray, silty SAND. Wood debris.
		SM	Becoming dark gray, wet.
5			
10			
15			

Boring completed to 5 feet below ground surface.
No ground water seepage was observed during the exploration.
Boring backfilled with hydrated bentonite chips and surface restored.

SAMPLE TYPE
SAMPLE NUMBER
PEN. RESISTANCE (blows/6 inches)
PID (ppm)
GROUNDWATER

▲ Blows per foot

0 10 20 30 40 50

0 20 40 60 80 100

Water Content (%)

Plastic Limit ⊢●⊣ Liquid Limit
Natural Water Content

NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated and therefore may not necessarily be indicative of other times and/or locations.

HWA GEOSCIENCES INC.

Bayside Marine Site
Everett, WA

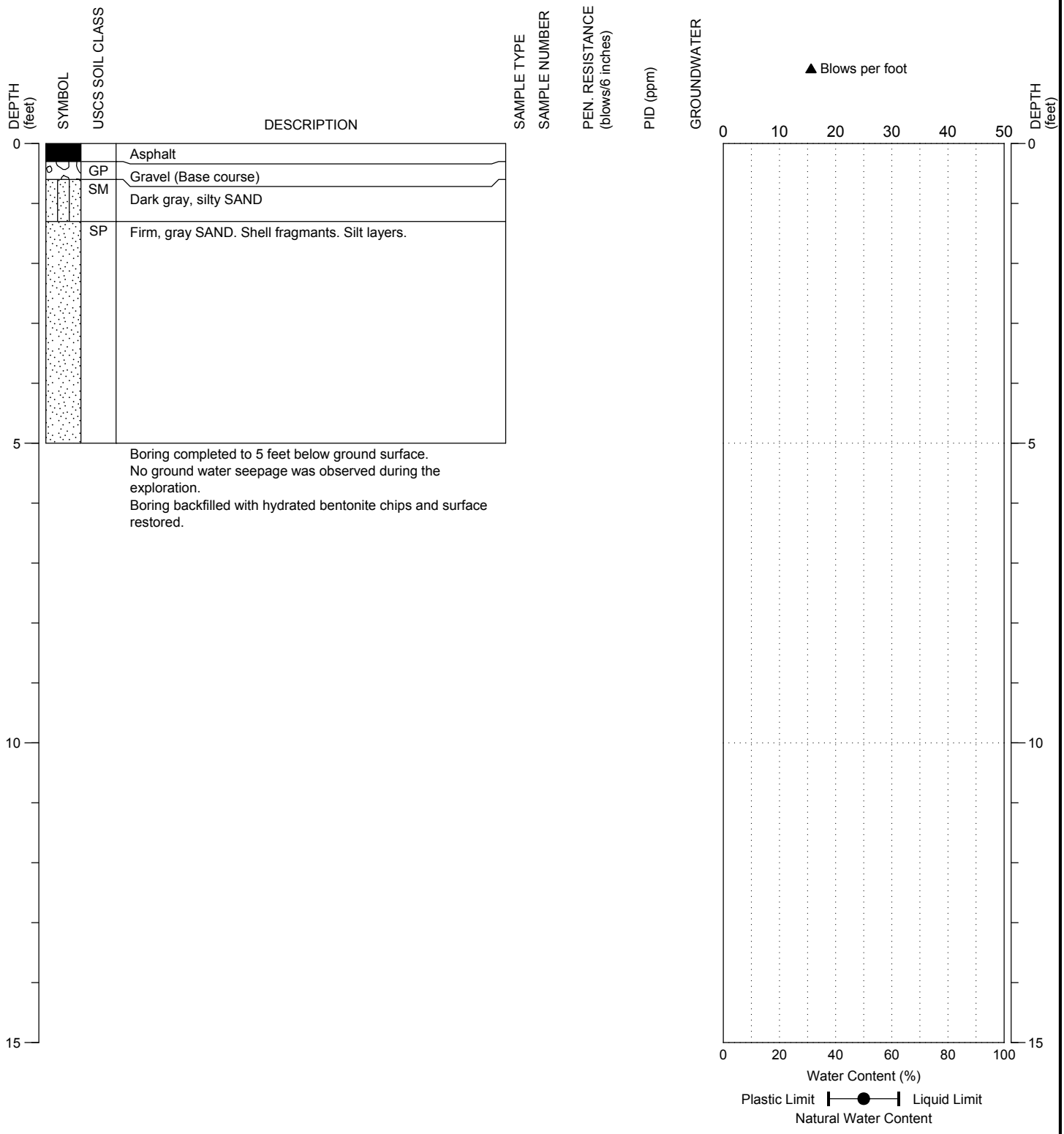
BORING:
CB-7

PROJECT NO.: 2013-066 FIGURE: A-8

DRILLING COMPANY: ESN Northwest
DRILLING METHOD: Direct-push
SAMPLING METHOD: 1.5"x60" Macrocore sampler with HDPE liner
LOCATION:

SURFACE ELEVATION: ± feet
CASING ELEVATION ± feet

DATE STARTED: 7/23/2014
DATE COMPLETED: 7/23/2014
LOGGED BY: V. Atkins



NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated and therefore may not necessarily be indicative of other times and/or locations.

HWA GEOSCIENCES INC.

Bayside Marine Site
Everett, WA

BORING:
HWA-B1

PAGE: 1 of 1

PROJECT NO.: 2013-066 FIGURE: A-9

DRILLING COMPANY: ESN Northwest
DRILLING METHOD: Direct-push
SAMPLING METHOD: 1.5"x60" Macrocore sampler with HDPE liner
LOCATION:

SURFACE ELEVATION: ± feet
CASING ELEVATION ± feet

DATE STARTED: 7/23/2014
DATE COMPLETED: 7/23/2014
LOGGED BY: V. Atkins

DEPTH (feet)	SYMBOL	USCS SOIL CLASS	DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	PEN. RESISTANCE (blows/6 inches)	OTHER TESTS	PID (ppm)	WELL COMPLETION SCHEMATIC	NOTES	DEPTH (feet)
0			Asphalt								0
		GP	Gravel (Base course)							Concrete & monument	
		SM	Dark brown, silty SAND. Trace wood debris.							Bentonite	
		SP	Gray, slightly silty fine SAND. Trace shell fragments.								
			Becomes wet at 4' depth.								
5											5
		ML	Stiff, dark gray SILT. Wet.							Prepacked well screen	
10											10
15											15

Boring completed to 13 feet below ground surface.
Ground water seepage was observed at 4' during the exploration.
Boring backfilled with hydrated bentonite chips and surface restored.

NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated and therefore may not necessarily be indicative of other times and/or locations.

HWA GEOSCIENCES INC.

Bayside Marine Site
Everett, WA

MONITORING WELL:
HWA-MW1

PROJECT NO.: 2013-066 FIGURE: A-10

DRILLING COMPANY: ESN Northwest
DRILLING METHOD: Direct-push
SAMPLING METHOD: 1.5"x60" Macrocore sampler with HDPE liner
LOCATION:

SURFACE ELEVATION: ± feet
CASING ELEVATION ± feet

DATE STARTED: 7/23/2014
DATE COMPLETED: 7/23/2014
LOGGED BY: V. Atkins

DEPTH (feet)	SYMBOL	USCS SOIL CLASS	DESCRIPTION	SAMPLE TYPE	SAMPLE NUMBER	PEN. RESISTANCE (blows/6 inches)	OTHER TESTS	PID (ppm)	WELL COMPLETION SCHEMATIC	NOTES	DEPTH (feet)
0			Asphalt							Concrete & monument	0
			Medium dense, brown to gray, silty slightly gravelly SAND.								
		SM	Gray, silty SAND							Bentonite	
		SP	Gray, slightly silty fine SAND. Trace brick debris.								
5		ML SM	Stiff, gray to dark gray sandy SILT. Wood fragment layers. Wet.								5
										Prepacked well screen	
10											10
15											15

Boring completed to 13 feet below ground surface.
No ground water seepage was observed during the exploration.
Boring backfilled with hydrated bentonite chips and surface restored.

NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated and therefore may not necessarily be indicative of other times and/or locations.

HWA GEOSCIENCES INC.

Bayside Marine Site
Everett, WA

MONITORING WELL:
HWA-MW2

PROJECT NO.: 2013-066 FIGURE: A-11

DRILLING COMPANY: ESN Northwest
DRILLING METHOD: Direct-push
SAMPLING METHOD: 1.5"x60" Macrocore sampler with HDPE liner
LOCATION:

SURFACE ELEVATION: ± feet
CASING ELEVATION ± feet

DATE STARTED: 7/23/2014
DATE COMPLETED: 7/23/2014
LOGGED BY: V. Atkins

DEPTH (feet)	SYMBOL	USCS SOIL CLASS	DESCRIPTION
0		GM	Light brown, silty GRAVEL. (FILL)
			Stiff, dark gray, sandy SILT.
		SM	Gray, slightly silty SAND. Sand fine to medium. Trace oxidation.
5		ML	Soft, dark gray to brown SILT. Wet.
		SM	Gray to dark gray, slightly silty SAND. Wood debris layers. Some shell fragmants. Wet.
10			
15			

SAMPLE TYPE | SAMPLE NUMBER | PEN. RESISTANCE (blows/6 inches) | OTHER TESTS | PID (ppm)

WELL COMPLETION SCHEMATIC

NOTES

Concrete & monument

Bentonite

Prepacked well screen

DEPTH (feet)

Boring completed to 13 feet below ground surface.
Ground water seepage was observed at 4' during the exploration.
Boring backfilled with hydrated bentonite chips and surface restored.

NOTE: This log of subsurface conditions applies only at the specified location and on the date indicated and therefore may not necessarily be indicative of other times and/or locations.

HWA GEOSCIENCES INC.

Bayside Marine Site
Everett, WA

MONITORING WELL:
HWA-MW3

PROJECT NO.: 2013-066 FIGURE: A-12

APPENDIX C

ANALYTICAL LABORATORY REPORTS

September 5, 2014

Mr. Arnie Sugar
HWA Geosciences Inc.
21312 - 30th Drive SE, Suite 110
Bothell, WA 98021-7010

Dear Mr. Sugar,

On September 3rd, 6 samples were received by our laboratory and assigned our laboratory project number EV14090020. The project was identified as your Port of Everett / #201300622. The sample identification and requested analyses are outlined on the attached chain of custody record.

No abnormalities or nonconformances were observed during the analyses of the project samples.

Please do not hesitate to call me if you have any questions or if I can be of further assistance.

Sincerely,

ALS Laboratory Group

Rick Bagan
Laboratory Director

ADDRESS 8620 Holly Drive, Suite 100, Everett, WA 98208 | PHONE 425-356-2600 | FAX 425-356-2626
ALS Laboratory Group A Campbell Brothers Limited Company

ALS Environmental

CERTIFICATE OF ANALYSIS

CLIENT:	HWA Geosciences Inc. 21312 - 30th Drive SE, Suite 110 Bothell, WA 98021-7010	DATE:	9/5/2014
		ALS JOB#:	EV14090020
		ALS SAMPLE#:	EV14090020-01
CLIENT CONTACT:	Arnie Sugar	DATE RECEIVED:	09/03/2014
CLIENT PROJECT:	Port of Everett / #201300622	COLLECTION DATE:	9/3/2014 9:30:00 AM
CLIENT SAMPLE ID	P27	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
TPH-Diesel Range	NWTPH-DX	U	130	1	ug/L	09/03/2014	EBS
TPH-Oil Range	NWTPH-DX	U	250	1	ug/L	09/03/2014	EBS
Nitrate	EPA-300.0	U	0.15	1	MG/L	09/03/2014	GAP
Sulfate	EPA-300.0	**0.58**	0.26	1	MG/L	09/03/2014	GAP
Mercury (Dissolved)	EPA-7470	U	0.20	1	ug/L	09/05/2014	RAL
Arsenic (Dissolved)	EPA-200.8	U	1.0	1	ug/L	09/05/2014	RAL
Cadmium (Dissolved)	EPA-200.8	U	1.0	1	ug/L	09/05/2014	RAL
Chromium (Dissolved)	EPA-200.8	U	2.0	1	ug/L	09/05/2014	RAL
Copper (Dissolved)	EPA-200.8	U	2.0	1	ug/L	09/05/2014	RAL
Lead (Dissolved)	EPA-200.8	U	1.0	1	ug/L	09/05/2014	RAL
Zinc (Dissolved)	EPA-200.8	**8.2**	2.5	1	ug/L	09/05/2014	RAL

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
C25	NWTPH-DX	**94.1**	09/03/2014	EBS

U - Analyte analyzed for but not detected at level above reporting limit.

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ALS Laboratory Group A Campbell Brothers Limited Company

ALS Environmental

CERTIFICATE OF ANALYSIS

CLIENT:	HWA Geosciences Inc. 21312 - 30th Drive SE, Suite 110 Bothell, WA 98021-7010	DATE:	9/5/2014
		ALS JOB#:	EV14090020
		ALS SAMPLE#:	EV14090020-02
CLIENT CONTACT:	Arnie Sugar	DATE RECEIVED:	09/03/2014
CLIENT PROJECT:	Port of Everett / #201300622	COLLECTION DATE:	9/3/2014 10:15:00 AM
CLIENT SAMPLE ID	HWA-MW-3	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
TPH-Diesel Range	NWTPH-DX	U	130	1	ug/L	09/03/2014	EBS
TPH-Oil Range	NWTPH-DX	U	250	1	ug/L	09/03/2014	EBS
Nitrate	EPA-300.0	**0.17**	0.15	1	MG/L	09/03/2014	GAP
Sulfate	EPA-300.0	U	0.26	1	MG/L	09/03/2014	GAP
Mercury (Dissolved)	EPA-7470	U	0.20	1	ug/L	09/05/2014	RAL
Arsenic (Dissolved)	EPA-200.8	U	1.0	1	ug/L	09/05/2014	RAL
Cadmium (Dissolved)	EPA-200.8	U	1.0	1	ug/L	09/05/2014	RAL
Chromium (Dissolved)	EPA-200.8	U	2.0	1	ug/L	09/05/2014	RAL
Copper (Dissolved)	EPA-200.8	U	2.0	1	ug/L	09/05/2014	RAL
Lead (Dissolved)	EPA-200.8	U	1.0	1	ug/L	09/05/2014	RAL
Zinc (Dissolved)	EPA-200.8	**10**	2.5	1	ug/L	09/05/2014	RAL

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
C25	NWTPH-DX	**90.1**	09/03/2014	EBS

U - Analyte analyzed for but not detected at level above reporting limit.

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ALS Laboratory Group A Campbell Brothers Limited Company

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CERTIFICATE OF ANALYSIS

CLIENT:	HWA Geosciences Inc. 21312 - 30th Drive SE, Suite 110 Bothell, WA 98021-7010	DATE:	9/5/2014
		ALS JOB#:	EV14090020
		ALS SAMPLE#:	EV14090020-03
CLIENT CONTACT:	Arnie Sugar	DATE RECEIVED:	09/03/2014
CLIENT PROJECT:	Port of Everett / #201300622	COLLECTION DATE:	9/3/2014 11:45:00 AM
CLIENT SAMPLE ID	P26	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
TPH-Diesel Range	NWTPH-DX	**180**	130	1	ug/L	09/03/2014	EBS
TPH-Oil Range	NWTPH-DX	U	250	1	ug/L	09/03/2014	EBS
Nitrate	EPA-300.0	**0.19**	0.15	1	MG/L	09/03/2014	GAP
Sulfate	EPA-300.0	**0.37**	0.26	1	MG/L	09/03/2014	GAP
Mercury (Dissolved)	EPA-7470	U	0.20	1	ug/L	09/05/2014	RAL
Arsenic (Dissolved)	EPA-200.8	**6.3**	1.0	1	ug/L	09/05/2014	RAL
Cadmium (Dissolved)	EPA-200.8	U	1.0	1	ug/L	09/05/2014	RAL
Chromium (Dissolved)	EPA-200.8	U	2.0	1	ug/L	09/05/2014	RAL
Copper (Dissolved)	EPA-200.8	U	2.0	1	ug/L	09/05/2014	RAL
Lead (Dissolved)	EPA-200.8	U	1.0	1	ug/L	09/05/2014	RAL
Zinc (Dissolved)	EPA-200.8	**5.7**	2.5	1	ug/L	09/05/2014	RAL

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
C25	NWTPH-DX	**94.4**	09/03/2014	EBS

U - Analyte analyzed for but not detected at level above reporting limit.
Chromatogram indicates that it is likely that sample contains weathered diesel.

ADDRESS 8620 Holly Drive, Suite 100, Everett, WA 98208 | PHONE 425-356-2600 | FAX 425-356-2626
ALS Laboratory Group A Campbell Brothers Limited Company

ALS Environmental

CERTIFICATE OF ANALYSIS

CLIENT:	HWA Geosciences Inc. 21312 - 30th Drive SE, Suite 110 Bothell, WA 98021-7010	DATE:	9/5/2014
		ALS JOB#:	EV14090020
		ALS SAMPLE#:	EV14090020-04
CLIENT CONTACT:	Arnie Sugar	DATE RECEIVED:	09/03/2014
CLIENT PROJECT:	Port of Everett / #201300622	COLLECTION DATE:	9/3/2014 12:45:00 PM
CLIENT SAMPLE ID	HWA-MW-1	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
TPH-Diesel Range	NWTPH-DX	**130**	130	1	ug/L	09/04/2014	EBS
TPH-Oil Range	NWTPH-DX	U	250	1	ug/L	09/04/2014	EBS
Nitrate	EPA-300.0	**0.27**	0.15	1	MG/L	09/03/2014	GAP
Sulfate	EPA-300.0	U	0.26	1	MG/L	09/03/2014	GAP
Mercury (Dissolved)	EPA-7470	U	0.20	1	ug/L	09/05/2014	RAL
Arsenic (Dissolved)	EPA-200.8	**91**	1.0	1	ug/L	09/05/2014	RAL
Cadmium (Dissolved)	EPA-200.8	U	1.0	1	ug/L	09/05/2014	RAL
Chromium (Dissolved)	EPA-200.8	**2.2**	2.0	1	ug/L	09/05/2014	RAL
Copper (Dissolved)	EPA-200.8	U	2.0	1	ug/L	09/05/2014	RAL
Lead (Dissolved)	EPA-200.8	U	1.0	1	ug/L	09/05/2014	RAL
Zinc (Dissolved)	EPA-200.8	**7.6**	2.5	1	ug/L	09/05/2014	RAL

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
C25	NWTPH-DX	**92.4**	09/04/2014	EBS

U - Analyte analyzed for but not detected at level above reporting limit.
Chromatogram indicates that it is likely that sample contains weathered diesel.

ADDRESS 8620 Holly Drive, Suite 100, Everett, WA 98208 | PHONE 425-356-2600 | FAX 425-356-2626
ALS Laboratory Group A Campbell Brothers Limited Company

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CERTIFICATE OF ANALYSIS

CLIENT:	HWA Geosciences Inc. 21312 - 30th Drive SE, Suite 110 Bothell, WA 98021-7010	DATE:	9/5/2014
		ALS JOB#:	EV14090020
		ALS SAMPLE#:	EV14090020-05
CLIENT CONTACT:	Arnie Sugar	DATE RECEIVED:	09/03/2014
CLIENT PROJECT:	Port of Everett / #201300622	COLLECTION DATE:	9/3/2014 1:45:00 PM
CLIENT SAMPLE ID	HWA-MW-2	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
TPH-Diesel Range	NWTPH-DX	**140**	130	1	ug/L	09/04/2014	EBS
TPH-Oil Range	NWTPH-DX	U	250	1	ug/L	09/04/2014	EBS
Nitrate	EPA-300.0	**0.61**	0.15	1	MG/L	09/03/2014	GAP
Sulfate	EPA-300.0	U	0.26	1	MG/L	09/03/2014	GAP
Mercury (Dissolved)	EPA-7470	U	0.20	1	ug/L	09/05/2014	RAL
Arsenic (Dissolved)	EPA-200.8	**8.2**	1.0	1	ug/L	09/05/2014	RAL
Cadmium (Dissolved)	EPA-200.8	U	1.0	1	ug/L	09/05/2014	RAL
Chromium (Dissolved)	EPA-200.8	**2.8**	2.0	1	ug/L	09/05/2014	RAL
Copper (Dissolved)	EPA-200.8	U	2.0	1	ug/L	09/05/2014	RAL
Lead (Dissolved)	EPA-200.8	U	1.0	1	ug/L	09/05/2014	RAL
Zinc (Dissolved)	EPA-200.8	**13**	2.5	1	ug/L	09/05/2014	RAL

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
C25	NWTPH-DX	**93.0**	09/04/2014	EBS

U - Analyte analyzed for but not detected at level above reporting limit.
Chromatogram indicates that it is likely that sample contains weathered diesel.

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ALS Laboratory Group A Campbell Brothers Limited Company

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CERTIFICATE OF ANALYSIS

CLIENT:	HWA Geosciences Inc. 21312 - 30th Drive SE, Suite 110 Bothell, WA 98021-7010	DATE:	9/5/2014
		ALS JOB#:	EV14090020
		ALS SAMPLE#:	EV14090020-06
CLIENT CONTACT:	Arnie Sugar	DATE RECEIVED:	09/03/2014
CLIENT PROJECT:	Port of Everett / #201300622	COLLECTION DATE:	9/3/2014 1:00:00 PM
CLIENT SAMPLE ID	DUP	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
TPH-Diesel Range	NWTPH-DX	U	130	1	ug/L	09/04/2014	EBS
TPH-Oil Range	NWTPH-DX	U	250	1	ug/L	09/04/2014	EBS
Nitrate	EPA-300.0	**0.31**	0.15	1	MG/L	09/03/2014	GAP
Sulfate	EPA-300.0	U	0.26	1	MG/L	09/03/2014	GAP
Mercury (Dissolved)	EPA-7470	U	0.20	1	ug/L	09/05/2014	RAL
Arsenic (Dissolved)	EPA-200.8	**7.5**	1.0	1	ug/L	09/05/2014	RAL
Cadmium (Dissolved)	EPA-200.8	U	1.0	1	ug/L	09/05/2014	RAL
Chromium (Dissolved)	EPA-200.8	**3.5**	2.0	1	ug/L	09/05/2014	RAL
Copper (Dissolved)	EPA-200.8	U	2.0	1	ug/L	09/05/2014	RAL
Lead (Dissolved)	EPA-200.8	U	1.0	1	ug/L	09/05/2014	RAL
Zinc (Dissolved)	EPA-200.8	**7.1**	2.5	1	ug/L	09/05/2014	RAL

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
C25	NWTPH-DX	**96.0**	09/04/2014	EBS

U - Analyte analyzed for but not detected at level above reporting limit.

ADDRESS 8620 Holly Drive, Suite 100, Everett, WA 98208 | PHONE 425-356-2600 | FAX 425-356-2626
ALS Laboratory Group A Campbell Brothers Limited Company

ALS Environmental

CERTIFICATE OF ANALYSIS

CLIENT: HWA Geosciences Inc.
21312 - 30th Drive SE, Suite 110
Bothell, WA 98021-7010

CLIENT CONTACT: Arnie Sugar
CLIENT PROJECT: Port of Everett / #201300622

DATE: 9/5/2014
ALS SDG#: EV14090020
WDOE ACCREDITATION: C601

LABORATORY BLANK RESULTS

MB-082814W - Batch 85623 - Water by NWTPH-DX

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
TPH-Diesel Range	NWTPH-DX	U	130	1	ug/L	08/28/2014	EBS
TPH-Oil Range	NWTPH-DX	U	250	1	ug/L	08/28/2014	EBS

U - Analyte analyzed for but not detected at level above reporting limit.

MBLK-932014 - Batch R240434 - Water by EPA-300.0

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
Nitrate	EPA-300.0	U	0.15	1	MG/L	09/03/2014	GAP
Sulfate	EPA-300.0	U	0.26	1	MG/L	09/03/2014	GAP

U - Analyte analyzed for but not detected at level above reporting limit.

MBLK-952014 - Batch R240435 - Water by EPA-7470

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
Mercury (Dissolved)	EPA-7470	U	0.20	1	ug/L	09/05/2014	RAL

U - Analyte analyzed for but not detected at level above reporting limit.

MB-090514W - Batch 85795 - Water by EPA-200.8

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
Arsenic (Dissolved)	EPA-200.8	U	1.0	1	ug/L	09/05/2014	RAL
Cadmium (Dissolved)	EPA-200.8	U	1.0	1	ug/L	09/05/2014	RAL
Chromium (Dissolved)	EPA-200.8	U	2.0	1	ug/L	09/05/2014	RAL
Copper (Dissolved)	EPA-200.8	U	2.0	1	ug/L	09/05/2014	RAL
Lead (Dissolved)	EPA-200.8	U	1.0	1	ug/L	09/05/2014	RAL
Zinc (Dissolved)	EPA-200.8	U	2.5	1	ug/L	09/05/2014	RAL

U - Analyte analyzed for but not detected at level above reporting limit.

ADDRESS 8620 Holly Drive, Suite 100, Everett, WA 98208 | PHONE 425-356-2600 | FAX 425-356-2626
ALS Laboratory Group A Campbell Brothers Limited Company

ALS Environmental

CERTIFICATE OF ANALYSIS

CLIENT:	HWA Geosciences Inc. 21312 - 30th Drive SE, Suite 110 Bothell, WA 98021-7010	DATE:	9/5/2014
		ALS SDG#:	EV14090020
		WDOE ACCREDITATION:	C601
CLIENT CONTACT:	Arnie Sugar		
CLIENT PROJECT:	Port of Everett / #201300622		

LABORATORY CONTROL SAMPLE RESULTS

ALS Test Batch ID: 85623 - Water by NWTPH-DX

SPIKED COMPOUND	METHOD	%REC	RPD	QUAL	ANALYSIS DATE	ANALYSIS BY
TPH-Diesel Range - BS	NWTPH-DX	**72.5**			08/28/2014	EBS
TPH-Diesel Range - BSD	NWTPH-DX	**72.4**	**0**		08/29/2014	EBS

ALS Test Batch ID: R240434 - Water by EPA-300.0

SPIKED COMPOUND	METHOD	%REC	RPD	QUAL	ANALYSIS DATE	ANALYSIS BY
Nitrate - BS	EPA-300.0	**108**			09/03/2014	GAP
Nitrate - BSD	EPA-300.0	**111**	**2**		09/03/2014	GAP
Sulfate - BS	EPA-300.0	**90.5**			09/03/2014	GAP
Sulfate - BSD	EPA-300.0	**98.5**	**8**		09/03/2014	GAP

ALS Test Batch ID: R240435 - Water by EPA-7470

SPIKED COMPOUND	METHOD	%REC	RPD	QUAL	ANALYSIS DATE	ANALYSIS BY
Mercury (Dissolved) - BS	EPA-7470	**102**			09/05/2014	RAL
Mercury (Dissolved) - BSD	EPA-7470	**105**	**3**		09/05/2014	RAL

ALS Test Batch ID: 85795 - Water by EPA-200.8

SPIKED COMPOUND	METHOD	%REC	RPD	QUAL	ANALYSIS DATE	ANALYSIS BY
Arsenic (Dissolved) - BS	EPA-200.8	**103**			09/05/2014	RAL
Arsenic (Dissolved) - BSD	EPA-200.8	**104**	**2**		09/05/2014	RAL
Cadmium (Dissolved) - BS	EPA-200.8	**103**			09/05/2014	RAL
Cadmium (Dissolved) - BSD	EPA-200.8	**110**	**6**		09/05/2014	RAL
Chromium (Dissolved) - BS	EPA-200.8	**95.8**			09/05/2014	RAL
Chromium (Dissolved) - BSD	EPA-200.8	**97.1**	**1**		09/05/2014	RAL
Copper (Dissolved) - BS	EPA-200.8	**102**			09/05/2014	RAL
Copper (Dissolved) - BSD	EPA-200.8	**103**	**1**		09/05/2014	RAL
Lead (Dissolved) - BS	EPA-200.8	**101**			09/05/2014	RAL
Lead (Dissolved) - BSD	EPA-200.8	**103**	**3**		09/05/2014	RAL
Zinc (Dissolved) - BS	EPA-200.8	**103**			09/05/2014	RAL
Zinc (Dissolved) - BSD	EPA-200.8	**103**	**0**		09/05/2014	RAL

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ALS Laboratory Group A Campbell Brothers Limited Company

CERTIFICATE OF ANALYSIS

APPROVED BY

Laboratory Director

ADDRESS 8620 Holly Drive, Suite 100, Everett, WA 98208 | PHONE 425-356-2600 | FAX 425-356-2626
ALS Laboratory Group A Campbell Brothers Limited Company

EV1409020

HWA GeoSciences Inc.

21312 30th Drive SE, Suite 110, Bothell, Washington 98021-7010
Tel 425.774.0106 Fax 425.774.2714 www.hwageo.com

Chain of Custody and Laboratory Anaylsis Request

DATE:
PAGE: ___ of ___

PROJECT NAME: Port of Everett #:20130062 2
SAMPLERS NAME: Kim Stilson PHONE: 7162087032
SAMPLERS SIGNATURE: K A Stilson DATE: 9/3/14
HWA CONTACT: Arnie Sugar PHONE:

	HWA SAMPLE ID	DATE	TIME	MATRIX	LAB ID	# OF BOTTLE
1	P27	9/3/14	930	W		3
2	HWA-MW-3	"	1015	W		3
3	P26	"	1145	W		3
4	HWA-MW-1	"	1245	W		3
5	HWA-MW-2	"	145	W		3
6	DUP	"	100	W		3

ANALYSIS REQUESTED

Nitrate	Sulfate	Diss Metals	MTPH-Dx									EDD
/	/	/	/									
/	/	/	/									
/	/	/	/									
/	/	/	/									
/	/	/	/									
/	/	/	/									

TURNAROUND TIME
☐ DAYS
☒ ~~STANDARD~~

REMARKS

Metals:
Mercury
Arsenic
Cadmium
Chromium
Copper
Lead, Zinc

Bill to Port of Everett
24 hour turnaround

PRINT NAME	SIGNATURE	COMPANY	DATE	TIME	REMARKS
Relinquished by: K Stilson	K A Stilson	HWA	9/3/14		
Received by: Rick Bogar	Rick Bogar	ALS	9/3/14	235	
Relinquished by:					
Received by:					

DISTRIBUTION: WHITE - Return to HWA GeoSciences; YELLOW - Retain by Lab; PINK - Retain by Sampler

August 19, 2014

Mr. Arnie Sugar
HWA Geosciences Inc.
21312 - 30th Drive SE, Suite 110
Bothell, WA 98021-7010

Dear Mr. Sugar,

On August 18th, 4 samples were received by our laboratory and assigned our laboratory project number EV14080087. The project was identified as your Port of Everett. The sample identification and requested analyses are outlined on the attached chain of custody record.

No abnormalities or nonconformances were observed during the analyses of the project samples.

Please do not hesitate to call me if you have any questions or if I can be of further assistance.

Sincerely,

ALS Laboratory Group

Rick Bagan
Laboratory Director

ADDRESS 8620 Holly Drive, Suite 100, Everett, WA 98208 | PHONE 425-356-2600 | FAX 425-356-2626
ALS Laboratory Group A Campbell Brothers Limited Company

ALS Environmental

CERTIFICATE OF ANALYSIS

CLIENT:	HWA Geosciences Inc. 21312 - 30th Drive SE, Suite 110 Bothell, WA 98021-7010	DATE:	8/19/2014
		ALS JOB#:	EV14080087
		ALS SAMPLE#:	EV14080087-01
CLIENT CONTACT:	Arnie Sugar	DATE RECEIVED:	08/18/2014
CLIENT PROJECT:	Port of Everett	COLLECTION DATE:	8/18/2014 12:30:00 PM
CLIENT SAMPLE ID	MW-1	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
Nitrate	EPA-300.0	U	0.15	1	MG/L	08/19/2014	GAP
Sulfate	EPA-300.0	U	0.26	1	MG/L	08/19/2014	GAP

U - Analyte analyzed for but not detected at level above reporting limit.

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ALS Laboratory Group A Campbell Brothers Limited Company

CERTIFICATE OF ANALYSIS

CLIENT:	HWA Geosciences Inc. 21312 - 30th Drive SE, Suite 110 Bothell, WA 98021-7010	DATE: ALS JOB#: ALS SAMPLE#:	8/19/2014 EV14080087 EV14080087-02
CLIENT CONTACT:	Arnie Sugar	DATE RECEIVED:	08/18/2014
CLIENT PROJECT:	Port of Everett	COLLECTION DATE:	8/18/2014 12:40:00 PM
CLIENT SAMPLE ID	MW1	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
Arsenic (Dissolved)	EPA-200.8	**77**	1.0	1	ug/L	08/19/2014	RAL

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ALS Environmental

CERTIFICATE OF ANALYSIS

CLIENT:	HWA Geosciences Inc. 21312 - 30th Drive SE, Suite 110 Bothell, WA 98021-7010	DATE:	8/19/2014
		ALS JOB#:	EV14080087
		ALS SAMPLE#:	EV14080087-03
CLIENT CONTACT:	Arnie Sugar	DATE RECEIVED:	08/18/2014
CLIENT PROJECT:	Port of Everett	COLLECTION DATE:	8/18/2014 1:15:00 PM
CLIENT SAMPLE ID	P-26	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
Nitrate	EPA-300.0	**0.18**	0.15	1	MG/L	08/19/2014	GAP
Sulfate	EPA-300.0	U	0.26	1	MG/L	08/19/2014	GAP

U - Analyte analyzed for but not detected at level above reporting limit.

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CERTIFICATE OF ANALYSIS

CLIENT:	HWA Geosciences Inc. 21312 - 30th Drive SE, Suite 110 Bothell, WA 98021-7010	DATE:	8/19/2014
		ALS JOB#:	EV14080087
		ALS SAMPLE#:	EV14080087-04
CLIENT CONTACT:	Arnie Sugar	DATE RECEIVED:	08/18/2014
CLIENT PROJECT:	Port of Everett	COLLECTION DATE:	8/18/2014 1:10:00 PM
CLIENT SAMPLE ID	P-26	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
Arsenic (Dissolved)	EPA-200.8	**9.8**	1.0	1	ug/L	08/19/2014	RAL

U - Analyte analyzed for but not detected at level above reporting limit.

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ALS Laboratory Group A Campbell Brothers Limited Company

ALS Environmental

CERTIFICATE OF ANALYSIS

CLIENT:	HWA Geosciences Inc. 21312 - 30th Drive SE, Suite 110 Bothell, WA 98021-7010	DATE:	8/19/2014
		ALS SDG#:	EV14080087
		WDOE ACCREDITATION:	C601
CLIENT CONTACT:	Arnie Sugar		
CLIENT PROJECT:	Port of Everett		

LABORATORY BLANK RESULTS

MBLK-8192014 - Batch R239496 - Water by EPA-300.0

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
Nitrate	EPA-300.0	U	0.15	1	MG/L	08/19/2014	GAP
Sulfate	EPA-300.0	U	0.26	1	MG/L	08/19/2014	GAP

U - Analyte analyzed for but not detected at level above reporting limit.

MB2-081914W - Batch 85260 - Water by EPA-200.8

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
Arsenic (Dissolved)	EPA-200.8	U	1.0	1	ug/L	08/19/2014	RAL

U - Analyte analyzed for but not detected at level above reporting limit.

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CERTIFICATE OF ANALYSIS

CLIENT:	HWA Geosciences Inc. 21312 - 30th Drive SE, Suite 110 Bothell, WA 98021-7010	DATE:	8/19/2014
		ALS SDG#:	EV14080087
		WDOE ACCREDITATION:	C601
CLIENT CONTACT:	Arnie Sugar		
CLIENT PROJECT:	Port of Everett		

LABORATORY CONTROL SAMPLE RESULTS

ALS Test Batch ID: R239496 - Water by EPA-300.0

SPIKED COMPOUND	METHOD	%REC	RPD	QUAL	ANALYSIS DATE	ANALYSIS BY
Nitrate - BS	EPA-300.0	**110**			08/19/2014	GAP
Nitrate - BSD	EPA-300.0	**107**	**3**		08/19/2014	GAP
Sulfate - BS	EPA-300.0	**106**			08/19/2014	GAP
Sulfate - BSD	EPA-300.0	**103**	**3**		08/19/2014	GAP

ALS Test Batch ID: 85260 - Water by EPA-200.8

SPIKED COMPOUND	METHOD	%REC	RPD	QUAL	ANALYSIS DATE	ANALYSIS BY
Arsenic (Dissolved) - BS	EPA-200.8	**101**			08/19/2014	RAL
Arsenic (Dissolved) - BSD	EPA-200.8	**102**	**1**		08/19/2014	RAL

APPROVED BY

Laboratory Director

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ALS Laboratory Group A Campbell Brothers Limited Company

ALS Laboratory Group
8620 Holly Drive, Suite 100
Everett, WA 98208
Phone (425) 356-2600
(206) 292-9059 Seattle
(425) 356-2626 Fax
http://www.alsenviro.com

Chain Of Custody/ Laboratory Analysis Request

ALS Job# (Laboratory Use Only): E V1408007 87

Date _____ Page _____ Of _____

PROJECT ID: Port of Everett
REPORT TO COMPANY: HWA
PROJECT MANAGER: Annie Sugar
ADDRESS: 21312 30th Drive SE Suite 110
Bothell WA 98021
PHONE: 425-774-0106 FAX:
P.O. NUMBER: 2013006-16 002 E-MAIL:
INVOICE TO COMPANY: Bill to Port of Everett
ATTENTION:
ADDRESS:

SAMPLE I.D.	DATE	TIME	TYPE	LAB#
1. MW1	8/18	1230	W	1
2. MW1	8/18	1240	W	2
3. P-26	8/18	115	W	3
4. P-26	8/18	110	W	4
5.				
6.				
7.				
8.				
9.				
10.				

ANALYSIS REQUESTED

NWTPH-HCID	NWTPH-DX	NWTPH-GX	BTEX by EPA-8021	MTBE by EPA-8021 ☐ EPA-8260 ☐	Halogenated Volatiles by EPA 8260	Volatile Organic Compounds by EPA 8260	EDB / EDC by EPA 8260 SIM (water)	EDB / EDC by EPA 8260 (soil)	Semivolatile Organic Compounds by EPA 8270	Polycyclic Aromatic Hydrocarbons (PAH) by EPA-8270 SIM ☐	PCB ☐ Pesticides ☐ by EPA 8081/8082	Metals-MTCA-5 ☐ RCRA-8 ☐ Pri Pol ☐ TAL ☐	Metals Other (Specify)	TCLP-Metals ☐ VOA ☐ Semi-Vol ☐ Pest ☐ Herbs ☐

OTHER (Specify)

	Sulfate	Nitrate	Dissolved Arsenic					NUMBER OF CONTAINERS	RECEIVED IN GOOD CONDITION?
1.	X	X						1	
2.			X					1	
3.	X	X						1	
4.			X					1	
5.									
6.									
7.									
8.									
9.									
10.									

LABORATORY COPY

SPECIAL INSTRUCTIONS

SIGNATURES (Name, Company, Date, Time):

1. Relinquished By: Kim Taylor HWA 8/18/14 130pm
Received By: [signature] ALS 8/18/14 130
2. Relinquished By: _____
Received By: _____

TURNAROUND REQUESTED in Business Days*

Organic, Metals & Inorganic Analysis: ~~10~~ Standard | 5 | 3 | 2 | 1 | SAME DAY

Fuels & Hydrocarbon Analysis: 5 Standard | 3 | 1 | SAME DAY

OTHER:
Specify: _____

* Turnaround request less than standard may incur Rush Charges

August 7, 2014

Mr. Arnie Sugar
HWA Geosciences Inc.
21312 - 30th Drive SE, Suite 110
Bothell, WA 98021-7010

Dear Mr. Sugar,

On July 24th, 6 samples were received by our laboratory and assigned our laboratory project number EV14070154. The project was identified as your Port of Everett - Bayside. The sample identification and requested analyses are outlined on the attached chain of custody record.

No abnormalities or nonconformances were observed during the analyses of the project samples.

Please do not hesitate to call me if you have any questions or if I can be of further assistance.

Sincerely,

ALS Laboratory Group

Rick Bagan
Laboratory Director

ADDRESS 8620 Holly Drive, Suite 100, Everett, WA 98208 | PHONE 425-356-2600 | FAX 425-356-2626
ALS Laboratory Group A Campbell Brothers Limited Company

ALS Environmental

CERTIFICATE OF ANALYSIS

CLIENT:	HWA Geosciences Inc. 21312 - 30th Drive SE, Suite 110 Bothell, WA 98021-7010	DATE:	8/7/2014
		ALS JOB#:	EV14070154
		ALS SAMPLE#:	EV14070154-01
CLIENT CONTACT:	Arnie Sugar	DATE RECEIVED:	07/24/2014
CLIENT PROJECT:	Port of Everett - Bayside	COLLECTION DATE:	7/24/2014 9:40:00 AM
CLIENT SAMPLE ID	P-27-0714	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
TPH-Diesel Range	NWTPH-DX	U	130	1	ug/L	07/25/2014	EBS
TPH-Oil Range	NWTPH-DX	U	250	1	ug/L	07/25/2014	EBS
Mercury (Dissolved)	EPA-7470	U	0.20	1	ug/L	08/04/2014	RAL
Arsenic (Dissolved)	EPA-200.8	U	1.0	1	ug/L	07/31/2014	RAL
Cadmium (Dissolved)	EPA-200.8	U	1.0	1	ug/L	07/31/2014	RAL
Chromium (Dissolved)	EPA-200.8	U	2.0	1	ug/L	07/31/2014	RAL
Copper (Dissolved)	EPA-200.8	U	2.0	1	ug/L	07/31/2014	RAL
Lead (Dissolved)	EPA-200.8	U	1.0	1	ug/L	07/31/2014	RAL
Zinc (Dissolved)	EPA-200.8	U	2.5	1	ug/L	07/31/2014	RAL

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
C25	NWTPH-DX	**85.4**	07/25/2014	EBS

U - Analyte analyzed for but not detected at level above reporting limit.

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ALS Laboratory Group A Campbell Brothers Limited Company

ALS Environmental

CERTIFICATE OF ANALYSIS

CLIENT:	HWA Geosciences Inc. 21312 - 30th Drive SE, Suite 110 Bothell, WA 98021-7010	DATE: ALS JOB#: ALS SAMPLE#:	8/7/2014 EV14070154 EV14070154-02
CLIENT CONTACT:	Arnie Sugar	DATE RECEIVED:	07/24/2014
CLIENT PROJECT:	Port of Everett - Bayside	COLLECTION DATE:	7/24/2014 10:30:00 AM
CLIENT SAMPLE ID	HWA-MW3-0714	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
TPH-Diesel Range	NWTPH-DX	U	130	1	ug/L	07/25/2014	EBS
TPH-Oil Range	NWTPH-DX	U	250	1	ug/L	07/25/2014	EBS
Mercury (Dissolved)	EPA-7470	U	0.20	1	ug/L	08/04/2014	RAL
Arsenic (Dissolved)	EPA-200.8	**2.1**	1.0	1	ug/L	07/31/2014	RAL
Cadmium (Dissolved)	EPA-200.8	U	1.0	1	ug/L	07/31/2014	RAL
Chromium (Dissolved)	EPA-200.8	U	2.0	1	ug/L	07/31/2014	RAL
Copper (Dissolved)	EPA-200.8	U	2.0	1	ug/L	07/31/2014	RAL
Lead (Dissolved)	EPA-200.8	U	1.0	1	ug/L	07/31/2014	RAL
Zinc (Dissolved)	EPA-200.8	U	2.5	1	ug/L	07/31/2014	RAL

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
C25	NWTPH-DX	**87.2**	07/25/2014	EBS

U - Analyte analyzed for but not detected at level above reporting limit.

ADDRESS 8620 Holly Drive, Suite 100, Everett, WA 98208 | PHONE 425-356-2600 | FAX 425-356-2626
ALS Laboratory Group A Campbell Brothers Limited Company

ALS Environmental

CERTIFICATE OF ANALYSIS

CLIENT:	HWA Geosciences Inc. 21312 - 30th Drive SE, Suite 110 Bothell, WA 98021-7010	DATE:	8/7/2014
		ALS JOB#:	EV14070154
		ALS SAMPLE#:	EV14070154-03
CLIENT CONTACT:	Arnie Sugar	DATE RECEIVED:	07/24/2014
CLIENT PROJECT:	Port of Everett - Bayside	COLLECTION DATE:	7/24/2014 10:40:00 AM
CLIENT SAMPLE ID	DUP-0714	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
TPH-Diesel Range	NWTPH-DX	U	130	1	ug/L	07/25/2014	EBS
TPH-Oil Range	NWTPH-DX	U	250	1	ug/L	07/25/2014	EBS
Mercury (Dissolved)	EPA-7470	U	0.20	1	ug/L	08/04/2014	RAL
Arsenic (Dissolved)	EPA-200.8	**2.1**	1.0	1	ug/L	07/31/2014	RAL
Cadmium (Dissolved)	EPA-200.8	U	1.0	1	ug/L	07/31/2014	RAL
Chromium (Dissolved)	EPA-200.8	U	2.0	1	ug/L	07/31/2014	RAL
Copper (Dissolved)	EPA-200.8	U	2.0	1	ug/L	07/31/2014	RAL
Lead (Dissolved)	EPA-200.8	U	1.0	1	ug/L	07/31/2014	RAL
Zinc (Dissolved)	EPA-200.8	U	2.5	1	ug/L	07/31/2014	RAL

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
C25	NWTPH-DX	**90.2**	07/25/2014	EBS

U - Analyte analyzed for but not detected at level above reporting limit.

ADDRESS 8620 Holly Drive, Suite 100, Everett, WA 98208 | PHONE 425-356-2600 | FAX 425-356-2626
ALS Laboratory Group A Campbell Brothers Limited Company

ALS Environmental

CERTIFICATE OF ANALYSIS

CLIENT:	HWA Geosciences Inc. 21312 - 30th Drive SE, Suite 110 Bothell, WA 98021-7010	DATE: ALS JOB#: ALS SAMPLE#:	8/7/2014 EV14070154 EV14070154-04
CLIENT CONTACT:	Arnie Sugar	DATE RECEIVED:	07/24/2014
CLIENT PROJECT:	Port of Everett - Bayside	COLLECTION DATE:	7/24/2014 11:10:00 AM
CLIENT SAMPLE ID	HWA-MW2-0714	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
TPH-Diesel Range	NWTPH-DX	**220**	130	1	ug/L	07/25/2014	EBS
TPH-Oil Range	NWTPH-DX	U	250	1	ug/L	07/25/2014	EBS
Mercury (Dissolved)	EPA-7470	U	0.20	1	ug/L	08/04/2014	RAL
Arsenic (Dissolved)	EPA-200.8	**2.7**	1.0	1	ug/L	07/31/2014	RAL
Cadmium (Dissolved)	EPA-200.8	U	1.0	1	ug/L	07/31/2014	RAL
Chromium (Dissolved)	EPA-200.8	**2.1**	2.0	1	ug/L	07/31/2014	RAL
Copper (Dissolved)	EPA-200.8	U	2.0	1	ug/L	07/31/2014	RAL
Lead (Dissolved)	EPA-200.8	U	1.0	1	ug/L	07/31/2014	RAL
Zinc (Dissolved)	EPA-200.8	**3.7**	2.5	1	ug/L	07/31/2014	RAL

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
C25	NWTPH-DX	**89.5**	07/25/2014	EBS

U - Analyte analyzed for but not detected at level above reporting limit.
Chromatogram indicates that it is likely that sample contains weathered diesel.

ADDRESS 8620 Holly Drive, Suite 100, Everett, WA 98208 | PHONE 425-356-2600 | FAX 425-356-2626
ALS Laboratory Group A Campbell Brothers Limited Company

CERTIFICATE OF ANALYSIS

CLIENT:	HWA Geosciences Inc. 21312 - 30th Drive SE, Suite 110 Bothell, WA 98021-7010	DATE: ALS JOB#: ALS SAMPLE#:	8/7/2014 EV14070154 EV14070154-05
CLIENT CONTACT:	Arnie Sugar	DATE RECEIVED:	07/24/2014
CLIENT PROJECT:	Port of Everett - Bayside	COLLECTION DATE:	7/24/2014 11:40:00 AM
CLIENT SAMPLE ID	P-26-0714	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
TPH-Diesel Range	NWTPH-DX	**140**	130	1	ug/L	07/25/2014	EBS
TPH-Oil Range	NWTPH-DX	U	250	1	ug/L	07/25/2014	EBS
Mercury (Dissolved)	EPA-7470	U	0.20	1	ug/L	08/04/2014	RAL
Arsenic (Dissolved)	EPA-200.8	**15**	1.0	1	ug/L	07/31/2014	RAL
Cadmium (Dissolved)	EPA-200.8	U	1.0	1	ug/L	07/31/2014	RAL
Chromium (Dissolved)	EPA-200.8	U	2.0	1	ug/L	07/31/2014	RAL
Copper (Dissolved)	EPA-200.8	U	2.0	1	ug/L	07/31/2014	RAL
Lead (Dissolved)	EPA-200.8	U	1.0	1	ug/L	07/31/2014	RAL
Zinc (Dissolved)	EPA-200.8	U	2.5	1	ug/L	07/31/2014	RAL

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
C25	NWTPH-DX	**90.8**	07/25/2014	EBS

U - Analyte analyzed for but not detected at level above reporting limit.
Chromatogram indicates that it is likely that sample contains weathered diesel.

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ALS Laboratory Group A Campbell Brothers Limited Company

CERTIFICATE OF ANALYSIS

CLIENT:	HWA Geosciences Inc. 21312 - 30th Drive SE, Suite 110 Bothell, WA 98021-7010	DATE: ALS JOB#: ALS SAMPLE#:	8/7/2014 EV14070154 EV14070154-06
CLIENT CONTACT:	Arnie Sugar	DATE RECEIVED:	07/24/2014
CLIENT PROJECT:	Port of Everett - Bayside	COLLECTION DATE:	7/24/2014 1:00:00 PM
CLIENT SAMPLE ID	HWA-MW1-0714	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
TPH-Diesel Range	NWTPH-DX	**150**	130	1	ug/L	07/25/2014	EBS
TPH-Oil Range	NWTPH-DX	U	250	1	ug/L	07/25/2014	EBS
Mercury (Dissolved)	EPA-7470	U	0.20	1	ug/L	08/04/2014	RAL
Arsenic (Dissolved)	EPA-200.8	**64**	1.0	1	ug/L	07/31/2014	RAL
Cadmium (Dissolved)	EPA-200.8	U	1.0	1	ug/L	07/31/2014	RAL
Chromium (Dissolved)	EPA-200.8	**2.1**	2.0	1	ug/L	07/31/2014	RAL
Copper (Dissolved)	EPA-200.8	U	2.0	1	ug/L	07/31/2014	RAL
Lead (Dissolved)	EPA-200.8	U	1.0	1	ug/L	07/31/2014	RAL
Zinc (Dissolved)	EPA-200.8	U	2.5	1	ug/L	07/31/2014	RAL

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
C25	NWTPH-DX	**93.0**	07/25/2014	EBS

U - Analyte analyzed for but not detected at level above reporting limit.
Chromatogram indicates that it is likely that sample contains weathered diesel.

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ALS Laboratory Group A Campbell Brothers Limited Company

ALS Environmental

CERTIFICATE OF ANALYSIS

CLIENT:	HWA Geosciences Inc. 21312 - 30th Drive SE, Suite 110 Bothell, WA 98021-7010	DATE:	8/7/2014
		ALS SDG#:	EV14070154
		WDOE ACCREDITATION:	C601
CLIENT CONTACT:	Arnie Sugar		
CLIENT PROJECT:	Port of Everett - Bayside		

LABORATORY BLANK RESULTS

MB-072414W - Batch 84560 - Water by NWTPH-DX

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
TPH-Diesel Range	NWTPH-DX	U	130	1	ug/L	07/24/2014	EBS
TPH-Oil Range	NWTPH-DX	U	250	1	ug/L	07/24/2014	EBS

U - Analyte analyzed for but not detected at level above reporting limit.

MBLK-842014 - Batch R238826 - Water by EPA-7470

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
Mercury (Dissolved)	EPA-7470	U	0.20	1	ug/L	08/04/2014	RAL

U - Analyte analyzed for but not detected at level above reporting limit.

MB-073014W - Batch 84650 - Water by EPA-200.8

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
Arsenic (Dissolved)	EPA-200.8	U	1.0	1	ug/L	07/31/2014	RAL
Cadmium (Dissolved)	EPA-200.8	U	1.0	1	ug/L	07/31/2014	RAL
Chromium (Dissolved)	EPA-200.8	U	2.0	1	ug/L	07/31/2014	RAL
Copper (Dissolved)	EPA-200.8	U	2.0	1	ug/L	07/31/2014	RAL
Lead (Dissolved)	EPA-200.8	U	1.0	1	ug/L	07/31/2014	RAL
Zinc (Dissolved)	EPA-200.8	U	2.5	1	ug/L	07/31/2014	RAL

U - Analyte analyzed for but not detected at level above reporting limit.

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CERTIFICATE OF ANALYSIS

CLIENT:	HWA Geosciences Inc. 21312 - 30th Drive SE, Suite 110 Bothell, WA 98021-7010	DATE:	8/7/2014
		ALS SDG#:	EV14070154
		WDOE ACCREDITATION:	C601
CLIENT CONTACT:	Arnie Sugar		
CLIENT PROJECT:	Port of Everett - Bayside		

LABORATORY CONTROL SAMPLE RESULTS

ALS Test Batch ID: 84560 - Water by NWTPH-DX

SPIKED COMPOUND	METHOD	%REC	RPD	QUAL	ANALYSIS DATE	ANALYSIS BY
TPH-Diesel Range - BS	NWTPH-DX	**71.6**			07/24/2014	EBS
TPH-Diesel Range - BSD	NWTPH-DX	**69.2**	**3**		07/24/2014	EBS

ALS Test Batch ID: R238826 - Water by EPA-7470

SPIKED COMPOUND	METHOD	%REC	RPD	QUAL	ANALYSIS DATE	ANALYSIS BY
Mercury (Dissolved) - BS	EPA-7470	**101**			08/04/2014	RAL
Mercury (Dissolved) - BSD	EPA-7470	**100**	**1**		08/04/2014	RAL

ALS Test Batch ID: 84650 - Water by EPA-200.8

SPIKED COMPOUND	METHOD	%REC	RPD	QUAL	ANALYSIS DATE	ANALYSIS BY
Arsenic (Dissolved) - BS	EPA-200.8	**100**			07/31/2014	RAL
Arsenic (Dissolved) - BSD	EPA-200.8	**103**	**3**		07/31/2014	RAL
Cadmium (Dissolved) - BS	EPA-200.8	**98.6**			07/31/2014	RAL
Cadmium (Dissolved) - BSD	EPA-200.8	**104**	**5**		07/31/2014	RAL
Chromium (Dissolved) - BS	EPA-200.8	**93.7**			07/31/2014	RAL
Chromium (Dissolved) - BSD	EPA-200.8	**96.4**	**3**		07/31/2014	RAL
Copper (Dissolved) - BS	EPA-200.8	**99.3**			07/31/2014	RAL
Copper (Dissolved) - BSD	EPA-200.8	**102**	**2**		07/31/2014	RAL
Lead (Dissolved) - BS	EPA-200.8	**96.2**			07/31/2014	RAL
Lead (Dissolved) - BSD	EPA-200.8	**98.8**	**3**		07/31/2014	RAL
Zinc (Dissolved) - BS	EPA-200.8	**99.8**			07/31/2014	RAL
Zinc (Dissolved) - BSD	EPA-200.8	**103**	**3**		07/31/2014	RAL

APPROVED BY

Laboratory Director

ADDRESS 8620 Holly Drive, Suite 100, Everett, WA 98208 | PHONE 425-356-2600 | FAX 425-356-2626
ALS Laboratory Group A Campbell Brothers Limited Company

ALS Environmental
8620 Holly Drive, Suite 100
Everett, WA 98208
Phone (425) 356-2600
Fax (425) 356-2626
http://www.alsglobal.com

Chain Of Custody/ Laboratory Analysis Request

ALS Job# (Laboratory Use Only): EV1407015 4

Date 7/24/14 Page _____ Of _____

PROJECT ID: PORT OF EVERETT - (BAYSIDE)
REPORT TO COMPANY: HWA
PROJECT MANAGER: A. SUGAR
ADDRESS:
PHONE: FAX:
P.O. #: 2013-066 E-MAIL:
INVOICE TO COMPANY: PORT OF EVERETT
ATTENTION: ERIK GERKING - CC RIGHTS
ADDRESS:

ANALYSIS REQUESTED

SAMPLE I.D.	DATE	TIME	TYPE	LAB#	NWTPH-HCID	NWTPH-DX	NWTPH-GX	BTEX by EPA-8021	MTBE by EPA-8021 ☐ EPA-8260 ☐	Halogenated Volatiles by EPA 8260	Volatile Organic Compounds by EPA 8260	EDB / EDC by EPA 8260 SIM (water)	EDB / EDC by EPA 8260 (soil)	Semivolatile Organic Compounds by EPA 8270	Polycyclic Aromatic Hydrocarbons (PAH) by EPA-8270 SIM ☐	PCB ☐ Pesticides ☐ by EPA 8081/8082	Metals-MTCA-5 ☐ RCRA-8 ☐ Pri Pol ☐ TAL ☐ (Plus)	Metals Other (Specify)	TCLP-Metals ☐ VOA ☐ Semi-Vol ☐ Pest ☐ Herbs ☐	OTHER (Specify): Copper / Zinc (Diss)	NUMBER OF CONTAINERS	RECEIVED IN GOOD CONDITION?
1. P-27-0714	7/24/14	940	W	1		/											/			/		
2. HWA-MW3-0714		1030		2		/											/			/		
3. DUP-0714		1040		3		/											/			/		
4. HWA-MW2-0714		1110		4		/											/			/		
5. P-26-0714		1140		5		/											/			/		
6. HWA-MW1-0714		1300		6		/											/			/		
7.																						
8.																						
9.																						
10.																						

LABORATORY COPY

SPECIAL INSTRUCTIONS

SIGNATURES (Name, Company, Date, Time):

1. Relinquished By: [signature] / HWA / 7-24-14 / 1350
   Received By: Mallory Hunt, ALS, 7/24/14, 1350
2. Relinquished By: _____
   Received By: _____

TURNAROUND REQUESTED in Business Days*

Organic, Metals & Inorganic Analysis: (10 Standard) 5 3 2 1 SAME DAY

Fuels & Hydrocarbon Analysis: (5 Standard) 3 1 SAME DAY

OTHER: Specify: _____

* Turnaround request less than standard may incur Rush Charges

August 6, 2014

Mr. Arnie Sugar
HWA Geosciences Inc.
21312 - 30th Drive SE, Suite 110
Bothell, WA 98021-7010

Dear Mr. Sugar,

On July 23rd, 33 samples were received by our laboratory and assigned our laboratory project number EV14070144. The project was identified as your Port of Everett - Bayside. The sample identification and requested analyses are outlined on the attached chain of custody record.

No abnormalities or nonconformances were observed during the analyses of the project samples.

Please do not hesitate to call me if you have any questions or if I can be of further assistance.

Sincerely,

ALS Laboratory Group

Rick Bagan
Laboratory Director

ADDRESS 8620 Holly Drive, Suite 100, Everett, WA 98208 | PHONE 425-356-2600 | FAX 425-356-2626
ALS Laboratory Group A Campbell Brothers Limited Company

ALS Environmental

CERTIFICATE OF ANALYSIS

CLIENT:	HWA Geosciences Inc. 21312 - 30th Drive SE, Suite 110 Bothell, WA 98021-7010	DATE:	8/6/2014
		ALS JOB#:	EV14070144
		ALS SAMPLE#:	EV14070144-01
CLIENT CONTACT:	Arnie Sugar	DATE RECEIVED:	07/23/2014
CLIENT PROJECT:	Port of Everett - Bayside	COLLECTION DATE:	7/23/2014 9:00:00 AM
CLIENT SAMPLE ID	HWA-B1-1	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
HCID-Gas Range	NWTPH-HCID	U	20	1	MG/KG	07/25/2014	EBS
HCID-Diesel Range	NWTPH-HCID	U	50	1	MG/KG	07/25/2014	EBS
HCID-Oil Range	NWTPH-HCID	U	100	1	MG/KG	07/25/2014	EBS
Benzo[A]Anthracene	EPA-8270 SIM	U	20	1	ug/Kg	08/01/2014	GAP
Chrysene	EPA-8270 SIM	**31**	20	1	ug/Kg	08/01/2014	GAP
Benzo[B]Fluoranthene	EPA-8270 SIM	**28**	20	1	ug/Kg	08/01/2014	GAP
Benzo[K]Fluoranthene	EPA-8270 SIM	U	20	1	ug/Kg	08/01/2014	GAP
Benzo[A]Pyrene	EPA-8270 SIM	**21**	20	1	ug/Kg	08/01/2014	GAP
Indeno[1,2,3-Cd]Pyrene	EPA-8270 SIM	U	20	1	ug/Kg	08/01/2014	GAP
Dibenz[A,H]Anthracene	EPA-8270 SIM	U	20	1	ug/Kg	08/01/2014	GAP
Mercury	EPA-7471	**0.049**	0.020	1	MG/KG	07/25/2014	RAL
Arsenic	EPA-6020	**6.5**	1.0	5	MG/KG	07/29/2014	RAL
Cadmium	EPA-6020	U	0.50	5	MG/KG	07/29/2014	RAL
Chromium	EPA-6020	**30**	5.0	5	MG/KG	07/29/2014	RAL
Copper	EPA-6020	**36**	0.50	5	MG/KG	07/29/2014	RAL
Lead	EPA-6020	**22**	0.50	5	MG/KG	07/29/2014	RAL
Zinc	EPA-6020	**130**	3.0	5	MG/KG	07/29/2014	RAL

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
BCB	NWTPH-HCID	**75.2**	07/25/2014	EBS
C25	NWTPH-HCID	**75.1**	07/25/2014	EBS
Terphenyl-d14	EPA-8270 SIM	**66.1**	08/01/2014	GAP

U - Analyte analyzed for but not detected at level above reporting limit.

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ALS Laboratory Group A Campbell Brothers Limited Company

ALS Environmental

CERTIFICATE OF ANALYSIS

CLIENT:	HWA Geosciences Inc. 21312 - 30th Drive SE, Suite 110 Bothell, WA 98021-7010	DATE:	8/6/2014
		ALS JOB#:	EV14070144
		ALS SAMPLE#:	EV14070144-02
CLIENT CONTACT:	Arnie Sugar	DATE RECEIVED:	07/23/2014
CLIENT PROJECT:	Port of Everett - Bayside	COLLECTION DATE:	7/23/2014 9:01:00 AM
CLIENT SAMPLE ID	HWA-B1-2	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
HCID-Gas Range	NWTPH-HCID	U	20	1	MG/KG	07/26/2014	EBS
HCID-Diesel Range	NWTPH-HCID	U	50	1	MG/KG	07/26/2014	EBS
HCID-Oil Range	NWTPH-HCID	U	100	1	MG/KG	07/26/2014	EBS
Benzo[A]Anthracene	EPA-8270 SIM	**29**	20	1	ug/Kg	08/01/2014	GAP
Chrysene	EPA-8270 SIM	**53**	20	1	ug/Kg	08/01/2014	GAP
Benzo[B]Fluoranthene	EPA-8270 SIM	**45**	20	1	ug/Kg	08/01/2014	GAP
Benzo[K]Fluoranthene	EPA-8270 SIM	U	20	1	ug/Kg	08/01/2014	GAP
Benzo[A]Pyrene	EPA-8270 SIM	**41**	20	1	ug/Kg	08/01/2014	GAP
Indeno[1,2,3-Cd]Pyrene	EPA-8270 SIM	**24**	20	1	ug/Kg	08/01/2014	GAP
Dibenz[A,H]Anthracene	EPA-8270 SIM	U	20	1	ug/Kg	08/01/2014	GAP
Mercury	EPA-7471	**0.040**	0.020	1	MG/KG	07/25/2014	RAL
Arsenic	EPA-6020	**3.1**	1.0	5	MG/KG	07/29/2014	RAL
Cadmium	EPA-6020	U	0.50	5	MG/KG	07/29/2014	RAL
Chromium	EPA-6020	**34**	5.0	5	MG/KG	07/29/2014	RAL
Copper	EPA-6020	**16**	0.50	5	MG/KG	07/29/2014	RAL
Lead	EPA-6020	**24**	0.50	5	MG/KG	07/29/2014	RAL
Zinc	EPA-6020	**55**	2.9	5	MG/KG	07/29/2014	RAL

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
BCB	NWTPH-HCID	**78.2**	07/26/2014	EBS
C25	NWTPH-HCID	**78.6**	07/26/2014	EBS
Terphenyl-d14	EPA-8270 SIM	**101**	08/01/2014	GAP

U - Analyte analyzed for but not detected at level above reporting limit.

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ALS Laboratory Group A Campbell Brothers Limited Company

ALS Environmental

CERTIFICATE OF ANALYSIS

CLIENT:	HWA Geosciences Inc. 21312 - 30th Drive SE, Suite 110 Bothell, WA 98021-7010	DATE:	8/6/2014
		ALS JOB#:	EV14070144
		ALS SAMPLE#:	EV14070144-03
CLIENT CONTACT:	Arnie Sugar	DATE RECEIVED:	07/23/2014
CLIENT PROJECT:	Port of Everett - Bayside	COLLECTION DATE:	7/23/2014 9:02:00 AM
CLIENT SAMPLE ID	HWA-B1-3	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
HCID-Gas Range	NWTPH-HCID	U	20	1	MG/KG	07/26/2014	EBS
HCID-Diesel Range	NWTPH-HCID	U	50	1	MG/KG	07/26/2014	EBS
HCID-Oil Range	NWTPH-HCID	U	100	1	MG/KG	07/26/2014	EBS
Benzo[A]Anthracene	EPA-8270 SIM	U	20	1	ug/Kg	08/01/2014	GAP
Chrysene	EPA-8270 SIM	U	20	1	ug/Kg	08/01/2014	GAP
Benzo[B]Fluoranthene	EPA-8270 SIM	U	20	1	ug/Kg	08/01/2014	GAP
Benzo[K]Fluoranthene	EPA-8270 SIM	U	20	1	ug/Kg	08/01/2014	GAP
Benzo[A]Pyrene	EPA-8270 SIM	U	20	1	ug/Kg	08/01/2014	GAP
Indeno[1,2,3-Cd]Pyrene	EPA-8270 SIM	U	20	1	ug/Kg	08/01/2014	GAP
Dibenz[A,H]Anthracene	EPA-8270 SIM	U	20	1	ug/Kg	08/01/2014	GAP
Mercury	EPA-7471	**0.029**	0.020	1	MG/KG	07/25/2014	RAL
Arsenic	EPA-6020	**1.9**	1.0	5	MG/KG	07/29/2014	RAL
Cadmium	EPA-6020	U	0.50	5	MG/KG	07/29/2014	RAL
Chromium	EPA-6020	**29**	5.0	5	MG/KG	07/29/2014	RAL
Copper	EPA-6020	**14**	0.50	5	MG/KG	07/29/2014	RAL
Lead	EPA-6020	**2.7**	0.50	5	MG/KG	07/29/2014	RAL
Zinc	EPA-6020	**32**	3.0	5	MG/KG	07/29/2014	RAL

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
BCB	NWTPH-HCID	**80.1**	07/26/2014	EBS
C25	NWTPH-HCID	**79.9**	07/26/2014	EBS
Terphenyl-d14	EPA-8270 SIM	**87.7**	08/01/2014	GAP

U - Analyte analyzed for but not detected at level above reporting limit.

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ALS Laboratory Group A Campbell Brothers Limited Company

ALS Environmental

CERTIFICATE OF ANALYSIS

CLIENT:	HWA Geosciences Inc. 21312 - 30th Drive SE, Suite 110 Bothell, WA 98021-7010	DATE: ALS JOB#: ALS SAMPLE#:	8/6/2014 EV14070144 EV14070144-04
CLIENT CONTACT:	Arnie Sugar	DATE RECEIVED:	07/23/2014
CLIENT PROJECT:	Port of Everett - Bayside	COLLECTION DATE:	7/23/2014 9:30:00 AM
CLIENT SAMPLE ID	HWA-MW1-1	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
HCID-Gas Range	NWTPH-HCID	U	20	1	MG/KG	07/26/2014	EBS
HCID-Diesel Range	NWTPH-HCID	U	50	1	MG/KG	07/26/2014	EBS
HCID-Oil Range	NWTPH-HCID	U	100	1	MG/KG	07/26/2014	EBS
Benzo[A]Anthracene	EPA-8270 SIM	U	20	1	ug/Kg	08/01/2014	GAP
Chrysene	EPA-8270 SIM	U	20	1	ug/Kg	08/01/2014	GAP
Benzo[B]Fluoranthene	EPA-8270 SIM	U	20	1	ug/Kg	08/01/2014	GAP
Benzo[K]Fluoranthene	EPA-8270 SIM	U	20	1	ug/Kg	08/01/2014	GAP
Benzo[A]Pyrene	EPA-8270 SIM	U	20	1	ug/Kg	08/01/2014	GAP
Indeno[1,2,3-Cd]Pyrene	EPA-8270 SIM	U	20	1	ug/Kg	08/01/2014	GAP
Dibenz[A,H]Anthracene	EPA-8270 SIM	U	20	1	ug/Kg	08/01/2014	GAP
Mercury	EPA-7471	**0.045**	0.020	1	MG/KG	07/25/2014	RAL
Arsenic	EPA-6020	**8.0**	1.0	5	MG/KG	07/29/2014	RAL
Cadmium	EPA-6020	U	0.50	5	MG/KG	07/29/2014	RAL
Chromium	EPA-6020	**24**	5.0	5	MG/KG	07/29/2014	RAL
Copper	EPA-6020	**75**	0.50	5	MG/KG	07/29/2014	RAL
Lead	EPA-6020	**88**	0.50	5	MG/KG	07/29/2014	RAL
Zinc	EPA-6020	**410**	3.2	5	MG/KG	07/29/2014	RAL

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
BCB	NWTPH-HCID	**82.0**	07/26/2014	EBS
C25	NWTPH-HCID	**83.8**	07/26/2014	EBS
Terphenyl-d14	EPA-8270 SIM	**68.4**	08/01/2014	GAP

U - Analyte analyzed for but not detected at level above reporting limit.

ADDRESS 8620 Holly Drive, Suite 100, Everett, WA 98208 | PHONE 425-356-2600 | FAX 425-356-2626
ALS Laboratory Group A Campbell Brothers Limited Company

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CERTIFICATE OF ANALYSIS

CLIENT:	HWA Geosciences Inc. 21312 - 30th Drive SE, Suite 110 Bothell, WA 98021-7010	DATE:	8/6/2014
		ALS JOB#:	EV14070144
		ALS SAMPLE#:	EV14070144-05
CLIENT CONTACT:	Arnie Sugar	DATE RECEIVED:	07/23/2014
CLIENT PROJECT:	Port of Everett - Bayside	COLLECTION DATE:	7/23/2014 9:31:00 AM
CLIENT SAMPLE ID	HWA-MW1-2	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
HCID-Gas Range	NWTPH-HCID	U	20	1	MG/KG	07/26/2014	EBS
HCID-Diesel Range	NWTPH-HCID	U	50	1	MG/KG	07/26/2014	EBS
HCID-Oil Range	NWTPH-HCID	U	100	1	MG/KG	07/26/2014	EBS
Benzo[A]Anthracene	EPA-8270 SIM	U	20	1	ug/Kg	08/01/2014	GAP
Chrysene	EPA-8270 SIM	U	20	1	ug/Kg	08/01/2014	GAP
Benzo[B]Fluoranthene	EPA-8270 SIM	U	20	1	ug/Kg	08/01/2014	GAP
Benzo[K]Fluoranthene	EPA-8270 SIM	U	20	1	ug/Kg	08/01/2014	GAP
Benzo[A]Pyrene	EPA-8270 SIM	U	20	1	ug/Kg	08/01/2014	GAP
Indeno[1,2,3-Cd]Pyrene	EPA-8270 SIM	U	20	1	ug/Kg	08/01/2014	GAP
Dibenz[A,H]Anthracene	EPA-8270 SIM	U	20	1	ug/Kg	08/01/2014	GAP
Mercury	EPA-7471	**0.040**	0.020	1	MG/KG	07/25/2014	RAL
Arsenic	EPA-6020	**3.0**	1.0	5	MG/KG	07/29/2014	RAL
Cadmium	EPA-6020	U	0.50	5	MG/KG	07/29/2014	RAL
Chromium	EPA-6020	**21**	5.0	5	MG/KG	07/29/2014	RAL
Copper	EPA-6020	**25**	0.50	5	MG/KG	07/29/2014	RAL
Lead	EPA-6020	**10**	0.50	5	MG/KG	07/29/2014	RAL
Zinc	EPA-6020	**51**	3.1	5	MG/KG	07/29/2014	RAL

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
BCB	NWTPH-HCID	**82.0**	07/26/2014	EBS
C25	NWTPH-HCID	**84.0**	07/26/2014	EBS
Terphenyl-d14	EPA-8270 SIM	**66.5**	08/01/2014	GAP

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CERTIFICATE OF ANALYSIS

CLIENT:	HWA Geosciences Inc. 21312 - 30th Drive SE, Suite 110 Bothell, WA 98021-7010	DATE:	8/6/2014
		ALS JOB#:	EV14070144
		ALS SAMPLE#:	EV14070144-06
CLIENT CONTACT:	Arnie Sugar	DATE RECEIVED:	07/23/2014
CLIENT PROJECT:	Port of Everett - Bayside	COLLECTION DATE:	7/23/2014 9:32:00 AM
CLIENT SAMPLE ID	HWA-MW1-3	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
HCID-Gas Range	NWTPH-HCID	U	20	1	MG/KG	07/26/2014	EBS
HCID-Diesel Range	NWTPH-HCID	U	50	1	MG/KG	07/26/2014	EBS
HCID-Oil Range	NWTPH-HCID	U	100	1	MG/KG	07/26/2014	EBS
Benzo[A]Anthracene	EPA-8270 SIM	U	20	1	ug/Kg	08/01/2014	GAP
Chrysene	EPA-8270 SIM	U	20	1	ug/Kg	08/01/2014	GAP
Benzo[B]Fluoranthene	EPA-8270 SIM	U	20	1	ug/Kg	08/01/2014	GAP
Benzo[K]Fluoranthene	EPA-8270 SIM	U	20	1	ug/Kg	08/01/2014	GAP
Benzo[A]Pyrene	EPA-8270 SIM	U	20	1	ug/Kg	08/01/2014	GAP
Indeno[1,2,3-Cd]Pyrene	EPA-8270 SIM	U	20	1	ug/Kg	08/01/2014	GAP
Dibenz[A,H]Anthracene	EPA-8270 SIM	U	20	1	ug/Kg	08/01/2014	GAP
Mercury	EPA-7471	**0.027**	0.020	1	MG/KG	07/25/2014	RAL
Arsenic	EPA-6020	**2.2**	1.0	5	MG/KG	07/29/2014	RAL
Cadmium	EPA-6020	U	0.50	5	MG/KG	07/29/2014	RAL
Chromium	EPA-6020	**20**	5.0	5	MG/KG	07/29/2014	RAL
Copper	EPA-6020	**8.6**	0.50	5	MG/KG	07/29/2014	RAL
Lead	EPA-6020	**2.2**	0.50	5	MG/KG	07/29/2014	RAL
Zinc	EPA-6020	**24**	3.1	5	MG/KG	07/29/2014	RAL

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
BCB	NWTPH-HCID	**84.4**	07/26/2014	EBS
C25	NWTPH-HCID	**85.6**	07/26/2014	EBS
Terphenyl-d14	EPA-8270 SIM	**93.0**	08/01/2014	GAP

U - Analyte analyzed for but not detected at level above reporting limit.

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CERTIFICATE OF ANALYSIS

CLIENT:	HWA Geosciences Inc. 21312 - 30th Drive SE, Suite 110 Bothell, WA 98021-7010	DATE:	8/6/2014
		ALS JOB#:	EV14070144
		ALS SAMPLE#:	EV14070144-07
CLIENT CONTACT:	Arnie Sugar	DATE RECEIVED:	07/23/2014
CLIENT PROJECT:	Port of Everett - Bayside	COLLECTION DATE:	7/23/2014 10:20:00 AM
CLIENT SAMPLE ID	HWA-MW2-1	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
HCID-Gas Range	NWTPH-HCID	U	20	1	MG/KG	07/26/2014	EBS
HCID-Diesel Range	NWTPH-HCID	U	50	1	MG/KG	07/26/2014	EBS
HCID-Oil Range	NWTPH-HCID	U	100	1	MG/KG	07/26/2014	EBS
Benzo[A]Anthracene	EPA-8270 SIM	U	20	1	ug/Kg	08/01/2014	GAP
Chrysene	EPA-8270 SIM	U	20	1	ug/Kg	08/01/2014	GAP
Benzo[B]Fluoranthene	EPA-8270 SIM	U	20	1	ug/Kg	08/01/2014	GAP
Benzo[K]Fluoranthene	EPA-8270 SIM	U	20	1	ug/Kg	08/01/2014	GAP
Benzo[A]Pyrene	EPA-8270 SIM	U	20	1	ug/Kg	08/01/2014	GAP
Indeno[1,2,3-Cd]Pyrene	EPA-8270 SIM	U	20	1	ug/Kg	08/01/2014	GAP
Dibenz[A,H]Anthracene	EPA-8270 SIM	U	20	1	ug/Kg	08/01/2014	GAP
Mercury	EPA-7471	**0.049**	0.020	1	MG/KG	07/25/2014	RAL
Arsenic	EPA-6020	**2.3**	1.0	5	MG/KG	07/29/2014	RAL
Cadmium	EPA-6020	U	0.50	5	MG/KG	07/29/2014	RAL
Chromium	EPA-6020	**24**	5.0	5	MG/KG	07/29/2014	RAL
Copper	EPA-6020	**14**	0.50	5	MG/KG	07/29/2014	RAL
Lead	EPA-6020	**7.3**	0.50	5	MG/KG	07/29/2014	RAL
Zinc	EPA-6020	**29**	2.9	5	MG/KG	07/29/2014	RAL

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
BCB	NWTPH-HCID	**83.7**	07/26/2014	EBS
C25	NWTPH-HCID	**85.2**	07/26/2014	EBS
Terphenyl-d14	EPA-8270 SIM	**111**	08/01/2014	GAP

U - Analyte analyzed for but not detected at level above reporting limit.

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CERTIFICATE OF ANALYSIS

CLIENT:	HWA Geosciences Inc. 21312 - 30th Drive SE, Suite 110 Bothell, WA 98021-7010	DATE:	8/6/2014
		ALS JOB#:	EV14070144
		ALS SAMPLE#:	EV14070144-08
CLIENT CONTACT:	Arnie Sugar	DATE RECEIVED:	07/23/2014
CLIENT PROJECT:	Port of Everett - Bayside	COLLECTION DATE:	7/23/2014 10:21:00 AM
CLIENT SAMPLE ID	HWA-MW2-2	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
HCID-Gas Range	NWTPH-HCID	U	20	1	MG/KG	07/26/2014	EBS
HCID-Diesel Range	NWTPH-HCID	U	50	1	MG/KG	07/26/2014	EBS
HCID-Oil Range	NWTPH-HCID	U	100	1	MG/KG	07/26/2014	EBS
Benzo[A]Anthracene	EPA-8270 SIM	U	20	1	ug/Kg	08/01/2014	GAP
Chrysene	EPA-8270 SIM	U	20	1	ug/Kg	08/01/2014	GAP
Benzo[B]Fluoranthene	EPA-8270 SIM	U	20	1	ug/Kg	08/01/2014	GAP
Benzo[K]Fluoranthene	EPA-8270 SIM	U	20	1	ug/Kg	08/01/2014	GAP
Benzo[A]Pyrene	EPA-8270 SIM	U	20	1	ug/Kg	08/01/2014	GAP
Indeno[1,2,3-Cd]Pyrene	EPA-8270 SIM	U	20	1	ug/Kg	08/01/2014	GAP
Dibenz[A,H]Anthracene	EPA-8270 SIM	U	20	1	ug/Kg	08/01/2014	GAP
Mercury	EPA-7471	**0.025**	0.020	1	MG/KG	07/25/2014	RAL
Arsenic	EPA-6020	**2.7**	1.0	5	MG/KG	07/29/2014	RAL
Cadmium	EPA-6020	U	0.50	5	MG/KG	07/29/2014	RAL
Chromium	EPA-6020	**25**	5.0	5	MG/KG	07/29/2014	RAL
Copper	EPA-6020	**16**	0.50	5	MG/KG	07/29/2014	RAL
Lead	EPA-6020	**14**	0.50	5	MG/KG	07/29/2014	RAL
Zinc	EPA-6020	**47**	3.0	5	MG/KG	07/29/2014	RAL

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
BCB	NWTPH-HCID	**73.7**	07/26/2014	EBS
C25	NWTPH-HCID	**82.1**	07/26/2014	EBS
Terphenyl-d14	EPA-8270 SIM	**87.3**	08/01/2014	GAP

U - Analyte analyzed for but not detected at level above reporting limit.

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CERTIFICATE OF ANALYSIS

CLIENT:	HWA Geosciences Inc. 21312 - 30th Drive SE, Suite 110 Bothell, WA 98021-7010	DATE: ALS JOB#: ALS SAMPLE#:	8/6/2014 EV14070144 EV14070144-09
CLIENT CONTACT:	Arnie Sugar	DATE RECEIVED:	07/23/2014
CLIENT PROJECT:	Port of Everett - Bayside	COLLECTION DATE:	7/23/2014 10:22:00 AM
CLIENT SAMPLE ID	HWA-MW2-3	WDOE ACCREDITATION:	C601

SAMPLE DATA RESULTS

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
HCID-Gas Range	NWTPH-HCID	U	20	1	MG/KG	07/26/2014	EBS
HCID-Diesel Range	NWTPH-HCID	U	50	1	MG/KG	07/26/2014	EBS
HCID-Oil Range	NWTPH-HCID	**>100**	100	1	MG/KG	07/26/2014	EBS
TPH-Diesel Range	NWTPH-DX	U	25	1	MG/KG	08/05/2014	EBS
TPH-Oil Range	NWTPH-DX	**120**	50	1	MG/KG	08/05/2014	EBS
Benzo[A]Anthracene	EPA-8270 SIM	**24**	20	1	ug/Kg	08/01/2014	GAP
Chrysene	EPA-8270 SIM	**38**	20	1	ug/Kg	08/01/2014	GAP
Benzo[B]Fluoranthene	EPA-8270 SIM	**34**	20	1	ug/Kg	08/01/2014	GAP
Benzo[K]Fluoranthene	EPA-8270 SIM	U	20	1	ug/Kg	08/01/2014	GAP
Benzo[A]Pyrene	EPA-8270 SIM	**29**	20	1	ug/Kg	08/01/2014	GAP
Indeno[1,2,3-Cd]Pyrene	EPA-8270 SIM	U	20	1	ug/Kg	08/01/2014	GAP
Dibenz[A,H]Anthracene	EPA-8270 SIM	U	20	1	ug/Kg	08/01/2014	GAP
Mercury	EPA-7471	**0.084**	0.020	1	MG/KG	07/25/2014	RAL
Arsenic	EPA-6020	**2.6**	1.0	5	MG/KG	07/29/2014	RAL
Cadmium	EPA-6020	U	0.50	5	MG/KG	07/29/2014	RAL
Chromium	EPA-6020	**21**	5.0	5	MG/KG	07/29/2014	RAL
Copper	EPA-6020	**38**	0.50	5	MG/KG	07/29/2014	RAL
Lead	EPA-6020	**28**	0.50	5	MG/KG	07/29/2014	RAL
Zinc	EPA-6020	**70**	2.9	5	MG/KG	07/29/2014	RAL

SURROGATE	METHOD	%REC	ANALYSIS DATE	ANALYSIS BY
BCB	NWTPH-HCID	**84.0**	07/26/2014	EBS
C25	NWTPH-HCID	**85.8**	07/26/2014	EBS
C25	NWTPH-DX	**90.2**	08/05/2014	EBS
Terphenyl-d14	EPA-8270 SIM	**93.3**	08/01/2014	GAP

U - Analyte analyzed for but not detected at level above reporting limit.
Chromatogram indicates that it is likely that sample contains lube oil.

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CERTIFICATE OF ANALYSIS

CLIENT:	HWA Geosciences Inc. 21312 - 30th Drive SE, Suite 110 Bothell, WA 98021-7010	DATE:	8/6/2014
		ALS SDG#:	EV14070144
		WDOE ACCREDITATION:	C601
CLIENT CONTACT:	Arnie Sugar		
CLIENT PROJECT:	Port of Everett - Bayside		

LABORATORY BLANK RESULTS

MB-072514S - Batch 84556 - Soil by NWTPH-HCID

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
HCID-Gas Range	NWTPH-HCID	U	20	1	MG/KG	07/25/2014	EBS
HCID-Diesel Range	NWTPH-HCID	U	50	1	MG/KG	07/25/2014	EBS
HCID-Oil Range	NWTPH-HCID	U	100	1	MG/KG	07/25/2014	EBS

U - Analyte analyzed for but not detected at level above reporting limit.

MB-073114S - Batch 84712 - Soil by NWTPH-DX

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
TPH-Diesel Range	NWTPH-DX	U	25	1	MG/KG	07/31/2014	EBS
TPH-Oil Range	NWTPH-DX	U	50	1	MG/KG	07/31/2014	EBS

U - Analyte analyzed for but not detected at level above reporting limit.

MB-072114S - Batch 84459 - Soil by EPA-8270 SIM

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
Naphthalene	EPA-8270 SIM	U	20	1	ug/Kg	07/23/2014	GAP
Benzo[A]Anthracene	EPA-8270 SIM	U	20	1	ug/Kg	07/23/2014	GAP
Chrysene	EPA-8270 SIM	U	20	1	ug/Kg	07/23/2014	GAP
Benzo[B]Fluoranthene	EPA-8270 SIM	U	20	1	ug/Kg	07/23/2014	GAP
Benzo[K]Fluoranthene	EPA-8270 SIM	U	20	1	ug/Kg	07/23/2014	GAP
Benzo[A]Pyrene	EPA-8270 SIM	U	20	1	ug/Kg	07/23/2014	GAP
Indeno[1,2,3-Cd]Pyrene	EPA-8270 SIM	U	20	1	ug/Kg	07/23/2014	GAP
Dibenz[A,H]Anthracene	EPA-8270 SIM	U	20	1	ug/Kg	07/23/2014	GAP
Benzo[G,H,I]Perylene	EPA-8270 SIM	U	20	1	ug/Kg	07/23/2014	GAP

U - Analyte analyzed for but not detected at level above reporting limit.

MBLK-7252014 - Batch R238223 - Soil by EPA-7471

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
Mercury	EPA-7471	U	0.020	1	MG/KG	07/25/2014	RAL

U - Analyte analyzed for but not detected at level above reporting limit.

MB-072514S - Batch 84509 - Soil by EPA-6020

ANALYTE	METHOD	RESULTS	REPORTING LIMITS	DILUTION FACTOR	UNITS	ANALYSIS DATE	ANALYSIS BY
Arsenic	EPA-6020	U	0.20	1	MG/KG	07/28/2014	RAL
Cadmium	EPA-6020	U	0.10	1	MG/KG	07/28/2014	RAL
Chromium	EPA-6020	U	1.0	1	MG/KG	07/28/2014	RAL

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CERTIFICATE OF ANALYSIS

CLIENT:	HWA Geosciences Inc. 21312 - 30th Drive SE, Suite 110 Bothell, WA 98021-7010	DATE:	8/6/2014
		ALS SDG#:	EV14070144
		WDOE ACCREDITATION:	C601
CLIENT CONTACT:	Arnie Sugar		
CLIENT PROJECT:	Port of Everett - Bayside		

LABORATORY BLANK RESULTS

MB-072514S - Batch 84509 - Soil by EPA-6020

Copper	EPA-6020	U	0.10	1	MG/KG	07/28/2014	RAL
Lead	EPA-6020	U	0.10	1	MG/KG	07/28/2014	RAL
Zinc	EPA-6020	U	0.50	1	MG/KG	07/28/2014	RAL

U - Analyte analyzed for but not detected at level above reporting limit.

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CERTIFICATE OF ANALYSIS

CLIENT:	HWA Geosciences Inc. 21312 - 30th Drive SE, Suite 110 Bothell, WA 98021-7010	DATE:	8/6/2014
		ALS SDG#:	EV14070144
		WDOE ACCREDITATION:	C601
CLIENT CONTACT:	Arnie Sugar		
CLIENT PROJECT:	Port of Everett - Bayside		

LABORATORY CONTROL SAMPLE RESULTS

ALS Test Batch ID: 84712 - Soil by NWTPH-DX

SPIKED COMPOUND	METHOD	%REC	RPD	QUAL	ANALYSIS DATE	ANALYSIS BY
TPH-Diesel Range - BS	NWTPH-DX	**78.9**			07/31/2014	EBS
TPH-Diesel Range - BSD	NWTPH-DX	**80.7**	**2**		07/31/2014	EBS

ALS Test Batch ID: 84459 - Soil by EPA-8270 SIM

SPIKED COMPOUND	METHOD	%REC	RPD	QUAL	ANALYSIS DATE	ANALYSIS BY
Naphthalene - BS	EPA-8270 SIM	**71.4**			07/23/2014	GAP
Naphthalene - BSD	EPA-8270 SIM	**69.2**	**3**		07/23/2014	GAP
Benzo[G,H,I]Perylene - BS	EPA-8270 SIM	**80.8**			07/23/2014	GAP
Benzo[G,H,I]Perylene - BSD	EPA-8270 SIM	**76.5**	**6**		07/23/2014	GAP

ALS Test Batch ID: R238223 - Soil by EPA-7471

SPIKED COMPOUND	METHOD	%REC	RPD	QUAL	ANALYSIS DATE	ANALYSIS BY
Mercury - BS	EPA-7471	**112**			07/25/2014	RAL
Mercury - BSD	EPA-7471	**103**	**8**		07/25/2014	RAL

ALS Test Batch ID: 84509 - Soil by EPA-6020

SPIKED COMPOUND	METHOD	%REC	RPD	QUAL	ANALYSIS DATE	ANALYSIS BY
Arsenic - BS	EPA-6020	**101**			07/28/2014	RAL
Arsenic - BSD	EPA-6020	**100**	**1**		07/28/2014	RAL
Cadmium - BS	EPA-6020	**105**			07/28/2014	RAL
Cadmium - BSD	EPA-6020	**99.0**	**6**		07/28/2014	RAL
Chromium - BS	EPA-6020	**114**			07/28/2014	RAL
Chromium - BSD	EPA-6020	**113**	**1**		07/28/2014	RAL
Copper - BS	EPA-6020	**113**			07/28/2014	RAL
Copper - BSD	EPA-6020	**116**	**2**		07/28/2014	RAL
Lead - BS	EPA-6020	**106**			07/28/2014	RAL
Lead - BSD	EPA-6020	**97.7**	**8**		07/28/2014	RAL
Zinc - BS	EPA-6020	**104**			07/28/2014	RAL
Zinc - BSD	EPA-6020	**98.7**	**5**		07/28/2014	RAL

ADDRESS 8620 Holly Drive, Suite 100, Everett, WA 98208 | PHONE 425-356-2600 | FAX 425-356-2626
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CERTIFICATE OF ANALYSIS

APPROVED BY

Laboratory Director

ADDRESS 8620 Holly Drive, Suite 100, Everett, WA 98208 | PHONE 425-356-2600 | FAX 425-356-2626
ALS Laboratory Group A Campbell Brothers Limited Company

ALS Environmental
8620 Holly Drive, Suite 100
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Chain Of Custody/ Laboratory Analysis Request

ALS Job# (Laboratory Use Only): EV1407014 4

Date _____ Page 1 Of 4

PROJECT ID: Port of Everett - Bayside
REPORT TO COMPANY: HWA
PROJECT MANAGER: A. Jappan
ADDRESS:
PHONE: FAX:
P.O. #: 2013-066 E-MAIL:
INVOICE TO COMPANY: Port of Everett
ATTENTION: Erik Perkins
ADDRESS:

ANALYSIS REQUESTED

SAMPLE I.D.	DATE	TIME	TYPE	LAB#	NWTPH-HCID	NWTPH-DX	NWTPH-GX	BTEX by EPA-8021	MTBE by EPA-8021 ☐ EPA-8260 ☐	Halogenated Volatiles by EPA 8260	Volatile Organic Compounds by EPA 8260	EDB / EDC by EPA 8260 SIM (water)	EDB / EDC by EPA 8260 (soil)	Semivolatile Organic Compounds by EPA 8270	cPAH Polycyclic Aromatic Hydrocarbons (PAH) by EPA-8270 SIM ☐	PCB ☐ Pesticides ☐ by EPA 8081/8082	Metals-MTCA-5 (X) RCRA-8 ☐ Pri Pol ☐ TAL ☐	Metals Other (Specify)	TCLP-Metals ☐ VOA ☐ Semi-Vol ☐ Pest ☐ Herbs ☐	OTHER (Specify): + Cu, Zn	NUMBER OF CONTAINERS	RECEIVED IN GOOD CONDITION?
1. HWA-B1-1	7/23/14	0900	Soil	1	/										/		/			X		
2. HWA-B1-2		901		2	/										/		/			X		
3. HWA-B1-3		902		3	/										/		/			X		
4. HWA-MW1-1		930		4	/										/		/			X		
5. HWA-MW1-2		931		5	/										/		/			X		
6. HWA-MW1-3		932		6	/										/		/			X		
7. HWA-MW2-1		1020		7	/										/		/			X		
8. HWA-MW2-2		1021		8	/										/		/			X		
9. HWA-MW2-3		1022		9	/	X									/		/			X		
10. HWA-MW3-1		1120		10																		

SPECIAL INSTRUCTIONS: (X) Added 8/4/14 per Arnie - standard TAT

SIGNATURES (Name, Company, Date, Time):

1. Relinquished By: [signature] HWA 7/23/14 - 1450
   Received By: Shawn Robinson ALS 7/23/14 2:50pm
2. Relinquished By: _____
   Received By: _____

TURNAROUND REQUESTED in Business Days*

Organic, Metals & Inorganic Analysis: ~~10~~ Standard | 5 | 3 | 2 | 1 | SAME DAY

Fuels & Hydrocarbon Analysis: ~~5~~ Standard | 3 | 1 | SAME DAY

OTHER: Specify: (X) 7/24/14 5pm

* Turnaround request less than standard may incur Rush Charges

ALS Environmental
8620 Holly Drive, Suite 100
Everett, WA 98208
Phone (425) 356-2600
Fax (425) 356-2626
http://www.alsglobal.com

Chain Of Custody/ Laboratory Analysis Request

ALS Job# (Laboratory Use Only)

EV1407 0144

Date _____ Page 2 Of 4

PROJECT ID: Port of Ent - Bay side
REPORT TO COMPANY: HWA
PROJECT MANAGER: A. Sugar.
ADDRESS:
PHONE: FAX:
P.O. #: 2013-066 E-MAIL:
INVOICE TO COMPANY: Port of Ent
ATTENTION: Erik Geneiny
ADDRESS:

ANALYSIS REQUESTED

SAMPLE I.D.	DATE	TIME	TYPE	LAB#
1. HWA-MW2-2	7/23/14	1120	S	11
2. HWA-MW3-3		1122		12
3. HWA-CB1-1		1215		13
4. HWA-CB1-2		1216		14
5. HWA-CB1-3		1217		15
6. HWA-CB2-1		1220		16
7. HWA-CB2-2		1221		17
8. HWA-CB2-3		1222		18
9. HWA-CB3-1		1230		19
10. HWA-CB3-2		1231		20

NWTPH-HCID	NWTPH-DX	NWTPH-GX	BTEX by EPA-8021	MTBE by EPA-8021 ☐ EPA-8260 ☐	Halogenated Volatiles by EPA 8260	Volatile Organic Compounds by EPA 8260	EDB / EDC by EPA 8260 SIM (water)	EDB / EDC by EPA 8260 (soil)	Semivolatile Organic Compounds by EPA 8270	Polycyclic Aromatic Hydrocarbons (PAH) by EPA-8270 SIM ☐	PCB ☐ Pesticides ☐ by EPA 8081/8082	Metals-MTCA-5 ☐ RCRA-8 ☐ Pri Pol ☐ TAL ☐	Metals Other (Specify)	TCLP-Metals ☐ VOA ☐ Semi-Vol ☐ Pest ☐ Herbs ☐	OTHER (Specify)	NUMBER OF CONTAINERS	RECEIVED IN GOOD CONDITION?

SPECIAL INSTRUCTIONS

SIGNATURES (Name, Company, Date, Time):

1. Relinquished By: _____ / HWA / 7/23/14 1450
   Received By: Shawn Roberson ALS 7/23/14 2:50
2. Relinquished By: _____
   Received By: _____

TURNAROUND REQUESTED in Business Days*

Organic, Metals & Inorganic Analysis: 10 Standard | 5 | 3 | 2 | 1 | SAME DAY

Fuels & Hydrocarbon Analysis: 5 Standard | 3 | 1 | SAME DAY

OTHER:
Specify: _____

* Turnaround request less than standard may incur Rush Charges

ALS Environmental
8620 Holly Drive, Suite 100
Everett, WA 98208
Phone (425) 356-2600
Fax (425) 356-2626
http://www.alsglobal.com

Chain Of Custody/ Laboratory Analysis Request

ALS Job# (Laboratory Use Only)

EV1407014 4

Date _____ Page 3 Of 4

PROJECT ID:	Port of Everett - Bay Side
REPORT TO COMPANY:	HWA
PROJECT MANAGER:	A. Sugam
ADDRESS:	
PHONE:	FAX:
P.O. #:	2013-066 E-MAIL:
INVOICE TO COMPANY:	Port of Eut
ATTENTION:	Erick Gerking
ADDRESS:	

ANALYSIS REQUESTED

SAMPLE I.D.	DATE	TIME	TYPE	LAB#	NWTPH-HCID	NWTPH-DX	NWTPH-GX	BTEX by EPA-8021	MTBE by EPA-8021 ☐ EPA-8260 ☐	Halogenated Volatiles by EPA 8260	Volatile Organic Compounds by EPA 8260	EDB / EDC by EPA 8260 SIM (water)	EDB / EDC by EPA 8260 (soil)	Semivolatile Organic Compounds by EPA 8270	Polycyclic Aromatic Hydrocarbons (PAH) by EPA-8270 SIM ☐	PCB ☐ Pesticides ☐ by EPA 8081/8082	Metals-MTCA-5 ☐ RCRA-8 ☐ Pri Pol ☐ TAL ☐	Metals Other (Specify)	TCLP-Metals ☐ VOA ☐ Semi-Vol ☐ Pest ☐ Herbs ☐	OTHER (Specify)	NUMBER OF CONTAINERS	RECEIVED IN GOOD CONDITION?
1. HWA-CB3-3	7/23/14	1232	Soil	21																	
2. HWA-CB4-1		1240		22																	
3. HWA-CB4-2		1241		23																	
4. HWA-CB4-3		1242		24																	
5. HWA-CB5-1		1250		25																	
6. HWA-CB5-2		1251		26																	
7. HWA-CB5-3		1252		27																	
8. HWA-CB6-1		1300		28																	
9. HWA-CB6-2		1301		29																	
10. HWA-CB6-3		1302		30																	

SPECIAL INSTRUCTIONS

SIGNATURES (Name, Company, Date, Time):

1. Relinquished By: [signature] HWA / 7-23-14 / 1450

Received By: Shawn Robertson ALS 7/23/14 2:50

2. Relinquished By: _____

Received By: _____

TURNAROUND REQUESTED in Business Days*

Organic, Metals & Inorganic Analysis

(10) Standard | 5 | 3 | 2 | 1 | SAME DAY

Fuels & Hydrocarbon Analysis

(5) Standard | 3 | 1 | SAME DAY

OTHER:

Specify: _____

* Turnaround request less than standard may incur Rush Charges

ALS Environmental
8620 Holly Drive, Suite 100
Everett, WA 98208
Phone (425) 356-2600
Fax (425) 356-2626
http://www.alsglobal.com

Chain Of Custody/ Laboratory Analysis Request

ALS Job# (Laboratory Use Only): EV1407014 4

Date _____ Page 4 Of 4

PROJECT ID: Port of Everett - Bayside
REPORT TO COMPANY: HWA
PROJECT MANAGER: A. Sugar
ADDRESS:
PHONE: FAX:
P.O. #: 2013-060 E-MAIL:
INVOICE TO COMPANY: Port of Everett
ATTENTION: Erik Genkin
ADDRESS:

ANALYSIS REQUESTED

SAMPLE I.D.	DATE	TIME	TYPE	LAB#
1. HWA-CB7-1	7/23/14	1305	Soil	31
2. HWA-CB7-2	"	1306	"	32
3. HWA-CB7-3	"	1307	"	33
4.				
5.				
6.				
7.				
8.				
9.				
10.				

NWTPH-HCID; NWTPH-DX; NWTPH-GX; BTEX by EPA-8021; MTBE by EPA-8021 ☐ EPA-8260 ☐; Halogenated Volatiles by EPA 8260; Volatile Organic Compounds by EPA 8260; EDB / EDC by EPA 8260 SIM (water); EDB / EDC by EPA 8260 (soil); Semivolatile Organic Compounds by EPA 8270; Polycyclic Aromatic Hydrocarbons (PAH) by EPA-8270 SIM ☐; PCB ☐ Pesticides ☐ by EPA 8081/8082; Metals-MTCA-5 ☐ RCRA-8 ☐ Pri Pol ☐ TAL ☐; Metals Other (Specify); TCLP-Metals ☐ VOA ☐ Semi-Vol ☐ Pest ☐ Herbs ☐

OTHER (Specify)

NUMBER OF CONTAINERS

RECEIVED IN GOOD CONDITION?

LABORATORY COPY

SPECIAL INSTRUCTIONS

SIGNATURES (Name, Company, Date, Time):

1. Relinquished By: Chris Hwa 7-23-14 1450
   Received By: Shawn Robertson ALS 7/23/14 2:50
2. Relinquished By: _____
   Received By: _____

TURNAROUND REQUESTED in Business Days*

Organic, Metals & Inorganic Analysis: 10 Standard | 5 | 3 | 2 | 1 | SAME DAY

Fuels & Hydrocarbon Analysis: 5 Standard | 3 | 1 | SAME DAY

OTHER: Specify: _____

* Turnaround request less than standard may incur Rush Charges

APPENDIX E

Terrestrial Ecological Exclusion Form

Voluntary Cleanup Program

Washington State Department of Ecology
Toxics Cleanup Program

TERRESTRIAL ECOLOGICAL EVALUATION FORM

Under the Model Toxics Control Act (MTCA), a terrestrial ecological evaluation is necessary if hazardous substances are released into the soils at a Site. In the event of such a release, you must take one of the following three actions as part of your investigation and cleanup of the Site:

1. Document an exclusion from further evaluation using the criteria in WAC 173-340-7491.
2. Conduct a simplified evaluation as set forth in WAC 173-340-7492.
3. Conduct a site-specific evaluation as set forth in WAC 173-340-7493.

When requesting a written opinion under the Voluntary Cleanup Program (VCP), you must complete this form and submit it to the Department of Ecology (Ecology). The form documents the type and results of your evaluation.

Completion of this form is not sufficient to document your evaluation. You still need to document your analysis and the basis for your conclusion in your cleanup plan or report.

If you have questions about how to conduct a terrestrial ecological evaluation, please contact the Ecology site manager assigned to your Site. For additional guidance, please refer to www.ecy.wa.gov/programs/tcp/policies/terrestrial/TEEHome.htm.

Step 1: IDENTIFY HAZARDOUS WASTE SITE	
Please identify below the hazardous waste site for which you are documenting an evaluation.	
Facility/Site Name: ABW Bayside Marine North Marina	
Facility/Site Address: 1332 West Marine View Drive, Everett, WA 98201	
Facility/Site No: 9286485	VCP Project No.: NW2842

Step 2: IDENTIFY EVALUATOR			
Please identify below the person who conducted the evaluation and their contact information.			
Name: Kathryn Hartley			Title: Senior Scientist
Organization: Landau Associates			
Mailing address: 130 2nd Ave S			
City: Edmonds		State: WA	Zip code: 98020
Phone: (425) 778-0907	Fax: (425) 778-6409	E-mail: khartley@landauinc.com	

Step 3: DOCUMENT EVALUATION TYPE AND RESULTS

A. Exclusion from further evaluation.

1. Does the Site qualify for an exclusion from further evaluation?

☒ Yes *If you answered **"YES,"** then answer **Question 2**.*

☐ No or Unknown *If you answered **"NO" or "UKNOWN,"** then skip to **Step 3B** of this form.*

2. What is the basis for the exclusion? *Check all that apply. Then skip to **Step 4** of this form.*

Point of Compliance: WAC 173-340-7491(1)(a)

☐ All soil contamination is, or will be,* at least 15 feet below the surface.

☐ All soil contamination is, or will be,* at least 6 feet below the surface (or alternative depth if approved by Ecology), and institutional controls are used to manage remaining contamination.

Barriers to Exposure: WAC 173-340-7491(1)(b)

☒ All contaminated soil, is or will be,* covered by physical barriers (such as buildings or paved roads) that prevent exposure to plants and wildlife, and institutional controls are used to manage remaining contamination.

Undeveloped Land: WAC 173-340-7491(1)(c)

☐ There is less than 0.25 acres of contiguous[#] undeveloped[±] land on or within 500 feet of any area of the Site and any of the following chemicals is present: chlorinated dioxins or furans, PCB mixtures, DDT, DDE, DDD, aldrin, chlordane, dieldrin, endosulfan, endrin, heptachlor, heptachlor epoxide, benzene hexachloride, toxaphene, hexachlorobenzene, pentachlorophenol, or pentachlorobenzene.

☒ For sites not containing any of the chemicals mentioned above, there is less than 1.5 acres of contiguous[#] undeveloped[±] land on or within 500 feet of any area of the Site.

Background Concentrations: WAC 173-340-7491(1)(d)

☐ Concentrations of hazardous substances in soil do not exceed natural background levels as described in WAC 173-340-200 and 173-340-709.

* An exclusion based on future land use must have a completion date for future development that is acceptable to Ecology.

[±] "Undeveloped land" is land that is not covered by building, roads, paved areas, or other barriers that would prevent wildlife from feeding on plants, earthworms, insects, or other food in or on the soil.

[#] "Contiguous" undeveloped land is an area of undeveloped land that is not divided into smaller areas of highways, extensive paving, or similar structures that are likely to reduce the potential use of the overall area by wildlife.

B. Simplified evaluation.

1. Does the Site qualify for a simplified evaluation?

☐ Yes *If you answered **"YES,"** then answer **Question 2** below.*

☐ No or Unknown *If you answered **"NO"** or **"UNKNOWN,"** then skip to **Step 3C** of this form.*

2. Did you conduct a simplified evaluation?

☐ Yes *If you answered **"YES,"** then answer **Question 3** below.*

☐ No *If you answered **"NO,"** then skip to **Step 3C** of this form.*

3. Was further evaluation necessary?

☐ Yes *If you answered **"YES,"** then answer **Question 4** below.*

☐ No *If you answered **"NO,"** then answer **Question 5** below.*

4. If further evaluation was necessary, what did you do?

☐ Used the concentrations listed in Table 749-2 as cleanup levels. *If so, then skip to **Step 4** of this form.*

☐ Conducted a site-specific evaluation. *If so, then skip to **Step 3C** of this form.*

5. If no further evaluation was necessary, what was the reason? *Check all that apply. Then skip to **Step 4** of this form.*

Exposure Analysis: WAC 173-340-7492(2)(a)

☐ Area of soil contamination at the Site is not more than 350 square feet.

☐ Current or planned land use makes wildlife exposure unlikely. Used Table 749-1.

Pathway Analysis: WAC 173-340-7492(2)(b)

☐ No potential exposure pathways from soil contamination to ecological receptors.

Contaminant Analysis: WAC 173-340-7492(2)(c)

☐ No contaminant listed in Table 749-2 is, or will be, present in the upper 15 feet at concentrations that exceed the values listed in Table 749-2.

☐ No contaminant listed in Table 749-2 is, or will be, present in the upper 6 feet (or alternative depth if approved by Ecology) at concentrations that exceed the values listed in Table 749-2, and institutional controls are used to manage remaining contamination.

☐ No contaminant listed in Table 749-2 is, or will be, present in the upper 15 feet at concentrations likely to be toxic or have the potential to bioaccumulate as determined using Ecology-approved bioassays.

☐ No contaminant listed in Table 749-2 is, or will be, present in the upper 6 feet (or alternative depth if approved by Ecology) at concentrations likely to be toxic or have the potential to bioaccumulate as determined using Ecology-approved bioassays, and institutional controls are used to manage remaining contamination.

C. Site-specific evaluation. A site-specific evaluation process consists of two parts: (1) formulating the problem, and (2) selecting the methods for addressing the identified problem. Both steps require consultation with and approval by Ecology. *See* WAC 173-340-7493(1)(c).

1. Was there a problem? *See* WAC 173-340-7493(2).

☐ Yes *If you answered **"YES,"** then answer **Question 2** below.*

☐ No *If you answered **"NO,"** then identify the reason here and then skip to **Question 5** below:*

- ☐ No issues were identified during the problem formulation step.
- ☐ While issues were identified, those issues were addressed by the cleanup actions for protecting human health.

2. What did you do to resolve the problem? *See* WAC 173-340-7493(3).

☐ Used the concentrations listed in Table 749-3 as cleanup levels. *If so, then skip to **Question 5** below.*

☐ Used one or more of the methods listed in WAC 173-340-7493(3) to evaluate and address the identified problem. *If so, then answer **Questions 3 and 4** below.*

3. If you conducted further site-specific evaluations, what methods did you use?
Check all that apply. See WAC 173-340-7493(3).

- ☐ Literature surveys.
- ☐ Soil bioassays.
- ☐ Wildlife exposure model.
- ☐ Biomarkers.
- ☐ Site-specific field studies.
- ☐ Weight of evidence.
- ☐ Other methods approved by Ecology. If so, please specify:

4. What was the result of those evaluations?

- ☐ Confirmed there was no problem.
- ☐ Confirmed there was a problem and established site-specific cleanup levels.

5. Have you already obtained Ecology's approval of both your problem formulation and problem resolution steps?

☐ Yes If so, please identify the Ecology staff who approved those steps:

☐ No

Step 4: SUBMITTAL

Please mail your completed form to the Ecology site manager assigned to your Site. If a site manager has not yet been assigned, please mail your completed form to the Ecology regional office for the County in which your Site is located.

Northwest Region: Attn: VCP Coordinator 3190 160th Ave. SE Bellevue, WA 98008-5452	**Central Region:** Attn: VCP Coordinator 15 W. Yakima Ave., Suite 200 Yakima, WA 98902
Southwest Region: Attn: VCP Coordinator P.O. Box 47775 Olympia, WA 98504-7775	**Eastern Region:** Attn: VCP Coordinator N. 4601 Monroe Spokane WA 99205-1295

APPENDIX F

Soil Cleanup Action Design Details

LEGEND

- B-1: SOIL CLEANUP ACTION AREA AND DESIGNATION TO BE EXCAVATED AS PART OF PROJECT
- EXISTING PAVED AREA
- L2-1: EXCAVATION REFERENCE POINT DESIGNATION
- MONITORING WELL LOCATION

TABLE A: EXCAVATION AREA COORDINATES (1)

CONTAMINATED SOIL AREA DESIGNATION	REFERENCE POINT DESIGNATION	REFERENCE POINT NORTHING	REFERENCE POINT EASTING
AREA B-1:	B1-1	367900.06	1301950.45
	B1-2	367892.81	1302130.21
	B1-3	367852.46	1302137.33
	B1-4	367853.01	1302107.91
	B1-5	367620.06	1302106.99
	B1-6	367620.55	1301981.40
	B1-7	367853.91	1301988.15
	B1-8	367855.17	1301950.32
AREA B-1a:	B1a-1	367620.55	1301981.40
	B1a-2	367730.55	1301984.81
	B1a-3	367730.55	1302037.71
	B1a-4	367620.02	1302036.55
AREA L-1:	L1-1	367821.18	1302392.42
	L1-2	367781.40	1302352.27
	L1-3	367819.64	1302314.37
	L1-4	367864.16	1302358.80
AREA L-2:	L2-1	367892.56	1302183.82
	L2-2	367875.67	1302212.59
	L2-3	367851.54	1302211.71
	L2-4	367851.88	1302168.34
AREA L-3:	L3-1	367892.81	1302130.20
	L3-2	367892.56	1302183.82
	L3-3	367851.88	1302168.18
	L3-4	367852.46	1302137.32

TABLE B: EXCAVATION AREA DEPTHS

CONTAMINATED SOIL AREA DESIGNATION	APPROXIMATE AREA (SF)	OVERBURDEN EXCAVATION DEPTH (FT)(2)	CONTAMINATED SOIL EXCAVATION DEPTH (FT)(2)	DISPOSAL DESIGNATION
~~AREA B-1:~~	~~35,752~~	~~0~~	~~1.0~~	~~INERT WASTE~~
AREA B-1a:	6,108	0	1.0	SOLID WASTE
~~AREA L-1:~~	~~2,915~~	~~0.25~~ (3)	~~1.5~~	~~INERT WASTE~~
AREA L-2:	1,588	0	1.0	INERT WASTE
AREA L-3:	1316	1.5	2.5	SOLID WASTE

NOTES:

1) NORTHINGS AND EASTINGS ARE BASED ON SITE COORDINATE SYSTEM AND CONTROL POINTS AND DO NOT CORRESPOND TO STATE PLANE COORDINATES. EXCAVATION AREA COORDINATES ARE ONLY APPROXIMATE WHEN BASED ON SITE FEATURES SUCH AS FENCE LINES OR EDGE OF PAVEMENT. EXCAVATIONS SHALL BE COMPLETED TO THE SITE FEATURES INDICATED.
2) DEPTH MEASURED FROM ORIGINAL GROUND SURFACE.
3) AREA IS PAVED. CONTAMINATED SOIL EXCAVATION TO COMMENCE IMMEDIATELY BELOW PAVEMENT.
4) EXISTING GROUNDWATER MONITORING WELLS TO BE PROTECTED UNTIL PROPERLY ABANDONED BY PORT REPRESENTATIVE.
5) PROTECT ALL UTILITIES FROM DAMAGE IN ACCORDANCE WITH SPECIFICATION 01560.

N

SCALE IN FEET
30 0 30 60

100% DESIGN REVIEW SUBMITTAL

NOTE: "L" — IF "L" DOES NOT MEASURE 1" ADJUST SCALES ACCORDINGLY.

PORT OF EVERETT | V:\1470201821FS\SV Cleanup Action-Final\CS1_7Revised.dwg (A) 'CS1.2' 10/4/2007

Port of EVERETT
P.O. BOX 538
EVERETT, WA 98206
(425) 259-3164

LANDAU ASSOCIATES
130 2nd Avenue South
Edmonds, Washington 98020
Ph: 425 778-0907

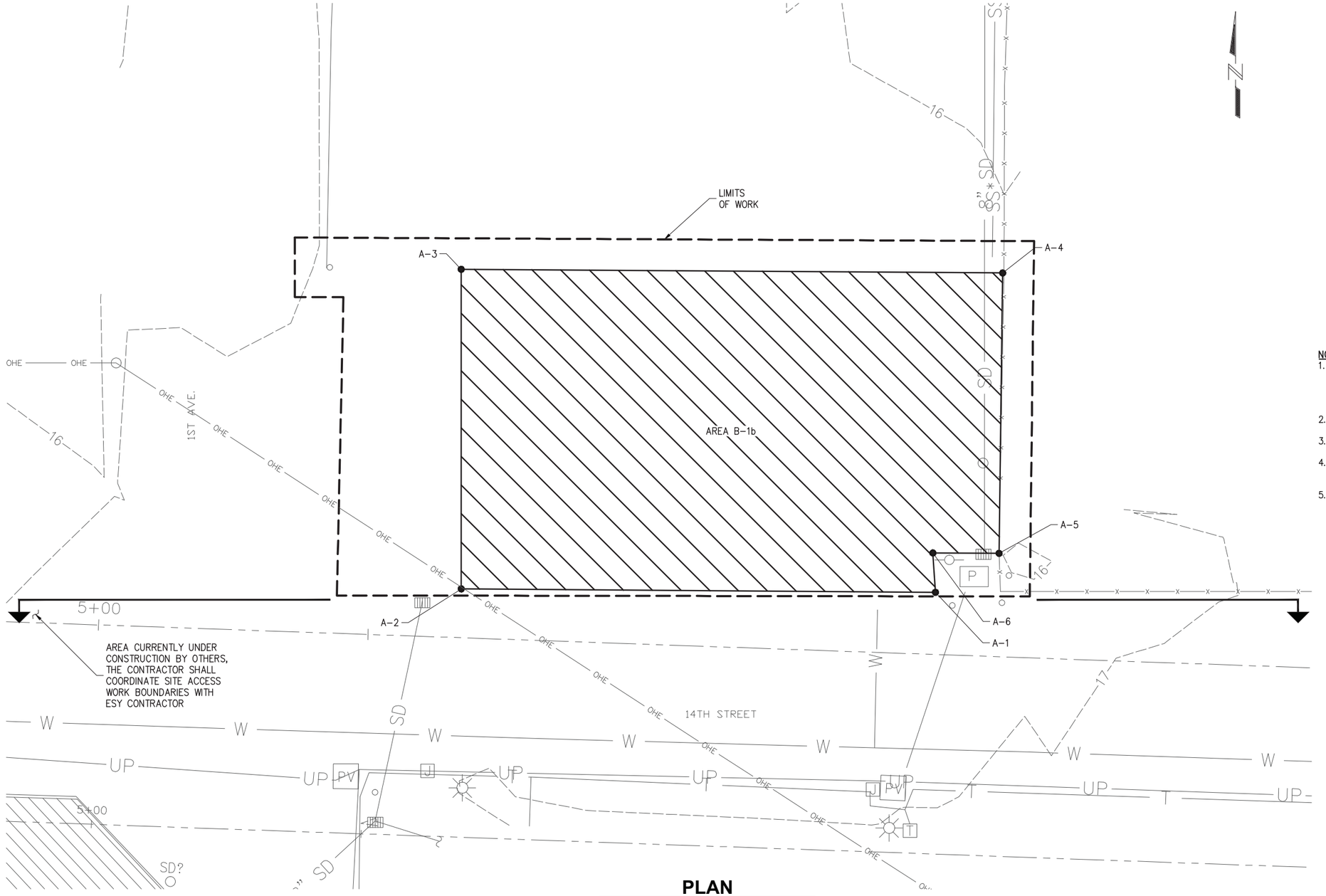
NO.	DATE	BY	REVISION
1	10/4/07	ERG	ADDED CLEANUP ACTION AREA B-1a TO ADDRESS AREA OF SOLID WASTE

DAVID A. PISCHER — STATE OF WASHINGTON — 19777 — REGISTERED PROFESSIONAL ENGINEER
EXPIRES: 7/18/2006

PROJECT ENGINEER: D. PISCHER	SCALE: 1"=30'
DESIGNED BY: L. BEARD	DATE: MAY 5, 2006
DRAWN BY: C. BATCHELOR	CHECKED BY: D. PISCHER
APPROVED BY:	

PORT OF EVERETT
NORTH MARINA REDEVELOPMENT
SHALLOW SOIL VCP CLEANUP ACTION
SOIL CLEANUP ACTION DETAILS

DWG. NO. CS1.2
CIP NO. 3-0-003-09
PROJECT NO. PD-NM-2006-03
SHEET NO. 6 OF 11



PLAN

0 5 10 20 30 FT.

AREA B-1b EXCAVATION COORDINATE TABLE		
REFERENCE POINT DESIGNATION	REFERENCE POINT NORTHING	REFERENCE POINT EASTING
A-1	367560.03	1302094.30
A-2	367561.06	1302006.36
A-3	367620.33	1302006.36
A-4	367619.66	1302106.75
A-5	367567.65	1302106.09
A-6	367567.73	1302093.81

NOTES:
1. NORTHINGS AND EASTINGS CORRESPOND TO STATE PLANE COORDINATES. EXCAVATION AREA COORDINATES ARE ONLY APPROXIMATE WHEN BASED ON SITE FEATURES SUCH AS FENCE LINES OR EDGE OF PAVEMENT. EXCAVATION SHALL BE COMPLETED TO THE SITE FEATURES INDICATED.
2. PROTECT ALL UTILITIES TO REMAIN FROM DAMAGE IN ACCORDANCE WITH SPECIFICATION 01560.
3. EXCAVATE CONTAMINATED SOIL TO 3 FT BELOW EXISTING GROUND SURFACE IN AREA B-1b CONSISTENT WITH SPECIFICATION 02315.
4. EXCAVATION MAY BE EXPANDED TO ADDRESS ADDITIONAL CLEANUP REQUIREMENTS IDENTIFIED DURING CONSTRUCTION, AS DIRECTED BY THE PORT.
5. THE CONTRACTOR SHALL COORDINATE SITE ACCESS WORK BOUNDARIES WITH ESY CONTRACTOR.

LEGEND

SOIL CLEANUP AREA

IF THIS DRAWING IS NOT 22"x34" SCALE ACCORDINGLY.

ISSUED FOR CONSTRUCTION

G:\Projects\147\tempLDB\144053.01-D1.3.dwg

Port of Everett
P.O. BOX 538
EVERETT, WA 98206
(425) 259-3164

LANDAU ASSOCIATES
130 2nd Avenue South
Edmonds, Washington 98020
Ph: 425-778-0907

NO.	DATE	BY	REVISION
0	11/24/14	LDB	ISSUED FOR CONSTRUCTION

LAWRENCE D. BEARD — STATE OF WASHINGTON — 24755 — REGISTERED PROFESSIONAL ENGINEER
11/24/14

PROJECT ENGINEER: J. KEISER	SCALE: NOTED
DESIGNED BY: L. BEARD	DATE: NOVEMBER 2014
DRAWN BY: G. DEAN	CHECKED BY: C. WIEST
APPROVED BY:	

PORT OF EVERETT

ABW/BAYSIDE MARINE VCP SITE CLEANUP ACTION
SOIL CLEAN UP ACTION DETAILS

DWG. NO.	D1.3
CIP NO.	3-0-012-07
PROJECT NO.	PD-CM-2014-16
SHEET NO.	7 OF 8